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KENNAMETAL®

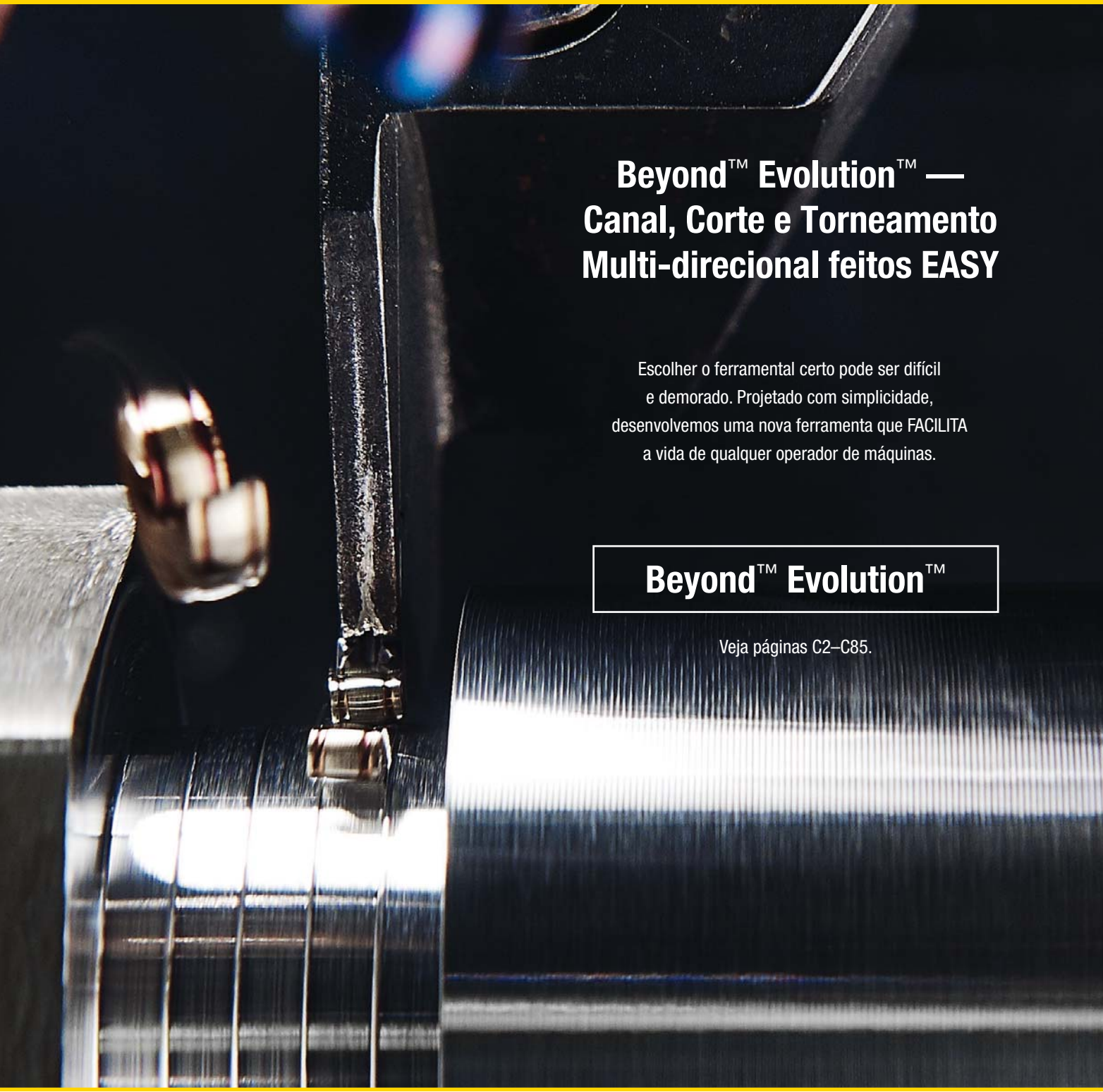
CATÁLOGO
MASTER 2018

VOLUME UM | FERRAMENTAS DE **TORNEAMENTO**



Torneamento ISO | Canal e corte | Rosqueamento | Aplicação específica

KENNAMETAL



Beyond™ Evolution™ — Canal, Corte e Torneamento Multi-direcional feitos EASY

Escolher o ferramental certo pode ser difícil e demorado. Projetado com simplicidade, desenvolvemos uma nova ferramenta que FACILITA a vida de qualquer operador de máquinas.

Beyond™ Evolution™

Veja páginas C2–C85.

Desde sua formação em 1938, a Kennametal sabe perfeitamente como melhorar a performance e a rentabilidade da produção — oferecendo produtos e serviços sem paralelo e reduzindo os custos operacionais e o tempo de entrega.

São mais de 900+ páginas que trazem a você o que há de mais moderno em produtos de torneamento e serviços de qualidade, especificamente planejados para aumentar a produtividade em geral, mesmo nas aplicações de usinagem mais difíceis.

Confie na Kennametal para melhorar significativamente a competitividade da produção. Para saber mais, contate seu Representante Kennametal ou um Distribuidor Autorizado Kennametal.

Visite-nos no site **kennametal.com**.

POWERED BY NOVO™

Volume Um • Ferramentas de torneamento

Este Catálogo Consiste em Dois Volumes - Volume Um: Ferramentas de Torneamento / Volume Dois: Ferramentas Rotativas

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Torneamento

PRODUTOS EM DESTAQUE

BEYOND™ EVOLUTION™

Para mais detalhes, veja a seção C.

A Kennametal tem a satisfação de apresentar a plataforma Beyond™ Evolution™. Esta plataforma inovadora é baseada na simplicidade e nos desafios da abordagem atual de canais e corte. A seleção da ferramenta correta é fácil com a plataforma Beyond™ Evolution™, porque esse sistema de alta performance é versátil e flexível. É o primeiro portfólio no mercado que compete com todas as aplicações de canais e corte, com até 35% menos ferramental em relação aos concorrentes.

O sistema de fornecimento de refrigerante exclusivo direciona o refrigerante precisamente para as arestas de corte sob o cavaco, o qual representa o melhor método para remoção de calor nas aplicações de canais e corte.



beyond™ EVOLUTION™



beyond™ DRIVE™

BEYOND™ DRIVE™

Para mais detalhes, veja a seção B.

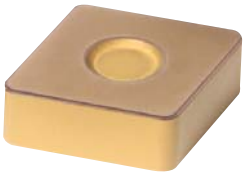
Os insertos de torneamento Beyond™ Drive™ ISO fornecem até 50% mais de utilização de aresta de inserto. O tratamento de superfície reduz a fadiga do revestimento e melhora a sua adesão. A camada exterior de bronze simplifica a detecção de desgaste e aumenta a utilização do inserto. As classes de PVD, KCU10™ e KCU25™, com tecnologia Beyond™, resistem à altas temperaturas de usinagem em ligas tenazes. Obtenha uma vida útil da ferramenta de 30 a 40% maior e mais lucratividade nos mercados de engenharia geral, transporte, aeroespacial, energia e terraplanagem. O revestimento de PVD ajuda a manter um controle do cavaco consistente e minimiza o desgaste da aresta do inserto no torneamento, canais e operações de corte, em uma ampla gama de materiais e aplicações.



TORNEAMENTO DE FERRO FUNDIDO COM KBK45™

Para mais detalhes, veja a seção B.

A KBK45 é uma nova classe de alto teor de PcBN, planejada para usinagem de alta performance de ferro fundido cinzento, como discos de freio e volantes. É projetada para reduzir a perda de cantos não usados, diminuindo o custo por peça (CPP) da produção através do uso de produtos mais confiáveis. A classe KBK45 proporciona um excelente valor de CPP.



TORNEAMENTO DURO COM A KBH20™

Para mais detalhes, veja a seção B.

A KBH20 é a classe de torneamento duro ideal de PcBN em aplicações contínuas até ligeiramente interrompidas com interrupção média a severa. A estrutura e as diferentes preparações de aresta permitem tolerâncias da peça justas e repetidas, além de excelente acabamento e integridade superficial, mesmo em velocidades elevadas.

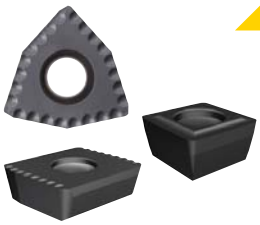
A classe KBH20 representa um novo substrato para aplicações como componentes cementados, incluindo engrenagens, eixos e outros componentes do sistema de transmissão.

O revestimento nanocompósito aumenta a capacidade de velocidade e a vida útil da ferramenta. A preparação de aresta aprimorada promove uma maior vida útil da ferramenta, performance confiável e melhor acabamento superficial.



Holemaking

PRODUTOS EM DESTAQUE



DRILL FIX™ DFSP™

BROCAS INTERCAMBIÁVEIS COM INSERTOS DS E LP

Para mais detalhes, veja a seção J (Volume Dois).

A DFSP foi renomeada para a plataforma de furação indexável Drill Fix DFS™ ampliada. O intervalo de diâmetro padrão agora é de 14–55mm nas proporções L/D 2 x D, 3 x D, 4 x D e 5 x D. A plataforma DFSP combina inserto externo quadrado econômico com as capacidades de centralização superiores do inserto interno trigonal. As brocas intercambiáveis oferecem elevada taxa de remoção de material (MRR) combinadas com uma alta qualidade superficial e retilinidade do furo.

Utilize os novos desenhos de pastilha com quebra-cavaco DS e LP com as brocas intercambiáveis Drill Fix DFSP, DFT™ e HTS, além das brocas modulares KSEM PLUS™. Esses insertos possibilitam uma excelente formação de cavacos em aços com baixo teor de carbono e outros materiais de cavacos longos.

KENTIP™ FS

A PERFEITA FUSÃO DA BROCA DE METAL DURO COM A BROCA INTERCAMBIÁVEL.

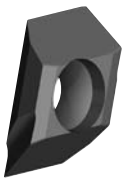
Para mais detalhes, veja a seção H (Volume Dois).

A nova broca modular KenTIP FS cobre mais aplicações e proporciona melhores desempenhos que qualquer outro sistema modular, fornecendo ganhos substanciais e simplificações de processo no seu chão de fábrica.

- 3 geometrias de ponta, 3 classes de alto desempenho, 3 diferentes estilos de haste.
- Faixa de diâmetros 6–26mm.
- Profundidades de furação até 12 x D.
- Aplicável em aço, aço inoxidável e ferro fundido.







COUNTERFIX MICRO

PEQUENOS INSERTOS QUE FAZEM UMA GRANDE DIFERENÇA!

Para mais detalhes, veja a seção H (Volume Dois).

Os novos insertos tangenciais CounterFix Micro (CFM) são uma nova maneira de melhorar as operações de furação, chanfro e escareamento. Eles permitem etapas incrementais muito pequenas em brocas escalonadas feitas à medida, maior vida útil da ferramenta por aresta, além de acabamento superficial melhorado.

Os insertos CFM podem ser usados nos produtos KenTIP, KSEM™ e Drill Fix, assim como em ferramentas de escareamento indexáveis feitas sob pedido.

CounterFix Micro estará disponível para brocas KenTIP FS especiais em 2018 sob pedido.

NOVAS BROCAS SGL COM REFRIGERAÇÃO INTERNA PARA AÇOS INOXIDÁVEIS

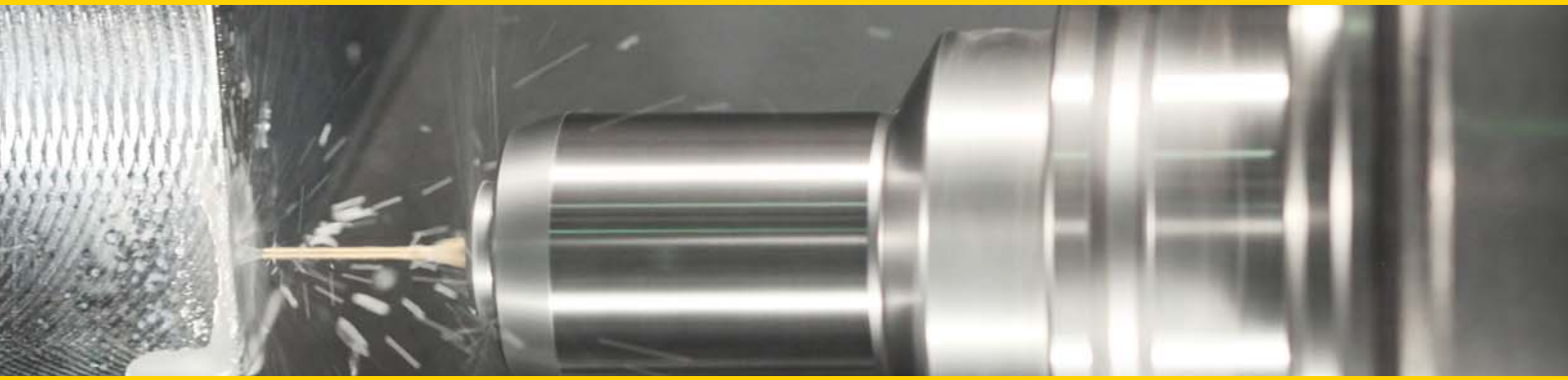
Para mais detalhes, veja a seção G (Volume Dois).

As totalmente novas séries de brocas de metal duro B21_SGL são projetadas especificamente para aplicações em aços inoxidáveis, oferecendo alto desempenho e longa vida útil também em super ligas e aços regulares. Combinando características únicas da Kennametal, tais como a nova geometria de ponta SGL com redução de aresta transversal patenteada, um formato de canal diferenciado e excelente cobertura numa única ferramenta, a broca B21*SGL é a mais nova ferramenta de produção para alto volume.

A nova série B27_SGL é projetada especificamente para furação profunda até 40 x D em aço inoxidável e super ligas.









NOVA BROCAS KMH PARA MATERIAIS DUROS

Para mais detalhes, veja a seção G (Volume Dois).

As novas brocas de metal duro KMH são projetadas para aplicações em materiais duros até 65 HRc. A broca B94_ sem refrigeração interna é especialmente projetada furar materiais duros e com superfície endurecida usando refrigeração externa. Com ângulo de ponta 145°, ela é perfeitamente adequada como broca piloto para a broca B95_ com 140° de ângulo de ponta e refrigeração interna para aplicações mais profundas.

Ambas as séries vem com núcleo maior para fortalecer a broca e aresta de corte curva com chanfros nas pontas de corte para evitar lascas nas guias e proporcionar maior vida útil nesses materiais desafiadores.

ALARGADORES COM FORMATO DE DISCO RMR™ E RHR™

Para mais detalhes, veja a seção K (Volume Dois).

Performance, qualidade e possibilidade de reafiação, como os alargadores de metal duro para diâmetros de 14 a 42,5mm.

Alargadores comuns possuem pontas individuais, soldadas sobre um corpo de aço. Os novos alargadores Kennametal RMR e RHR têm um disco de metal duro soldado sobre o corpo de aço. Isso permite mais reafiamentos do que um alargador com ponta regular, o que reduz o custo por furo significativamente. O novo revestimento KCU05 mantém o acabamento superficial mais do dobro do tempo do que revestimentos de alargadores convencionais, dependendo do material da peça.





GOTAP™

MACHOS DE ROSQUEAMENTO HSS-E MULTIUSO

Para mais detalhes, veja a seção M (Volume Dois).

O sistema GOtap é uma linha multiuso de machos de rosqueamento que inclui geometrias otimizadas e revestimentos PVD com habilidade de rosqueamento em uma ampla gama de materiais de ferro fundido nodular, como aço inoxidável, aço carbono e aços-liga, alumínio fundido e ferro dúctil. A versatilidade dos machos GOtap é ampliada além da peça, uma vez que pode ser usado em uma ampla gama de máquinas-ferramenta e condições de aplicação. Os novos machos GOtap TC multiaplicação permitem o rosqueamento de furos cegos com suportes de tensão/compressão, sem os problemas de dimensionamento devido ao excesso de avanço. A versatilidade incomparável dos machos GOtap significa custos de inventário menores, sem perda de produtividade, vida útil da ferramenta consistente e acabamento de rosca com alta qualidade.

Fresamento de topo inteiriço

PRODUTOS EM DESTAQUE

DUO-λOCK®

Para mais detalhes, veja a seção O (Volume Dois).

O sistema Duo-Lock™ é um novo método de acoplamento revolucionário para aplicações de fresamento de topo de metal duro. Este design de cabeçote substituível combina uma alta precisão em batimento e repetibilidade em comprimento com estabilidade máxima, tornando-a uma interface precisa e quase inquebrável para aplicações desafiadoras de fresamento.

- **A medida de até 1 x D de canal completo eleva as taxas de remoção de materiais, aumentando significativamente a produtividade.**
- **A medida de 1,5 x D de comprimento de aresta de corte padrão permite menos passagens.**
- **Dados de corte e vida útil da ferramenta comparáveis com ferramentas de metal duro de alta performance.**



DUO-λOCK®
da HAIMER® e Kennametal



FAMÍLIA HARVI™ III

Para mais detalhes, veja a seção P (Volume Dois).

As fresas HARVI III são a primeira escolha para usinagem de ligas resistentes à altas temperaturas, perfilagem, semiacabamento e acabamento. A classe Beyond KCSM15™ fornece altas taxas de remoção de material e vida útil da ferramenta excepcional, em titânio e aço inoxidável, e também promove um excelente acabamento superficial.

- **Ponta esférica cônica para usinagem complexa de 5 eixos.**
- **Ponta esférica para fresamento de perfil 3D.**
- **Extremidade quadrada para operações de acabamento e semiacabamento.**

beyond



FRESAS DE TOPO CERÂMICAS INTEIRIÇAS BEYOND™ EADE

Para mais detalhes, veja a seção P (Volume Dois).

As fresas de topo cerâmicas inteiriças Beyond™ EADE oferecem maior produtividade em desbaste de ligas resistentes a altas temperaturas à base de níquel. Apresentando tempo de usinagem reduzido, as fresas de topo cerâmicas EADE também proporcionam uma maior vida útil da ferramenta em comparação com o ferramental de metal duro.

— A classe Beyond KYS40™ permite velocidades de corte de até 1000 m/min.



beyond



PLATAFORMA GOMILL™ GP

Para mais detalhes, veja a seção Q (Volume Dois).

As ferramentas GOmill GP oferecem operação de fresamento de mergulho, abertura de canais e perfilagem com maior vida útil da ferramenta, em uma ampla gama de materiais das peças. Elas são projetadas para oferecer altas taxas de remoção de material (MRR) bom acabamento superficial a um excelente custo-benefício.

— Desbaste e acabamento com uma única ferramenta.

— Excelente custo-benefício.

— Classes KC633M™ multicamadas para maior vida útil da ferramenta.

Fresamento intercambiável

PRODUTOS EM DESTAQUE

MILL 4-11™ E MILL 4-15™

Para mais detalhes, veja a seção T (Volume Dois).

As séries de fresas Mill 4-11™ e Mill 4-15™ são especialmente desenvolvidas para fornecer uma excelente qualidade superficial, além de taxas de remoção de material superiores, em aplicações de fresamento de canto. Seu design exclusivo permite passadas múltiplas (redução) com excelentes resultados.

Use a Mill 4-11 em operações de desbaste a acabamento, em aço, ferro fundido, aço inoxidável, materiais não ferrosos e ligas resistentes à altas temperaturas. Use a Mill 4-15 para operações de desbaste a acabamento em aço, ferro fundido, aço inoxidável e titânio.





MILL 16™

Para mais detalhes, veja a seção S (Volume Dois).

A nova série Mill 16™ é uma plataforma feita sob medida para fresamento de desbaste de componentes em materiais de ferro fundido (CGI, DCI, GCI), como cabeçotes e blocos, carcaças, caixas de engrenagem e todas as outras operações de fresamento de face em ferro fundido.



KCSM40™

NOVA CLASSE DE FRESAMENTO PARA USINAGEM DE TITÂNIO

Inovadora classe de fresamento intercambiável para operações de desbaste e semiacabamento em titânio e aço inoxidável. Faixa de aplicação S40, M30.

Disponível para as seguintes plataformas de fresamento intercambiável: Mill 1-10™, Mill 1-14™, Mill 1-18™, Mill 4-11™, Mill 4-15™, Dodeka™ Mini, Dodeka, Dodeka MAX™, MEGA™, KSOM™ Mini, KSOM™, KSRM™, NGE™, KSSM™ 90, KSSM8+™, Rodeka™, Stellram® 5230, Stellram 7713 e Stellram 7792.





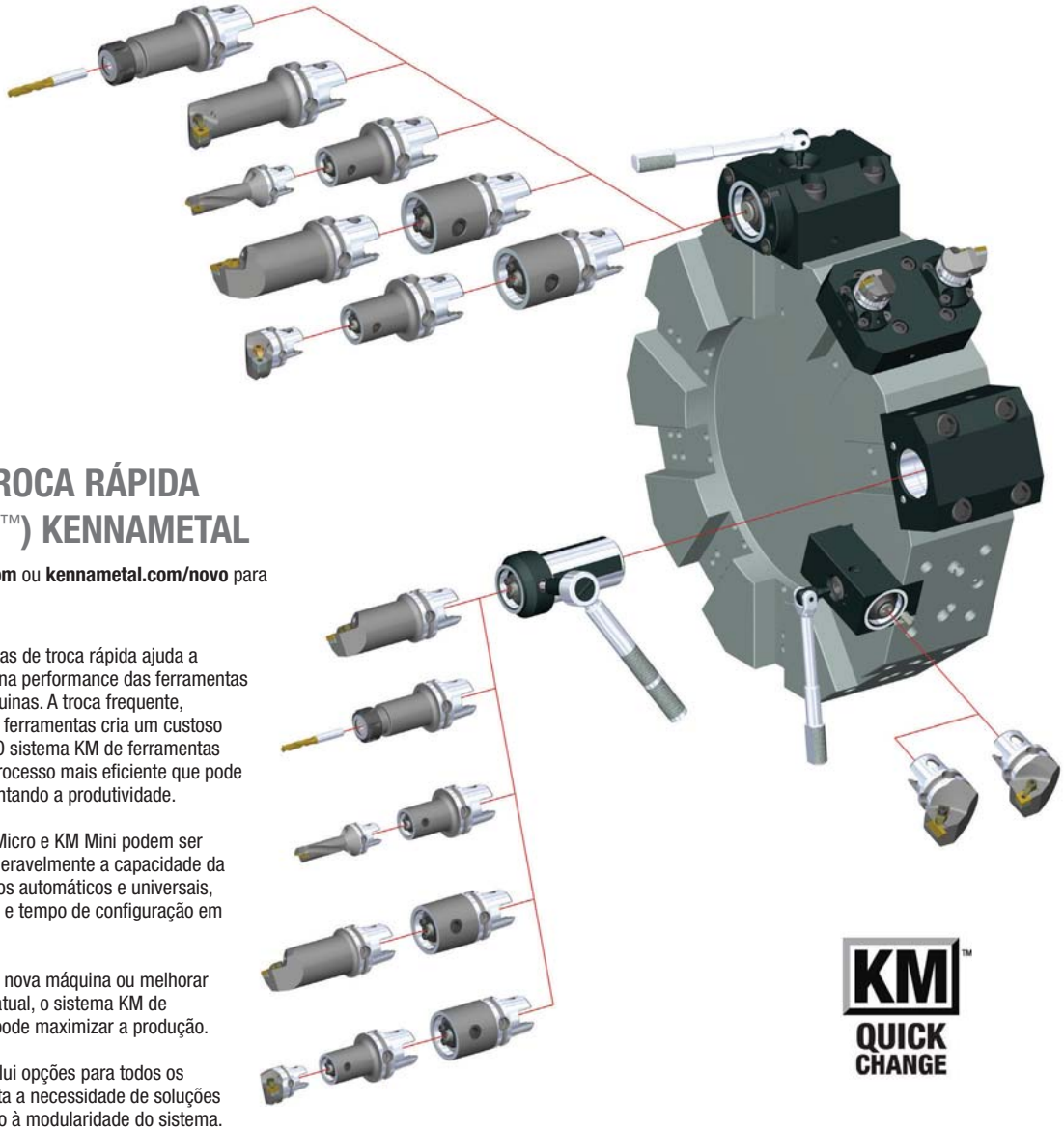
FRESAS DE ALTO AVANÇO STELLRAM® 7792VX

Para mais detalhes, veja a seção V (Volume Dois).

A série de fresas 7792VX foi projetada para aplicações de fresamento de alto avanço com acabamento superficial superior. As fresas 7792VX são projetadas para uma ampla gama de aplicações, incluindo faceamento, fresamento de cavidade, fresamento de rampa, interpolação helicoidal e fresamento de mergulho. Elas são capazes de fazer usinagem em todos os materiais, como aço, aço inoxidável, ferro fundido, ligas resistentes à alta temperatura e de alumínio.

Sistemas de ferramental

PRODUTOS EM DESTAQUE



SISTEMA DE TROCA RÁPIDA MODULAR (KM™) KENNAMETAL

Acesse o site **kennametal.com** ou **kennametal.com/novo** para obter mais detalhes.

O sistema KM™ de ferramentas de troca rápida ajuda a atingir melhorias dramáticas na performance das ferramentas de corte e produção das máquinas. A troca frequente, configuração, e calibração de ferramentas cria um custoso tempo morto das máquinas. O sistema KM de ferramentas de troca rápida fornece um processo mais eficiente que pode reduzir o tempo morto, aumentando a produtividade.

Além disso, os sistemas KM Micro e KM Mini podem ser usados para aumentar consideravelmente a capacidade da máquina-ferramenta em tornos automáticos e universais, além de diminuir a indexação e tempo de configuração em até 66%.

Se você procura equipar uma nova máquina ou melhorar a produção do equipamento atual, o sistema KM de ferramentas de troca rápida pode maximizar a produção.

O portfólio do sistema KM inclui opções para todos os requisitos de aplicação e limita a necessidade de soluções customizadas custosas devido à modularidade do sistema.

KM™ QUICK CHANGE



KM4X™

Acesse o site **kennametal.com** ou **kennametal.com/novo** para obter mais detalhes.

A interface de fuso da KM4X é projetada para as aplicações de usinagem pesada. É especialmente adequada para usinagem de componentes estruturais. Esses adaptadores de ferramentas rotativas e estáticas possuem três vezes mais capacidade de flexão que os modelos semelhantes da concorrência.

- Configuração rígida por meio de uma força de fixação maior.
- O projeto permite configuração frontal do fuso.
- Capacidade de alta velocidade do fuso.
- Planejado para uso na maioria das aplicações.
- Use em uma ampla gama de velocidades e torques altos e baixos.
- Possibilidade de atualização para a KM4X em fusos que usam o formato HSK.
- Mantenha o contato cônico em altas velocidades.





BLOCOS DE FERRAMENTAL ACIONÁVEL E FERRAMENTA ESTÁTICA

Acesse o site **kennametal.com** ou **kennametal.com/novo** para obter mais detalhes.

Transforme seu torno CNC em um fornecedor de soluções multitarefa com unidades de fixação acionáveis, adaptadas ao torno revólver, para aplicações de rotação e blocos de ferramentas estáticas para garantir a máxima flexibilidade de troca rápida. Seja para fresamento, furação, rosqueamento, mandrilamento ou aplicações sem rotação, é possível maximizar a utilização da máquina empregando o ferramental e soluções da Kennametal. Disponível em vários tamanhos e formatos do sistema KM™ para permitir versatilidade e produtividade.

- Opções de 0 e 90° estão disponíveis como padrão.
- Velocidades de até 12.000 RPM garantem altas taxas de remoção de material.
- Relações de engrenagens de 1:1 e 1:2 estão disponíveis para aumentar a velocidade ou torque.
- Estão disponíveis configurações padrão para vários fabricantes e customizáveis para adaptar-se à maioria dos tornos revólver.
- Soluções de troca rápida estão disponíveis para aplicações estáticas e de rotação para maximizar a eficiência das máquinas.

MANDRILAMENTO AJUSTÁVEL

Acesse o site **kennametal.com** ou **kennametal.com/novo** para obter mais detalhes.

As barras de furo ajustável da Kennametal podem aumentar a produtividade e solucionar a vibração por ressonância e outros problemas em operações de mandrilamento demorado.

As várias melhorias importantes em nosso portfólio de barras de furo ajustáveis atual incluem:

- O processo de ajuste fino aprimorado na área de fabricação garante o ajuste preciso na projeção máxima.
- Nitruração de barra de furo ajustável de aço para eliminar os efeitos de lavagem do cavaco.
- A eliminação de facetas nas barras de furo ajustáveis aumenta a estabilidade e a fixação correta da ferramenta.
- O acréscimo de uma pequena faceta no anel de conexão permite o uso de uma ferramenta com altura central.
- Melhor processo de montagem.



A Kennametal na internet

kennametal.com

ENCONTRE AS ÚLTIMAS INFORMAÇÕES SOBRE OS PRODUTOS

Se a sua atividade é torneamento, fresamento ou holemaking, as marcas da Kennametal são as ferramentas de alta performance que você precisa. Oferecemos soluções padrão e customizadas para uma ampla gama de aplicações.

Encontre informações sobre as nossas mais recentes campanhas e catálogos.



Registre-se no Konnect para obter as funcionalidades completas do site de pedidos on-line da Kennametal.

ENTRE EM CONTATO CONOSCO

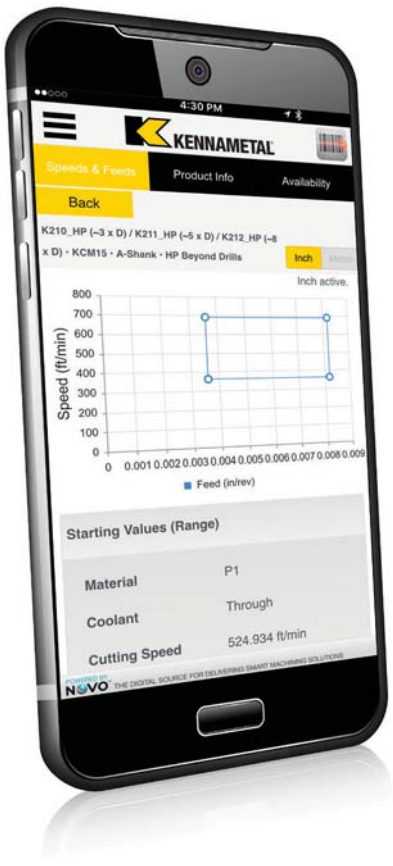
Nossos clientes são importantes para nós. Nós queremos proporcionar a você o melhor atendimento ao cliente do setor. Se você tiver um comentário ou uma pergunta, envie para nós. Faremos o possível para responder a todas as consultas dentro de 24 horas.

ENCONTRE UM DISTRIBUIDOR AUTORIZADO LOCAL EM SUA ÁREA

A Kennametal oferece produtos e serviços de classe mundial em todo o mundo. Nossos distribuidores nos conhecem e, mais importante, eles conhecem você. Eles sabem melhor que qualquer pessoa no setor como fazer a potência global da Kennametal trabalhar para você — na sua indústria, na sua região e para seus negócios.

Aplicativo móvel

O aplicativo móvel da Kennametal torna mais fácil acessar as informações sobre produtos, calculadoras e muito mais, a partir de dispositivos iPhone® e Android™.



CARACTERÍSTICAS

Faça o escaneamento do código de barras do pacote de ferramentas Kennametal ou pesquise pelo número de catálogo do produto para acessar as informações completas sobre os produtos.

As informações sobre produtos incluem imagens das ferramentas, dimensões, classes e destaques de produtos.

Verifique a disponibilidade de produtos em locais globais.

Obtenha informações sobre velocidade e avanço em valores no sistema métrico e em polegadas para todos os produtos de corte de metal.

Veja dicas técnicas para soluções úteis aos problemas comuns de usinagem.

Entre em contato com o atendimento a clientes diretamente a partir do aplicativo.

CALCULADORAS DE USINAGEM

Visualize dados para aplicações de fresamento e furação.

Valores calculados em polegadas ou no sistema métrico.

PEDIDOS

Faça seu login usando suas credenciais do Konnect para concluir uma compra.

ONDE ENCONTRÁ-LO

Baixe o aplicativo gratuito ainda hoje na loja do iTunes® ou Google Play™.

ANDROID APP ON Google play

Available on the App Store

Serviço e suporte

Suporte à aplicação do cliente (CAS)

Obtenha respostas rápidas e confiáveis para os seus problemas de usinagem de metais mais difíceis

A nossa Equipe de Suporte de Aplicação do Cliente (CAS) é o recurso de suporte líder da indústria de usinagem de metal para soluções de aplicação de ferramentas e resolução de problemas.

Fácil acesso para conhecimento comprovado em usinagem!

Os Engenheiros de Aplicação do Cliente da Kennametal ajudam os clientes e grupos de engenharia em todo o mundo, com seleção especializada de ferramentas e recomendações de aplicação para toda a gama de ferramentas Kennametal.

EXCELÊNCIA EM NÍVEL DE SERVIÇO	Resposta telefônica rápida. Soluções técnicas rápidas. Gestão eficiente de casos.
SERVIÇOS	Parâmetros de operação. Otimização do processo. Suporte de hardware. Seleção de ferramental. Solução de problemas.
MELHORES FERRAMENTAS E TECNOLOGIAS DE SUPORTE	Base de dados de materiais. Calculadores de aplicação. Especialistas em performance de ferramental.



País original	Idioma	Telefone	E-mail
Austrália	Inglês	1800 666 667	ap-kmt.techsupport@kennametal.com
Áustria	Alemão	0800 202873	eu.techsupport@kennametal.com
Bélgica	Inglês/Francês	0800 80850	eu.techsupport@kennametal.com
China	Chinês	400 889 2238	k-cn.techsupport@kennametal.com
Dinamarca	Inglês	808 89298	na.techsupport@kennametal.com
Finlândia	Inglês	0800 919412	na.techsupport@kennametal.com
França	Francês	080 5540 367	eu.techsupport@kennametal.com
Alemanha	Alemão	0800 0006651	eu.techsupport@kennametal.com
Índia	Inglês	1 800 103 5227	in.techsupport@kennametal.com
Israel	Inglês	1809 449889	na.techsupport@kennametal.com
Itália	Italiano	800 916561	eu.techsupport@kennametal.com
Japão	Inglês	03 3820 2855	ap-kmt.techsupport@kennametal.com
Coreia do Sul	Inglês	+82 2 2100 6100	ap-kmt.techsupport@kennametal.com
Malásia	Inglês	1800 812 990	ap-kmt.techsupport@kennametal.com
México	Espanhol	1800 253 0758	na.techsupport@kennametal.com
Holanda	Inglês	0800 0201 130	eu.techsupport@kennametal.com
Nova Zelândia	Inglês	0800 450 941	ap-kmt.techsupport@kennametal.com
Noruega	Inglês	800 10080	na.techsupport@kennametal.com
Polônia	Polonês	0080 04411887	eu.techsupport@kennametal.com
Rússia (telefone fixo)	Russo	8800 5556394	eu.techsupport@kennametal.com
Rússia (telefone celular)	Russo	+7 8005556394	eu.techsupport@kennametal.com
Cingapura	Inglês	1800 6221031	ap-kmt.techsupport@kennametal.com
África do Sul	Inglês	0800 981643	na.techsupport@kennametal.com
Suécia	Inglês	020799246	na.techsupport@kennametal.com
Taiwan	Inglês	0800 666 197	ap-kmt.techsupport@kennametal.com
Tailândia	Inglês	1800 4417820	ap-kmt.techsupport@kennametal.com
Reino Unido	Inglês	0800 032 8339	na.techsupport@kennametal.com
Ucrânia	Russo	0800502664	eu.techsupport@kennametal.com
EUA	Inglês	800 835 3668	na.techsupport@kennametal.com

Os números mostrados servem somente aos países listados.

O NOVO SABE PROCURAR

A procura por uma ferramenta foi melhorada através de funções de Aconselhamento e seleção do NOVO™, economizando tempo e dinheiro.

SUGERIR

Utiliza uma abordagem baseada em regras para fornecer recomendações de ferramenta de corte:

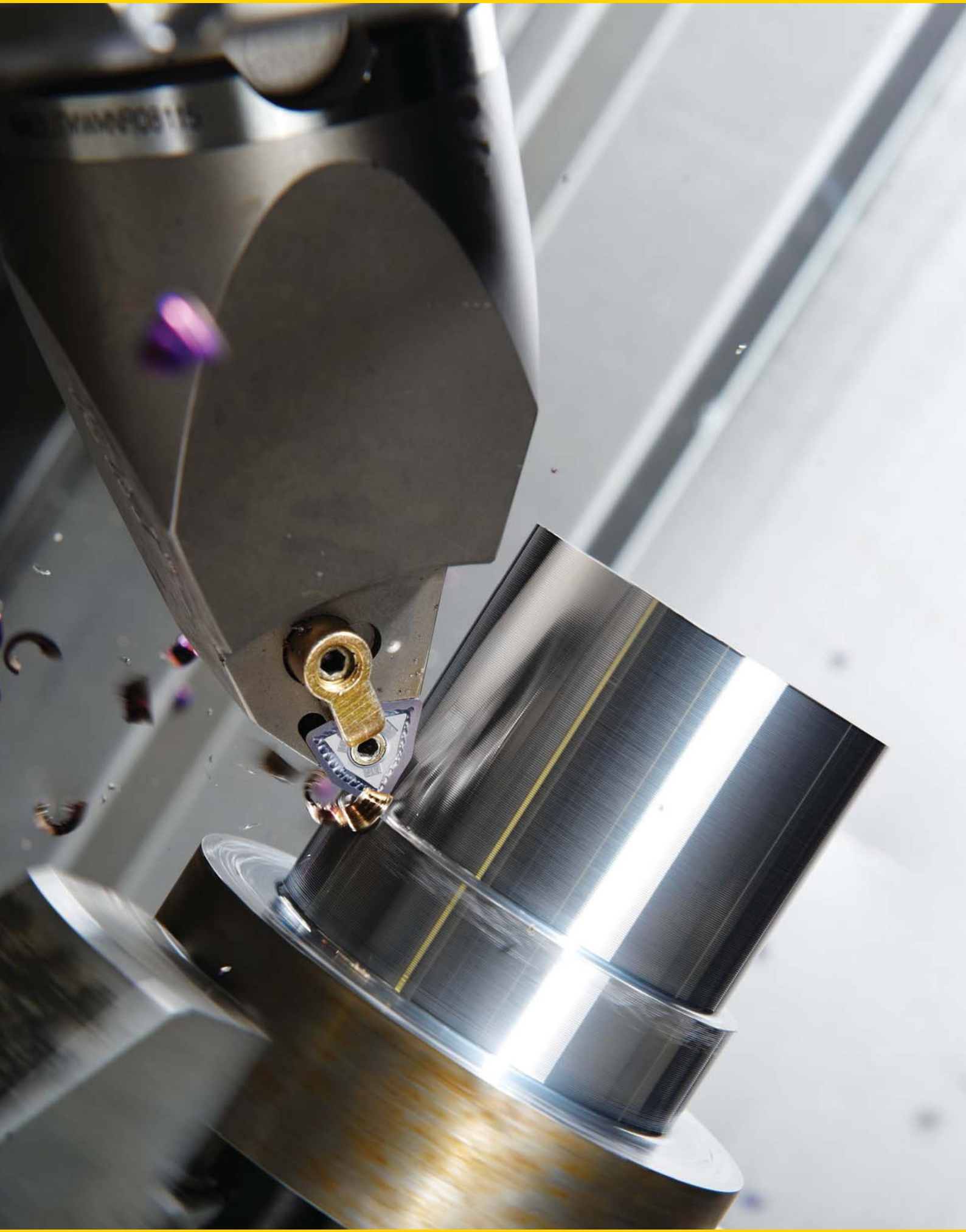
- Definir recurso de usinagem (fresamento de face, canais, furo cego etc.)
- Aplicar requisitos de limitação (geometria, material, tolerância etc.)
- Definir sequência de usinagem (operações de etapa única ou múltiplas, desbaste e acabamento etc.)
- Receber os resultados em ranking

SELECIONAR

Um método de selecionar ferramenta de corte de uma estrutura em árvore por meio de uma busca hierárquica ou paramétrica:

- Se você sabe qual é produto que está procurando, uma busca rápida pode ser feita somente com o número de catálogo ou descrição do produto.
- Filtros inteligentes reduzem significativamente a quantidade de potenciais soluções de ferramental.
- Após a ferramenta ter sido selecionada, o NOVO também fornece opções de itens de corte e adaptação que combinam com a sua solução.

O NOVO pode garantir que você tenha as ferramentas certas no seu maquinário, na sequência certa. Resultando em execução perfeita que acelera todos os trabalhos e maximiza todos os turnos. **kennametal.com/novo**



Torneamento

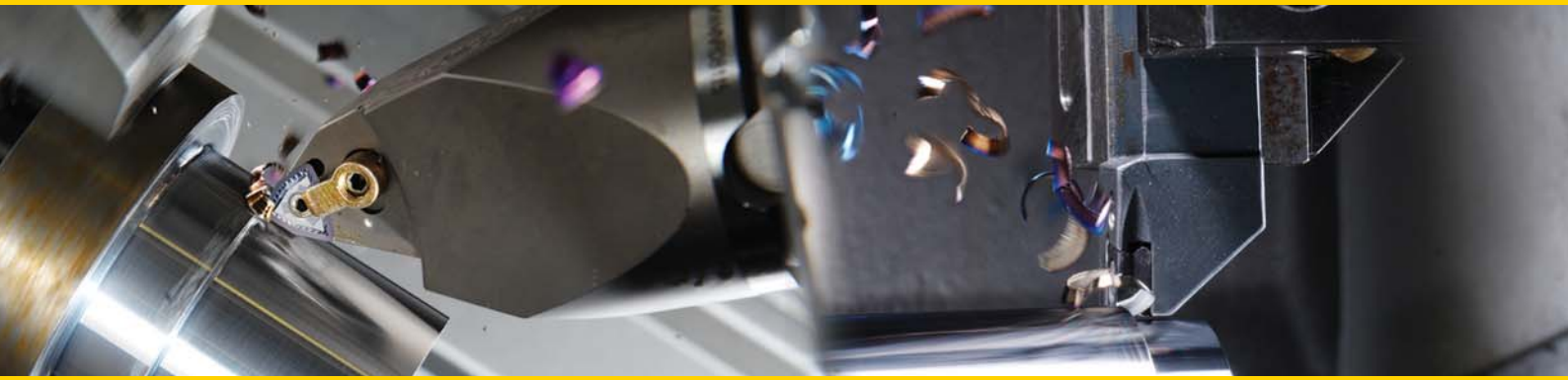
Introdução ao torneamento **A2–A3**

Torneamento ISO **B1–B387**

Canal e Corte **C1–C179**

Rosqueamento **D1–D110**

Aplicações específicas **E1–E65**



Produtos de torneamento

As nossas mais recentes inovações em usinagem de metais foram desenvolvidas para fornecer produtividade superior, maior vida útil da ferramenta e maior versatilidade.

Para mais informações sobre os mais recentes produtos e serviços da Kennametal, entre em contato com seu representante da Kennametal, com um distribuidor autorizado da Kennametal ou acesse o site **www.kennametal.com**.

TORNEAMENTO ISO

Para mais detalhes, veja a seção B.

- Insertos negativos.
- Porta ferramentas, barras internas, cápsulas e cabeças intercambiáveis para insertos negativos.
- Insertos positivos.
- Porta ferramentas, barras internas, cápsulas e cabeças intercambiáveis para insertos positivos.
- Insertos de materiais avançados para usinagem:
  — Ferro fundido
  — Aços endurecidos
  — Ligas resistentes a altas temperaturas
- Insertos de PCD.
- Porta-ferramentas, barras de mandrilar, cápsulas e cabeças aparafusadas para uso com insertos de materiais avançados.
- Barras ajustáveis.



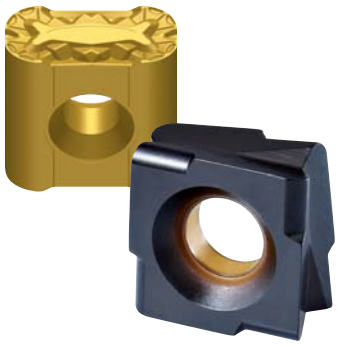


ROSQUEAMENTO, ABERTURA DE CANAL E CORTE (TG&C)

Para mais detalhes, veja as seções C e D.

- Beyond Evolution para Corte, Canais e Torneamento Lateral
- A4 para Canais e Torneamento Lateral
- Canal Top Notch™
- Rosqueamento Top Notch
- Rosqueamento de assentamento





APLICAÇÃO ESPECÍFICA

Para mais detalhes, veja a seção E.

- Torneamento Fix-Perfect™
- Perfilagem Top Notch
- Ferramentas para usinagem de material ferroviário e rodas
- K-Lock™





Torneamento ISO

Sistema Kennametal de Seleção de Insertos **B2–B21**
Classes Kennametal e Descrição de Classes/Áreas de Aplicação **B22–B29**
Geometrias de Quebra Cavaco, Avanços, Profundidades de Corte e Áreas de Aplicação **B30–B35**
Visão Geral de Porta Ferramentas, Barras Internas e Cápsulas; Códigos ISO **B36–B45**
Insertos de estilo negativo Kenloc, porta-ferramentas, barras de mandrilar, cápsulas e cabeças para tornear interno **B46–B165**
Insertos de estilo positivo Kendex, porta-ferramentas, barras de mandrilar, cápsulas e cabeças para tornear interno **B166–B174**
Insertos de estilo positivo Screw-On,porta-ferramentas, barras de mandrilar, cápsulas e cabeças para tornear interno **B175–B273**
Insertos de materiais avançados, porta-ferramentas, barras de mandrilar, cápsulas e cabeças para tornear interno **B274–B378**
Materiais avançados para usinagem de ferro fundido B278–B300
Materiais avançados para torneamento duro B302–B324
Materiais avançados para usinagem de super ligas B326–B337
PCD Insertos B338–B352
Porta-ferramentas, barras de mandrilar, cápsulas e cabeças para tornear interno B353–B378
Barras ajustáveis **B380–B387**

Aplicativo Móvel

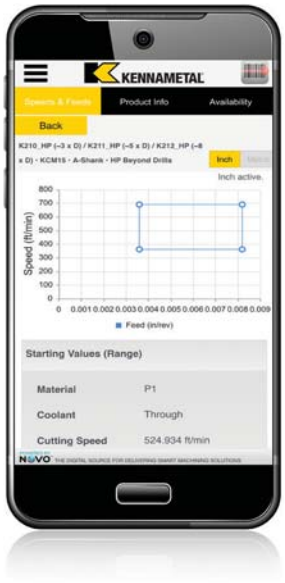
O aplicativo móvel da Kennametal proporciona acesso fácil a informações de produtos e calculadoras em ambos equipamentos, iPhone® e Android™. Destacamos algumas das principais características...

Há um aplicativo para isso.

VELOCIDADES DE CORTE & AVANÇOS
Veja informações sobre velocidades de corte e avanços para produtos metalúrgicos.

DISPONIBILIDADE DO PRODUTO
Verifique a disponibilidade global de produtos. Veja quantidades disponíveis fornecendo sua credencial de acesso do Konnect.

CALCULADORAS
Utilize nossa calculadora de usinagem para aplicações de fresamento e furação.



Ao digitalizar o código de barra da embalagem do inserto, você pode encontrar as condições de corte mais produtivas para vida útil e controle de cavaco.

NOTA: O aplicativo está disponível somente na versão em Inglês. Nós temos planos para traduzir o aplicativo em diferentes idiomas para liberações futuras.

Google play | Available on the App Store

Insertos, porta-ferramentas e barras de mandrilar de torneamento ISO

Máquinas CNC modernas e fábricas de produção flexível necessitam de ferramentas com versatilidade nas aplicações. Os insertos de alto desempenho, porta ferramentas e barras internas da Kennametal são projetados para qualquer aplicação de torneamento. Não importa se você está usinando aço ou titânio, ou fazendo um acabamento fino ou desbaste pesado, nós temos a solução em ferramenta para atingir as suas necessidades.

Características e benefícios

Insertos Beyond™ Drive™

- Planejado para proporcionar uma produtividade aumentada.
- O tratamento pós-revestimento reduz o stress e melhora a adesão do revestimento.
- Excelente dureza e resistência a desgaste.
- Melhor detecção do desgaste do inserto.

Classes PVD Beyond™

Classe KCU10™

- Resistência superior a desgaste e maiores velocidades de corte a altas temperaturas.
- Ideal para aço inoxidável e ligas de alta temperatura.
- Melhor resistência a desgaste por entalhe no flanco.
- Uso em aplicações médias e de acabamento.

Classe KCU25™

- Dureza superior das arestas.
- Excelente resistência a desgaste.
- Uso em aplicações médias e orientadas para desbaste.



Soluções de torneamento da Kennametal por material

P	Aço	Insertos de metal duro ou cermet
M	Aço inoxidável	Insertos de metal duro
K	Ferro fundido	Insertos de metal duro, cerâmica ou PcBN
N	Materiais não ferrosos	Insertos de metal duro ou PCD
S	Ligas resistentes a altas temperaturas	Insertos de metal duro, cerâmica ou PcBN
H	Materiais endurecidos	Insertos de cerâmica ou PcBN

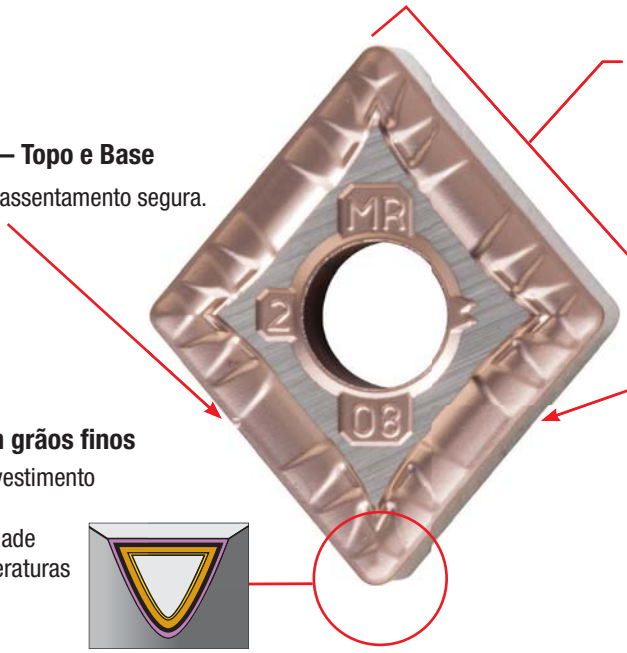
Insertos Beyond™ Drive™ • Detalhes da tecnologia

Tratamento pós-revestimento

- Melhora a dureza das arestas.
- vida útil da ferramenta previsível e longa.
- Reduz o desgaste por entalhe no flanco.
- Ampla faixa de aplicações.

Retífica pós-cobertura — Topo e Base

- Proporciona superfície de assentamento segura.



Arestas micropolidas

- Melhora a dureza das arestas.
- Proporciona uma superfície externa mais lisa, resultando na redução das forças, do atrito e da aderência do material da peça.

Camada de alumina com grãos finos

- Oferece integridade de revestimento a velocidades elevadas.
- Produtividade e confiabilidade superiores em altas temperaturas de corte.

TiN/MT-TiCN/TiCN/Al_2O_3/TiOCN

Porta-ferramentas, barras para mandrilamento e cápsulas



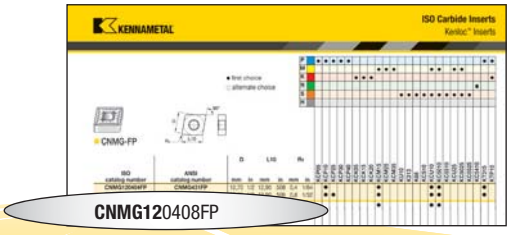






Como funcionam os números de catálogo?

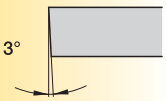
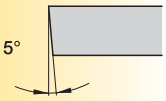
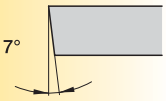
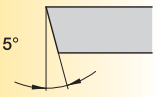
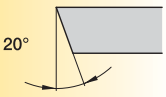
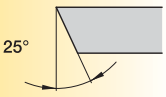
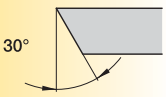
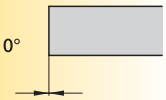
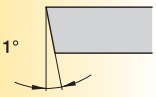
Cada caractere no nosso número de catálogo significa uma característica específica daquele produto. Use as colunas-chave a seguir e as imagens correspondentes para fazer uma identificação fácil do atributo a ser aplicado.



C — Formato do inserto

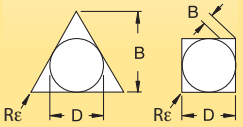
H	Hexágono 120°	
O	Octágono 135°	
P	Pentágono 108°	
R	Redondo —	
S	Quadrado 90°	
T	Triangular 60°	
C D E M V	Romboide 80° 55° 75° 86° 35°	
W	Trígono 80° com ângulos de cantos ampliados	
L	Retângulo 90°	
A B N/K	Paralelogramo 85° 82° 55°	

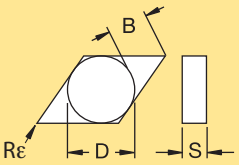
N — Ângulo de folga do inserto

A	3°	
B	5°	
C	7°	
D	15°	
E	20°	
F	25°	
G	30°	
N	0°	
P	11°	
O	Indicado para outros ângulos de folga que requerem descrições.	

M — Classe de tolerância

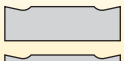
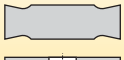
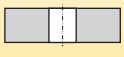
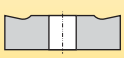
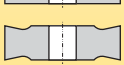
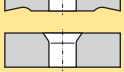
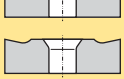
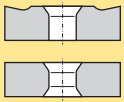
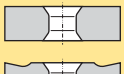
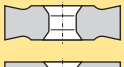
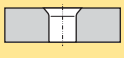
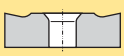
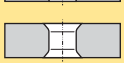
A tolerância se aplica antes da preparação e do revestimento da aresta





D = Diâmetro teórico do círculo inscrito no inserto
S = Espessura
B = Ver figuras abaixo

G — Características do inserto

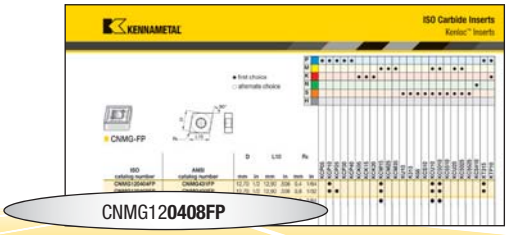
N	
R	
F	
A	
M	
G	
W	
T	
Q	
U	
B	
H	
C	
J	
X	Design especial

12 — Tamanho

"D" mm	Código para polegada comprimento da aresta de corte "L10" C	D	R	S	T	V	W
3,97	S4	04	03	03	06	—	—
4,76	04	05	04	04	08	08	S3
5,56	05	06	05	05	09	09	03
6,00	—	—	06	—	—	—	—
6,35	06	07	06	06	11	11	04
7,94	08	09	07	07	13	13	05
8,00	—	—	08	—	—	—	—
9,52	09	11	09	09	16	16	06
10,00	—	—	10	—	—	—	—
11,11	11	13	11	11	19	19	07
12,00	—	—	12	—	—	—	—
12,70	12	15	12	12	22	22	08
14,29	14	17	14	14	24	24	09
15,88	16	19	15	15	27	27	10
16,00	—	—	16	—	—	—	—
17,46	17	21	17	17	30	30	11
19,05	19	23	19	19	33	33	13
20,00	—	—	20	—	—	—	—
22,22	22	27	22	22	38	38	15
25,00	—	—	25	—	—	—	—
25,40	25	31	25	25	44	44	17
31,75	32	38	31	31	54	54	21
32,00	—	—	32	—	—	—	—

classe de tolerância	tolerância para "D"	tolerância para "B"	tolerância para "S"
C	±0,025	±0,013	±0,025
H	±0,013	±0,013	±0,025
E	±0,025	±0,025	±0,025
G	±0,025	±0,025	±0,013
M	Veja as tabelas na próxima página		±0,013
U	Veja as tabelas na próxima página		±0,013

Consultando este guia fácil de usar, você pode identificar o produto correto para atender às suas necessidades.



04	08			FP
Espessura S	Canto Raio "Rε"	Sentido de rotação do inserto *(opcional)*	Aresta de corte *(opcional)*	Quebra-cavacos *(opcional)*

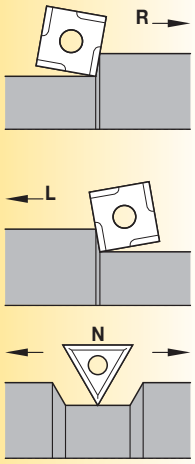
símbolo	espessura
mm	mm
–	0,79
T0	1,00
01	1,59
T1	1,98
02	2,38
03	3,18
T3	3,97
04	4,76
05	5,56
06	6,35
07	7,94
9	9,52
11	11,11
12	12,70

símbolo	raio de canto	
mm	mm	
X0	0,04	
01	0,1	
02	0,2	
04	0,4	
08	0,8	
12	1,2	
16	1,6	
20	2,0	
24	2,4	
28	2,8	
32	3,2	
00		inserto redondo
M0		
—		

R = Sentido de rotação à direita

L = Sentido de rotação à esquerda

N = Neutro



F Afiado

E Arredondado

T Chanfrado

S Chanfrado e arredondado

K Chanfrado duplo

P Chanfrado duplo e arredondado

F	=	Afiado
FF	=	Acabamento fino
FN	=	Acabamento negativo
MN	=	Médio negativo
MR	=	Desbaste médio
RN	=	Desbaste negativo
UN	=	Universal médio
FP	=	Positivo para acabamento
MP	=	Positivo médio
RP	=	Desbaste positivo
RM	=	Desbaste médio
RH (MD)	=	Desbaste pesado
FW	=	Wiper de acabamento
MW	=	Wiper médio
FS	=	Afiado de acabamento
MS	=	Afiado médio
RW	=	Wiper de desbaste
HP	=	Altamente positivo
UP	=	Universal positivo
K	=	Controle do cavaco de velocidade leve
UF	=	Acabamento ultrafino
LF	=	Acabamento leve
MF	=	Acabamento médio
E	=	Somente arredondamento da aresta (Hone)
T	=	Inclinação negativa
S	=	Inclinação negativa, mais arredondamento da aresta (hone)
MP-K	=	Positivo médio
MG-P	=	Positivo médio

	± tolerância para "D"			
	Tolerância da classe M			Tolerância da classe U
"D"	Formas S, T, C, R, & W	Forma D	Forma V	Formas S, T, & C
mm	mm	mm	mm	mm
3,97	0,05	–	–	–
4,76	0,05	–	–	0,08
5,56	0,05	0,05	0,05	0,08
6,35	0,05	0,05	0,05	0,08
7,94	0,05	0,05	0,05	0,08
9,52	0,05	0,05	0,05	0,08
11,11	0,08	0,08	0,08	0,13
12,70	0,08	0,08	0,08	0,13
14,29	0,08	0,08	0,08	0,13
15,88	0,10	0,10	0,10	0,18
17,46	0,10	0,10	0,10	0,18
19,05	0,10	0,10	0,10	0,18
22,22	0,13	–	–	0,25
25,40	0,13	–	–	0,25
31,75	0,15	–	–	0,25

	± tolerância para "B"			
	Tolerância da classe M			Tolerância da classe U
"D"	Formas S, T, C, R, & W	Forma D	Forma V	Formas S, T, & C
mm	mm	mm	mm	mm
3,97	0,08	–	–	–
4,76	0,08	–	–	0,13
5,56	0,08	0,11	–	0,13
6,35	0,08	0,11	–	0,13
7,94	0,08	0,11	–	0,13
9,52	0,08	0,11	0,18	0,13
11,11	0,13	0,15	–	–
12,70	0,13	0,15	0,25	0,20
14,29	0,13	0,15	–	–
15,88	0,15	0,18	–	0,27
17,46	0,15	0,18	–	0,27
19,05	0,15	0,18	–	0,27
22,22	0,15	–	–	0,38
25,40	0,18	–	–	0,38
31,75	0,20	–	–	0,38

Um sistema de classes, geometrias e diretrizes de aplicação para proporcionar soluções perfeitas para as suas necessidades de usinagem de materiais. É fácil determinar qual ferramenta de corte com controle de cavacos da Kennametal irá funcionar melhor nos seus materiais e aplicações específicos!

Classe • Beyond™ • Beyond™ Drive™

K	C	P	M	25	B
Marca	Material do inserto	Material principal da peça *(ISO 513)*	Material secundário da peça *(opcional)*	Gama de aplicações	Atualizações futuras *(opcional)*
K = Kennametal		P Aço M Aço inoxidável K Ferro fundido N Materiais não ferrosos S Ligas resistentes a altas temperaturas H Materiais endurecidos U Usinagem universal			**B** = Beyond™ Drive™ **C** = Geração 3 etc.

Blank = Metal duro sem revestimento
C = Metal duro com revestimento
T = Cermet
Y = Cerâmica
D = PCD
B = PcBN

Mais duro

5	acabamento fino
10	acabamento
15 **20**	de médio a desbaste
25 **30** **35**	desbaste
40 **45** **50**	desbaste pesado

Mais tenaz

NOTA: A gama de aplicação não se aplica a classes com PcBN.

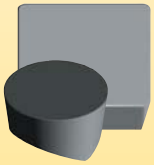
Insertos positivos



Pastilhas fixadas com parafuso

- Os insertos Screw-On são a sua primeira escolha para torneamento de diâmetro interno de todos os materiais e de diâmetro externo em tornos de pequeno e médio porte.
- Disponível nas geometrias com face lisa e de controle de cavacos com periferias moldadas e retificadas. Adequado para todos os tipos de materiais das peças.

Veja as páginas:
Metal duro: B175–B273
Materiais avançados: B284–B351



Insertos com fundo em V e Kendex™

- Os insertos Kendex positivos e com fundo em V são a sua primeira escolha para a usinagem eficaz de ligas resistentes a altas temperaturas em tornos de médio e grande porte.
- Disponíveis nas geometrias de face lisa com periferia retificada.

Veja as páginas:
Metal duro: B166–B168
Materiais avançados: B284–B351



Insertos para torneamento de perfil Top Notch™

- Primeira opção para perfilagem de alta produção.
- O projeto de fixação do inserto exclusivo oferece rigidez superior.
- Disponíveis nas geometrias de controle de cavacos com periferias moldadas e retificadas. Adequado para todos os tipos de materiais das peças.

Veja as páginas de E20–E43 para obter a lista de produtos.



Insertos K-Lock™

- Os insertos K-Lock são ideais para torneamento de canal profundo e de perfil.
- Um sistema de fixação do inserto exclusivo, que permite um fluxo de cavacos livre.
- Disponível em periferias moldadas e retificadas.

Veja a página de E62–E65 para obter a lista de produtos.

Insertos negativos



Insertos Kenloc™

- Os insertos Kenloc são a sua primeira escolha para a usinagem em geral de todos os materiais em tornos de médio e grande porte.
- Os insertos Kenloc oferecem a melhor opção de economia para altas taxas de remoção de material.
- Disponível nas geometrias com face lisa e de controle de cavacos com periferias moldadas e retificadas. Adequado para todos os tipos de materiais das peças.

Veja as páginas:
Metal duro: B46–B165
Materiais avançados: B284–B351



Insertos Kendex

- Os insertos de cerâmica Kendex são uma boa opção para a usinagem eficaz de ligas resistentes a altas temperaturas.
- Os insertos com ângulo negativo Kendex também são recomendados para a usinagem de materiais endurecidos e ferros fundidos.
- Disponíveis nas geometrias com face lisa com periferias moldadas e retificadas.
- Ampla gama de porta-ferramentas padrão oferecida.

Veja as páginas de B284–B351 para obter a lista de produtos.



Insertos para torneamento Top Notch

- Os insertos para torneamento de cerâmica Top Notch são a primeira opção para desbaste e acabamento de alta velocidade de ferros fundidos.
- Disponíveis nas geometrias de face lisa com periferias moldadas e retificadas.

Veja as páginas de B284–B351 para obter a lista de produtos.



Insertos Fix-Perfect™

- Projeto tangencial e sistema de fixação rígido

Veja páginas E2–E18 para lista de produtos.



Insertos Ferroviários

- Projetados para usinagem de rodas e eixos ferroviários.

Veja páginas E44–E61 para lista de produtos.

Sistema de seleção de insertos

Como usar

Com o sistema de seleção de insertos de três etapas da Kennametal, a escolha e a aplicação das ferramentas mais efetivas é rápida. As recomendações para as ferramentas estão baseadas em seis grupos de materiais das peças, otimizando a precisão da seleção.

Exemplo:
Seis grupos de materiais das peças

Etapa 1 • Escolha a geometria do inserto

Conhecidos:	profundidade de corte = 1mm avanço = 0,4mm
Desconhecido:	**geometria do inserto**
Solução:	-MN

Etapa 2 • Escolha a classe

Conhecidos:	condições de corte: corte ligeiramente interrompido
Geometria:	-MN
Desconhecido:	**classe**
Solução:	KCP25

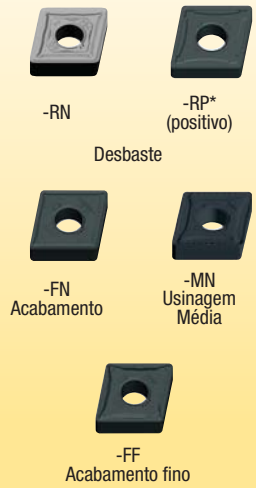
Etapa 3 • Escolha a velocidade de corte

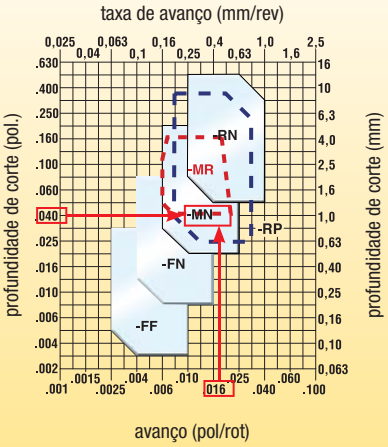
Conhecidos:	classe KCP25 condições de corte material CK15
Desconhecido:	**velocidade de corte**
Solução:	280 m/mín

Precisa de ajuda para escolher um produto?
Informações adicionais podem ser obtidas entrando em contato com a equipe de suporte de aplicações ao cliente da Kennametal.
Acesse o site kennametal.com para encontrar o número de telefone no seu país.

Etapa 1 • Escolha a geometria do inserto

Insertos negativos





* -RP – Geometria suplementar para materiais de alta resistência

P	Aço
M	Aço inoxidável
K	Ferro fundido
N	Materiais não ferrosos
S	Ligas resistentes a altas temperaturas
H	Materiais endurecidos

beyond™ beyond™ DRIVE™

Etapa 2 • Escolha a classe

condições de corte	-FF	-FN	-MN	-RN	-RP	-11	-UF	-LF	-FP	-MF	-MP
corte altamente interrompido	KCP10B/ KCP10	KCP25B/ KCP25	KCP30B/ KCP30	KCP30B/ KCP30/ KCP40B/ KCP40	KCP30B/ KCP30/ KCP40B/ KCP40	–	KCU10/ KCP25B/ KCP25	KCP25B/ KCP25	KCU25/ KCP25B/ KCP25	KCP40B/ KCP40B	KCP40B/ KCP40B
corte levemente interrompido	KCP10B/ KCP10	KCP25B/ KCP25	KCP25B/ KCP25	KCP30B/ KCP30/ KCP40B/ KCP40	KCP30B/ KCP30/ KCP40B/ KCP40	–	KCU10/ KCP25B/ KCP25	KCP25B/ KCP25	KCP25B/ KCP25	KCP25B/ KCP25	KCP25B/ KCP25
profundidade de corte variável, casca de fundição ou de forjamento	KCP05B/ KCP05/ KT315	KCP10B/ KCP10	KCP10B/ KCP10	KCP30B/ KCP30/ KCP40B/ KCP40	KCP30B/ KCP30/ KCP40B/ KCP40	KT315	KCP10B/ KCP10	KCP10B/ KCP10	KCP10B/ KCP10	KCP10B/ KCP10	KCP10B/ KCP10

Etapa 3 • Escolha a velocidade de corte

Aço de usinagem livre e de baixo carbono (<0,3% C) — **velocidade — m/mín (SFM)** — **Condições de início**

grupo de materiais	classe	135 (450)	180 (600)	225 (800)	275 (900)	320 (1050)	360 (1200)	410 (1350)	455 (1500)	495 (1650)	m/mín	SFM
P1	KCP05B/KCP05/KTP10							◇			435	1450
	KCP10B/KCP10							◇			395	1320
	KCP25B/KCP25				◆						275	925
	KCP30B/KCP30/KCP40B/KCP40			◇							210	700

Novo guia de seleção de grupo de materiais Beyond™:

Para otimizar as recomendações de velocidade, os subgrupos dos materiais Beyond foram adicionados a cada grupo de materiais das peças.

material	código ISO do grupo de materiais	número de subgrupos de materiais
aço	P	1–6
aço inoxidável	M	1–3
ferro fundido	K	1–3
materiais não ferrosos	N	1–8
ligas resistentes a altas temperaturas	S	1–4
materiais endurecidos	H	1

Etapa 1 • Escolha a geometria do inserto

Insertos negativos



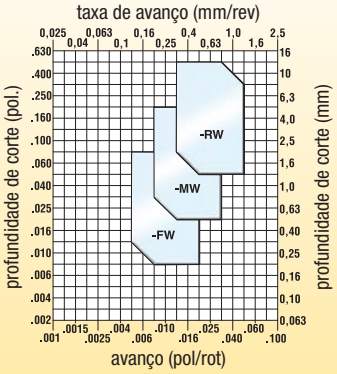
-RW
Wiper desbaste



-MW
Wiper médio



-FW
Wiper de acabamento



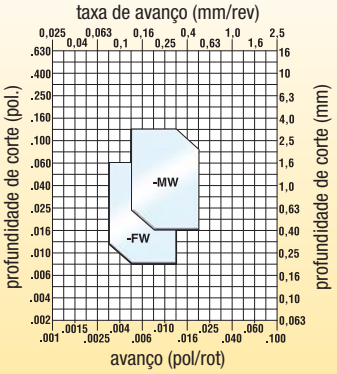
Insertos positivos



-MW
Wiper médio



-FW
Wiper de acabamento



Etapa 2 • Escolha a classe

condições de corte	Geometria negativa do inserto			Geometria positiva do inserto	
	-FW	-MW	-RW	-FW	-MW
corte altamente interrompido	–	–	KCP25B/KCP25	–	KCP25B/KCP25
corte levemente interrompido	KCP10B/KCP10	KCP25B/KCP25	KCP25B/KCP25	KCP25B/KCP25	KCP25B/KCP25
profundidade de corte variável, casca de fundição ou de forjamento	KCP05B/KCP05/ KT315	KCP10B/KCP10	KCP10B/KCP10	KCP10B/KCP10/ KCK20B/KCK20	KCP10B/KCP10
corte suave, superfície pré-torneada	KCP05B/KCP05/ KT315	KCP05B/KCP05	KCP10B/KCP10	KCP10B/KCP10/ KT315	KT315

Etapa 1 • Escolha a geometria do inserto

Insertos negativos



-RN



-RP*
(positivo)



-MR
Desbaste médio



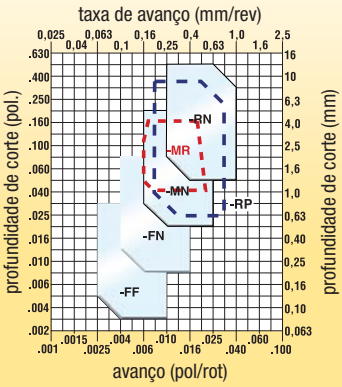
-MN
Usinagem Média



-FN
Acabamento



-FF
Acabamento fino



* -RP – Geometria suplementar para materiais de alta resistência

Insertos positivos



-MF



-MP
Positivo

Usinagem média



-LF



-FP
Positivo

Acabamento

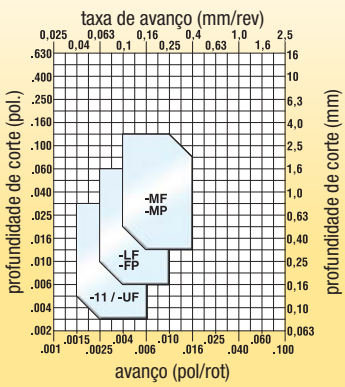


-11



-UF

Acabamento fino



Etapa 2 • Escolha a classe

condições de corte	Geometria negativa do inserto							Geometria positiva do inserto				
	-FF	-FN	-MN	-MR	-RN	-RP	-11	-UF	-LF	-FP	-MF	-MP
corte altamente interrompido	KCP10B/ KCP10	KCP25B/ KCP25	KCP30B/ KCP30	–	KCP30B/ KCP40B	KCP30B/ KCP40B	–	KCU10/ KCP25B/ KCP25	KCP25B/ KCP25	KCP25B/ KCP25	KCP40B/ KCP40	KCM25B/ KCM25
corte levemente interrompido	KCP10B/ KCP10	KCP25B/ KCP25	KCP25B/ KCP25	KCP25B/ KCP25	KCP25B/ KCP25	KCP25B/ KCP25	–	KCU10/ KCP25B/ KCP25	KCP25B/ KCP25	KCP25B/ KCP25	KCP25B/ KCP25	KCP25B/ KCP25
profundidade de corte variável, casca de fundição ou de forjamento	KCP05B/ KCP05/ KT315	KCP10B/ KCP10	KCP10B/ KCP10	KCP10B/ KCP10	KCP10B/ KCP10	KCP10B/ KCP10	KT315	KCP10B/ KCP10	KCP10B/ KCP10	KCP10B/ KCP10	KCP10B/ KCP10	KCP10B/ KCP10
corte suave, superfície pré-torneada	KCP05B/ KCP05/ KT315	KCP05B/ KCP05	KCP05B/ KCP05	KCP10B/ KCP10/ KCK15B	KCP05B/ KCP10	KCP05B/ KCP10	KT315	KCP05B/ KCP05	KCP05B/ KCP05/ KT315	KCP05B/ KCP05/ KTP10	KCP05B/ KCP05	KCP05B/ KCP05

Etapa 3 • Escolha a velocidade de corte

Aço de usinagem livre e de baixo carbono (<0,3% C) — velocidade — m/mín (SFM) — Condições de início ◁▷

grupo de materiais	classe	135 (450)	180 (600)	225 (800)	275 (900)	320 (1050)	360 (1200)	410 (1350)	455 (1500)	495 (1650)	m/mín	SFM
P0/P1	KCP05B/KCP05/KCPK05							◁▷			435	1450
	KCP10B/KCP10						◁▷				395	1320
	KCP25B/KCP25				◁▷						275	925
	KCP30B/KCP30/KCP40B/KCP40		◁▷								210	700
	KT315/KTP10							◁▷			440	1450
	KCU10			◁▷							280	925

Aços de médio e alto carbono (>0,3% C) — velocidade — m/mín (SFM) — Condições de início ◁▷

grupo de materiais	classe	135 (450)	180 (600)	225 (800)	275 (900)	320 (1050)	360 (1200)	410 (1350)	455 (1500)	495 (1650)	m/mín	SFM
P2	KCP05B/KCP05/KCPK05				◁▷						240	800
	KCP10B/KCP10			◁▷							265	880
	KCP25B/KCP25		◁▷								195	650
	KCP30B/KCP30/KCP40B/KCP40	◁▷									150	500
	KT315/KTP10				◁▷						270	880
	KCU10	◁▷									200	650

Aços ligados e aços-ferramenta (≤330 HB) (≤35 HRC) — velocidade — m/mín (SFM) — Condições de início ◁▷

grupo de materiais	classe	135 (450)	180 (600)	225 (800)	275 (900)	320 (1050)	360 (1200)	410 (1350)	455 (1500)	495 (1650)	m/mín	SFM
P3	KCP05B/KCP05/KCPK05			◁▷							205	680
	KCP10B/KCP10		◁▷								190	630
	KCP25B/KCP25	◁▷									155	510
	KCP30B/KCP30/KCP40B/KCP40	◁▷									120	400
	KT315/KTP10			◁▷							210	680
	KCU10		◁▷								155	510

Aços ligados e aços-ferramenta (de 340 a 450 HB) (de 36 a 48 HRC) — velocidade — m/mín (SFM) — Condições de início ◁▷

grupo de materiais	classe	60 (200)	90 (300)	120 (400)	150 (500)	180 (600)	210 (700)	240 (800)	270 (900)	300 (1000)	m/mín	SFM
P4	KCP05B/KCP05/KCPK05				◁▷						160	530
	KCP10B/KCP10				◁▷						145	480
	KCP25B/KCP25			◁▷							105	360
	KCP30B/KCP30/KCP40B/KCP40		◁▷								95	325
	KT315/KTP10					◁▷					210	530
	KCU10			◁▷							110	360

Aços inoxidáveis ferrítico, martensítico e PH (<330 HB) (<35 HRC) — velocidade — m/mín (SFM) — Condições de início ◁▷

grupo de materiais	classe	120 (400)	150 (500)	180 (600)	210 (700)	240 (800)	270 (900)	300 (1000)	330 (1100)	360 (1200)	m/mín	SFM
P5	KCP05B/KCP05/KCPK05					◁▷					240	800
	KCP10B/KCP10				◁▷						215	720
	KCP25B/KCP25			◁▷							195	650
	KCP30B/KCP30/KCP40B/KCP40		◁▷								135	450
	KT315/KTP10					◁▷					250	800
	KCU10				◁▷						200	660

Aços inoxidáveis ferrítico, martensítico e endurecido por precipitação (PH) (de 340 a 450 HB) (de 36 a 48 HRC) — velocidade — m/mín (SFM) — Condições de início ◁▷

grupo de materiais	classe	105 (350)	135 (450)	165 (550)	195 (650)	225 (750)	255 (850)	285 (950)	315 (1050)	345 (1150)	m/mín	SFM
P6	KCP05B/KCP05/KCPK05				◁▷						200	660
	KCP10B/KCP10				◁▷						180	600
	KCP25B/KCP25			◁▷							150	500
	KCP30B/KCP30/KCP40B/KCP40	◁▷									105	350
	KT315/KTP10				◁▷						200	660
	KCU10			◁▷							150	500

Etapa 1 • Escolha a geometria do inserto

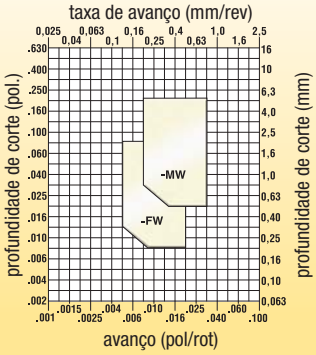
Insertos Wiper negativos



-MW
Wiper médio



-FW
Wiper de acabamento



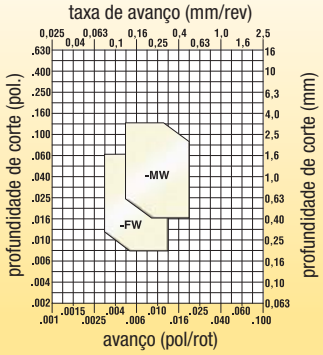
Insertos Wiper positivos



-MW
Wiper médio



-FW
Wiper de acabamento



Etapa 2 • Escolha a classe

condições de corte		Geometria negativa do inserto -FW	Geometria negativa do inserto -MW	Geometria positiva do inserto -FW	Geometria positiva do inserto -MW
corte altamente interrompido		–	–	–	–
corte levemente interrompido		KCM15B/KCM15	KCM25B/KCM25	KCM15B/KCM15	KCM15B/KCM15
profundidade de corte variável, casca de fundição ou de forjamento		KCM15B/KCM15/ KCU10	KCM15B/KCM15	KCU10	KCU10
corte suave, superfície pré-torneada		KCM15B/KCM15/ KT315	KCM15B/KCM15	KT315	KT315

Etapa 1 • Escolha a geometria do inserto

Insertos negativos



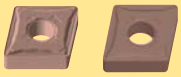
-RP -P
Desbaste



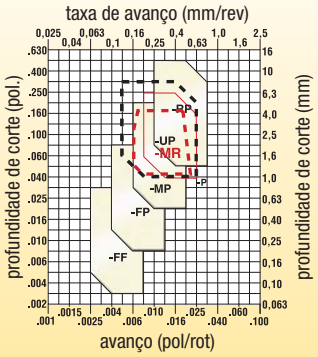
-MR
Desbaste médio



-MP -UP
Usinagem média



-FP -FF
Acabamento



Insertos positivos



-MP
Usinagem média



-LF



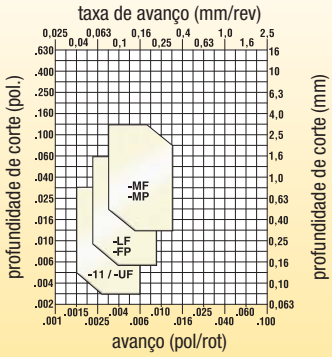
..GT-LF
Acabamento



-11



-UF
Acabamento fino



Etapa 2 • Escolha a classe

condições de corte		Geometria negativa do inserto -FF	-FP	-MP/-UP	-P/-RP	-MR
corte altamente interrompido		KCU10	KCM15B/KCM15	KCM35B/KCM35	KCM35B/KCM35	KCM35B/KCM35
corte levemente interrompido		KCU10	KCM15B/KCM15	KCM25B/KCM25	KCM25B/KCM25	KCM25B/KCM25
profundidade de corte variável, casca de fundição ou de forjamento		KT315	KCM15B/KCM15/ KCU10	KCM15B/KCM15	KCM15B/KCM15/ KCM25B/KCM25	KCM15B/KCM15
corte suave, superfície pré-torneada		KT315	KCM15B/KCM15/ KT315	KCM15B/KCM15/ KCU10	KCU10	KCM15B/KCM15

(continuação)

Etapa 2 • Escolha a classe *(continuação)*

condições de corte		Geometria positiva do inserto -11	-UF	-LF	-MP/-MF	-FP	..GT-LF
corte altamente interrompido		–	KCU25	KCM35B/KCM35	KCM25B/KCM25	KCU25/KCM25B/ KCM25	KCU25
corte levemente interrompido		–	KCU10	KCM25B/KCM25	KCM25B/KCM25	KCM15B/KCM15	KCU25
profundidade de corte variável, casca de fundição ou de forjamento		KT315	–	KCM15B/KCU10	KCM15B/KCM15	KCU10	KCU10
orte suave, superfície pré-torneada		KT315	–	KCM15B/KCM15/ KT315	KCM15B/KCM15	KTP10	KCU10

Etapa 3 • Escolha a velocidade de corte

Aços inoxidáveis austeníticos — velocidade — m/min (SFM) — condições iniciais ◁▷

grupo de materiais	classe	90 (300)	135 (450)	180 (600)	225 (800)	270 (900)	315 (1050)	360 (1200)	405 (1350)	450 (1500)	m/mín	SFM
M1	KCM15B/KCM15			◁▷							180	600
	KCM25B/KCM25		◁▷								150	500
	KCM35B/KCM35	◁▷									120	400
	KT315				◁▷						230	750
	KCU10			◁▷							215	700
	KCU25		◁▷								180	550

Aços inoxidáveis austeníticos — velocidade — m/min (SFM) — condições iniciais ◁▷

grupo de materiais	classe	90 (300)	135 (450)	180 (600)	225 (800)	270 (900)	315 (1050)	360 (1200)	405 (1350)	450 (1500)	m/mín	SFM
M2	KCM15B/KCM15			◁▷							165	550
	KCM25B/KCM25		◁▷								140	450
	KCM35B/KCM35	◁▷									105	350
	KT315				◁▷						215	700
	KCU10			◁▷							200	650
	KCU25		◁▷								165	500

Aços inoxidáveis austeníticos: Duplex (mistura de ferrítico e austenítico) — velocidade — m/min (SFM) — condições iniciais ◁▷

grupo de materiais	classe	90 (300)	135 (450)	180 (600)	225 (800)	270 (900)	315 (1050)	360 (1200)	405 (1350)	450 (1500)	m/mín	SFM
M3	KCM15B/KCM15			◁▷							150	500
	KCM25B/KCM25		◁▷								120	400
	KCM35B/KCM35	◁▷									90	300
	KT315				◁▷						200	650
	KCU10			◁▷							185	600
	KCU25		◁▷								150	450

Etapa 1 • Escolha a geometria do inserto

Insertos Wiper negativos



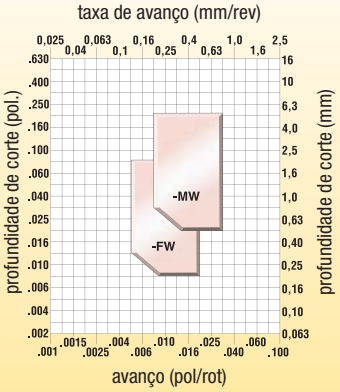
-MW -S...MW
Wiper médio



-FW -FW
-T-20FW



-FW
-T-20FW
Wiper de acabamento



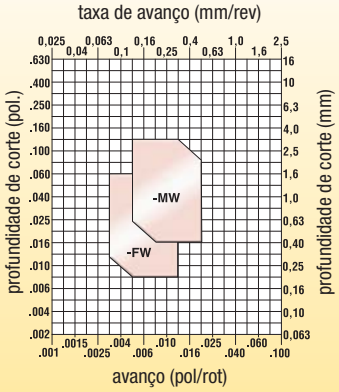
Insertos Wiper positivos



-MW
Wiper médio



-FW
Wiper de acabamento



Etapa 2 • Escolha a classe

Ferro cinzento

		Geometria negativa do inserto			Geometria positiva do inserto	
condições de corte		**-FW**	**-T-20FW**	**-S...MW...**	**-FW**	**-MW**
corte altamente interrompido		–	KY3500	KB1345	–	KCK15B/KCK15/ KCK20B/KCK20
corte levemente interrompido		KCK15B/KCK15	KY3500	KB1345	KCK20B/KCK20	KCK15B/KCK15/ KCK20B/KCK20
profundidade de corte variável, casca de fundição ou de forjamento		KCK05B/KCK05/ KT315	KYK10	KB1345	KCK20B/KCK20	KCK15B/KCK15/ KCK20B/KCK20
corte suave, superfície pré-torneada		KCK05B/KCK05/ KT315	KYK25	KB1345	KCK20B/ KT315	KCK15B/KCK15/ KCK20B/KCK20/KT315

Ferro fundido dúctil

		Geometria negativa do inserto		Geometria positiva do inserto	
condições de corte		**-FW**	**-T-20FW**	**-FW**	**-MW**
corte altamente interrompido		–	–	–	–
corte levemente interrompido		KCK15B/ KCK15	KY3500	KCK20B/ KCK20	KCK20B/ KCK20
profundidade de corte variável, casca de fundição ou de forjamento		KCK05B/KCK05/ KT315	KYK10	KCK20B/ KCK20	KCK20B/ KCK20
corte suave, superfície pré-torneada		KCK05B/KCK05/ KT315	KYK25	KCK20B/KCK20/ KT315	KCK20B/KCK20/ KT315

Etapa 3 • Escolha a velocidade de corte

Ferros fundidos cinzentos — velocidade — m/mín (SFM) — condições iniciais ◁▷

grupo de materiais	classe	60 (200)	150 (500)	240 (800)	330 (1100)	420 (1400)	510 (1700)	600 (2000)	690 (2300)	780 (2600)	m/mín	SFM
K1	KCK05B/KCK05					◁▷					450	1500
	KCK15B/KCK15				◁▷						360	1200
	KCK20B/KCK20/KCPK05				◁▷						300	1000
	KT315				◁▷						275	900

Ferros fundidos nodulares, de grafita compactada (CGI) e maleáveis (<80 KSI de resistência à tração) — velocidade — m/mín (SFM) — condições iniciais ◁▷

grupo de materiais	classe	60 (200)	150 (500)	240 (800)	330 (1100)	420 (1400)	510 (1700)	600 (2000)	690 (2300)	780 (2600)	m/mín	SFM
K2	KCK05B/KCK05				◁▷						360	1200
	KCK15B/KCK15			◁▷							270	900
	KCK20B/KCK20/KCPK05			◁▷							240	800
	KT315				◁▷						275	900

Ferros fundidos maleáveis, de grafita compactada e dúcteis (>80 KSI de resistência a tensão) — velocidade — m/mín (SFM) — condições iniciais ◁▷

grupo de materiais	classe	60 (200)	150 (500)	240 (800)	330 (1100)	420 (1400)	510 (1700)	600 (2000)	690 (2300)	780 (2600)	m/mín	SFM
K3	KCK05B/KCK05			◁▷							240	800
	KCK15B/KCK15			◁▷							215	725
	KCK20B/KCK20/KCPK05		◁▷								210	700
	KT315			◁▷							230	750

Etapa 1 • Escolha a geometria do inserto

Insertos negativos


..MA
-S-20

-T-20


-MR
Desbaste médio


-S-20
Desbaste


-UN


-RP

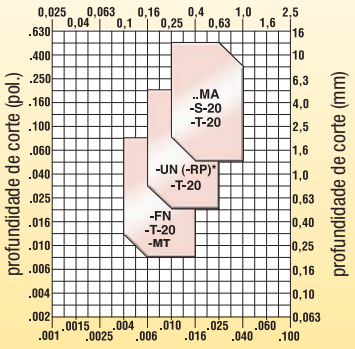

-T-20
Usinagem média


-FN
Acabamento


-T-20


-MT
Acabamento

taxa de avanço (mm/rev)



profundidade de corte (pol.) / profundidade de corte (mm)

avanço (pol/rot)

Insertos positivos


-MF

-T-20


-MP


-C
Usinagem média


-LF


-T-20

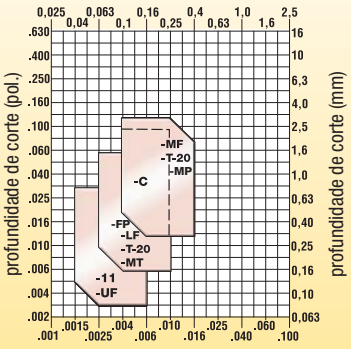

-FP
Positivo


-MT
Acabamento


-11


-UF
Acabamento fino

taxa de avanço (mm/rev)



profundidade de corte (pol.) / profundidade de corte (mm)

avanço (pol/rot)

* A geometria pode ser usada em operações de usinagem média para reduzir a pressão da ferramenta em materiais de alta resistência.

Etapa 2 • Escolha a classe

Ferro cinzento

condições de corte	Geometria negativa do inserto -FN	-MR	-UN(-RP)	-MA	Geometria positiva do inserto -LF	-FP	-MF	-MP
corte altamente interrompido	KCK15B/ KCK15	KCP25B/ KCP25/ KCP10B/KCP10	KCK20B/ KCK20	KCK20B/ KCK20	KCK20B/ KCK20	KCK20B/ KCK20	KCK20B/ KCK20	KCK20B/ KCK20
corte levemente interrompido	KCK15B/ KCK15	KCP10B/ KCP10/ KCP25B/KCP25	KCK20B/ KCK20	KCK20B/ KCK20	KCK20B/ KCK20	KCK20B/ KCK20	KCK20B/ KCK20	KCK20B/ KCK20
profundidade de corte variável, casca de fundição ou de forjamento	KCK05B/ KCK05/ KT315	KCK15B/ KCK15	KCK15B/ KCK15	KCK15B/ KCK15	KCK15B/ KCK15	KCK20B/ KCK20	KCK15B/ KCK15	KCK20B/ KCK20
corte suave, superfície pré-torneada	KCK05B/ KCK05/ KT315	KCK15B/ KCK15	KCK05B/ KCK05	KCK05B/ KCK05	KCK05B/ KCK05	KCK20B/ KCK20	KCK15B/ KCK15	KCK20B/ KCK20

Ferro fundido dúctil

condições de corte	Geometria negativa do inserto -FN	-UN(-RP)	-MA	-11/-UF	Geometria positiva do inserto -LF	-MF	-FP	-MP
corte altamente interrompido	KCK15B/ KCK15	KCK20B/ KCK20	KCK20B/ KCK20	–	KCK20B/ KCK20	KCK20B/ KCK20	KCK20B/ KCK20	KCK20B/ KCK20
corte levemente interrompido	KCK15B/ KCK15	KCK20B/ KCK20	KCK20B/ KCK20	KCU10	KCK20B/ KCK20	KCK20B/ KCK20	KCK20B/ KCK20	KCK20B/ KCK20
profundidade de corte variável, casca de fundição ou de forjamento	KCK05B/ KCK05/ KT315	KCK15B/ KCK15	KCK15B/ KCK15	KCU10	KCK15B/ KCK15	KCK15B/ KCK15	KCK20B/ KCK20	KCK20B/ KCK20
corte suave, superfície pré-torneada	KCK05B/ KCK05/ KT315	KCK05B/ KCK05	KCK05B/ KCK05	KT315	KCU10	KCK15B/ KCK15	KCK20B/ KCK20	KCK20B/ KCK20

(continuação)

Etapa 3 • Escolha a velocidade de corte *(continuação)* (A velocidade ideal depende da qualidade e disposição da fundição)

Ferros fundidos cinzentos — **velocidade — m/mín (SFM)** — **condições iniciais** ◁▷

grupo de materiais	classe	60 (200)	180 (600)	305 (1000)	430 (1400)	550 (1800)	675 (2200)	800 (2600)	920 (3000)	1040 (3400)	1160 (3800)	m/mín	SFM
K1	KT315		◁▷									275	900
	KB1340/KB1345							◁▷				760	2500
	KCK05B/KCK05				◁▷							450	1500
	KCK15B/KCK15			◁▷								360	1200
	KCK20B/KCK20/KCPK05			◁▷								300	1000

Ferros fundidos nodulares, de grafita compactada (CGI) e maleáveis (<600 MPa de resistência à tração) — **velocidade — m/mín (SFM)** — **condições iniciais** ◁▷

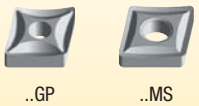
grupo de materiais	classe	90 (300)	135 (450)	180 (600)	225 (750)	275 (900)	320 (1050)	360 (1200)	410 (1350)	460 (1500)	500 (1650)	550 (1800)	600 (1950)	m/mín	SFM
K2	KT315					◁▷								275	900
	KCU10			◁▷										200	650
	KCK05B/KCK05						◁▷							360	1200
	KCK15B/KCK15						◁▷							270	900
	KCK20B/KCK20/KCPK05				◁▷									240	800

Ferros fundidos maleáveis, de grafita compactada e dúcteis (>600 MPa de resistência a tensão) — **velocidade — m/mín (SFM)** — **condições iniciais** ◁▷

grupo de materiais	classe	90 (300)	135 (450)	180 (600)	225 (750)	275 (900)	320 (1050)	360 (1200)	410 (1350)	460 (1500)	500 (1650)	550 (1800)	600 (1950)	m/mín	SFM
K3	KT315				◁▷									230	750
	KCU10			◁▷										150	500
	KCK05B/KCK05				◁▷									240	800
	KCK15B/KCK15			◁▷										215	725
	KCK20B/KCK20/KCPK05		◁▷											210	700

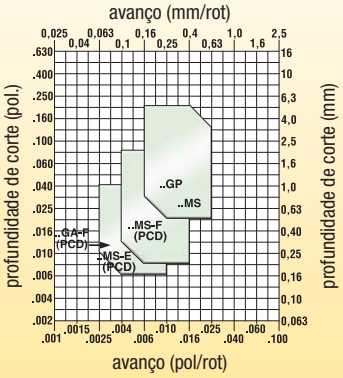
Etapa 1 • Escolha a geometria do inserto

Insertos negativos



..GP ..MS

Acabamento médio



Insertos positivos



..GT-HP

Acabamento médio

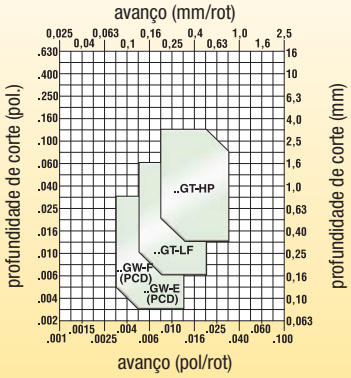


..GT-LF

Acabamento



..GW-F (PCD) ..GW-E (PCD)



Etapa 2 • Escolha a classe

		Geometria do inserto negativa		Geometria do inserto positiva	
condições de corte		**..GP**	**..MS**	**..GT-LF**	**..GT-HP**
corte altamente interrompido		**KC5410/K313**	**KC5410**	**–**	**KC5410**
corte levemente interrompido		**KC5410/K313**	**KC5410**	**KC5410**	**KC5410**
profundidade de corte variável, casca de fundição ou de forjamento		**KC5410/K313**	**KC5410**	**KC5410**	**KC5410**
corte suave, superfície pré-torneada		**KC5410/K313**	**KC5410**	**KC5410**	**KC5410**

Etapa 3 • Escolha a velocidade de corte

Ligas de alumínio de baixo teor de silício (Hipoeutético <12,2% Si) e ligas magnéticas

velocidade — m/mín (SFM) **Condições de início** ◁▷

grupo de materiais	classe	250 (800)	500 (1600)	750 (2400)	1000 (3200)	1250 (4000)	1500 (4800)	1750 (5600)	2000 (6400)	2250 (7200)	2500 (8000)	m/mín	SFM
N1	**KC5410**		◁▷									550	1800

Recomendações de velocidade de corte adicionais para materiais de peças variadas

À base de cobre, latão e zinco em uma faixa de índice de usinabilidade de 70 a 100

grupo de materiais	classe	velocidade — m/mín (SFM) 250 (800)	500 (1600)	750 (2400)	1000 (3200)	Condições de início m/mín	SFM
N4	KC5410	◁▷				275	900
	K313	◁▷				260	850

Náilon, plásticos, borrachas, fenóis, resinas, fibra de vidro e vidro

grupo de materiais	classe	velocidade — m/mín (SFM) 250 (800)	500 (1600)	750 (2400)	1000 (3200)	Condições de início m/mín	SFM
N5	KC5410	◁▷				170	550

Compósitos de carbono e grafite: Ligas de cobre, cobalto e berílio, Kevlar e grafite (de 280 a 400 HB) (de 30 a 43 HRC)

grupo de materiais	classe	velocidade — m/mín (SFM) 250 (800)	500 (1600)	750 (2400)	1000 (3200)	Condições de início m/mín	SFM
N6	KC5410	◁▷				200	650

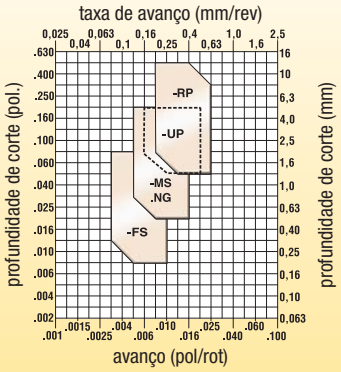
Ligas de estanho, fundido: ASTM 823, ligas 1, 2, 3, 11

grupo de materiais	classe	velocidade — m/mín (SFM) 250 (800)	500 (1600)	750 (2400)	1000 (3200)	Condições de início m/mín	SFM
N8	KC5410	◁▷				215	700
	K313	◁▷				180	600

Etapa 1 • Escolha a geometria do inserto

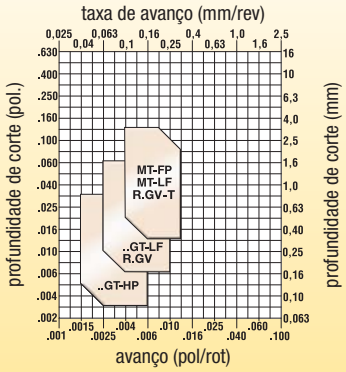
Insertos negativos





Insertos positivos





Etapa 2 • Escolha a classe

condições de corte		Geometria negativa do inserto -FS	-MS	-UP	-RP
corte altamente interrompido		KCU25	KCU25	KCM35B	KCM25B/ KCM35B
corte levemente interrompido		KCU10	KCU25	KCM25B	KCM15B
profundidade de corte variável, casca de fundição ou de forjamento		KCU10	KCU10	KCM15B	KCU25
corte suave, superfície pré-torneada		KCU10/K313	KCU10/K313	KCU10	KCU10

condições de corte		Geometria positiva do inserto MT-FP	..GT-HP	MT-LF	..GT-LF
corte altamente interrompido		KCU25	–	KCU25	KCU25
corte levemente interrompido		KCU25	KCU25	KCU25	KCU25
profundidade de corte variável, casca de fundição ou de forjamento		KCU10/KU10	KCU10	KCU10	KCU10
corte suave, superfície pré-torneada		KCU10/KU10	KCU10/K313	KCU10/K313	KCU10/K313

Etapa 3 • Escolha a velocidade de corte

Ligas resistentes a altas temperaturas à base de ferro (de 135 a 320 HB) (≤34 HRC)

grupo de materiais	classe	velocidade — m/mín (SFM) 15 (50)	45 (150)	75 (250)	105 (350)	140 (450)	170 (550)	200 (650)	230 (750)	260 (850)	290 (950)	310 (1050)	350 (1150)	380 (1250)	condições iniciais m/mín	SFM
S1	K313/KU10		◁▷												30	100
	KCU10			◁▷											55	180
	KCU25		◁▷												40	125
	KCM15B/KCM15			◁▷											55	180
	KCM25B/KCM25/KCM35B/KCM35		◁▷												40	125

Ligas resistentes a altas temperaturas à base de cobalto (de 150 a 425 HB) (≤45 HRC)

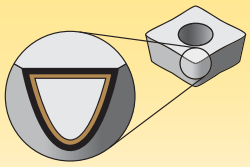
grupo de materiais	classe	velocidade — m/mín (SFM) 15 (50)	45 (150)	75 (250)	105 (350)	140 (450)	170 (550)	200 (650)	230 (750)	260 (850)	290 (950)	310 (1050)	350 (1150)	380 (1250)	condições iniciais m/mín	SFM
S2	K313/KU10		◁▷												35	110
	KCU10			◁▷											60	195
	KCU25		◁▷												30	100
	KCM15B/KCM15			◁▷											60	195
	KCM25B/KCM25/KCM35B/KCM35		◁▷												30	100

Ligas resistentes a altas temperaturas à base de níquel (de 140 a 475 HB) (≤48 HRC)

grupo de materiais	classe	velocidade — m/mín (SFM) 15 (50)	45 (150)	75 (250)	105 (350)	140 (450)	170 (550)	200 (650)	230 (750)	260 (850)	290 (950)	310 (1050)	350 (1150)	380 (1250)	condições iniciais m/mín	SFM
S3	K313/KU10		◁▷												40	125
	KCU10			◁▷											70	225
	KCU25		◁▷												40	125
	KCM15B/KCM15			◁▷											70	225
	KCM25B/KCM25/KCM35B/KCM35		◁▷												40	125

Titânio e ligas de titânio (110–450 HB) (≤48 HRC)

grupo de materiais	classe	velocidade — m/mín (SFM) 15 (50)	45 (150)	75 (250)	105 (350)	140 (450)	170 (550)	200 (650)	230 (750)	260 (850)	290 (950)	310 (1050)	350 (1150)	380 (1250)	condições iniciais m/mín	SFM
S4	K313/KU10		◁▷												45	150
	KCU10			◁▷											70	225
	KCU25		◁▷												55	175
	KCM15B/KCM15			◁▷											70	225
	KCM25B/KCM25/KCM35B/KCM35		◁▷												55	175



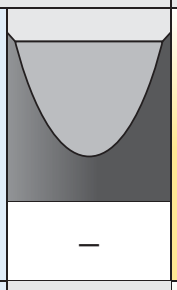
Os revestimentos proporcionam capacidade de alta velocidade e são projetados para acabamento e desbaste leve.

P	Aço
M	Aço inoxidável
K	Ferro fundido
N	Materiais não ferrosos
S	Ligas resistentes a altas temperaturas
H	Materiais endurecidos

resistência ao desgaste ⟷ **tenacidade**

Classes de metal duro sem revestimento

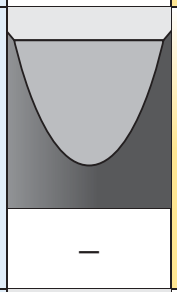
K313



Composição: Classe dura, com baixo teor de aglutinante e sem liga, com grãos finos de WC/Co.
Aplicação: Excepcional resistência a desgaste da aresta combinada com altíssima resistência para a usinagem de titânio, ferros fundidos, aços inoxidáveis austenísticos, metais não ferrosos, não metais e a maioria das ligas resistentes a altas temperaturas. Excelente resistência à deformação térmica e ao desgaste por entalhe no flanco. A estrutura do grão é bem controlada, proporcionando furos e facetas mínimas, o que contribui para um serviço durável e confiável.

	05	10	15	20	25	30	35	40	45
M									
K									
N									
S									

K68

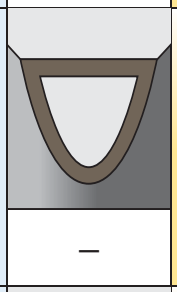


Composição: Classe dura, com baixo teor de aglutinante e com liga, com grãos finos de WC/Co.
Aplicação: A classe K68 possui tem resistência à abrasão para a usinagem de ferros fundidos, aços inoxidáveis austeníticos, metais não ferrosos, não metais e pode ser usada como uma alternativa para a classe K313 em ligas resistentes a altas temperaturas. Use como uma classe de uso geral para materiais não ferrosos.

	05	10	15	20	25	30	35	40	45
M									
K									
N									
S									

Classes com revestimento PVD sobre um substrato de metal duro

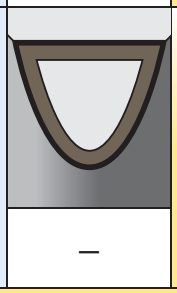
KCS10



Composição: Classe com avançado revestimento PVD de AlTiN sobre um substrato de metal duro de grãos finos com liga de tungstênio.
Aplicação: A classe KCS10 é especialmente projetada para a usinagem eficaz de ligas resistentes a altas temperaturas. O substrato de metal duro de grãos finos com liga de tungstênio oferece excelente dureza e resistência à deformação, enquanto o revestimento avançado PVD permite que as velocidades de usinagem de metais sejam o dobro das ferramentas de corte com revestimento PVD convencionais.

	05	10	15	20	25	30	35	40	45
P									
M									
K									
N									
S									
H									

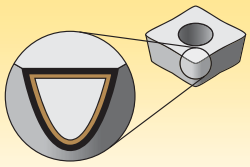
KCU10



Composição: Revestimento avançado PVD multicamadas sobre um substrato de metal duro sem liga e muito resistente à deformação. O revestimento novo e melhorado aumenta a estabilidade da aresta, com capacidade para uma ampla faixa de velocidades e avanços.
Aplicação: A classe KCU10 é ideal para usinagem de acabamento até usinagem em geral da maioria dos materiais das peças em uma ampla faixa de capacidades de velocidades e avanços. Excelente para usinar a maior parte dos aços, aços inoxidáveis, ferros fundidos, materiais não ferrosos e ligas resistentes a altas temperaturas, com dureza da aresta melhorada, resistência de entalhamento e com capacidade para maiores velocidades de corte e avanços.

beyond

	05	10	15	20	25	30	35	40	45
P									
M									
K									
N									
S									
H									



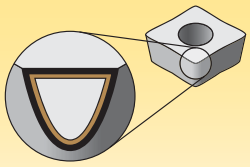
Os revestimentos proporcionam capacidade de alta velocidade e são projetados para acabamento e desbaste leve.

P	Aço
M	Aço inoxidável
K	Ferro fundido
N	Materiais não ferrosos
S	Ligas resistentes a altas temperaturas
H	Materiais endurecidos

resistência ao desgaste ⟷ tenacidade

Classes com revestimento PVD sobre um substrato de metal duro

Revestimento	Descrição da classe		05	10	15	20	25	30	35	40	45
KCU25	**Composição:** Uma classe PVD avançada com revestimento AlTiN duro e substrato sem liga de grãos finos. O revestimento novo e melhorado aumenta a estabilidade da aresta, com capacidade para uma ampla faixa de velocidades e avanços. **Aplicação:** A classe KCU25™ é ideal para a usinagem em geral da maior parte dos aços, aços inoxidáveis, ligas resistentes a altas temperaturas, titânio, ferros fundidos e materiais não ferrosos em uma ampla faixa de velocidades e avanços, com dureza da aresta melhorada para cortes interrompidos e altas faixas de avanço. beyond	P				■	■	■			
		M				■	■	■			
		K				■	■	■			
		N				■	■	■			
		S				■	■	■			
KC5010	**Composição:** Revestimento avançado PVD de AlTiN sobre um substrato de metal duro sem liga e muito resistente à deformação. **Aplicação:** A classe KC5010™ é ideal para acabamento de usinagem geral da maioria de materiais das peças em velocidades mais altas. Excelente para usinar a maior parte dos aços, aços inoxidáveis, ferros fundidos, materiais não ferrosos e ligas resistentes a altas temperaturas sob condições estáveis. Também desempenha bem na usinagem de materiais endurecidos e de cavacos curtos.	P		■	■	■					
		M		■	■	■					
		K	■	■	■	■					
		N		■	■	■					
		S		■	■	■					
		H		■							
KC5025	**Composição:** Classe com revestimento avançado PVD de AlTiN sobre um substrato tenaz, sem liga e de grão ultrafino. **Aplicação:** Para usinagem em geral da maior parte dos aços, aços inoxidáveis, ligas resistentes a altas temperaturas, titânio, ferros fundidos e materiais não ferrosos. As velocidades podem variar de baixa até média e admitem cortes interrompidos e altas taxas de avanço.	P				■	■	■			
		M				■	■	■			
		K				■	■	■			
		N				■	■	■			
		S				■	■	■			
KC5410	**Composição:** Revestimento PVD de TiB_2 sobre um substrato sem liga, extremamente resistente à deformação. **Aplicação:** Elaborado para desbaste, semi-acabamento e acabamento de usinagem livre (hipoeutético <12,2% Si) em alumínio, ligas de alumínio e ligas magnéticas. O revestimento de TiB2 é mais duro que os de TiN e TiAlN e tem uma superfície extremamente uniforme, resultando em menor atrito, fluxo de cavacos rápido e resistência a desgaste extraordinária. Evita a formação de aresta postiça, pois este revestimento tem uma baixa afinidade com o alumínio. O substrato sem liga e de grão fino oferece arestas afiadas, superfícies lisas e excelente resistência à deformação térmica e integridade da aresta. Insertos com uma periferia retificada são polidos antes do revestimento e têm uma aresta afiada. Insertos moldados têm um hone leve.										
		N				■					



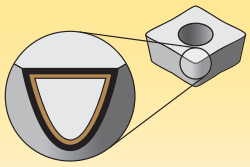
Os revestimentos proporcionam capacidade de alta velocidade e são projetados para acabamento e desbaste leve.

P	Aço
M	Aço inoxidável
K	Ferro fundido
N	Materiais não ferrosos
S	Ligas resistentes a altas temperaturas
H	Materiais endurecidos

resistência ao desgaste ⟷ tenacidade

Classes com revestimento CVD sobre um substrato de metal duro

Revestimento	Descrição da classe		05	10	15	20	25	30	35	40	45
KCP05B	**Composição:** Um substrato enriquecido com cobalto, altamente resistente a deformações e inovador com um revestimento CVD de MT-TiCN-Al_2O_3-TiOCN aderente e especialmente desenhado. **Aplicação:** Para efetuar acabamento e semiacabamento da maioria dos aços, aços inoxidáveis ferríticos, martensíticos e PH e de ferros fundidos. Fornece excelente combinação de resistência à deformação e resistência da aresta de corte. O novo revestimento, combinado com um tratamento pós-revestimento de última geração, proporciona alta produtividade com uma longa vida útil previsível e um acabamento superficial superior para a peça. beyond™ DRIVE™	P									
		K									
KCP05	**Composição:** Revestimento CVD de MT-TiCN-Al_2O_3 aderente, especialmente projetado, sobre um substrato inovador, altamente resistente à deformações, enriquecido com cobalto. **Aplicação:** Para efetuar acabamento e semiacabamento da maioria dos aços, aços inoxidáveis ferríticos, martensíticos e PH e de ferros fundidos. Fornece excelente combinação de resistência à deformação e resistência da aresta de corte. O novo revestimento, combinado com um tratamento pós-revestimento de última geração, proporciona alta produtividade com uma longa vida útil previsível e um acabamento superficial superior para a peça. beyond	P									
		K									
KCPK05	**Composição:** Um substrato enriquecido com cobalto e resistente a deformações, com revestimento espesso CVD de MT-TiCN-Al_2O_3. **Aplicação:** Para torneamento de alta produtividade de aços e aços inoxidáveis PH em cortes contínuos a ligeiramente interrompidos. Esta classe fornece uma combinação excelente de dureza e resistência a desgaste de alta velocidade, permitindo a produção mais rápida de peças em aço. Sua combinação exclusiva de substrato e revestimento também a torna uma classe ideal de desbaste para ferro fundido onde a resistência aos cavacos é necessária. beyond	P									
		K									
KCP10B	**Composição:** Uma classe de metal duro enriquecido com cobalto e especialmente usinado com revestimento espesso de CVD de MT-TiCN-Al_2O_3-TiOCN para máxima resistência a desgaste. **Aplicação:** Excelente classe para usinagem desde acabamento a usinagem média, para diversos materiais das peças, inclusive a maior parte dos aços, aços inoxidáveis ferríticos, martensíticos e PH, além de ferros fundidos. O substrato enriquecido com cobalto oferece uma combinação equilibrada de resistência à deformação e dureza, enquanto as camadas espessas de revestimento oferecem extraordinária resistência à abrasão e resistência a desgaste por craterização na usinagem em altas velocidades. O revestimento uniforme fornece resistência à formação de aresta postiça e à ocorrência de microlascamentos, além de produzir excelentes acabamentos superficiais. beyond™ DRIVE™	P									
		K									
KCP10	**Composição:** Classe especialmente projetada com um espesso revestimento CVD de MT-TiCN-Al_2O_3 sobre um substrato de metal duro enriquecido com cobalto, oferecendo a máxima resistência a desgaste. **Aplicação:** Excelente classe para usinagem desde acabamento a usinagem média, para diversos materiais das peças, inclusive a maior parte dos aços, aços inoxidáveis ferríticos, martensíticos e PH, além de ferros fundidos. O substrato enriquecido com cobalto oferece uma combinação equilibrada de resistência à deformação e dureza, enquanto as camadas espessas de revestimento oferecem extraordinária resistência à abrasão e resistência a desgaste por craterização na usinagem em altas velocidades. O revestimento uniforme fornece resistência à formação de aresta postiça e à ocorrência de microlascamentos, além de produzir excelentes acabamentos superficiais. beyond	P									
		K									



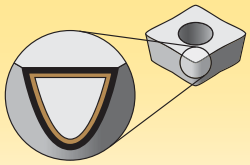
Os revestimentos proporcionam capacidade de alta velocidade e são projetados para acabamento e desbaste leve.

P	Aço
M	Aço inoxidável
K	Ferro fundido
N	Materiais não ferrosos
S	Ligas resistentes a altas temperaturas
H	Materiais endurecidos

resistência ao desgaste ← → tenacidade

Classes com revestimento CVD sobre um substrato de metal duro

Revestimento		Descrição da classe	05	10	15	20	25	30	35	40	45
KCP25B	—	**Composição:** Classe tenaz de metal duro enriquecido com cobalto, com revestimento CVD multicamadas de MT-TiCN-Al_2O_3-TiOCN com excelente adesão entre as camadas. **Aplicação:** Melhor classe para uso geral em torneamento da maioria dos aços e de aços inoxidáveis ferríticos e martensíticos. O projeto do substrato garante uma adequada resistência à deformação com excelente comprimento da aresta do inserto. As camadas do revestimento oferecem boa resistência a desgaste em uma ampla gama de condições de usinagem, e o tratamento pós-revestimento minimiza a ocorrência de microlascamentos e melhora a aresta postiça do revestimento ao substrato, levando a uma maior vida útil da ferramenta e a melhores acabamentos da peça. beyond DRIVE™	P				■	■	■			
			K					■	■	■	
KCP25	—	**Composição:** Classe de metal duro tenaz com um moderno revestimento CVD multicamadas de MT-TiCN-Al_2O_3 com excelente adesão entre as camadas, sobre um substrato de metal duro enriquecido com cobalto. **Aplicação:** Melhor classe para uso geral em torneamento da maioria dos aços e de aços inoxidáveis ferríticos e martensíticos. O projeto do substrato garante uma adequada resistência à deformação com excelente comprimento da aresta do inserto. As camadas do revestimento oferecem boa resistência a desgaste em uma ampla gama de condições de usinagem, e o tratamento pós-revestimento minimiza a ocorrência de microlascamentos e melhora a aresta postiça do revestimento ao substrato, levando a uma maior vida útil da ferramenta e a melhores acabamentos da peça. beyond™	P				■	■	■			
			K					■	■	■	
KCP30B	—	**Composição:** Uma classe de metal duro tenaz enriquecido com cobalto, com um revestimento avançado CVD de MT-TiCN-Al_2O_3-TiOCN de multicamadas. **Aplicação:** Para usinagem de média a pesada de todos os aços carbono, ligas de aço e aços inoxidáveis. O projeto do substrato fornece a resistência superior do inserto necessária para esta aplicação, e um revestimento multicamadas aumenta a resistência a desgaste do inserto, resultando em longa vida útil da ferramenta. beyond DRIVE™	P						■	■	■	
			M				■	■				
KCP30	—	**Composição:** Classe tenaz de metal duro enriquecido com cobalto, com um avançado revestimento CVD multicamadas de MT-TiCN-Al_2O_3. **Aplicação:** Para usinagem de média a pesada de todos os aços carbono, ligas de aço e aços inoxidáveis. O projeto do substrato fornece a resistência superior do inserto necessária para esta aplicação, e um revestimento multicamadas aumenta a resistência a desgaste do inserto, resultando em longa vida útil da ferramenta. beyond™	P						■	■	■	
			M				■	■				



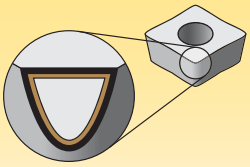
Os revestimentos proporcionam capacidade de alta velocidade e são projetados para acabamento e desbaste leve.

P	Aço
M	Aço inoxidável
K	Ferro fundido
N	Materiais não ferrosos
S	Ligas resistentes a altas temperaturas
H	Materiais endurecidos

resistência ao desgaste ⟷ tenacidade

Classes com revestimento CVD sobre um substrato de metal duro

Revestimento	Descrição da classe		05	10	15	20	25	30	35	40	45
KCP40B	**Composição:** Classe tenaz de metal duro um revestimento ligeiramente espesso CVD de MT-TiCN-Al_2O_3. **Aplicação:** Para usinagem pesada de aços carbono, ligas de aço e aços inoxidáveis. A combinação entre substrato e revestimento oferece extraordinária dureza e segurança na operação, permitindo altas taxas de remoção de material, mesmo nos cortes interrompidos mais difíceis. beyond DRIVE™	P							■	■	■
		M				■	■	■			
		K									
		N									
		S									
		H									
KCP40	**Composição:** Classe tenaz de metal duro com um revestimento ligeiramente espesso de CVD de MT-TiCN-Al_2O_3. **Aplicação:** Para usinagem pesada de aços carbono, ligas de aço e aços inoxidáveis. A combinação entre substrato e revestimento oferece extraordinária dureza e segurança na operação, permitindo altas taxas de remoção de material, mesmo nos cortes interrompidos mais difíceis. beyond	P							■	■	■
		M				■	■	■			
		K									
		N									
		S									
		H									
KCK05B	**Composição:** Um revestimento de camadas múltiplas com camadas de MTCVD TiCN-Al_2O_3-TiOCN moderadamente espessas sobre o substrato de metal duro altamente resistente à deformação. **Aplicação:** Desenvolvido para a usinagem em alta velocidade de ferros fundidos cinzentos e dúcteis. A arquitetura do substrato e do revestimento, juntamente com o tratamento pós-revestimento, garantem a vantagem de uma enorme vida útil da ferramenta, especialmente ao cortar ferros fundidos dúcteis e cinzentos com resistências à tensão mais altas, onde a consistência dimensional da peça e a confiabilidade na vida útil da ferramenta são essenciais. Excelente tanto em profundidades de corte constantes quanto variadas. beyond DRIVE™	P	■								
		M									
		K	■	■	■						
		N									
		S									
		H									
KCK05	**Composição:** Revestimento CVD multicamadas com camadas ligeiramente espessas de MT-TiCN-Al_2O_3 sobre um substrato de metal duro altamente resistente à deformação. **Aplicação:** Desenvolvido para a usinagem em alta velocidade de ferros fundidos cinzentos e dúcteis. A arquitetura do substrato e do revestimento, juntamente com o tratamento pós-revestimento, garantem a vantagem de uma enorme vida útil da ferramenta, especialmente ao cortar ferros fundidos dúcteis e cinzentos com resistências à tensão mais altas, onde a consistência dimensional da peça e a confiabilidade na vida útil da ferramenta são essenciais. Excelente tanto em profundidades de corte constantes quanto variadas. beyond	P	■								
		M									
		K	■	■	■						
		N									
		S									
		H									
KCK15B	**Composição:** Um revestimento de camadas múltiplas com camadas MTCVD TiCN-Al_2O_3-TiOCN aplicadas em um substrato de metal duro especialmente elaborado para ferros fundidos. **Aplicação:** Proporciona uma performance constante na usinagem em alta velocidade de ferros dúcteis cinzentos e nodulares. O projeto do substrato permite que o inserto permaneça no corte por muito tempo em velocidades altas e com a mínima deformação. O revestimento de CVD espesso e o tratamento pós-revestimento oferecem resistência superior ao desgaste, garantindo uma vida útil da ferramenta longa e constante. Pode ser aplicado tanto em cortes contínuos quanto ligeiramente interrompidos. beyond DRIVE™	P	■	■							
		M									
		K		■	■	■	■				
		N									
		S									
		H									



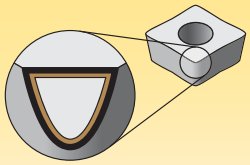
Os revestimentos proporcionam capacidade de alta velocidade e são projetados para acabamento e desbaste leve.

P	Aço
M	Aço inoxidável
K	Ferro fundido
N	Materiais não ferrosos
S	Ligas resistentes a altas temperaturas
H	Materiais endurecidos

resistência ao desgaste ⟷ tenacidade

Classes com revestimento CVD sobre um substrato de metal duro

Revestimento	Descrição da classe	05	10	15	20	25	30	35	40	45
KCK15 —	**Composição:** Revestimento CVD multicamadas com camadas espessas de MT-TiCN-Al_2O_3 sobre um substrato de metal duro especificamente projetado para ferros fundidos. **Aplicação:** Proporciona uma performance constante na usinagem em alta velocidade de ferros dúcteis cinzentos e nodulares. O projeto do substrato permite que o inserto permaneça no corte por muito tempo em velocidades altas e com a mínima deformação. O revestimento de CVD espesso e o tratamento pós-revestimento oferecem resistência superior ao desgaste, garantindo uma vida útil da ferramenta longa e constante. Pode ser aplicado tanto em cortes contínuos quanto ligeiramente interrompidos. beyond	P	P								
KCK20B —	**Composição:** Um revestimento CVD de MT-TiCN-Al_2O_3-TiOCN com dureza especial sobre um substrato resistente ao desgaste. **Aplicação:** Especificamente desenvolvida para maximizar a adesão do revestimento e a resistência da aresta, tornando essa classe ideal para cortes interrompidos com refrigeração de ferros fundidos dúctil e cinzento. Ela pode ser usada em uma ampla gama de aplicações, de acabamento a desbaste, para maximizar a produtividade onde quer que resistência e confiabilidade sejam necessárias. beyond DRIVE	P	P	P							
KCK20 —	**Composição:** Revestimento CVD de MT-TiCN-Al_2O_3 com tenacidade especial sobre um substrato resistente ao desgaste. **Aplicação:** Especificamente desenvolvida para maximizar a adesão do revestimento e a resistência da aresta, tornando essa classe ideal para cortes interrompidos com refrigeração de ferros fundidos dúctil e cinzento. Ela pode ser usada em uma ampla gama de aplicações, de acabamento a desbaste, para maximizar a produtividade onde quer que resistência e confiabilidade sejam necessárias. beyond	P	P	P							
KCM15B —	**Composição:** Classe de metal duro com revestimento de CVD multicamadas de MT-TiCN-Al_2O_3. **Aplicação:** Um excelente acabamento para a classe de usinagem média para aços inoxidáveis austeníticos em velocidades mais altas e cobre uma ampla faixa de aplicações de aço na faixa de P20 a P25. A classe KCM15B, em combinação com geometrias exclusivas, foi desenvolvida para resistir a desgaste por entalhe no flanco e minimizar a formação de rebarbas. O tratamento pós-revestimento reduz os estresses, melhora a aresta postiça do revestimento, minimiza a ocorrência de microlascamentos e o acúmulo de material na aresta, além de melhorar o acabamento da peça. beyond DRIVE	P	P	P							
		M	M	M							



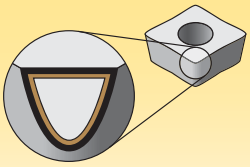
Os revestimentos proporcionam capacidade de alta velocidade e são projetados para acabamento e desbaste leve.

P	Aço
M	Aço inoxidável
K	Ferro fundido
N	Materiais não ferrosos
S	Ligas resistentes a altas temperaturas
H	Materiais endurecidos

resistência ao desgaste ⟷ tenacidade

Classes com revestimento CVD sobre um substrato de metal duro

Revestimento	Descrição da classe		05	10	15	20	25	30	35	40	45
KCM15	**Composição:** Classe de metal duro com revestimento de CVD multicamadas de MT-TiCN-Al_2O_3. **Aplicação:** Um excelente acabamento para a classe de usinagem média para aços inoxidáveis austeníticos em velocidades mais altas e cobre uma ampla faixa de aplicações de aço na faixa de P20 a P25. A classe KCM15, em combinação com geometrias exclusivas, foi desenvolvida para resistir a desgaste por entalhe no flanco e minimizar a formação de rebarbas. O tratamento pós-revestimento reduz os estresses, melhora a aresta postiça do revestimento, minimiza a ocorrência de microlascamentos e o acúmulo de material na aresta, além de melhorar o acabamento da peça. beyond	P				■	■				
		M		■	■	■						
KCM25B	**Composição:** Uma classe de metal duro revestido com CVD de MT-TiCN-Al_2O_3-TiOCN em multicamadas. **Aplicação:** Essa classe com revestimento de CVD foi projetada para a usinagem em geral de aços inoxidáveis austeníticos, em velocidades e avanços moderados. Esta classe oferece uma extraordinária combinação de dureza, resistência à formação de aresta postiça e resistência a desgaste em aplicações em aço inoxidável. beyond DRIVE	P							■	■	■
		M				■	■	■			
KCM25	**Composição:** Revestimento de CVD multicamadas constituído de CVD de camadas de MT-TiCN-Al_2O_3 sobre um substrato tenaz de metal duro, enriquecido com cobalto. **Aplicação:** Essa classe com revestimento de CVD foi projetada para a usinagem em geral de aços inoxidáveis austeníticos, em velocidades e avanços moderados. Esta classe oferece uma extraordinária combinação de dureza, resistência à formação de aresta postiça e resistência a desgaste em aplicações em aço inoxidável. beyond	P							■	■	■
		M				■	■	■			
KCM35B	**Composição:** Um revestimento multicamada de CVD de MT-TiCN-Al_2O_3-TiOCN sobre um substrato super-duro. **Aplicação:** Projetado para atender às aplicações de usinagem mais pesadas em aços inoxidáveis fundidos. O substrato resiste a cortes interrompidos pesados, enquanto que o revestimento oferece a resistência a desgaste necessária para uma longa vida útil da ferramenta. A superfície polida resiste à formação de aresta postiça, mesmo em baixas velocidades de corte. Disponível em tamanhos e geometrias de insertos apropriados para avanços pesados e grandes profundidades de corte. beyond DRIVE	P								■	■
		M						■	■	■	
KCM35	**Composição:** Revestimento CVD multicamadas de MT-TiCN-Al_2O_3 sobre um substrato super duro. **Aplicação:** Projetado para atender às aplicações de usinagem mais pesadas em aços inoxidáveis fundidos. O substrato resiste a cortes interrompidos pesados, enquanto que o revestimento oferece a resistência a desgaste necessária para uma longa vida útil da ferramenta. A superfície polida resiste à formação de aresta postiça, mesmo em baixas velocidades de corte. Disponível em tamanhos e geometrias de insertos apropriados para avanços pesados e grandes profundidades de corte. beyond	P								■	■
		M						■	■	■	

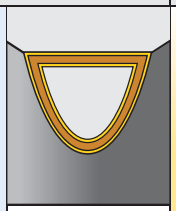
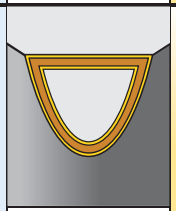


Os revestimentos proporcionam capacidade de alta velocidade e são projetados para acabamento e desbaste leve.

P	Aço
M	Aço inoxidável
K	Ferro fundido
N	Materiais não ferrosos
S	Ligas resistentes a altas temperaturas
H	Materiais endurecidos

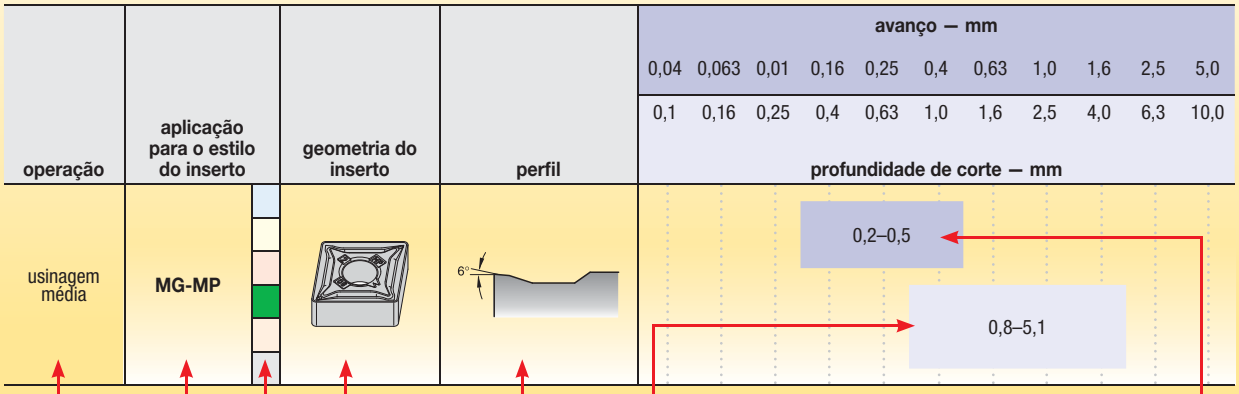
resistência ao desgaste ⟷ tenacidade

Classes de cermet com revestimento PVD

Revestimento	Descrição da classe		05	10	15	20	25	30	35	40	45
KT315  —	**Composição:** Classe com revestimento de PVD multicamadas de TiN/TiCN/TiN sobre um substrato de cermet, para torneamento. **Aplicação:** Ideal para acabamento de alta velocidade para usinagem média da maioria dos aços carbono, aços-liga e aços inoxidáveis. Funciona muito bem também em aplicações para ferros fundidos cinzentos e dúcteis. Possibilita uma longa e uniforme vida útil da ferramenta e produzirá excelentes acabamentos nas peças.	P									
		M									
		K									
KTP10  —	**Composição:** Classe com revestimento de PVD multicamadas de TiN/TiCN/TiN sobre um substrato de cermet, para torneamento. **Aplicação:** Ideal para acabamento de alta velocidade para usinagem média da maioria dos aços carbono, aços-liga e aços inoxidáveis. Funciona muito bem também em aplicações para ferros fundidos cinzentos e dúcteis. Possibilita uma longa e uniforme vida útil da ferramenta e produzirá excelentes acabamentos nas peças.	P									
		M									
		K									

Selecione a geometria — com base na taxa de avanço e na profundidade de corte

P	Aço
M	Aço inoxidável
K	Ferro fundido
N	Não ferrosos
S	Ligas resistentes a altas temperaturas
H	Materiais endurecidos



Intervalo das taxas de avanço —
para melhores resultados, use o centro de 60% do intervalo

Intervalo da profundidade de corte —
para todos os insertos no programa, selecione o menor para cortes mais leves e os maiores para cortes pesados

Geometria do quebra-cavacos —
seção é pelo raio de ponta do inserto

Peça principal
Grupo de materiais

P	Aço
M	Aço inoxidável
K	Ferro fundido
N	Não ferrosos
S	Ligas resistentes a altas temperaturas
H	Materiais endurecidos

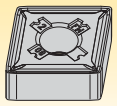
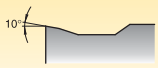
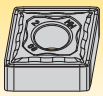
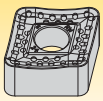
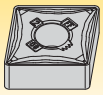
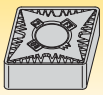
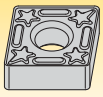
Designação de geometria de controle de cavacos —
exemplo: MG-MP = CNMG-432MP

Operação de Usinagem —
para a qual a geometria do inserto é desenhado

NOTA: Para recomendações detalhadas de classe e geometria, consulte o Sistema de Seleção Kennametal Beyond nas páginas B8–B21.

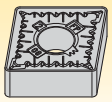
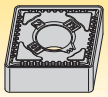
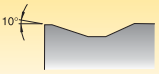
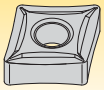
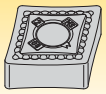
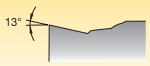
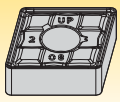
Selecione a geometria — com base na taxa de avanço e na profundidade de corte

P	Aço
M	Aço inoxidável
K	Ferro fundido
N	Não ferrosos
S	Ligas resistentes a altas temperaturas
H	Materiais endurecidos

operação	aplicação para o estilo do inserto	geometria do inserto	perfil	avanço — mm: 0,04 / 0,063 / 0,1 / 0,16 / 0,25 / 0,4 / 0,63 / 1,0 / 1,6 / 2,5 / 5,0 profundidade de corte — mm: 0,1 / 0,16 / 0,25 / 0,4 / 0,63 / 1,0 / 1,6 / 2,5 / 4,0 / 6,3 / 10,0
acabamento Wiper	**MG-FW**			0,2–0,4 0,25–2,0
usinagem média Wiper	**MG-MW**			0,3–0,6 0,8–5,1
desbaste Wiper	**MM-RW**			0,3–1,3 1,3–12,7
acabamento fino	**MG-FF**			0,05–0,25 0,08–2,0
agudo acabamento	**GG-FS** precisão retificado			0,07–0,25 0,20–2,0
acabamento	**GG-LF** precisão retificado			0,1–0,5 0,5–3,0

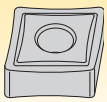
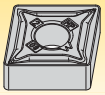
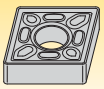
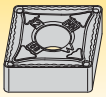
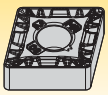
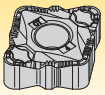
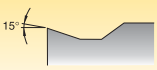
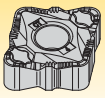
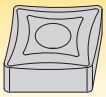
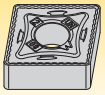
Selecione a geometria — com base na taxa de avanço e na profundidade de corte

P	Aço
M	Aço inoxidável
K	Ferro fundido
N	Não ferrosos
S	Ligas resistentes a altas temperaturas
H	Materiais endurecidos

operação	aplicação para o estilo do inserto	geometria do inserto	perfil	avanço — mm: 0,04 / 0,063 / 0,1 / 0,16 / 0,25 / 0,4 / 0,63 / 1,0 / 1,6 / 2,5 / 5,0 profundidade de corte — mm: 0,1 / 0,16 / 0,25 / 0,4 / 0,63 / 1,0 / 1,6 / 2,5 / 4,0 / 6,3 / 10,0
acabamento	MG-FP			0,1–0,3 0,25–2,5
	MG-FN			0,1–0,3 0,3–2,5
	MP-K			0,1–0,3 0,2–2,5
agudo médio	MG-MS			0,12–0,35 0,76–5,0
usinagem média	MG-UP			0,2–0,6 1–6,4

Selecione a geometria — com base na taxa de avanço e na profundidade de corte

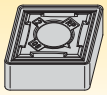
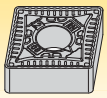
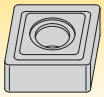
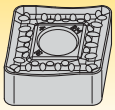
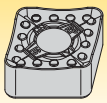
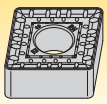
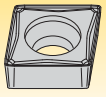
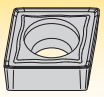
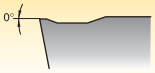
P	Aço
M	Aço inoxidável
K	Ferro fundido
N	Não ferrosos
S	Ligas resistentes a altas temperaturas
H	Materiais endurecidos

operação	aplicação para o estilo do inserto	geometria do inserto	perfil	avanço — mm: 0,04 / 0,063 / 0,01 / 0,16 / 0,25 / 0,4 / 0,63 / 1,0 / 1,6 / 2,5 / 5,0 profundidade de corte — mm: 0,1 / 0,16 / 0,25 / 0,4 / 0,63 / 1,0 / 1,6 / 2,5 / 4,0 / 6,3 / 10,0
usinagem média	_GP*			0,3–0,5 0,5–3,2
	MG-MP			0,15–0,5 0,8–5,1
	MG-P			0,15–0,5 0,75–5,0
	MG-MN			0,15–0,5 0,5–5,1
	MG-MR			0,15–0,55 1,5–6,3
	MG-CT Torneamento O.D.			0,13–0,5 1,0–3,0
	MG-CT Faceamento externo			0,25–0,5 0,25–1,0
	-MS lado único			0,15–0,4 0,6–2,3
	MG-UN			0,2–0,5 0,8–3,8

*As geometrias de 35° e 55° têm face única.

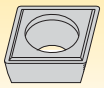
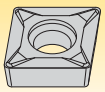
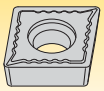
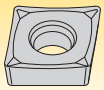
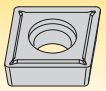
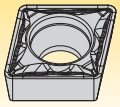
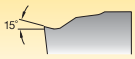
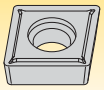
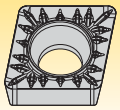
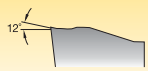
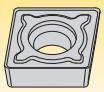
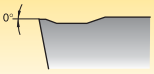
Selecione a geometria — com base na taxa de avanço e na profundidade de corte

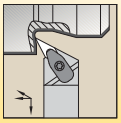
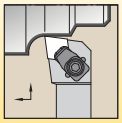
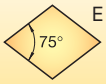
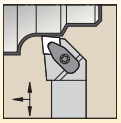
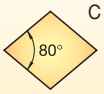
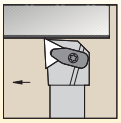
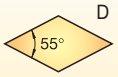
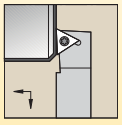
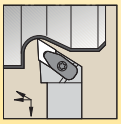
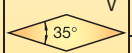
P	Aço
M	Aço inoxidável
K	Ferro fundido
N	Não ferrosos
S	Ligas resistentes a altas temperaturas
H	Materiais endurecidos

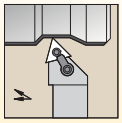
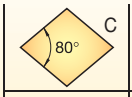
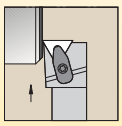
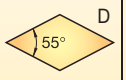
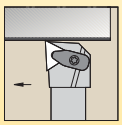
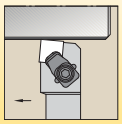
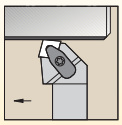
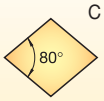
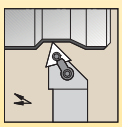
operação	aplicação para o estilo do inserto	geometria do inserto	perfil	avanço — mm: 0,04 / 0,063 / 0,01 / 0,16 / 0,25 / 0,4 / 0,63 / 1,0 / 1,6 / 2,5 / 5,0 — profundidade de corte — mm: 0,1 / 0,16 / 0,25 / 0,4 / 0,63 / 1,0 / 1,6 / 2,5 / 4,0 / 6,3 / 10,0
desbaste	**MG-RP**			0,2–0,6 1,1–6,4
desbaste pesado	**MG-RN**			0,3–0,63 1,1–5,7
	MG			0,3–0,8 1,1–5,7
	MM-RM lado único			0,3–1,0 1,3–12,7
	MM-RP lado único			0,2–1,0 1,3–10,0
	MM-RH lado único			0,4–1,3 1,3–12,7
acabamento Wiper	**MT-FW**			0,08–0,35 0,2–1,5
Wiper, acabamento médio	**MT-MW**			0,12–0,5 0,4–3,3

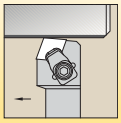
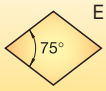
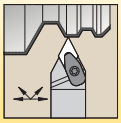
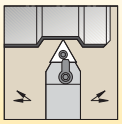
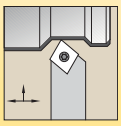
Selecione a geometria — com base na taxa de avanço e na profundidade de corte

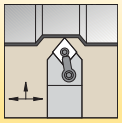
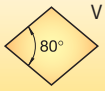
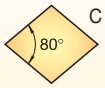
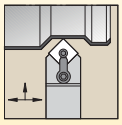
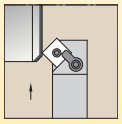
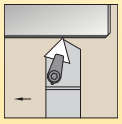
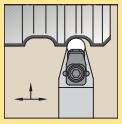
P	Aço
M	Aço inoxidável
K	Ferro fundido
N	Não ferrosos
S	Ligas resistentes a altas temperaturas
H	Materiais endurecidos

operação	aplicação para o estilo do inserto	geometria do inserto	perfil	avanço — mm: 0,04 / 0,063 / 0,01 / 0,16 / 0,25 / 0,4 / 0,63 / 1,0 / 1,6 / 2,5 / 5,0 profundidade de corte — mm: 0,1 / 0,16 / 0,25 / 0,4 / 0,63 / 1,0 / 1,6 / 2,5 / 4,0 / 6,3 / 10,0
acabamento fino	_GM precisão retificado			0,05–0,2 0,2–1,0
	MT-11			0,08–0,25 0,2–1,3
	.MT-UF			0,05–0,25 0,1–1,3
acabamento	GT-HP precisão retificado			0,2–0,4 0,6–2,3
	GT-LF precisão retificado			0,2–0,4 0,8–2,3
	MT-FP			0,063–0,25 0,16–1,6
	MT-LF			0,2–0,4 0,8–2,3
usinagem média	MT-MP			0,15–0,4 0,4–2,3
	MT-MF			0,2–0,4 1,1–2,3

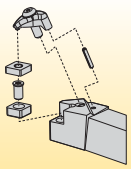
trajeto da ferramenta	forma do inserto	estilo de fixação	Torneamento	Perfilamento	Faceamento	Mergulho	Chanfrar	página(s)
Ângulo de posição de 117,5°								
	 V 35°	Kenloc™	●	●	●			B151
		Kenclamp™	●		●			B150
Ângulo de posição de 107,5°								
	 D 55°	Screw-On	●	●				B213
		TNT	●	●		●		B151
	 V 35°	Screw-On	●	●				B265
Ângulo de posição de 97,5°								
	 E 75°	MTS	●		●			–
Ângulo de posição de 95°								
	 C 80°	Kenloc	●	●	●			B62
		Kenclamp	●	●	●			B59
		Kenlever™	●	●	●			B65
		Screw-On	●	●	●			B180, B193
		MTS	●	●	●			B358
	 W 80°	Kenloc	●	●	●			B162
		Kenclamp	●	●	●			B161
		Kenlever	●	●	●			B163
		Screw-On	●	●	●			B271
		MTS	●	●	●			B369
		Wedgelock™	●	●	●			B162
Ângulo de posição de 93°								
	 D 55°	Kenloc	●	●				B86
		Kenclamp	●	●				B85
		Kenlever	●	●				B87
		Screw-On	●	●				B210
		MTS	●	●				B360
	 V 35°	Kenloc	●	●				B151
		Kenclamp	●	●				B149
		Screw-On	●	●				B267
	 T 60°	Wedgelock	●	●				B133

trajeto da ferramenta	forma do inserto	estilo de fixação	Torneamento	Perfilamento	Faceamento	Mergulho	Chanfrar	página(s)
Ângulo de posição de 90°								
	 C 80°	Screw-on	●	●	●			B179
	 D 55°	Screw-on	●	●	●			B209
	 V 35°	Screw-on	●	●	●			B266
	 T 60°	Kenloc	●	●	●	●		B133
		Kenclamp	●	●	●			B132
		Kenlever	●	●	●			B135
		Screw-on	●	●	●			B247
		TNT	●	●	●			–
		Wedgelock	●	●	●			B133
Ângulo de posição de 85°								
	 S 90°	MTS	●		●			B366
Ângulo de posição de 75°								
	 C 80°	Kenloc	●	●	●			B61
		Kenclamp	●	●	●			B58
		Kenlever	●		●			B64
		TNT	●	●				–
		Screw-On	●		●			B180
		MTS	●					B356
	 S 90°	Kenloc	●		●			B108
		Kenclamp	●		●			B105
		Kenlever	●	●	●			B111
		Screw-On	●	●	●			B233
		MTS	●	●	●			B364
Ângulo de posição de 72,5°								
	 V 35°	Kenloc	●	●				B152
		Kenclamp		●				B150
		Screw-On	●	●				B268

trajeto da ferramenta	forma do inserto	estilo de fixação	Torneamento	Perfilamento	Faceamento	Mergulho	Chanfrar	página(s)
Ângulo de posição de 70°								
	 E 75°	**Kenloc™**	●	●				–
Ângulo de posição de 63°								
	 D 55°	**Kenloc**	●	●				B85
Ângulo de posição de 62,5°								
	 D 55°	**Kenloc**	●	●	●			B86
		Kenlever	●	●	●			B88
		Screw-On	●	●				B211
Ângulo de posição de 60°								
 	 T 60°	**Kenloc**	●	●	●			B133

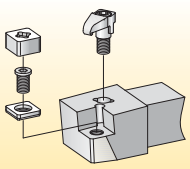
trajeto da ferramenta	forma do inserto	estilo de fixação	Torneamento	Perfilamento	Faceamento	Mergulho	Chanfrar	página(s)
Ângulo de posição de 50°								
	 V 80°	**Kenloc**	●	●	●			B63
Ângulo de posição de 45°								
	 C 80°	**Kenloc**	●	●	●			B60
		Kendex™	●	●	●			B66
		Screw-On	●	●	●			B192
	 S 90°	**Kenloc**	●	●	●			B109
		Kenclamp	●	●	●			B105
		**Kenlever™**	●	●	●			B111
		Kendex	●	●	●			–
		Screw-On	●	●	●			B233
		**MTS**	●	●	●			B213
	 T 60°	**Kenlever**	●	●	●			B86
	 R	**Kenloc**	●	●	●			B95
		Kenclamp	●	●	●			–
		**Fix-Perfect™**	●	●	●			–
		Screw-On	●	●	●			B227
		MTS	●	●	●			B365

Estilos de fixação



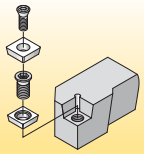
Estilo Kenclamp™

- Utiliza insertos de estilo negativo Kenloc™.
- O projeto do grampo exclusivo fornece fixação rígida.
- Garante a repetibilidade e posicionamento da pastilha.
- Vibração por ressonância reduzida e maior vida útil da ferramenta.



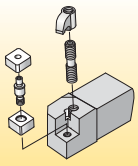
Sistema de ferramentas modulares estilo MTS

- Sistema comprovadamente superior para fixação rígida de insertos cerâmicos em operações de torneamento e perfilagem.
- Usa tamanhos padrão de insertos — 80°, 75°, 55°, quadrado e trígono.
- Este sistema oferece a versatilidade adicional de usar hardware opcional para fixar os insertos padrão Kendex™ e Kenloc.



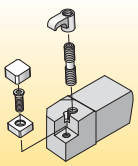
Estilo Screw-On

- Fixação superior por parafuso para insertos Screw-On.



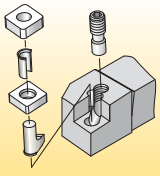
Estilo Kenloc™

- Utiliza insertos de estilo negativo Kenloc™.
- O pino de trava e o grampo superior fornecem fixação rígida.
- Uma ampla variedade de estilos de insertos pode ser usada.
- As ferramentas podem ser usadas com ou sem grampo.



Estilo Kendex

- Usa insertos Kendex.
- Opção com quebra-cavacos disponível para insertos de cerâmica.
- Uma ampla variedade de estilos de insertos pode ser usada.

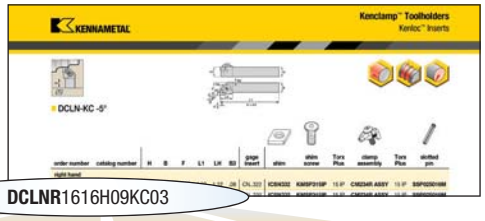


Estilo Kenlever™

- Sistema comprovadamente superior para fixação rígida de insertos cerâmicos em operações de torneamento e perfilagem.
- Pode ser usado com insertos Kendex ou Kenloc por meio de hardware opcional.

Como funcionam os números de catálogo?

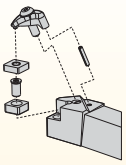
Cada caractere no nosso número de catálogo significa uma característica específica daquele produto. Use as colunas-chave a seguir e as imagens correspondentes para uma identificação fácil do atributo a ser aplicado.



DCLNR1616H09KC03

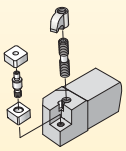
D — Método de fixação do inserto

D



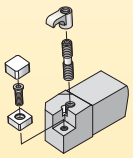
Kenclamp™

M



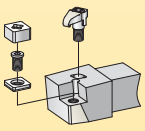
Kenloc™

C



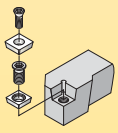
Kendex™

N



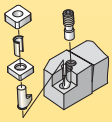
Perfilagem Top Notch™

S



Screw-On

P



Kenlever™

C — Formato do inserto

A 85°

B 82°

C 80°

D 55°

E 75°

H 120°

K 55°

L 90°

M 86°

O 135°

P 108°

R

S 90°

T 60°

V 35°

W 80°

L — Estilo da ferramenta ou ângulo de posição

A 90°

B 15°

C 90°

D 45°

E 60°

F 90°

G 90°

H 107,5°

J 93°

K 75°

L 95°

M 50°

P 107,5°

Q 107,5°

R 75°

S 45°

U 93°

V 72,5°

Y 85°

N — Ângulo de folga do inserto

N 0°

B 5°

C 11°

P 11°

D 15°

E 20°

F 25°

R — Sentido de rotação da ferramenta

R =

Sentido de rotação à direita

L =

Sentido de rotação à esquerda

N =

Neutro

Informações adicionais

C =

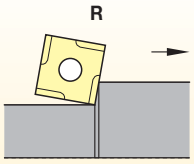
Encaixe profundo para inserto de cerâmica

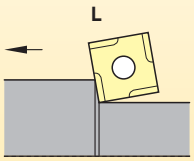
S =

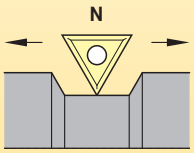
Parede de posicionamento de encaixe simples

F =

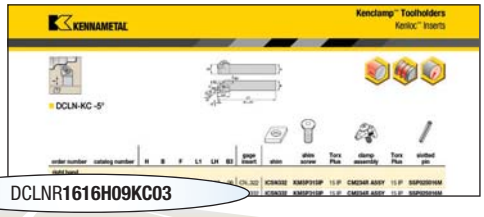
Canal reto, sem deslocamento





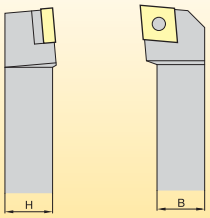


Consultando este guia fácil de usar, você pode identificar o produto correto para atender às suas necessidades.



DCLNR**1616H09KC03**

16	16	H	09	KC	03
Dimensões da haste		Comprimento da ferramenta	Tamanho do inserto	Informações adicionais	Espessura do inserto *(opcional)*



A sétima e a oitava posições devem ser um número de dois algarismos significativo, que indica a seção transversal do porta-inserto.

- Se a dimensão para a largura "B" ou para a altura "H" for representada por um número de um dígito, será colocado um 0 (zero) na frente dele.

Exemplo: 8,0mm = 08

L1	ISO
32	A
40	B
50	C
60	D
70	E
80	F
90	G
100	H
110	J
125	K
140	L
150	M
160	N
170	P
180	Q
200	R
250	S
300	T
350	U
400	V
450	W
500	Y
Projeto especial	X

KC =
Kenclamp™

H4 =
Sistema de fixação Wedgelock™

M =
Sistema de fixação MTS para insertos de cerâmica e com PcBN.

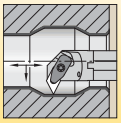
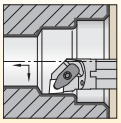
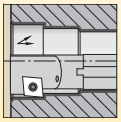
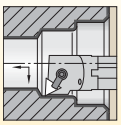
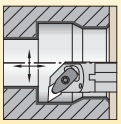
04 = 4,76mm

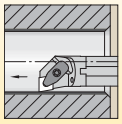
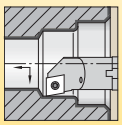
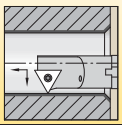
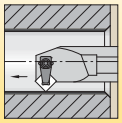
06 = 6,35mm

Comprimento da aresta de corte L10

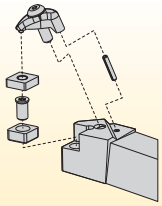
H	Hexágono 120°	
O	Octágono 135°	
P	Pentágono 108°	
S	Quadrado 90°	
T	Triangular 60°	
R	Redondo —	

C	Romboide 80°	
D	55°	
E	75°	
M	86°	
V	35°	
W	Trígono 80° com ângulos de cantos ampliados	
L	Retângulo 90°	
A	Paralelogramo 85°	
B	82°	
K	55°	

trajeto da ferramenta	forma do inserto	estilo de fixação	Boring	Back Boring	Perfilamento	página(s)
Ângulo de posição de 117,5°						
	D 55°	KenClamp™	●		●	B89
Ângulo de posição de 107,5°						
	D 55°	Kenclamp	●	●	●	B89
		Screw-On	●	●		B212, B217
	V 35°	Screw-On	●	●	●	B268
Ângulo de posição de 95°						
 	C 80°	Kenloc™	●		●	B67
		Kenclamp™	●		●	B66
		Screw-on	●		●	B182, B196
		Kenlever™	●		●	B68
		MTS	●		●	B372
	E 75°	MTS	●		●	–
	T 60°	Screw-On	●		●	B250
	W 80°	Kenloc	●			B164
		Kenclamp	●		●	B163
		Kenlever	●		●	B165
		Screw-on	●		●	B271
		MTS	●		●	B374
Ângulo de posição de 93°						
 	C 55°	Kenloc	●	●	●	B90
		Kenclamp	●	●	●	B90
		Screw-on	●		●	B212, B217
		MTS	●		●	–
	V 35°	Kenloc	●		●	B153
		Kenclamp	●	●		B152
		Screw-on	●	●	●	B269
	T 60°	Kendex™	●		●	B371
	W 80°	Screw-On	●		●	B272

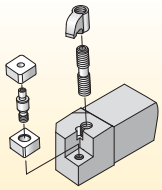
trajeto da ferramenta	forma do inserto	estilo de fixação	Boring	Back Boring	Perfilamento	página(s)
Ângulo de posição de 90°						
	C 80°	Screw-On	●		●	B182, B194
	T 60°	Kenloc	●			B137
		Kenclamp	●		●	B137
		Kenlever	●		●	B138
		Kendex	●		●	–
		Screw-On	●			B248, B257
Ângulo de posição de 75°						
	C 80°	Screw-On	●			B195
	S 90°	Kenloc	●			B114
		Kenclamp	●			B113
		Kenlever	●			B114
		Kendex	●			–
		Screw-On	●			B233
	T 60°	MTS	●			–
		Kendex	●			–
Ângulo de posição de 60°						
	T 60°	Screw-On	●		●	–
Ângulo de posição de 45°						
	S 90°	MTS	●			B373

Estilos de fixação



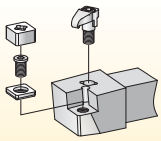
Estilo Kenclamp™

- Utiliza insertos de estilo negativo Kenloc™.
- O projeto do grampo exclusivo fornece fixação rígida.
- Garante a repetibilidade e posicionamento da pastilha.
- Vibração por ressonância reduzida e maior vida útil da ferramenta.



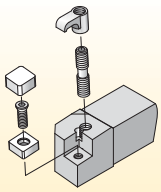
Estilo Kenloc™

- Utiliza insertos de estilo negativo Kenloc™.
- O pino de trava e o grampo superior fornecem fixação rígida.
- Uma ampla variedade de estilos de insertos pode ser usada.
- As ferramentas podem ser usadas com ou sem grampo.



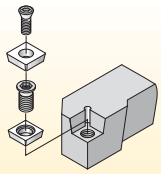
Estilo MTS

- Sistema comprovadamente superior para fixação rígida de insertos cerâmicos em operações de torneamento e perfilagem.
- Usa tamanhos padrão de insertos — 80°, 75°, 55°, quadrado e trígono.
- Este sistema oferece maior versatilidade de uso de hardware opcional para suportar insertos padrão Kendex™ e Kenloc™.



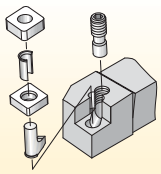
Estilo Kendex™

- Usa insertos Kendex.
- Opção com quebra-cavacos disponível para insertos de cerâmica.
- Uma ampla variedade de estilos de insertos pode ser usada.



Estilo Screw-On

- Fixação superior por parafuso para insertos Screw-On.

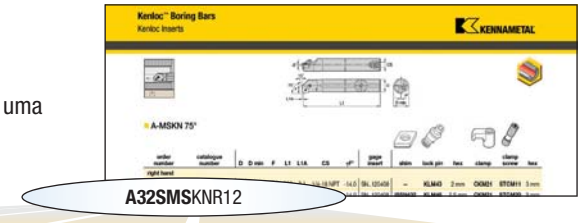


Estilo Kenlever™

- Sistema comprovadamente superior para fixação rígida de insertos cerâmicos em operações de torneamento e perfilagem.
- Pode ser usado com insertos Kendex ou Kenloc por meio de hardware opcional.

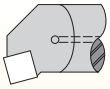
Como funcionam os números de catálogo?

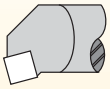
Cada caractere no nosso número de catálogo significa uma característica específica daquele produto. Use as colunas-chave a seguir e as imagens correspondentes para uma identificação fácil do atributo a ser aplicado.

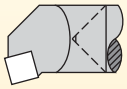


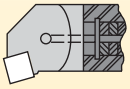
A32SMSKNR12

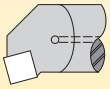
A — Tipo de barra

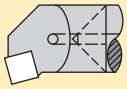
A 
Barra de aço com refrigeração

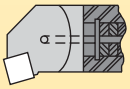
S 
Barra de aço sem refrigeração

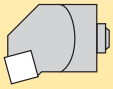
C 
Barra de metal duro

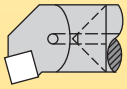
D 
Barra desvibradora com refrigeração

D 
Barra ajustável com refrigeração

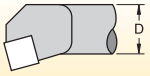
E 
Barra de metal duro com refrigeração

B 
Desvibrador

H 
Cabeça intercambiável

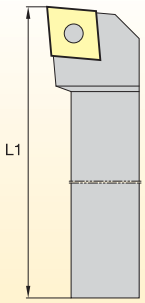
L 
Barra de metal pesado com refrigeração

32 — Diâmetro da barra



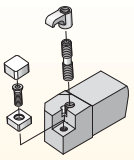
Métrico:
um número de dois dígitos indica o diâmetro da barra em milímetros.
Se o diâmetro for representado por um número de um dígito, será colocado um 0 (zero) na frente dele.
Exemplo: 8mm = 08

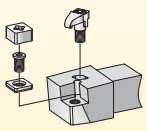
S — Comprimento da barra

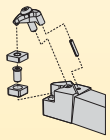


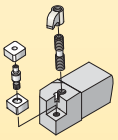
L1		ISO
32	=	A
40	=	B
50	=	C
60	=	D
70	=	E
80	=	F
90	=	G
100	=	H
110	=	J
125	=	K
140	=	L
150	=	M
160	=	N
170	=	P
180	=	Q
200	=	R
250	=	S
300	=	T
350	=	U
400	=	V
450	=	W
500	=	Y
Comprimento Especial	=	X

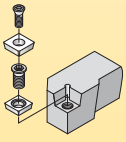
M — Método de fixação do inserto

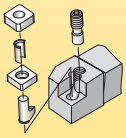
C 
Kendex™

N 
Perfilagem Top Notch™

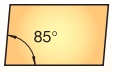
D 
Kenclamp™

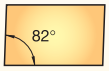
M 
Kenloc™

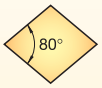
S 
Screw-On

P 
Kenlever™

S — Formato do inserto

A 

B 

C 

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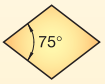
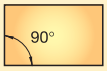
E 

H 

K 

L 

M 

O 

P 

R 

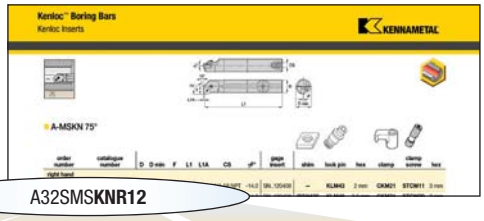
S 

T 

V 

W 

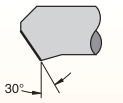
Consultando este guia fácil de usar, você pode identificar o produto correto para atender às suas necessidades.

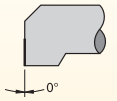


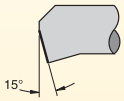
A32SMS**KNR12**

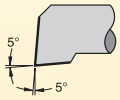
K	**N**	**R**	**12**	
Estilo da barra ou ângulo de posição	Ângulo de folga do inserto	Sentido de rotação da ferramenta	Comprimento da aresta de corte do inserto L10	Informações adicionais

K

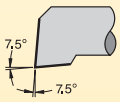
E 

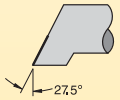
F 

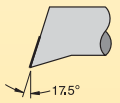
K 

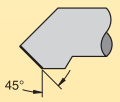
L 

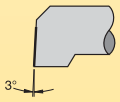
(insertos estilo E)

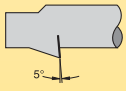
L 

P 

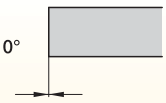
Q 

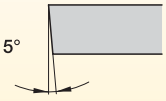
S 

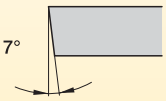
U 

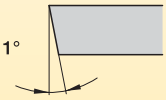
X 

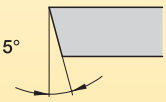
N

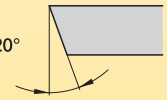
N 0° 

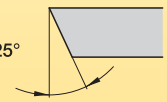
B 5° 

C 7° 

P 11° 

D 15° 

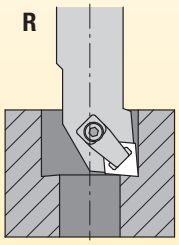
E 20° 

F 25° 

R

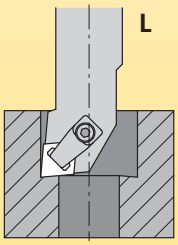
R =

Barra de mandrilar à direita



L =

Barra de mandrilar à esquerda



12

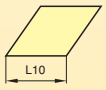
H 

O 

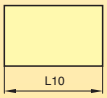
P 

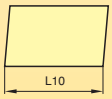
S 

T 

CDE M V 

W 

L 

A B K 

R 

M... =

Sistemas de fixação TNT/ MTS para insertos de cerâmica e com PCBN

D =

Encaixe duplo

AP5 =

Positivo axial

KC =

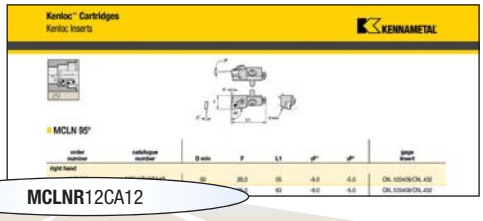
Kenclamp™

+ =

Espessura do inserto

Como funcionam os números de catálogo?

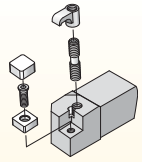
Cada caractere no nosso número de catálogo significa uma característica específica daquele produto. Use as colunas-chave a seguir e as imagens correspondentes para uma identificação fácil do atributo a ser aplicado.



MCLNR12CA12

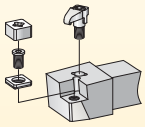
M
Sistema de fixação do inserto

C



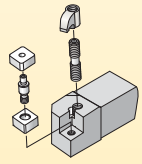
Kendex™

N



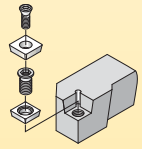
Perfilagem Top Notch™

M



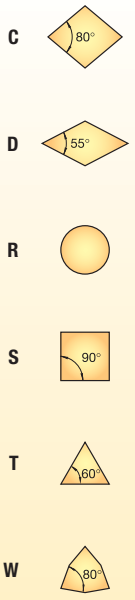
Kenloc™

S

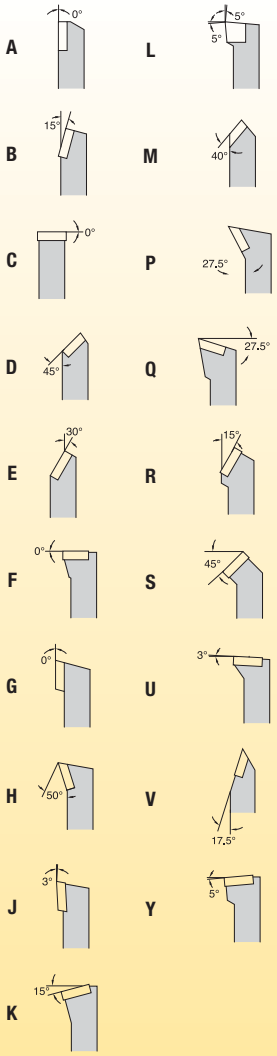


Screw-On

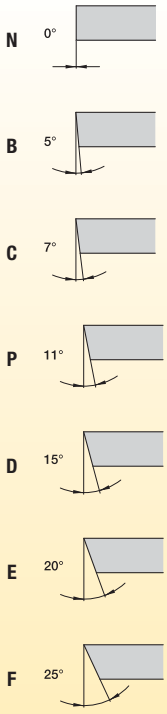
C
Formato do inserto



L
Estilo da ferramenta ou ângulo de posição

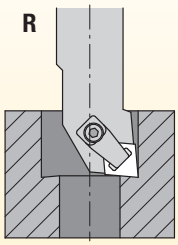


N
Ângulo de folga do inserto

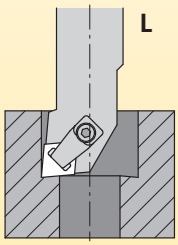


R
Sentido de rotação da ferramenta

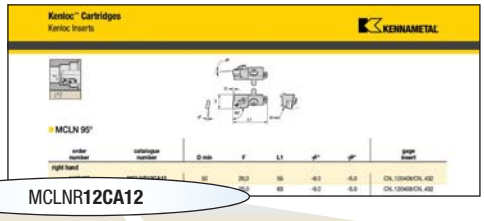
R =
Barra de mandrilar à direita



L =
Barra de mandrilar à esquerda



Consultando este guia fácil de usar, você pode identificar o produto correto para atender às suas necessidades.

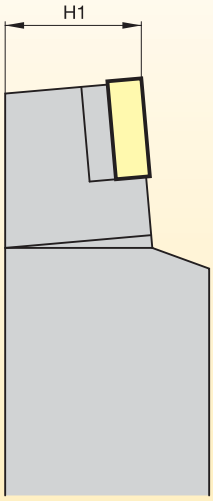


MCLNR**12CA12**

12

Tamanho da cápsula

H1 = Altura da aresta de corte da cápsula em milímetros



C

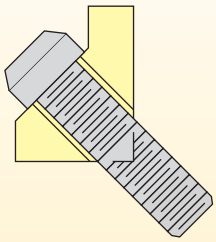
Código de identificação da cápsula

C = Cápsula

A

Esquema de montagem da cápsula

A = Fixação angular ISO 5611



12

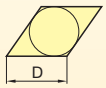
Tamanho do inserto

Comprimento da aresta de corte D

C



D



R



S



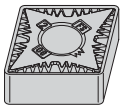
T

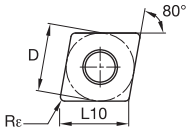


W



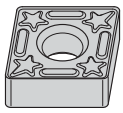
● primeira opção
○ opção alternativa

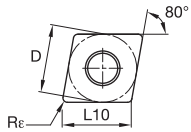




CNGG-FS

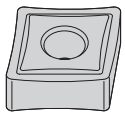
ISO código do produto	D	L10	Rε	KCP05B	KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30B	KCP30	KCP40B	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35B	KCM35	KCPK05	K313	K68	KCU10	KCU25	KC5010	KC5025	KC5410	KT315
CNGG120401FS	12,70	12,90	0,1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	●	–	–	–
CNGG120402FS	12,70	12,90	0,2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	●	●	–	–	–
CNGG120404FS	12,70	12,90	0,4	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	●	●	●	–	–
CNGG120408FS	12,70	12,90	0,8	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	●	●	●	–	–

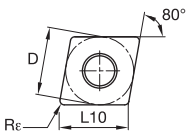




CNGG-LF

ISO código do produto	D	L10	Rε	KCP05B	KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30B	KCP30	KCP40B	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35B	KCM35	KCPK05	K313	K68	KCU10	KCU25	KC5010	KC5025	KC5410	KT315
CNGG120401LF	12,70	12,90	0,1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	●	–	–	–
CNGG120402LF	12,70	12,90	0,2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	●	–	–	–
CNGG120404LF	12,70	12,90	0,4	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	●	–	–	–
CNGG120408LF	12,70	12,90	0,8	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	●	–	–	–
CNGG120412LF	12,70	12,90	1,2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	●	–	–	–



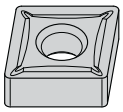


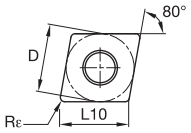
CNGP

ISO código do produto	D	L10	Rε	KCP05B	KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30B	KCP30	KCP40B	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35B	KCM35	KCPK05	K313	K68	KCU10	KCU25	KC5010	KC5025	KC5410	KT315
CNGP120401	12,70	12,90	0,1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	●	–	●	–
CNGP120402	12,70	12,90	0,2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	●	–	●	–
CNGP120404	12,70	12,90	0,4	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	●	●	–	●	–	●	–
CNGP120408	12,70	12,90	0,8	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	●	●	–	●	–	●	–
CNGP120412	12,70	12,90	1,2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	●	–	●	–	●	–
CNGP120416	12,70	12,90	1,6	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–

NOTA: Insertos intercambiáveis para fixação P.

● primeira opção
○ opção alternativa

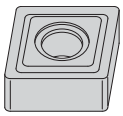


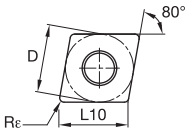


CNGP-K

| | | |

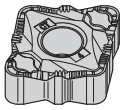
● primeira opção
○ opção alternativa

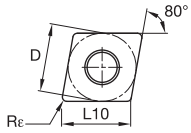




CNMG-33

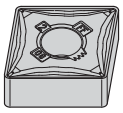
ISO código do produto	D	L10	Rε	KCP05B	KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30B	KCP30	KCP40B	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35B	KCM35	KCPK05	K313	K68	KCU10	KCU25	KC5010	KC5025	KC5410	KT315
CNMG12040833	12,70	12,90	0,8	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●

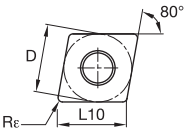




CNMG-CT

ISO código do produto	D	L10	Rε	KCP05B	KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30B	KCP30	KCP40B	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35B	KCM35	KCPK05	K313	K68	KCU10	KCU25	KC5010	KC5025	KC5410	KT315
CNMG120408CT	12,70	12,90	0,8	–	●	●	–	●	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	●	–	–	–
CNMG120412CT	12,70	12,90	1,2	–	–	●	–	●	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
CNMG120416CT	12,70	12,90	1,6	–	–	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–

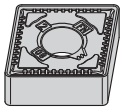


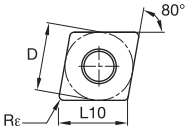


CNMG-FF

ISO código do produto	D	L10	Rε	KCP05B	KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30B	KCP30	KCP40B	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35B	KCM35	KCPK05	K313	K68	KCU10	KCU25	KC5010	KC5025	KC5410	KT315
CNMG090304FF	9,53	9,67	0,4	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–
CNMG090308FF	9,53	9,67	0,8	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–
CNMG120404FF	12,70	12,90	0,4	–	●	●	●	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–	–	–	–	–	●	–	●	–	–	●
CNMG120408FF	12,70	12,90	0,8	–	●	●	●	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–	–	–	–	–	●	–	●	–	–	●

● primeira opção
○ opção alternativa

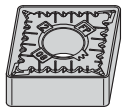


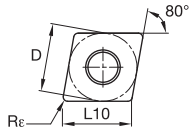


CNMG-FN

ISO código do produto	D	L10	Rε	KCP05B	KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30B	KCP30	KCP40B	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35B	KCM35	KCPK05	K313	K68	KCU10	KCU25	KC5010	KC5025	KC5410	KT315
CNMG090304FN	9,53	9,67	0,4	–	–	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●
CNMG090308FN	9,53	9,67	0,8	–	–	●	●	–	–	–	–	–	–	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
CNMG120402FN	12,70	12,90	0,2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	●	–	–	●
CNMG120404FN	12,70	12,90	0,4	–	●	●	●	●	●	–	–	–	–	–	●	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●
CNMG120408FN	12,70	12,90	0,8	–	●	●	●	●	●	–	–	–	–	–	●	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●
CNMG120412FN	12,70	12,90	1,2	–	–	●	–	●	●	–	–	–	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●
CNMG120416FN	12,70	12,90	1,6	–	–	–	●	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–

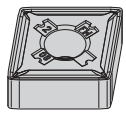
NOTA: Insertos intercambiáveis para fixação P.

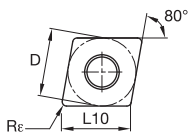




CNMG-FP

ISO código do produto	D	L10	Rε	KCP05B	KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30B	KCP30	KCP40B	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35B	KCM35	KCPK05	K313	K68	KCU10	KCU25	KC5010	KC5025	KC5410	KT315
CNMG120404FP	12,70	12,90	0,4	–	–	–	●	●	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–	–	–	–	●	–	●	–	–	●
CNMG120408FP	12,70	12,90	0,8	–	–	●	–	●	●	–	–	–	–	–	–	–	–	–	–	●	●	–	–	–	–	–	–	–	●	–	●	–	–	●
CNMG120412FP	12,70	12,90	1,2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–	–	–	–	●	–	–	–	–	–

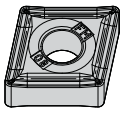


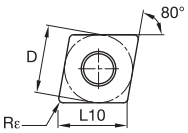


CNMG-FW

ISO código do produto	D	L10	Rε	KCP05B	KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30B	KCP30	KCP40B	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35B	KCM35	KCPK05	K313	K68	KCU10	KCU25	KC5010	KC5025	KC5410	KT315
CNMG120404FW	12,70	12,90	0,4	–	●	●	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	●	–	–	●
CNMG120408FW	12,70	12,90	0,8	●	●	●	●	–	–	–	–	–	–	–	–	●	–	–	–	●	–	–	–	–	–	–	–	–	●	–	●	–	–	●
CNMG120412FW	12,70	12,90	1,2	–	●	●	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	●	–	–	●

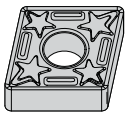
● primeira opção
○ opção alternativa

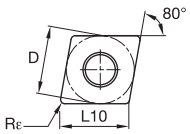




CNMG-FM

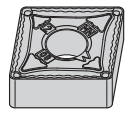
ISO código do produto	D	L10	Rε	KCP05B	KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30B	KCP30	KCP40B	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35B	KCM35	KCPK05	K313	K68	KCU10	KCU25	KC5010	KC5025	KC5410	KT315
				P	●	●	●	●	●	●	●	●	●	●	○	○	○	○	○	○	○	○	○	○	○	○	●	●	●	●	●	●	●		●
				M									○	○							●	●	●	●	●	●		●	●	●	●	●	●		●
				K	○	○	○	○	○	○					●	●	●	●	●	●							●	●	●	●	●	●	●		●
				N																							●	●	●	●	●	●	●	
				S																							●	●	●	●	●	●			
				H																														
CNMG120412FM	12,70	12,90	1,2	–	–	●	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–

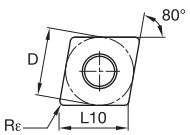




CNMG-LF

ISO código do produto	D	L10	Rε	KCP05B	KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30B	KCP30	KCP40B	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35B	KCM35	KCPK05	K313	K68	KCU10	KCU25	KC5010	KC5025	KC5410	KT315
CNMG120402LF	12,70	12,90	0,2	–	–	–	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
CNMG120404LF	12,70	12,90	0,4	–	–	–	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
CNMG120408LF	12,70	12,90	0,8	–	–	–	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–





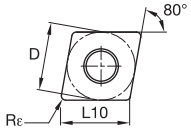
CNMG-MN

ISO código do produto	D	L10	Rε	KCP05B	KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30B	KCP30	KCP40B	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35B	KCM35	KCPK05	K313	K68	KCU10	KCU25	KC5010	KC5025	KC5410	KT315
CNMG090304MN	9,53	9,67	0,4	–	–	–	●	●	–	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
CNMG090308MN	9,53	9,67	0,8	–	–	●	●	●	●	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
CNMG090312MN	9,53	9,67	1,2	–	–	–	–	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
CNMG120404MN	12,70	12,90	0,4	–	–	●	●	●	●	–	●	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
CNMG120408MN	12,70	12,90	0,8	●	●	●	●	●	●	●	●	●	●	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–	–	–	–	–
CNMG120412MN	12,70	12,90	1,2	–	●	●	●	●	●	●	–	●	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
CNMG120416MN	12,70	12,90	1,6	–	–	●	●	●	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
CNMG160608MN	15,88	16,12	0,8	–	–	●	●	●	●	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
CNMG160612MN	15,88	16,12	1,2	–	–	●	●	●	●	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
CNMG160616MN	15,88	16,12	1,6	–	–	●	●	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
CNMG190608MN	19,05	19,34	0,8	–	–	–	●	●	●	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
CNMG190612MN	19,05	19,34	1,2	–	–	–	●	●	●	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
CNMG190616MN	19,05	19,34	1,6	–	–	●	–	●	●	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
CNMG190624MN	19,05	19,34	2,4	–	–	–	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–

● primeira opção
○ opção alternativa

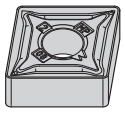
		KCP05B	KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30B	KCP30	KCP40B	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35B	KCM35	KCPK05	K313	K68	KCU10	KCU25	KC5010	KC5025	KC5410	KT315
P		●	●	●	●	●	●	●	●	●	●	○	○	○	○	○	○	○	○	○	○	○	○	●	●	●	●	●	●	●		●
M										○	○							●	●	●	●	●	●		●	●	●	●	●	●		●
K		○	○	○	○	○	○					●	●	●	●	●	●							●	●	●	●	●	●	●		●
N																									●	●	●	●	●	●	●	
S																									●	●	●	●	●	●		
H																																

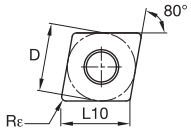




CNMU-MN

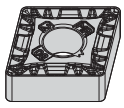
ISO código do produto	D	L10	Rε																														
CNMU120612MN	12,70	12,90	1,2	●	–	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
CNMU120616MN	12,70	12,90	1,6	–	–	–	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–

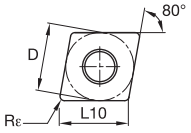




CNMG-MP

ISO código do produto	D	L10	Rε																														
CNMG090308MP	9,53	9,67	0,8	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	●	–	–	–	–	–	●	–	●	–	–	–	–
CNMG120404MP	12,70	12,90	0,4	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	●	●	●	●	●	–	–	–	●	–	●	–	–	–	–
CNMG120408MP	12,70	12,90	0,8	–	–	–	●	●	●	–	–	–	–	–	–	–	–	●	●	●	●	●	●	–	–	–	●	●	●	●	–	–	–
CNMG120412MP	12,70	12,90	1,2	–	–	–	●	–	●	–	–	–	–	–	–	–	–	●	●	●	●	–	●	–	–	–	●	●	●	–	–	–	–
CNMG120416MP	12,70	12,90	1,6	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–
CNMG160608MP	15,88	16,12	0,8	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	●	–	●	–	–	–	●	–	●	–	–	–	–
CNMG160612MP	15,88	16,12	1,2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	●	●	●	–	–	–	–	–	●	●	●	–	–	–	–
CNMG160616MP	15,88	16,12	1,6	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–	–	–	–	–	●	–	–	–	–
CNMG190608MP	19,05	19,34	0,8	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	●	●	–	–	–	–	–	–	–	●	–	–	–	–
CNMG190612MP	19,05	19,34	1,2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	●	●	–	–	–	–	–	●	●	–	–	–	–	–
CNMG190616MP	19,05	19,34	1,6	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–	●	–	–	●	–	–	–	–

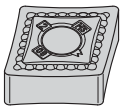


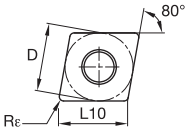


CNMG-MR

ISO código do produto	D	L10	Rε																														
CNMG120404MR	12,70	12,90	0,4	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
CNMG120408MR	12,70	12,90	0,8	–	–	●	–	●	–	●	–	–	–	●	–	–	–	●	●	●	●	–	●	●	–	–	●	–	–	–	–	–	–
CNMG120412MR	12,70	12,90	1,2	–	–	●	–	●	–	–	–	–	–	●	–	–	–	●	●	●	●	–	●	●	–	–	●	–	–	–	–	–	–
CNMG120416MR	12,70	12,90	1,6	–	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
CNMG160608MR	15,88	16,12	0,8	–	–	–	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
CNMG160612MR	15,88	16,12	1,2	–	–	●	–	●	–	–	–	–	●	–	–	–	–	–	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–
CNMG160616MR	15,88	16,12	1,6	–	–	●	–	●	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–
CNMG190612MR	19,05	19,34	1,2	–	–	–	–	●	–	–	–	–	–	–	–	–	–	–	–	●	●	–	–	–	–	–	–	–	–	–	–	–	–
CNMG190616MR	15,88	16,12	1,6	–	–	–	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–

● primeira opção
○ opção alternativa

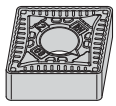


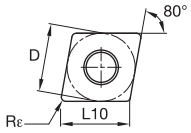


CNMG-MS

| | | |

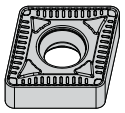
● primeira opção
○ opção alternativa

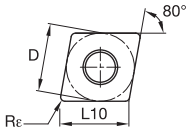




CNMG-RN

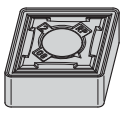
ISO código do produto	D	L10	Rε	KCP05B	KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30B	KCP30	KCP40B	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35B	KCM35	KCPK05	K313	K68	KCU10	KCU25	KC5010	KC5025	KC5410	KT315
				P ●	●	●	●	●	●	●	●	●	●	○	○	○	○	○	○	○	○	○	○	○	○	●	●	●	●	●	●	●		●
				M								○	○							●	●	●	●	●	●		●	●	●	●	●	●		●
				K ○	○	○	○	○	○					●	●	●	●	●	●							●	●	●	●	●	●	●		●
				N																							●	●	●	●	●	●	●	
				S																							●	●	●	●	●	●		
				H																														
CNMG120408RN	12,70	12,90	0,8	–	●	●	●	●	●	●	●	●	●	–	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
CNMG120412RN	12,70	12,90	1,2	–	–	●	●	●	●	●	●	●	●	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–	–	–	–	–
CNMG120416RN	12,70	12,90	1,6	–	–	●	●	●	●	–	–	●	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
CNMG160608RN	15,88	16,12	0,8	–	–	●	–	●	●	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
CNMG160612RN	15,88	16,12	1,2	–	–	●	●	●	●	●	●	●	●	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–	–	–	–	–
CNMG160616RN	15,88	16,12	1,6	–	–	●	●	●	●	–	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–	–	–	–	–
CNMG190608RN	19,05	19,34	0,8	–	–	●	–	●	●	–	–	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
CNMG190612RN	19,05	19,34	1,2	–	–	●	●	●	●	●	●	●	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
CNMG190616RN	19,05	19,34	1,6	–	–	●	–	●	●	●	●	●	●	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–	–	–	–	–
CNMG190624RN	19,05	19,34	2,4	–	–	–	–	●	●	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–

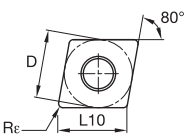




CNMU-RN

ISO código do produto	D	L10	Rε	KCP05B	KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30B	KCP30	KCP40B	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35B	KCM35	KCPK05	K313	K68	KCU10	KCU25	KC5010	KC5025	KC5410	KT315
CNMU120412RN	12,70	12,90	1,2	–	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–

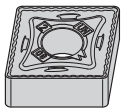


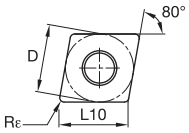


CNMG-RP

ISO código do produto	D	L10	Rε	KCP05B	KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30B	KCP30	KCP40B	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35B	KCM35	KCPK05	K313	K68	KCU10	KCU25	KC5010	KC5025	KC5410	KT315
CNMG120404RP	12,70	12,90	0,4	–	–	–	●	●	●	–	–	–	–	–	–	–	–	–	–	–	–	●	●	–	–	–	–	–	●	●	●	●	–	–
CNMG120408RP	12,70	12,90	0,8	●	●	●	●	●	●	●	●	–	●	–	●	●	●	●	●	●	●	●	●	●	●	–	–	●	●	●	●	–	–
CNMG120412RP	12,70	12,90	1,2	–	●	●	●	●	●	●	●	●	●	–	●	●	●	●	●	●	–	●	●	●	●	●	–	–	●	●	●	●	–	–
CNMG120416RP	12,70	12,90	1,6	–	–	●	●	●	●	–	–	–	–	–	–	–	●	–	–	–	–	●	●	–	●	–	–	–	●	●	●	–	–	–
CNMG160608RP	15,88	16,12	0,8	–	–	–	●	●	●	–	–	–	–	–	–	–	–	–	●	–	–	–	–	–	–	–	–	–	●	●	–	●	–	–
CNMG160612RP	15,88	16,12	1,2	–	–	●	●	●	●	–	●	●	●	–	●	–	●	●	●	●	–	●	●	●	●	●	–	–	●	●	●	●	–	–
CNMG160616RP	15,88	16,12	1,6	–	–	●	●	●	●	–	–	–	–	–	–	–	–	–	●	–	–	●	●	–	–	●	–	–	–	●	–	●	–	–
CNMG190612RP	19,05	19,34	1,2	–	–	●	–	●	●	–	●	●	–	–	–	–	●	–	–	–	–	●	●	–	●	–	–	–	●	●	●	●	–	–
CNMG190616RP	19,05	19,34	1,6	–	–	–	●	●	–	–	●	–	–	–	–	–	–	–	–	–	–	●	●	–	●	●	–	–	●	●	–	–	–	–

● primeira opção
○ opção alternativa





CNMG-UN

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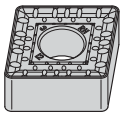
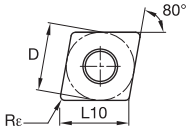
● primeira opção
○ opção alternativa

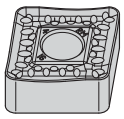


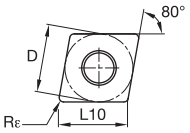


CNMM-RH

P		●	●	●	●	●	●	●	●	●	●	○	○	○	○	○	○	○	○	○	○	○	○	●	●	●	●	●	●	●		●
M										○	○							●	●	●	●	●	●		●	●	●	●	●	●		●
K		○	○	○	○	○	○					●	●	●	●	●	●							●	●	●	●	●	●	●		●
N																									●	●	●	●	●	●	●		
S																									●	●	●	●	●	●			
H																																	

ISO código do produto	D	L10	Rε	KCP05B	KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30B	KCP30	KCP40B	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35B	KCM35	KCPK05	K313	K68	KCU10	KCU25	KC5010	KC5025	KC5410	KT315
CNMM190612RH	19,05	19,34	1,2	–	–	–	–	–	●	–	–	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
CNMM190616RH	19,05	19,34	1,6	–	–	●	–	●	–	–	●	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
CNMM190624RH	19,05	19,34	2,4	–	–	●	●	●	●	–	●	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
CNMM250924RH	25,40	25,79	2,4	–	–	–	●	●	●	●	●	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–

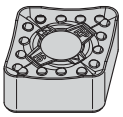


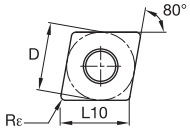


CNMM-RM

ISO código do produto	D	L10	Rε	KCP05B	KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30B	KCP30	KCP40B	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35B	KCM35	KCPK05	K313	K68	KCU10	KCU25	KC5010	KC5025	KC5410	KT315
CNMM120408RM	12,70	12,90	0,8	–	–	–	●	●	●	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
CNMM120412RM	12,70	12,90	1,2	–	–	●	●	●	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
CNMM160612RM	15,88	16,12	1,2	–	–	●	●	●	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
CNMM160616RM	15,88	16,12	1,6	–	–	●	●	●	●	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
CNMM160624RM	15,88	16,12	2,4	–	–	–	●	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
CNMM190612RM	19,05	19,34	1,2	–	–	–	●	●	●	–	–	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
CNMM190616RM	19,05	19,34	1,6	–	–	●	●	●	●	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
CNMM190624RM	19,05	19,34	2,4	–	–	–	–	●	●	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
CNMM250924RM	25,40	25,79	2,4	–	–	–	●	●	●	–	–	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–

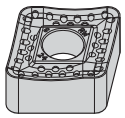
● primeira opção
○ opção alternativa

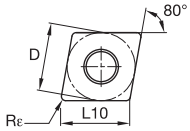




CNMM-RP

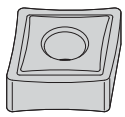
ISO código do produto	D	L10	Rε	KCP05B	KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30B	KCP30	KCP40B	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35B	KCM35	KCPK05	K313	K68	KCU10	KCU25	KC5010	KC5025	KC5410	KT315
				P		●	●	●	●	●	●	●	●	●	○	○	○	○	○	○	○	○	○	○	○	○	●	●	●	●	●	●	●		●
				M									○	○							●	●	●	●	●	●		●	●	●	●	●	●		●
				K		○	○	○	○	○	○					●	●	●	●	●	●							●	●	●	●	●	●	●		●
				N																							●	●	●	●	●	●	●		
				S																							●	●	●	●	●	●			
				H																														
CNMM120408RP	12,70	12,90	0,8	–	●	–	●	●	–	–	–	–	●	–	–	–	–	–	–	–	–	●	●	–	–	–	–	–	–	–	–	–	–
CNMM120412RP	12,70	12,90	1,2	–	–	●	–	●	●	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
CNMM120416RP	12,70	12,90	1,6	–	–	–	–	●	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
CNMM160608RP	15,88	16,12	0,8	–	–	–	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
CNMM160612RP	15,88	16,12	1,2	–	–	●	●	–	●	–	–	–	●	–	–	–	–	–	–	–	–	●	–	–	–	–	–	–	–	–	–	–	–	–
CNMM160616RP	15,88	16,12	1,6	–	–	●	●	●	●	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	●	–	–	–	–	–	–	–	–
CNMM160624RP	15,88	16,12	2,4	–	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
CNMM190612RP	19,05	19,34	1,2	–	–	–	–	●	●	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–	–	–	–	–	–	–	–	–
CNMM190616RP	19,05	19,34	1,6	–	–	●	●	●	●	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–	–	–	–	–	–	–	–	–
CNMM190624RP	19,05	19,34	2,4	–	–	–	–	–	●	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–	–	–	–	–	–	–	–	–
CNMM250924RP	25,40	25,79	2,4	–	–	–	–	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–

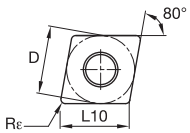




CNMM-RW

ISO código do produto	D	L10	Rε	KCP05B	KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30B	KCP30	KCP40B	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35B	KCM35	KCPK05	K313	K68	KCU10	KCU25	KC5010	KC5025	KC5410	KT315
CNMM190624RW	19,05	19,34	2,4	–	–	●	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
CNMM250924RW	25,40	25,79	2,4	–	–	–	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–



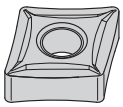


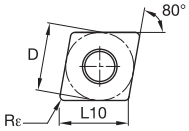
CNMP

ISO código do produto	D	L10	Rε	KCP05B	KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30B	KCP30	KCP40B	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35B	KCM35	KCPK05	K313	K68	KCU10	KCU25	KC5010	KC5025	KC5410	KT315
CNMP120404	12,70	12,90	0,4	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	●	–	–	–	–	●	–
CNMP120408	12,70	12,90	0,8	–	–	–	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	●	–	–	–	–	●	–
CNMP120412	12,70	12,90	1,2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–	–	–
CNMP160608	15,88	16,12	0,8	–	–	–	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
CNMP190612	19,05	19,34	1,2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–	–	–	–

● primeira opção
○ opção alternativa

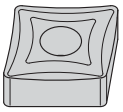
		KCP05B	KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30B	KCP30	KCP40B	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35B	KCM35	KCPK05	K313	K68	KCU10	KCU25	KC5010	KC5025	KC5410	KT315
P		●	●	●	●	●	●	●	●	●	●	○	○	○	○	○	○	○	○	○	○	○	○	●	●	●	●	●	●	●		●
M										○	○							●	●	●	●	●	●		●	●	●	●	●	●		●
K		○	○	○	○	○	○					●	●	●	●	●	●							●	●	●	●	●	●	●		●
N																									●	●	●	●	●	●	●	
S																									●	●	●	●	●	●		
H																																

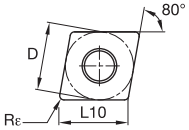




CNMP-K

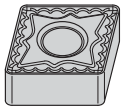
ISO código do produto	D	L10	Rε																														
CNMP120404K	12,70	12,90	0,4	–	–	●	–	●	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
CNMP120408K	12,70	12,90	0,8	–	–	●	●	●	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–

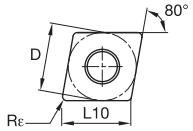




CNMS

ISO código do produto	D	L10	Rε																														
CNMS120408	12,70	12,90	0,8	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–	●	–
CNMS160608	15,88	16,12	0,8	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–
CNMS190608	19,05	19,34	0,8	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–	●	–
CNMS190612	19,05	19,34	1,2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–	–	–

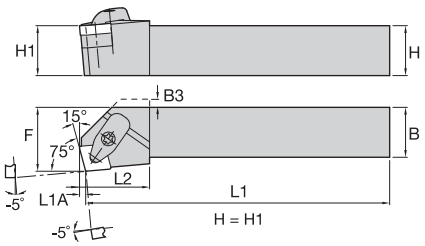


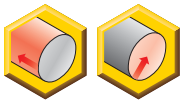


CNMG-MG

ISO código do produto	D	L10	Rε																														
CNMG120408MG	12,70	12,90	0,8	–	–	●	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–
CNMG120412MG	12,70	12,90	1,2	–	–	●	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
CNMG120416MG	12,70	12,90	1,6	–	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
CNMG160612MG	15,88	16,12	1,2	–	–	–	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
CNMG160616MG	15,88	16,12	1,6	–	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
CNMG190612MG	19,05	19,34	1,2	–	–	–	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–



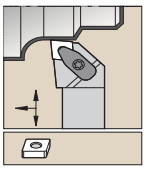


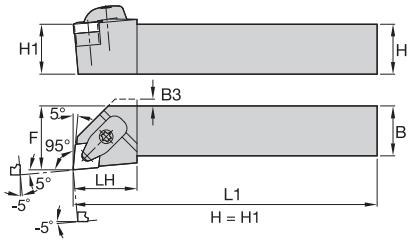


DCKN-KC 75°



número para pedido	código do produto	H	B	F	L1	LH	L1A	B3	inserto padrão	calço	parafuso do calço	Torx Plus	conjunto do grampo	Torx Plus	pino elástico	pino de trava opcional
corte à direita (R)																
2273083	**DCKNR2020K12KC04**	20	20	25,0	125	32,0	3,1	6,0	CN..120408	**ICSN433**	**KMSP415IP**	15 IP	**CM234R ASSY**	15 IP	**SSP025016M**	**KLM4615IP**
1875200	**DCKNR2525M12KC04**	25	25	32,0	150	32,0	3,1	–	CN..120408	**ICSN443**	**KMSP415IP**	15 IP	**CM234R ASSY**	15 IP	**SSP025016M**	**KLM4615IP**
2273084	**DCKNR3225P12KC04**	32	25	32,0	170	32,0	3,1	–	CN..120408	**ICSN443**	**KMSP415IP**	15 IP	**CM234R ASSY**	15 IP	**SSP025016M**	**KLM46L15IP**
2273085	**DCKNR3232P16KC06**	32	32	40,0	170	32,0	3,8	–	CN..160612	**ICSN543**	**KMSP515IP**	15 IP	**CM209R ASSY**	15 IP	**SSP025016M**	**KLM58L15IP**
corte à esquerda (L)																
2273087	**DCKNL2020K12KC04**	20	20	25,0	125	32,0	3,1	6,0	CN..120408	**ICSN433**	**KMSP415IP**	15 IP	**CM234R ASSY**	15 IP	**SSP025016M**	**KLM4615IP**
1875204	**DCKNL2525M12KC04**	25	25	32,0	150	32,0	3,1	–	CN..120408	**ICSN443**	**KMSP415IP**	15 IP	**CM234R ASSY**	15 IP	**SSP025016M**	**KLM4615IP**
2273088	**DCKNL3225P12KC04**	32	25	32,0	170	32,0	3,1	–	CN..120408	**ICSN443**	**KMSP415IP**	15 IP	**CM234R ASSY**	15 IP	**SSP025016M**	**KLM46L15IP**







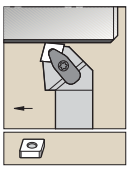
DCLN-KC 95°

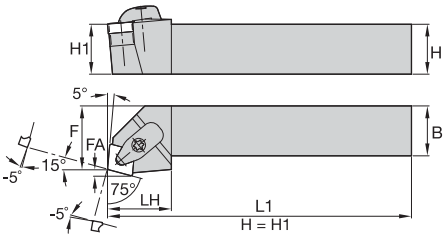


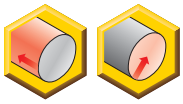




número para pedido	código do produto	H	B	F	L1	LH	B3	inserto padrão	calço	parafuso do calço	Torx Plus	conjunto do grampo	Torx Plus	pino elástico	pino de trava opcional
corte à direita (R)															
2417296	**DCLNR1616H09KC03**	16	16	20,0	100	30,0	6,0	CN..090308	**ICSN332**	**KMSP315IP**	9 IP	**CM234R ASSY**	15 IP	**SSP025016M**	**KLM34L9IP**
1875199	**DCLNR2020K12KC04**	20	20	25,0	125	32,0	4,0	CN..120408	**ICSN433**	**KMSP415IP**	15 IP	**CM234R ASSY**	15 IP	**SSP025016M**	**KLM4615IP**
1875193	**DCLNR2525M12KC04**	25	25	32,0	150	32,0	—	CN..120408	**ICSN443**	**KMSP415IP**	15 IP	**CM234R ASSY**	15 IP	**SSP025016M**	**KLM46L15IP**
1875212	**DCLNR2525M16KC06**	25	25	32,0	150	33,0	—	CN..160612	**ICSN543**	**KMSP515IP**	15 IP	**CM209R ASSY**	15 IP	**SSP025016M**	**KLM58L15IP**
1875223	**DCLNR3225P12KC04**	32	25	32,0	170	32,0	—	CN..120408	**ICSN443**	**KMSP415IP**	15 IP	**CM234R ASSY**	15 IP	**SSP025016M**	**KLM46L15IP**
1875232	**DCLNR3225P16KC06**	32	25	32,0	170	33,0	—	CN..160612	**ICSN543**	**KMSP515IP**	15 IP	**CM209R ASSY**	15 IP	**SSP025016M**	**KLM58L15IP**
1875224	**DCLNR3232P16KC06**	32	32	40,0	170	33,0	—	CN..160612	**ICSN543**	**KMSP515IP**	15 IP	**CM209R ASSY**	15 IP	**SSP025016M**	**KLM58L15IP**
2273091	**DCLNR3232P19KC06**	32	32	40,0	170	40,0	—	CN..190612	**ICSN643**	**KMSP625IP**	25 IP	**CM210R ASSY**	25 IP	**SSP025016M**	**KLM68L25IP**
2273092	**DCLNR4040S19KC06**	40	40	50,0	250	40,0	—	CN..190612	**ICSN643**	**KMSP625IP**	25 IP	**CM210R ASSY**	25 IP	**SSP025016M**	**KLM68L25IP**
corte à esquerda (L)															
1875194	**DCLNL2020K12KC04**	20	20	25,0	125	32,0	4,0	CN..120408	**ICSN433**	**KMSP415IP**	15 IP	**CM234R ASSY**	15 IP	**SSP025016M**	**KLM4615IP**
1875196	**DCLNL2525M12KC04**	25	25	32,0	150	32,0	—	CN..120408	**ICSN443**	**KMSP415IP**	15 IP	**CM234R ASSY**	15 IP	**SSP025016M**	**KLM46L15IP**
1875205	**DCLNL2525M16KC06**	25	25	32,0	150	33,0	—	CN..160612	**ICSN543**	**KMSP515IP**	15 IP	**CM209R ASSY**	15 IP	**SSP025016M**	**KLM58L15IP**
1875231	**DCLNL3225P12KC04**	32	25	32,0	170	32,0	—	CN..120408	**ICSN443**	**KMSP415IP**	15 IP	**CM234R ASSY**	15 IP	**SSP025016M**	**KLM46L15IP**
1875230	**DCLNL3225P16KC06**	32	25	32,0	170	33,0	—	CN..160612	**ICSN543**	**KMSP515IP**	15 IP	**CM209R ASSY**	15 IP	**SSP025016M**	**KLM58L15IP**
1875225	**DCLNL3232P16KC06**	32	32	40,0	170	33,0	—	CN..160612	**ICSN543**	**KMSP515IP**	15 IP	**CM209R ASSY**	15 IP	**SSP025016M**	**KLM58L15IP**
2273093	**DCLNL3232P19KC06**	32	32	40,0	170	40,0	—	CN..190612	**ICSN643**	**KMSP625IP**	25 IP	**CM210R ASSY**	25 IP	**SSP025016M**	**KLM68L25IP**
2273094	**DCLNL4040S19KC06**	40	40	50,0	250	40,0	—	CN..190612	**ICSN643**	**KMSP625IP**	25 IP	**CM210R ASSY**	25 IP	**SSP025016M**	**KLM68L25IP**





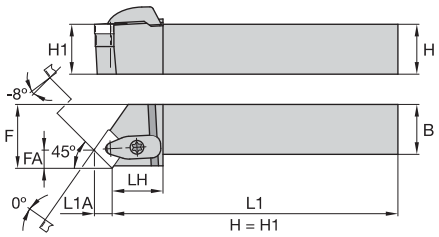


DCRN-KC 75°



número para pedido	código do produto	H	B	F	L1	LH	FA	inserto padrão	calço	parafuso do calço	Torx Plus	conjunto do grampo	Torx Plus	pino elástico	pino de trava opcional
corte à direita (R)															
1875226	**DCRNR2020K12KC04**	20	20	25,0	125	32,0	3,3	CN..120408	**ICSN433**	**KMSP415IP**	15 IP	**CM234R ASSY**	15 IP	**SSP025016M**	**KLM4615IP**
1875201	**DCRNR2525M12KC04**	25	25	32,0	150	32,0	3,3	CN..120408	**ICSN443**	**KMSP415IP**	15 IP	**CM234R ASSY**	15 IP	**SSP025016M**	**KLM46L15IP**
2273095	**DCRNR3225P12KC04**	32	25	32,0	170	32,0	3,3	CN..120408	**ICSN443**	**KMSP415IP**	15 IP	**CM234R ASSY**	15 IP	**SSP025016M**	**KLM46L15IP**
2273097	**DCRNR3232P19KC06**	32	32	40,0	170	38,0	4,9	CN..190612	**ICSN643**	**KMSP625IP**	25 IP	**CM210R ASSY**	25 IP	**SSP025016M**	**KLM68L25IP**
corte à esquerda (L)															
1875206	**DCRNL2525M12KC04**	25	25	32,0	150	32,0	3,3	CN..120408	**ICSN443**	**KMSP415IP**	15 IP	**CM234R ASSY**	15 IP	**SSP025016M**	**KLM46L15IP**
2273099	**DCRNL3232P16KC06**	32	32	40,0	170	38,0	4,1	CN..160612	**ICSN543**	**KMSP515IP**	15 IP	**CM209R ASSY**	15 IP	**SSP025016M**	**KLM58L15IP**



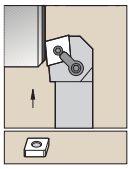


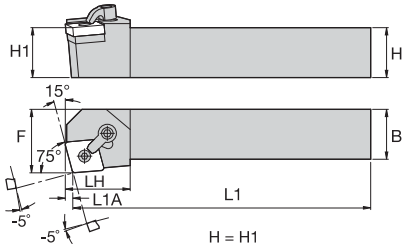


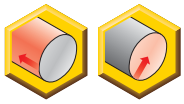
DCSN-KC 45°



número para pedido	código do produto	H	B	F	L1	LH	FA	L1A	inserto padrão	calço	parafuso do calço	Torx Plus	conjunto do grampo	Torx Plus	pino elástico	pino de trava opcional
corte à direita (R)																
2273101	**DCSNR2020K12KC04**	20	20	25,0	125	35,0	8,2	8,5	CN..120408	**ICSN433**	**KMSP415IP**	15 IP	**CM234R ASSY**	15 IP	**SSP025016M**	**KLM4615IP**
2273102	**DCSNR2525M12KC04**	25	25	32,0	150	35,0	8,2	8,5	CN..120408	**ICSN443**	**KMSP415IP**	15 IP	**CM234R ASSY**	15 IP	**SSP025016M**	**KLM46L15IP**
corte à esquerda (L)																
2273104	**DCSNL2525M12KC04**	25	25	32,0	150	35,0	8,2	8,5	CN..120408	**ICSN443**	**KMSP415IP**	15 IP	**CM234R ASSY**	15 IP	**SSP025016M**	**KLM46L15IP**



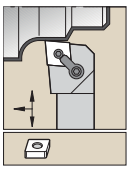


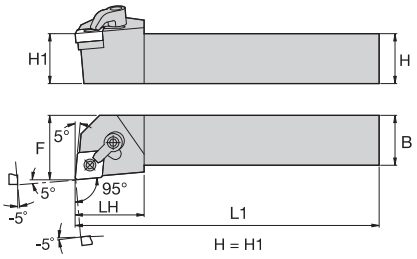


MCKN 75°



número para pedido	código do produto	H	B	F	L1	LH	L1A	inserto padrão	calço	pino de trava	sexta-vada	grampo	parafuso do grampo	sexta-vada
corte à direita (R)														
1102236	**MCKNR2525M12**	25	25	32,0	150	32,0	3,1	CN..120408	**ICSN432**	**KLM46**	2.5 mm	**CKM21**	**STCM20**	3 mm
1102237	**MCKNR3225P12**	32	25	32,0	170	32,0	3,1	CN..120408	**ICSN432**	**KLM46**	2.5 mm	**CKM21**	**STCM20**	3 mm
1102240	**MCKNR3225P16**	32	25	32,0	170	33,0	3,6	CN..160612	**ICSN533**	**KLM58**	3 mm	**CKM21**	**STCM20**	3 mm
corte à esquerda (L)														
1102729	**MCKNL2525M12**	25	25	32,0	150	32,0	3,1	CN..120408	**ICSN432**	**KLM46**	2.5 mm	**CKM21**	**STCM20**	3 mm
1099253	**MCKNL3225P16**	32	25	32,0	170	33,0	3,6	CN..160612	**ICSN533**	**KLM58**	3 mm	**CKM21**	**STCM20**	3 mm
1102728	**MCKNL3232P19**	32	32	40,0	170	38,0	4,4	CN..190612	**ICSN633**	**KLM68**	4 mm	**CKM12**	**STCM4**	4 mm



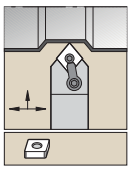


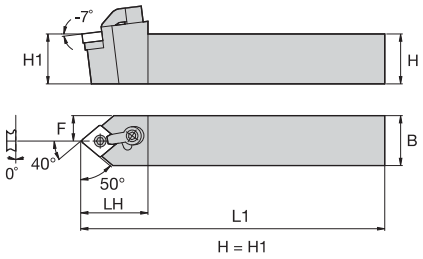


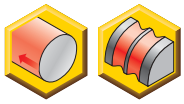
MCLN 95°



número para pedido	código do produto	H	B	F	L1	LH	inserto padrão	calço	pino de trava	sexta-vada	grampo	parafuso do grampo	sexta-vada
corte à direita (R)													
1100939	**MCLNR1616H09**	16	16	20,0	100	25,0	CN..090308	–	**KLM33**	2 mm	**CKM6**	**STCM5**	2.5 mm
1101710	**MCLNR1616H12**	16	16	20,0	100	32,0	CN..120408	**ICSN432**	**KLM46**	2.5 mm	**CKM21**	**STCM20**	3 mm
1099132	**MCLNR2020K09**	20	20	25,0	125	25,0	CN..090308	**ICSN332**	**KLM34L**	2 mm	**CKM6**	**STCM5**	2.5 mm
1099133	**MCLNR2020K12**	20	20	25,0	125	32,0	CN..120408	**ICSN432**	**KLM46**	2.5 mm	**CKM21**	**STCM20**	3 mm
1100943	**MCLNR2525M09**	25	25	32,0	150	25,0	CN..090308	**ICSN332**	**KLM34L**	2 mm	**CKM6**	**STCM5**	2.5 mm
1101711	**MCLNR2525M12**	25	25	32,0	150	32,0	CN..120408	**ICSN432**	**KLM46**	2.5 mm	**CKM21**	**STCM20**	3 mm
1101641	**MCLNR2525M16**	25	25	32,0	150	33,0	CNMA160612	**ICSN533**	**KLM58**	3 mm	**CKM21**	**STCM20**	3 mm
1101704	**MCLNR2525M19**	25	25	32,0	150	38,0	CN..190612	**ICSN633**	**KLM68**	4 mm	**CKM12**	**STCM4**	4 mm
1101712	**MCLNR3225P12**	32	25	32,0	170	32,0	CN..120408	**ICSN432**	**KLM46**	2.5 mm	**CKM21**	**STCM20**	3 mm
1101642	**MCLNR3225P16**	32	25	32,0	170	33,0	CN..160612	**ICSN533**	**KLM58**	3 mm	**CKM21**	**STCM20**	3 mm
1101705	**MCLNR3225P19**	32	25	32,0	170	38,0	CN..190612	**ICSN633**	**KLM68**	4 mm	**CKM12**	**STCM4**	4 mm
3595785	**MCLNR3232P12**	32	32	40,5	171	32,0	CN..120408	**ICSN432**	**KLM46**	2.5 mm	**CKM21**	**STCM20**	3 mm
3595787	**MCLNR3232P16**	32	32	40,5	171	33,0	CN..160612	**ICSN533**	**KLM58**	3 mm	**CKM21**	**STCM20**	3 mm
1101706	**MCLNR3232P19**	32	32	40,0	170	38,0	CN..190612	**ICSN633**	**KLM68**	4 mm	**CKM12**	**STCM4**	4 mm
1101707	**MCLNR4040R19**	40	40	50,0	200	38,0	CN..190612	**ICSN633**	**KLM68**	4 mm	**CKM12**	**STCM4**	4 mm
corte à esquerda (L)													
1100938	**MCLNL1616H09**	16	16	20,0	100	25,0	CN..090308	–	**KLM33**	2 mm	**CKM6**	**STCM5**	2.5 mm
1102539	**MCLNL1616H12**	16	16	20,0	100	32,0	CN..120408	**ICSN432**	**KLM46**	2.5 mm	**CKM21**	**STCM20**	3 mm
1102540	**MCLNL2020K12**	20	20	25,0	125	32,0	CN..120408	**ICSN432**	**KLM46**	2.5 mm	**CKM21**	**STCM20**	3 mm
1102541	**MCLNL2525M12**	25	25	32,0	150	32,0	CN..120408	**ICSN432**	**KLM46**	2.5 mm	**CKM21**	**STCM20**	3 mm
1102440	**MCLNL2525M16**	25	25	32,0	150	33,0	CNMA160612	**ICSN533**	**KLM58**	3 mm	**CKM21**	**STCM20**	3 mm
1102534	**MCLNL2525M19**	25	25	32,0	150	38,0	CN..190612	**ICSN633**	**KLM68**	4 mm	**CKM12**	**STCM4**	4 mm
1102542	**MCLNL3225P12**	32	25	32,0	170	32,0	CN..120408	**ICSN432**	**KLM46**	2.5 mm	**CKM21**	**STCM20**	3 mm
1102442	**MCLNL3225P16**	32	25	32,0	170	33,0	CN..160612	**ICSN533**	**KLM58**	3 mm	**CKM21**	**STCM20**	3 mm
1102535	**MCLNL3225P19**	32	25	32,0	170	38,0	CN..190612	**ICSN633**	**KLM68**	4 mm	**CKM12**	**STCM4**	4 mm
3595786	**MCLNL3232P12**	32	32	40,5	171	32,0	CN..120408	**ICSN432**	**KLM46**	2.5 mm	**CKM21**	**STCM20**	3 mm
3595788	**MCLNL3232P16**	32	32	40,5	171	33,0	CN..160612	**ICSN533**	**KLM58**	3 mm	**CKM21**	**STCM20**	3 mm
1102536	**MCLNL3232P19**	32	32	40,0	170	38,0	CN..190612	**ICSN633**	**KLM68**	4 mm	**CKM12**	**STCM4**	4 mm
1102537	**MCLNL4040R19**	40	40	50,0	200	38,0	CN..190612	**ICSN633**	**KLM68**	4 mm	**CKM12**	**STCM4**	4 mm



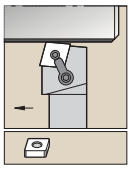


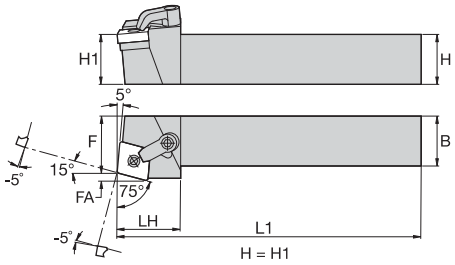


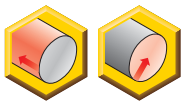
MCMN 50°



número para pedido	código do produto	H	B	F	L1	LH	inserto padrão	calço	pino de trava	sexta-vada	grampo	parafuso do grampo	sexta-vada
1101708	**MCMNN2020K12**	61	20	10,0	125	32,0	CN..120408	**ICSN432**	**KLM46**	2.5 mm	**CKM21**	**STCM20**	3 mm
1101709	**MCMNN2525M12**	86	25	12,9	150	32,0	CN..120408	**ICSN432**	**KLM46**	2.5 mm	**CKM21**	**STCM20**	3 mm
1102538	**MCMNN3225P16**	94	32	12,9	170	38,0	CN..160612	**ICSN533**	**KLM58**	3 mm	**CKM21**	**STCM20**	3 mm
1102239	**MCMNN4040R19**	117	40	20,0	200	42,0	CN..190612	**ICSN633**	**KLM68**	4 mm	**CKM12**	**STCM4**	4 mm



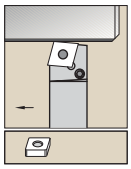


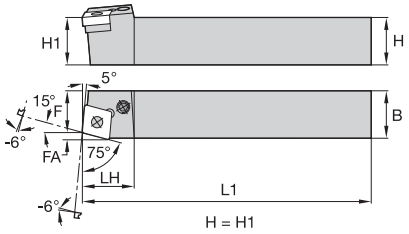


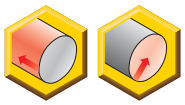
MCRN 75°



número para pedido	código do produto	H	B	F	L1	LH	FA	inserto padrão	calço	pino de trava	sexta-vada	grampo	parafuso do grampo	sexta-vada
corte à direita (R)														
1101638	**MCRNR2020K12**	20	20	25,0	125	32,0	3,3	CN..120408	**ICSN432**	**KLM46**	2.5 mm	**CKM21**	**STCM20**	3 mm
1101639	**MCRNR2525M12**	25	25	32,0	150	32,0	3,3	CN..120408	**ICSN432**	**KLM46**	2.5 mm	**CKM21**	**STCM20**	3 mm
1101640	**MCRNR3225P12**	32	25	32,0	170	32,0	3,3	CN..120408	**ICSN432**	**KLM46**	2.5 mm	**CKM21**	**STCM20**	3 mm
1102732	**MCRNR3232P16**	32	32	32,0	170	33,0	4,2	CN..160612	**ICSN533**	**KLM58**	3 mm	**CKM21**	**STCM20**	3 mm
1101643	**MCRNR3232P19**	32	32	40,0	170	38,0	4,6	CN..190612	**ICSN633**	**KLM68**	4 mm	**CKM12**	**STCM4**	4 mm
corte à esquerda (L)														
1102437	**MCRNL2525M12**	25	25	32,0	150	32,0	3,3	CN..120408	**ICSN432**	**KLM46**	2.5 mm	**CKM21**	**STCM20**	3 mm
1102439	**MCRNL3225P12**	32	25	32,0	170	32,0	3,3	CN..120408	**ICSN432**	**KLM46**	2.5 mm	**CKM21**	**STCM20**	3 mm
1102241	**MCRNL3232P16**	32	32	32,0	170	33,0	4,2	CN..160612	**ICSN533**	**KLM58**	3 mm	**CKM21**	**STCM20**	3 mm
1102443	**MCRNL3232P19**	32	32	40,0	170	38,0	4,6	CN..190612	**ICSN633**	**KLM68**	4 mm	**CKM12**	**STCM4**	4 mm



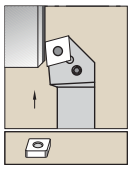


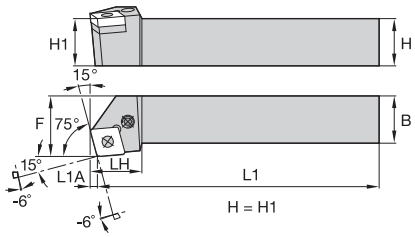


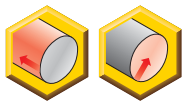
PCBN 75°



número para pedido	código do produto	H	B	F	L1	LH	FA	inserto padrão	calço	pino do calço	punção do pino	alavanca	parafuso da alavanca	Torx Plus
corte à direita (R)														
1244779	**PCBNR2525M12**	25	25	22,0	150	26,0	3,1	CN..120408	**512.112**	**513.023**	**515.018**	**511.023**	**514.123**	15 IP
1244635	**PCBNR2525M16**	25	25	22,0	150	28,0	4,2	CN..160612	**512.117**	**513.025**	**515.022**	**511.025**	**514.125**	15 IP
1244636	**PCBNR3225P12**	32	25	22,0	170	28,0	3,1	CN..120408	**512.112**	**513.023**	**515.018**	**511.023**	**514.123**	15 IP
1244637	**PCBNR3225P16**	32	25	22,0	170	28,0	4,2	CN..160612	**512.117**	**513.025**	**515.022**	**511.025**	**514.125**	15 IP
1244638	**PCBNR3232P16**	32	32	27,0	170	38,0	4,2	CN..160612	**512.117**	**513.025**	**515.022**	**511.025**	**514.125**	15 IP
1244795	**PCBNR3232P19**	32	32	27,0	170	38,0	4,6	CN..190612	**512.123**	**513.033**	**515.022**	**511.033**	**514.133**	25 IP
1192373	**PCBNR4040S19**	40	40	35,0	250	38,0	4,6	CN..190612	**512.123**	**513.033**	**515.022**	**511.033**	**514.133**	25 IP
corte à esquerda (L)														
1244630	**PCBNL2020K12**	20	20	17,0	125	26,0	3,1	CN..120408	**512.112**	**513.023**	**515.018**	**511.023**	**514.123**	15 IP
1244859	**PCBNL2525M12**	25	25	22,0	150	26,0	3,1	CN..120408	**512.112**	**513.023**	**515.018**	**511.023**	**514.123**	15 IP
1244631	**PCBNL2525M16**	25	25	22,0	150	28,0	4,2	CN..160612	**512.117**	**513.025**	**515.022**	**511.025**	**514.125**	15 IP
1244794	**PCBNL3232P16**	32	32	27,0	170	38,0	4,2	CN..160612	**512.117**	**513.025**	**515.022**	**511.025**	**514.125**	15 IP
1244633	**PCBNL3232P19**	32	32	27,0	170	38,0	4,6	CN..190612	**512.123**	**513.033**	**515.022**	**511.033**	**514.133**	25 IP
1192372	**PCBNL4040S19**	40	40	35,0	250	38,0	4,6	CN..190612	**512.123**	**513.033**	**515.022**	**511.033**	**514.133**	25 IP



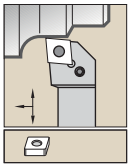


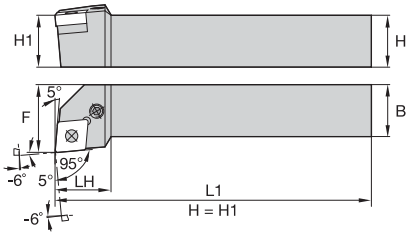


PCKN 75°



número para pedido	código do produto	H	B	F	L1	LH	L1A	inserto padrão	calço	pino do calço	punção do pino	alavanca	parafuso da alavanca	Torx Plus
corte à direita (R)														
1244649	**PCKNR2020K12**	20	20	25,0	125	23,0	3,1	CN..120408	**512.112**	**513.023**	**515.018**	**511.023**	**514.123**	15 IP
1244797	**PCKNR2525M12**	25	25	32,0	150	23,0	3,1	CN..120408	**512.112**	**513.023**	**515.018**	**511.023**	**514.123**	15 IP
1244775	**PCKNR2525M16**	25	25	32,0	150	30,0	3,8	CN..160612	**512.117**	**513.025**	**515.022**	**511.025**	**514.125**	15 IP
1244650	**PCKNR3225P12**	32	25	32,0	170	26,0	3,1	CN..120408	**512.112**	**513.023**	**515.018**	**511.023**	**514.123**	15 IP
1244776	**PCKNR3225P16**	32	25	32,0	170	30,0	3,8	CN..160612	**512.117**	**513.025**	**515.022**	**511.025**	**514.125**	15 IP
1244798	**PCKNR3232P19**	32	32	40,0	170	37,5	4,6	CN..190612	**512.123**	**513.033**	**515.022**	**511.033**	**514.133**	25 IP
corte à esquerda (L)														
1244646	**PCKNL2020K12**	20	20	25,0	125	23,0	3,1	CN..120408	**512.112**	**513.023**	**515.018**	**511.023**	**514.123**	15 IP
1244780	**PCKNL2525M12**	25	25	32,0	150	23,0	3,1	CN..120408	**512.112**	**513.023**	**515.018**	**511.023**	**514.123**	15 IP
1244647	**PCKNL3225P12**	32	25	32,0	170	26,0	3,1	CN..120408	**512.112**	**513.023**	**515.018**	**511.023**	**514.123**	15 IP
1244777	**PCKNL3225P16**	32	25	32,0	170	30,0	3,8	CN..160612	**512.117**	**513.025**	**515.022**	**511.025**	**514.125**	15 IP
1244648	**PCKNL3232P19**	32	32	40,0	170	37,5	4,6	CN..190612	**512.123**	**513.033**	**515.022**	**511.033**	**514.133**	25 IP



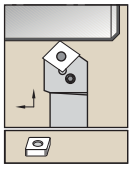


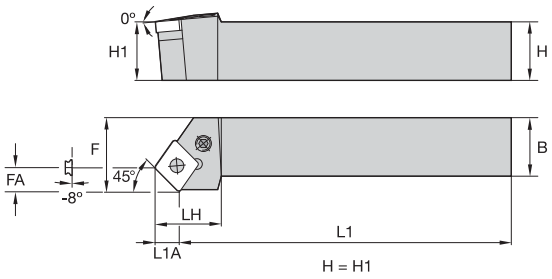


PCLN 95°



número para pedido	código do produto	H	B	F	L1	LH	inserto padrão	calço	pino do calço	punção do pino	alavanca	parafuso da alavanca	Torx Plus
corte à direita (R)													
1244809	**PCLNR1616H12**	16	16	20,0	100	26,0	CN..120408	**512.112**	**513.023**	**515.018**	**511.023**	**514.123**	15 IP
1244810	**PCLNR2020K12**	20	20	25,0	125	26,0	CN..120408	**512.112**	**513.023**	**515.018**	**511.023**	**514.123**	15 IP
1108097	**PCLNR2525M12**	25	25	32,0	150	26,0	CN..120408	**512.112**	**513.023**	**515.018**	**511.023**	**514.123**	15 IP
1192378	**PCLNR2525M16**	25	25	32,0	150	28,0	CN..160612	**512.117**	**513.025**	**515.022**	**511.025**	**514.125**	15 IP
1244652	**PCLNR2525M19**	25	25	32,0	150	36,0	CN..190612	**512.123**	**513.033**	**515.022**	**511.033**	**514.133**	25 IP
1244811	**PCLNR3225P12**	32	25	32,0	170	26,0	CN..120408	**512.112**	**513.023**	**515.018**	**511.023**	**514.123**	15 IP
1244812	**PCLNR3225P16**	32	25	32,0	170	38,0	CN..160612	**512.117**	**513.025**	**515.022**	**511.025**	**514.125**	15 IP
1244653	**PCLNR3225P19**	32	25	32,0	170	38,0	CN..190612	**512.123**	**513.033**	**515.022**	**511.033**	**514.133**	25 IP
1236864	**PCLNR3232P16**	32	32	40,0	170	36,0	CN..160612	**512.117**	**513.025**	**515.022**	**511.025**	**514.125**	15 IP
1244813	**PCLNR3232P19**	32	32	40,0	170	36,0	CN..190612	**512.123**	**513.033**	**515.022**	**511.033**	**514.133**	25 IP
1192379	**PCLNR4040S19**	40	40	50,0	250	36,0	CN..190612	**512.123**	**513.033**	**515.022**	**511.033**	**514.133**	25 IP
corte à esquerda (L)													
1244799	**PCLNL1616H12**	16	16	20,0	100	26,0	CN..120408	**512.112**	**513.023**	**515.018**	**511.023**	**514.123**	15 IP
1156962	**PCLNL2020K12**	20	20	25,0	125	26,0	CN..120408	**512.112**	**513.023**	**515.018**	**511.023**	**514.123**	15 IP
1192375	**PCLNL2525M12**	25	25	32,0	150	26,0	CN..120408	**512.112**	**513.023**	**515.018**	**511.023**	**514.123**	15 IP
1192376	**PCLNL2525M16**	25	25	32,0	150	28,0	CN..160612	**512.117**	**513.025**	**515.022**	**511.025**	**514.125**	15 IP
1244800	**PCLNL2525M19**	25	25	32,0	150	36,0	CN..190612	**512.123**	**513.033**	**515.022**	**511.033**	**514.133**	25 IP
1244858	**PCLNL3225P12**	32	25	32,0	170	26,0	CN..120408	**512.112**	**513.023**	**515.018**	**511.023**	**514.123**	15 IP
1244802	**PCLNL3225P16**	32	25	32,0	170	38,0	CN..160612	**512.117**	**513.025**	**515.022**	**511.025**	**514.125**	15 IP
1244803	**PCLNL3225P19**	32	25	32,0	170	38,0	CN..190612	**512.123**	**513.033**	**515.022**	**511.033**	**514.133**	25 IP
1244804	**PCLNL3232P16**	32	32	40,0	170	36,0	CN..160612	**512.117**	**513.025**	**515.022**	**511.025**	**514.125**	15 IP
1244805	**PCLNL3232P19**	32	32	40,0	170	36,0	CN..190612	**512.123**	**513.033**	**515.022**	**511.033**	**514.133**	25 IP
1192377	**PCLNL4040S19**	40	40	50,0	250	36,0	CN..190612	**512.123**	**513.033**	**515.022**	**511.033**	**514.133**	25 IP





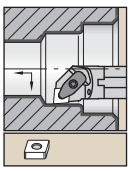


PCSN 45°

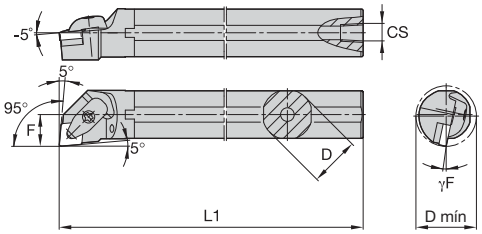


número para pedido	código do produto	H	B	F	L1	LH	FA	L1A	inserto padrão	calço	pino do calço	punção do pino	alavanca	parafuso da alavanca	Torx Plus
corte à direita (R)															
1244656	**PCSNR2020K12**	20	20	25,0	125	26,0	8,3	8,5	CN..120408	**512.112**	**513.023**	**515.018**	**511.023**	**514.123**	15 IP
1244818	**PCSNR2525M12**	25	25	32,0	150	28,0	8,3	8,5	CN..120408	**512.112**	**513.023**	**515.018**	**511.023**	**514.123**	15 IP
1244657	**PCSNR3225P12**	32	25	32,0	170	29,0	8,3	8,5	CN..120408	**512.112**	**513.023**	**515.018**	**511.023**	**514.123**	15 IP
1244819	**PCSNR3232P19**	32	32	40,0	170	37,5	12,5	12,7	CN..190612	**512.123**	**513.033**	**515.022**	**511.033**	**514.133**	25 IP
corte à esquerda (L)															
1244654	**PCSNL2020K12**	20	20	25,0	125	26,0	8,3	8,5	CN..120408	**512.112**	**513.023**	**515.018**	**511.023**	**514.123**	15 IP
1244655	**PCSNL2525M12**	25	25	32,0	150	28,0	8,3	8,5	CN..120408	**512.112**	**513.023**	**515.018**	**511.023**	**514.123**	15 IP
1284109	**PCSNL3225P12**	32	25	32,0	170	29,0	8,3	8,5	CN..120408	**512.112**	**513.023**	**515.018**	**511.023**	**514.123**	15 IP
1244817	**PCSNL3232P19**	32	32	40,0	170	37,5	12,5	12,7	CN..190612	**512.123**	**513.033**	**515.022**	**511.033**	**514.133**	25 IP

Barras de mandrilar Kenclamp™



Haste de aço com refrigeração interna.

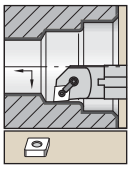




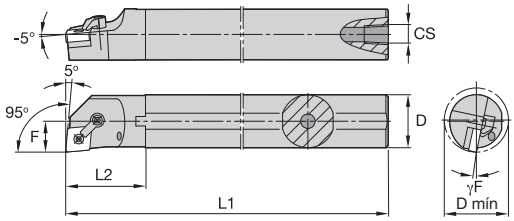
A-DCLN-KC 95°



número para pedido	código do produto	D	D mín	F	L1	CS	γF°	inserto padrão	calço	parafuso do calço	Torx Plus	conjunto do grampo	pino elástico	Torx Plus
corte à direita (R)														
2441867	**A25RDCLNR12KC04**	25	32,0	17,0	200	1/4-18 NPT	-12.0	CN.120408	**–**	**–**	15 IP	**CM234R ASSY**	**SSP025016M**	15 IP
2441931	**A32SDCLNR12KC04**	32	40,0	22,0	250	1/4-18 NPT	-12.0	CN.120408	**ICSN433**	**KMSP415IP**	15 IP	**CM234R ASSY**	**SSP025016M**	15 IP
2441933	**A40TDCLNR12KC04**	40	50,0	27,0	300	1/4-18 NPT	-9.0	CN..120408	**ICSN433**	**KMSP415IP**	15 IP	**CM234R ASSY**	**SSP025016M**	15 IP
corte à esquerda (L)														
2441930	**A25RDCLNL12KC04**	25	32,0	17,0	200	1/4-18 NPT	-12.0	CN.120408	**–**	**–**	15 IP	**CM234R ASSY**	**SSP025016M**	15 IP
2441932	**A32SDCLNL12KC04**	32	40,0	22,0	250	1/4-18 NPT	-12.0	CN.120408	**ICSN433**	**KMSP415IP**	15 IP	**CM234R ASSY**	**SSP025016M**	15 IP
2441934	**A40TDCLNL12KC04**	40	50,0	27,0	300	1/4-18 NPT	-9.0	CN.120408	**ICSN433**	**KMSP415IP**	15 IP	**CM234R ASSY**	**SSP025016M**	15 IP
2441938	**A40TDCLNL16KC06**	40	50,0	27,0	300	1/4-18 NPT	-12.0	CN..160612	**ICSN533**	**KMSP515IP**	15 IP	**CM209R ASSY**	**SSP025018M**	15 IP



Haste de aço com refrigeração interna.

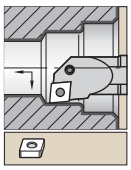




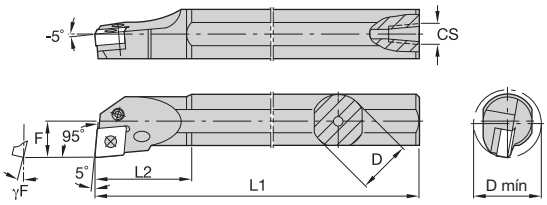
A-MCLN 95°



número para pedido	código do produto	D	D mín	F	L1	L2	CS	γF°	inserto padrão	calço	pino de trava	sexta-vada	grampo	parafuso do grampo	sexta-vada
corte à direita (R)															
1098767	**A25RMCLNR09**	25	32,0	17,0	200	40,0	1/4-18 NPT	-12.0	CN..090308	**–**	**KLM33**	2 mm	**CKM6**	**STCM5**	2.5 mm
1098088	**A25RMCLNR12**	25	32,0	17,0	200	33,0	1/4-18 NPT	-12.0	CN..120408	**–**	**KLM43**	2 mm	**CKM21**	**STCM11**	3 mm
1098090	**A32SMCLNR12**	32	40,0	22,0	250	–	1/4-18 NPT	-12.0	CN..120408	**ICSN432**	**KLM46**	2.5 mm	**CKM21**	**STCM20**	3 mm
1098092	**A40TMCLNR12**	40	50,0	27,0	300	–	1/4-18 NPT	-12.0	CN..120408	**ICSN432**	**KLM46**	2.5 mm	**CKM21**	**STCM20**	3 mm
1098096	**A40TMCLNR16**	40	50,0	27,0	300	–	1/4-18 NPT	-11.0	CN..160612	**ICSN533**	**KLM58**	3 mm	**CKM21**	**STCM20**	3 mm
1098094	**A50UMCLNR12**	50	63,0	35,0	350	–	1/4-18 NPT	-12.0	CN..120408	**ICSN432**	**KLM46**	2.5 mm	**CKM21**	**STCM20**	3 mm
1098098	**A50UMCLNR16**	50	63,0	35,0	350	–	1/4-18 NPT	-12.0	CN..160608	**ICSN533**	**KLM58**	3 mm	**CKM21**	**STCM20**	3 mm
1098100	**A50UMCLNR19**	50	63,0	35,0	350	–	1/4-18 NPT	-12.0	CN..190608	**ICSN633**	**KLM68**	4 mm	**CKM12**	**STCM4**	4 mm
corte à esquerda (L)															
1098089	**A25RMCLNL12**	25	32,0	17,0	200	33,0	1/4-18 NPT	-12.0	CN..120408	**–**	**KLM43**	2 mm	**CKM21**	**STCM11**	3 mm
1098091	**A32SMCLNL12**	32	40,0	22,0	250	–	1/4-18 NPT	-12.0	CN..120408	**ICSN432**	**KLM46**	2.5 mm	**CKM21**	**STCM20**	3 mm
1098093	**A40TMCLNL12**	40	50,0	27,0	300	–	1/4-18 NPT	-12.0	CN..120408	**ICSN432**	**KLM46**	2.5 mm	**CKM21**	**STCM20**	3 mm
1098097	**A40TMCLNL16**	40	50,0	27,0	300	–	1/4-18 NPT	-11.0	CN..160608	**ICSN533**	**KLM58**	3 mm	**CKM21**	**STCM20**	3 mm
1098095	**A50UMCLNL12**	50	63,0	35,0	350	–	1/4-18 NPT	-7.0	CN..120408	**ICSN432**	**KLM46**	2.5 mm	**CKM21**	**STCM20**	3 mm
1098099	**A50UMCLNL16**	50	63,0	35,0	350	–	1/4-18 NPT	-12.0	CN..160608	**ICSN533**	**KLM58**	3 mm	**CKM21**	**STCM20**	3 mm
1098101	**A50UMCLNL19**	50	63,0	35,0	350	–	1/4-18 NPT	-12.0	CN..190608	**ICSN633**	**KLM68**	4 mm	**CKM12**	**STCM4**	4 mm



Haste de aço com refrigeração interna.



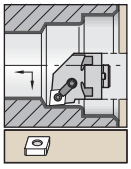


A-PCLN 95°

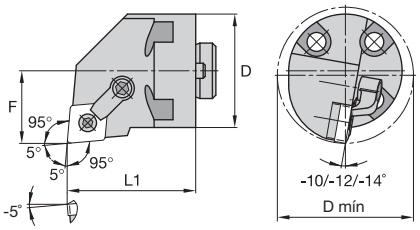


número para pedido	código do produto	D	D mín	F	L1	L2	CS	γF°	inserto padrão	calço	pino do calço	pino	alavanca	parafuso da alavanca	Torx Plus
corte à direita (R)															
2447150	**A25TPCLNR12**	25	32,0	17,0	300	40	1/4-18 NPT	-12.0	CN..120408	–	–	–	**511.022**	**514.122**	10 IP
2447152	**A32UPCLNR12**	32	40,0	22,0	350	50	1/4-18 NPT	-10.0	CN..120408	**512.112**	**513.023**	**515.018**	**511.023**	**514.123**	15 IP
2447476	**A32UPCLNR16**	32	50,0	22,0	350	50	1/4-18 NPT	-10.0	CN..160612	**512.117**	**513.025**	**515.022**	**511.025**	**514.125**	15 IP
2447533	**A40VPCLNR12**	40	50,0	27,0	400	55	1/4-18 NPT	-10.0	CN..120408	**512.112**	**513.023**	**515.018**	**511.023**	**514.123**	15 IP
2447478	**A40VPCLNR16**	40	50,0	27,0	400	55	1/4-18 NPT	-11.0	CN..160612	**512.117**	**513.025**	**515.022**	**511.025**	**514.125**	15 IP
corte à esquerda (L)															
2447151	**A25TPCLNL12**	25	32,0	17,0	300	40	1/4-18 NPT	-12.0	CN..120408	–	–	–	**511.022**	**514.122**	10 IP
2447473	**A32UPCLNL12**	32	40,0	22,0	350	50	1/4-18 NPT	-10.0	CN..120408	**512.112**	**513.023**	**515.018**	**511.023**	**514.123**	15 IP
2447534	**A40VPCLNL12**	40	50,0	27,0	400	55	1/4-18 NPT	-10.0	CN..120408	**512.112**	**513.023**	**515.018**	**511.023**	**514.123**	15 IP
2447479	**A40VPCLNL16**	40	50,0	27,0	400	55	1/4-18 NPT	-11.0	CN..160612	**512.117**	**513.025**	**515.022**	**511.025**	**514.125**	15 IP

Cabeças de mandrilar Kenloc



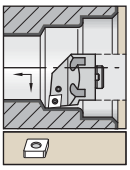
Com refrigeração interna.



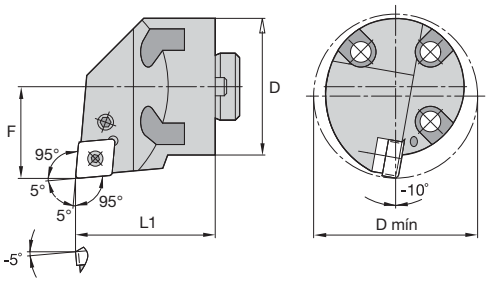
H-MCLN 95°



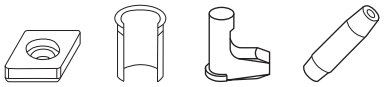
número para pedido	código do produto	D	D mín	F	L1	inserto padrão	calço	pino de trava	sexta-vada	grampo	parafuso do grampo	sexta-vada
corte à direita (R)												
3612156	**H32MCLNR12**	32	40,0	22,0	41	CN..120408	**ICSN432**	**KLM46**	2.5 mm	**CKM21**	**STCM20**	3 mm
3612178	**H50MCLNR12**	50	63,0	35,0	41	CN..120408	**ICSN432**	**KLM46**	2.5 mm	**CKM20**	**STCM20**	3 mm
1099102	**H50MCLNR19**	50	63,0	35,0	41	CN..190612	**ICSN633**	**KLM68**	4 mm	**CKM12**	**STCM4**	4 mm



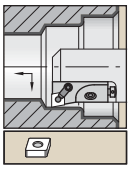
Com refrigeração interna.

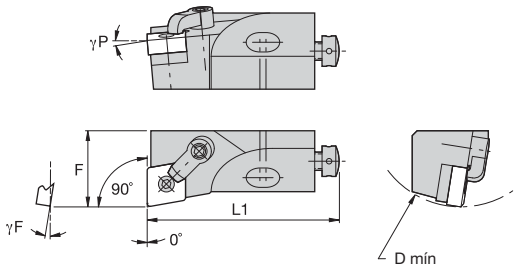


H-PCLN 95°



número para pedido	código do produto	D	D mín	F	L1	inserto padrão	calço	pino do calço	alavanca	punção do pino	parafuso da alavanca	sexta-vada
corte à direita (R)												
1861493	**H32PCLNR12**	32	40,0	22,0	41	CN..120408	**512.112**	**513.023**	**514.123**	**515.018**	**514.123**	15 IP
1861500	**H40PCLNR12**	40	50,0	27,0	41	CN..120408	**512.112**	**513.023**	**514.123**	**515.018**	**514.123**	15 IP
1861517	**H50PCLNR12**	50	63,0	35,0	41	CN..120408	**512.112**	**513.023**	**514.123**	**515.018**	**514.123**	15 IP
corte à esquerda (L)												
1861501	**H40PCLNL12**	40	50,0	27,0	41	CN..120408	**512.112**	**513.023**	**514.123**	**515.018**	**514.123**	15 IP
1861518	**H50PCLNL12**	50	63,0	35,0	41	CN..120408	**512.112**	**513.023**	**514.123**	**515.018**	**514.123**	15 IP

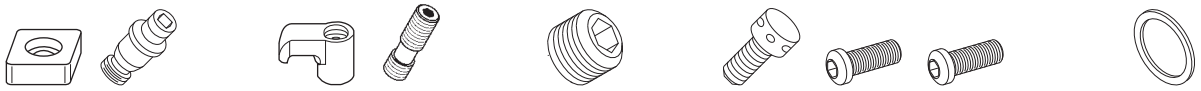




MCFN 90°

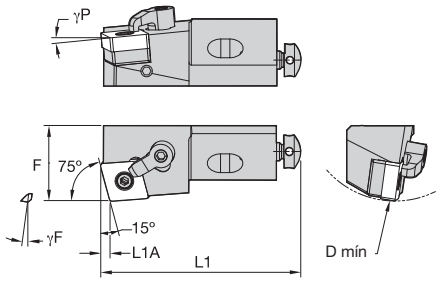
número para pedido	código do produto	D mín	F	L1	γF°	γP°	inserto padrão
corte à direita (R)							
3331146	**MCFNR10CA09**	40	14,0	50	-9.0	-9.0	CN..090308/CN..322
3346236	**MCFNR12CA12**	50	20,0	55	-9.0	-5.0	CN..120408/CN..432
2074433	**MCFNR16CA12**	60	25,0	63	-9.0	-5.0	CN..120408/CN..432
3330195	**MCFNR20CA12**	70	25,0	70	-9.0	-5.0	CN..120408\CN..432
corte à esquerda (L)							
3331145	**MCFNL10CA09**	40	14,0	50	-9.0	-9.0	CN..090308/CN..322
1906272	**MCFNL12CA12**	50	20,0	55	-9.0	-5.0	CN..120408/CN..432

Peças de reposição



D mín	calço	pino de trava	sexta-vada	grampo	parafuso do grampo	sexta-vada	parafuso de ajuste radial	sexta-vada	parafuso de ajuste axial	parafuso de montagem	parafuso de montagem	sexta-vada	arruela
40	**–**	**KLM33**	2 mm	**CKM36**	**STCM38**	2 mm	**KUAM28**	2 mm	**KUAM30**	**191.405**	**–**	4 mm	**CSWM 060 050**
50	**–**	**KLM43**	2 mm	**CKM34**	**STCM38**	2 mm	**KUAM22**	2 mm	**KUAM31**	**–**	**191.406**	4 mm	**CSWM 060 050**
60	**ICSN432**	**KLM46S**	2.5 mm	**CKM34**	**STCM9**	2.5 mm	**KUAM25**	2.5 mm	**KUAM32**	**–**	**191.407**	5 mm	**CSWM 080 050**
70	**ICSN432**	**KLM46**	2.5 mm	**CKM34**	**STCM9**	2.5 mm	**KUAM25**	2.5 mm	**KUAM32**	**–**	**191.407**	5 mm	**CSWM 080 050**





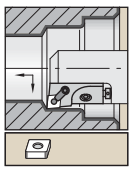
MCKN 75°

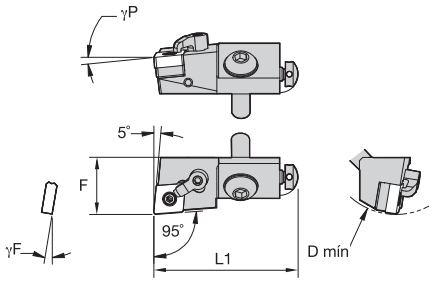
número para pedido	código do produto	D mín	F	L1	L1A	γF°	γP°	inserto padrão
corte à direita (R)								
3346238	**MCKNR12CA12**	50	20,0	55	3	-9.0	-5.0	CN..120408/CN..432
3330222	**MCKNR16CA12**	60	25,0	63	3	-9.0	-5.0	CN..120408/CN..432
corte à esquerda (L)								
3346237	**MCKNL12CA12**	50	20,0	55	3	-9.0	-5.0	CN..120408/CN..432

Peças de reposição



D mín	calço	pino de trava	sexta-vada	grampo	parafuso do grampo	sexta-vada	parafuso de ajuste radial	sexta-vada	parafuso de ajuste axial	parafuso de montagem	sexta-vada	arruela
50	**–**	**KLM43**	2 mm	**CKM34**	**STCM38**	2 mm	**KUAM22**	2 mm	**KUAM31**	**191.406**	4 mm	**CSWM 060 050**
60	**ICSN432**	**KLM46S**	2.5 mm	**CKM34**	**STCM9**	2.5 mm	**KUAM25**	2.5 mm	**KUAM32**	**191.407**	5 mm	**CSWM 080 050**





MCLN 95°

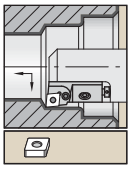
número para pedido	código do produto	D mín	F	L1	γF°	γP°	inserto padrão
corte à direita (R)							
1100493	**MCLNR12CA12**	50	20,0	55	-9.0	-5.0	CN..120408/CN..432
1282100	**MCLNR16CA12**	60	25,0	63	-9.0	-5.0	CN..120408/CN..432
3330197	**MCLNR20CA12**	70	25,0	70	-9.0	-5.0	CN..120408/CN..432
3332803	**MCLNR25CA12**	100	32,0	100	-9.0	-5.0	CN..120408/CN..432
3332804	**MCLNR25CA16**	100	32,0	100	-9.0	-5.0	CN..160612/CN..543
3332805	**MCLNR25CA19**	100	32,0	100	-9.0	-5.0	CN..190612/CN..643
corte à esquerda (L)							
2077947	**MCLNL12CA12**	50	20,0	55	-9.0	-5.0	CN..120408/CN..432
3330273	**MCLNL16CA12**	60	25,0	63	-9.0	-5.0	CN..120408/CN..432
3330196	**MCLNL20CA12**	70	25,0	70	-9.0	-5.0	CN..120408/CN..432
3332362	**MCLNL25CA19**	100	32,0	100	-9.0	-5.0	CN..190612/CN..643

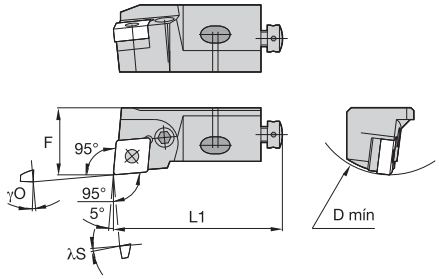
NOTA: Escolha as peças de reposição com base no D mín. e no tamanho do inserto escolhido.

Peças de reposição



D mín	calço	pino de trava	sexta-vada	grampo	parafuso do grampo	sexta-vada	parafuso de ajuste radial	sexta-vada	parafuso de ajuste axial	parafuso de montagem	parafuso de montagem	sexta-vada	arruela
50	**–**	**KLM43**	2 mm	**CKM34**	**STCM38**	2 mm	**KUAM22**	2 mm	**KUAM31**	**191.406**	**–**	4 mm	**CSWM 060 050**
60	**ICSN432**	**KLM46S**	2.5 mm	**CKM34**	**STCM9**	2.5 mm	**KUAM25**	2.5 mm	**KUAM32**	**191.407**	**–**	5 mm	**CSWM 080 050**
70	**ICSN432**	**KLM46**	2.5 mm	**CKM34**	**STCM9**	2.5 mm	**KUAM25**	2.5 mm	**KUAM32**	**191.407**	**–**	5 mm	**CSWM 080 050**
100	**ICSN633**	**KLM68**	4 mm	**CKM35**	**STCM8**	4 mm	**KUAM27**	4 mm	**KUAM32**	**–**	**MS364**	8 mm	**CSWM 100 080**
100	**ICSN432**	**KLM46**	2.5 mm	**CKM37**	**STCM40**	2.5 mm	**KUAM25**	2.5 mm	**KUAM32**	**–**	**MS364**	8 mm	**CSWM 100 080**
100	**ICSN533**	**KLM58**	3 mm	**CKM41**	**STCM20**	3 mm	**KUAM26**	3 mm	**KUAM32**	**–**	**MS364**	8 mm	**CSWM 100 080**
100	**ICSN633**	**KLM68**	4 mm	**CKM35**	**STCM8**	4 mm	**KUAM27**	4 mm	**KUAM32**	**–**	**MS364**	8 mm	**CSWM 100 080**





PCLN 95°

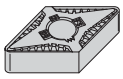
número para pedido	código do produto	D mín	F	L1	λS°	γO°	inserto padrão
corte à direita (R)							
1244444	**PCLNR12CA-12**	50	20,0	55	-6.0	-9.0	CN..120408/CN..432
1244496	**PCLNR16CA-12**	60	25,0	63	-6.0	-7.0	CN..120408/CN..432
corte à esquerda (L)							
1244443	**PCLNL16CA-12**	60	25,0	63	-6.0	-7.0	CN..120408/CN..432

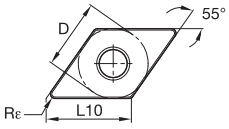
Peças de reposição



D mín	calço	pino do calço	alavanca	parafuso da alavanca	tamanho da chave do parafuso da alavanca	parafuso de ajuste radial	sexta-vada	parafuso de ajuste axial	parafuso de montagem	sexta-vada	arruela
50	**–**	**–**	**511.022**	**514.122**	10 IP	**KUAM28**	2 mm	**KUAM31**	**191.406**	4 mm	**CSWM 060 050**
60	**512.112**	**513.023**	**511.023**	**514.123**	15 IP	**KUAM23**	2.5 mm	**KUAM32**	**191.407**	5 mm	**CSWM 080 050**

● primeira opção
○ opção alternativa

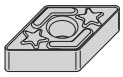


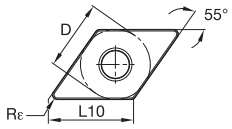


DNGG-FS

P		●	●	●	●	●	●	●	●	●	●	●	○	○	○	○	○	○	○	○	○	○	○	○	○	●	●	●	●	●	●	●		●
M											○	○							●	●	●	●	●	●	●		●	●	●	●	●	●	●		●
K		○	○	○	○	○	○						●	●	●	●	●	●								●	●	●	●	●	●	●		●
N																											●	●	●	●	●	●	●	●	
S																											●	●	●	●	●	●			
H																																			

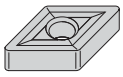
ISO código do produto	D	L10	Rε	KCP05B	KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30B	KCP30	KCP40B	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35B	KCM35	KCPK05	K313	K68	KCU10	KCU25	KC5010	KC5025	KC5410	KT315
DNGG110402FS	9,53	11,63	0,2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	●	–	–	–
DNGG110404FS	9,53	11,63	0,4	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–	–
DNGG110408FS	9,53	11,63	0,8	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–	–
DNGG150401FS	12,70	15,50	0,1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–	–
DNGG150402FS	12,70	15,50	0,2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	●	–	–	–
DNGG150404FS	12,70	15,50	0,4	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	●	●	–	–
DNGG150604FS	12,70	15,50	0,4	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–	–
DNGG150408FS	12,70	15,50	0,8	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	●	●	–	–	–
DNGG150608FS	12,70	15,50	0,8	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–	–
DNGG150412FS	12,70	15,50	1,2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–

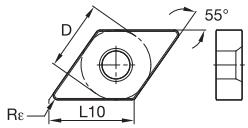




DNGG-LF

ISO código do produto	D	L10	Rε	KCP05B	KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30B	KCP30	KCP40B	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35B	KCM35	KCPK05	K313	K68	KCU10	KCU25	KC5010	KC5025	KC5410	KT315
DNGG150402LF	12,70	15,50	0,2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	●	–	–	–
DNGG150404LF	12,70	15,50	0,4	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	●	–	–	–
DNGG150408LF	12,70	15,50	0,8	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	●	–	–	–

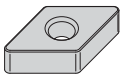


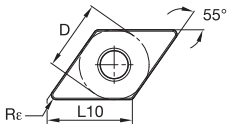


DNGP

ISO código do produto	D	L10	Rε	KCP05B	KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30B	KCP30	KCP40B	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35B	KCM35	KCPK05	K313	K68	KCU10	KCU25	KC5010	KC5025	KC5410	KT315
DNGP150401	12,70	15,50	0,1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–
DNGP150402	12,70	15,50	0,2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	●	–	●	–
DNGP150404	12,70	15,50	0,4	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	●	–	●	–	●	–
DNGP150604	12,70	15,50	0,4	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	●	–	–	–	●	–
DNGP150408	12,70	15,50	0,8	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	●	–	●	–	●	–
DNGP150608	12,70	15,50	0,8	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	●	–	–	–

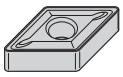
● primeira opção
○ opção alternativa

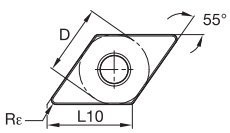




DNMA

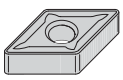
ISO código do produto	D	L10	Rε	KCP05B	KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30B	KCP30	KCP40B	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35B	KCM35	KCPK05	K313	K68	KCU10	KCU25	KC5010	KC5025	KC5410	KT315
P				●	●	●	●	●	●	●	●	●	●	○	○	○	○	○	○	○	○	○	○	○	○	●	●	●	●	●	●	●		●
M												○	○							●	●	●	●	●	●		●	●	●	●	●	●		●
K				○	○	○	○	○	○					●	●	●	●	●	●							●	●	●	●	●	●	●		●
N																											●	●	●	●	●	●	●	
S																											●	●	●	●	●	●		
H																																		
DNMA110408	9,53	11,63	0,8	–	–	–	–	–	–	–	–	–	–	–	●	–	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
DNMA150408	12,70	15,50	0,8	–	–	–	–	–	–	–	–	–	–	–	●	–	●	●	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
DNMA150608	12,70	15,50	0,8	–	–	–	–	–	–	–	–	–	–	–	●	–	●	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
DNMA150412	12,70	15,50	1,2	–	–	–	–	–	–	–	–	–	–	–	●	–	●	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
DNMA150612	12,70	15,50	1,2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
DNMA150416	12,70	15,50	1,6	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–

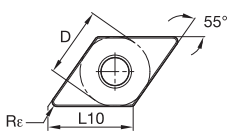




DNMG

ISO código do produto	D	L10	Rε	KCP05B	KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30B	KCP30	KCP40B	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35B	KCM35	KCPK05	K313	K68	KCU10	KCU25	KC5010	KC5025	KC5410	KT315
DNMG150408B	12,70	15,50	0,8	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–	–	–

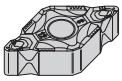


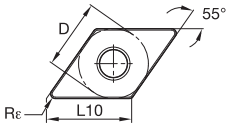


DNMG-33

ISO código do produto	D	L10	Rε	KCP05B	KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30B	KCP30	KCP40B	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35B	KCM35	KCPK05	K313	K68	KCU10	KCU25	KC5010	KC5025	KC5410	KT315
DNMG11040433	9,53	11,63	0,4	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●
DNMG11040833	9,53	11,63	0,8	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●
DNMG15060433	12,70	15,50	0,4	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●
DNMG15060833	12,70	15,50	0,8	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●

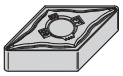
● primeira opção
○ opção alternativa

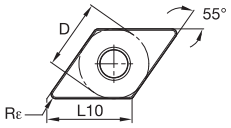




DNMG-CT

				KCP05B	KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30B	KCP30	KCP40B	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35B	KCM35	KCPK05	K313	K68	KCU10	KCU25	KC5010	KC5025	KC5410	KT315
				P	●	●	●	●	●	●	●	●	●	●	○	○	○	○	○	○	○	○	○	○	○	○	●	●	●	●	●	●	●		●
				M									○	○							●	●	●	●	●	●		●	●	●	●	●	●		●
				K	○	○	○	○	○	○					●	●	●	●	●	●							●	●	●	●	●	●	●		●
				N																							●	●	●	●	●	●	●	
				S																							●	●	●	●	●	●		
				H																														
ISO código do produto		D	L10	Rε																														
DNMG110412CT		9,53	11,62	1,2	–	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
DNMG110408CT		9,53	11,63	0,8	–	●	●	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
DNMG150604CT		12,70	15,50	0,3	–	–	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
DNMG150404CT		12,70	15,50	0,4	–	–	–	●	●	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	●	–	–	–
DNMG150408CT		12,70	15,50	0,8	–	–	●	●	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–
DNMG150608CT		12,70	15,50	0,8	–	–	●	●	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
DNMG150412CT		12,70	15,50	1,2	–	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–	–
DNMG150612CT		12,70	15,50	1,2	●	●	●	●	●	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–

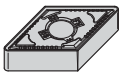


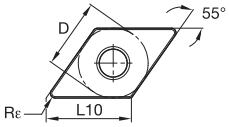


DNMG-FF

ISO código do produto	D	L10	Rε	KCP05B	KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30B	KCP30	KCP40B	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35B	KCM35	KCPK05	K313	K68	KCU10	KCU25	KC5010	KC5025	KC5410	KT315
DNMG110404FF	9,53	11,63	0,4	–	●	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	●	–	–	●
DNMG110408FF	9,53	11,63	0,8	●	●	●	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–	●
DNMG150404FF	12,70	15,50	0,4	–	–	–	●	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–	–	–	–	–	●	–	●	–	–	●
DNMG150604FF	12,70	15,50	0,4	–	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	●
DNMG150408FF	12,70	15,50	0,8	–	●	●	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	●	–	–	●
DNMG150608FF	12,70	15,50	0,8	–	–	●	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	●

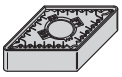
● primeira opção
○ opção alternativa

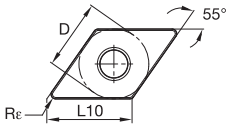




DNMG-FN

ISO código do produto	D	L10	Rε	KCP05B	KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30B	KCP30	KCP40B	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35B	KCM35	KCPK05	K313	K68	KCU10	KCU25	KC5010	KC5025	KC5410	KT315
DNMG110404FN	9,53	11,63	0,4	–	●	●	●	●	–	–	–	–	–	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●
DNMG110408FN	9,53	11,63	0,8	–	●	●	●	●	–	–	–	–	–	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●
DNMG110412FN	9,53	11,63	1,2	–	●	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
DNMG150404FN	12,70	15,50	0,4	–	●	●	●	●	●	–	–	–	–	–	●	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●
DNMG150604FN	12,70	15,50	0,4	–	●	●	●	●	●	–	–	–	–	–	●	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●
DNMG150408FN	12,70	15,50	0,8	–	●	●	●	●	●	–	–	–	–	–	●	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–	–	–	–	●
DNMG150608FN	12,70	15,50	0,8	–	●	●	●	●	●	–	–	–	–	–	●	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●
DNMG150412FN	12,70	15,50	1,2	–	●	●	–	–	–	–	–	–	–	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●
DNMG150612FN	12,70	15,50	1,2	–	●	●	●	–	●	–	–	–	–	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●

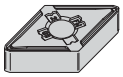


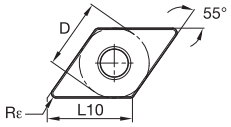


DNMG-FP

ISO código do produto	D	L10	Rε	KCP05B	KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30B	KCP30	KCP40B	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35B	KCM35	KCPK05	K313	K68	KCU10	KCU25	KC5010	KC5025	KC5410	KT315
DNMG110404FP	9,53	11,63	0,4	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	●	–	–	–	–	●	–	–	●	–	●	–	–	–
DNMG110408FP	9,53	11,63	0,8	–	–	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–	●	–	–	●	–	●	–	–	●
DNMG150404FP	12,70	15,50	0,4	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–	–	–	–	●	–	●	–	–	●
DNMG150604FP	12,70	15,50	0,4	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–	–	–	–	●	–	●	–	–	–
DNMG150408FP	12,70	15,50	0,8	–	–	–	●	–	●	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–	–	–	–	●	–	●	–	–	●
DNMG150608FP	12,70	15,50	0,8	–	–	●	●	●	●	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–	–	–	–	●	–	●	–	–	–
DNMG150412FP	12,70	15,50	1,2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–	–
DNMG150612FP	12,70	15,50	1,2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	●

● primeira opção
○ opção alternativa

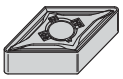


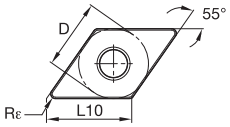


DNMG-FW

| | | |

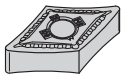
● primeira opção
○ opção alternativa

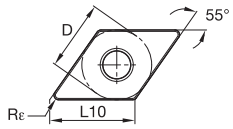




DNMG-MP

ISO código do produto	D	L10	Rε	KCP05B	KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30B	KCP30	KCP40B	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35B	KCM35	KCPK05	K313	K68	KCU10	KCU25	KC5010	KC5025	KC5410	KT315
P				●	●	●	●	●	●	●	●	●	●	○	○	○	○	○	○	○	○	○	○	○	○	●	●	●	●	●	●	●		●
M												○	○							●	●	●	●	●	●		●	●	●	●	●	●		●
K				○	○	○	○	○	○					●	●	●	●	●	●							●	●	●	●	●	●	●		●
N																											●	●	●	●	●	●	●	
S																											●	●	●	●	●	●		
H																																		
DNMG110408MP	9,53	11,63	0,8	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	●	●	–	–	–	–	–	●	–	●	–	–	–
DNMG110412MP	9,53	11,63	1,2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	●	–	–	–	–	–	–	–	–	–	–	–	–
DNMG150404MP	12,70	15,50	0,4	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	●	●	–	●	–	–	–	●	–	●	–	–	–
DNMG150604MP	12,70	15,50	0,4	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	●	●	–	●	–	–	–	●	–	●	–	–	–
DNMG150408MP	12,70	15,50	0,8	–	–	–	●	–	●	–	–	–	–	–	–	–	–	–	–	●	–	●	●	–	●	–	–	–	●	–	●	–	–	–
DNMG150608MP	12,70	15,50	0,8	–	–	–	●	–	●	–	–	–	–	–	–	–	–	–	–	●	●	●	●	–	●	–	–	–	●	●	●	–	–	–
DNMG150412MP	12,70	15,50	1,2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–	–	●	–	●	–	–	–
DNMG150612MP	12,70	15,50	1,2	–	–	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	●	●	–	–	–	–	–	–	●	●	●	–	–	–

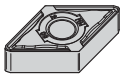


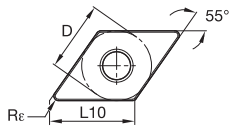


DNMG-MS

ISO código do produto	D	L10	Rε	KCP05B	KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30B	KCP30	KCP40B	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35B	KCM35	KCPK05	K313	K68	KCU10	KCU25	KC5010	KC5025	KC5410	KT315
DNMG110408MS	9,53	11,63	0,8	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	●	●	●	–	–
DNMG150401MS	12,70	15,50	0,1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–	–
DNMG150402MS	12,70	15,50	0,2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	●	●	–	–	–
DNMG150404MS	12,70	15,50	0,4	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	●	●	●	●	–	–
DNMG150604MS	12,70	15,50	0,4	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	●	●	●	●	–	–
DNMG150408MS	12,70	15,50	0,8	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	●	●	●	●	–	–
DNMG150608MS	12,70	15,50	0,8	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	●	●	●	●	–	–
DNMG150412MS	12,70	15,50	1,2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	●	●	–	–	–
DNMG150612MS	12,70	15,50	1,2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	●	–	●	–	–

● primeira opção
○ opção alternativa

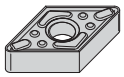


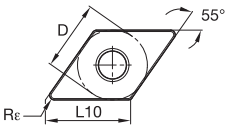


DNMG-MW

| | | |

● primeira opção
○ opção alternativa



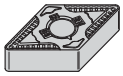


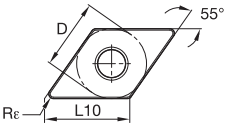
		KCP05B	KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30B	KCP30	KCP40B	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35B	KCM35	KCPK05	K313	K68	KCU10	KCU25	KC5010	KC5025	KC5410	KT315
P		●	●	●	●	●	●	●	●	●	●	○	○	○	○	○	○	○	○	○	○	○	○	●	●	●	●	●	●	●		●
M										○	○							●	●	●	●	●	●		●	●	●	●	●	●		●
K		○	○	○	○	○	○					●	●	●	●	●	●							●	●	●	●	●	●	●		●
N																									●	●	●	●	●	●	●	
S																									●	●	●	●	●	●		
H																																

DNMG-P

ISO código do produto	D	L10	Rε																													
DNMG150404P	12,70	15,50	0,4	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	●	–	–	–
DNMG150408P	12,70	15,50	0,8	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	●	–	–	–
DNMG150608P	12,70	15,50	0,8	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–

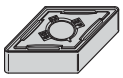
DNMG-RN

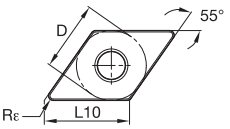




ISO código do produto	D	L10	Rε																													
DNMG150408RN	12,70	15,50	0,8	–	–	●	●	●	●	●	–	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
DNMG150608RN	12,70	15,50	0,8	–	●	●	●	●	●	●	–	●	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
DNMG150412RN	12,70	15,50	1,2	–	–	●	–	●	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–	–	–	–	–
DNMG150612RN	12,70	15,50	1,2	–	●	●	●	●	●	–	–	●	●	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–	–	–	–	–
DNMG150416RN	12,70	15,50	1,6	–	–	–	–	–	●	–	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
DNMG150616RN	12,70	15,50	1,6	–	–	–	●	●	●	–	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
DNMG190608RN	15,88	19,38	0,8	–	–	●	–	–	●	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
DNMG190612RN	15,88	19,38	1,2	–	–	●	–	–	●	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–

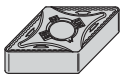
DNMG-RP

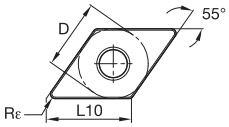




ISO código do produto	D	L10	Rε																													
DNMG110408RP	9,53	11,63	0,8	–	–	–	●	●	–	–	–	–	–	–	–	–	●	–	–	●	–	–	–	–	–	–	–	●	–	●	–	–	–
DNMG110412RP	9,53	11,63	1,2	–	–	–	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
DNMG150408RP	12,70	15,50	0,8	–	–	●	●	●	●	–	–	–	–	●	–	–	●	●	–	●	●	●	–	●	–	–	–	●	●	●	●	–	–
DNMG150608RP	12,70	15,50	0,8	–	●	●	●	●	●	–	●	–	–	–	●	–	–	●	–	●	●	●	–	–	–	–	–	●	●	●	●	–	–
DNMG150412RP	12,70	15,50	1,2	–	–	●	–	●	●	–	●	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–	●	●	–	–	–	–
DNMG150612RP	12,70	15,50	1,2	–	–	●	●	●	●	–	–	–	–	●	–	●	●	●	–	–	–	●	●	–	–	–	–	●	●	–	–	–	–
DNMG150416RP	12,70	15,50	1,6	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	●	–	–	–
DNMG150616RP	12,70	15,50	1,6	–	–	●	●	●	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–	–

● primeira opção
○ opção alternativa

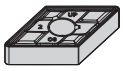


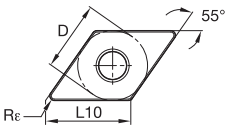


DNMG-UN

P		●	●	●	●	●	●	●	●	●	●	●	○	○	○	○	○	○	○	○	○	○	○	○	○	●	●	●	●	●	●	●		●
M											○	○							●	●	●	●	●	●	●		●	●	●	●	●	●		●
K		○	○	○	○	○	○						●	●	●	●	●	●								●	●	●	●	●	●	●		●
N																											●	●	●	●	●	●	●		
S																											●	●	●	●	●	●			
H																																				

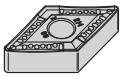
ISO código do produto	D	L10	Rε	KCP05B	KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30B	KCP30	KCP40B	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35B	KCM35	KCPK05	K313	K68	KCU10	KCU25	KC5010	KC5025	KC5410	KT315
DNMG110408UN	9,53	11,63	0,8	–	–	–	–	–	–	–	–	–	–	–	–	●	●	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
DNMG110412UN	9,53	11,63	1,2	–	–	–	–	–	–	–	–	–	–	–	–	●	●	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
DNMG150408UN	12,70	15,50	0,8	–	–	–	–	–	–	–	–	–	–	–	●	●	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
DNMG150608UN	12,70	15,50	0,8	–	–	–	–	–	–	–	–	–	–	–	–	●	●	●	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
DNMG150412UN	12,70	15,50	1,2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
DNMG150612UN	12,70	15,50	1,2	–	–	–	–	–	–	–	–	–	–	–	–	●	●	●	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
DNMG150416UN	12,70	15,50	1,6	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
DNMG150616UN	12,70	15,50	1,6	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–

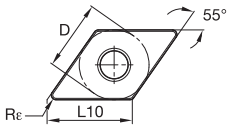




DNMG-UP

ISO código do produto	D	L10	Rε	KCP05B	KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30B	KCP30	KCP40B	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35B	KCM35	KCPK05	K313	K68	KCU10	KCU25	KC5010	KC5025	KC5410	KT315
DNMG110408UP	9,53	11,63	0,8	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–	–	–	–	–	–	–	–
DNMG150404UP	12,70	15,50	0,4	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	●	–	–	–	–	–	●	–	–	–	–	–
DNMG150604UP	12,70	15,50	0,4	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–	–	–	–	–	–	–	–
DNMG150408UP	12,70	15,50	0,8	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	●	●	–	●	–	–	–	●	–	●	–	–	–
DNMG150608UP	12,70	15,50	0,8	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	●	–	–	–	–	–	–	●	–	●	–	–	–

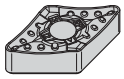


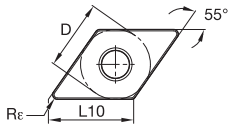


DNMM-RM

ISO código do produto	D	L10	Rε	KCP05B	KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30B	KCP30	KCP40B	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35B	KCM35	KCPK05	K313	K68	KCU10	KCU25	KC5010	KC5025	KC5410	KT315
DNMM150408RM	12,70	15,50	0,8	–	–	–	–	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
DNMM150608RM	12,70	15,50	0,8	–	–	–	●	●	–	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
DNMM150412RM	12,70	15,50	1,2	–	–	–	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
DNMM150612RM	12,70	15,50	1,2	–	–	–	●	●	●	–	–	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
DNMM150616RM	12,70	15,50	1,6	–	–	–	–	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–

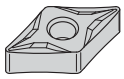
● primeira opção
○ opção alternativa

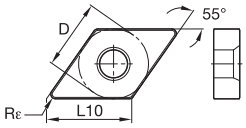




DNMM-RP

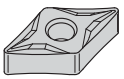
ISO código do produto	D	L10	Rε	KCP05B	KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30B	KCP30	KCP40B	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35B	KCM35	KCPK05	K313	K68	KCU10	KCU25	KC5010	KC5025	KC5410	KT315
P				●	●	●	●	●	●	●	●	●	●	○	○	○	○	○	○	○	○	○	○	○	○	●	●	●	●	●	●	●		●
M												○	○							●	●	●	●	●	●		●	●	●	●	●	●		●
K				○	○	○	○	○	○					●	●	●	●	●	●							●	●	●	●	●	●	●		●
N																											●	●	●	●	●	●	●	
S																											●	●	●	●	●	●		
H																																		
DNMM150608RP	12,70	15,50	0,8	–	–	–	●	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
DNMM150612RP	12,70	15,50	1,2	–	–	●	–	●	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
DNMM150616RP	12,70	15,50	1,6	–	–	●	–	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–

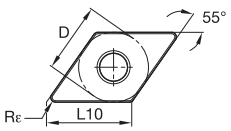




DNMP

ISO código do produto	D	L10	Rε	KCP05B	KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30B	KCP30	KCP40B	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35B	KCM35	KCPK05	K313	K68	KCU10	KCU25	KC5010	KC5025	KC5410	KT315
DNMP150404	12,70	15,50	0,4	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–	–	–
DNMP150408	12,70	15,50	0,8	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–	–	–
DNMP150412	12,70	15,50	1,2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–	–	–

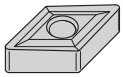


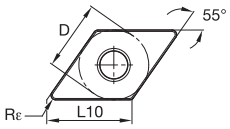


DNMP-K

ISO código do produto	D	L10	Rε	KCP05B	KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30B	KCP30	KCP40B	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35B	KCM35	KCPK05	K313	K68	KCU10	KCU25	KC5010	KC5025	KC5410	KT315
DNMP110408K	9,53	11,63	0,8	–	–	–	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
DNMP150404K	12,70	15,50	0,4	–	–	–	–	●	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
DNMP150604K	12,70	15,50	0,4	–	–	–	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
DNMP150408K	12,70	15,50	0,8	–	–	●	–	●	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
DNMP150608K	12,70	15,50	0,8	–	–	●	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
DNMP150412K	12,70	15,50	1,2	–	–	●	–	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–

● primeira opção
○ opção alternativa





DNMS

ISO código do produto	D	L10	Rε	KCP05B	KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30B	KCP30	KCP40B	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35B	KCM35	KCPK05	K313	K68	KCU10	KCU25	KC5010	KC5025	KC5410	KT315
				P		●	●	●	●	●	●	●	●	●	○	○	○	○	○	○	○	○	○	○	○	○	●	●	●	●	●	●	●		●
				M										○	○							●	●	●	●	●	●		●	●	●	●	●	●		●
				K		○	○	○	○	○	○					●	●	●	●	●	●								●	●	●	●	●	●	●		●
				N																								●	●	●	●	●	●	●	
				S																								●	●	●	●	●	●		
				H																														
DNMS150408	12,70	15,50	0,8	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–	●	–

Aplicativo Móvel

O aplicativo móvel da Kennametal proporciona acesso fácil a informações de produtos e calculadoras em ambos equipamentos, iPhone® e Android™. Destacamos algumas das principais características...

Há um aplicativo para isso.

VELOCIDADES DE CORTE & AVANÇOS

Veja informações sobre velocidades de corte e avanços para produtos metalúrgicos.

DISPONIBILIDADE DO PRODUTO

Verifique a disponibilidade global de produtos. Veja quantidades disponíveis fornecendo sua credencial de acesso do Konnect.

CALCULADORAS

Utilize nossa calculadora de usinagem para aplicações de fresamento e furação.

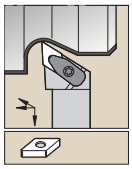


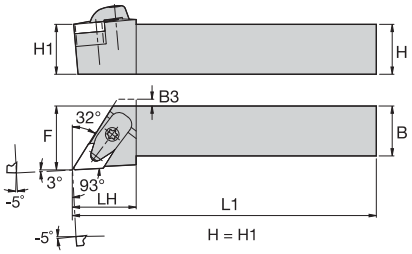
Ao digitalizar o código de barra da embalagem do inserto, você pode encontrar as condições de corte mais produtivas para vida útil e controle de cavaco.

NOTA: O aplicativo está disponível somente na versão em Inglês. Nós temos planos para traduzir o aplicativo em diferentes idiomas para liberações futuras.

Google play

Available on the App Store

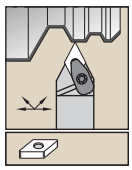


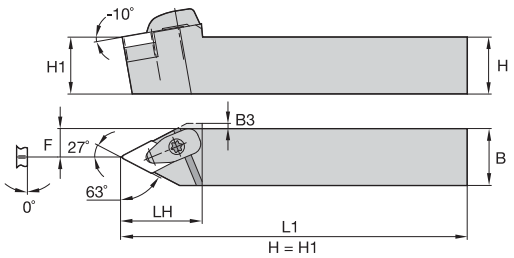


DDJN-KC 93°



número para pedido	código do produto	H	B	F	L1	LH	B3	inserto padrão	calço	parafuso do calço	Torx Plus	conjunto do grampo	Torx Plus	pino elástico	pino de trava opcional
corte à direita (R)															
2273105	**DDJNR2020K11KC04**	20	20	25,0	125	30,0	2,0	DN..110408	**IDSN322**	**KMSP315IP**	15 IP	**CM234R ASSY**	15 IP	**SSP025016M**	**KLM34L9IP**
1875197	**DDJNR2020K15KC06**	20	20	25,0	125	32,0	4,0	DN..150608	**IDSN433**	**KMSP415IP**	15 IP	**CM234R ASSY**	15 IP	**SSP025016M**	**KLM46L15IP**
2273106	**DDJNR2525M11KC04**	25	25	32,0	150	30,0	—	DN..110408	**IDSN322**	**KMSP315IP**	15 IP	**CM234R ASSY**	15 IP	**SSP025016M**	**KLM34L9IP**
1875191	**DDJNR2525M15KC06**	25	25	32,0	150	32,0	—	DN..150608	**IDSN433**	**KMSP415IP**	15 IP	**CM234R ASSY**	15 IP	**SSP025016M**	**KLM46L15IP**
1875208	**DDJNR3225P15KC06**	32	25	32,0	170	32,0	—	DN..150608	**IDSN433**	**KMSP415IP**	15 IP	**CM234R ASSY**	15 IP	**SSP025016M**	**KLM46L15IP**
1875227	**DDJNR3232P15KC06**	32	32	40,0	170	32,0	—	DN..150608	**IDSN433**	**KMSP415IP**	15 IP	**CM234R ASSY**	15 IP	**SSP025016M**	**KLM46L15IP**
corte à esquerda (L)															
2273107	**DDJNL2020K11KC04**	20	20	25,0	125	30,0	2,0	DN..110408	**IDSN322**	**KMSP315IP**	15 IP	**CM234R ASSY**	15 IP	**SSP025016M**	**KLM34L9IP**
1875198	**DDJNL2020K15KC06**	20	20	25,0	125	32,0	4,0	DN..150608	**IDSN433**	**KMSP415IP**	15 IP	**CM234R ASSY**	15 IP	**SSP025016M**	**KLM46L15IP**
2273108	**DDJNL2525M11KC04**	25	25	32,0	150	30,0	—	DN..110408	**IDSN322**	**KMSP315IP**	15 IP	**CM234R ASSY**	15 IP	**SSP025016M**	**KLM34L9IP**
1875192	**DDJNL2525M15KC06**	25	25	32,0	150	32,0	—	DN..150608	**IDSN433**	**KMSP415IP**	15 IP	**CM234R ASSY**	15 IP	**SSP025016M**	**KLM46L15IP**
1875207	**DDJNL3225P15KC06**	32	25	32,0	170	32,0	—	DN..150608	**IDSN433**	**KMSP415IP**	15 IP	**CM234R ASSY**	15 IP	**SSP025016M**	**KLM46L15IP**
1875209	**DDJNL3232P15KC06**	32	32	40,0	171	32,0	—	DN..150608	**IDSN433**	**KMSP415IP**	15 IP	**CM234R ASSY**	15 IP	**SSP025016M**	**KLM46L15IP**

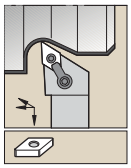


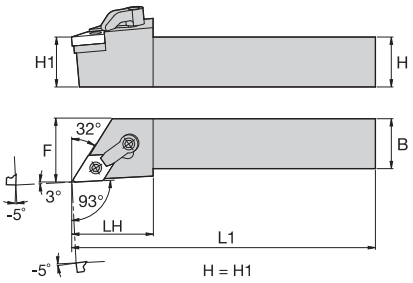


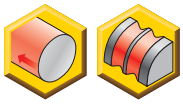
DDNN-KC 63°



número para pedido	código do produto	H	B	F	L1	LH	B3	inserto padrão	calço	parafuso do calço	Torx Plus	conjunto do grampo	Torx Plus	pino elástico	pino de trava opcional
corte à direita (R)															
2273111	**DDNNR2020K15KC06**	20	20	10,0	125	40,0	2,5	DN..150608	**IDSN433**	**KMSP415IP**	15 IP	**CM234R ASSY**	15 IP	**SSP025016M**	**KLM46L15IP**
2273112	**DDNNR2525M15KC06**	25	25	13,0	150	40,0	—	DN..150608	**IDSN433**	**KMSP415IP**	15 IP	**CM234R ASSY**	15 IP	**SSP025016M**	**KLM46L15IP**





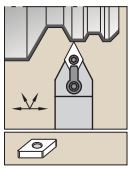


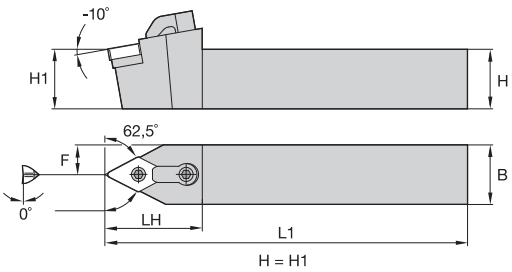
MDJN 93°

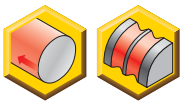





número para pedido	código do produto	H	B	F	L1	LH	inserto padrão	calço	pino de trava	sexta-vada	grampo	parafuso do grampo	sexta-vada
corte à direita (R)													
1100936	**MDJNR1616H11**	16	16	20,0	100	32,0	DN..110408	**IDSN322**	**KLM34L**	2 mm	**CKM7**	**STCM5**	2.5 mm
1101286	**MDJNR2020K11**	20	20	25,0	125	32,0	DN..110408	**IDSN322**	**KLM34L**	2 mm	**CKM7**	**STCM5**	2.5 mm
1101356	**MDJNR2020K15**	20	20	25,0	125	36,0	DN..150608	**IDSN432**	**KLM46L**	2.5 mm	**CKM22**	**STCM20**	3 mm
1101288	**MDJNR2525M11**	25	25	32,0	150	32,0	DN..110408	**IDSN322**	**KLM34L**	2 mm	**CKM7**	**STCM5**	2.5 mm
1101357	**MDJNR2525M15**	25	25	32,0	150	36,0	DN..150608	**IDSN432**	**KLM46L**	2.5 mm	**CKM22**	**STCM20**	3 mm
1101358	**MDJNR3225P15**	32	25	32,0	170	36,0	DN..150608	**IDSN432**	**KLM46L**	2.5 mm	**CKM22**	**STCM20**	3 mm
3638550	**MDJNR3232P15**	32	32	40,5	173	32,0	DN..150608	**IDSN432**	**KLM46L**	2.5 mm	**CKM22**	**STCM20**	3 mm
corte à esquerda (L)													
1101285	**MDJNL2020K11**	20	20	25,0	125	32,0	DN..110408	**IDSN322**	**KLM34L**	2 mm	**CKM7**	**STCM5**	2.5 mm
1101287	**MDJNL2525M11**	25	25	32,0	150	32,0	DN..110408	**IDSN322**	**KLM34L**	2 mm	**CKM7**	**STCM5**	2.5 mm
1102316	**MDJNL2525M15**	25	25	32,0	150	36,0	DN..150608	**IDSN432**	**KLM46L**	2.5 mm	**CKM22**	**STCM20**	3 mm
1102317	**MDJNL3225P15**	32	25	32,0	170	32,0	DN..150608	**IDSN432**	**KLM46L**	2.5 mm	**CKM22**	**STCM20**	3 mm
3638551	**MDJNL3232P15**	32	32	40,5	173	32,0	DN..150608	**IDSN432**	**KLM46L**	2.5 mm	**CKM22**	**STCM20**	3 mm





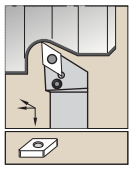


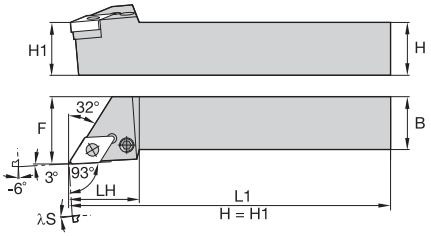
MDNN 62,5°

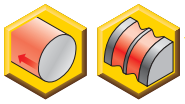





número para pedido	código do produto	H	B	F	L1	LH	inserto padrão	calço	pino de trava	sexta-vada	grampo	parafuso do grampo	sexta-vada
corte à direita (R)													
1101636	**MDNNR2525M15**	68	25	12,5	150	41,0	DN..150608	**IDSN432**	**KLM46L**	2.5 mm	**CKM22**	**STCM20**	3 mm
1101637	**MDNNR3225P15**	88	32	12,5	170	41,0	DN..150608	**IDSN432**	**KLM46L**	2.5 mm	**CKM22**	**STCM20**	3 mm
corte à esquerda (L)													
1102434	**MDNNL2525M15**	68	25	12,5	150	41,0	DN..150608	**IDSN432**	**KLM46L**	2.5 mm	**CKM22**	**STCM20**	3 mm
1102435	**MDNNL3225P15**	88	32	12,5	170	41,0	DN..150608	**IDSN432**	**KLM46L**	2.5 mm	**CKM22**	**STCM20**	3 mm



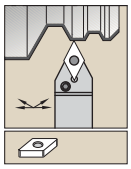


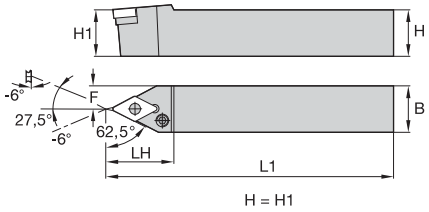


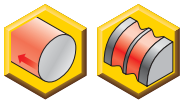
PDJN 93°



número para pedido	código do produto	H	B	F	L1	LH	λS°	inserto padrão	calço	pino do calço	punção do pino	alavanca	parafuso da alavanca	Torx Plus
corte à direita (R)														
1244752	PDJNR1616H11	16	16	20,0	100	24,0	-6.0	DN..110408	512.060	513.060	515.018	511.060	514.118	10 IP
1192382	PDJNR2020K11	20	20	25,0	125	30,0	-7.0	DN..110408	512.060	513.060	515.018	511.060	514.118	10 IP
1192383	PDJNR2020K15	20	20	25,0	125	36,0	-7.0	DN..150608	512.153	513.023	515.018	511.024	514.128	15 IP
1192384	PDJNR2525M11	25	25	32,0	150	30,0	-7.0	DN..110408	512.060	513.060	515.018	511.060	514.118	10 IP
1192385	PDJNR2525M15	25	25	32,0	150	36,0	-7.0	DN..150608	512.153	513.023	515.018	511.024	514.128	15 IP
1156969	PDJNR3225P15	32	25	32,0	170	36,0	-7.0	DN..150608	512.153	513.023	515.018	511.024	514.128	15 IP
1236865	PDJNR3232P15	32	32	40,0	170	36,0	-7.0	DN..150608	512.153	513.023	515.018	511.024	514.128	15 IP
1244784	PDJNR4025R15	40	25	32,0	200	36,0	-7.0	DN..150608	512.153	513.023	515.018	511.024	514.128	15 IP
corte à esquerda (L)														
1244751	PDJNL1616H11	16	16	20,0	100	24,0	-6.0	DN..110408	512.060	513.060	515.018	511.060	514.118	10 IP
1244658	PDJNL2020K11	20	20	25,0	125	30,0	-7.0	DN..110408	512.060	513.060	515.018	511.060	514.118	10 IP
1244820	PDJNL2020K15	20	20	25,0	125	36,0	-7.0	DN..150608	512.153	513.023	515.018	511.024	514.128	15 IP
1192380	PDJNL2525M11	25	25	32,0	150	30,0	-7.0	DN..110408	512.060	513.060	515.018	511.060	514.118	10 IP
1156968	PDJNL2525M15	25	25	32,0	150	36,0	-7.0	DN..150608	512.153	513.023	515.018	511.024	514.128	15 IP
1244781	PDJNL3225P15	32	25	32,0	170	36,0	-7.0	DN..150608	512.153	513.023	515.018	511.024	514.128	15 IP
1244821	PDJNL3232P15	32	32	40,0	170	36,0	-7.0	DN..150608	512.153	513.023	515.018	511.024	514.128	15 IP
1192381	PDJNL4025R15	40	25	32,0	200	36,0	-7.0	DN..150608	512.153	513.023	515.018	511.024	514.128	15 IP



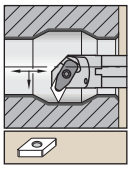




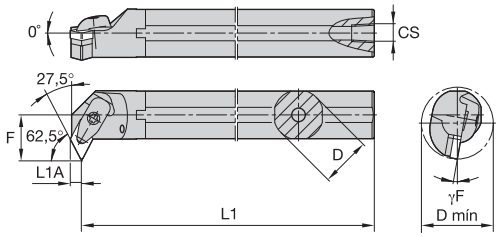
PDNN 62,5°



número para pedido	código do produto	H	B	F	L1	LH	inserto padrão	calço	pino do calço	punção do pino	alavanca	parafuso da alavanca	Torx Plus
corte à direita (R)													
1244756	**PDNNR2020K11**	20	20	10,0	125	24,0	DN..110408	**512.060**	**513.060**	**515.018**	**511.060**	**514.118**	10 IP
1244824	**PDNNR2020K15**	20	20	10,0	125	36,0	DN..150608	**512.153**	**513.023**	**515.018**	**511.024**	**514.128**	15 IP
1244773	**PDNNR2525M15**	25	25	12,5	150	36,0	DN..150608	**512.153**	**513.023**	**515.018**	**511.024**	**514.128**	15 IP
1244825	**PDNNR4025M15**	40	25	12,5	150	36,0	DN..150608	**512.153**	**513.023**	**515.018**	**511.024**	**514.128**	15 IP
corte à esquerda (L)													
1244754	**PDNNL2020K11**	20	20	10,0	125	24,0	DN..110408	**512.060**	**513.060**	**515.018**	**511.060**	**514.118**	10 IP
1244822	**PDNNL2020K15**	20	20	10,0	125	36,0	DN..150608	**512.153**	**513.023**	**515.018**	**511.024**	**514.128**	15 IP
1244659	**PDNNL2525M11**	25	25	12,5	150	30,0	DN..110408	**512.060**	**513.060**	**515.018**	**511.060**	**514.118**	10 IP
1244785	**PDNNL2525M15**	25	25	12,5	150	36,0	DN..150608	**512.153**	**513.023**	**515.018**	**511.024**	**514.128**	15 IP
1244823	**PDNNL4025M15**	40	25	12,5	150	36,0	DN..150608	**512.153**	**513.023**	**515.018**	**511.024**	**514.128**	15 IP



Haste de aço com refrigeração interna.

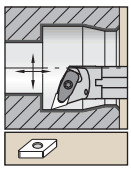




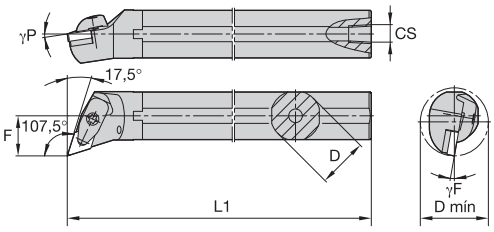
A-DDPN-KC 117,5°



número para pedido	código do produto	D	D mín	F	L1	L1A	CS	γF°	inserto padrão	calço	parafuso do calço	Torx Plus	conjunto do grampo	pino elástico	Torx Plus
corte à direita (R)															
2441957	**A25RDDPNR11KC04**	25	37,0	22,0	200	4,8	1/4-18 NPT	-10.0	DN..110408	**IDSN322**	**KMSP315IP**	15 IP	**CM234R ASSY**	**SSP025016M**	15 IP
2441959	**A32SDDPNR15KC06**	32	45,0	27,0	250	6,5	1/4-18 NPT	-12.0	DN..150608	**IDSN433**	**KMSP415IP**	15 IP	**CM234R ASSY**	**SSP025016M**	15 IP
2441961	**A40TDDPNR15KC06**	40	52,0	30,0	300	6,6	1/4-18 NPT	-10.0	DN..150608	**IDSN433**	**KMSP415IP**	15 IP	**CM234R ASSY**	**SSP025016M**	15 IP
corte à esquerda (L)															
2441960	**A32SDDPNL15KC06**	32	45,0	27,0	250	—	1/4-18 NPT	-12.0	DN..150608	**IDSN433**	**KMSP415IP**	15 IP	**CM234R ASSY**	**SSP025016M**	15 IP
2441962	**A40TDDPNL15KC06**	40	52,0	30,0	300	6,6	1/4-18 NPT	-10.0	DN..150608	**IDSN433**	**KMSP415IP**	15 IP	**CM234R ASSY**	**SSP025016M**	15 IP



Haste de aço com refrigeração interna.

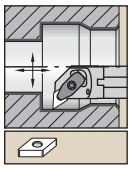




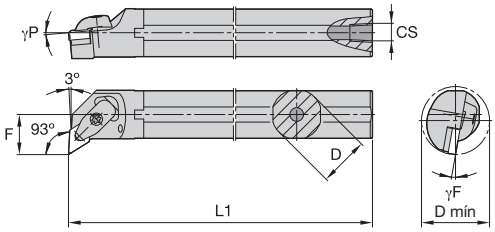
A-DDQN-KC 107,5°



número para pedido	código do produto	D	D mín	F	L1	CS	γF°	γP°	inserto padrão	calço	parafuso do calço	Torx Plus	conjunto do grampo	pino elástico	Torx Plus
corte à direita (R)															
2441951	**A25RDDQNR11KC04**	25	32,0	17,0	200	1/4-18 NPT	-11.0	-7.0	DN..110408	—	—	—	**CM234R ASSY**	**SSP025016M**	15 IP
2441953	**A32SDDQNR15KC06**	32	40,0	22,0	250	1/4-18 NPT	-12.0	-10.0	DN..150608	**IDSN433**	**KMSP415IP**	15 IP	**CM234R ASSY**	**SSP025016M**	15 IP
2441955	**A40TDDQNR15KC06**	40	50,0	27,0	300	1/4-18 NPT	-10.0	-10.0	DN..150608	**IDSN433**	**KMSP415IP**	15 IP	**CM234R ASSY**	**SSP025016M**	15 IP
corte à esquerda (L)															
2441952	**A25RDDQNL11KC04**	25	32,0	17,0	200	1/4-18 NPT	-11.0	-7.0	DN..110408	—	—	—	**CM234R ASSY**	**SSP025016M**	15 IP
2441954	**A32SDDQNL15KC06**	32	40,0	22,0	250	1/4-18 NPT	-12.0	-10.0	DN..150608	**IDSN433**	**KMSP415IP**	15 IP	**CM234R ASSY**	**SSP025016M**	15 IP
2441956	**A40TDDQNL15KC06**	40	50,0	27,0	300	1/4-18 NPT	-10.0	-10.0	DN..150608	**IDSN433**	**KMSP415IP**	15 IP	**CM234R ASSY**	**SSP025016M**	15 IP



Haste de aço com refrigeração interna.

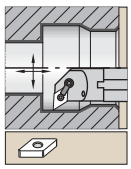




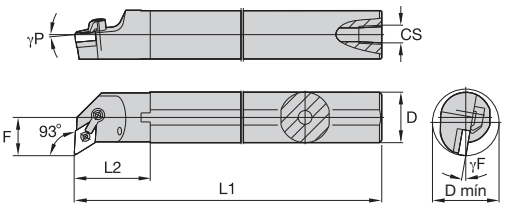
A-DDUN-KC 93°



número para pedido	código do produto	D	D mín	F	L1	CS	γF°	γP°	inserto padrão	calço	parafuso do calço	Torx Plus	conjunto do grampo	pino elástico	Torx Plus
corte à direita (R)															
2441939	**A25RDDUNR11KC04**	25	32,0	17,0	200	1/4-18 NPT	-12.0	-5.0	DN..110408	–	–	–	**CM234R ASSY**	**SSP025016M**	15 IP
2441941	**A32SDDUNR11KC04**	32	40,0	22,0	250	1/4-18 NPT	-12.0	-5.0	DN..110408	**IDSN322**	**KMSP315IP**	15 IP	**CM234R ASSY**	**SSP025016M**	15 IP
2441945	**A32SDDUNR15KC06**	32	40,0	22,0	250	1/4-18 NPT	-12.0	-6.0	DN..150608	**IDSN433**	**KMSP415IP**	15 IP	**CM234R ASSY**	**SSP025016M**	15 IP
2441947	**A40TDDUNR15KC06**	40	50,0	27,0	300	1/4-18 NPT	-9.0	-5.0	DN..150608	**IDSN433**	**KMSP415IP**	15 IP	**CM234R ASSY**	**SSP025016M**	15 IP
2441949	**A50UDDUNR15KC06**	50	63,0	35,0	350	1/4-18 NPT	-7.0	-5.0	DN..150608	**IDSN433**	**KMSP415IP**	15 IP	**CM234R ASSY**	**SSP025016M**	15 IP
corte à esquerda (L)															
2441940	**A25RDDUNL11KC04**	25	32,0	17,0	200	1/4-18 NPT	-12.0	-5.0	DN..110408	–	–	–	**CM234R ASSY**	**SSP025016M**	15 IP
2441942	**A32SDDUNL11KC04**	32	40,0	22,0	250	1/4-18 NPT	-12.0	-5.0	DN..110408	**IDSN322**	**KMSP315IP**	15 IP	**CM234R ASSY**	**SSP025016M**	15 IP
2441946	**A32SDDUNL15KC06**	32	40,0	22,0	250	1/4-18 NPT	-12.0	-6.0	DN..150608	**IDSN433**	**KMSP415IP**	15 IP	**CM234R ASSY**	**SSP025016M**	15 IP
2441948	**A40TDDUNL15KC06**	40	50,0	27,0	300	1/4-18 NPT	-9.0	-5.0	DN..150608	**IDSN433**	**KMSP415IP**	15 IP	**CM234R ASSY**	**SSP025016M**	15 IP
2441950	**A50UDDUNL15KC06**	50	63,0	35,0	350	1/4-18 NPT	-7.0	-5.0	DN..150608	**IDSN433**	**KMSP415IP**	15 IP	**CM234R ASSY**	**SSP025016M**	15 IP



Haste de aço com refrigeração interna.





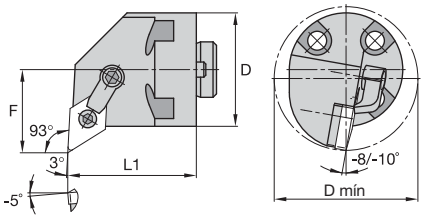
A-MDUN 93°



número para pedido	código do produto	D	D mín	F	L1	L2	CS	γF°	γP°	inserto padrão	calço	pino de trava	sexta-vada	grampo	parafuso do grampo	sexta-vada
corte à direita (R)																
1098769	**A25RMDUNR11**	25	32,0	17,0	200	40,0	1/4-18 NPT	-14.0	-5.0	DN..110408	–	**KLM33L**	2 mm	**CKM7**	**STCM5**	2.5 mm
1098102	**A25RMDUNR15**	25	32,0	17,0	200	–	1/4-18 NPT	-14.0	-5.0	DN..150408	**IDSN432**	**KLM46L**	2.5 mm	**CKM22**	**STCM11**	3 mm
1098770	**A32SMDUNR11**	32	40,0	22,0	250	50,0	1/4-18 NPT	-12.0	-5.0	DN..110408	**IDSN322**	**KLM34L**	2 mm	**CKM7**	**STCM5**	2.5 mm
1098104	**A32SMDUNR15**	32	40,0	22,0	250	–	1/4-18 NPT	-12.0	-6.0	DN..150608	**IDSN432**	**KLM46L**	2.5 mm	**CKM22**	**STCM20**	3 mm
1098106	**A40TMDUNR15**	40	50,0	27,0	300	–	1/4-18 NPT	-9.0	-5.0	DN..150608	**IDSN432**	**KLM46L**	2.5 mm	**CKM22**	**STCM20**	3 mm
1098108	**A50UMDUNR15**	50	63,0	35,0	350	–	1/4-18 NPT	-7.0	-5.0	DN..150608	**IDSN432**	**KLM46L**	2.5 mm	**CKM22**	**STCM20**	3 mm
corte à esquerda (L)																
1098779	**A25RMDUNL11**	25	32,0	17,0	200	40,0	1/4-18 NPT	-14.0	-5.0	DN..110408	–	**KLM33L**	2 mm	**CKM7**	**STCM5**	2.5 mm
1098103	**A25RMDUNL15**	25	32,0	17,0	200	–	1/4-18 NPT	-14.0	-5.0	DN..150408	**IDSN432**	**KLM46L**	2.5 mm	**CKM22**	**STCM11**	3 mm
1098780	**A32SMDUNL11**	32	40,0	22,0	250	50,0	1/4-18 NPT	-12.0	-5.0	DN..110408	**IDSN322**	**KLM34L**	2 mm	**CKM7**	**STCM5**	2.5 mm
1098105	**A32SMDUNL15**	32	40,0	22,0	250	–	1/4-18 NPT	-12.0	-6.0	DN..150608	**IDSN432**	**KLM46L**	2.5 mm	**CKM22**	**STCM20**	3 mm
1098107	**A40TMDUNL15**	40	50,0	27,0	300	–	1/4-18 NPT	-9.0	-5.0	DN..150608	**IDSN432**	**KLM46L**	2.5 mm	**CKM22**	**STCM20**	3 mm
1098109	**A50UMDUNL15**	50	63,0	35,0	350	–	1/4-18 NPT	-7.0	-5.0	DN..150608	**IDSN432**	**KLM46L**	2.5 mm	**CKM22**	**STCM20**	3 mm



Com refrigeração interna.

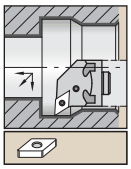


H-MDUN 93°

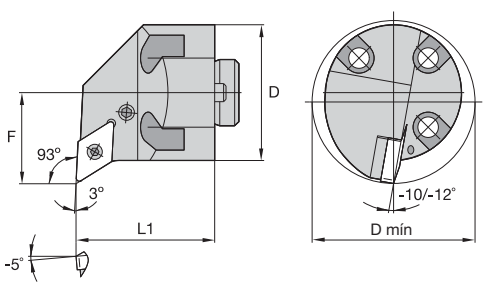


número para pedido	código do produto	D	D mín	F	L1	inserto padrão	calço	pino de trava	sexta-vada	grampo	parafuso do grampo	sexta-vada
corte à direita (R)												
1099094	**H40MDUNR15**	40	50,0	27,0	41	DN..150608	**IDSN432**	**KLM46L**	2.5 mm	**CKM22**	**STCM20**	3 mm
corte à esquerda (L)												
3612192	**H50MDUNL19**	50	63,0	35,0	41	DN..190612	**IDSN533**	**KLM58**	3 mm	**CKM12**	**STCM4**	4 mm

Cabeças de mandrilar Kenlever™



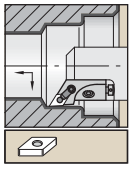
Com refrigeração interna.

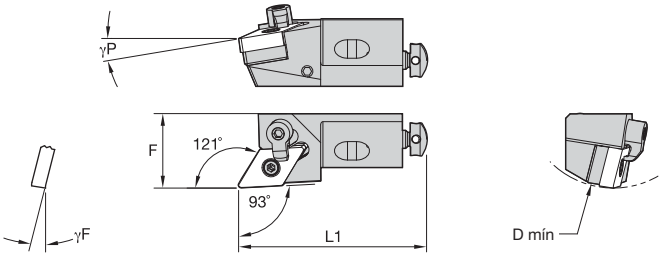


H-PDUN 93°



número para pedido	código do produto	D	D mín	F	L1	inserto padrão	calço	pino do calço	pino	alavanca	parafuso da alavanca	Torx Plus
corte à direita (R)												
1861496	**H32PDUNR15**	32	43,0	25,0	41	DN..150608	**512.153**	**513.023**	**515.018**	**511.024**	**514.128**	15 IP
1861519	**H50PDUNR15**	50	63,0	35,0	41	DN..150608	**512.153**	**513.023**	**515.018**	**511.024**	**514.128**	15 IP
corte à esquerda (L)												
1861520	**H50PDUNL15**	50	63,0	35,0	41	DN..150608	**512.153**	**513.023**	**515.018**	**511.024**	**514.128**	15 IP





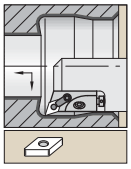
MDJN 93°

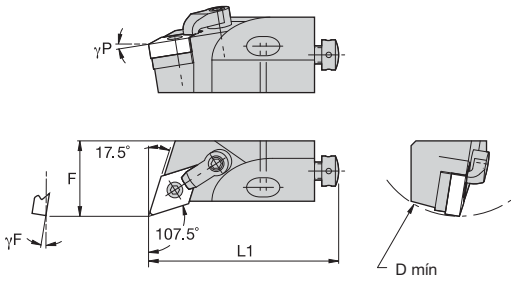
número para pedido	código do produto	D mín	F	L1	γF°	γP°	inserto padrão
corte à direita (R)							
3346241	**MDJNR12CA11**	50	20,0	55	-9.0	-9.0	DN..110408/DN..322
3330275	**MDJNR16CA15**	60	25,0	63	-9.0	-9.0	DN..150408/DN..432
3330199	**MDJNR20CA15**	70	25,0	70	-8.5	-8.5	DN..150408/DN..3.532
corte à esquerda (L)							
3346240	**MDJNL12CA11**	50	20,0	55	-9.0	-9.0	DN..110408/DN..322
3330274	**MDJNL16CA15**	60	25,0	63	-9.0	-9.0	DN..150408/DN..432

Peças de reposição



D mín	calço	pino de trava	sexta-vada	grampo	parafuso do grampo	sexta-vada	parafuso de ajuste radial	sexta-vada	parafuso de ajuste axial	parafuso de montagem	sexta-vada	arruela
50	**–**	**KLM33L**	2 mm	**CKM34**	**STCM38**	2 mm	**KUAM22**	2 mm	**KUAM31**	**191.406**	4 mm	**CSWM 060 050**
60	**IDSN432**	**KLM46S**	2.5 mm	**CKM36**	**STCM9**	2.5 mm	**KUAM25**	2.5 mm	**KUAM32**	**191.407**	5 mm	**CSWM 080 050**
70	**IDSN432**	**KLM46**	2.5 mm	**CKM41**	**STCM40**	2.5 mm	**KUAM25**	2.5 mm	**KUAM32**	**191.407**	5 mm	**CSWM 080 050**





MDQN 107,5°

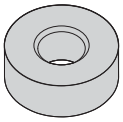
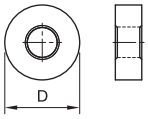
número para pedido	código do produto	D mín	F	L1	γF°	γP°	inserto padrão
corte à direita (R)							
3330277	**MDQNR16CA15**	60	25,0	63	-9.0	-6.0	DN..150408/DN..432
3330201	**MDQNR20CA15**	70	25,0	70	-9.0	-8.0	DN..150408/DN..432
corte à esquerda (L)							
3330276	**MDQNL16CA15**	60	25,0	63	-9.0	-6.0	DN..150408/DN..432
3330200	**MDQNL20CA15**	70	25,0	70	-9.0	-8.0	DN..150408/DN..432

Peças de reposição



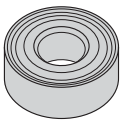
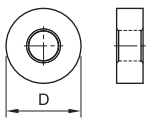
D mín	calço	pino de trava	sexta-vada	grampo	parafuso do grampo	sexta-vada	parafuso de ajuste radial	sexta-vada	parafuso de ajuste axial	parafuso de montagem	sexta-vada	arruela
60	**IDSN432**	**KLM46S**	2.5 mm	**CKM36**	**STCM9**	2.5 mm	**KUAM25**	2.5 mm	**KUAM32**	**191.407**	5 mm	**CSWM 080 050**
70	**IDSN432**	**KLM46**	2.5 mm	**CKM34**	**STCM9**	2.5 mm	**KUAM25**	2.5 mm	**KUAM32**	**191.407**	5 mm	**CSWM 080 050**

● primeira opção
○ opção alternativa

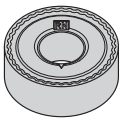
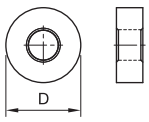
RNMA

ISO código do produto	D	L10	Rε	KCP05B	KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30B	KCP30	KCP40B	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35B	KCM35	KCPK05	K313	K68	KCU10	KCU25	KC5010	KC5025	KC5410	KT315
RNMA120400	12,70	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–	–	–
RNMA150600	15,88	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–	–	–

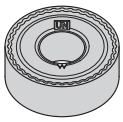
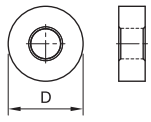
RNMG

ISO código do produto	D	L10	Rε	KCP05B	KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30B	KCP30	KCP40B	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35B	KCM35	KCPK05	K313	K68	KCU10	KCU25	KC5010	KC5025	KC5410	KT315
RNMG190600	19,05	–	–	–	–	–	–	–	●	–	–	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–	–	–	–

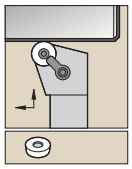
RNMG-RN

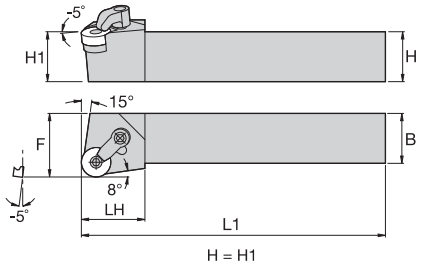
ISO código do produto	D	L10	Rε	KCP05B	KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30B	KCP30	KCP40B	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35B	KCM35	KCPK05	K313	K68	KCU10	KCU25	KC5010	KC5025	KC5410	KT315
RNMG090300RN	9,53	–	–	–	–	–	–	●	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
RNMG120400RN	12,70	–	–	–	–	●	●	●	–	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	●	–	–	–
RNMG150600RN	15,88	–	–	–	–	–	–	●	–	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–
RNMG190600RN	19,05	–	–	–	–	–	–	●	●	–	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–	–
RNMG250900RN	25,40	–	–	–	–	–	●	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–

RNMG-UN

ISO código do produto	D	L10	Rε	KCP05B	KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30B	KCP30	KCP40B	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35B	KCM35	KCPK05	K313	K68	KCU10	KCU25	KC5010	KC5025	KC5410	KT315
RNMG120400UN	12,70	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–







MRGN

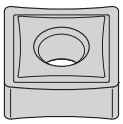


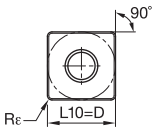



número para pedido	código do produto	H	B	F	L1	LH	inserto padrão	calço	pino de trava	sexta-vada	grampo	parafuso do grampo	sexta-vada
corte à direita (R)													
1102086	**MRGNR2525M12**	25	25	32,0	150	32,0	RN..120400	**IRSN43**	**KLM46**	2.5 mm	**CKM21**	**STCM20**	3 mm
corte à esquerda (L)													
1102699	**MRGNL2525M12**	25	25	32,0	150	32,0	RN..120400	**IRSN43**	**KLM46**	2.5 mm	**CKM21**	**STCM20**	3 mm

● primeira opção
○ opção alternativa

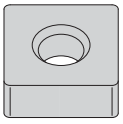
SNGP

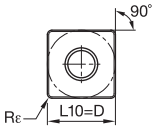




ISO código do produto	D	L10	Rε	KCP05B	KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30B	KCP30	KCP40B	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35B	KCM35	KCPK05	K313	K68	KCU10	KCU25	KC5010	KC5025	KC5410	KT315
P				●	●	●	●	●	●	●	●	●	●	○	○	○	○	○	○	○	○	○	○	○	○	●	●	●	●	●	●	●		●
M												○	○							●	●	●	●	●	●		●	●	●	●	●	●		●
K				○	○	○	○	○	○					●	●	●	●	●	●							●	●	●	●	●	●	●		●
N																											●	●	●	●	●	●	●	
S																											●	●	●	●	●	●		
H																																		
SNGP120404	12,70	12,70	0,4	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–
SNGP120408	12,70	12,70	0,8	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–

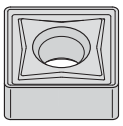
SNMA

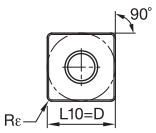




ISO código do produto	D	L10	Rε	KCP05B	KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30B	KCP30	KCP40B	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35B	KCM35	KCPK05	K313	K68	KCU10	KCU25	KC5010	KC5025	KC5410	KT315
SNMA120408	12,70	12,70	0,8	–	–	–	–	–	–	–	–	–	–	–	–	●	–	●	●	–	–	–	–	–	–	–	–	●	–	–	–	–	–	–
SNMA120412	12,70	12,70	1,2	–	–	–	–	–	–	–	–	–	–	–	–	●	●	●	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
SNMA150612	15,88	15,88	1,2	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
SNMA190612	19,05	19,05	1,2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–	–	–	–	–	●	–	–	–	–	–	–
SNMA190616	19,05	19,05	1,6	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–

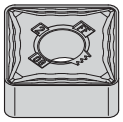
SNMG

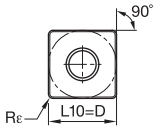




ISO código do produto	D	L10	Rε	KCP05B	KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30B	KCP30	KCP40B	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35B	KCM35	KCPK05	K313	K68	KCU10	KCU25	KC5010	KC5025	KC5410	KT315
SNMG120408	12,70	12,70	0,8	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–	–	–	–
SNMG120412	12,70	12,70	1,2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–	–	–
SNMG190612	19,05	19,05	1,2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–	–
SNMG190616	19,05	19,05	1,6	–	–	–	–	–	–	–	–	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
SNMG250924	25,40	25,40	2,4	–	–	–	–	–	●	–	–	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–	–

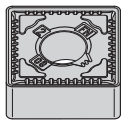
● primeira opção
○ opção alternativa

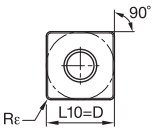




SNMG-FF

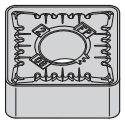
ISO código do produto	D	L10	Rε	KCP05B	KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30B	KCP30	KCP40B	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35B	KCM35	KCPK05	K313	K68	KCU10	KCU25	KC5010	KC5025	KC5410	KT315
P				●	●	●	●	●	●	●	●	●	●	○	○	○	○	○	○	○	○	○	○	○	○	●	●	●	●	●	●	●		●
M												○	○							●	●	●	●	●	●		●	●	●	●	●	●		●
K				○	○	○	○	○	○					●	●	●	●	●	●							●	●	●	●	●	●	●		●
N																											●	●	●	●	●	●	●	
S																											●	●	●	●	●	●		
H																																		
SNMG090304FF	9,53	9,53	0,4	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	●	–	–	–
SNMG090308FF	9,53	9,53	0,8	–	–	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	●	–	–	●
SNMG120408FF	12,70	12,70	0,8	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–

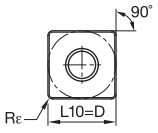




SNMG-FN

ISO código do produto	D	L10	Rε	KCP05B	KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30B	KCP30	KCP40B	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35B	KCM35	KCPK05	K313	K68	KCU10	KCU25	KC5010	KC5025	KC5410	KT315
SNMG090308FN	9,53	9,53	0,8	–	–	–	●	–	–	–	–	–	–	–	●	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
SNMG120404FN	12,70	12,70	0,4	–	●	●	–	–	–	–	–	–	–	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
SNMG120408FN	12,70	12,70	0,8	–	–	●	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●
SNMG120412FN	12,70	12,70	1,2	–	–	–	●	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
SNMG120416FN	12,70	12,70	1,6	–	–	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–



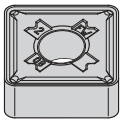


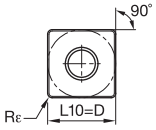
SNMG-FP

ISO código do produto	D	L10	Rε	KCP05B	KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30B	KCP30	KCP40B	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35B	KCM35	KCPK05	K313	K68	KCU10	KCU25	KC5010	KC5025	KC5410	KT315
SNMG120404FP	12,70	12,70	0,4	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–	–	–	–	●	–	–	–	–	–
SNMG120408FP	12,70	12,70	0,8	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	●	–	–	–	–	–	–	●	–	–	–	–	–

● primeira opção
○ opção alternativa

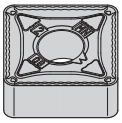
SNMG-FW

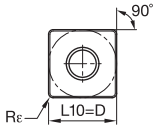




ISO código do produto	D	L10	Rε	KCP05B	KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30B	KCP30	KCP40B	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35B	KCM35	KCPK05	K313	K68	KCU10	KCU25	KC5010	KC5025	KC5410	KT315
SNMG120408FW	12,70	12,70	0,8	–	●	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
SNMG120412FW	12,70	12,70	1,2	–	–	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●

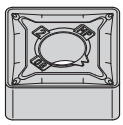
SNMG-MN

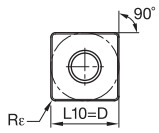




ISO código do produto	D	L10	Rε	KCP05B	KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30B	KCP30	KCP40B	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35B	KCM35	KCPK05	K313	K68	KCU10	KCU25	KC5010	KC5025	KC5410	KT315
SNMG090308MN	9,53	9,53	0,8	–	–	●	●	●	●	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
SNMG090312MN	9,53	9,53	1,2	–	–	–	●	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
SNMG120404MN	12,70	12,70	0,4	–	–	●	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
SNMG120408MN	12,70	12,70	0,8	–	–	●	●	●	●	●	●	●	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
SNMG120412MN	12,70	12,70	1,2	–	–	●	●	●	●	–	●	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
SNMG120416MN	12,70	12,70	1,6	–	–	–	–	●	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
SNMG150612MN	15,88	15,88	1,2	–	–	●	–	●	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
SNMG150616MN	15,88	15,88	1,6	–	–	–	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
SNMG190612MN	19,05	19,05	1,2	–	–	–	●	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
SNMG190616MN	19,05	19,05	1,6	–	–	–	–	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–

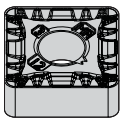
SNMG-MP

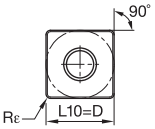




ISO código do produto	D	L10	Rε	KCP05B	KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30B	KCP30	KCP40B	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35B	KCM35	KCPK05	K313	K68	KCU10	KCU25	KC5010	KC5025	KC5410	KT315
SNMG120408MP	12,70	12,70	0,8	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	●	●	●	●	–	–	–	–	●	–	●	–	–	–
SNMG120412MP	12,70	12,70	1,2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	●	●	–	●	–	–	–	●	●	●	–	–	–
SNMG120416MP	12,70	12,70	1,6	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–	–	–	–	–	–	–	–	–
SNMG150608MP	15,88	15,88	0,8	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	●	–	–	–	–	–	–	–	–	–
SNMG150612MP	15,88	15,88	1,2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	●	●	–	–	–	–	–	●	–	●	–	–	–
SNMG150616MP	15,88	15,88	1,6	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–	–	●	–	–	–	–	–
SNMG190612MP	19,05	19,05	1,2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	●	●	–	●	–	–	–	–	–	–	–	–	–
SNMG190616MP	19,05	19,05	1,6	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–

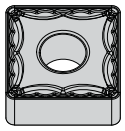
● primeira opção
○ opção alternativa

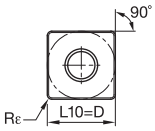




SNMG-MR

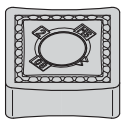
				KCP05B	KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30B	KCP30	KCP40B	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35B	KCM35	KCPK05	K313	K68	KCU10	KCU25	KC5010	KC5025	KC5410	KT315
P				●	●	●	●	●	●	●	●	●	●	○	○	○	○	○	○	○	○	○	○	○	○	●	●	●	●	●	●	●		●
M												○	○							●	●	●	●	●	●		●	●	●	●	●	●		●
K				○	○	○	○	○	○					●	●	●	●	●	●							●	●	●	●	●	●	●		●
N																											●	●	●	●	●	●	●	
S																											●	●	●	●	●	●		
H																																		
ISO código do produto	D	L10	Rε																															
SNMG120408MR	12,70	12,70	0,8	–	–	–	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–	–	●	–	–	–	–	–
SNMG120412MR	12,70	12,70	1,2	–	–	●	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–	–	●	–	–	–	–	–
SNMG150612MR	15,88	15,88	1,2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–	–	●	–	–	–	–	–	–	–	–

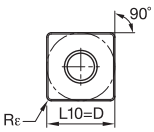




SNMG-MG

ISO código do produto	D	L10	Rε	KCP05B	KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30B	KCP30	KCP40B	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35B	KCM35	KCPK05	K313	K68	KCU10	KCU25	KC5010	KC5025	KC5410	KT315
SNMG120416MG	12,70	12,70	1,6	–	–	–	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–

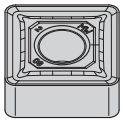


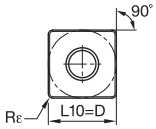


SNMG-MS

ISO código do produto	D	L10	Rε	KCP05B	KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30B	KCP30	KCP40B	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35B	KCM35	KCPK05	K313	K68	KCU10	KCU25	KC5010	KC5025	KC5410	KT315
SNMG120408MS	12,70	12,70	0,8	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	●	●	●	–	–
SNMG120412MS	12,70	12,70	1,2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	●	●	–	–	–
SNMG150608MS	15,88	15,88	0,8	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–
SNMG150612MS	15,88	15,88	1,2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–
SNMG190612MS	19,05	19,05	1,2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	●	–	–	–

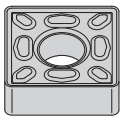
● primeira opção
○ opção alternativa

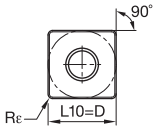




SNMG-MW

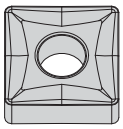
ISO código do produto	D	L10	Rε	KCP05B	KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30B	KCP30	KCP40B	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35B	KCM35	KCPK05	K313	K68	KCU10	KCU25	KC5010	KC5025	KC5410	KT315
SNMG120408MW	12,70	12,70	0,8	–	–	–	–	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
SNMG120412MW	12,70	12,70	1,2	–	–	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–

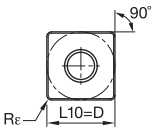




SNMG-P

ISO código do produto	D	L10	Rε	KCP05B	KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30B	KCP30	KCP40B	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35B	KCM35	KCPK05	K313	K68	KCU10	KCU25	KC5010	KC5025	KC5410	KT315
SNMG120412P	12,70	12,70	1,2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–	–

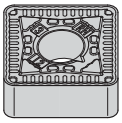


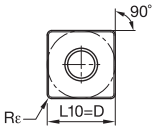


SNMG-RM

ISO código do produto	D	L10	Rε	KCP05B	KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30B	KCP30	KCP40B	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35B	KCM35	KCPK05	K313	K68	KCU10	KCU25	KC5010	KC5025	KC5410	KT315
SNMG250924RM	25,40	25,40	2,4	–	–	–	–	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	●	–	–	–

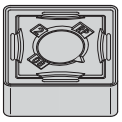
● primeira opção
○ opção alternativa

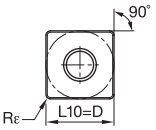




SNMG-RN

ISO código do produto	D	L10	Rε	KCP05B	KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30B	KCP30	KCP40B	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35B	KCM35	KCPK05	K313	K68	KCU10	KCU25	KC5010	KC5025	KC5410	KT315
P				●	●	●	●	●	●	●	●	●	●	○	○	○	○	○	○	○	○	○	○	○	○	●	●	●	●	●	●	●		●
M												○	○							●	●	●	●	●	●		●	●	●	●	●	●		●
K				○	○	○	○	○	○					●	●	●	●	●	●							●	●	●	●	●	●	●		●
N																											●	●	●	●	●	●	●	
S																											●	●	●	●	●	●		
H																																		
SNMG090412RN	9,53	9,53	1,2	–	–	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
SNMG120408RN	12,70	12,70	0,8	–	–	–	●	●	●	●	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
SNMG120412RN	12,70	12,70	1,2	–	–	●	●	●	●	●	–	●	●	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–	–	–	–	–
SNMG120416RN	12,70	12,70	1,6	–	–	●	–	●	●	–	–	●	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
SNMG150608RN	15,88	15,88	0,8	–	–	–	●	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
SNMG150612RN	15,88	15,88	1,2	–	–	●	–	●	●	–	–	●	●	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–	–	–	–	–
SNMG150616RN	15,88	15,88	1,6	–	–	–	–	●	●	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–	–	–	–	–
SNMG190608RN	19,05	19,05	0,8	–	–	–	–	●	–	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
SNMG190612RN	19,05	19,05	1,2	–	–	●	–	●	●	●	–	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
SNMG190616RN	19,05	19,05	1,6	–	–	–	●	●	●	●	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–	–	–	–	–
SNMG190624RN	19,05	19,05	2,4	–	–	–	–	–	●	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
SNMG250924RN	25,40	25,40	2,4	–	–	–	–	–	–	–	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–

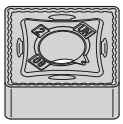


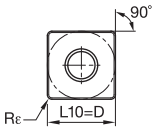


SNMG-RP

ISO código do produto	D	L10	Rε	KCP05B	KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30B	KCP30	KCP40B	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35B	KCM35	KCPK05	K313	K68	KCU10	KCU25	KC5010	KC5025	KC5410	KT315
SNMG120408RP	12,70	12,70	0,8	–	●	–	●	●	●	–	–	–	–	–	–	–	–	●	●	–	–	–	●	–	●	–	–	–	●	●	●	●	–	–
SNMG120412RP	12,70	12,70	1,2	–	●	●	●	●	●	–	●	–	●	–	●	●	●	–	●	–	–	●	●	–	–	–	–	–	●	●	●	●	–	–
SNMG120416RP	12,70	12,70	1,6	–	–	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	●	–	–
SNMG150612RP	15,88	15,88	1,2	–	–	●	–	●	●	–	–	–	●	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–	●	●	–	–	–	–
SNMG150616RP	15,88	15,88	1,6	–	–	●	–	–	●	–	–	–	–	–	–	–	–	–	–	●	–	●	–	–	–	–	–	–	–	●	–	–	–	–
SNMG190612RP	19,05	19,05	1,2	–	–	–	●	●	–	–	–	–	●	–	–	–	–	–	–	–	–	●	–	–	●	–	–	–	●	●	●	●	–	–
SNMG190616RP	19,05	19,05	1,6	–	–	–	●	–	–	–	–	–	●	–	–	–	–	–	●	–	–	●	●	–	–	●	–	–	●	●	–	●	–	–

● primeira opção
○ opção alternativa

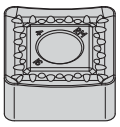


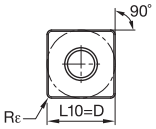


SNMG-UN

| | | |

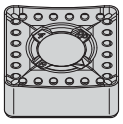
● primeira opção
○ opção alternativa

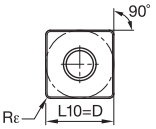




SNMM-RM

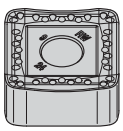
ISO código do produto	D	L10	Rε	KCP05B	KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30B	KCP30	KCP40B	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35B	KCM35	KCPK05	K313	K68	KCU10	KCU25	KC5010	KC5025	KC5410	KT315
				P ●	●	●	●	●	●	●	●	●	●	○	○	○	○	○	○	○	○	○	○	○	○	●	●	●	●	●	●	●		●
				M								○	○							●	●	●	●	●	●		●	●	●	●	●	●		●
				K ○	○	○	○	○	○					●	●	●	●	●	●								●	●	●	●	●	●		●
				N																							●	●	●	●	●	●	●	
				S																							●	●	●	●	●	●		
				H																														
SNMM120408RM	12,70	12,70	0,8	–	–	–	–	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
SNMM120412RM	12,70	12,70	1,2	–	–	–	–	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
SNMM150612RM	15,88	15,88	1,2	–	–	–	●	●	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
SNMM150616RM	15,88	15,88	1,6	–	–	–	●	●	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
SNMM190612RM	19,05	19,05	1,2	–	–	–	●	●	●	–	–	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
SNMM190616RM	19,05	19,05	1,6	–	–	–	●	●	●	–	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
SNMM190624RM	19,05	19,05	2,4	–	–	–	–	●	●	–	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
SNMM250724RM	25,40	25,40	2,4	–	–	–	●	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
SNMM250924RM	25,40	25,40	2,4	–	–	–	–	–	●	–	●	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–

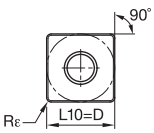




SNMM-RP

ISO código do produto	D	L10	Rε	KCP05B	KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30B	KCP30	KCP40B	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35B	KCM35	KCPK05	K313	K68	KCU10	KCU25	KC5010	KC5025	KC5410	KT315
SNMM120408RP	12,70	12,70	0,8	–	–	–	–	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–	–	–	–	–	–
SNMM120412RP	12,70	12,70	1,2	–	–	–	–	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–	–	–	–	–	–	–	–
SNMM150612RP	15,88	15,88	1,2	–	–	–	–	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
SNMM150616RP	15,88	15,88	1,6	–	–	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–	–	–	–	–	–	–	–
SNMM190612RP	19,05	19,05	1,2	–	–	–	–	–	●	–	–	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
SNMM190616RP	19,05	19,05	1,6	–	–	–	–	–	–	–	–	–	●	–	–	–	–	–	–	–	–	●	●	–	–	–	–	–	–	–	–	–	–	–
SNMM190624RP	19,05	19,05	2,4	–	–	–	–	●	●	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–	–	–	–	–	–	–	–
SNMM250724RP	25,40	25,40	2,4	–	–	–	–	–	●	–	–	–	●	–	–	–	–	–	–	–	–	–	●	–	–	–	–	–	–	–	–	–	–	–
SNMM250924RP	25,40	25,40	2,4	–	–	–	–	–	●	–	–	–	–	–	–	–	–	–	–	–	–	●	●	–	–	–	–	–	–	–	–	–	–	–

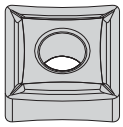


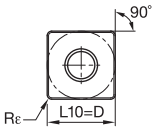


SNMM-RW

ISO código do produto	D	L10	Rε	KCP05B	KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30B	KCP30	KCP40B	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35B	KCM35	KCPK05	K313	K68	KCU10	KCU25	KC5010	KC5025	KC5410	KT315
SNMM190624RW	19,05	19,05	2,4	–	–	–	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
SNMM250724RW	25,40	25,40	2,4	–	–	–	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–

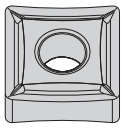
● primeira opção
○ opção alternativa

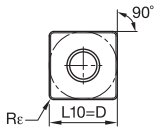




SNMP

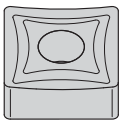
ISO código do produto	D	L10	Rε	KCP05B	KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30B	KCP30	KCP40B	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35B	KCM35	KCPK05	K313	K68	KCU10	KCU25	KC5010	KC5025	KC5410	KT315
P				●	●	●	●	●	●	●	●	●	●	○	○	○	○	○	○	○	○	○	○	○	○	●	●	●	●	●	●		●
M												○	○							●	●	●	●	●	●		●	●	●	●	●	●		●
K				○	○	○	○	○	○					●	●	●	●	●	●							●	●	●	●	●	●	●		●
N																											●	●	●	●	●	●	●	
S																											●	●	●	●	●	●		
H																																		
SNMP190612	19,05	19,05	1,2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	●	–	–	–	–	–

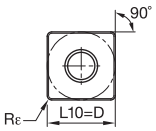




SNMP-K

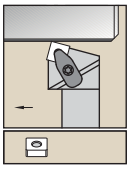
ISO código do produto	D	L10	Rε	KCP05B	KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30B	KCP30	KCP40B	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35B	KCM35	KCPK05	K313	K68	KCU10	KCU25	KC5010	KC5025	KC5410	KT315
SNMP120408K	12,70	12,70	0,8	–	–	–	–	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–

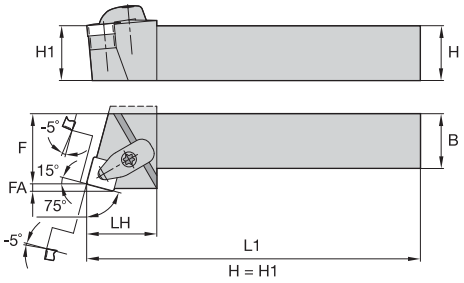


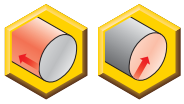


SNMS

ISO código do produto	D	L10	Rε	KCP05B	KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30B	KCP30	KCP40B	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35B	KCM35	KCPK05	K313	K68	KCU10	KCU25	KC5010	KC5025	KC5410	KT315
SNMS120408	12,70	12,70	0,8	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–	–	–
SNMS190612	19,05	19,05	1,2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–	●	–



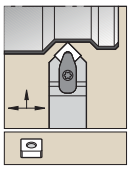


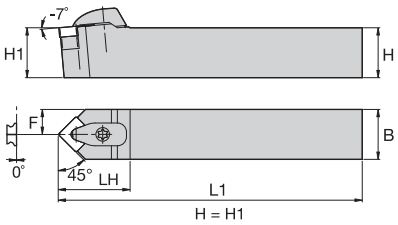


DSBN-KC 75°



número para pedido	código do produto	H	B	F	L1	LH	FA	inserto padrão	calço	parafuso do calço	Torx Plus	conjunto do grampo	Torx Plus	pino elástico	pino de trava opcional
corte à esquerda (L)															
1875215	**DSBNL2525M12KC04**	25	25	22,0	150	32,0	3,0	SN..120408	**ISSN443**	**KMSP415IP**	15 IP	**CM234R ASSY**	15 IP	**SSP025016M**	**KLM46L15IP**



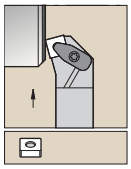


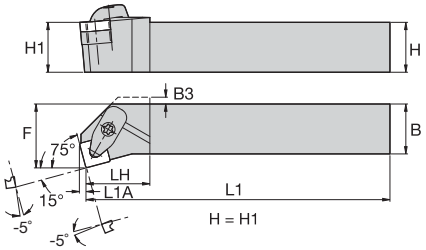


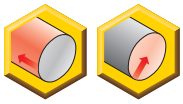
DSDN-KC 45°



número para pedido	código do produto	H	B	F	L1	LH	inserto padrão	calço	parafuso do calço	Torx Plus	conjunto do grampo	Torx Plus	pino elástico	pino de trava opcional
1875210	**DSDNN2020K12KC04**	20	20	10,0	125	36,0	SN..120408	**ISSN433**	**KMSP415IP**	15 IP	**CM234R ASSY**	15 IP	**SSP025016M**	**KLM4615IP**
1875211	**DSDNN2525M12KC04**	25	25	12,0	150	36,0	SN..120408	**ISSN443**	**KMSP415IP**	15 IP	**CM234R ASSY**	15 IP	**SSP025016M**	**KLM46L15IP**
1875216	**DSDNN2525M15KC06**	25	25	12,0	150	42,0	SN..150612	**ISSN543**	**KMSP515IP**	15 IP	**CM209R ASSY**	15 IP	**SSP025016M**	**KLM58L15IP**
2273139	**DSDNN3232P19KC06**	32	32	15,5	170	44,0	SN..190612	**ISSN643**	**KMSP625IP**	25 IP	**CM210R ASSY**	25 IP	**SSP025016M**	**KLM68L25IP**
2456320	**DSDNN4040S25KC09**	40	40	19,5	250	59,0	SN..250924	**ISSN846**	**KMSP825IP**	25 IP	**CM236R ASSY**	25 IP	**SSP025018M**	**KLM81025IP**







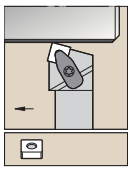
DSKN-KC 75°

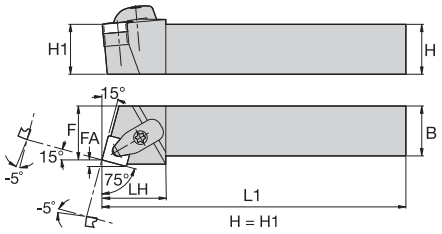


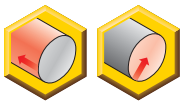




número para pedido	código do produto	H	B	F	L1	LH	L1A	B3	inserto padrão	calço	parafuso do calço	Torx Plus	conjunto do grampo	Torx Plus	pino elástico	pino de trava opcional
corte à direita (R)																
1875219	**DSKNR2525M12KC04**	25	25	32,0	150	32,0	3,1	4,0	SN..120408	**ISSN443**	**KMSP415IP**	15 IP	**CM234R ASSY**	15 IP	**SSP025016M**	**KLM46L15IP**
corte à esquerda (L)																
1875220	**DSKNL2525M12KC04**	25	25	32,0	150	32,0	3,1	4,0	SN..120408	**ISSN443**	**KMSP415IP**	15 IP	**CM234R ASSY**	15 IP	**SSP025016M**	**KLM46L15IP**







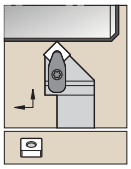
DSRN-KC 75°

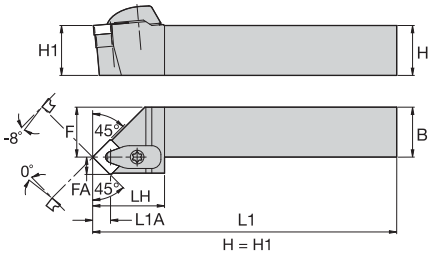






número para pedido	código do produto	H	B	F	L1	LH	FA	inserto padrão	calço	parafuso do calço	Torx Plus	conjunto do grampo	Torx Plus	pino elástico	pino de trava opcional
corte à direita (R)															
1875228	**DSRNR2525M12KC04**	25	25	27,0	150	32,0	3,3	SN..120408	**ISSN443**	**KMSP415IP**	15 IP	**CM234R ASSY**	15 IP	**SSP025016M**	**KLM46L15IP**
2456321	**DSRNR4040S25KC09**	40	40	43,0	250	52,0	6,1	SN..250924	**ISSN846**	**KMSP825IP**	25 IP	**CM236R ASSY**	25 IP	**SSP025018M**	**KLM81025IP**
corte à esquerda (L)															
2456322	**DSRNL4040S25KC09**	40	40	43,0	250	52,0	6,1	SN..250924	**ISSN846**	**KMSP825IP**	25 IP	**CM236R ASSY**	25 IP	**SSP025018M**	**KLM81025IP**



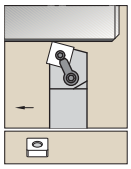


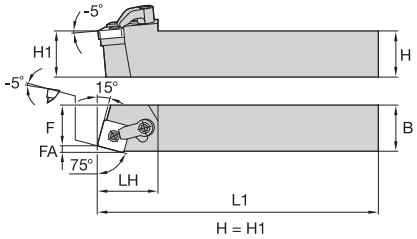


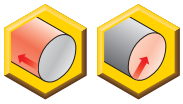
DSSN-KC 45°



número para pedido	código do produto	H	B	F	L1	LH	FA	L1A	inserto padrão	calço	parafuso do calço	Torx Plus	conjunto do grampo	Torx Plus	pino elástico	pino de trava opcional
corte à direita (R)																
1875202	**DSSNR2020K12KC04**	20	20	25,0	125	36,0	8,4	8,7	SN..120408	**ISSN433**	**KMSP415IP**	15 IP	**CM234R ASSY**	15 IP	**SSP025016M**	**KLM4615IP**
1875195	**DSSNR2525M12KC04**	25	25	32,0	150	36,0	8,4	9,6	SN..120408	**ISSN443**	**KMSP415IP**	15 IP	**CM234R ASSY**	15 IP	**SSP025016M**	**KLM46L15IP**
2273156	**DSSNR3225P12KC04**	32	25	32,0	170	35,4	8,4	8,7	SN..120408	**ISSN443**	**KMSP415IP**	15 IP	**CM234R ASSY**	15 IP	**SSP025016M**	**KLM46L15IP**
corte à esquerda (L)																
1875203	**DSSNL2525M12KC04**	25	25	32,0	150	36,0	8,4	8,7	SN..120408	**ISSN443**	**KMSP415IP**	15 IP	**CM234R ASSY**	15 IP	**SSP025016M**	**KLM46L15IP**



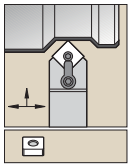


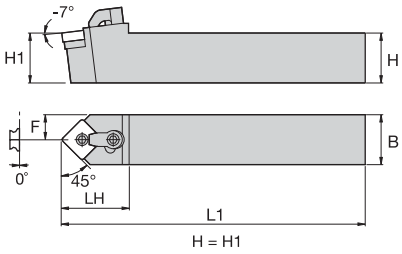


MSBN 75°



número para pedido	código do produto	H	B	F	L1	LH	FA	inserto padrão	calço	pino de trava	sexta-vada	grampo	parafuso do grampo	sexta-vada
corte à direita (R)														
1101893	**MSBNR3232P19**	32	32	27,0	170	40,0	4,6	SN..190612	**ISSN633**	**KLM68**	4 mm	**CKM12**	**STCM4**	4 mm
1101954	**MSBNR4040R19**	40	40	35,0	200	40,0	4,6	SN..190612	**ISSN633**	**KLM68**	4 mm	**CKM12**	**STCM4**	4 mm
1100937	**MSBNR2020K12**	61	20	17,0	125	32,0	3,1	SN..120408	**ISSN433**	**KLM46**	2.5 mm	**CKM21**	**STCM20**	3 mm
1101359	**MSBNR2525M15**	80	25	22,0	150	35,0	3,8	SN..150612	**ISSN533**	**KLM58**	3 mm	**CKM21**	**STCM20**	3 mm
1100941	**MSBNR2525M12**	86	25	22,0	150	32,0	3,1	SN..120408	**ISSN433**	**KLM46**	2.5 mm	**CKM21**	**STCM20**	3 mm
1101361	**MSBNR3232P15**	100	32	27,0	170	35,0	3,8	SN..150612	**ISSN533**	**KLM58**	3 mm	**CKM21**	**STCM20**	3 mm
1101289	**MSBNR3225P12**	106	32	22,0	170	32,0	3,1	SN..120408	**ISSN433**	**KLM46**	2.5 mm	**CKM21**	**STCM20**	3 mm
corte à esquerda (L)														
1102640	**MSBNL3232P19**	32	32	27,0	170	40,0	4,6	SN..190612	**ISSN633**	**KLM68**	4 mm	**CKM12**	**STCM4**	4 mm
1099148	**MSBNL4040R19**	40	40	35,0	200	40,0	4,6	SN..190612	**ISSN633**	**KLM68**	4 mm	**CKM12**	**STCM4**	4 mm
1102242	**MSBNL2020K12**	61	20	17,0	125	32,0	3,1	SN..120408	**ISSN433**	**KLM46**	2.5 mm	**CKM21**	**STCM20**	3 mm
1102318	**MSBNL2525M15**	80	25	22,0	150	35,0	3,8	SN..150612	**ISSN533**	**KLM58**	3 mm	**CKM21**	**STCM20**	3 mm
1102243	**MSBNL2525M12**	86	25	22,0	150	32,0	3,1	SN..120408	**ISSN433**	**KLM46**	2.5 mm	**CKM21**	**STCM20**	3 mm
1102319	**MSBNL3232P15**	100	32	27,0	170	35,0	3,8	SN..150612	**ISSN533**	**KLM58**	3 mm	**CKM21**	**STCM20**	3 mm
1102314	**MSBNL3225P12**	106	32	22,0	170	32,0	3,1	SN..120408	**ISSN433**	**KLM46**	2.5 mm	**CKM21**	**STCM20**	3 mm



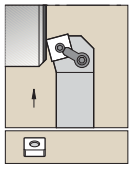


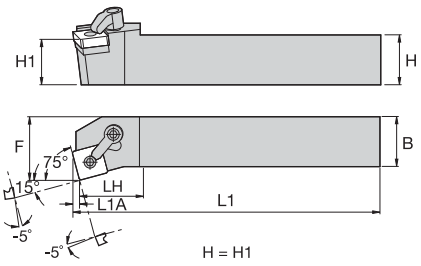


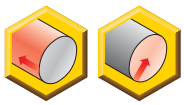
MSDN 45°



número para pedido	código do produto	H	B	F	L1	LH	inserto padrão	calço	pino de trava	sexta-vada	grampo	parafuso do grampo	sexta-vada
1101891	**MSDNN2525M12**	25	25	12,0	150	32,0	SN..120408	**ISSN432**	**KLM46**	2.5 mm	**CKM21**	**STCM20**	3 mm
1101889	**MSDNN1616H09**	44	16	8,0	100	28,0	SN..090308	**ISSN332**	**KLM34L**	2 mm	**CKM19**	**STCM9**	2.5 mm
1101890	**MSDNN2020K12**	61	20	10,0	125	32,0	SN..120408	**ISSN432**	**KLM46**	2.5 mm	**CKM21**	**STCM20**	3 mm
1101892	**MSDNN2525M15**	80	25	12,5	150	35,0	SN..150612	**ISSN533**	**KLM58**	3 mm	**CKM21**	**STCM20**	3 mm
1101888	**MSDNN3232P19**	86	32	16,0	170	42,0	SN..190612	**ISSN633**	**KLM68**	4 mm	**CKM12**	**STCM4**	4 mm
1101713	**MSDNN3225P12**	106	32	12,5	170	32,0	SN..120408	**ISSN432**	**KLM46**	2.5 mm	**CKM21**	**STCM20**	3 mm



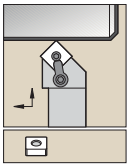


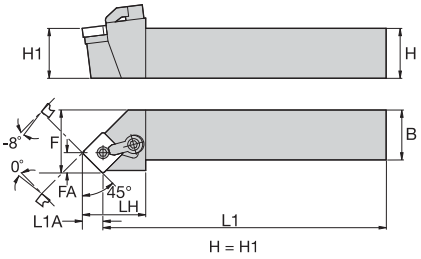


MSKN 75°



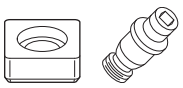
número para pedido	código do produto	H	B	F	L1	LH	L1A	inserto padrão	calço	pino de trava	sexta-vada	grampo	parafuso do grampo	sexta-vada
corte à direita (R)														
1101886	**MSKNR2525M12**	25	25	32,0	150	32,0	3,1	SN..120408	**ISSN432**	**KLM46**	2.5 mm	**CKM21**	**STCM20**	3 mm
1101957	**MSKNR3232P19**	32	32	40,0	170	40,0	4,6	SN..190612	**ISSN633**	**KLM68**	4 mm	**CKM12**	**STCM4**	4 mm
corte à esquerda (L)														
1102637	**MSKNL2525M12**	25	25	32,0	150	32,0	3,1	SN..120408	**ISSN432**	**KLM46**	2.5 mm	**CKM21**	**STCM20**	3 mm
1102638	**MSKNL3225P12**	32	25	32,0	170	32,0	3,1	SN..120408	**ISSN432**	**KLM46**	2.5 mm	**CKM21**	**STCM20**	3 mm
1099158	**MSKNL3232P15**	32	32	40,0	170	35,0	3,7	SN..150612	**ISSN533**	**KLM58**	3 mm	**CKM21**	**STCM20**	3 mm
1102641	**MSKNL3232P19**	32	32	40,0	170	40,0	4,6	SN..190612	**ISSN633**	**KLM68**	4 mm	**CKM12**	**STCM4**	4 mm

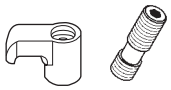




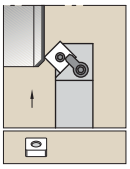


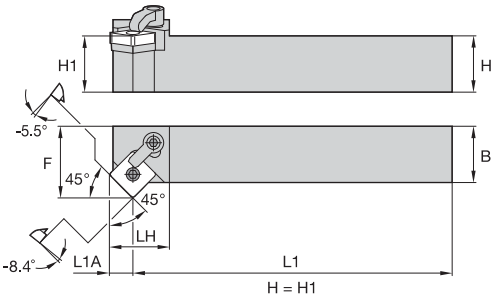
MSSN 45°





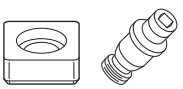
número para pedido	código do produto	H	B	F	L1	LH	FA	L1A	inserto padrão	calço	pino de trava	sexta-vada	grampo	parafuso do grampo	sexta-vada
corte à direita (R)															
1102166	**MSSNR3232P19**	32	32	40,0	170	40,0	12,5	12,5	SN..190612	**ISSN633**	**KLM68**	4 mm	**CKM12**	**STCM4**	4 mm
1102164	**MSSNR2020K12**	71	20	25,0	125	32,0	8,4	9,6	SN..120408	**ISSN433**	**KLM46**	2.5 mm	**CKM21**	**STCM20**	3 mm
1102165	**MSSNR2525M12**	96	25	32,0	150	32,0	8,4	9,6	SN..120408	**ISSN433**	**KLM46**	2.5 mm	**CKM21**	**STCM20**	3 mm
corte à esquerda (L)															
1102717	**MSSNL2020K12**	20	20	25,0	125	32,0	8,4	8,3	SN..120408	**ISSN433**	**KLM46**	2.5 mm	**CKM21**	**STCM20**	3 mm
1102719	**MSSNL3232P19**	32	32	40,0	170	40,0	12,5	12,5	SN..190612	**ISSN633**	**KLM68**	4 mm	**CKM12**	**STCM4**	4 mm
1102718	**MSSNL2525M12**	96	25	32,0	150	32,0	8,4	9,6	SN..120408	**ISSN433**	**KLM46**	2.5 mm	**CKM21**	**STCM20**	3 mm

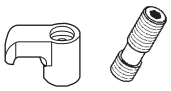




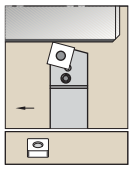


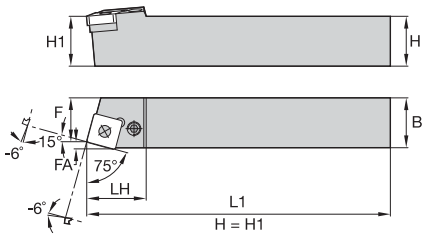
MSZN 45°

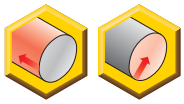




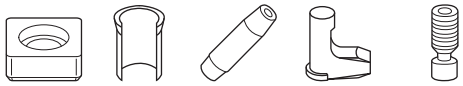
número para pedido	código do produto	H	B	F	L1	LH	L1A	inserto padrão	calço	pino de trava	sexta-vada	grampo	parafuso do grampo	sexta-vada
corte à direita (R)														
1101884	**MSZNR2525M12**	25	25	32,0	150	25,0	8,5	SN..120408	**ISSN432**	**KLM46**	2.5 mm	**CKM21**	**STCM20**	3 mm
corte à esquerda (L)														
1102634	**MSZNL2525M12**	25	25	32,0	150	25,0	8,5	SN..120408	**ISSN432**	**KLM46**	2.5 mm	**CKM21**	**STCM20**	3 mm



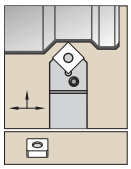


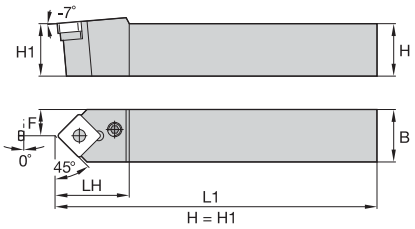


PSBN 75°



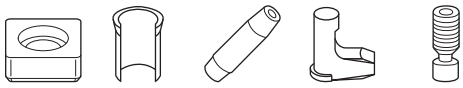
número para pedido	código do produto	H	B	F	L1	LH	FA	inserto padrão	calço	pino do calço	punção do pino	alavanca	parafuso da alavanca	Torx Plus
corte à direita (R)														
1244833	**PSBNR2020K12**	20	20	17,0	125	26,0	3,1	SN..120408	**512.063**	**513.023**	**515.018**	**511.023**	**514.123**	15 IP
1244677	**PSBNR2525M12**	25	25	22,0	150	26,0	3,1	SN..120408	**512.063**	**513.023**	**515.018**	**511.023**	**514.123**	15 IP
1244834	**PSBNR2525M15**	25	25	22,0	150	36,0	3,8	SN..150608	**512.025**	**513.025**	**515.022**	**511.025**	**514.125**	15 IP
1244678	**PSBNR3225P12**	32	25	22,0	170	26,0	3,1	SN..120408	**512.063**	**513.023**	**515.018**	**511.023**	**514.123**	15 IP
1244680	**PSBNR3232P15**	32	32	27,0	170	33,0	3,8	SN..150608	**512.025**	**513.025**	**515.022**	**511.025**	**514.125**	15 IP
1244681	**PSBNR3232P19**	32	32	27,0	170	40,0	4,6	SN..190612	**512.083**	**513.033**	**515.022**	**511.033**	**514.133**	25 IP
1244682	**PSBNR4040S19**	40	40	35,0	250	38,0	4,6	SN..190612	**512.083**	**513.033**	**515.022**	**511.033**	**514.133**	25 IP
1244683	**PSBNR4040S25**	40	40	35,0	250	47,0	5,9	SN..250724	**512.092**	**513.038**	**515.028**	**511.038**	**514.138**	30 IP
corte à esquerda (L)														
1244774	**PSBNL2020K12**	20	20	17,0	125	26,0	3,1	SN..120408	**512.063**	**513.023**	**515.018**	**511.023**	**514.123**	15 IP
1244668	**PSBNL2525M12**	25	25	22,0	150	26,0	3,1	SN..120408	**512.063**	**513.023**	**515.018**	**511.023**	**514.123**	15 IP
1244669	**PSBNL2525M15**	25	25	22,0	150	36,0	3,8	SN..150608	**512.025**	**513.025**	**515.022**	**511.025**	**514.125**	15 IP
1244672	**PSBNL3232P15**	32	32	27,0	170	33,0	3,8	SN..150608	**512.025**	**513.025**	**515.022**	**511.025**	**514.125**	15 IP
1244673	**PSBNL3232P19**	32	32	27,0	170	40,0	4,6	SN..190612	**512.083**	**513.033**	**515.022**	**511.033**	**514.133**	25 IP
1244674	**PSBNL4040S19**	40	40	35,0	250	38,0	4,6	SN..190612	**512.083**	**513.033**	**515.022**	**511.033**	**514.133**	25 IP
1244675	**PSBNL4040S25**	40	40	35,0	250	47,0	5,9	SN..250724	**512.092**	**513.038**	**515.028**	**511.038**	**514.138**	30 IP



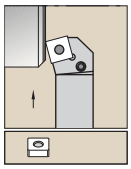


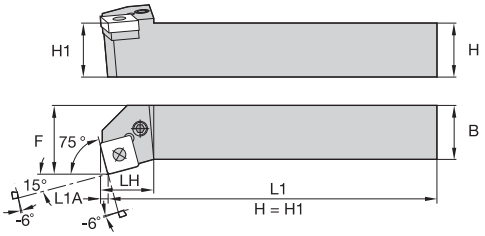


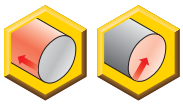
PSDN 45°



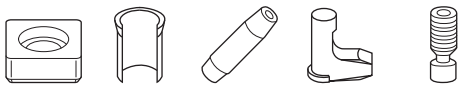
número para pedido	código do produto	H	B	F	L1	LH	inserto padrão	calço	pino do calço	punção do pino	alavanca	parafuso da alavanca	Torx Plus
1244686	**PSDNN1616H09**	16	16	8,0	100	22,0	SN..090308	**512.053**	**513.019**	**515.018**	**511.018**	**514.118**	10 IP
1244863	**PSDNN2020K12**	20	20	10,0	125	26,0	SN..120408	**512.063**	**513.023**	**515.018**	**511.023**	**514.123**	15 IP
1156970	**PSDNN2525M12**	25	25	12,5	150	26,0	SN..120408	**512.063**	**513.023**	**515.018**	**511.023**	**514.123**	15 IP
1244687	**PSDNN3225P12**	32	25	12,5	170	28,0	SN..120408	**512.063**	**513.023**	**515.018**	**511.023**	**514.123**	15 IP
1244688	**PSDNN3225P19**	32	25	12,5	170	40,0	SN..190612	**512.083**	**513.033**	**515.022**	**511.033**	**514.133**	25 IP
1244835	**PSDNN3232P19**	32	32	16,0	170	40,0	SN..190612	**512.083**	**513.033**	**515.022**	**511.033**	**514.133**	25 IP
1147356	**PSDNN4040S25**	40	40	20,0	250	50,0	SN..250724	**512.092**	**513.038**	**515.028**	**511.038**	**514.138**	30 IP



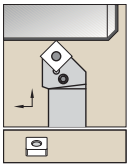


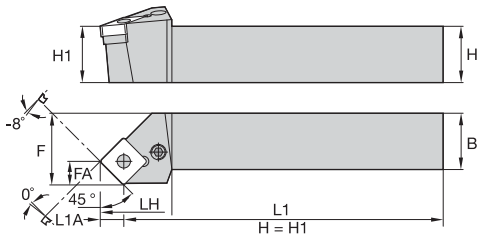


PSKN 75°



número para pedido	código do produto	H	B	F	L1	LH	L1A	inserto padrão	calço	pino do calço	punção do pino	alavanca	parafuso da alavanca	Torx Plus
corte à direita (R)														
1244699	**PSKNR2020K12**	20	20	25,0	125	23,0	3,1	SN..120408	**512.063**	**513.023**	**515.018**	**511.023**	**514.123**	15 IP
1244836	**PSKNR2525M12**	25	25	32,0	150	23,0	3,1	SN..120408	**512.063**	**513.023**	**515.018**	**511.023**	**514.123**	15 IP
1244701	**PSKNR3232P15**	32	32	40,0	170	32,0	3,8	SN..150608	**512.025**	**513.025**	**515.022**	**511.025**	**514.125**	15 IP
1244702	**PSKNR3232P19**	32	32	40,0	170	37,5	4,6	SN..190612	**512.083**	**513.033**	**515.022**	**511.033**	**514.133**	25 IP
corte à esquerda (L)														
1244690	**PSKNL2525M12**	25	25	32,0	150	23,0	3,1	SN..120408	**512.063**	**513.023**	**515.018**	**511.023**	**514.123**	15 IP
1244693	**PSKNL3232P19**	32	32	40,0	170	37,5	4,6	SN..190612	**512.083**	**513.033**	**515.022**	**511.033**	**514.133**	25 IP



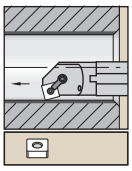




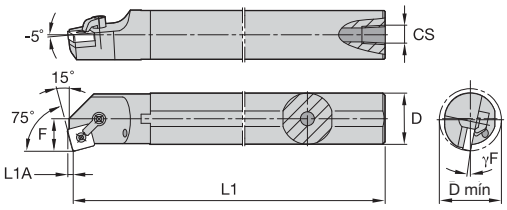
PSSN 45°



número para pedido	código do produto	H	B	F	L1	LH	FA	L1A	inserto padrão	calço	pino do calço	punção do pino	alavanca	parafuso da alavanca	Torx Plus
corte à direita (R)															
1244718	**PSSNR2020K09**	20	20	25,0	125	26,0	6,1	6,1	SN..090308	**512.053**	**513.019**	**515.018**	**511.018**	**514.118**	10 IP
1244837	**PSSNR2020K12**	20	20	25,0	125	28,0	8,3	8,3	SN..120408	**512.063**	**513.023**	**515.018**	**511.023**	**514.123**	15 IP
1156961	**PSSNR2525M12**	25	25	32,0	150	28,0	8,3	8,3	SN..120408	**512.063**	**513.023**	**515.018**	**511.023**	**514.123**	15 IP
1244719	**PSSNR2525M15**	25	25	32,0	150	32,0	10,2	10,2	SN..150608	**512.025**	**513.025**	**515.022**	**511.025**	**514.125**	15 IP
1244720	**PSSNR3225P12**	32	25	32,0	170	29,0	8,3	8,3	SN..120408	**512.063**	**513.023**	**515.018**	**511.023**	**514.123**	15 IP
1244722	**PSSNR3232P15**	32	32	40,0	170	32,0	10,0	11,5	SN..150612	**512.025**	**513.025**	**515.022**	**511.025**	**514.125**	15 IP
1244838	**PSSNR3232P19**	32	32	40,0	170	37,5	12,5	12,5	SN..190612	**512.083**	**513.033**	**515.022**	**511.033**	**514.133**	25 IP
1244723	**PSSNR4040S19**	40	40	50,0	250	37,5	12,5	12,5	SN..190612	**512.083**	**513.033**	**515.022**	**511.033**	**514.133**	25 IP
corte à esquerda (L)															
1244709	**PSSNL2020K12**	20	20	25,0	125	28,0	8,3	8,3	SN..120408	**512.063**	**513.023**	**515.018**	**511.023**	**514.123**	15 IP
1244789	**PSSNL2525M12**	25	25	32,0	150	28,0	8,3	8,3	SN..120408	**512.063**	**513.023**	**515.018**	**511.023**	**514.123**	15 IP
1244710	**PSSNL2525M15**	25	25	32,0	150	32,0	10,2	10,2	SN..150608	**512.025**	**513.025**	**515.022**	**511.025**	**514.125**	15 IP
1244711	**PSSNL3225P12**	32	25	32,0	170	29,0	8,3	8,3	SN..120408	**512.063**	**513.023**	**515.018**	**511.023**	**514.123**	15 IP
1244714	**PSSNL3232P19**	32	32	40,0	170	37,5	12,5	12,5	SN..190612	**512.083**	**513.033**	**515.022**	**511.033**	**514.133**	25 IP
1244715	**PSSNL4040S19**	40	40	50,0	250	37,5	12,5	12,5	SN..190612	**512.083**	**513.033**	**515.022**	**511.033**	**514.133**	25 IP



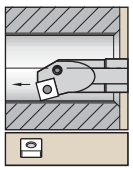
Haste de aço com refrigeração interna.



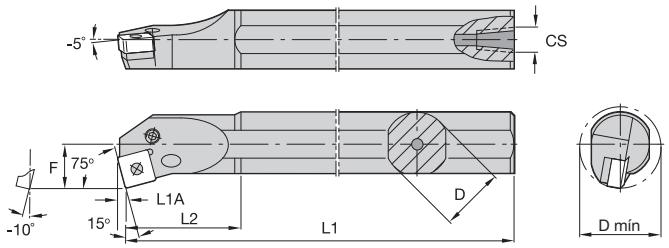
A-MSKN 75°



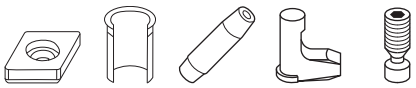
número para pedido	código do produto	D	D mín	F	L1	L1A	CS	γF°	inserto padrão	calço	pino de trava	sex-ta-vada	grampo	parafuso do grampo	sexta-vada
corte à direita (R)															
1098116	**A40TMSKNR12**	40	50,0	27,0	300	3,1	1/4-18 NPT	-10.0	SN..120408	**ISSN432**	**KLM46**	2.5 mm	**CKM21**	**STCM20**	3 mm
1098120	**A50UMSKNR19**	50	63,0	35,0	350	4,6	1/4-18 NPT	-12.0	SN..190608	**ISSN633**	**KLM68**	4 mm	**CKM12**	**STCM4**	4 mm
corte à esquerda (L)															
1098115	**A32SMSKNL12**	32	40,0	22,0	250	3,1	1/4-18 NPT	-14.0	SN..120408	**ISSN432**	**KLM46**	2.5 mm	**CKM21**	**STCM20**	3 mm
1098117	**A40TMSKNL12**	40	50,0	27,0	300	3,1	1/4-18 NPT	-10.0	SN..120408	**ISSN432**	**KLM46**	2.5 mm	**CKM21**	**STCM20**	3 mm



Haste de aço com refrigeração interna.

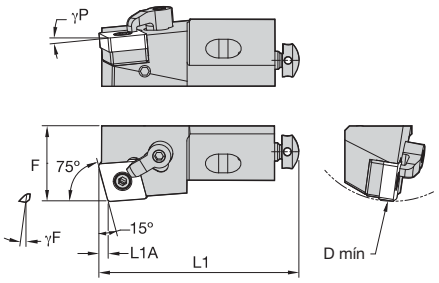


A-PSKN 75°



número para pedido	código do produto	D	D mín	F	L1	L2	L1A	CS	inserto padrão	calço	pino do calço	pino	alavanca	parafuso da alavanca	Torx Plus
corte à direita (R)															
2447480	**A25TPSKNR12**	25	30,0	17,0	300	43	3,0	1/4-18 NPT	SN..120408	–	–	–	**511.022**	**514.122**	10 IP
2447482	**A32UPSKNR12**	32	40,0	22,0	350	52	3,0	1/4-18 NPT	SN..120408	**512.063**	**513.023**	**515.018**	**511.023**	**514.124**	15 IP





MSKN 75°

número para pedido	código do produto	D mín	F	L1	L1A	γF°	γP°	inserto padrão
corte à direita (R)								
2114011	**MSKNR10CA09**	40	14,0	50	2,2	-9.0	-5.0	SN..090308/SN..322
2114013	**MSKNR12CA12**	50	20,0	55	3,0	-9.0	-5.0	SN..120408/SN..432
2074430	**MSKNR16CA12**	60	25,0	63	3,0	-9.0	-5.0	SN..120408/SN..432
2072222	**MSKNR20CA15**	70	25,0	70	3,7	-9.0	-5.0	SN..150612/SN..543
2987166	**MSKNR25CA19**	100	32,0	100	4,6	-9.0	-5.0	SN..190612/SN..543
corte à esquerda (L)								
3346242	**MSKNL12CA12**	50	20,0	55	3,0	-9.0	-5.0	SN..120408/SN..432
3330202	**MSKNL20CA15**	70	25,0	70	3,7	-9.0	-5.0	SN..150612/SN..543

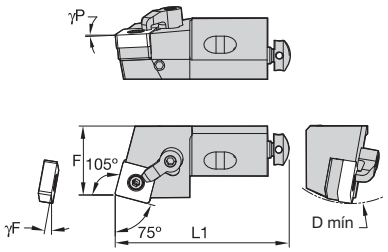
NOTA: Escolha as peças de reposição com base no D mín. e no tamanho do inserto escolhido.

Peças de reposição



D mín	calço	pino de trava	sextavada	grampo	parafuso do grampo	sextavada	parafuso de ajuste radial	sextavada	parafuso de ajuste axial	parafuso de montagem	parafuso de montagem	parafuso de montagem	sextavada	arruela
40	**–**	**KLM33**	2 mm	**CKM36**	**STCM38**	2 mm	**KUAM28**	2 mm	**KUAM30**	**191.405**	**–**	**–**	4 mm	**CSWM 060 050**
50	**–**	**KLM43**	2 mm	**CKM34**	**STCM38**	2 mm	**KUAM22**	2 mm	**KUAM31**	**–**	**191.406**	**–**	4 mm	**CSWM 060 050**
60	**ISSN432**	**KLM46S**	2.5 mm	**CKM34**	**STCM9**	2.5 mm	**KUAM25**	2.5 mm	**KUAM32**	**–**	**191.407**	**–**	5 mm	**CSWM 080 050**
70	**SKSN566K**	**KLM54**	2.5 mm	**CKM37**	**STCM40**	2.5 mm	**KUAM25**	2.5 mm	**KUAM32**	**–**	**191.407**	**–**	5 mm	**CSWM 080 050**
100	**ISSN633**	**KLM68**	4 mm	**CKM35**	**STCM8**	4 mm	**KUAM27**	4 mm	**KUAM32**	**–**	**–**	**MS364**	8 mm	**CSWM 100 080**





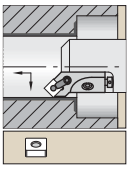
MSRN 75°

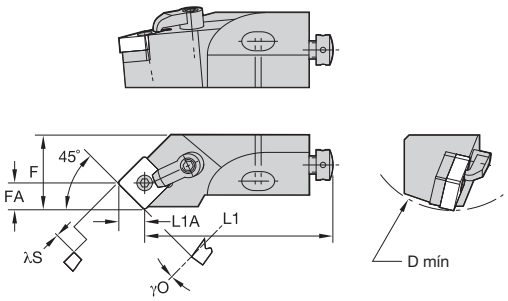
número para pedido	código do produto	D mín	F	L1	γF°	γP°	inserto padrão
corte à direita (R)							
1098436	**MSRNR10CA09**	40	14,0	50	-9.0	-5.0	SN..090308/SN..322
2078231	**MSRNR12CA12**	50	20,0	55	-9.0	-5.0	SN..120408/SN..432
2074432	**MSRNR16CA12**	60	25,0	63	-9.0	-5.0	SN..120408/SN..432
corte à esquerda (L)							
1282803	**MSRNL12CA12**	50	20,0	55	-9.0	-5.0	SN..120408/SN..432
3330279	**MSRNL16CA12**	60	25,0	63	-9.0	-5.0	SN..120408/SN..432
3330203	**MSRNL20CA15**	70	25,0	70	-9.0	-5.0	SN..150612/SN..543

Peças de reposição



D mín	calço	pino de trava	sexta-vada	grampo	parafuso do grampo	sexta-vada	parafuso de ajuste radial	sexta-vada	parafuso de ajuste axial	parafuso de montagem	parafuso de montagem	sexta-vada	arruela
40	**–**	**KLM33**	2 mm	**CKM36**	**STCM38**	2 mm	**KUAM28**	2 mm	**KUAM30**	**191.405**	**–**	4 mm	**CSWM 060 050**
50	**–**	**KLM43**	2 mm	**CKM34**	**STCM38**	2 mm	**KUAM22**	2 mm	**KUAM31**	**–**	**191.406**	4 mm	**CSWM 060 050**
60	**ISSN432**	**KLM46S**	2.5 mm	**CKM34**	**STCM9**	2.5 mm	**KUAM25**	2.5 mm	**KUAM32**	**–**	**191.407**	5 mm	**CSWM 080 050**
70	**SKSN566K**	**KLM54**	2.5 mm	**CKM37**	**STCM40**	2.5 mm	**KUAM25**	2.5 mm	**KUAM32**	**–**	**191.407**	5 mm	**CSWM 080 050**





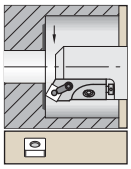
MSSN 45°

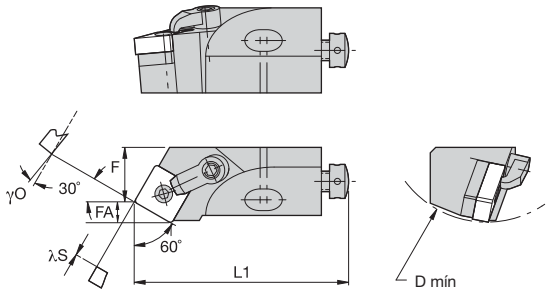
número para pedido	código do produto	D mín	F	L1	L1A	λS°	γO°	inserto padrão
corte à direita (R)								
1339367	**MSSNR10CA09**	40	14,0	44	6,1	-13.0	0.0	SN..090308/SN..322
1282807	**MSSNR12CA12**	50	20,0	47	8,3	-13.0	0.0	SN..120408/SN..432
3330281	**MSSNR16CA12**	60	25,0	53	8,3	-13.0	0.0	SN..120408/SN..432
3330206	**MSSNR20CA15**	70	25,0	60	10,3	-13.0	0.0	SN..150612/SN..543
corte à esquerda (L)								
2071758	**MSSNL10CA09**	40	14,0	44	6,1	-13.0	0.0	SN..090308/SN..322
2071739	**MSSNL12CA12**	50	20,0	47	8,3	-13.0	0.0	SN..120408/SN..432

Peças de reposição



D mín	calço	pino de trava	sexta-vada	grampo	parafuso do grampo	sexta-vada	parafuso de ajuste radial	sexta-vada	parafuso de ajuste axial	parafuso de montagem	parafuso de montagem	sexta-vada	arruela
40	**–**	**KLM33**	2 mm	**CKM36**	**STCM38**	2 mm	**KUAM28**	2 mm	**KUAM30**	**191.405**	**–**	4 mm	**CSWM 060 050**
50	**–**	**KLM43**	2 mm	**CKM34**	**STCM38**	2 mm	**KUAM22**	2 mm	**KUAM31**	**–**	**191.406**	4 mm	**CSWM 060 050**
60	**ISSN432**	**KLM46S**	2.5 mm	**CKM36**	**STCM9**	2.5 mm	**KUAM25**	2.5 mm	**KUAM32**	**–**	**191.407**	5 mm	**CSWM 080 050**
70	**SKSN566K**	**KLM54**	2.5 mm	**CKM37**	**STCM40**	2.5 mm	**KUAM25**	2.5 mm	**KUAM32**	**–**	**191.407**	5 mm	**CSWM 080 050**





MSTN 60°

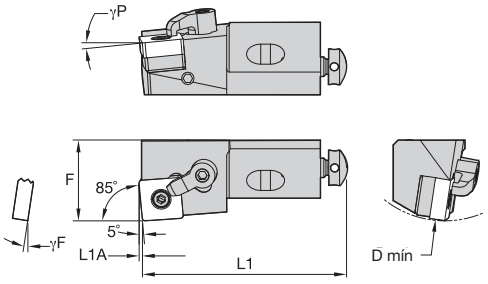
número para pedido	código do produto	D mín	F	L1	FA	λS°	γO°	inserto padrão
corte à direita (R)								
3331149	**MSTNR10CA09**	40,0	9,0	50	13,3	-11.0	0.0	SN..090308/SN..322
2074904	**MSTNR12CA12**	50,0	13,0	55	5,9	-11.0	0.0	SN..120408/SN..432

Peças de reposição



D mín	pino de trava	sexta-vada	grampo	parafuso do grampo	sexta-vada	parafuso de ajuste radial	sexta-vada	parafuso de ajuste axial	parafuso de montagem	parafuso de montagem	sexta-vada	arruela
40	**KLM33**	2 mm	**CKM36**	**STCM38**	2 mm	**KUAM28**	2 mm	**KUAM30**	**191.405**	**–**	4 mm	**CSWM 060 050**
50	**KLM43**	2 mm	**CKM34**	**STCM38**	2 mm	**KUAM22**	2 mm	**KUAM31**	**–**	**191.406**	4 mm	**CSWM 060 050**





MSYN 85°

número para pedido	código do produto	D mín	F	L1	L1A	γF°	γP°	inserto padrão
corte à direita (R)								
2114015	**MSYNR10CA09**	40	14,0	50	0,8	-9.0	-5.0	SN..090308/SN..322
3346274	**MSYNR12CA12**	50	20,0	55	1,0	-9.0	-5.0	SN..120408/SN..432
3330283	**MSYNR16CA12**	60	25,0	63	1,0	-9.0	-5.0	SN..120408/SN..432
1098465	**MSYNR25CA19**	100	32,0	100	1,5	-9.0	-5.0	SN..190612/SN..643
corte à esquerda (L)								
3331150	**MSYNL10CA09**	40	14,0	50	0,8	-9.0	-5.0	SN..090308/SN..322
3346273	**MSYNL12CA12**	50	20,0	55	1,0	-9.0	-5.0	SN..120408/SN..432
1098691	**MSYNL20CA15**	70	25,0	70	1,3	-9.0	-5.0	SN..150612/SN..543

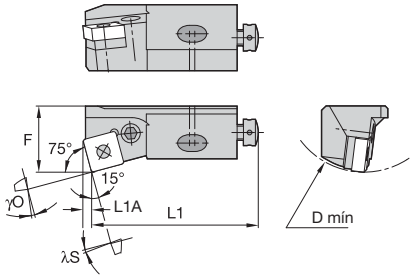
NOTA: Escolha as peças de reposição com base no D mín. e no tamanho do inserto escolhido.

Peças de reposição



D mín	calço	pino de trava	sexta-vada	grampo	parafuso do grampo	sexta-vada	parafuso de ajuste radial	sexta-vada	parafuso de ajuste radial	parafuso de montagem	parafuso de montagem	parafuso de montagem	sexta-vada	arruela
40	**–**	**KLM33**	2 mm	**CKM36**	**STCM38**	2 mm	**KUAM28**	2 mm	**KUAM30**	**191.405**	**–**	**–**	4 mm	**CSWM 060 050**
50	**–**	**KLM43**	2 mm	**CKM34**	**STCM38**	2 mm	**KUAM22**	2 mm	**KUAM31**	**–**	**191.406**	**–**	4 mm	**CSWM 060 050**
60	**ISSN432**	**KLM46S**	2.5 mm	**CKM36**	**STCM9**	2.5 mm	**KUAM25**	2.5 mm	**KUAM32**	**–**	**191.407**	**–**	5 mm	**CSWM 080 050**
70	**SKSN566K**	**KLM54**	2.5 mm	**CKM37**	**STCM40**	2.5 mm	**KUAM25**	2.5 mm	**KUAM33**	**–**	**191.407**	**–**	6 mm	**CSWM 080 050**
100	**ISSN633**	**KLM68**	4 mm	**CKM34**	**STCM8**	4 mm	**KUAM27**	4 mm	**KUAM33**	**–**	**–**	**MS364**	8 mm	**CSWM 100 080**





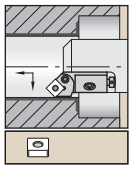
PSKN 75°

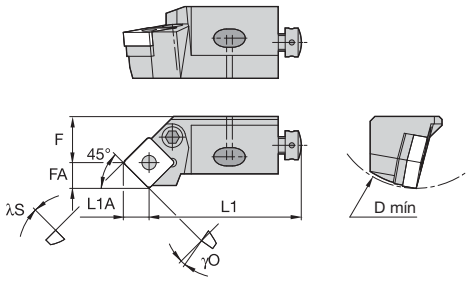
número para pedido	código do produto	D mín	F	L1	L1A	λS°	γO°	inserto padrão
corte à direita (R)								
1188639	**PSKNR12CA-12**	50	20,0	55	3,1	-8.0	-6.0	SN..120408/SN..432

Peças de reposição



D mín	alavanca	parafuso da alavanca	tamanho da chave do parafuso da alavanca	parafuso de ajuste radial	sexta-vada	parafuso de ajuste axial	parafuso de montagem	sexta-vada	arruela
50	**511.022**	**514.122**	10 IP	**KUAM28**	2 mm	**KUAM31**	**191.406**	4 mm	**CSWM 060 050**





PSSN 45°

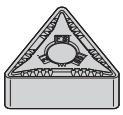
número para pedido	código do produto	D mín	F	L1	FA	L1A	λS°	γO°	γP°	inserto padrão
corte à direita (R)										
1244455	**PSSNR12CA-12**	50,0	20,0	47	8,7	8,3	-10.0	0.0	–	SN..120408/SN..432
corte à esquerda (L)										
1244452	**PSSNL12CA12**	50,0	11,3	47	8,7	8,3	0.0	0.0	-10.0 deg	SN..120408/SN..432

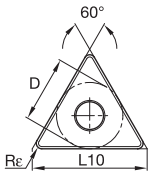
Peças de reposição



D mín	alavanca	parafuso da alavanca	tamanho da chave do parafuso da alavanca	parafuso de ajuste radial	sexta-vada	parafuso de ajuste axial	parafuso de montagem	sexta-vada	arruela
50	**511.022**	**514.122**	10 IP	**KUAM28**	2 mm	**KUAM31**	**191.406**	4 mm	**CSWM 060 050**

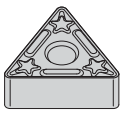
● primeira opção
○ opção alternativa

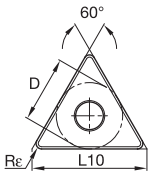




TNGG-FS

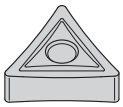
ISO código do produto	D	L10	Rε	KCP05B	KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30B	KCP30	KCP40B	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35B	KCM35	KCPK05	K313	K68	KCU10	KCU25	KC5010	KC5025	KC5410	KT315
TNGG160402FS	9,53	16,50	0,2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–
TNGG160404FS	9,53	16,50	0,4	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	●	●	–	–
TNGG220408FS	12,70	22,00	0,8	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–	–

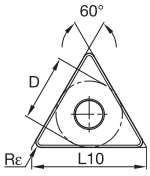




TNGG-LF

ISO código do produto	D	L10	Rε	KCP05B	KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30B	KCP30	KCP40B	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35B	KCM35	KCPK05	K313	K68	KCU10	KCU25	KC5010	KC5025	KC5410	KT315
TNGG160402LF	9,53	16,50	0,2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	●	–	–	–
TNGG160404LF	9,53	16,50	0,4	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–
TNGG160408LF	9,53	16,50	0,8	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–



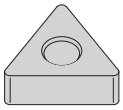


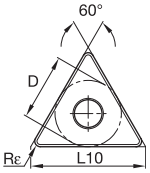
TNGP

ISO código do produto	D	L10	Rε	KCP05B	KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30B	KCP30	KCP40B	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35B	KCM35	KCPK05	K313	K68	KCU10	KCU25	KC5010	KC5025	KC5410	KT315
TNGP160402	9,53	16,50	0,2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	●	–	–	–
TNGP160404	9,53	16,50	0,4	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	●	–	●	–
TNGP160408	9,53	16,50	0,8	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	●	–	●	–

● primeira opção
○ opção alternativa

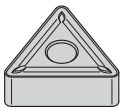
		KCP05B	KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30B	KCP30	KCP40B	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35B	KCM35	KCPK05	K313	K68	KCU10	KCU25	KC5010	KC5025	KC5410	KT315
P		●	●	●	●	●	●	●	●	●	●	○	○	○	○	○	○	○	○	○	○	○	○	●	●	●	●	●	●	●		●
M										○	○							●	●	●	●	●	●		●	●	●	●	●	●		●
K		○	○	○	○	○	○					●	●	●	●	●	●							●	●	●	●	●	●	●		●
N																									●	●	●	●	●	●	●	
S																									●	●	●	●	●	●		
H																																

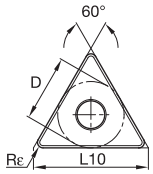




TNMA

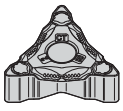
ISO código do produto	D	L10	Rε	KCP05B	KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30B	KCP30	KCP40B	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35B	KCM35	KCPK05	K313	K68	KCU10	KCU25	KC5010	KC5025	KC5410	KT315
TNMA160408	9,53	16,50	0,8	–	–	–	–	–	–	–	–	–	–	–	–	●	●	●	●	–	–	–	–	–	–	–	–	●	–	–	–	–	–	–
TNMA160412	9,53	16,50	1,2	–	–	–	–	–	–	–	–	–	–	–	–	●	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
TNMA160416	9,53	16,50	1,6	–	–	–	–	–	–	–	–	–	–	–	–	●	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
TNMA220408	12,70	22,00	0,8	–	–	–	–	–	–	–	–	–	–	●	–	–	●	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–	–	–
TNMA220412	12,70	22,00	1,2	–	–	–	–	–	–	–	–	–	–	–	●	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
TNMA270616	15,88	27,50	1,6	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–

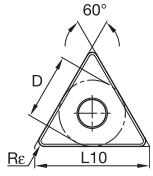




TNMG

ISO código do produto	D	L10	Rε	KCP05B	KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30B	KCP30	KCP40B	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35B	KCM35	KCPK05	K313	K68	KCU10	KCU25	KC5010	KC5025	KC5410	KT315
TNMG220412	12,70	22,00	1,2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–	–	–
TNMG330924	19,05	33,00	2,4	–	–	–	–	–	●	–	–	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–

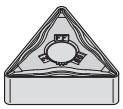


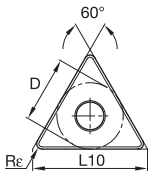


TNMG-CT

ISO código do produto	D	L10	Rε	KCP05B	KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30B	KCP30	KCP40B	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35B	KCM35	KCPK05	K313	K68	KCU10	KCU25	KC5010	KC5025	KC5410	KT315
TNMG160408CT	9,53	16,50	0,8	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–	–	–	–	–

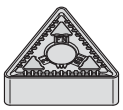
● primeira opção
○ opção alternativa

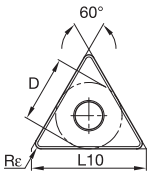




TNMG-FF

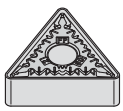
				P	M	K	N	S	H	KCP05B	KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30B	KCP30	KCP40B	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35B	KCM35	KCPK05	K313	K68	KCU10	KCU25	KC5010	KC5025	KC5410	KT315
				●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	○	○	○	○	○	○	○	○	○	○	○	○	○	●	●	●	●	●	●	●		●
																		○	○							●	●	●	●	●	●		●	●	●	●	●	●		●
				○	○	○	○	○	○											●	●	●	●	●	●							●	●	●	●	●	●	●		●
																																●	●	●	●	●	●	●	●	
																																●	●	●	●	●	●	●		
ISO código do produto	D	L10	Rε																																					
TNMG110304FF	6,35	11,00	0,4							–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–	–
TNMG110308FF	6,35	11,00	0,8							–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–
TNMG160404FF	9,53	16,50	0,4							–	–	–	●	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–	–	–	–	●	–	●	–	–	●
TNMG160408FF	9,53	16,50	0,8							–	●	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	●	–	–	●

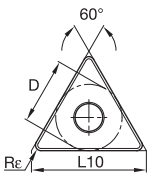




TNMG-FN

ISO código do produto	D	L10	Rε	KCP05B	KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30B	KCP30	KCP40B	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35B	KCM35	KCPK05	K313	K68	KCU10	KCU25	KC5010	KC5025	KC5410	KT315
TNMG110304FN	6,35	11,00	0,4	–	–	–	–	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
TNMG110308FN	6,35	11,00	0,8	–	–	–	●	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
TNMG160404FN	9,53	16,50	0,4	–	●	●	●	●	●	–	–	–	–	–	●	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●
TNMG160408FN	9,53	16,50	0,8	●	–	●	●	●	●	–	–	–	–	–	●	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●
TNMG160412FN	9,53	16,50	1,2	–	●	●	–	–	●	–	–	–	–	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●
TNMG220404FN	12,70	22,00	0,4	–	–	–	–	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
TNMG220408FN	12,70	22,00	0,8	–	–	●	–	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
TNMG220412FN	12,70	22,00	1,2	–	–	●	–	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–





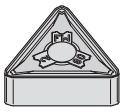
TNMG-FP

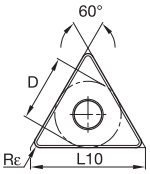
ISO código do produto	D	L10	Rε	KCP05B	KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30B	KCP30	KCP40B	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35B	KCM35	KCPK05	K313	K68	KCU10	KCU25	KC5010	KC5025	KC5410	KT315
TNMG160404FP	9,53	16,50	0,4	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–	–	–	–	●	–	●	–	–	●
TNMG160408FP	9,53	16,50	0,8	–	–	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–	–	–	–	●	–	●	–	–	●
TNMG160412FP	9,53	16,50	1,2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–	–	–	–	●	–	●	–	–	–
TNMG220404FP	12,70	22,00	0,4	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	●	–	–	–	–	–	–	●	–	●	–	–	–
TNMG220408FP	12,70	22,00	0,8	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–	–	–	–	●	–	–	–	–	–

● primeira opção
○ opção alternativa

		KCP05B	KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30B	KCP30	KCP40B	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35B	KCM35	KCPK05	K313	K68	KCU10	KCU25	KC5010	KC5025	KC5410	KT315
P		●	●	●	●	●	●	●	●	●	●	○	○	○	○	○	○	○	○	○	○	○	○	●	●	●	●	●	●	●		●
M										○	○							●	●	●	●	●	●		●	●	●	●	●	●		●
K		○	○	○	○	○	○					●	●	●	●	●	●							●	●	●	●	●	●	●		●
N																									●	●	●	●	●	●	●	
S																									●	●	●	●	●	●		
H																																

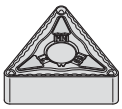
TNMG-FW

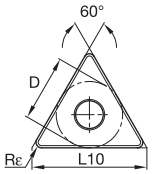




ISO código do produto	D	L10	Rε	KCP05B	KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30B	KCP30	KCP40B	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35B	KCM35	KCPK05	K313	K68	KCU10	KCU25	KC5010	KC5025	KC5410	KT315
TNMG160404FW	9,53	16,50	0,2	–	●	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	●	–	–	●
TNMG160408FW	9,53	16,50	0,4	–	●	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●
TNMG160412FW	9,53	16,50	1,2	–	●	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●

TNMG-MN

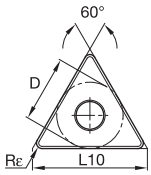




ISO código do produto	D	L10	Rε	KCP05B	KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30B	KCP30	KCP40B	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35B	KCM35	KCPK05	K313	K68	KCU10	KCU25	KC5010	KC5025	KC5410	KT315
TNMG160404MN	9,53	16,50	0,4	–	–	●	●	●	●	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
TNMG160408MN	9,53	16,50	0,8	–	●	●	●	●	●	●	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
TNMG160412MN	9,53	16,50	1,2	–	–	●	–	●	●	–	–	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
TNMG220404MN	12,70	22,00	0,4	–	–	–	●	●	●	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
TNMG220408MN	12,70	22,00	0,8	–	–	●	●	●	●	–	–	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
TNMG220412MN	12,70	22,00	1,2	–	–	●	–	●	●	–	●	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–

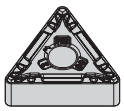
TNMG-MP

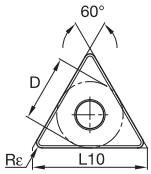




ISO código do produto	D	L10	Rε	KCP05B	KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30B	KCP30	KCP40B	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35B	KCM35	KCPK05	K313	K68	KCU10	KCU25	KC5010	KC5025	KC5410	KT315
TNMG160404MP	9,53	16,50	0,4	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	●	●	●	●	–	–	–	–	●	–	●	–	–	–
TNMG160408MP	9,53	16,50	0,8	–	–	–	–	●	●	–	–	–	–	–	–	–	–	–	–	●	●	●	●	●	●	–	–	–	●	–	●	–	–	–
TNMG160412MP	9,53	16,50	1,2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	●	●	–	–	–	–	–	–	–	●	–	–	–
TNMG220408MP	12,70	22,00	0,8	–	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	●	●	–	–	–	–	–	●	–	●	–	–	–
TNMG220412MP	12,70	22,00	1,2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	●	–	–	–	–	–	–	–	●	–	–	–
TNMG220416MP	12,70	22,00	1,6	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–

● primeira opção
○ opção alternativa



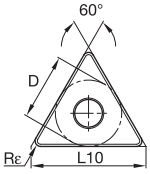


TNMG-MR

P		●	●	●	●	●	●	●	●	●	●	○	○	○	○	○	○	○	○	○	○	○	○	●	●	●	●	●	●	●		●
M										○	○							●	●	●	●	●	●		●	●	●	●	●	●		●
K		○	○	○	○	○	○					●	●	●	●	●	●							●	●	●	●	●	●	●		●
N																									●	●	●	●	●	●	●	
S																									●	●	●	●	●	●		
H																																

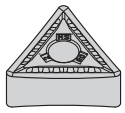
ISO código do produto	D	L10	Rε	KCP05B	KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30B	KCP30	KCP40B	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35B	KCM35	KCPK05	K313	K68	KCU10	KCU25	KC5010	KC5025	KC5410	KT315
TNMG160408MR	9,53	16,50	0,8	–	–	●	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	●	●	–	–	–	–	–	–	–	–	–	–	–
TNMG160412MR	9,53	16,50	1,2	–	–	●	–	●	–	–	–	–	–	–	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
TNMG220408MR	12,70	22,00	0,8	–	–	–	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–	–	–	–	–	–	–	–
TNMG220412MR	12,70	22,00	1,2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–	–	–	–	–	–	–	–	–
TNMG270612MR	15,88	27,50	1,2	–	–	–	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–

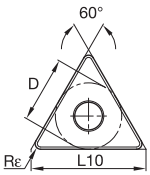




TNMG-MG

ISO código do produto	D	L10	Rε	KCP05B	KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30B	KCP30	KCP40B	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35B	KCM35	KCPK05	K313	K68	KCU10	KCU25	KC5010	KC5025	KC5410	KT315
TNMG160408MG	9,53	16,50	0,8	–	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–

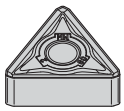


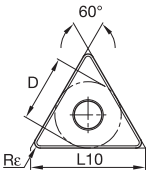


TNMG-MS

ISO código do produto	D	L10	Rε	KCP05B	KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30B	KCP30	KCP40B	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35B	KCM35	KCPK05	K313	K68	KCU10	KCU25	KC5010	KC5025	KC5410	KT315
TNMG160402MS	9,53	16,50	0,2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	●	●	●	–	–
TNMG160404MS	9,53	16,50	0,4	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	●	●	●	–	–
TNMG160408MS	9,53	16,50	0,8	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	●	●	●	–	–
TNMG220404MS	12,70	22,00	0,4	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	●	●	●	–	–
TNMG220408MS	12,70	22,00	0,8	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	●	●	●	●	–	–
TNMG220412MS	12,70	22,00	1,2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	●	–	–	–	–
TNMG270608MS	15,88	27,50	0,8	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	●	–	–
TNMG270616MS	15,88	27,50	1,6	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–	–	–	–

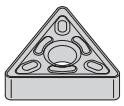
● primeira opção
○ opção alternativa

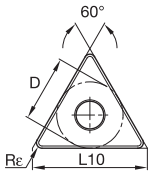




TNMG-MW

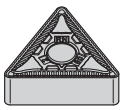
ISO código do produto	D	L10	Rε	KCP05B	KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30B	KCP30	KCP40B	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35B	KCM35	KCPK05	K313	K68	KCU10	KCU25	KC5010	KC5025	KC5410	KT315
TNMG160408MW	9,53	16,50	0,8	–	●	–	●	●	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
TNMG160412MW	9,53	16,50	1,2	–	–	●	●	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–

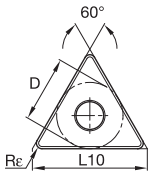




TNMG-P

ISO código do produto	D	L10	Rε	KCP05B	KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30B	KCP30	KCP40B	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35B	KCM35	KCPK05	K313	K68	KCU10	KCU25	KC5010	KC5025	KC5410	KT315
TNMG160404P	9,53	16,50	0,4	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	●	–	–	–
TNMG160408P	9,53	16,50	0,8	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–	–
TNMG220404P	12,70	22,00	0,4	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–	–
TNMG220408P	12,70	22,00	0,8	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–	–
TNMG220412P	12,70	22,00	1,2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–	–

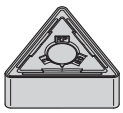


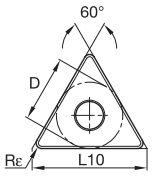


TNMG-RN

ISO código do produto	D	L10	Rε	KCP05B	KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30B	KCP30	KCP40B	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35B	KCM35	KCPK05	K313	K68	KCU10	KCU25	KC5010	KC5025	KC5410	KT315
TNMG160408RN	9,53	16,50	0,8	–	–	●	●	●	●	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
TNMG160412RN	9,53	16,50	1,2	–	–	●	–	●	●	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
TNMG220408RN	12,70	22,00	0,8	–	–	●	–	●	●	●	●	●	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
TNMG220412RN	12,70	22,00	1,2	–	–	●	●	●	●	●	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
TNMG220416RN	12,70	22,00	1,6	–	–	–	–	●	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
TNMG270608RN	15,88	27,50	0,8	–	–	–	●	●	●	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
TNMG270612RN	15,88	27,50	1,2	–	–	●	●	–	●	●	–	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
TNMG270616RN	15,88	27,50	1,6	–	–	–	●	●	●	●	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
TNMG330924RN	19,05	33,00	2,4	–	–	●	–	●	●	●	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–

● primeira opção
○ opção alternativa





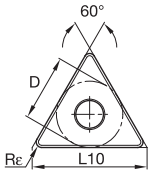
TNMG-RP

		KCP05B	KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30B	KCP30	KCP40B	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35B	KCM35	KCPK05	K313	K68	KCU10	KCU25	KC5010	KC5025	KC5410	KT315
P		●	●	●	●	●	●	●	●	●	●	○	○	○	○	○	○	○	○	○	○	○	○	●	●	●	●	●	●	●		●
M										○	○							●	●	●	●	●	●		●	●	●	●	●	●		●
K		○	○	○	○	○	○					●	●	●	●	●	●							●	●	●	●	●	●	●		●
N																									●	●	●	●	●	●	●	
S																									●	●	●	●	●	●		
H																																

ISO código do produto	D	L10	Rε
TNMG160408RP	9,53	16,50	0,8
TNMG160412RP	9,53	16,50	1,2
TNMG160416RP	9,53	16,50	1,6
TNMG220408RP	12,70	22,00	0,8
TNMG220412RP	12,70	22,00	1,2
TNMG220416RP	12,70	22,00	1,6
TNMG220432RP	12,70	22,00	3,2
TNMG270612RP	15,88	27,50	1,2
TNMG270616RP	15,88	27,50	1,6
TNMG330924RP	19,05	33,00	2,4

		KCP05B	KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30B	KCP30	KCP40B	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35B	KCM35	KCPK05	K313	K68	KCU10	KCU25	KC5010	KC5025	KC5410	KT315
P		●	●	●	●	●	●	●	●	●	●	○	○	○	○	○	○	○	○	○	○	○	○	●	●	●	●	●	●	●		●
M										○	○							●	●	●	●	●	●		●	●	●	●	●	●		●
K		○	○	○	○	○	○					●	●	●	●	●	●							●	●	●	●	●	●	●		●
N																									●	●	●	●	●	●	●	
S																									●	●	●	●	●	●		
H																																

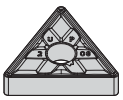


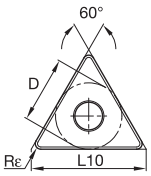


TNMG-UN

ISO código do produto	D	L10	Rε
TNMG160408UN	9,53	16,50	0,8
TNMG160412UN	9,53	16,50	1,2
TNMG160416UN	9,53	16,50	1,6
TNMG220408UN	12,70	22,00	0,8
TNMG220412UN	12,70	22,00	1,2
TNMG220416UN	12,70	22,00	1,6

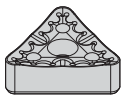
● primeira opção
○ opção alternativa

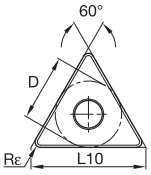




TNMG-UP

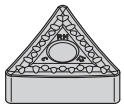
ISO código do produto	D	L10	Rε	KCP05B	KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30B	KCP30	KCP40B	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35B	KCM35	KCPK05	K313	K68	KCU10	KCU25	KC5010	KC5025	KC5410	KT315
				P	●	●	●	●	●	●	●	●	●	●	○	○	○	○	○	○	○	○	○	○	○	○	●	●	●	●	●	●	●		●
				M										○	○							●	●	●	●	●	●		●	●	●	●	●	●		●
				K	○	○	○	○	○	○					●	●	●	●	●	●								●	●	●	●	●	●		●
				N																							●	●	●	●	●	●	●	
				S																							●	●	●	●	●	●		
				H																														
TNMG160404UP	9,53	16,50	0,4	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–	–	–	–	–	–	–	–
TNMG160408UP	9,53	16,50	0,8	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	●	–	–	–	–	–	–	–	–	–	–	–
TNMG220408UP	12,70	22,00	0,8	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	●	–	–	–	–	–	–	–	–	–

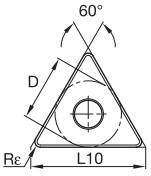




TNMM-MR

ISO código do produto	D	L10	Rε	KCP05B	KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30B	KCP30	KCP40B	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35B	KCM35	KCPK05	K313	K68	KCU10	KCU25	KC5010	KC5025	KC5410	KT315
TNMM330924MR	19,05	33,00	2,4	–	–	–	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–

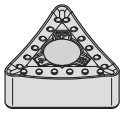


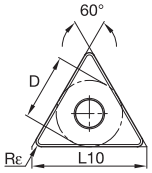


TNMM-RM

ISO código do produto	D	L10	Rε	KCP05B	KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30B	KCP30	KCP40B	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35B	KCM35	KCPK05	K313	K68	KCU10	KCU25	KC5010	KC5025	KC5410	KT315
TNMM160408RM	9,53	16,50	0,8	–	–	–	–	●	●	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
TNMM160412RM	9,53	16,50	1,2	–	–	–	–	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
TNMM220408RM	12,70	22,00	0,8	–	–	–	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
TNMM220412RM	12,70	22,00	1,2	–	–	–	–	●	●	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
TNMM220416RM	12,70	22,00	1,6	–	–	–	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
TNMM270612RM	15,88	27,50	1,2	–	–	–	–	–	●	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
TNMM270616RM	15,88	27,50	1,6	–	–	–	–	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–

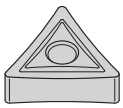
● primeira opção
○ opção alternativa

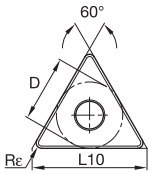




TNMM-RP

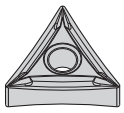
ISO código do produto	D	L10	Rε	KCP05B	KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30B	KCP30	KCP40B	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35B	KCM35	KCPK05	K313	K68	KCU10	KCU25	KC5010	KC5025	KC5410	KT315
TNMM220408RP	12,70	22,00	0,8	–	–	●	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
TNMM220412RP	12,70	22,00	1,2	–	–	–	–	–	●	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–	–	–	–	–	–	–	–	–
TNMM220416RP	12,70	22,00	1,6	–	–	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–

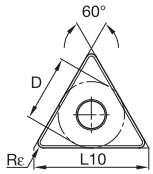




TNMP

ISO código do produto	D	L10	Rε	KCP05B	KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30B	KCP30	KCP40B	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35B	KCM35	KCPK05	K313	K68	KCU10	KCU25	KC5010	KC5025	KC5410	KT315
TNMP160404	9,53	16,50	0,4	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–	–	–	–
TNMP160408	9,53	16,50	0,8	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–	–	–	–
TNMP220416	12,70	22,00	1,6	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–	–	–

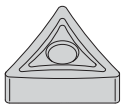


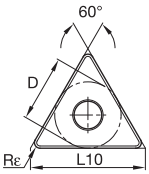


TNMP-K

ISO código do produto	D	L10	Rε	KCP05B	KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30B	KCP30	KCP40B	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35B	KCM35	KCPK05	K313	K68	KCU10	KCU25	KC5010	KC5025	KC5410	KT315
TNMP160404K	9,53	16,50	0,4	–	–	–	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
TNMP160408K	9,53	16,50	0,8	–	–	–	●	●	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
TNMP220408K	12,70	22,00	0,8	–	–	–	–	●	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–

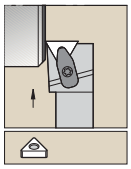
● primeira opção
○ opção alternativa

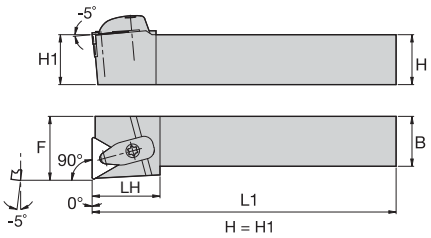


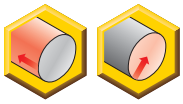


TNMS

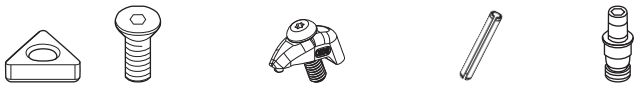
				KCP05B	KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30B	KCP30	KCP40B	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35B	KCM35	KCPK05	K313	K68	KCU10	KCU25	KC5010	KC5025	KC5410	KT315
				P	●	●	●	●	●	●	●	●	●	●	○	○	○	○	○	○	○	○	○	○	○	○	●	●	●	●	●	●	●		●
				M										○	○							●	●	●	●	●	●		●	●	●	●	●	●		●
				K	○	○	○	○	○	○					●	●	●	●	●	●								●	●	●	●	●	●	●		●
				N																							●	●	●	●	●	●	●	●	
				S																							●	●	●	●	●	●			
				H																															
ISO código do produto	D	L10	Rε																															
TNMS160404	9,53	16,50	0,4	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–	–	–
TNMS160408	9,53	16,50	0,8	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–	–	–
TNMS220408	12,70	22,00	0,8	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–	●	–



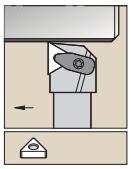


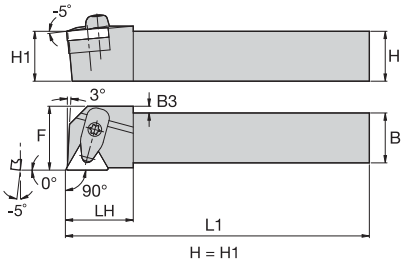


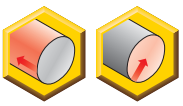
DTFN-KC 90°



número para pedido	código do produto	H	B	F	L1	LH	inserto padrão	calço	parafuso do calço	Torx Plus	conjunto do grampo	Torx Plus	pino elástico	pino de trava opcional
corte à direita (R)														
2273392	**DTFNR2020K16KC04**	20	20	25,0	125	32,0	TN..160408	**ITSN323**	**KMSP315IP**	15 IP	**CM234R ASSY**	15 IP	**SSP025016M**	**KLM34L9IP**
corte à esquerda (L)														
1875233	**DTFNL2525M22KC04**	25	25	32,0	150	34,0	TN..220408	**ITSN443**	**KMSP415IP**	15 IP	**CM234R ASSY**	15 IP	**SSP025016M**	**KLM46L15IP**



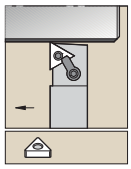


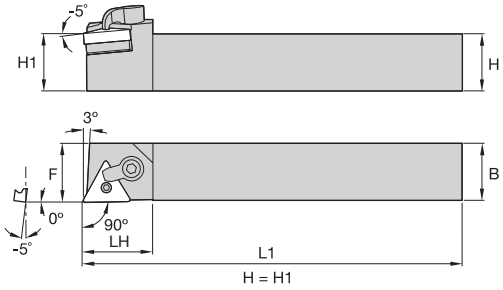


DTGN-KC 90°



número para pedido	código do produto	H	B	F	L1	LH	B3	inserto padrão	calço	parafuso do calço	Torx Plus	conjunto do grampo	Torx Plus	pino elástico	pino de trava opcional
corte à direita (R)															
2273440	**DTGNR2020K16KC04**	20	20	25,0	125	25,0	6,5	TN..160408	**ITSN323**	**KMSP315IP**	15 IP	**CM234R ASSY**	15 IP	**SSP025016M**	**KLM34L9IP**
2273441	**DTGNR2525M16KC04**	25	25	32,0	150	25,0	—	TN..160408	**ITSN323**	**KMSP315IP**	15 IP	**CM234R ASSY**	15 IP	**SSP025016M**	**KLM34L9IP**
1875222	**DTGNR2525M22KC04**	25	25	32,0	150	32,0	3,0	TN..220408	**ITSN443**	**KMSP415IP**	15 IP	**CM234R ASSY**	15 IP	**SSP025016M**	**KLM46L15IP**
corte à esquerda (L)															
1875234	**DTGNL2525M22KC04**	25	25	32,0	150	32,0	3,0	TN..220408	**ITSN443**	**KMSP415IP**	15 IP	**CM234R ASSY**	15 IP	**SSP025016M**	**KLM46L15IP**



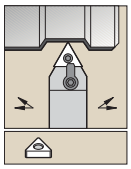


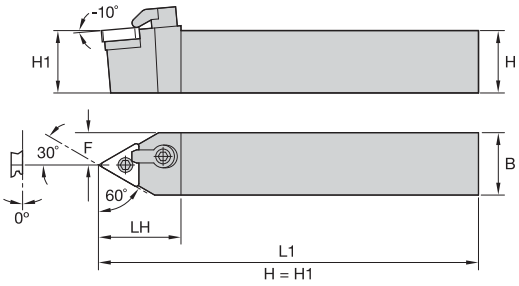


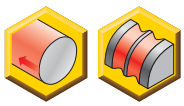
MTAN-S 90°



número para pedido	código do produto	H	B	F	L1	LH	inserto padrão	calço	pino de trava	sexta-vada	grampo	parafuso do grampo	sexta-vada
corte à direita (R)													
1102172	**MTANRS2020K16**	20	20	20,5	125	32,0	TN..160408	**ITSN322**	**KLM34L**	2 mm	**CKM21**	**STCM20**	3 mm
1102173	**MTANRS2525M16**	25	25	25,5	150	30,0	TN..160408	**ITSN322**	**KLM34L**	2 mm	**CKM21**	**STCM20**	3 mm
corte à esquerda (L)													
1102726	**MTANLS2525M16**	25	25	25,5	150	32,0	TN..160408	**ITSN322**	**KLM34L**	2 mm	**CKM21**	**STCM20**	3 mm



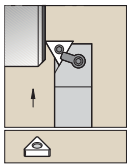


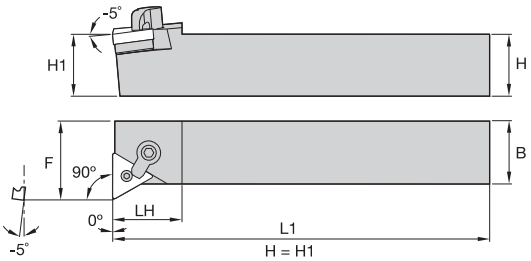


MTEN-S 60°



número para pedido	código do produto	H	B	F	L1	LH	inserto padrão	calço	pino de trava	sexta-vada	grampo	parafuso do grampo	sexta-vada
1102169	**MTENNS2020K16**	20	20	10,0	125	32,0	TN..160408	**ITSN322**	**KLM34L**	2 mm	**CKM21**	**STCM20**	3 mm
1102170	**MTENNS2525M16**	25	25	12,0	150	32,0	TN..160408	**ITSN322**	**KLM34L**	2 mm	**CKM21**	**STCM20**	3 mm
1102171	**MTENNS2525M22**	25	25	12,0	150	35,0	TN..220408	**ITSN433**	**KLM46**	2.5 mm	**CKM9**	**STCM4**	4 mm
1102168	**MTENNS3225P22**	32	25	12,0	170	35,0	TN..220408	**ITSN433**	**KLM46**	2.5 mm	**CKM9**	**STCM4**	4 mm



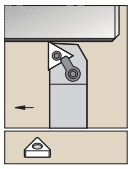


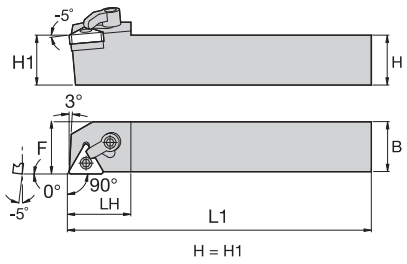


MTFN 90°



número para pedido	código do produto	H	B	F	L1	LH	inserto padrão	calço	pino de trava	sexta-vada	grampo	parafuso do grampo	sexta-vada
corte à direita (R)													
1101961	**MTFNR2525M16**	25	25	32,0	150	32,0	TN..160408	**ITSN322**	**KLM34L**	2 mm	**CKM20**	**STCM11**	3 mm
corte à esquerda (L)													
1102643	**MTFNL2020K16**	20	20	25,0	125	32,0	TN..160408	**ITSN322**	**KLM34L**	2 mm	**CKM20**	**STCM11**	3 mm
1102694	**MTFNL2525M16**	25	25	32,0	150	32,0	TN..160408	**ITSN322**	**KLM34L**	2 mm	**CKM20**	**STCM11**	3 mm



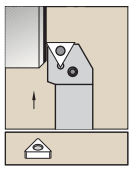


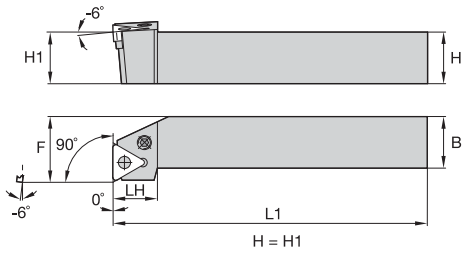


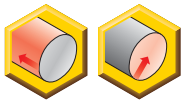
MTGN 90°



número para pedido	código do produto	H	B	F	L1	LH	inserto padrão	calço	pino de trava	sexta-vada	grampo	parafuso do grampo	sexta-vada
corte à direita (R)													
1102091	**MTGNR2525M22**	25	25	32,0	150	32,0	TN..220408	**ITSN433**	**KLM46**	2.5 mm	**CKM9**	**STCM4**	4 mm
1102088	**MTGNR1616H16**	36	25	20,0	100	32,0	TN..160408	**ITSN322**	**KLM34L**	2 mm	**CKM20**	**STCM11**	3 mm
1102090	**MTGNR2525M16**	86	32	32,0	150	32,0	TN..160408	**ITSN322**	**KLM34L**	2 mm	**CKM21**	**STCM20**	3 mm
1102093	**MTGNR3232P22**	106	32	40,0	170	32,0	TN..220408	**ITSN433**	**KLM46**	2.5 mm	**CKM9**	**STCM4**	4 mm
corte à esquerda (L)													
1102714	**MTGNL2525M16**	86	32	32,0	150	32,0	TN..160408	**ITSN322**	**KLM34L**	2 mm	**CKM21**	**STCM20**	3 mm
1102715	**MTGNL2525M22**	86	38	32,0	150	32,0	TN..220408	**ITSN433**	**KLM46**	2.5 mm	**CKM9**	**STCM4**	4 mm
1102716	**MTGNL3232P22**	106	25	40,0	170	32,0	TN..220408	**ITSN433**	**KLM46**	2.5 mm	**CKM9**	**STCM4**	4 mm



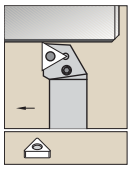


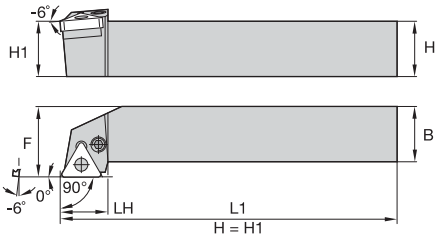


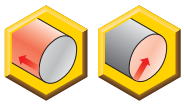
PTFN 90°



número para pedido	código do produto	H	B	F	L1	LH	inserto padrão	calço	pino do calço	punção do pino	alavanca	parafuso da alavanca	sexta-vada
corte à direita (R)													
1244843	**PTFNR2020K16**	20	20	25,0	125	20,0	TN..160408	**512.013**	**513.018**	**515.018**	**511.018**	**514.118**	10 IP
1244844	**PTFNR2525M16**	25	25	32,0	150	20,0	TN..160408	**512.013**	**513.018**	**515.018**	**511.018**	**514.118**	10 IP
corte à esquerda (L)													
1244839	**PTFNL2020K16**	20	20	25,0	125	20,0	TN..160408	**512.013**	**513.018**	**515.018**	**511.018**	**514.118**	10 IP
1244726	**PTFNL2525M16**	25	25	32,0	150	20,0	TN..160408	**512.013**	**513.018**	**515.018**	**511.018**	**514.118**	10 IP



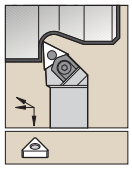


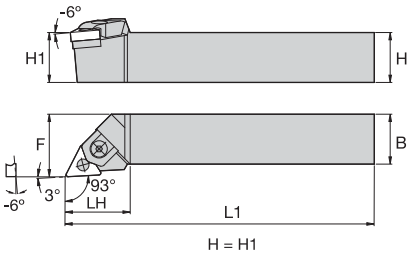


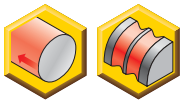
PTGN 90°



número para pedido	código do produto	H	B	F	L1	LH	inserto padrão	calço	pino do calço	punção do pino	alavanca	parafuso da alavanca	sexta-vada
corte à direita (R)													
1156972	**PTGNR1616H16**	16	16	20,0	100	20,0	TN..160408	**512.013**	**513.018**	**515.018**	**511.018**	**514.118**	10 IP
1244850	**PTGNR2020K16**	20	20	25,0	125	20,0	TN..160408	**512.013**	**513.018**	**515.018**	**511.018**	**514.118**	10 IP
1192394	**PTGNR2525M16**	25	25	32,0	150	20,0	TN..160408	**512.013**	**513.018**	**515.018**	**511.018**	**514.118**	10 IP
1244851	**PTGNR2525M22**	25	25	32,0	150	26,0	TN..220408	**512.023**	**513.023**	**515.018**	**511.023**	**514.123**	15 IP
corte à esquerda (L)													
1244791	**PTGNL1616H16**	16	16	20,0	100	20,0	TN..160408	**512.013**	**513.018**	**515.018**	**511.018**	**514.118**	10 IP
1244848	**PTGNL2020K16**	20	20	25,0	125	20,0	TN..160408	**512.013**	**513.018**	**515.018**	**511.018**	**514.118**	10 IP
1244792	**PTGNL2525M16**	25	25	32,0	150	20,0	TN..160408	**512.013**	**513.018**	**515.018**	**511.018**	**514.118**	10 IP
1244778	**PTGNL2525M22**	25	25	32,0	150	26,0	TN..220408	**512.023**	**513.023**	**515.018**	**511.023**	**514.123**	15 IP







MTJN 93°

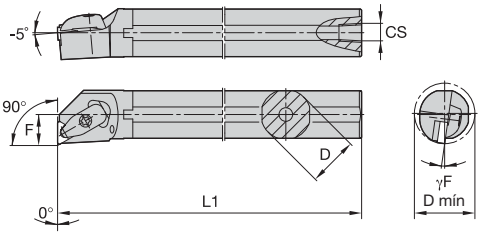




número para pedido	código do produto	H	B	F	L1	LH	inserto padrão	calço	pino do calço	conjunto do grampo	sexta-vada
corte à direita (R)											
1192350	**MTJNR2020K16H4**	20	20	25,0	125	32,0	TN..160408	**512.125**	**513.125**	**551.125**	3 mm
1192352	**MTJNR2525M16H4**	25	25	32,0	150	32,0	TN..160408	**512.125**	**513.125**	**551.125**	3 mm
1245000	**MTJNR2525M22H4**	25	25	32,0	150	36,0	TN..220408	**512.126**	**513.126**	**551.126**	3 mm
1244998	**MTJNR3225P16H4**	32	25	32,0	170	32,0	TN..160408	**512.125**	**513.125**	**551.125**	3 mm
1244999	**MTJNR3225P22H4**	32	25	32,0	170	36,0	TN..220408	**512.126**	**513.126**	**551.126**	3 mm
corte à esquerda (L)											
1244996	**MTJNL2020K16H4**	20	20	25,0	125	32,0	TN..160408	**512.125**	**513.125**	**551.125**	3 mm
1245002	**MTJNL2525M16H4**	25	25	32,0	150	32,0	TN..160408	**512.125**	**513.125**	**551.125**	3 mm
1245001	**MTJNL2525M22H4**	25	25	32,0	150	36,0	TN..220408	**512.126**	**513.126**	**551.126**	3 mm
1244997	**MTJNL3225P16H4**	32	25	32,0	170	32,0	TN..160408	**512.125**	**513.125**	**551.125**	3 mm



Haste de aço com refrigeração interna.



A-DTFN-KC 90°

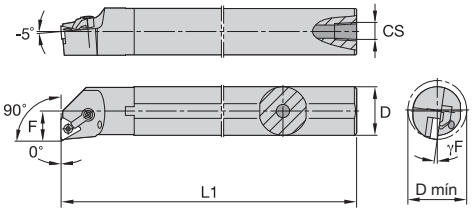


número para pedido	código do produto	D	D mín	F	L1	CS	γF°	inserto padrão	calço	parafuso do calço	Torx Plus	conjunto do grampo	pino elástico	Torx Plus
corte à direita (R)														
2441866	**A25RDTFNR16KC04**	25	32,0	17,0	200	1/4-18 NPT	-14.0	TN..160408	**ITSN323**	**KMSP315IP**	15 IP	**CM234R ASSY**	**SSP025016M**	15 IP
2441870	**A32SDTFNR16KC04**	32	40,0	22,0	250	1/4-18 NPT	-12.0	TN..160408	**ITSN323**	**KMSP315IP**	15 IP	**CM234R ASSY**	**SSP025016M**	15 IP
corte à esquerda (L)														
2441869	**A25RDTFNL16KC04**	25	32,0	17,0	200	1/4-18 NPT	-14.0	TN..160408	**ITSN323**	**KMSP315IP**	15 IP	**CM234R ASSY**	**SSP025016M**	15 IP

Barras de mandrilar Kenloc™



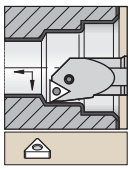
Haste de aço com refrigeração interna.



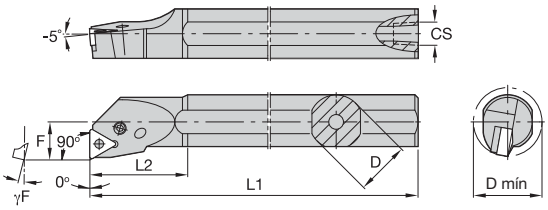
A-MTFN 90°



número para pedido	código do produto	D	D mín	F	L1	CS	γF°	inserto padrão	calço	pino de trava	sexta-vada	grampo	parafuso do grampo	sexta-vada
corte à direita (R)														
1098121	**A25RMTFNR16**	25	32,0	17,0	200	1/4-18 NPT	-14.0	TN..160408	**ITSN322**	**KLM34L**	2 mm	**CKM21**	**STCM20**	3 mm
1098123	**A32SMTFNR16**	32	40,0	22,0	250	1/4-18 NPT	-12.0	TN..160408	**ITSN322**	**KLM34L**	2 mm	**CKM21**	**STCM20**	3 mm
1098125	**A40TMTFNR16**	40	50,0	27,0	300	1/4-18 NPT	-9.0	TN..160408	**ITSN322**	**KLM34L**	2 mm	**CKM21**	**STCM20**	3 mm
corte à esquerda (L)														
1098122	**A25RMTFNL16**	25	32,0	17,0	200	1/4-18 NPT	-14.0	TN..160408	**ITSN322**	**KLM34L**	2 mm	**CKM21**	**STCM20**	3 mm
1098124	**A32SMTFNL16**	32	40,0	22,0	250	1/4-18 NPT	-12.0	TN..160408	**ITSN322**	**KLM34L**	2 mm	**CKM21**	**STCM20**	3 mm



Haste de aço com refrigeração interna.

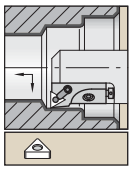


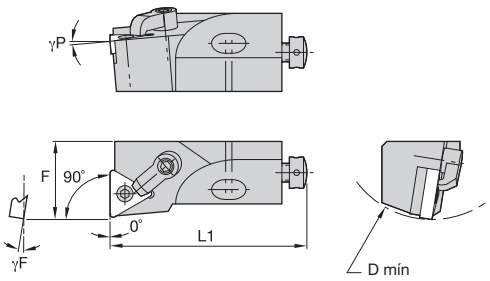


A-PTFN 90°



número para pedido	código do produto	D	D mín	F	L1	L2	CS	γF°	inserto padrão	calço	pino do calço	pino	alavanca	parafuso da alavanca	Torx Plus
corte à direita (R)															
2447535	**A16RPTFNR11**	16	20,0	11,0	200	28	1/8-27 NPT	-14.0	TN..110304	**–**	**–**	**–**	**511.011**	**514.111**	8 IP
2447536	**A20SPTFNR11**	20	25,0	13,0	250	30	1/8-27 NPT	-12.0	TN..110304	**–**	**–**	**–**	**511.011**	**514.111**	8 IP
2447537	**A25TPTFNR16**	25	32,0	17,0	300	40	1/4-18 NPT	-12.0	TN..160408	**512.013**	**513.018**	**515.018**	**511.018**	**514.118**	10 IP
2447539	**A32UPTFNR16**	32	40,0	22,0	350	50	1/4-18 NPT	-10.0	TN..160408	**512.013**	**513.018**	**515.018**	**511.018**	**514.118**	10 IP
2447504	**A40VPTFNR22**	40	48,0	27,0	400	55	1/4-18 NPT	-10.0	TN..220408	**512.023**	**513.023**	**515.018**	**511.023**	**514.123**	15 IP
corte à esquerda (L)															
2447489	**A20SPTFNL11**	20	25,0	13,0	250	30	1/8-27 NPT	-12.0	TN..110304	**–**	**–**	**–**	**511.011**	**514.111**	8 IP
2447538	**A25TPTFNL16**	25	32,0	17,0	300	40	1/4-18 NPT	-12.0	TN..160408	**512.013**	**513.018**	**515.018**	**511.018**	**514.118**	10 IP
2447503	**A32UPTFNL16**	32	40,0	22,0	350	50	1/4-18 NPT	-10.0	TN..160408	**512.013**	**513.018**	**515.018**	**511.018**	**514.118**	10 IP





MTFN 90°

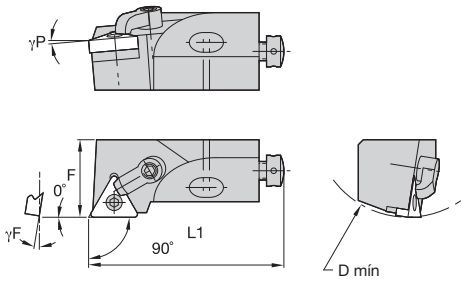
número para pedido	código do produto	D mín	F	L1	γF°	γP°	inserto padrão
corte à direita (R)							
2078236	**MTFNR12CA16**	50	20,0	55	-9.0	-5.0	TN..160408/TN..332
2074429	**MTFNR16CA16**	60	25,0	63	-9.0	-5.0	TN..160408/TN..332
3330208	**MTFNR20CA22**	70	25,0	70	-9.0	-5.0	TN..220408/TN..432
corte à esquerda (L)							
2057426	**MTFNL12CA16**	50	20,0	55	-9.0	-5.0	TN..160408/TN..332
2193621	**MTFNL16CA16**	60	25,0	63	-9.0	-5.0	TN..160408/TN..332
3330207	**MTFNL20CA22**	70	25,0	70	-9.0	-5.0	TN..220408/TN..432

Peças de reposição



D mín	calço	pino de trava	sexta-vada	grampo	parafuso do grampo	sexta-vada	parafuso de ajuste radial	sexta-vada	parafuso de ajuste axial	parafuso de montagem	sexta-vada	arruela
50	**–**	**KLM33L**	2 mm	**CKM34**	**STCM38**	2 mm	**KUAM22**	2 mm	**KUAM31**	**191.406**	4 mm	**CSWM 060 050**
60	**ITSN322**	**KLM34L**	2 mm	**CKM34**	**STCM9**	2 mm	**KUAM25**	2 mm	**KUAM32**	**191.407**	5 mm	**CSWM 080 050**
70	**ITSN433**	**KLM46**	2.5 mm	**CKM35**	**STCM37**	2.5 mm	**KUAM25**	2.5 mm	**KUAM32**	**191.407**	5 mm	**CSWM 080 050**





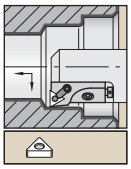
MTGN 90°

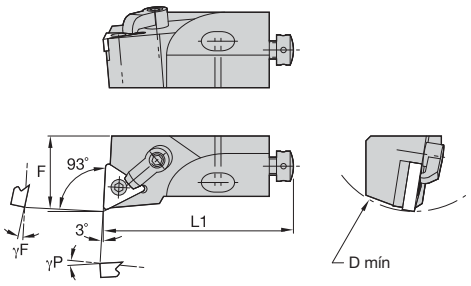
número para pedido	código do produto	D mín	F	L1	γF°	γP°	inserto padrão
corte à direita (R)							
2114041	**MTGNR12CA16**	50	20,0	55	-9.0	-5.0	TN..160408/TN..332
3330285	**MTGNR16CA16**	60	25,0	63	-9.0	-5.0	TN..160408/TN..332
corte à esquerda (L)							
3346275	**MTGNL12CA16**	50	20,0	55	-9.0	-5.0	TN..160408/TN..332
3330209	**MTGNL20CA22**	70	25,0	70	-9.0	-5.0	TN..220408/TN..432

Peças de reposição



D mín	calço	pino de trava	sexta-vada	grampo	parafuso do grampo	sexta-vada	parafuso de ajuste radial	sexta-vada	parafuso de ajuste axial	parafuso de montagem	sexta-vada	arruela
50	**–**	**KLM33L**	2 mm	**CKM34**	**STCM38**	2 mm	**KUAM22**	2 mm	**KUAM31**	**191.406**	4 mm	**CSWM 060 050**
60	**ITSN322**	**KLM34L**	2 mm	**CKM34**	**STCM9**	2.5 mm	**KUAM25**	2.5 mm	**KUAM32**	**191.407**	5 mm	**CSWM 080 050**
70	**ITSN433**	**KLM46**	2.5 mm	**CKM35**	**STCM37**	2.5 mm	**KUAM25**	2.5 mm	**KUAM32**	**191.407**	5 mm	**CSWM 080 050**





MTUN 93°

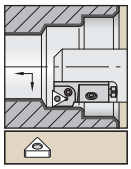
número para pedido	código do produto	D mín	F	L1	γF°	γP°	inserto padrão
corte à direita (R)							
1098536	**MTUNR20CA22**	70	25,0	70	-9.0	-5.0	TN..220408/TN..432
corte à esquerda (L)							
1098529	**MTUNL12CA16**	50	20,0	55	-9.0	-5.0	TN..160408/TN..332
1098535	**MTUNL16CA16**	60	25,0	63	-9.0	-5.0	TN..160408/TN..332

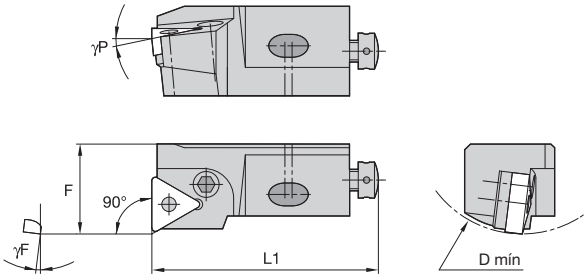
NOTA: Escolha as peças de reposição com base no D mín. e no tamanho do inserto escolhido.

Peças de reposição



D mín	calço	pino de trava	sexta-vada	grampo	parafuso do grampo	sexta-vada	parafuso de ajuste radial	sexta-vada	parafuso de ajuste axial	parafuso de montagem	sexta-vada	arruela
50	**–**	**KLM33L**	2 mm	**CKM34**	**STCM38**	2 mm	**KUAM22**	2 mm	**KUAM31**	**191.406**	4 mm	**CSWM 060 050**
60	**ITSN322**	**KLM34L**	2 mm	**CKM34**	**STCM9**	2.5 mm	**KUAM25**	2.5 mm	**KUAM32**	**191.407**	5 mm	**CSWM 080 050**
70	**ITSN433**	**KLM46**	–	**CKM35**	**STCM37**	2.5 mm	**KUAM25**	2.5 mm	**KUAM33**	**191.407**	5 mm	**CSWM 080 050**





PTFN 90°

número para pedido	código do produto	D mín	F	L1	γF°	γP°	inserto padrão
corte à direita (R)							
1188641	**PTFNR12CA-16**	50	20,0	55	-7.0	-6.0	TN..160408/TN..332
corte à esquerda (L)							
1244457	**PTFNL12CA-16**	50	20,0	55	-7.0	-6.0	TN..160408/TN..332

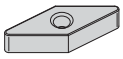
Peças de reposição

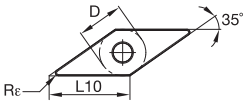


D mín	alavanca	parafuso da alavanca	tamanho da chave do parafuso da alavanca	parafuso de ajuste radial	sexta-vada	parafuso de ajuste axial	parafuso de montagem	sexta-vada	arruela
50	**511.030**	**514.112**	8 IP	**KUAM28**	2 mm	**KUAM31**	**191.406**	4 mm	**CSWM 060 050**

● primeira opção
○ opção alternativa

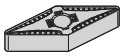
		KCP05B	KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30B	KCP30	KCP40B	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35B	KCM35	KCPK05	K313	K68	KCU10	KCU25	KC5010	KC5025	KC5410	KT315
P		●	●	●	●	●	●	●	●	●	●	○	○	○	○	○	○	○	○	○	○	○	○	●	●	●	●	●	●	●		●
M										○	○							●	●	●	●	●	●		●	●	●	●	●	●		●
K		○	○	○	○	○	○					●	●	●	●	●	●							●	●	●	●	●	●	●		●
N																									●	●	●	●	●	●	●	
S																									●	●	●	●	●	●		
H																																

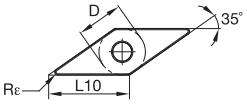




VNGA

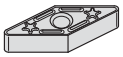
ISO código do produto	D	L10	Rε																													
VNGA160404	9,53	16,61	0,4	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–	–	–
VNGA160408	9,53	16,61	0,8	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–	–	–

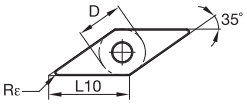




VNGG-FS

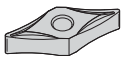
ISO código do produto	D	L10	Rε																													
VNGG160401FS	9,53	16,61	0,1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–	–
VNGG160402FS	9,53	16,61	0,2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	●	●	–	–	–
VNGG160404FS	9,53	16,61	0,4	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	●	●	●	–	–
VNGG160408FS	9,53	16,61	0,8	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	●	●	●	–	–

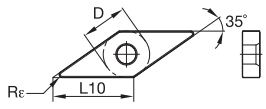




VNGG-LF

ISO código do produto	D	L10	Rε																													
VNGG160402LF	9,53	16,61	0,2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	●	–	–	–
VNGG160404LF	9,53	16,61	0,4	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	●	–	–	–
VNGG160408LF	9,53	16,61	0,8	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	●	–	●	–	–	–
VNGG220408LF	12,70	22,14	0,8	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	●	–	–	–

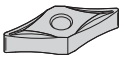


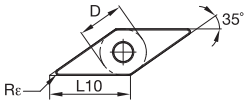


VNGP

ISO código do produto	D	L10	Rε																													
VNGP160401	9,53	16,61	0,1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	●	–	●	–
VNGP160402	9,53	16,61	0,2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	●	–	●	–
VNGP220404	12,70	22,14	0,4	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	●	–	–	–
VNGP220408	12,70	22,14	0,8	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	●	–	●	–	–	–

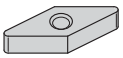
● primeira opção
○ opção alternativa

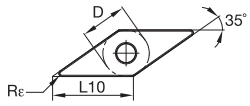




VNGP-K

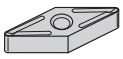
ISO código do produto	D	L10	Rε	KCP05B	KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30B	KCP30	KCP40B	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35B	KCM35	KCPK05	K313	K68	KCU10	KCU25	KC5010	KC5025	KC5410	KT315
VNGP160404K	9,53	16,61	0,4	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–	●	–	–	–
VNGP160408K	9,53	16,61	0,8	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–	●	–	–	–
VPGP443K	12,70	22,14	1,2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–

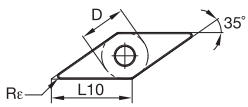




VNMA

ISO código do produto	D	L10	Rε	KCP05B	KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30B	KCP30	KCP40B	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35B	KCM35	KCPK05	K313	K68	KCU10	KCU25	KC5010	KC5025	KC5410	KT315
VNMA160408	9,53	16,61	0,8	–	–	–	–	–	–	–	–	–	–	–	●	●	●	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–

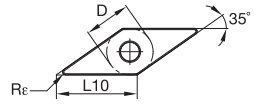




VNMG

ISO código do produto	D	L10	Rε	KCP05B	KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30B	KCP30	KCP40B	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35B	KCM35	KCPK05	K313	K68	KCU10	KCU25	KC5010	KC5025	KC5410	KT315
VNMG160408	9,53	16,61	0,8	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–	–	–
VNMG160412	9,53	16,61	1,2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–	–	–
VNMG220408	12,70	22,14	0,8	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–	–	–
VNMG220412	12,70	22,14	1,2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–	–	–



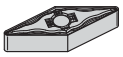


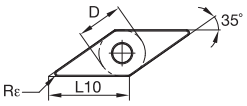
VNMG-LF

ISO código do produto	D	L10	Rε	KCP05B	KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30B	KCP30	KCP40B	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35B	KCM35	KCPK05	K313	K68	KCU10	KCU25	KC5010	KC5025	KC5410	KT315
VNMG160408LF	9,53	16,61	0,8	–	–	–	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
VNMG220404LF	12,70	22,14	0,4	–	–	–	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
VNMG220408LF	12,70	22,14	0,8	–	–	–	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–

● primeira opção
○ opção alternativa

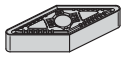
		KCP05B	KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30B	KCP30	KCP40B	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35B	KCM35	KCPK05	K313	K68	KCU10	KCU25	KC5010	KC5025	KC5410	KT315
P		●	●	●	●	●	●	●	●	●	●	○	○	○	○	○	○	○	○	○	○	○	○	●	●	●	●	●	●	●		●
M										○	○							●	●	●	●	●	●		●	●	●	●	●	●		●
K		○	○	○	○	○	○					●	●	●	●	●	●							●	●	●	●	●	●	●		●
N																									●	●	●	●	●	●	●	
S																									●	●	●	●	●	●		
H																																

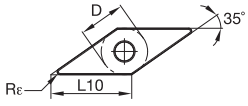




VNMG-FF

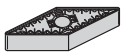
ISO código do produto	D	L10	Rε																													
VNMG160404FF	9,53	16,61	0,4	–	●	●	●	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–	–	–	–	●	–	●	–	–	●
VNMG160408FF	9,53	16,61	0,8	–	●	●	●	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	●	–	–	●

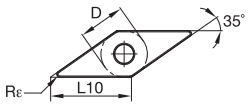




VNMG-FN

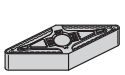
ISO código do produto	D	L10	Rε																													
VNMG160404FN	9,53	16,61	0,4	–	●	●	●	●	●	–	–	–	–	–	●	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●
VNMG160408FN	9,53	16,61	0,8	–	●	●	●	●	●	–	–	–	–	–	●	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●

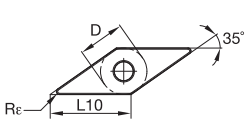




VNMG-FP

ISO código do produto	D	L10	Rε																													
VNMG160404FP	9,53	16,61	0,4	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–	–	–	–	●	–	●	–	–	●
VNMG160408FP	9,53	16,61	0,8	–	–	–	●	●	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–	–	–	–	●	–	●	–	–	●

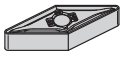


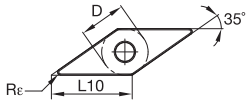


VNMG-MN

ISO código do produto	D	L10	Rε																													
VNMG160404MN	9,53	16,61	0,4	–	–	●	●	●	●	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
VNMG160408MN	9,53	16,61	0,8	●	●	●	●	●	●	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
VNMG160412MN	9,53	16,61	1,2	–	–	–	●	●	●	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–

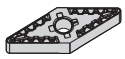
● primeira opção
○ opção alternativa

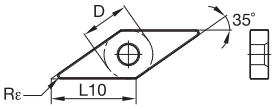




VNMG-MP

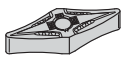
				KCP05B	KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30B	KCP30	KCP40B	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35B	KCM35	KCPK05	K313	K68	KCU10	KCU25	KC5010	KC5025	KC5410	KT315
P				●	●	●	●	●	●	●	●	●	●	○	○	○	○	○	○	○	○	○	○	○	○	●	●	●	●	●	●	●		●
M												○	○							●	●	●	●	●	●		●	●	●	●	●	●		●
K				○	○	○	○	○	○					●	●	●	●	●	●							●	●	●	●	●	●	●		●
N																											●	●	●	●	●	●	●
S																											●	●	●	●	●	●		
H																																		
ISO código do produto	D	L10	Rε																															
VNMG160404MP	9,53	16,61	0,4	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	●	●	●	–	–	–	–	–	●	–	●	–	–	–
VNMG160408MP	9,53	16,61	0,8	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	●	●	●	–	●	–	–	–	●	–	●	–	–	–
VNMG160412MP	9,53	16,61	1,2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–	–	–	–	–	●	–	●	–	–	–

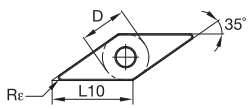




VNMG-MR

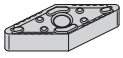
				KCP05B	KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30B	KCP30	KCP40B	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35B	KCM35	KCPK05	K313	K68	KCU10	KCU25	KC5010	KC5025	KC5410	KT315
ISO código do produto	D	L10	Rε																															
VNMG160412MR	9,52	16,61	1,2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–
VNMG160408MR	9,53	16,61	0,8	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–

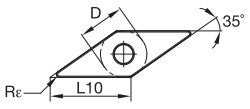




VNMG-MS

				KCP05B	KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30B	KCP30	KCP40B	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35B	KCM35	KCPK05	K313	K68	KCU10	KCU25	KC5010	KC5025	KC5410	KT315
ISO código do produto	D	L10	Rε																															
VNMG160401MS	9,53	16,61	0,1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	●	●	●	–	–	–
VNMG160402MS	9,53	16,61	0,2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	●	●	●	●	–	–
VNMG160404MS	9,53	16,61	0,4	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	●	●	●	●	–	–
VNMG160408MS	9,53	16,61	0,8	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	●	●	●	●	–	–
VNMG220404MS	12,70	22,14	0,4	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	●	●	–	–	–
VNMG220408MS	12,70	22,14	0,8	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	●	●	●	–	–

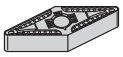


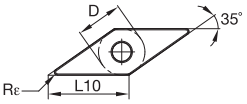


VNMG-P

				KCP05B	KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30B	KCP30	KCP40B	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35B	KCM35	KCPK05	K313	K68	KCU10	KCU25	KC5010	KC5025	KC5410	KT315
ISO código do produto	D	L10	Rε																															
VNMG160404P	9,53	16,61	0,4	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	●	–	●	–	–	–
VNMG160408P	9,53	16,61	0,8	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	●	–	●	–	–	–

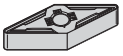
● primeira opção
○ opção alternativa

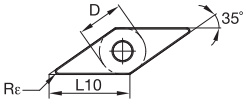




VNMG-RN

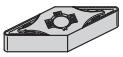
ISO código do produto	D	L10	Rε	KCP05B	KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30B	KCP30	KCP40B	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35B	KCM35	KCPK05	K313	K68	KCU10	KCU25	KC5010	KC5025	KC5410	KT315
				P		●	●	●	●	●	●	●	●	○	○	○	○	○	○	○	○	○	○	○	○	●	●	●	●	●	●	●		●
				M								○	○							●	●	●	●	●	●		●	●	●	●	●	●		●
				K		○	○	○	○	○	○					●	●	●	●	●	●						●	●	●	●	●	●		●
				N																							●	●	●	●	●	●	●	
				S																							●	●	●	●	●	●		
				H																														
VNMG160408RN	9,53	16,61	0,8	–	–	●	●	●	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
VNMG160412RN	9,53	16,61	1,2	–	–	–	●	●	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
VNMG220408RN	12,70	22,14	0,8	–	–	●	●	●	●	–	●	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
VNMG220412RN	12,70	22,14	1,2	–	–	–	●	–	●	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–

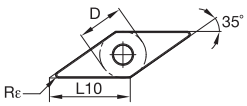




VNMG-RP

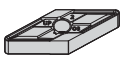
ISO código do produto	D	L10	Rε	KCP05B	KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30B	KCP30	KCP40B	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35B	KCM35	KCPK05	K313	K68	KCU10	KCU25	KC5010	KC5025	KC5410	KT315
VNMG160408RP	9,53	16,61	0,8	–	–	–	●	–	●	–	–	–	–	–	–	–	●	●	–	–	●	–	–	–	–	–	–	–	●	●	●	●	–	–
VNMG160412RP	9,53	16,61	1,2	–	–	–	●	–	●	–	–	–	–	–	–	●	●	–	●	–	–	–	●	–	–	–	–	–	●	●	–	●	–	–

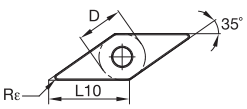




VNMG-UN

ISO código do produto	D	L10	Rε	KCP05B	KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30B	KCP30	KCP40B	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35B	KCM35	KCPK05	K313	K68	KCU10	KCU25	KC5010	KC5025	KC5410	KT315
VNMG160404UN	9,53	16,61	0,4	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
VNMG160408UN	9,53	16,61	0,8	–	–	–	–	–	–	–	–	–	–	●	–	●	●	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–

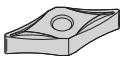


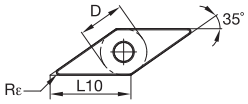


VNMG-UP

ISO código do produto	D	L10	Rε	KCP05B	KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30B	KCP30	KCP40B	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35B	KCM35	KCPK05	K313	K68	KCU10	KCU25	KC5010	KC5025	KC5410	KT315
VNMG160404UP	9,53	16,61	0,4	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	●	–	–	–	–	–	–	–	●	–	–	–
VNMG160408UP	9,53	16,61	0,8	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	●	–	–	–	–	–	●	–	●	–	–	–
VNMG160412UP	9,53	16,61	1,2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–

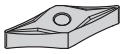
● primeira opção
○ opção alternativa

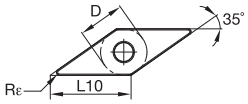




VNMP

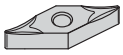
				KCP05B	KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30B	KCP30	KCP40B	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35B	KCM35	KCPK05	K313	K68	KCU10	KCU25	KC5010	KC5025	KC5410	KT315
ISO código do produto	**D**	**L10**	**Rε**																															
VNMP160404	9,53	16,61	0,4	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	●	–	–	–	–	–	–
VNMP160408	9,53	16,61	0,8	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	●	–	–	–	–	–	–

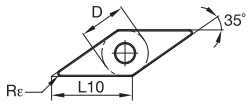




VNMP-K

				KCP05B	KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30B	KCP30	KCP40B	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35B	KCM35	KCPK05	K313	K68	KCU10	KCU25	KC5010	KC5025	KC5410	KT315
ISO código do produto	**D**	**L10**	**Rε**																															
VNMP160404K	9,53	16,61	0,4	–	–	●	–	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–	–	–
VNMP160408K	9,53	16,61	0,8	–	–	●	●	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–	–	–

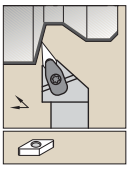


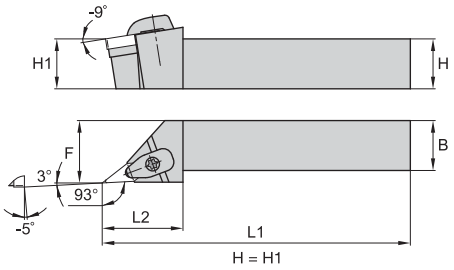


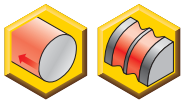
VNMS

				KCP05B	KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30B	KCP30	KCP40B	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35B	KCM35	KCPK05	K313	K68	KCU10	KCU25	KC5010	KC5025	KC5410	KT315
ISO código do produto	**D**	**L10**	**Rε**																															
VNMS160404	9,53	16,61	0,4	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–	●	–
VNMS160408	9,53	16,61	0,8	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–	●	–

P	●	●	●	●	●	●	●	●	●	●	○	○	○	○	○	○	○	○	○	○	○	○	○	●	●	●	●	●	●	●		●
M									○	○									●	●	●	●	●	●		●	●	●	●	●	●		●
K	○	○	○	○	○	○					●	●	●	●	●	●									●	●	●	●	●	●	●		●
N																										●	●	●	●	●	●	●	
S																										●	●	●	●	●	●		
H																																	



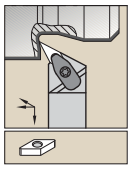


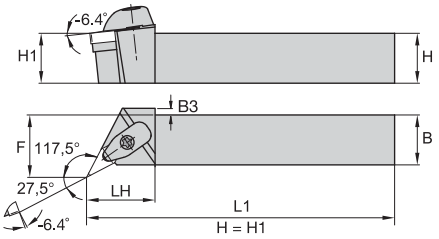


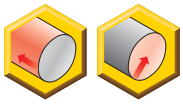
DVJN-KC 93°



número para pedido	código do produto	H	B	F	L1	LH	inserto padrão	calço	parafuso do calço	Torx Plus	conjunto do grampo	Torx Plus	pino elástico	pino de trava opcional
corte à direita (R)														
2439399	**DVJNR2020K16KC04**	20	20	25,0	125	46,0	VN..160408	**IVSN322**	**KMSP315IP**	15 IP	**CM215R ASSY**	15 IP	**SSP025016M**	**KLM34L9IP**
2439401	**DVJNR2525M16KC04**	25	25	32,0	150	46,0	VN..160408	**IVSN322**	**KMSP315IP**	15 IP	**CM215R ASSY**	15 IP	**SSP025016M**	**KLM34L9IP**
2439443	**DVJNR3225P16KC04**	32	25	32,0	170	46,0	VN..160408	**IVSN322**	**KMSP315IP**	15 IP	**CM215R ASSY**	15 IP	**SSP025016M**	**KLM34L9IP**
corte à esquerda (L)														
2439400	**DVJNL2020K16KC04**	20	20	25,0	125	46,0	VN..160408	**IVSN322**	**KMSP315IP**	15 IP	**CM215R ASSY**	15 IP	**SSP025016M**	**KLM34L9IP**
2439402	**DVJNL2525M16KC04**	25	25	32,0	150	46,0	VN..160408	**IVSN322**	**KMSP315IP**	15 IP	**CM215R ASSY**	15 IP	**SSP025016M**	**KLM34L9IP**
2439444	**DVJNL3225P16KC04**	32	25	32,0	170	46,0	VN..160408	**IVSN322**	**KMSP315IP**	15 IP	**CM215R ASSY**	15 IP	**SSP025016M**	**KLM34L9IP**



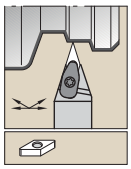


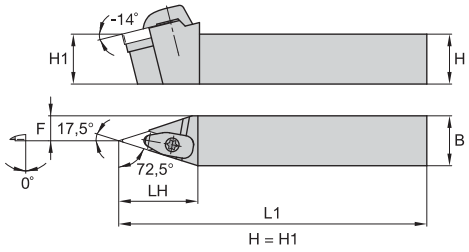


DVON-KC 117,5°



número para pedido	código do produto	H	B	F	L1	LH	B3	inserto padrão	calço	parafuso do calço	Torx Plus	conjunto do grampo	Torx Plus	pino elástico	pino de trava opcional
corte à direita (R)															
2439449	**DVONR2020K16KC04**	20	20	27,0	125	38,0	5,0	VN..160408	**IVSN322**	**KMSP315IP**	15 IP	**CM215R ASSY**	15 IP	**SSP025016M**	**KLM34L9IP**
2439451	**DVONR2525M16KC04**	25	25	32,0	150	38,0	—	VN..160408	**IVSN322**	**KMSP315IP**	15 IP	**CM215R ASSY**	15 IP	**SSP025016M**	**KLM34L9IP**
2439453	**DVONR3225P16KC04**	32	25	32,0	170	38,0	—	VN..160408	**IVSN322**	**KMSP315IP**	15 IP	**CM215R ASSY**	15 IP	**SSP025016M**	**KLM34L9IP**
corte à esquerda (L)															
2439450	**DVONL2020K16KC04**	20	20	27,0	125	38,0	5,0	VN..160408	**IVSN322**	**KMSP315IP**	15 IP	**CM215R ASSY**	15 IP	**SSP025016M**	**KLM34L9IP**
2439452	**DVONL2525M16KC04**	25	25	32,0	150	38,0	—	VN..160408	**IVSN322**	**KMSP315IP**	15 IP	**CM215R ASSY**	15 IP	**SSP025016M**	**KLM34L9IP**
2439454	**DVONL3225P16KC04**	32	25	32,0	170	38,0	—	VN..160408	**IVSN322**	**KMSP315IP**	15 IP	**CM215R ASSY**	15 IP	**SSP025016M**	**KLM34L9IP**



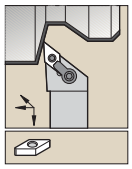


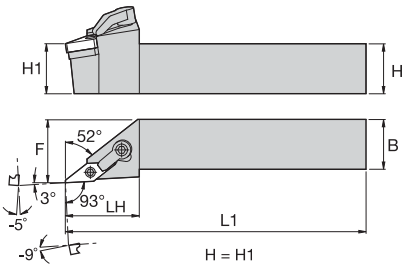


DVVN-KC 72,5°



número para pedido	código do produto	H	B	F	L1	LH	inserto padrão	calço	parafuso do calço	Torx Plus	conjunto do grampo	Torx Plus	pino elástico	pino de trava opcional
2439455	**DVVNN2020K16KC04**	20	20	10,0	150	48,0	VN..160408	**IVSN322**	**KMSP315IP**	15 IP	**CM215R ASSY**	15 IP	**SSP025016M**	**KLM34L9IP**
2439456	**DVVNN2525M16KC04**	25	25	12,0	150	48,0	VN..160408	**IVSN322**	**KMSP315IP**	15 IP	**CM215R ASSY**	15 IP	**SSP025016M**	**KLM34L9IP**

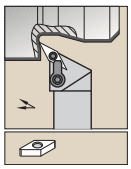


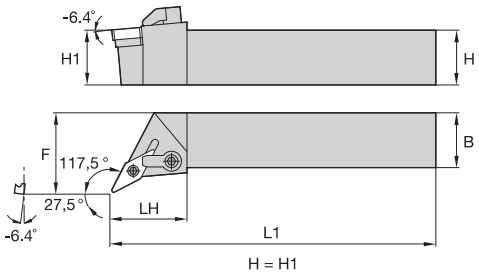


MVJN 93°

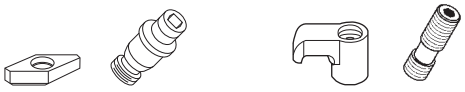


número para pedido	código do produto	H	B	F	L1	LH	inserto padrão	calço	pino de trava	sexta-vada	grampo	parafuso do grampo	sexta-vada
corte à direita (R)													
1101362	**MVJNR2020K16**	20	20	25,0	125	37,0	VN..160408	**IVSN322**	**KLM34L**	2 mm	**CKM31**	**STCM20**	3 mm
1101634	**MVJNR2525M16**	25	25	32,0	150	37,0	VN..160408	**IVSN322**	**KLM34L**	2 mm	**CKM31**	**STCM20**	3 mm
1101363	**MVJNR3225P16**	32	25	32,0	170	37,0	VN..160408	**IVSN322**	**KLM34L**	2 mm	**CKM31**	**STCM20**	3 mm
1101635	**MVJNR3225P22**	32	25	32,0	170	50,0	VN..220408	**IVSN432**	**KLM46**	2.5 mm	**CKM26**	**STCM4**	4 mm
3612649	**MVJNR3232P16**	32	32	40,5	171	37,0	VN..160408	**IVSN322**	**KLM34L**	2 mm	**CKM31**	**STCM20**	3 mm
corte à esquerda (L)													
1102320	**MVJNL2020K16**	20	20	25,0	125	37,0	VN..160408	**IVSN322**	**KLM34L**	2 mm	**CKM31**	**STCM20**	3 mm
1102321	**MVJNL2525M16**	25	25	32,0	150	37,0	VN..160408	**IVSN322**	**KLM34L**	2 mm	**CKM31**	**STCM20**	3 mm
1102322	**MVJNL3225P16**	32	25	32,0	170	37,0	VN..160408	**IVSN322**	**KLM34L**	2 mm	**CKM31**	**STCM20**	3 mm
1102323	**MVJNL3225P22**	32	25	32,0	170	50,0	VN..220408	**IVSN432**	**KLM46**	2.5 mm	**CKM26**	**STCM4**	4 mm
3612650	**MVJNL3232P16**	32	32	40,5	170	37,0	VN..160408	**IVSN322**	**KLM34L**	2 mm	**CKM31**	**STCM20**	3 mm

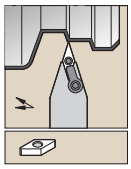


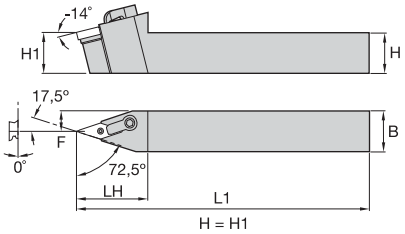


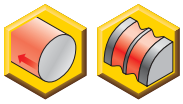
MVON 117,5°



número para pedido	código do produto	H	B	F	L1	LH	inserto padrão	calço	pino de trava	sexta-vada	grampo	parafuso do grampo	sexta-vada
corte à direita (R)													
1102238	**MVONR2525M16**	25	25	32,0	150	30,0	VN..160408	**IVSN322**	**KLM34L**	2 mm	**CKM6**	**STCM5**	2.5 mm
corte à esquerda (L)													
1102730	**MVONL2525M16**	25	25	32,0	150	30,0	VN..160408	**IVSN322**	**KLM34L**	2 mm	**CKM6**	**STCM5**	2.5 mm



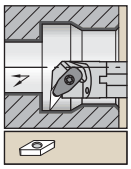




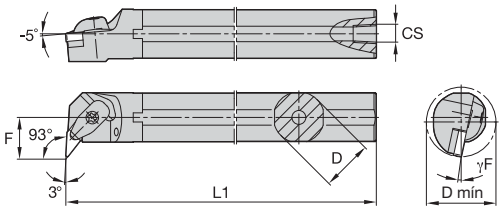
MVVN 72,5°



número para pedido	código do produto	H	B	F	L1	LH	inserto padrão	calço	pino de trava	sexta-vada	grampo	parafuso do grampo	sexta-vada
1102723	**MVVNN2525M22**	25	25	12,0	150	55,0	VN..220408	**IVSN432**	**KLM46**	2.5 mm	**CKM26**	**STCM4**	4 mm
1102720	**MVVNN2020K16**	42	20	10,0	125	42,0	VN..160408	**IVSN322**	**KLM34L**	2 mm	**CKM31**	**STCM20**	3 mm
1102721	**MVVNN2525M16**	66	25	12,5	150	42,0	VN..160408	**IVSN322**	**KLM34L**	2 mm	**CKM31**	**STCM20**	3 mm
1102722	**MVVNN3225P16**	86	32	12,5	170	42,0	VN..160408	**IVSN322**	**KLM34L**	2 mm	**CKM31**	**STCM20**	3 mm



Haste de aço com refrigeração interna.

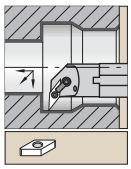




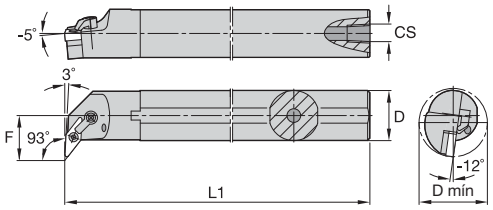
A-DVUN-KC 93°



número para pedido	código do produto	D	D mín	F	L1	CS	γF°	inserto padrão	calço	parafuso do calço	Torx Plus	conjunto do grampo	pino elástico	Torx Plus
corte à direita (R)														
2441916	**A32SDVUNR16KC04**	32	40,0	22,0	250	1/4-18 NPT	-9.0	VN..160408	**IVSN322**	**KMSP315IP**	15 IP	**CM234R ASSY**	**SSP025016M**	15 IP
2441918	**A40TDVUNR16KC04**	40	50,0	27,0	300	1/4-18 NPT	-8.0	VN..160408	**IVSN322**	**KMSP315IP**	15 IP	**CM215R ASSY**	**SSP025016M**	15 IP
corte à esquerda (L)														
2441917	**A32SDVUNL16KC04**	32	40,0	22,0	250	1/4-18 NPT	-9.0	VN..160408	**IVSN322**	**KMSP315IP**	15 IP	**CM234R ASSY**	**SSP025016M**	15 IP
2441919	**A40TDVUNL16KC04**	40	50,0	27,0	300	1/4-18 NPT	-8.0	VN..160408	**IVSN322**	**KMSP315IP**	15 IP	**CM215R ASSY**	**SSP025016M**	15 IP



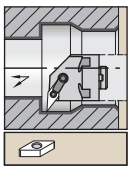
Haste de aço com refrigeração interna.



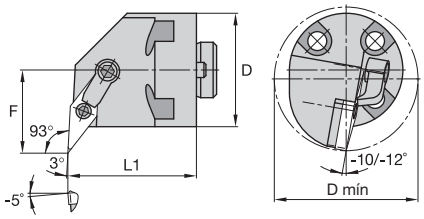
A-MVUN 93°



número para pedido	código do produto	D	D mín	F	L1	CS	inserto padrão	calço	pino de trava	sexta-vada	grampo	parafuso do grampo	sexta-vada
corte à direita (R)													
1098128	**A25RMVUNR16**	25	37,0	22,0	200	1/4-18 NPT	VN..160408	**IVSN322**	**KLM34L**	2 mm	**CKM31**	**STCM26**	3 mm
1098130	**A32SMVUNR16**	32	40,0	22,0	250	1/4-18 NPT	VN..160408	**IVSN322**	**KLM34L**	2 mm	**CKM31**	**STCM20**	3 mm
corte à esquerda (L)													
1098129	**A25RMVUNL16**	25	37,0	22,0	200	1/4-18 NPT	VN..160408	**IVSN322**	**KLM34L**	2 mm	**CKM31**	**STCM26**	3 mm
1098131	**A32SMVUNL16**	32	40,0	22,0	250	1/4-18 NPT	VN..160408	**IVSN322**	**KLM34L**	2 mm	**CKM31**	**STCM20**	3 mm



Com refrigeração interna.

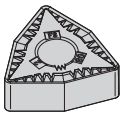


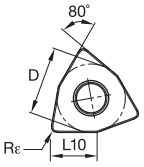
H-MVUN 93°



número para pedido	código do produto	D	D mín	F	L1	inserto padrão	calço	pino de trava	sexta-vada	grampo	parafuso do grampo	sexta-vada
corte à direita (R)												
3612215	**H40MVUNR16**	40	50,0	27,0	41	VN..160408	**IVSN322**	**KLM34L**	2 mm	**CKM22**	**STCM20**	3 mm
3612219	**H50MVUNR16**	50	63,0	35,0	41	VN..160408	**IVSN322**	**KLM34L**	2 mm	**CKM22**	**STCM20**	3 mm

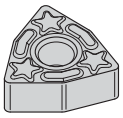
● primeira opção
○ opção alternativa

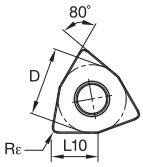




WNGG-FS

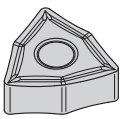
ISO código do produto	D	L10	Rε	KCP05B	KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30B	KCP30	KCP40B	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35B	KCM35	KCPK05	K313	K68	KCU10	KCU25	KC5010	KC5025	KC5410	KT315
P				●	●	●	●	●	●	●	●	●	●	○	○	○	○	○	○	○	○	○	○	○	○	●	●	●	●	●	●	●		●
M												○	○							●	●	●	●	●	●		●	●	●	●	●	●		●
K				○	○	○	○	○	○					●	●	●	●	●	●							●	●	●	●	●	●	●		●
N																											●	●	●	●	●	●	●	
S																											●	●	●	●	●	●		
H																																		
WNGG080404FS	12,70	8,69	0,4	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–
WNGG080408FS	12,70	8,69	0,8	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–	–

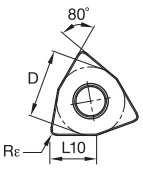




WNGG-LF

ISO código do produto	D	L10	Rε	KCP05B	KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30B	KCP30	KCP40B	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35B	KCM35	KCPK05	K313	K68	KCU10	KCU25	KC5010	KC5025	KC5410	KT315
WNGG080401LF	12,70	8,69	0,1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–
WNGG080402LF	12,70	8,69	0,2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	●	–	–	–
WNGG080404LF	12,70	8,69	0,4	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	●	–	–	–
WNGG080408LF	12,70	8,69	0,8	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–

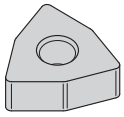


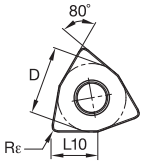


WNGP-K

ISO código do produto	D	L10	Rε	KCP05B	KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30B	KCP30	KCP40B	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35B	KCM35	KCPK05	K313	K68	KCU10	KCU25	KC5010	KC5025	KC5410	KT315
WNGP080408K	12,70	8,69	0,8	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	●	–

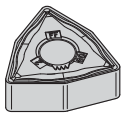
● primeira opção
○ opção alternativa

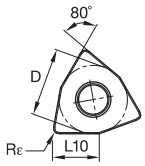




WNMA

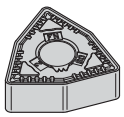
ISO código do produto	D	L10	Rε	KCP05B	KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30B	KCP30	KCP40B	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35B	KCM35	KCPK05	K313	K68	KCU10	KCU25	KC5010	KC5025	KC5410	KT315
WNMA060408	9,53	6,52	0,8	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
WNMA060412	9,53	6,52	1,2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
WNMA080408	12,70	8,69	0,8	–	–	–	–	–	–	–	–	–	–	–	●	–	●	●	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
WNMA080412	12,70	8,69	1,2	–	–	–	–	–	–	–	–	–	–	–	–	●	●	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
WNMA080416	12,70	8,69	1,6	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–

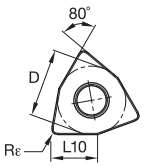




WNMG-FF

ISO código do produto	D	L10	Rε	KCP05B	KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30B	KCP30	KCP40B	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35B	KCM35	KCPK05	K313	K68	KCU10	KCU25	KC5010	KC5025	KC5410	KT315
WNMG060404FF	9,53	6,52	0,4	–	–	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–	–
WNMG060408FF	9,53	6,52	0,8	–	–	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	●
WNMG080404FF	12,70	8,69	0,4	–	–	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	●	–	–	–
WNMG080408FF	12,70	8,69	0,8	–	–	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–

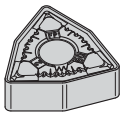


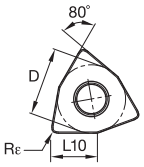


WNMG-FN

ISO código do produto	D	L10	Rε	KCP05B	KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30B	KCP30	KCP40B	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35B	KCM35	KCPK05	K313	K68	KCU10	KCU25	KC5010	KC5025	KC5410	KT315
WNMG060404FN	9,53	6,52	0,4	–	–	–	●	–	–	–	–	–	–	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●
WNMG060408FN	9,53	6,52	0,8	–	–	–	●	–	●	–	–	–	–	–	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●
WNMG080404FN	12,70	8,69	0,4	–	●	●	●	●	–	–	–	–	–	●	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●
WNMG080408FN	12,70	8,69	0,8	–	●	●	●	●	●	–	–	–	–	–	●	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●

● primeira opção
○ opção alternativa





WNMG-FP

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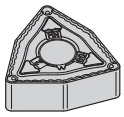
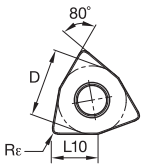
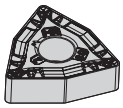
● primeira opção
○ opção alternativa

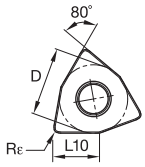




WNMG-MN

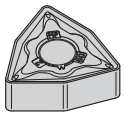
ISO código do produto	D	L10	Rε	KCP05B	KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30B	KCP30	KCP40B	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35B	KCM35	KCPK05	K313	K68	KCU10	KCU25	KC5010	KC5025	KC5410	KT315
				P ●	●	●	●	●	●	●	●	●	●	○	○	○	○	○	○	○	○	○	○	○	○	●	●	●	●	●	●	●		●
				M								○	○							●	●	●	●	●	●		●	●	●	●	●	●		●
				K	○	○	○	○	○	○					●	●	●	●	●	●							●	●	●	●	●	●	●		●
				N																							●	●	●	●	●	●	●		
				S																							●	●	●	●	●	●			
				H																														
WNMG060404MN	9,53	6,52	0,4	–	–	–	●	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
WNMG060408MN	9,53	6,52	0,8	–	–	●	●	●	●	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
WNMG060412MN	9,53	6,52	1,2	–	–	–	●	–	●	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
WNMG080408MN	12,70	8,69	0,8	–	●	●	●	●	●	●	●	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
WNMG080412MN	12,70	8,69	1,2	–	–	●	●	●	●	–	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
WNMG080416MN	12,70	8,69	1,6	–	–	–	–	●	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–

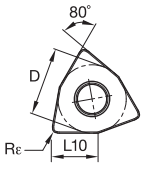




WNMG-MR

ISO código do produto	D	L10	Rε	KCP05B	KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30B	KCP30	KCP40B	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35B	KCM35	KCPK05	K313	K68	KCU10	KCU25	KC5010	KC5025	KC5410	KT315
WNMG060408MR	9,53	6,52	0,8	–	–	–	–	●	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–
WNMG080408MR	12,70	8,69	0,8	–	–	●	–	●	–	–	–	–	–	–	–	●	–	–	–	●	–	●	●	–	●	●	–	–	●	–	–	–	–	–
WNMG080412MR	12,70	8,69	1,2	–	–	●	–	●	–	–	–	–	–	–	–	–	–	–	–	●	–	●	–	–	●	●	–	–	–	–	–	–	–	–
WNMG080416MR	12,70	8,69	1,6	–	–	●	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–

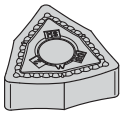


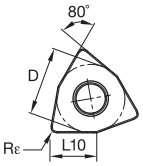


WNMG-MP

ISO código do produto	D	L10	Rε	KCP05B	KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30B	KCP30	KCP40B	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35B	KCM35	KCPK05	K313	K68	KCU10	KCU25	KC5010	KC5025	KC5410	KT315
WNMG060404MP	9,53	6,52	0,4	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	●	–	–	–	–	–	–	●	–	●	–	–	–
WNMG060408MP	9,53	6,52	0,8	–	–	–	–	–	●	–	–	–	–	–	–	–	–	–	–	–	●	●	●	●	–	–	–	–	●	–	●	–	–	–
WNMG060412MP	9,53	6,52	1,2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–	–	–	–	–	–	–	–
WNMG080408MP	12,70	8,69	0,8	–	–	–	●	●	●	–	–	–	–	–	–	–	–	–	–	●	●	●	●	●	●	–	–	–	●	–	●	–	–	–
WNMG080412MP	12,70	8,69	1,2	–	–	–	●	●	–	–	–	–	–	–	–	–	–	–	–	●	●	●	–	●	–	–	–	–	●	–	●	–	–	–

● primeira opção
○ opção alternativa





WNMG-MS

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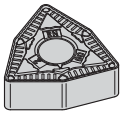
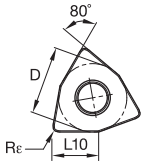
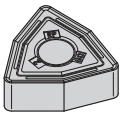
● primeira opção
○ opção alternativa

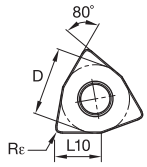




WNMG-RN

ISO código do produto	D	L10	Rε	KCP05B	KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30B	KCP30	KCP40B	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35B	KCM35	KCPK05	K313	K68	KCU10	KCU25	KC5010	KC5025	KC5410	KT315
P				●	●	●	●	●	●	●	●	●	●	○	○	○	○	○	○	○	○	○	○	○	○	●	●	●	●	●	●	●		●
M												○	○							●	●	●	●	●	●		●	●	●	●	●	●		●
K				○	○	○	○	○	○					●	●	●	●	●	●							●	●	●	●	●	●	●		●
N																											●	●	●	●	●	●	●	
S																											●	●	●	●	●	●		
H																																		
WNMG060408RN	9,53	6,52	0,8	–	–	●	–	●	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
WNMG060412RN	9,53	6,52	1,2	–	–	–	–	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
WNMG080408RN	12,70	8,69	0,8	–	–	●	●	●	●	●	●	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
WNMG080412RN	12,70	8,69	1,2	–	●	●	●	●	●	●	●	●	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–	–	–	–	–
WNMG080416RN	12,70	8,69	1,6	–	–	●	●	●	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–



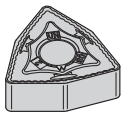


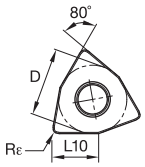
WNMG-RP

ISO código do produto	D	L10	Rε	KCP05B	KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30B	KCP30	KCP40B	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35B	KCM35	KCPK05	K313	K68	KCU10	KCU25	KC5010	KC5025	KC5410	KT315
WNMG060408RP	9,53	6,52	0,8	–	–	●	●	–	●	–	–	–	–	–	–	–	–	–	–	–	●	–	●	–	–	–	–	–	●	●	●	–	–	–
WNMG060412RP	9,53	6,52	1,2	–	–	–	●	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
WNMG080408RP	12,70	8,69	0,8	–	●	●	●	●	●	●	–	●	–	●	●	●	●	●	●	●	●	●	●	●	●	●	–	–	●	●	●	●	–	–
WNMG080412RP	12,70	8,69	1,2	–	●	●	●	●	●	–	●	–	–	–	●	●	●	●	●	–	●	●	●	●	●	●	–	–	●	●	●	–	–	–
WNMG080416RP	12,70	8,69	1,6	–	–	–	●	●	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–

Torneamento ISO

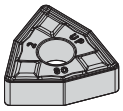
● primeira opção
○ opção alternativa

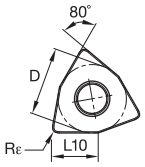




WNMG-UN

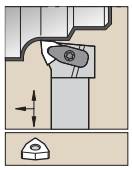
ISO código do produto	D	L10	Rε	KCP05B	KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30B	KCP30	KCP40B	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35B	KCM35	KCPK05	K313	K68	KCU10	KCU25	KC5010	KC5025	KC5410	KT315
P				●	●	●	●	●	●	●	●	●	●	○	○	○	○	○	○	○	○	○	○	○	○	●	●	●	●	●	●	●		●
M												○	○							●	●	●	●	●	●		●	●	●	●	●	●		●
K				○	○	○	○	○	○					●	●	●	●	●	●							●	●	●	●	●	●	●		●
N																											●	●	●	●	●	●	●	
S																											●	●	●	●	●	●		
H																																		
WNMG060408UN	9,53	6,52	0,8	–	–	–	–	–	–	–	–	–	–	–	–	–	●	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
WNMG080404UN	12,70	8,69	0,4	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
WNMG080408UN	12,70	8,69	0,8	–	–	–	–	–	–	–	–	–	–	●	–	●	●	●	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
WNMG080412UN	12,70	8,69	1,2	–	–	–	–	–	–	–	–	–	–	–	●	●	●	●	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
WNMG080416UN	12,70	8,69	1,6	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–

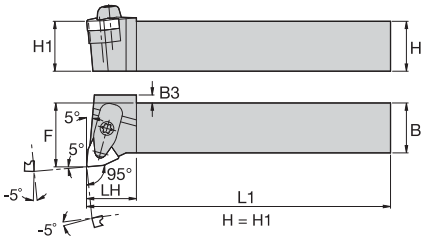




WNMG-UP

ISO código do produto	D	L10	Rε	KCP05B	KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30B	KCP30	KCP40B	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35B	KCM35	KCPK05	K313	K68	KCU10	KCU25	KC5010	KC5025	KC5410	KT315
WNMG060408UP	9,53	6,52	0,8	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–	–	–	–	–	–	–	–	–
WNMG080408UP	12,70	8,69	0,8	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	●	●	–	–	–	–	–	●	–	●	–	–	–
WNMG080412UP	12,70	8,69	1,2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	●	–	–	–	●	–	●	–	–	–



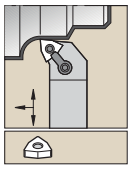


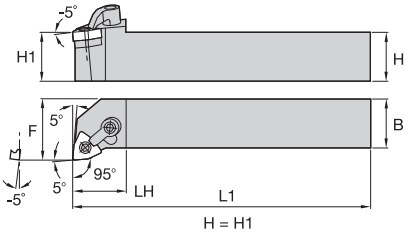


DWLN-KC 95°



número para pedido	código do produto	H	B	F	L1	LH	B3	inserto padrão	calço	parafuso do calço	Torx Plus	conjunto do grampo	Torx Plus	pino elástico	pino de trava opcional
corte à direita (R)															
2439476	**DWLNR2020K06KC04**	20	20	25,0	125	31,0	—	WN..060408	**IWSN322**	**KMSP315IP**	15 IP	**CM234R ASSY**	15 IP	**SSP025016M**	**KLM34L9IP**
2439471	**DWLNR2020K08KC04**	20	20	25,0	125	33,0	—	WN..080408	**IWSN433**	**KMSP415IP**	15 IP	**CM234R ASSY**	15 IP	**SSP025016M**	**KLM4615IP**
2273451	**DWLNR2525M06KC04**	25	25	32,0	150	25,0	—	WN..060408	**IWSN322**	**KMSP315IP**	15 IP	**CM234R ASSY**	15 IP	**SSP025016M**	**KLM34L9IP**
1908860	**DWLNR2525M08KC04**	25	25	32,0	150	25,0	4,0	WN..080408	**IWSN433**	**KMSP415IP**	15 IP	**CM234R ASSY**	15 IP	**SSP025016M**	**KLM4615IP**
1908862	**DWLNR3232P08KC04**	32	32	40,0	170	25,0	—	WN..080408	**IWSN433**	**KMSP415IP**	15 IP	**CM234R ASSY**	15 IP	**SSP025016M**	**KLM4615IP**
corte à esquerda (L)															
2439470	**DWLNL2020K06KC04**	20	20	25,0	125	31,0	—	WN..060408	**IWSN322**	**KMSP315IP**	15 IP	**CM234R ASSY**	15 IP	**SSP025016M**	**KLM34L9IP**
2439472	**DWLNL2020K08KC04**	20	20	25,0	125	33,0	—	WN..080408	**IWSN433**	**KMSP415IP**	15 IP	**CM234R ASSY**	15 IP	**SSP025016M**	**KLM4615IP**
2273455	**DWLNL2525M06KC04**	25	25	32,0	150	25,0	—	WN..060408	**IWSN322**	**KMSP315IP**	15 IP	**CM234R ASSY**	15 IP	**SSP025016M**	**KLM34L9IP**
1908861	**DWLNL2525M08KC04**	25	25	32,0	150	25,0	4,0	WN..080408	**IWSN433**	**KMSP415IP**	15 IP	**CM234R ASSY**	15 IP	**SSP025016M**	**KLM4615IP**
1908893	**DWLNL3232P08KC04**	32	32	40,0	170	25,0	—	WN..080408	**IWSN433**	**KMSP415IP**	15 IP	**CM234R ASSY**	15 IP	**SSP025016M**	**KLM4615IP**





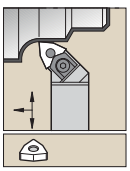


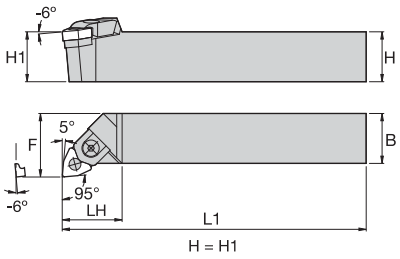
MWLN 95°



número para pedido	código do produto	H	B	F	L1	LH	inserto padrão	calço	pino de trava	sexta-vada	grampo	parafuso do grampo	sexta-vada
corte à direita (R)													
1101293	**MWLNR2020K06**	20	20	25,0	125	25,0	WN..060408	**IWSN322**	**KLM34L**	2 mm	**CKM6**	**STCM5**	2.5 mm
1101355	**MWLNR2525M06**	25	25	32,0	150	25,0	WN..060408	**IWSN322**	**KLM34L**	2 mm	**CKM6**	**STCM5**	2.5 mm
3612259	**MWLNR3232P08**	32	32	40,0	170	32,0	WNMA080408	**IWSN433**	**KLM46**	2.5 mm	**CKM7**	**STCM5**	2.5 mm
corte à esquerda (L)													
1101292	**MWLNL2020K06**	20	20	25,0	125	25,0	WN..060408	**IWSN322**	**KLM34L**	2 mm	**CKM6**	**STCM5**	2.5 mm
1101354	**MWLNL2525M06**	25	25	32,0	150	25,0	WN..060408	**IWSN322**	**KLM34L**	2 mm	**CKM6**	**STCM5**	2.5 mm
3612260	**MWLNL3232P08**	32	32	40,0	170	32,0	WNMA080408	**IWSN433**	**KLM46**	2.5 mm	**CKM7**	**STCM5**	2.5 mm

Porta-ferramentas Wedgelock™ • Insertos Wedgelock



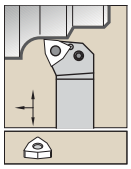


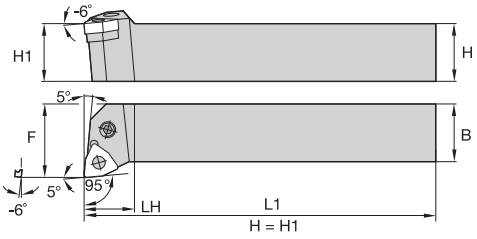


MWLN 95°



número para pedido	código do produto	H	B	F	L1	LH	inserto padrão	calço	pino de trava	kit de parafusos com ponta cônica	Torx	conjunto do grampo	sexta-vada
corte à direita (R)													
1244924	**MWLNR2020K08H4**	20	20	25,0	125	32,0	WN..080408	**512.131**	**513.132**	**192.636**	T15	**551.131**	3 mm
1192355	**MWLNR2525M08H4**	25	25	32,0	150	36,0	WN..080408	**512.131**	**513.132**	**192.636**	T15	**551.131**	3 mm
1244925	**MWLNR3225P08H4**	32	25	32,0	170	36,0	WN..080408	**512.131**	**513.132**	**192.636**	T15	**551.131**	3 mm
corte à esquerda (L)													
1244921	**MWLNL2020K08H4**	20	20	25,0	125	32,0	WN..080408	**512.131**	**513.132**	**192.636**	T15	**551.131**	3 mm
1244922	**MWLNL2525M08H4**	25	25	32,0	150	36,0	WN..080408	**512.131**	**513.132**	**192.636**	T15	**551.131**	3 mm
1244923	**MWLNL3225P08H4**	32	25	32,0	170	36,0	WN..080408	**512.131**	**513.132**	**192.636**	T15	**551.131**	3 mm





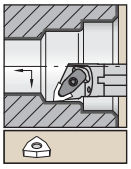


PWLN 95°

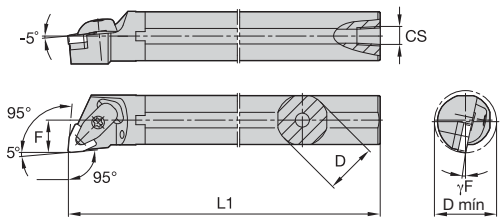


número para pedido	código do produto	H	B	F	L1	LH	inserto padrão	calço	pino do calço	punção do pino	alavanca	parafuso da alavanca	Torx Plus
corte à direita (R)													
1244771	**PWLNR1616H06**	16	16	20,0	100	14,0	WN..060404	**512.134**	**513.018**	**515.018**	**511.018**	**514.118**	10 IP
1192397	**PWLNR2020K06**	20	20	25,0	125	14,0	WN..060404	**512.134**	**513.018**	**515.018**	**511.018**	**514.118**	10 IP
1192398	**PWLNR2020K08**	20	20	25,0	125	20,0	WN..080408	**512.135**	**513.023**	**515.018**	**511.023**	**514.123**	15 IP
1192399	**PWLNR2525M08**	25	25	32,0	150	26,0	WN..080408	**512.135**	**513.023**	**515.018**	**511.023**	**514.123**	15 IP
1244772	**PWLNR3225P08**	32	25	32,0	170	26,0	WN..080408	**512.135**	**513.023**	**515.018**	**511.023**	**514.123**	15 IP
corte à esquerda (L)													
1192396	**PWLNL1616H06**	16	16	20,0	100	14,0	WN..060404	**512.134**	**513.018**	**515.018**	**511.018**	**514.118**	10 IP
1244767	**PWLNL2020K06**	20	20	25,0	125	14,0	WN..060404	**512.134**	**513.018**	**515.018**	**511.018**	**514.118**	10 IP
1244768	**PWLNL2020K08**	20	20	25,0	125	20,0	WN..080408	**512.135**	**513.023**	**515.018**	**511.023**	**514.123**	15 IP
1244769	**PWLNL2525M08**	25	25	32,0	150	26,0	WN..080408	**512.135**	**513.023**	**515.018**	**511.023**	**514.123**	15 IP
1244770	**PWLNL3225P08**	32	25	32,0	170	26,0	WN..080408	**512.135**	**513.023**	**515.018**	**511.023**	**514.123**	15 IP

Barras de mandrilar Kenclamp™



Haste de aço com refrigeração interna.

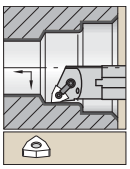




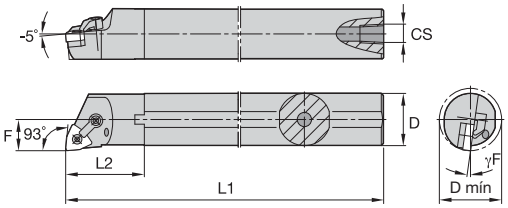
A-DWLN-KC 95°



número para pedido	código do produto	D	D mín	F	L1	CS	γF°	inserto padrão	calço	parafuso do calço	Torx Plus	conjunto do grampo	pino elástico	Torx Plus
corte à direita (R)														
2441921	**A25RDWLNR06KC04**	25	32,0	17,0	200	1/4-18 NPT	-14.0	WN..060408	–	–	–	**CM234R ASSY**	**SSP025016M**	15 IP
2441923	**A25RDWLNR08KC04**	25	32,0	17,0	200	1/4-18 NPT	-12.0	WN..080408	–	–	–	**CM234R ASSY**	**SSP025016M**	15 IP
2441925	**A32SDWLNR08KC04**	32	40,0	22,0	250	1/4-18 NPT	-14.0	WN..080408	**IWSN433**	**KMSP415IP**	15 IP	**CM234R ASSY**	**SSP025016M**	15 IP
2441927	**A40TDWLNR08KC04**	40	50,0	27,0	300	1/4-18 NPT	-14.0	WN..080408	**IWSN433**	**KMSP415IP**	15 IP	**CM234R ASSY**	**SSP025016M**	15 IP
corte à esquerda (L)														
2441922	**A25RDWLNL06KC04**	25	32,0	17,0	200	1/4-18 NPT	-14.0	WN..060408	–	–	–	**CM234R ASSY**	**SSP025016M**	15 IP
2441924	**A25RDWLNL08KC04**	25	32,0	17,0	200	1/4-18 NPT	-12.0	WN..080408	–	–	–	**CM234R ASSY**	**SSP025016M**	15 IP
2441926	**A32SDWLNL08KC04**	32	40,0	22,0	250	1/4-18 NPT	-14.0	WN..080408	**IWSN433**	**KMSP415IP**	15 IP	**CM234R ASSY**	**SSP025016M**	15 IP

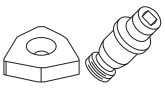


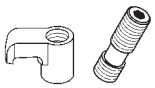
Haste de aço com refrigeração interna.



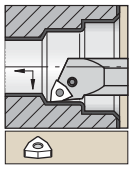


A-MWLN 95°

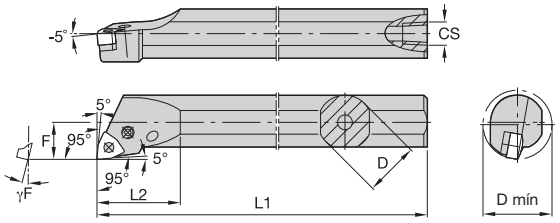




número para pedido	código do produto	D	D mín	F	L1	LH	CS	γF°	inserto padrão	calço	pino de trava	sexta-vada	grampo	parafuso do grampo	sexta-vada
corte à direita (R)															
1098771	**A25RMWLNR06**	25	32,0	17,0	200	—	1/4-18 NPT	-12.0	WN..060408	**—**	**KLM33L**	2 mm	**CKM6**	**STCM5**	2.5 mm
1098773	**A25RMWLNR08**	25	32,0	17,0	200	39,0	1/4-18 NPT	-12.0	WN..080408	**—**	**KLM43**	2 mm	**CKM20**	**STCM11**	3 mm
1098772	**A32SMWLNR06**	32	40,0	22,0	250	—	1/4-18 NPT	-10.0	WN..060408	**IWSN322**	**KLM34L**	2 mm	**CKM6**	**STCM5**	2.5 mm
1098774	**A32SMWLNR08**	32	40,0	22,0	250	39,7	1/4-18 NPT	-14.0	WN..080408	**IWSN433**	**KLM46**	2.5 mm	**CKM20**	**STCM20**	3 mm
1098775	**A40TMWLNR08**	40	50,0	27,0	300	41,6	1/4-18 NPT	-12.0	WN..080408	**IWSN433**	**KLM46**	2.5 mm	**CKM20**	**STCM20**	3 mm
corte à esquerda (L)															
1098783	**A25RMWLNL08**	25	32,0	17,0	200	39,0	1/4-18 NPT	-12.0	WN..080408	**—**	**KLM43**	2 mm	**CKM20**	**STCM11**	3 mm
1098782	**A32SMWLNL06**	32	40,0	22,0	250	—	1/4-18 NPT	-10.0	WN..060408	**IWSN322**	**KLM34L**	2 mm	**CKM6**	**STCM5**	2.5 mm
1098784	**A32SMWLNL08**	32	40,0	22,0	251	39,7	1/4-18 NPT	-14.0	WN..080408	**IWSN433**	**KLM46**	2.5 mm	**CKM20**	**STCM20**	3 mm
1098785	**A40TMWLNL08**	40	50,0	27,0	300	41,6	1/4-18 NPT	-12.0	WN..080408	**IWSN433**	**KLM46**	2.5 mm	**CKM20**	**STCM20**	3 mm



Haste de aço com refrigeração interna.



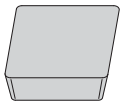
A-PWLN 95°

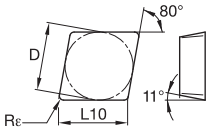


número para pedido	código do produto	D	D mín	F	L1	L2	CS	γF°	inserto padrão	calço	pino do calço	pino	alavanca	parafuso da alavanca	Torx Plus
corte à direita (R)															
1244113	**A16RPWLNR06**	16	27,0	11,0	200	32	1/8-27 NPT	-12.0	WN..060404	**–**	**–**	**–**	**511.030**	**514.112**	–
1244115	**A20SPWLNR06**	20	25,0	13,0	250	–	1/8-27 NPT	-14.0	WN..060408	**–**	**–**	**–**	**511.030**	**514.112**	8 IP
1194440	**A25RPWLNR08**	25	32,0	17,0	200	–	1/4-18 NPT	-12.0	WN..080408	**512.135**	**513.023**	**515.018**	**511.023**	**514.123**	15 IP
1244118	**A32SPWLNR08**	32	40,0	22,0	250	50	1/4-18 NPT	-10.0	WN..080408	**512.135**	**513.023**	**515.018**	**511.023**	**514.123**	–
1244120	**A40TPWLNR08**	40	50,0	27,0	300	54	1/4-18 NPT	-8.0	WN..080408	**512.135**	**513.023**	**515.018**	**511.023**	**514.123**	–
corte à esquerda (L)															
1191396	**A16RPWLNL06**	16	27,0	11,0	200	32	1/8-27 NPT	-12.0	WN..060404	**–**	**–**	**–**	**511.030**	**514.112**	–
1244114	**A20SPWLNL06**	20	25,0	13,0	250	–	1/8-27 NPT	-14.0	WN..060408	**–**	**–**	**–**	**511.030**	**514.112**	8 IP
1244116	**A25RPWLNL08**	25	32,0	17,0	200	–	1/4-18 NPT	-12.0	WN..080408	**512.135**	**513.023**	**515.018**	**511.023**	**514.123**	15 IP
1244117	**A32SPWLNL08**	32	40,0	22,0	250	50	1/4-18 NPT	-10.0	WN..080408	**512.135**	**513.023**	**515.018**	**511.023**	**514.123**	–
1244119	**A40TPWLNL08**	40	50,0	27,0	300	54	1/4-18 NPT	-8.0	WN..080408	**512.135**	**513.023**	**515.018**	**511.023**	**514.123**	–

● primeira opção
○ opção alternativa

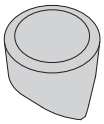
		KCP25B	KCK15B	KCK15	K313	K68	KCS10	KCU10	KC5010
P		●	○	○	●	●		●	●
M					●	●	●	●	●
K		○	●	●	●	●		●	●
N					●	●		●	●
S					●	●	●	●	●
H									

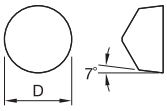




CPGN

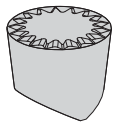
ISO código do produto	D	L10	Rε	KCP25B	KCK15B	KCK15	K313	K68	KCS10	KCU10	KC5010
CPGN120304	12,70	12,90	0,4	–	–	–	●	●	–	–	–
CPGN120308	12,70	12,90	0,8	–	–	–	●	●	–	–	–

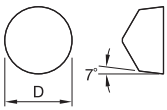




RCGV

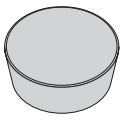
ISO código do produto	D	L10	Rε	KCP25B	KCK15B	KCK15	K313	K68	KCS10	KCU10	KC5010
RCGV060400	6,35	–	–	–	–	–	–	–	–	●	●
RCGV090700	9,53	–	–	–	–	–	–	–	–	–	●
RCGV120700	12,70	–	–	–	–	–	●	–	–	–	●

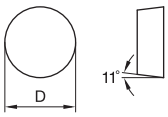




RCGV-MP

ISO código do produto	D	L10	Rε	KCP25B	KCK15B	KCK15	K313	K68	KCS10	KCU10	KC5010
RCGX060400MP	6,35	–	–	–	–	–	–	–	●	–	–
RCGX120700MP	12,70	–	–	–	–	–	–	–	●	–	–

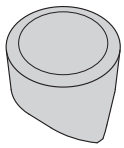


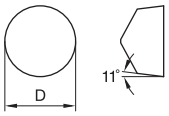


RPGN

ISO código do produto	D	L10	Rε	KCP25B	KCK15B	KCK15	K313	K68	KCS10	KCU10	KC5010
RPGN120300	12,70	–	–	–	–	–	●	–	–	–	–

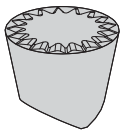
● primeira opção
○ opção alternativa

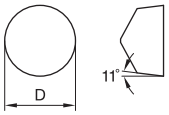




RPGV

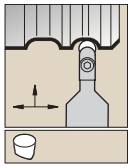
ISO código do produto	D	L10	Rε	KCP25B	KCK15B	KCK15	K313	K68	KCS10	KCU10	KC5010
				P ●	○	○	●	●		●	●
				M				●	●	●	●
				K ○	●	●	●	●		●	●
				N				●	●		●	●
				S				●	●	●	●	●
				H								
RPGV060400	6,35	–	–	–	–	–	–	–	–	–	●
RPGV090700	9,53	–	–	–	–	–	–	–	–	–	●
RPGV120700	12,70	–	–	–	–	–	–	–	–	–	●

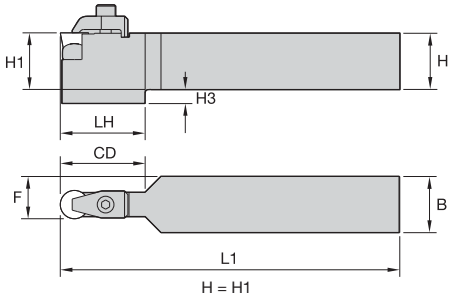




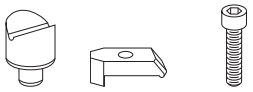
RPGV-MP

ISO código do produto	D	L10	Rε	KCP25B	KCK15B	KCK15	K313	K68	KCS10	KCU10	KC5010
RPGX060400MP	6,35	–	–	–	–	–	–	–	●	–	–
RPGX090700MP	9,53	–	–	–	–	–	–	–	●	–	–
RPGV120700MP	12,70	–	–	–	–	–	–	–	–	–	●
RPGX120700MP	12,70	–	–	–	–	–	–	–	●	–	–



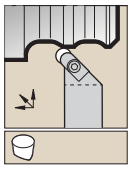


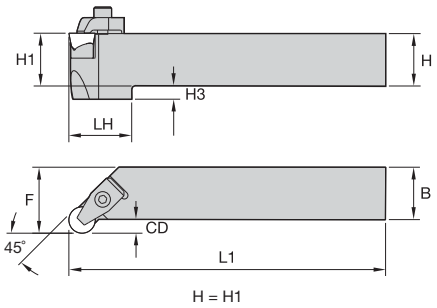
CRDP



número para pedido	código do produto	H	B	F	L1	LH	H3	CD	inserto padrão	assento	grampo	parafuso do grampo	sexta-vada
3642247	**CRDPN2525M06V**	25	25	12,5	151	—	—	19,0	RPGX060400E	**NST1**	**CM214**	**MS1321**	2.5 mm
3642249	**CRDPN3232P09V**	32	32	16,0	171	—	—	29,0	RPGX090700E	**NST2**	**CM219**	**CS412**	3.5 mm
3642248	**CRDPN2525M09V**	25	25	12,5	151	—	—	29,0	RPGX090700E	**NST2**	**CM219**	**CS412**	3.5 mm
3642251	**CRDPN3232P12V**	32	32	16,0	171	—	—	38,0	RPGX120700E	**NST3**	**CM216**	**CS412**	3.5 mm
3642252	**CRDPN3232P15V**	32	32	16,0	171	38,1	6,4	38,0	RPGX151000	**NST4**	**CM217**	**MS1294**	6 mm

NOTA: Os porta-ferramentas CRDP podem usar os estilos de insertos RPGX e RCGX.





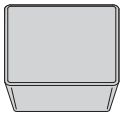
CRGP

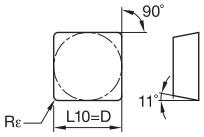


número para pedido	código do produto	H	B	F	L1	CD	inserto padrão	assento	grampo	parafuso do grampo	sexta-vada
corte à direita (R)											
3642276	**CRGPR2525M06V**	25	25	32,0	151	7,0	RPGX060400E	**NST1**	**CM214**	**MS1321**	2.5 mm
3642280	**CRGPR3232P09V**	32	32	40,0	171	8,0	RPGX090700E	**NST2**	**CM219**	**CS412**	3.5 mm
corte à esquerda (L)											
3642277	**CRGPL2525M06V**	25	25	32,0	151	7,0	RPGX060400E	**NST1**	**CM214**	**MS1321**	2.5 mm
3642281	**CRGPL3232P09V**	32	32	40,0	171	8,0	RPGX090700E	**NST2**	**CM219**	**CS412**	3.5 mm

NOTA: Os porta-ferramentas CRGP podem usar os estilos de insertos RPGX e RCGX.

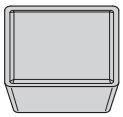
● primeira opção
○ opção alternativa

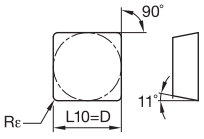




SPGN

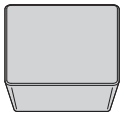
ISO código do produto	D	L10	Rε	KCP25B	KCK15B	KCK15	K313	K68	KCS10	KCU10	KC5010
				P ●	○	○	●	●		●	●
				M				●	●	●	●
				K ○	●	●	●	●		●	●
				N				●	●	●	●
				S				●	●	●	●
				H							
SPGN090304	9,53	9,53	0,4	–	–	–	–	●	–	–	●
SPGN090308	9,53	9,53	0,8	–	–	●	–	●	–	–	●
SPGN120304	12,70	12,70	0,4	–	–	–	–	●	–	●	●
SPGN120308	12,70	12,70	0,8	–	–	–	●	●	–	●	●
SPGN120312	12,70	12,70	1,2	–	–	–	–	●	–	–	–
SPGN120412	12,70	12,70	1,2	–	–	–	–	–	–	●	–
SPGN120316	12,70	12,70	1,6	–	–	–	–	–	–	–	●
SPGN190408	19,05	19,05	0,8	–	–	–	–	●	–	–	–
SPGN190412	19,05	19,05	1,2	–	–	–	●	–	–	●	–

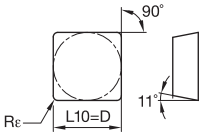




SPGR–K

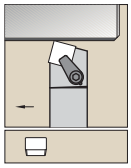
ISO código do produto	D	L10	Rε	KCP25B	KCK15B	KCK15	K313	K68	KCS10	KCU10	KC5010
SPGR090308K	9,53	9,53	0,8	–	–	–	–	–	–	●	●
SPGR120308K	12,70	12,70	0,8	●	–	–	–	–	–	–	–

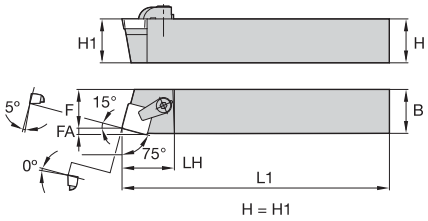




SPUN

ISO código do produto	D	L10	Rε	KCP25B	KCK15B	KCK15	K313	K68	KCS10	KCU10	KC5010
SPUN120304	12,70	12,70	0,4	●	–	–	–	●	–	–	–
SPUN120308	12,70	12,70	0,8	●	–	–	–	●	–	–	–
SPUN120312	12,70	12,70	1,2	●	–	–	–	–	–	–	–

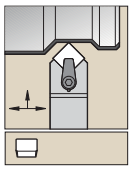


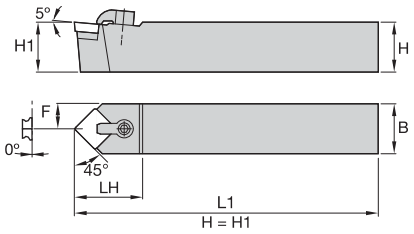


CSBP 75°



número para pedido	código do produto	H	B	F	L1	LH	FA	inserto padrão	calço	parafuso do calço	sexta-vada	grampo	parafuso do grampo	sexta-vada
corte à direita (R)														
1097750	**CSBPR2020K12**	20	20	17,0	125	30,0	3,1	SP..120308	**SM840**	**MS111**	2 mm	**CKM10**	**STCM8**	4 mm

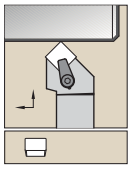


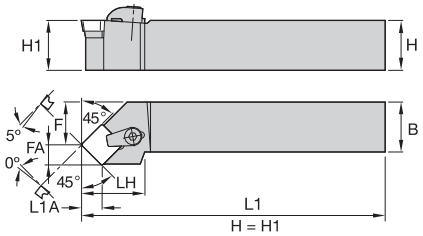


CSDP 45°



número para pedido	código do produto	H	B	F	L1	LH	inserto padrão	calço	parafuso do calço	sexta-vada	grampo	parafuso do grampo	sexta-vada
1097754	**CSDPN2020K12**	20	20	10,0	125	32,0	SP..120308	**SM840**	**MS111**	2 mm	**CKM10**	**STCM8**	4 mm
1097755	**CSDPN2525M12**	25	25	12,5	150	32,0	SP..120308	**SM840**	**MS111**	2 mm	**CKM9**	**STCM4**	4 mm

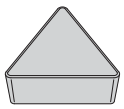


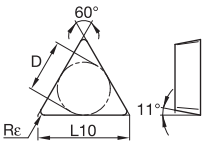


CSSP 45°



número para pedido	código do produto	H	B	F	L1	LH	FA	L1A	inserto padrão	calço	parafuso do calço	sexta-vada	grampo	parafuso do grampo	sexta-vada
corte à direita (R)															
1244605	**CSSPR2020K12**	20	20	25,0	125	32,0	8,7	8,3	SP..120308	**SM840**	**MS111**	2 mm	**CKM10**	**STCM8**	4 mm
1244606	**CSSPR2525M12**	25	25	32,0	150	32,0	8,7	8,3	SP..120308	**SM840**	**MS111**	2 mm	**CKM9**	**STCM4**	4 mm
corte à esquerda (L)															
1244604	**CSSPL2525M12**	25	25	32,0	150	32,0	8,7	8,3	SP..120308	**SM840**	**MS111**	2 mm	**CKM9**	**STCM4**	4 mm



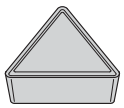


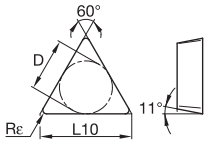
● primeira opção
○ opção alternativa

P		●	○	○	●	●		●	●
M					●	●	●	●	●
K		○	●	●	●	●		●	●
N					●	●		●	●
S					●	●	●	●	●
H									

TPGN/TPG

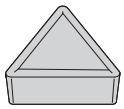
ISO código do produto	D	L10	Rε	KCP25B	KCK15B	KCK15	K313	K68	KCS10	KCU10	KC5010
TPGN110304	6,35	11,00	0,4	–	–	–	●	●	–	●	●
TPGN110308	6,35	11,00	0,8	–	–	–	–	●	–	●	●
TPGN160302	9,53	16,50	0,2	–	–	–	●	●	–	–	●
TPGN160304	9,53	16,50	0,4	–	–	–	●	●	–	●	●
TPGN160308	9,53	16,50	0,8	–	–	–	●	●	–	●	●
TPGN160312	9,53	16,50	1,2	–	–	–	●	–	–	–	●
TPGN160316	9,53	16,50	1,6	–	–	–	–	●	–	–	●
TPGN220404	12,70	22,00	0,4	–	–	–	●	●	–	●	●
TPGN220408	12,70	22,00	0,8	●	–	–	●	●	–	●	●
TPGN220412	12,70	22,00	1,2	–	–	–	–	●	–	●	●
TPGN220416	12,70	22,00	1,6	–	–	–	–	●	–	–	●

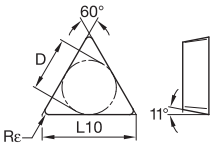




TPGR–K

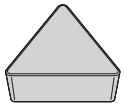
ISO código do produto	D	L10	Rε	KCP25B	KCK15B	KCK15	K313	K68	KCS10	KCU10	KC5010
TPGR110304K	6,35	11,00	0,4	–	–	–	–	–	–	–	●
TPGR110308K	6,35	11,00	0,8	–	–	–	–	–	–	●	–
TPGR160304K	9,53	16,50	0,4	–	–	–	–	–	–	●	●
TPGR160308K	9,53	16,50	0,8	●	–	–	–	–	–	●	●
TPGR220404K	12,70	22,00	0,4	–	–	–	–	–	–	●	–
TPGR220408K	12,70	22,00	0,8	–	–	–	–	–	–	●	–

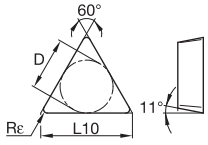




TPMR

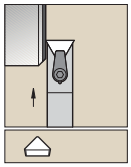
ISO código do produto	D	L10	Rε	KCP25B	KCK15B	KCK15	K313	K68	KCS10	KCU10	KC5010
TPMR110304	6,35	11,00	0,4	●	●	–	–	–	–	–	–
TPMR110308	6,35	11,00	0,8	●	–	–	–	–	–	–	–
TPMR160304	9,53	16,50	0,4	●	●	–	–	–	–	–	–
TPMR160308	9,53	16,50	0,8	●	●	–	–	–	–	–	–
TPMR220408	12,70	22,00	0,8	●	–	–	–	–	–	–	–

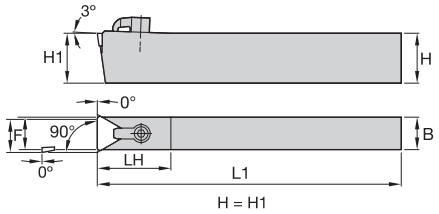




TPUN

ISO código do produto	D	L10	Rε	KCP25B	KCK15B	KCK15	K313	K68	KCS10	KCU10	KC5010
TPUN110304	6,35	11,00	0,4	–	●	–	–	●	–	–	–
TPUN110308	6,35	11,00	0,8	–	●	–	–	●	–	–	–
TPUN160304	9,53	16,50	0,4	●	●	–	–	●	–	–	–
TPUN160308	9,53	16,50	0,8	●	●	–	–	●	–	–	–
TPUN220408	12,70	22,00	0,8	●	●	–	–	●	–	–	–
TPUN220412	12,70	22,00	1,2	●	●	–	–	●	–	–	–

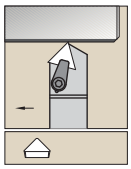


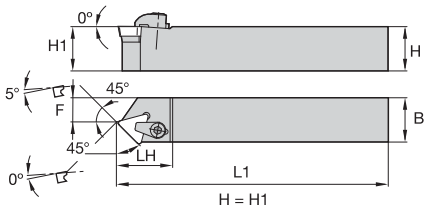


CTCPN 90°

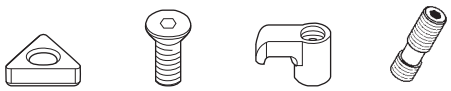


número para pedido	código do produto	H	B	F	L1	LH	inserto padrão	calço	parafuso do calço	sexta-vada	grampo	parafuso do grampo	sexta-vada
1097775	**CTCPN2510M11**	25	10	10,0	150	26,0	TP..110304	**SM819**	**MS960**	–	**CKM7**	**STCM5**	2.5 mm
1097776	**CTCPN2514M16**	25	14	14,4	150	28,0	TP..160308	**SM841**	**MS111**	2 mm	**CKM13**	**STCM4**	4 mm
1097781	**CTCPN2518M22**	25	18	19,2	150	41,0	TP..220408	**SM837**	**MS125**	2.5 mm	**CKM13**	**STCM4**	4 mm
1097778	**CTCPN2520M22**	25	20	20,2	150	41,0	TP..220408	**SM837**	**MS125**	2.5 mm	**CKM13**	**STCM4**	4 mm

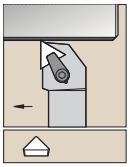


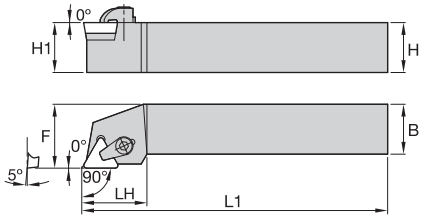


CTDP 45°



número para pedido	código do produto	H	B	F	L1	LH	inserto padrão	calço	parafuso do calço	grampo	parafuso do grampo	sexta-vada
corte à direita (R)												
1244613	**CTDPR1212F11**	12	12	6,0	80	22,0	TP..110304	**SM819**	**MS960**	**CKM19**	**STCM9**	2.5 mm

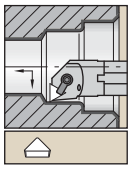




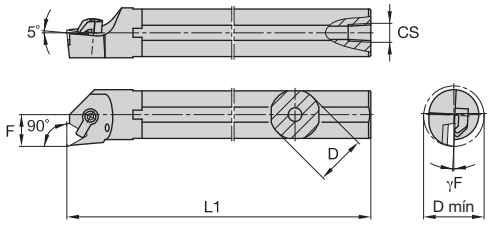
CTGP 90°



número para pedido	código do produto	H	B	F	L1	LH	inserto padrão	calço	parafuso do calço	sexta-vada	grampo	parafuso do grampo	sexta-vada
corte à direita (R)													
1097762	**CTGPR1212F11**	12	12	16,0	80	20,0	TP..110304	**SM819**	**MS960**	–	**CKM19**	**STCM9**	2.5 mm
1097763	**CTGPR1616H11**	16	16	20,0	100	20,0	TP..110304	**SM819**	**MS960**	–	**CKM19**	**STCM9**	2.5 mm
1244595	**CTGPR2020K11**	20	20	25,0	125	20,0	TP..110304	**SM819**	**MS960**	–	**CKM19**	**STCM9**	2.5 mm
1097764	**CTGPR2020K16**	20	20	25,0	125	26,0	TP..160308	**SM841**	**MS111**	2 mm	**CKM10**	**STCM8**	4 mm
1097765	**CTGPR2525M16**	25	25	32,0	150	26,0	TP..160308	**SM841**	**MS111**	2 mm	**CKM9**	**STCM4**	4 mm
corte à esquerda (L)													
1097916	**CTGPL1212F11**	12	12	16,0	80	20,0	TP..110304	**SM819**	**MS960**	–	**CKM19**	**STCM9**	2.5 mm
1097918	**CTGPL2020K16**	20	20	25,0	125	26,0	TP..160308	**SM841**	**MS111**	2 mm	**CKM10**	**STCM8**	4 mm
1097919	**CTGPL2525M16**	25	25	32,0	150	26,0	TP..160308	**SM841**	**MS111**	2 mm	**CKM9**	**STCM4**	4 mm



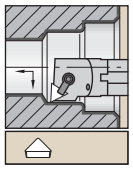
Haste de aço com refrigeração interna.



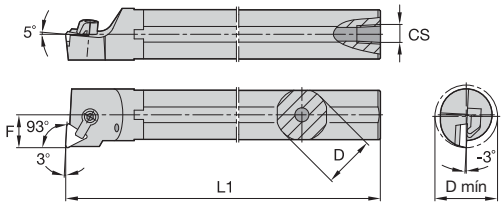
A-CTFP 90°



número para pedido	código do produto	D	D mín	F	L1	CS	γF°	inserto padrão	calço	parafuso do calço	sexta-vada	grampo	parafuso do grampo	sexta-vada
corte à direita (R)														
1886492	**A16RCTFPR11**	16	20,0	11,0	200	1/8-27 NPT	-4.0	TP..110304	**–**	**–**	–	**CKM19**	**STCM9**	2.5 mm
1098051	**A20QCTFPR11**	20	25,0	13,0	180	1/8-27 NPT	0.0	TP..110304	**SM815**	**MS961**	–	**CKM19**	**STCM9**	2.5 mm
1098053	**A25RCTFPR16**	25	32,0	17,0	200	1/4-18 NPT	-3.0	TP..160308	**SM841**	**MS110**	2 mm	**CKM10**	**STCM8**	4 mm
1098055	**A32SCTFPR16**	32	40,0	22,0	250	1/4-18 NPT	-3.0	TP..160308	**SM841**	**MS110**	2 mm	**CKM10**	**STCM8**	4 mm
1886494	**A40VCTFPR16**	40	48,0	27,0	400	1/4-18 NPT	-3.0	TP..160308	**SM841**	**MS110**	2 mm	**CKM10**	**STCM8**	4 mm
corte à esquerda (L)														
1098054	**A25RCTFPL16**	25	32,0	17,0	200	1/4-18 NPT	-3.0	TP..160308	**SM841**	**MS110**	2 mm	**CKM10**	**STCM8**	4 mm
1098056	**A32SCTFPL16**	32	40,0	22,0	250	1/4-18 NPT	-3.0	TP..160308	**SM841**	**MS110**	2 mm	**CKM10**	**STCM8**	4 mm



Haste de aço com refrigeração interna.

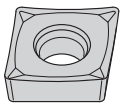


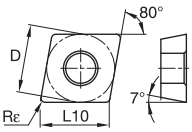
A-CTUP 93°



número para pedido	código do produto	D	D mín	F	L1	CS	inserto padrão	calço	parafuso do calço	grampo	parafuso do grampo	sexta-vada
corte à direita (R)												
1098057	**A16MCTUPR11**	16	20,0	11,0	150	1/8-27 NPT	TP..110304	**SM815**	**MS961**	**CKM19**	**STCM9**	2.5 mm
corte à esquerda (L)												
1098058	**A16MCTUPL11**	16	20,0	11,0	150	1/8-27 NPT	TP..110304	**SM815**	**MS961**	**CKM19**	**STCM9**	2.5 mm

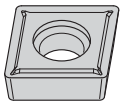
● primeira opção
○ opção alternativa

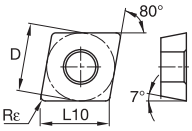




CCGT-HP

ISO código do produto	D	L10	Rε	KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35	KU10	K313	K68	KCS10	KCU10	KCU25	KC5010	KC5025	KC5410	KT315	KTP10
P				●	●	●	●	●	●	●	○	○	○	○	○	○	○	○	○	○	○	●	●	●		●	●	●	●		●	●
M										○							●	●	●	●	●	●	●	●	●	●	●	●	●		●	●
K				○	○	○	○	○			●	●	●	●	●	●						●	●	●		●	●	●	●		●	●
N																						●	●	●		●	●	●	●	●		
S																						●	●	●	●	●	●	●	●			
H																																
CCGT060202HP	6,35	6,45	0,2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	●	●	–	●	●	–	–
CCGT060204HP	6,35	6,45	0,4	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	●	●	●	●	●	–	–
CCGT060208HP	6,35	6,45	0,8	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	●	–	●	–	–
CCGT09T302HP	9,53	9,67	0,2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	●	●	●	●	●	–	–
CCGT09T304HP	9,53	9,67	0,4	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	●	●	●	●	●	–	–
CCGT09T308HP	9,53	9,67	0,8	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	●	●	●	●	–	–
CCGT120402HP	12,70	12,90	0,2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	●	●	–	–	–	–
CCGT120404HP	12,70	12,90	0,4	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	●	–	●	●	●	–	–
CCGT120408HP	12,70	12,90	0,8	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	●	●	●	–	●	–	–

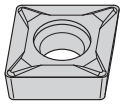


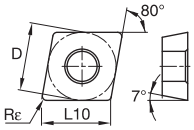


CCGT-LF

ISO código do produto	D	L10	Rε	KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35	KU10	K313	K68	KCS10	KCU10	KCU25	KC5010	KC5025	KC5410	KT315	KTP10
CCGT0602X0LF	6,35	6,45	0,0	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–
CCGT060201LF	6,35	6,45	0,1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	●	●	–	–	–
CCGT060202LF	6,35	6,45	0,2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	●	●	–	–	–
CCGT060204LF	6,35	6,45	0,4	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	●	●	–	–	–
CCGT060208LF	6,35	6,45	0,8	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	●	–	–	–	–
CCGT09T3X0LF	9,53	9,67	0,0	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–
CCGT09T301LF	9,53	9,67	0,1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	●	●	–	–	–
CCGT09T302LF	9,53	9,67	0,2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	●	●	–	–	–
CCGT09T304LF	9,53	9,67	0,4	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	●	●	●	–	–
CCGT09T308LF	9,53	9,67	0,8	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	●	–	●	●	–	–	–

● primeira opção
○ opção alternativa

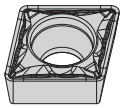


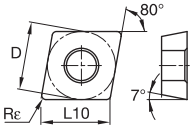


CCMT-11

ISO código do produto	D	L10	Rε	KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35	KU10	K313	K68	KCS10	KCU10	KCU25	KC5010	KC5025	KC5410	KT315	KTP10
CCMT06020411	6,35	6,45	0,4	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–
CCMT09T30411	9,53	9,67	0,4	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–
CCMT09T30811	9,53	9,67	0,8	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–

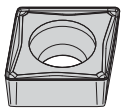
NOTA: Insertos intercambiáveis para fixação S.

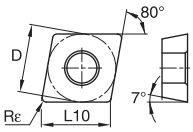




CCMT-FP

ISO código do produto	D	L10	Rε	KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35	KU10	K313	K68	KCS10	KCU10	KCU25	KC5010	KC5025	KC5410	KT315	KTP10
CCMT060202FP	6,35	6,45	0,2	–	–	●	–	●	–	–	–	–	–	–	–	–	–	–	●	●	–	–	–	–	–	●	●	–	–	–	–	–
CCMT060204FP	6,35	6,45	0,4	●	●	●	●	●	–	–	–	–	–	–	–	–	●	●	●	●	–	–	–	–	–	●	●	–	–	–	–	●
CCMT060208FP	6,35	6,45	0,8	–	–	–	●	●	–	–	–	–	–	–	–	–	–	–	●	●	–	–	–	–	–	●	●	–	–	–	–	●
CCMT09T302FP	9,53	9,67	0,2	–	–	–	●	●	–	–	–	–	–	–	–	–	–	–	●	●	–	–	–	–	–	●	●	–	–	–	–	●
CCMT09T304FP	9,53	9,67	0,4	●	●	–	●	●	–	–	–	–	–	–	–	–	●	●	●	●	–	–	–	–	–	●	●	–	–	–	–	●
CCMT09T308FP	9,53	9,67	0,8	–	●	●	●	●	–	–	–	–	–	–	–	–	●	–	●	●	–	–	–	–	–	●	●	–	–	–	–	●
CCMT120404FP	12,70	12,90	0,4	–	●	–	●	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–	–	–	●	●	–	–	–	–	–
CCMT120408FP	12,70	12,90	0,8	–	–	–	●	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–	–	●	–	–	–	–	–	–
CCMT120412FP	12,70	12,90	1,2	–	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–

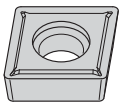


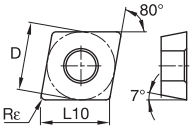


CCMT-FW

ISO código do produto	D	L10	Rε	KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35	KU10	K313	K68	KCS10	KCU10	KCU25	KC5010	KC5025	KC5410	KT315	KTP10
CCMT060202FW	6,35	6,45	0,2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	●	–
CCMT060204FW	6,35	6,45	0,4	–	–	–	–	●	–	–	–	–	–	–	●	–	–	–	–	–	–	–	–	–	–	●	–	●	–	–	●	–
CCMT060208FW	6,35	6,45	0,8	–	–	–	–	●	–	–	–	–	–	–	–	●	–	–	–	–	–	–	–	–	–	–	–	●	–	–	●	–
CCMT09T304FW	9,53	9,67	0,4	–	–	–	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	●	–	–	●	–
CCMT09T308FW	9,53	9,67	0,8	–	–	–	–	●	–	–	–	–	–	–	–	●	●	–	–	–	–	–	–	–	–	●	–	●	–	–	●	–

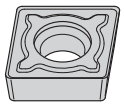
● primeira opção
○ opção alternativa

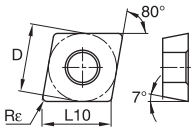




CCMT-LF

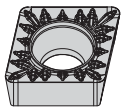
ISO código do produto	D	L10	Rε	KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35	KU10	K313	K68	KCS10	KCU10	KCU25	KC5010	KC5025	KC5410	KT315	KTP10
CCMT060202LF	6,35	6,45	0,2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	●	–	●	–
CCMT060204LF	6,35	6,45	0,4	–	●	●	●	●	●	–	–	●	●	●	●	●	●	●	●	●	–	–	●	–	–	–	–	●	●	–	●	–
CCMT060208LF	6,35	6,45	0,8	●	–	●	●	●	●	–	●	●	●	●	●	–	●	–	–	●	–	–	–	–	–	–	–	●	●	–	●	–
CCMT09T302LF	9,53	9,67	0,2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–	●	●	–	●	–
CCMT09T304LF	9,53	9,67	0,4	–	●	●	●	●	●	–	–	●	●	●	–	●	●	–	●	●	●	–	●	–	–	–	–	●	●	–	●	–
CCMT09T308LF	9,53	9,67	0,8	●	●	●	●	●	●	–	–	●	●	●	●	●	●	–	●	●	●	–	●	–	–	–	–	●	–	–	●	–
CCMT120404LF	12,70	12,90	0,4	–	–	●	●	●	●	–	–	–	●	–	–	●	–	–	–	–	–	–	–	–	–	–	–	●	●	–	–	–
CCMT120408LF	12,70	12,90	0,8	–	●	●	●	●	–	–	–	–	–	●	●	●	–	–	●	–	●	–	–	–	–	–	–	●	●	–	–	–
CCMT120412LF	12,70	12,90	1,2	–	–	●	●	–	–	–	–	–	–	–	●	–	–	–	–	●	–	–	–	–	–	–	–	–	–	–	–	–

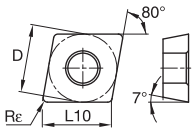




CCMT-MF

ISO código do produto	D	L10	Rε	KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35	KU10	K313	K68	KCS10	KCU10	KCU25	KC5010	KC5025	KC5410	KT315	KTP10
CCMT060204MF	6,35	6,45	0,4	–	●	●	●	●	●	–	–	–	–	●	–	●	●	–	●	●	●	–	–	–	–	–	–	–	–	–	–	–
CCMT09T304MF	9,53	9,67	0,4	–	●	–	●	●	●	–	–	–	●	●	●	●	●	–	●	●	–	–	–	–	–	–	–	–	–	–	–	–
CCMT09T308MF	9,53	9,67	0,8	–	●	–	●	●	●	–	–	–	●	●	●	●	●	–	●	●	●	–	–	–	–	–	–	–	●	–	–	–
CCMT09T312MF	9,53	9,67	1,2	–	–	●	●	●	–	–	–	–	–	●	●	●	–	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–
CCMT120408MF	12,70	12,90	0,8	–	●	●	●	●	●	–	–	–	●	●	●	●	●	–	●	●	●	–	–	–	–	–	–	–	–	–	–	–
CCMT120412MF	12,70	12,90	1,2	–	–	–	●	●	–	–	–	–	–	●	–	●	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–

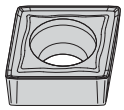


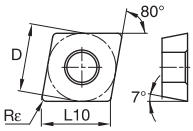


CCMT-MP

ISO código do produto	D	L10	Rε	KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35	KU10	K313	K68	KCS10	KCU10	KCU25	KC5010	KC5025	KC5410	KT315	KTP10
CCMT060204MP	6,35	6,45	0,4	–	–	●	–	●	–	–	–	–	–	–	–	–	●	●	●	●	–	–	–	–	–	●	–	–	–	–	–	–
CCMT09T304MP	9,53	9,67	0,4	–	–	●	–	●	–	–	–	–	–	–	●	–	●	–	●	●	–	–	–	–	–	●	–	–	–	–	–	–
CCMT09T308MP	9,53	9,67	0,8	–	–	●	–	●	–	–	–	–	–	–	●	●	●	–	●	●	–	–	–	–	–	●	–	–	–	–	–	–
CCMT09T312MP	9,53	9,67	1,2	–	–	–	–	●	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–	–	●	–	–	–	–	–	–
CCMT120408MP	12,70	12,90	0,8	–	–	●	–	●	–	–	–	–	–	–	●	●	–	–	●	–	–	–	–	–	–	●	–	–	–	–	–	–
CCMT120412MP	12,70	12,90	1,2	–	–	–	–	●	–	–	–	–	–	–	–	●	–	–	●	●	–	–	–	–	–	–	–	–	–	–	–	–

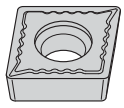
● primeira opção
○ opção alternativa

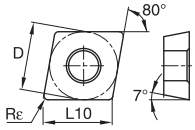




CCMT-MW

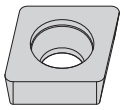
ISO código do produto	D	L10	Rε	KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35	KU10	K313	K68	KCS10	KCU10	KCU25	KC5010	KC5025	KC5410	KT315	KTP10
P				●	●	●	●	●	●	●	○	○	○	○	○	○	○	○	○	○	○	●	●	●		●	●	●	●		●	●
M										○							●	●	●	●	●	●	●	●	●	●	●	●	●		●	●
K				○	○	○	○	○			●	●	●	●	●	●						●	●	●		●	●	●	●		●	●
N																						●	●	●		●	●	●	●	●		
S																						●	●	●	●	●	●	●	●			
H																																
CCMT09T304MW	9,53	9,67	0,4	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–	–	–	–	–	●	–	●	–	●	●	–
CCMT09T308MW	9,53	9,67	0,8	–	–	–	–	●	–	–	–	–	–	–	●	●	●	–	–	–	–	–	–	–	–	●	–	●	–	●	●	–
CCMT120404MW	12,70	12,90	0,4	–	–	–	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–
CCMT120408MW	12,70	12,90	0,8	–	–	–	–	●	–	–	–	–	–	–	●	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–

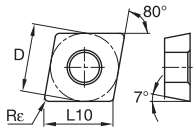




CCMT-UF

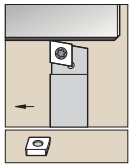
ISO código do produto	D	L10	Rε	KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35	KU10	K313	K68	KCS10	KCU10	KCU25	KC5010	KC5025	KC5410	KT315	KTP10
CCMT060204UF	6,35	6,45	0,4	●	–	●	●	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–
CCMT09T302UF	9,53	9,67	0,2	●	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–
CCMT09T304UF	9,53	9,67	0,4	–	–	●	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–
CCMT09T308UF	9,53	9,67	0,8	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–

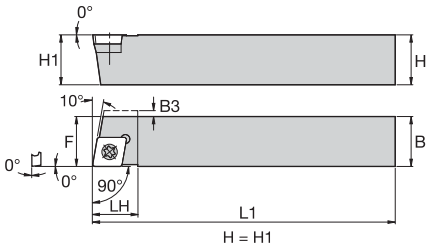


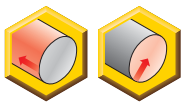


CCMW

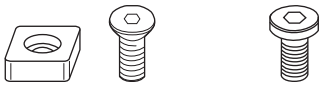
ISO código do produto	D	L10	Rε	KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35	KU10	K313	K68	KCS10	KCU10	KCU25	KC5010	KC5025	KC5410	KT315	KTP10
CCMW060204	6,35	6,45	0,4	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
CCMW09T308	9,53	9,67	0,8	–	–	–	–	–	–	–	–	–	–	–	●	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
CCMW120408	12,70	12,90	0,8	–	–	–	–	–	–	–	–	–	–	–	●	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
CCMW120412	12,70	12,90	1,2	–	–	–	–	–	–	–	–	–	–	–	●	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–



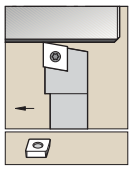


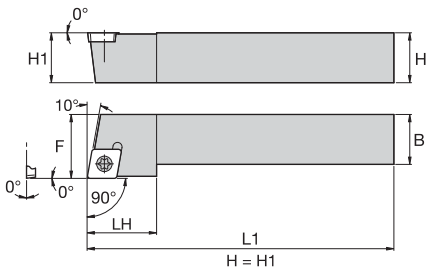


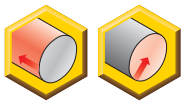
SCAC 90°



número para pedido	código do produto	H	B	F	L1	LH	inserto padrão	calço	parafuso do calço	sexta-vada	parafuso do inserto	sexta-vada
corte à direita (R)												
1097708	**SCACR1010M06Q**	10	10	10,0	150	11,0	CC..060204	–	–	–	**MS1153**	T7
1097710	**SCACR1212M06Q**	12	12	12,0	150	11,0	CC..060204	–	–	–	**MS1153**	T7
1097714	**SCACR1616K09Q**	16	16	16,0	125	16,0	CC..09T308	**SKCP343**	**SRS3**	3.5 mm	**MS1156**	T15



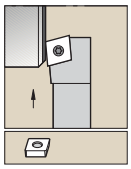


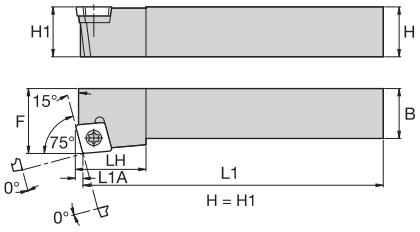


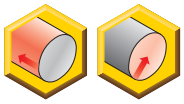
SCGC 90°



número para pedido	código do produto	H	B	F	L1	LH	inserto padrão	parafuso do inserto	Torx
corte à direita (R)									
1097824	**SCGCR1010M06**	10	10	12,0	150	11,0	CC..060204	**MS1153**	T7
1097825	**SCGCR1212N09**	12	12	16,0	160	16,0	CC..09T308	**MS1155**	T15
corte à esquerda (L)									
1097970	**SCGCL1212N09**	12	12	16,0	160	16,0	CC..09T308	**MS1155**	T15





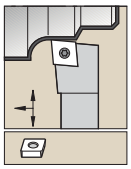


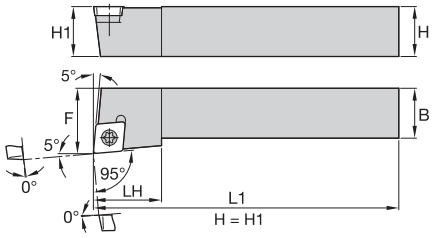
SCKC 75°





número para pedido	código do produto	H	B	F	L1	LH	L1A	inserto padrão	calço	parafuso do calço	sexta-vada	parafuso do inserto	Torx
corte à direita (R)													
1097840	**SCKCR2020K09**	20	20	25,0	125	16,0	2,3	CC..09T308	**SKCP343**	**SRS3**	3.5 mm	**MS1156**	T15





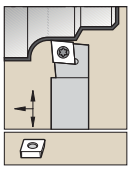


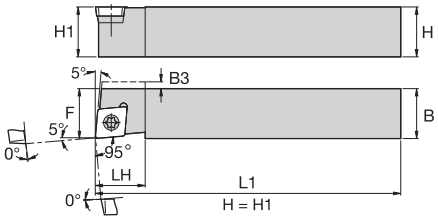
SCLC 95°





número para pedido	código do produto	H	B	F	L1	LH	inserto padrão	calço	parafuso do calço	sexta-vada	parafuso do inserto	Torx
corte à direita (R)												
1097814	**SCLCR0808L06**	8	8	10,0	140	12,0	CC..060204	–	–	–	**MS1153**	T7
1097816	**SCLCR1010M06**	10	10	12,0	150	12,0	CC..060204	–	–	–	**MS1153**	T7
1097818	**SCLCR1212N09**	12	12	16,0	160	16,0	CC..09T308	–	–	–	**MS1155**	T15
1097819	**SCLCR1616H09**	16	16	20,0	100	15,8	CC..09T308	**SKCP343**	**SRS3**	3.5 mm	**MS1156**	T15
1097821	**SCLCR2020K09**	20	20	25,0	125	15,8	CC..09T308	**SKCP343**	**SRS3**	3.5 mm	**MS1156**	T15
1097820	**SCLCR2020K12**	20	20	25,0	125	19,8	CC..120408	**SKCP453**	**SRS4**	4 mm	**MS1158**	T15
1244995	**SCLCR2525M09**	25	25	32,0	150	15,8	CC..09T308	**SKCP343**	**SRS3**	3.5 mm	**MS1156**	T15
1097822	**SCLCR2525M12**	25	25	32,0	150	20,0	CC..120408	**SKCP453**	**SRS4**	4 mm	**MS1158**	T15
corte à esquerda (L)												
1097959	**SCLCL0808L06**	8	8	10,0	140	12,0	CC..060204	–	–	–	**MS1153**	T7
1097961	**SCLCL1010M06**	10	10	12,0	150	12,0	CC..060204	–	–	–	**MS1153**	T7
1097963	**SCLCL1212N09**	12	12	16,0	160	16,0	CC..09T308	–	–	–	**MS1155**	T15
1097964	**SCLCL1616H09**	16	16	20,0	100	15,8	CC..09T308	**SKCP343**	**SRS3**	3.5 mm	**MS1156**	T15
1097966	**SCLCL2020K09**	20	20	25,0	125	15,8	CC..09T308	**SKCP343**	**SRS3**	3.5 mm	**MS1156**	T15
1097965	**SCLCL2020K12**	20	20	25,0	125	19,8	CC..120408	**SKCP453**	**SRS4**	4 mm	**MS1158**	T15
1318353	**SCLCL2525M09**	25	25	32,0	150	15,8	CC..09T308	**SKCP343**	**SRS3**	3.5 mm	**MS1156**	T15
1097967	**SCLCL2525M12**	25	25	32,0	150	20,0	CC..120408	**SKCP453**	**SRS4**	4 mm	**MS1158**	T15



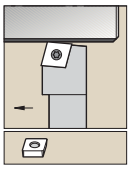


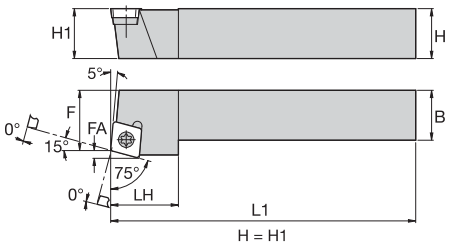


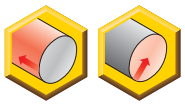
SCLC-F 95°



número para pedido	código do produto	H	B	F	L1	LH	B3	inserto padrão	calço	parafuso do calço	sexta-vada	parafuso do inserto	Torx
corte à direita (R)													
1772152	**SCLCRF0808M06Q**	8	8	8,0	150	12,0	1,5	CC..060204	–	–	–	**MS1153**	T7
1097812	**SCLCRF1010M06Q**	10	10	10,0	150	11,0	–	CC..060204	–	–	–	**MS1153**	T7
1097813	**SCLCRF1212M06Q**	12	12	12,0	150	11,0	–	CC..060204	–	–	–	**MS1153**	T7
1097817	**SCLCRF1616K09Q**	16	16	16,0	125	16,0	–	CC..09T308	**SKCP343**	**SRS3**	3.5 mm	**MS1156**	T15



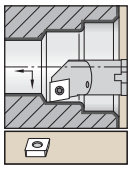




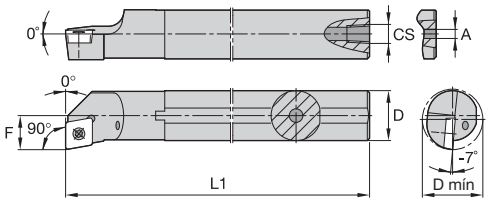
SCRC 75°



número para pedido	código do produto	H	B	F	L1	LH	FA	inserto padrão	calço	parafuso do calço	sexta-vada	parafuso do inserto	Torx
corte à direita (R)													
1097828	**SCRCR1212N09**	12	12	13,0	160	14,0	2,3	CC..09T308	–	–	–	**MS1155**	T15
1097829	**SCRCR1616H09**	16	16	17,0	100	14,0	2,3	CC..09T308	**SKCP343**	**SRS3**	3.5 mm	**MS1156**	T15



Haste de aço com refrigeração interna.

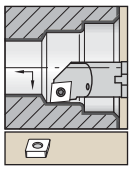




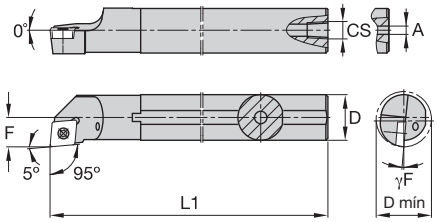
A-SCFC 90°



número para pedido	código do produto	D	D mín	F	L1	CS	inserto padrão	parafuso do inserto	Torx
corte à direita (R)									
1098266	**A25TSCFCR12**	25	32,0	17,0	300	1/4-18 NPT	CC..120408	**MS1157**	T15
corte à esquerda (L)									
1098270	**A25TSCFCL12**	25	32,0	17,0	300	1/4-18 NPT	CC..120408	**MS1157**	T15



Haste de aço com refrigeração interna.

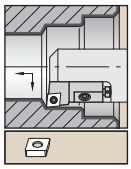


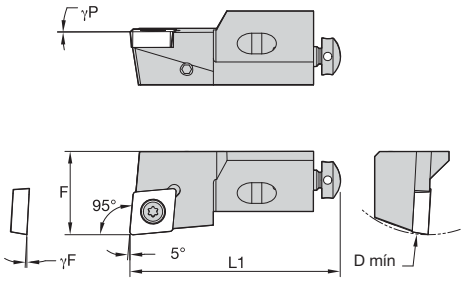


A-SCLC 95°



número para pedido	código do produto	D	D mín	F	L1	A	CS	γF°	inserto padrão	calço	parafuso do calço	sexta-vada	parafuso do inserto	Torx
corte à direita (R)														
1098159	**A08JSCLCR06**	8	11,0	6,0	110	2,4	–	-8.0	CC..060204	**–**	**–**	–	**MS1939**	T7
1098168	**A10KSCLCR06**	10	13,0	7,0	125	3,2	–	-7.0	CC..060204	**–**	**–**	–	**MS1153**	T7
1098178	**A12MSCLCR06**	12	16,0	9,0	150	4,0	1/16-27 NPT	-6.0	CC..060204	**–**	**–**	–	**MS1153**	T7
1098225	**A16RSCLCR09**	16	20,0	11,0	200	4,0	1/8-27 NPT	-7.0	CC..09T308	**–**	**–**	–	**MS1155**	T15
1098239	**A20SSCLCR09**	20	25,0	13,0	250	4,0	1/8-27 NPT	-5.0	CC..09T308	**–**	**–**	–	**MS1155**	T15
1098268	**A25TSCLCR12**	25	32,0	17,0	300	6,4	1/4-18 NPT	-7.0	CC..120408	**–**	**–**	–	**MS1157**	T15
1098280	**A32TSCLCR12**	32	40,0	22,0	300	6,4	1/4-18 NPT	-7.0	CC..120408	**SKCP453**	**SRS4**	4 mm	**MS1158**	T15
corte à esquerda (L)														
1098163	**A08JSCLCL06**	8	11,0	6,0	110	2,4	–	-8.0	CC..060204	**–**	**–**	–	**MS1939**	T7
1098173	**A10KSCLCL06**	10	13,0	7,0	25	3,2	–	-7.0	CC..060204	**–**	**–**	–	**MS1153**	T7
1098183	**A12MSCLCL06**	12	16,0	9,0	150	4,0	1/16-27 NPT	-6.0	CC..060204	**–**	**–**	–	**MS1153**	T7
1098231	**A16RSCLCL09**	16	20,0	11,0	200	4,0	1/8-27 NPT	-7.0	CC..09T308	**–**	**–**	–	**MS1155**	T15
1098244	**A20SSCLCL09**	20	25,0	13,0	250	4,0	1/8-27 NPT	-5.0	CC..09T308	**–**	**–**	–	**MS1155**	T15
1098272	**A25TSCLCL12**	25	32,0	17,0	300	6,4	1/4-18 NPT	-7.0	CC..120408	**–**	**–**	–	**MS1157**	T15
1098282	**A32TSCLCL12**	32	40,0	22,0	300	6,4	1/4-18 NPT	-7.0	CC..120408	**SKCP453**	**SRS4**	4 mm	**MS1158**	T15





SCLC 95°

número para pedido	código do produto	D mín	F	L1	γF°	γP°	inserto padrão
corte à direita (R)							
1098544	**SCLCR12CA12**	50	20,0	55	-3.0	0.0	CC..120408/CC..432
1098545	**SCLCR16CA12**	60	25,0	63	-3.0	0.0	CC..120408/CC..432
corte à esquerda (L)							
1098732	**SCLCL12CA12**	50	20,0	55	-3.0	0.0	CC..120408/CC..432

Peças de reposição

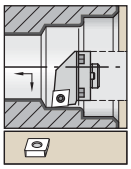




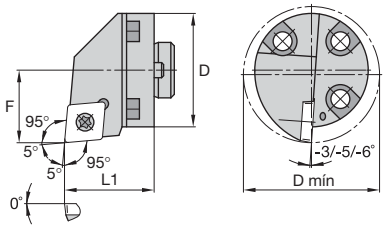


D mín	parafuso do inserto	Torx	parafuso de ajuste radial	sexta-vada	parafuso de ajuste axial	parafuso de montagem	sexta-vada	arruela
50	**MS1157**	T15	**KUAM23**	2.5 mm	**KUAM31**	**191.406**	4 mm	**CSWM 060 050**
60	**MS1157**	T15	**KUAM25**	2.5 mm	**KUAM32**	**191.407**	5 mm	**CSWM 080 050**

Cabeçotes de mandrilar Screw-On



Com refrigeração interna.

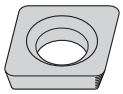


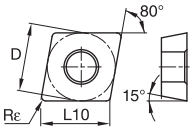
H-SCLC 95°



número para pedido	código do produto	D	D mín	F	L1	inserto padrão	parafuso do inserto	Torx
corte à direita (R)								
1772253	**H32SCLCR09**	32	40,0	21,9	25	CC..09T308	**MS1155**	T15
3612090	**H40SCLCR12**	40	50,0	27,0	41	CC..120408	**MS1158**	T15

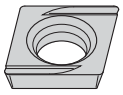
● primeira opção
○ opção alternativa

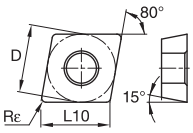




CDHB

				KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35	KU10	K313	K68	KCS10	KCU10	KCU25	KC5010	KC5025	KC5410	KT315	KTP10
				P		●	●	●	●	●	●	●	○	○	○	○	○	○	○	○	○	○	○	●	●	●		●	●	●	●		●	●
				M								○							●	●	●	●	●	●	●	●	●	●	●	●		●	●
				K		○	○	○	○	○			●	●	●	●	●	●						●	●	●		●	●	●	●		●	●
				N																			●	●	●		●	●	●	●	●		
				S																			●	●	●	●	●	●	●	●			
				H																													
ISO código do produto	D	L10	Rε																														
CDHBS4T0S0	3,97	4,03	0,1		–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	●	●	●	–	–	–
CDHBS4T0X0	3,97	4,03	0,1		–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–	–	–
CDHBS4T002	3,97	4,03	0,2		–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	●	●	●	●	–	●	–
CDHBS4T004	3,97	4,03	0,4		–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	●	●	●	–	●	–

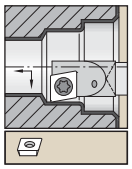




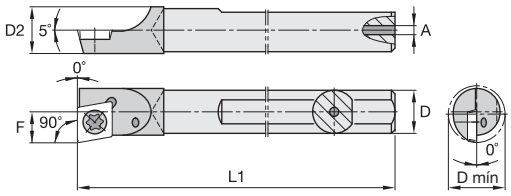
CDHH

				KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35	KU10	K313	K68	KCS10	KCU10	KCU25	KC5010	KC5025	KC5410	KT315	KTP10
ISO código do produto	D	L10	Rε																													
CDHHS4T002L	3,97	4,03	0,2		–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	●	●	●	–	●	–
CDHHS4T002R	3,97	4,03	0,2		–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	●	●	–	●	–
CDHHS4T004L	3,97	4,03	0,4		–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	●	●	●	–	–	–
CDHHS4T004R	3,97	4,03	0,4		–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	●	–	–	–	–

NOTA: Inserto direito é usado em barras esquerdas. Inserto esquerdo é usado em barras direitas.



Haste de metal duro com refrigeração interna.

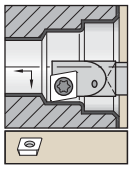




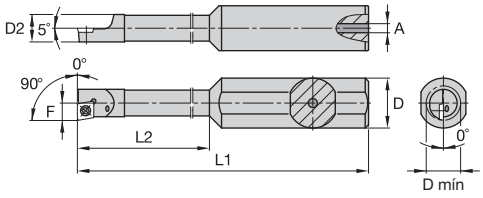
E-SCFD 90°



número para pedido	código do produto	D	D mín	F	L1	A	inserto padrão	parafuso do inserto	Torx
corte à direita (R)									
1930354	**E05HSCFDRS4**	5	5,9	3,2	101	1,0	CD..S4T002	**CC11**	T6
1930360	**E06HSCFDRS4**	6	7,1	3,7	100	1,2	CD..S4T002	**CC11**	T6



Haste de aço com pescoço com refrigeração interna.

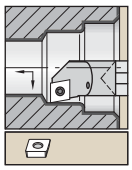




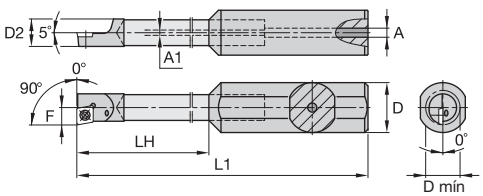
A-SCFD 90° • Escalonado



número para pedido	código do produto	D	D mín	D2	F	L1	L2	A	inserto padrão	parafuso do inserto	Torx
corte à direita (R)											
1930376	**A0510ESCFDRS412**	10	5,9	5,2	3,1	70	12,7	1,0	CD..S4T002	**CC11**	T6
1930380	**A0510ESCFDRS425**	10	5,9	5,2	3,1	70	25,4	1,0	CD..S4T002	**CC11**	T6
1930404	**A0612ESCFDRS431**	12	7,4	6,6	3,9	70	31,8	1,0	CD..S4T002	**CC11**	T6



Haste de metal duro com pescoço com refrigeração interna.

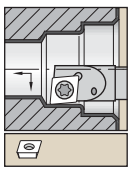




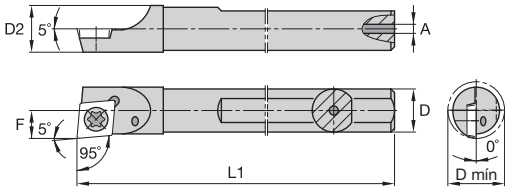
E-SCFD 90° • Escalonado



número para pedido	código do produto	D	D mín	D2	F	L1	LH	A	A1	inserto padrão	parafuso do inserto	Torx
corte à direita (R)												
1930408	**E0512XSCFDRS425**	12	5,9	5,0	3,2	64	10,0	1,0	1,2	CD..S4T002	**CC11**	T6
1930412	**E0512XSCFDRS450**	12	5,9	5,0	3,2	89	10,0	3,2	1,2	CD..S4T002	**CC11**	T6
1930436	**E0616XSCFDRS463**	16	7,4	6,3	3,9	127	12,3	3,2	1,2	CD..S4T002	**CC11**	T6



Haste de aço com refrigeração interna.

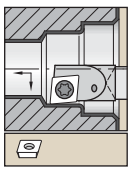




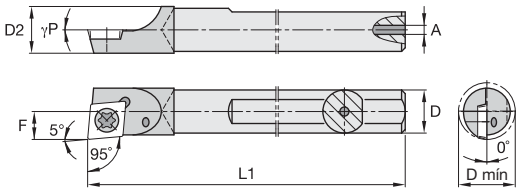
A-SCLD 95°



número para pedido	código do produto	D	D mín	D2	F	L1	A	inserto padrão	parafuso do inserto	Torx
corte à direita (R)										
1288877	**A04XSCLDRS4**	4	4,6	4,2	2,4	65	1,0	CD..S4T002	**CC09**	T6
1930298	**A05XSCLDRS4**	5	5,8	5,2	3,0	64	1,0	CD..S4T002	**CC09**	T6
1288893	**A06XSCLDRS4**	6	7,1	6,2	3,7	64	1,0	CD..S4T002	**CC11**	T6
1288906	**A08XSCLDRS4**	8	9,0	8,2	4,7	76	1,5	CD..S4T002	**CC11**	T6
corte à esquerda (L)										
1288876	**A04XSCLDLS4**	4	4,6	4,2	2,4	65	1,0	CD..S4T002	**CC09**	T6
1930297	**A05XSCLDLS4**	5	5,8	5,2	3,0	64	1,0	CD..S4T002	**CC09**	T6
1288892	**A06XSCLDLS4**	6	7,1	6,2	3,7	64	1,0	CD..S4T002	**CC11**	T6
1288905	**A08XSCLDLS4**	8	9,0	8,2	4,7	76	1,5	CD..S4T002	**CC11**	T6



Haste de metal duro com refrigeração interna.

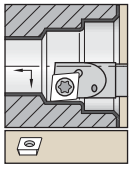




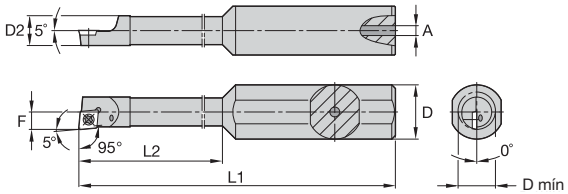
E-SCLD 95°



número para pedido	código do produto	D	D mín	D2	F	L1	A	γP°	inserto padrão	parafuso do inserto	Torx
corte à direita (R)											
1930300	**E04HSCLDRS4**	4	4,6	4,2	2,4	100	1,0	0.0	CD..S4T002	**CC09**	T6
1270967	**E04MSCLDRS4**	4	4,6	4,2	2,4	152	1,0	0.0	CD..S4T002	**CC09**	T6
1930356	**E05HSCLDRS4**	5	5,9	–	3,0	101	1,0	5.0	CD..S4T002	**CC09**	T6
1930358	**E05MSCLDRS4**	5	5,9	–	3,0	152	1,0	5.0	CD..S4T002	**CC09**	T6
1930362	**E06HSCLDRS4**	6	7,1	–	3,7	100	1,2	5.0	CD..S4T002	**CC11**	T6
1270978	**E06MSCLDRS4**	6	6,9	–	3,7	152	1,2	5.0	CD..S4T002	**CC09**	T6
1270988	**E08MSCLDRS4**	8	9,1	–	4,7	150	2,4	5.0	CD..120605	**CC11**	T6
corte à esquerda (L)											
1930299	**E04HSCLDLS4**	4	4,6	4,2	2,4	100	1,0	0.0	CD..S4T002	**CC09**	T6
1270966	**E04MSCLDLS4**	4	4,6	4,2	2,4	152	1,0	0.0	CD..S4T002	**CC09**	T6
1930355	**E05HSCLDLS4**	5	5,9	–	3,0	101	1,0	5.0	CD..S4T002	**CC11**	T6
1930357	**E05MSCLDLS4**	5	5,9	–	3,0	152	1,0	5.0	CD..S4T002	**CC09**	T6
1930361	**E06HSCLDLS4**	6	7,1	–	3,7	100	1,2	5.0	CD..S4T002	**CC11**	T6
1270977	**E06MSCLDLS4**	6	7,1	–	3,7	152	1,2	5.0	CD..S4T002	**CC11**	T6
1270987	**E08MSCLDLS4**	8	9,0	–	4,7	152	2,4	5.0	CD..S4T002	**CC11**	T6



Haste de Aço com pescoço com refrigeração interna.

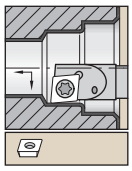




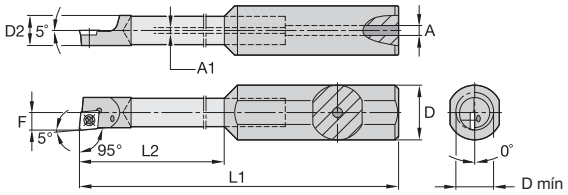
A-SCLD 95° • Escalonado



número para pedido	código do produto	D	D mín	F	L1	L2	A	inserto padrão	parafuso do inserto	Torx
corte à direita (R)										
1930372	**A0410ESCLDRS412**	10	5,2	2,6	70	12,7	1,0	CD..S4T002	**CC09**	T6
1930374	**A0410ESCLDRS425**	10	5,2	2,6	70	25,4	1,0	CD..S4T002	**CC09**	T6
1289129	**A0412ESCLDRS412**	12	5,2	2,6	70	12,7	1,0	CD..S4T002	**CC09**	T6
1289130	**A0412ESCLDRS425**	12	5,2	2,6	70	25,4	1,0	CD..S4T002	**CC09**	T6
1930378	**A0510ESCLDRS412**	10	5,8	3,0	70	12,3	1,0	CD..S4T002	**CC11**	T6
1930382	**A0510ESCLDRS425**	10	5,8	3,0	70	25,0	1,0	CD..S4T002	**CC09**	T6
1098071	**A0510GSCLDRS4**	10	6,0	3,2	90	25,0	3,2	CD..S4T002	**MS1454**	T5
1098073	**A0610HSCLDRS4**	10	7,6	3,8	100	32,0	3,2	CD..S4T002	**MS1454**	T5
1930402	**A0612ESCLDRS419**	12	7,2	3,7	70	19,1	1,0	CD..S4T002	**CC11**	T6



Haste de metal duro com pescoço com refrigeração interna.



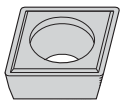


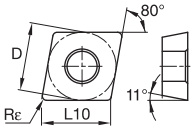
E-SCLD 95° • Escalonado



número para pedido	código do produto	D	D mín	D2	F	L1	L2	A	inserto padrão	parafuso do inserto	Torx
corte à direita (R)											
1930406	**E0412DSCLDRS422**	12	5,3	5,0	2,6	60	22,2	3,2	CD..S4T002	**CC09**	T6
1262129	**E0412XSCLDRS447**	12	5,3	5,0	2,6	86	47,6	3,2	CD..S4T002	**CC09**	T6
1262131	**E0416KSCLDRS447**	16	5,3	5,0	2,6	111	47,6	3,2	CD..S4T002	**CC09**	T6
1930410	**E0512XSCLDRS425**	12	5,9	–	3,0	64	25,4	1,0	CD..S4T002	**CC11**	T6
1930418	**E0612ESCLDRS431**	12	7,2	–	3,7	70	31,8	3,2	CD..S4T002	**CC11**	T6
1262178	**E0612HSCLDRS463**	12	7,2	–	3,7	102	63,5	3,2	CD..S4T002	**CC11**	T6
1930434	**E0616HSCLDRS431**	16	7,2	–	3,7	95	31,8	3,2	CD..S4T002	**CC11**	T6
1262175	**E0616XSCLDRS463**	16	7,2	–	3,7	127	63,5	3,2	CD..120605	**CC11**	T6

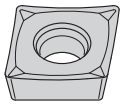
● primeira opção
○ opção alternativa

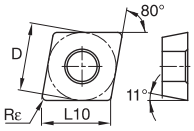




CPGH (T)

				KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35	KU10	K313	K68	KCS10	KCU10	KCU25	KC5010	KC5025	KC5410	KT315	KTP10
P				●	●	●	●	●	●	●	○	○	○	○	○	○	○	○	○	○	○	●	●	●		●	●	●	●		●	●
M										○							●	●	●	●	●	●	●	●	●	●	●	●	●		●	●
K				○	○	○	○	○			●	●	●	●	●	●						●	●	●		●	●	●	●		●	●
N																						●	●	●		●	●	●	●	●		
S																						●	●	●	●	●	●	●	●			
H																																
ISO código do produto	**D**	**L10**	**Rε**																													
CPGT060202K	6,35	6,45	0,2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–	–	–	–	–
CPGT060204K	6,35	6,45	0,4	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	●	–	–	–	●	–	–	–	–
CPGH09T301	9,53	9,67	0,1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	●	●	–	●	–
CPGH09T302	9,53	9,67	0,2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	●	●	●	●	–	–	–
CPGH09T304	9,53	9,67	0,4	–	●	–	●	–	–	–	–	–	–	–	–	–	●	–	–	–	–	–	●	●	–	●	●	●	●	–	●	–
CPGH09T308	9,53	9,67	0,8	–	●	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	●	–	●	●	●	●	–	–	–

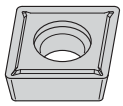


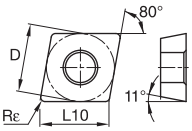


CPGT-HP

ISO código do produto	**D**	**L10**	**Rε**	KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35	KU10	K313	K68	KCS10	KCU10	KCU25	KC5010	KC5025	KC5410	KT315	KTP10
CPGT060202HP	6,35	6,45	0,2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	●	●	●	●	–	–
CPGT060204HP	6,35	6,45	0,4	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	●	●	●	●	–	–
CPGT060208HP	6,35	6,45	0,8	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	●	–	●	–	–
CPGT09T302HP	9,53	9,67	0,2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	●	–	●	●	●	–	–
CPGT09T304HP	9,53	9,67	0,4	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	●	●	●	●	●	–	–
CPGT09T308HP	9,53	9,67	0,8	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	●	●	–	●	–	–

● primeira opção
○ opção alternativa

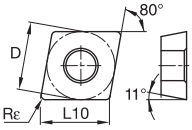




CPGT-LF

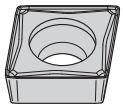
ISO código do produto	D	L10	Rε	KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35	KU10	K313	K68	KCS10	KCU10	KCU25	KC5010	KC5025	KC5410	KT315	KTP10
P				●	●	●	●	●	●	●	○	○	○	○	○	○	○	○	○	○	○	●	●	●		●	●	●	●		●	●
M										○							●	●	●	●	●	●	●	●	●	●	●	●	●		●	●
K				○	○	○	○	○			●	●	●	●	●	●						●	●	●		●	●	●	●		●	●
N																						●	●	●		●	●	●	●	●		
S																						●	●	●	●	●	●	●	●			
H																																
CPGT060201LF	6,35	6,45	0,1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	●	●	●	–	–
CPGT060202LF	6,35	6,45	0,2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	●	●	–	–	–
CPGT060204LF	6,35	6,45	0,4	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	●	●	●	–	–
CPGT060208LF	6,35	6,45	0,8	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	●	●	–	–	–
CPGT09T302LF	9,53	9,67	0,2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	●	●	–	–	–
CPGT09T304LF	9,53	9,67	0,4	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	●	●	●	–	–
CPGT09T308LF	9,53	9,67	0,8	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	●	●	–	–	–

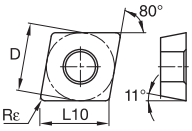




CPMT-FP

ISO código do produto	D	L10	Rε	KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35	KU10	K313	K68	KCS10	KCU10	KCU25	KC5010	KC5025	KC5410	KT315	KTP10
CPMT050202FP	5,56	5,65	0,2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	●	–	–	–	–	–
CPMT050204FP	5,56	5,65	0,4	–	–	–	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	●	–	–	–	–	–
CPMT060202FP	6,35	6,45	0,2	–	–	●	–	●	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–	–	●	●	–	–	–	–	●
CPMT060204FP	6,35	6,45	0,4	–	–	●	●	●	–	–	–	–	–	–	–	●	–	–	–	●	–	–	–	–	–	●	●	–	–	–	–	●
CPMT060208FP	6,35	6,45	0,8	–	–	–	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●
CPMT09T302FP	9,53	9,67	0,2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–	–	●	–	–	–	–	–	–
CPMT09T304FP	9,53	9,67	0,4	–	–	●	●	–	–	–	–	–	–	–	–	–	–	●	–	●	–	–	–	–	–	●	●	–	–	–	–	–
CPMT09T308FP	9,53	9,67	0,8	–	–	●	●	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–	–	●	●	–	–	–	–	●

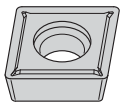


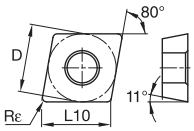


CPMT-FW

ISO código do produto	D	L10	Rε	KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35	KU10	K313	K68	KCS10	KCU10	KCU25	KC5010	KC5025	KC5410	KT315	KTP10
CPMT060202FW	6,35	6,45	0,2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	●	–
CPMT060204FW	6,35	6,45	0,4	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–	–	–	–	–	–	●	–	●	–	–	●	–
CPMT060208FW	6,35	6,45	0,8	–	–	–	–	●	–	–	–	–	–	–	–	●	–	–	–	–	–	–	–	–	–	●	–	●	–	–	●	–
CPMT09T304FW	9,53	9,67	0,4	–	–	–	–	●	–	–	–	–	–	–	●	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	●	–
CPMT09T308FW	9,53	9,67	0,8	–	–	–	–	●	–	–	–	–	–	–	–	●	–	–	–	–	–	–	–	–	–	●	–	●	–	–	●	–

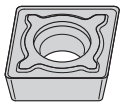
● primeira opção
○ opção alternativa

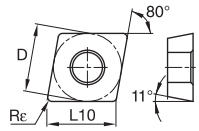




CPMT-LF

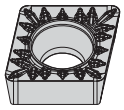
ISO código do produto	D	L10	Rε	KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35	KU10	K313	K68	KCS10	KCU10	KCU25	KC5010	KC5025	KC5410	KT315	KTP10
P				●	●	●	●	●	●	●	○	○	○	○	○	○	○	○	○	○	○	●	●	●		●	●	●	●		●	●
M										○							●	●	●	●	●	●	●	●	●	●	●	●	●		●	●
K				○	○	○	○	○			●	●	●	●	●	●						●	●	●		●	●	●	●		●	●
N																						●	●	●		●	●	●	●	●		
S																						●	●	●	●	●	●	●	●			
H																																
CPMT050202LF	5,56	5,65	0,2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–
CPMT050204LF	5,56	5,65	0,4	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	●	–	●	–
CPMT060202LF	6,35	6,45	0,2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	●	–	–	–
CPMT060204LF	6,35	6,45	0,4	–	●	●	●	●	–	–	●	●	●	●	–	●	–	●	–	●	–	–	●	●	–	–	–	●	●	–	●	–
CPMT060208LF	6,35	6,45	0,8	–	–	●	●	●	●	–	–	●	–	●	–	–	–	–	–	●	–	–	●	–	–	–	–	●	●	–	●	–
CPMT09T302LF	9,53	9,67	0,2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	●	–
CPMT09T304LF	9,53	9,67	0,4	●	●	●	●	●	●	–	–	●	●	–	●	●	●	●	●	●	–	–	–	–	–	–	–	●	●	–	●	–
CPMT09T308LF	9,53	9,67	0,8	–	●	●	●	●	●	–	–	●	●	●	●	●	–	●	–	●	–	–	–	●	–	–	–	●	●	–	●	–

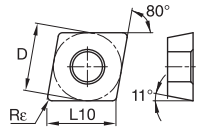




CPMT-MF

ISO código do produto	D	L10	Rε	KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35	KU10	K313	K68	KCS10	KCU10	KCU25	KC5010	KC5025	KC5410	KT315	KTP10
CPMT060208MF	6,35	6,45	0,8	–	●	–	●	–	–	–	–	–	–	●	●	●	●	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–
CPMT09T308MF	9,53	9,67	0,8	–	●	●	●	●	–	–	–	–	●	●	●	●	●	●	●	●	●	–	–	–	–	–	–	–	–	–	–	–
CPMT09T312MF	9,53	9,67	1,2	–	–	–	–	●	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–

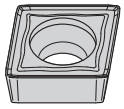


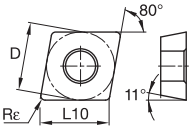


CPMT-MP

ISO código do produto	D	L10	Rε	KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35	KU10	K313	K68	KCS10	KCU10	KCU25	KC5010	KC5025	KC5410	KT315	KTP10
CPMT060208MP	6,35	6,45	0,8	–	–	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–	–	–
CPMT09T308MP	9,53	9,67	0,8	–	–	●	●	●	–	–	–	–	–	–	–	●	–	–	●	●	–	–	–	–	–	●	–	–	–	–	–	–

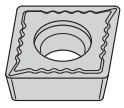
● primeira opção
○ opção alternativa

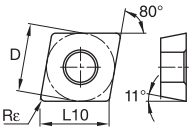




CPMT-MW

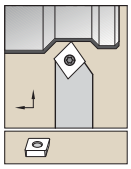
ISO código do produto	D	L10	Rε	KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35	KU10	K313	K68	KCS10	KCU10	KCU25	KC5010	KC5025	KC5410	KT315	KTP10
P				●	●	●	●	●	●	●	○	○	○	○	○	○	○	○	○	○	○	●	●	●		●	●	●	●		●	●
M										○							●	●	●	●	●	●	●	●	●	●	●	●	●		●	●
K				○	○	○	○	○			●	●	●	●	●	●						●	●	●		●	●	●	●		●	●
N																						●	●	●		●	●	●	●	●		
S																						●	●	●	●	●	●	●	●			
H																																
CPMT09T304MW	9,53	9,67	0,4	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–	–	–
CPMT09T308MW	9,53	9,67	0,8	–	–	–	–	●	–	–	–	–	–	–	●	●	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–

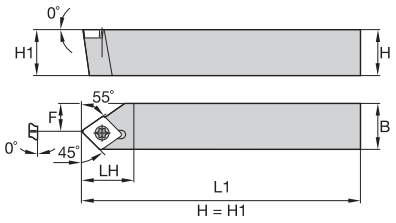




CPMT-UF

ISO código do produto	D	L10	Rε	KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35	KU10	K313	K68	KCS10	KCU10	KCU25	KC5010	KC5025	KC5410	KT315	KTP10
CPMT060204UF	6,35	6,45	0,4	–	●	–	●	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–
CPMT09T304UF	9,53	9,67	0,4	–	–	–	●	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–



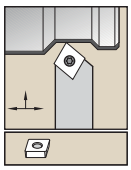


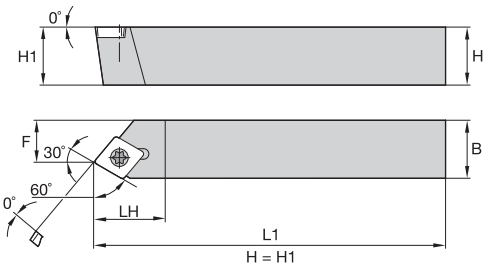


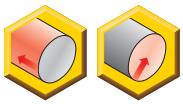
SCDP 45°



número para pedido	código do produto	H	B	F	L1	LH	inserto padrão	parafuso do inserto	Torx
corte à direita (R)									
1244893	**SCDPR1212H06**	12	12	7,0	100	14,0	CP..060203	**MS1153**	T7



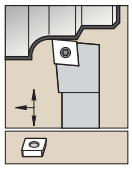


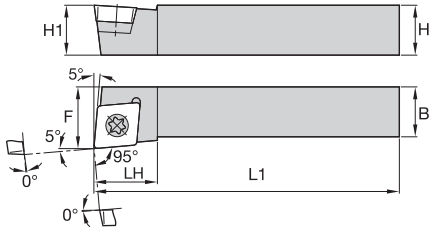


SCEP 60°



número para pedido	código do produto	H	B	F	L1	LH	inserto padrão	parafuso do inserto	Torx
corte à direita (R)									
1244896	**SCEPR1010H06**	10	10	6,5	100	12,0	CP..060203R.	**MS1153**	T7
1250901	**SCEPR1212H06**	12	12	8,5	100	12,0	CP..060203R.	**MS1153**	T7



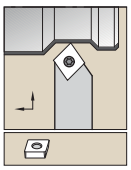


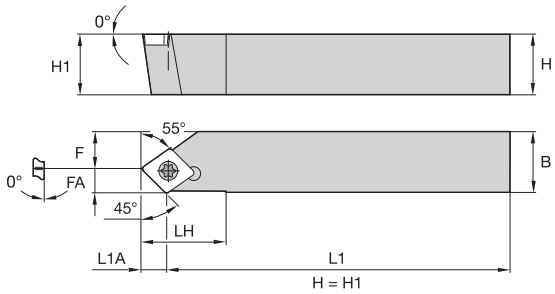


SCLP 95°



número para pedido	código do produto	H	B	F	L1	LH	inserto padrão	parafuso do inserto	Torx
corte à direita (R)									
1192469	**SCLPR1212M06**	12	12	13,0	150	11,4	CP..060203	**MS1153**	T7
corte à esquerda (L)									
1244913	**SCLPL1212M06**	12	12	13,0	150	11,4	CP..060203	**MS1153**	T7



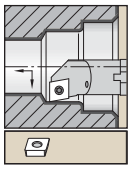




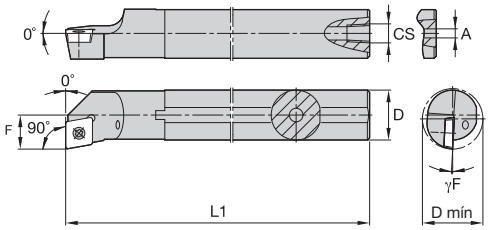
SCSP 45°



número para pedido	código do produto	H	B	F	L1	LH	FA	L1A	inserto padrão	parafuso do inserto	Torx
corte à direita (R)											
1244917	**SCSPR1010H06**	10	10	6,0	100	14,0	4,2	4,2	CP..060203	**MS1153**	T7



Haste de aço com refrigeração interna.

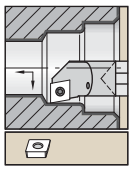




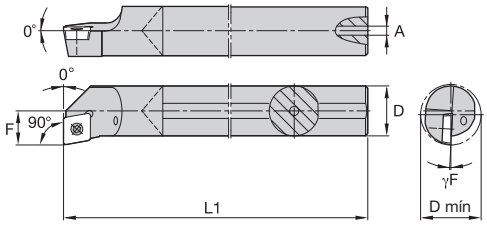
A-SCFP 90°



número para pedido	código do produto	D	D mín	F	L1	A	CS	γF°	inserto padrão	parafuso do inserto	Torx
corte à direita (R)											
1098157	**A08JSCFPR06**	8	11,0	6,0	110	2,4	–	-8.0	CP..060204	**MS1153**	T7
1098165	**A10KSCFPR06**	10	13,0	7,0	125	3,2	–	-6.0	CP..060204	**MS1153**	T7
1098175	**A12MSCFPR06**	12	16,0	9,0	150	4,0	1/16-27 NPT	-4.0	CP..060204	**MS1153**	T7
1886498	**A16RSCFPR06**	16	20,0	11,0	200	–	1/8-27 NPT	-5.0	CP..060203	**MS1153**	T7
1098221	**A16RSCFPR09**	16	20,0	11,0	200	4,0	1/8-27 NPT	-4.0	CP..09T308	**MS1155**	T15
1098235	**A20SSCFPR09**	20	25,0	13,0	250	4,0	1/8-27 NPT	-2.0	CP..09T308	**MS1155**	T15
corte à esquerda (L)											
1098161	**A08JSCFPL06**	8	11,0	6,0	110	2,4	–	-8.0	CP..060204	**MS1153**	T7
1098170	**A10KSCFPL06**	10	13,0	7,0	125	3,2	–	-6.0	CP..060204	**MS1153**	T7
1098180	**A12MSCFPL06**	12	16,0	9,0	150	4,0	1/16-27 NPT	-4.0	CP..060204	**MS1153**	T7
1098227	**A16RSCFPL09**	16	20,0	11,0	200	4,0	1/8-27 NPT	-4.0	CP..09T308	**MS1155**	T15
1098241	**A20SSCFPL09**	20	25,0	13,0	250	4,0	1/8-27 NPT	-2.0	CP..09T308	**MS1155**	T15



Haste de metal duro com refrigeração interna.

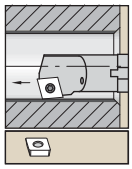




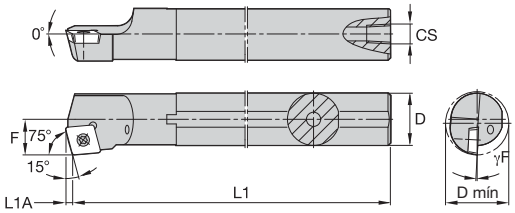
E-SCFP 90°



número para pedido	código do produto	D	D mín	F	L1	A	γF°	inserto padrão	parafuso do inserto	Torx
corte à direita (R)										
1152852	**E08KSCFPR06A**	8	11,0	6,0	125	2,4	-8.0	CP..060204	**MS1939**	T7
1152854	**E10MSCFPR06A**	10	13,0	7,0	150	3,2	-4.0	CP..060204	**MS1939**	T7
1152888	**E12QSCFPR06**	12	16,0	9,0	180	4,8	-3.0	CP..060204	**MS1153**	T7
corte à esquerda (L)										
1152853	**E08KSCFPL06A**	8	11,0	6,0	125	2,4	-8.0	CP..060204	**MS1939**	T7



Haste de aço com refrigeração interna.

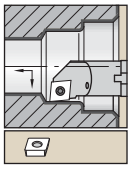




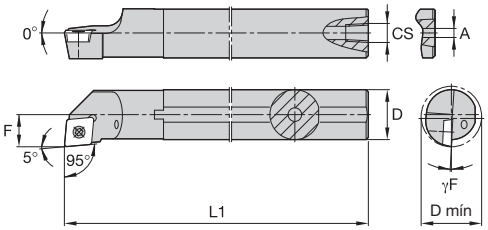
A-SCKP 75°



número para pedido	código do produto	D	D mín	F	L1	L1A	CS	γF°	inserto padrão	parafuso do inserto	Torx
corte à direita (R)											
1098236	**A20SSCKPR09**	20	25,0	13,0	250	2,3	1/8-27 NPT	-3.0	CP..09T308	**MS1155**	T15



Haste de aço com refrigeração interna.

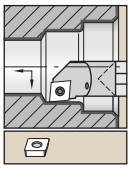




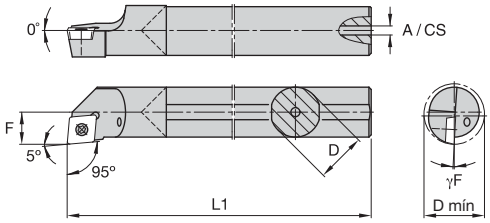
A-SCLP 95°



número para pedido	código do produto	D	D mín	F	L1	A	CS	γF°	inserto padrão	parafuso do inserto	Torx
corte à direita (R)											
1098156	**A08JSCLPR06**	.315	.433	.236	4.33	.09	–	-6.0	CP..060204	**MS1939**	T7
1098164	**A10KSCLPR06**	.390	.512	.276	4.92	.13	–	-4.0	CP..060204	**MS1939**	T7
1098174	**A12MSCLPR06**	.472	.630	.354	5.91	.16	1/16-27 NPT	-3.0	CP..060204	**MS1153**	T7
1886502	**A16RSCLPR06**	.630	.787	.433	7.87	–	1/8-27 NPT	-5.0	CP..060203	**MS1153**	T7
1098220	**A16RSCLPR09**	.630	.787	.433	7.87	.16	1/8-27 NPT	-4.0	CP..09T308	**MS1155**	T15
1098234	**A20SSCLPR09**	.787	.984	.512	9.84	.16	1/8-27 NPT	-2.0	CP..09T308	**MS1155**	T15
1886504	**A20SSCLPR06**	.787	.984	.512	9.84	–	1/8-27 NPT	-3.0	CP..060203	**MS1153**	T7
corte à esquerda (L)											
1098160	**A08JSCLPL06**	.315	.433	.236	4.33	.09	–	-6.0	CP..060204	**MS1939**	T7
1098169	**A10KSCLPL06**	.390	.512	.276	4.92	.13	–	-4.0	CP..060204	**MS1939**	T7
1098179	**A12MSCLPL06**	.472	.630	.354	5.91	.16	1/16-27 NPT	-3.0	CP..060204	**MS1153**	T7
1886501	**A16RSCLPL06**	.630	.787	.433	7.87	–	1/8-27 NPT	-5.0	CP..060203	**MS1153**	T7
1098226	**A16RSCLPL09**	.630	.787	.433	7.87	.16	1/8-27 NPT	-4.0	CP..09T308	**MS1155**	T15
1098240	**A20SSCLPL09**	.787	.984	.512	9.84	.16	1/8-27 NPT	-2.0	CP..09T308	**MS1155**	T15



Haste de metal duro com refrigeração interna.

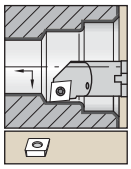




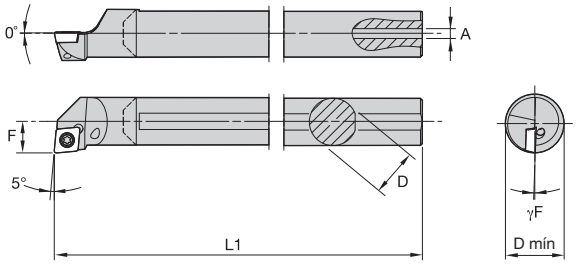
E-SCLP 95°



número para pedido	código do produto	D	D mín	F	L1	A	γF°	inserto padrão	parafuso do inserto	Torx
corte à direita (R)										
1152856	**E08KSCLPR06A**	8	11,0	6,0	122	2,4	-6.0	CP..060204	**MS1939**	T7
1152858	**E10MSCLPR06A**	10	13,0	7,0	150	3,2	-4.0	CP..060204	**MS1939**	T7
1152889	**E12QSCLPR06**	12	16,0	9,0	180	4,8	-3.0	CP..060204	**MS1153**	T7
1152897	**E16RSCLPR09**	16	20,0	11,0	200	5,5	-4.0	CP..09T308	**MS1155**	T15
1152902	**E20SSCLPR09**	20	25,0	13,0	250	7,1	-2.0	CP..09T308	**MS1155**	T15
corte à esquerda (L)										
1152857	**E08KSCLPL06A**	8	11,0	6,0	122	2,4	-6.0	CP..060204	**MS1939**	T7
1152859	**E10MSCLPL06A**	10	13,0	7,0	150	3,2	-4.0	CP..060204	**MS1939**	T7
1152891	**E12QSCLPL06**	12	16,0	9,0	180	4,8	-3.0	CP..060204	**MS1153**	T7
1152899	**E16RSCLPL09**	16	20,0	11,0	200	5,5	-4.0	CP..09T308	**MS1155**	T15
1152905	**E20SSCLPL09**	20	25,0	13,0	250	7,1	-2.0	CP..09T308	**MS1155**	T15



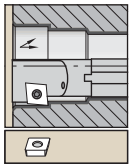
Barra de metal pesado com refrigeração interna.



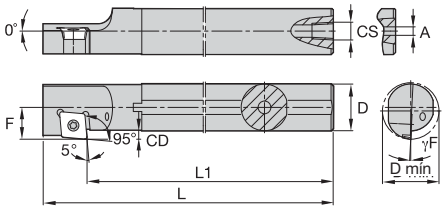
L-SCLP 95°



número para pedido	código do produto	D	D mín	F	L1	A	γF°	inserto padrão	parafuso do inserto	Torx
corte à direita (R)										
3331115	**L08KSCLPR06**	8	11,0	6,0	123	2,4	-6.0	CP..060204..	**MS1939**	T7
3331107	**L10MSCLPR06**	10	13,0	7,0	149	3,2	-4.0	CP..060204..	**MS1939**	T7
3331110	**L12QSCLPR06**	12	16,0	9,0	181	4,0	-3.0	CP..060204..	**MS1153**	T7
3331108	**L16RSCLPR09**	16	20,0	11,0	203	4,0	-4.0	CP..09T308..	**MS1155**	T15
3331106	**L20SSCLPR09**	20	25,0	13,0	251	4,0	-2.0	CP..09T308..	**MS1155**	T15
corte à esquerda (L)										
3331112	**L12QSCLPL06**	12	16,0	9,0	181	4,0	-3.0	CP..060204..	**MS1153**	T7
3331114	**L16RSCLPL09**	16	20,0	11,0	203	4,0	-4.0	CP..09T308..	**MS1155**	T15
3331109	**L20SSCLPL09**	20	25,0	13,0	251	4,0	-2.0	CP..09T308..	**MS1155**	T15



Haste de aço com refrigeração interna.

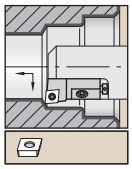


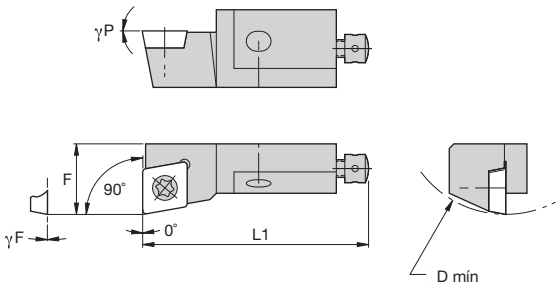


A-SCXP 95°



número para pedido	código do produto	D	D mín	F	L1	L	A	CS	γF°	inserto padrão	parafuso do inserto	Torx
corte à direita (R)												
1098167	**A10KSCXPR06**	10	13,0	7,0	125	136,0	3,2	–	-4.0	CP..060204	**MS1153**	T7
1098177	**A12MSCXPR06**	12	16,0	9,0	150	161,0	4,0	1/16-27 NPT	-3.0	CP..060204	**MS1153**	T7
1098223	**A16RSCXPR09**	16	20,0	11,0	200	218,0	4,0	1/8-27 NPT	-4.0	CP..09T308	**MS1155**	T15



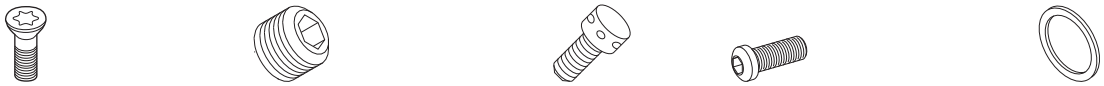


SCFP 90°

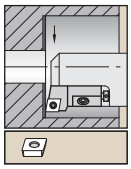
número para pedido	código do produto	D mín	F	L1	γF°	γP°	inserto padrão
corte à direita (R)							
1098551	**SCFPR06CA05**	20	8,0	25	0.0	0.0	CP..050204/CP..18151
1082671	**SCFPR08CA06**	25	10,0	32	0.0	0.0	CP..060204/CP..2151
1797235	**SCFPR10CA09**	40	14,0	50	0.0	0.0	CP..09T308/CP..3252
corte à esquerda (L)							
1098766	**SCFPL08CA06**	25	10,0	32	0.0	0.0	CP..060204/CP..2151

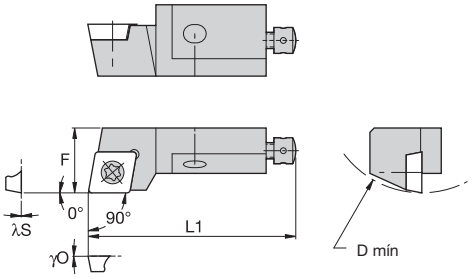
NOTA: Insertos de furo escareado de 60° compatíveis com ANSI/ISO.
Esta ferramenta também aceita insertos CPGM/CPGT/CPGW-21.5.

Peças de reposição



D mín	parafuso do inserto	Torx	parafuso de ajuste radial	sexta-vada	parafuso de ajuste axial	parafuso de montagem	sexta-vada	arruela
20	**MS1933**	T7	**KUAM34**	1.5 mm	**KUAM35**	**MS2173**	2 mm	**CSWM 035 040**
25	**MS1153**	T7	**KUAM34**	1.5 mm	**KUAM20**	**MS2175**	2.5 mm	**CSWM 040 050**
40	**MS1155**	T15	**KUAM28**	2 mm	**KUAM30**	**191.405**	4 mm	**CSWM 060 050**





SCGP 90°

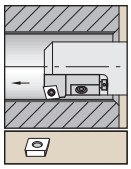
número para pedido	código do produto	D mín	F	L1	λS°	γO°	inserto padrão
corte à direita (R)							
1098554	**SCGPR08CA06**	25	10,0	32	0.0	0.0	CP..060204/CP..2151

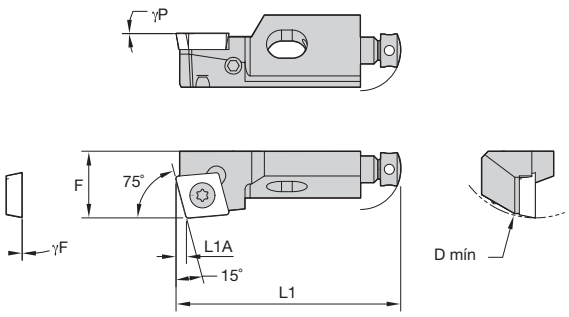
NOTA: Insertos de furo escareado de 60° compatíveis com ANSI/ISO.
Esta ferramenta também aceita insertos CPGM/CPGT/CPGW-21.5.

Peças de reposição



D mín	parafuso do inserto	Torx	parafuso de ajuste radial	sexta-vada	parafuso de ajuste axial	parafuso de montagem	sexta-vada	arruela
25	**MS1153**	T7	**KUAM34**	1.5 mm	**KUAM20**	**MS2175**	2.5 mm	**CSWM 040 050**





SCKP 75°

número para pedido	código do produto	D mín	F	L1	L1A	γF°	γP°	inserto padrão
corte à direita (R)								
1098552	**SCKPR08CA06**	25	10,0	32	1,6	0.0	0.0	CP..060204/CP..2151
corte à esquerda (L)								
1098763	**SCKPL08CA06**	25	10,0	32	1,6	0.0	0.0	CP..060204/CP..2151

NOTA: Insertos de furo escareado de 60° compatíveis com ANSI/ISO.
Esta ferramenta também aceita insertos CPGM/CPGT/CPGW-21.5.

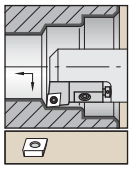
Peças de reposição

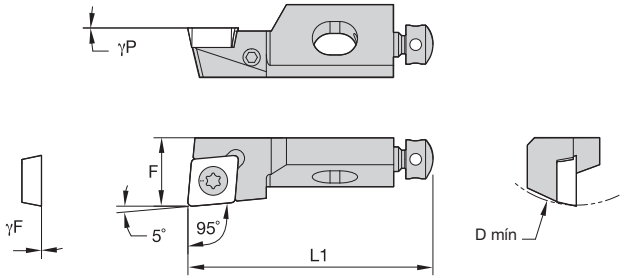






D mín	parafuso do inserto	Torx	parafuso de ajuste radial	sexta-vada	parafuso de ajuste axial	parafuso de montagem	sexta-vada	arruela
25	**MS1153**	T7	**KUAM34**	1.5 mm	**KUAM20**	**MS2175**	2.5 mm	**CSWM 040 050**





SCLP 95°

número para pedido	código do produto	D mín	F	L1	γF°	γP°	inserto padrão
corte à direita (R)							
1098541	**SCLPR06CA05**	20	8,0	25	0.0	0.0	CP..050204/CP..18151
1098542	**SCLPR08CA06**	25	10,0	32	0.0	0.0	CP..060204/CP..2151
1098543	**SCLPR10CA09**	40	14,0	50	0.0	0.0	CP..09T308/CP..3252
corte à esquerda (L)							
1098730	**SCLPL08CA06**	25	10,0	32	0.0	0.0	CP..060204/CP..2151
1098731	**SCLPL10CA09**	40	14,0	50	0.0	0.0	CP..09T308/CP..3252

NOTA: Insertos de furo escareado de 60° compatíveis com ANSI/ISO.
Esta ferramenta também aceita insertos CPGM/CPGT/CPGW-21.5.
Insertos de furo escareado de 60° compatíveis com ANSI/ISO (por exemplo, CPMT/CPGT/CPGW-32.5_).
Insertos de furo escareado de 90° (por exemplo, CPGM/CPGB-32.5_) são incompatíveis com esta ferramenta.

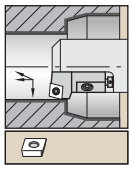
Peças de reposição

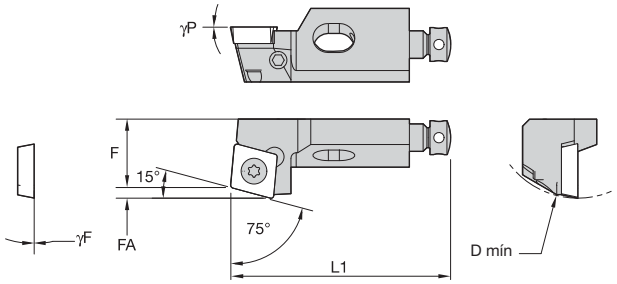






D mín	parafuso do inserto	Torx	parafuso de ajuste radial	sexta-vada	parafuso de ajuste axial	parafuso de montagem	sexta-vada	arruela
20	**MS1933**	T7	**KUAM34**	1.5 mm	**KUAM35**	**MS2173**	2 mm	**CSWM 035 040**
25	**MS1153**	T7	**KUAM34**	1.5 mm	**KUAM20**	**MS2175**	2.5 mm	**CSWM 040 050**
40	**MS1155**	T15	**KUAM28**	2 mm	**KUAM30**	**191.405**	4 mm	**CSWM 060 050**





SCRP 75°

número para pedido	código do produto	D mín	F	L1	FA	γF°	γP°	inserto padrão
corte à direita (R)								
1098555	**SCRPR08CA06**	25	10,0	32	1,5	0.0	0.0	CP..060204/CP..2151

NOTA: Insertos de furo escareado de 60° compatíveis com ANSI/ISO.
Esta ferramenta também aceita insertos CPGM/CPGT/CPGW-21.5.

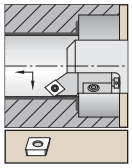
Peças de reposição

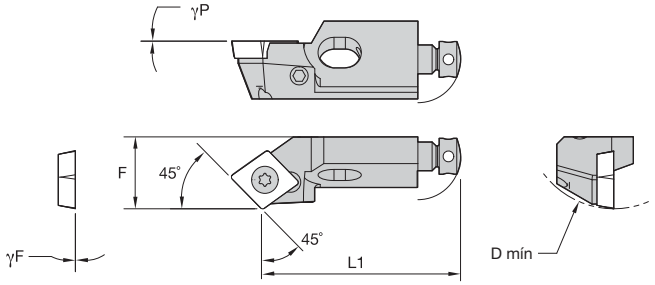






D mín	parafuso do inserto	Torx	parafuso de ajuste radial	sexta-vada	parafuso de ajuste axial	parafuso de montagem	sexta-vada	arruela
25	**MS1153**	T7	**KUAM34**	1.5 mm	**KUAM20**	**MS2175**	2.5 mm	**CSWM 040 050**





SCSP 45°

número para pedido	código do produto	D mín	F	L1	γF°	γP°	inserto padrão
corte à direita (R)							
1098328	**SCSPR06CA05**	20	8,0	21	0.0	0.0	CP..050204/CP..18151
1086536	**SCSPR08CA06**	25	10,0	28	0.0	0.0	CP..060204/CP..2151
corte à esquerda (L)							
1098548	**SCSPL06CA05**	20	8,0	21	0.0	0.0	CP..050204/CP..18151
1098549	**SCSPL08CA06**	25	10,0	28	0.0	0.0	CP..060204/CP..2151

NOTA: Insertos de furo escareado de 60° compatíveis com ANSI/ISO.
Esta ferramenta também aceita insertos CPGM/CPGT/CPGW-21.5.

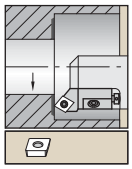
Peças de reposição

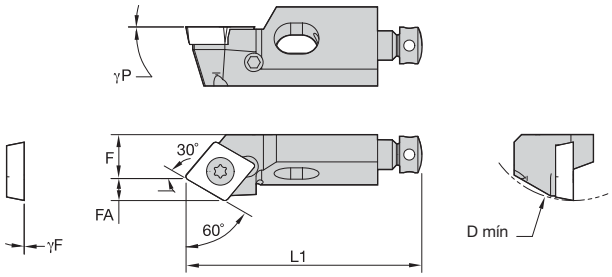






D mín	parafuso do inserto	Torx	parafuso de ajuste radial	sexta-vada	parafuso de ajuste axial	parafuso de montagem	sexta-vada	arruela
20	**MS1933**	T7	**–**	–	**KUAM35**	**MS2173**	2 mm	**CSWM 035 040**
25	**MS1153**	T7	**KUAM34**	1.5 mm	**KUAM20**	**MS2175**	2.5 mm	**CSWM 040 050**





SCTP 60°

número para pedido	código do produto	D mín	F	L1	FA	γF°	γP°	inserto padrão
corte à direita (R)								
1098556	**SCTPR06CA05**	20	5,5	25	2,6	0.0	0.0	CP..050204/CP..18151
1098557	**SCTPR08CA06**	25	6,0	32	3,0	0.0	0.0	CP..060204/CP..2151
corte à esquerda (L)								
1098736	**SCTPL08CA06**	25	6,0	32	3,0	0.0	0.0	CP..060204/CP..2151

NOTA: Insertos de furo escareado de 60° compatíveis com ANSI/ISO.
Esta ferramenta também aceita insertos CPGM/CPGT/CPGW-21.5.

Peças de reposição

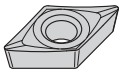


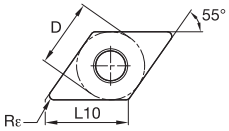




D mín	parafuso do inserto	Torx	parafuso de ajuste radial	sexta-vada	parafuso de ajuste axial	parafuso de montagem	sexta-vada	arruela
20	**MS1933**	T7	**–**	–	**KUAM35**	**MS2173**	2 mm	**CSWM 035 040**
25	**MS1153**	T7	**KUAM34**	1.5 mm	**KUAM20**	**MS2175**	2.5 mm	**CSWM 040 050**

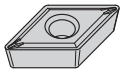
● primeira opção
○ opção alternativa

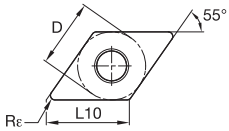




DCGT-HP

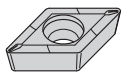
ISO código do produto	D	L10	Rε	KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35	KU10	K313	K68	KCS10	KCU10	KCU25	KC5010	KC5025	KC5410	KT315	KTP10
				P ●	P ●	P ●	P ●	P ●	P ●	P ●	P ○	P ○	P ○	P ○	P ○	P ○	P ○	P ○	P ○	P ○	P ○	P ●	P ●	P ●	P	P ●	P ●	P ●	P ●	P	P ●	P ●
				M	M	M	M	M	M	M ○	M	M	M	M	M	M	M ●	M ●	M ●	M ●	M ●	M ●	M ●	M ●	M ●	M ●	M ●	M ●	M ●	M ●	M	M ●	M ●
				K ○	K ○	K ○	K ○	K ○	K	K	K ●	K ●	K ●	K ●	K ●	K ●	K	K	K	K	K	K ●	K ●	K ●	K	K ●	K ●	K ●	K ●	K	K ●	K ●
				N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N ●	N ●	N ●	N	N ●	N ●	N ●	N ●	N ●	N	N	N
				S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S ●	S ●	S ●	S ●	S ●	S ●	S ●	S ●	S	S	S
				H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H
DCGT070202HP	6,35	7,75	0,2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	●	●	●	●	●	–	–
DCGT070204HP	6,35	7,75	0,4	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	●	●	●	●	●	–	–
DCGT070208HP	6,35	7,75	0,8	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	●	●	●	–	–
DCGT11T302HP	9,53	11,63	0,2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	●	●	●	●	●	–	–
DCGT11T304HP	9,53	11,63	0,4	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	●	●	●	●	●	–	–
DCGT11T308HP	9,53	11,63	0,8	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	●	●	●	●	●	–	–

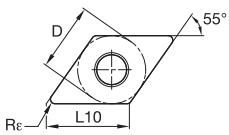




DCGT-LF

ISO código do produto	D	L10	Rε	KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35	KU10	K313	K68	KCS10	KCU10	KCU25	KC5010	KC5025	KC5410	KT315	KTP10
DCGT0702X0LF	6,35	7,75	0,0	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–
DCGT070201LF	6,35	7,75	0,1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	●	●	–	–	–
DCGT11T3X0LF	9,53	11,63	0,0	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–
DCGT11T301LF	9,53	11,63	0,1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	●	●	–	–	–
DCGT150408LF	12,70	15,50	0,8	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	●	–	–	–	–

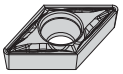


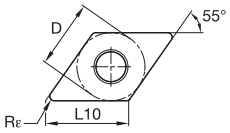


DCMT-11

ISO código do produto	D	L10	Rε	KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35	KU10	K313	K68	KCS10	KCU10	KCU25	KC5010	KC5025	KC5410	KT315	KTP10
DCMT07020211	6,35	7,75	0,2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–
DCMT07020411	6,35	7,75	0,4	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–
DCMT11T30411	9,53	11,63	0,4	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–
DCMT11T30811	9,53	11,63	0,8	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–

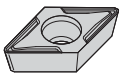
● primeira opção
○ opção alternativa

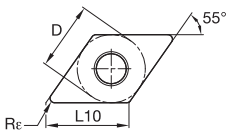




DCMT-FP

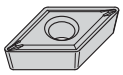
				KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35	KU10	K313	K68	KCS10	KCU10	KCU25	KC5010	KC5025	KC5410	KT315	KTP10
ISO código do produto	**D**	**L10**	**Rε**																													
DCMT070202FP	6,35	7,75	0,2	–	–	–	●	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–	●	–	–	–	–	–	●
DCMT070204FP	6,35	7,75	0,4	–	–	●	–	●	–	–	–	–	–	–	–	–	–	●	●	●	–	–	–	–	●	●	–	–	–	–	–
DCMT070208FP	6,35	7,75	0,8	●	–	–	●	●	–	–	–	–	–	–	–	–	–	–	●	●	–	–	–	–	●	–	–	–	–	–	–
DCMT11T302FP	9,53	11,63	0,2	–	●	–	●	●	–	–	–	–	–	–	–	–	–	–	●	●	–	–	–	–	●	●	–	–	–	–	●
DCMT11T304FP	9,53	11,63	0,4	●	●	●	●	●	–	–	–	–	–	–	–	–	–	●	●	●	–	–	–	–	●	●	–	–	–	–	●
DCMT11T308FP	9,53	11,63	0,8	●	●	●	–	●	–	–	–	–	–	–	●	–	–	●	●	●	–	–	–	–	●	●	–	–	–	–	●
DCMT11T312FP	9,53	11,63	1,2	–	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
DCMT150404FP	12,70	15,50	0,4	–	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–	–	–	–	–	–	–	–	–
DCMT150408FP	12,70	15,50	0,8	●	–	–	–	●	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–	●	–	–	–	–	–	–

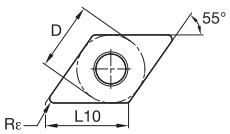




DCMT-FW

				KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35	KU10	K313	K68	KCS10	KCU10	KCU25	KC5010	KC5025	KC5410	KT315	KTP10
ISO código do produto	**D**	**L10**	**Rε**																													
DCMT11T304FW	9,53	11,63	0,2	–	–	–	–	●	–	–	–	–	–	–	–	●	–	–	–	–	–	–	–	–	●	–	●	–	–	–	–
DCMT11T308FW	9,53	11,63	0,8	–	–	–	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–	●	–

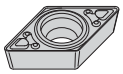


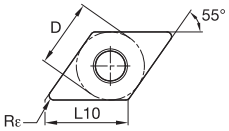


DCMT-LF

				KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35	KU10	K313	K68	KCS10	KCU10	KCU25	KC5010	KC5025	KC5410	KT315	KTP10
ISO código do produto	**D**	**L10**	**Rε**																													
DCMT070202LF	6,35	7,75	0,2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–	●	●	–	–	–
DCMT070204LF	6,35	7,75	0,4	–	●	●	●	●	●	–	–	–	●	–	–	●	●	●	●	●	●	–	●	–	–	–	–	●	●	–	●	–
DCMT11T302LF	9,53	11,63	0,2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	●	–	●	–
DCMT11T304LF	9,53	11,63	0,4	●	●	●	●	●	●	–	–	●	–	●	●	●	●	●	●	●	–	–	●	–	–	–	–	●	●	–	●	–
DCMT11T308LF	9,53	11,63	0,8	–	●	●	●	●	–	–	–	●	●	●	●	●	●	●	●	●	–	–	●	–	–	●	–	●	●	–	●	–
DCMT11T312LF	9,53	11,63	1,2	–	●	●	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–
DCMT150404LF	12,70	15,50	0,4	–	–	●	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	●	–	–	–
DCMT150408LF	12,70	15,50	0,8	–	●	●	●	●	–	–	–	–	–	–	–	●	–	–	–	–	–	–	–	–	–	–	–	●	●	–	–	–

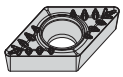
● primeira opção
○ opção alternativa

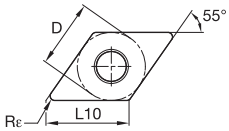




DCMT-MF

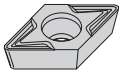
ISO código do produto	D	L10	Rε	KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35	KU10	K313	K68	KCS10	KCU10	KCU25	KC5010	KC5025	KC5410	KT315	KTP10
P				●	●	●	●	●	●	●	○	○	○	○	○	○	○	○	○	○	○	●	●	●		●	●	●	●		●	●
M										○							●	●	●	●	●	●	●	●	●	●	●	●	●		●	●
K				○	○	○	○	○			●	●	●	●	●	●						●	●	●		●	●	●	●		●	●
N																						●	●	●		●	●	●	●	●		
S																						●	●	●	●	●	●	●	●			
H																																
DCMT11T304MF	9,53	11,63	0,4	–	●	●	●	●	●	–	–	–	–	●	–	●	–	●	●	●	–	–	–	–	–	–	–	–	–	–	–
DCMT11T308MF	9,53	11,63	0,8	–	●	●	●	●	●	–	–	–	–	●	–	●	●	●	–	●	●	–	–	–	–	–	–	–	–	–	–
DCMT11T312MF	9,53	11,63	1,2	–	●	●	●	–	–	–	–	–	–	●	●	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–

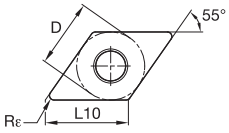




DCMT-MP

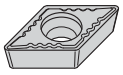
ISO código do produto	D	L10	Rε	KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35	KU10	K313	K68	KCS10	KCU10	KCU25	KC5010	KC5025	KC5410	KT315	KTP10
DCMT11T304MP	9,53	11,63	0,4	–	–	●	–	●	–	–	–	–	–	–	●	●	–	●	●	●	–	–	–	–	–	●	–	–	–	–	–	–
DCMT11T308MP	9,53	11,63	0,8	–	–	●	–	●	–	–	–	–	–	–	●	●	–	●	●	●	–	–	–	–	–	●	–	–	–	–	–	–
DCMT11T312MP	9,53	11,63	1,2	–	–	–	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–	–	–

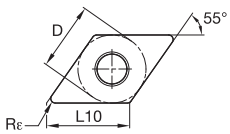




DCMT-MW

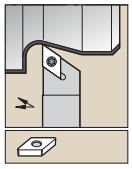
ISO código do produto	D	L10	Rε	KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35	KU10	K313	K68	KCS10	KCU10	KCU25	KC5010	KC5025	KC5410	KT315	KTP10
DCMT11T304MW	9,53	11,63	0,4	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–	–	–
DCMT11T308MW	9,53	11,63	0,8	–	–	–	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–	–	–

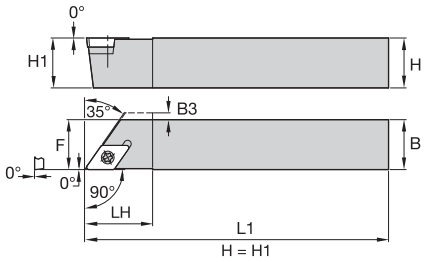


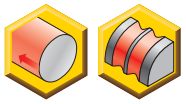


DCMT-UF

ISO código do produto	D	L10	Rε	KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35	KU10	K313	K68	KCS10	KCU10	KCU25	KC5010	KC5025	KC5410	KT315	KTP10
DCMT070204UF	6,35	7,75	0,4	–	–	–	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–
DCMT11T302UF	9,53	11,63	0,2	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–
DCMT11T304UF	9,53	11,63	0,4	●	●	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–
DCMT11T308UF	9,53	11,63	0,8	●	●	●	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–





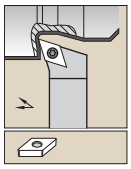


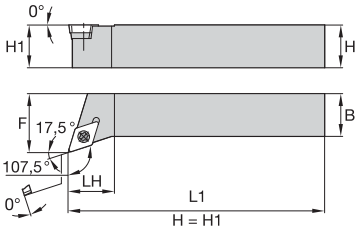
SDAC 90°

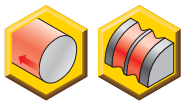




número para pedido	código do produto	H	B	F	L1	LH	B3	inserto padrão	calço	parafuso do calço	sexta-vada	parafuso do inserto	Torx
corte à direita (R)													
1772159	**SDACR1212M11Q**	12	12	12,0	150	22,0	1,5	DC..11T308	–	–	–	**MS1155**	T15
1097720	**SDACR1616K11Q**	16	16	16,0	125	22,0	–	DC..11T308	**SKDP343**	**SRS3**	3.5 mm	**MS1156**	T15
corte à esquerda (L)													
1772160	**SDACL1212M11Q**	12	12	12,0	150	22,0	1,5	DC..11T308	–	–	–	**MS1155**	T15





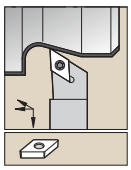


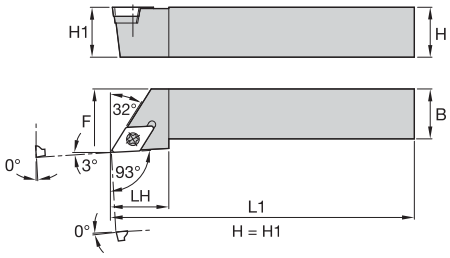
SDHC 107,5°

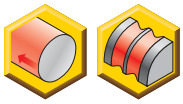




número para pedido	código do produto	H	B	F	L1	LH	inserto padrão	calço	parafuso do calço	sexta-vada	parafuso do inserto	Torx
corte à direita (R)												
1097841	**SDHCR1616H11**	16	16	20,0	100	20,0	DC..11T308	**SKDP343**	**SRS3**	3.5 mm	**MS1156**	T15
1097989	**SDHCR2020K11**	20	20	25,0	125	20,0	DC..11T308	**SKDP343**	**SRS3**	3.5 mm	**MS1156**	T15
1130381	**SDHCR2525M11**	25	25	32,0	150	20,0	DC..11T308	**SKDP343**	**SRS3**	3.5 mm	**MS1156**	T15
1097843	**SDHCR2525M15**	25	25	32,0	150	25,0	DC..150408	**SKDP453**	**SRS4**	4 mm	**MS1158**	T15
corte à esquerda (L)												
1097986	**SDHCL1616H11**	16	16	20,0	100	20,0	DC..11T308	**SKDP343**	**SRS3**	3.5 mm	**MS1156**	T15
1097930	**SDHCL2020K11**	20	20	25,0	125	20,0	DC..11T308	**SKDP343**	**SRS3**	3.5 mm	**MS1156**	T15
1124630	**SDHCL2525M11**	25	25	32,0	150	20,0	DC..11T308	**SKDP343**	**SRS3**	3.5 mm	**MS1156**	T15
1097988	**SDHCL2525M15**	25	25	32,0	150	25,0	DC..150408	**SKDP453**	**SRS4**	4 mm	**MS1158**	T15





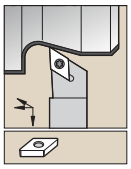


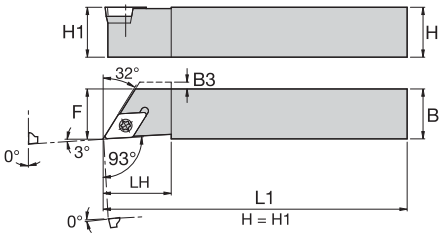
SDJC 93°

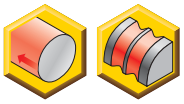




número para pedido	código do produto	H	B	F	L1	LH	inserto padrão	calço	parafuso do calço	sexta-vada	parafuso do inserto	Torx
corte à direita (R)												
1097847	**SDJCR0808L07**	8	8	10,0	140	16,0	DC..070204	–	–	–	**MS1153**	T7
1097848	**SDJCR1010M07**	10	10	12,0	150	16,0	DC..070204	–	–	–	**MS1153**	T7
1097849	**SDJCR1212N07**	12	12	16,0	160	16,0	DC..070204	–	–	–	**MS1153**	T7
1097850	**SDJCR1212N11**	12	12	16,0	160	22,0	DC..11T308	–	–	–	**MS1155**	T15
1244972	**SDJCR1616H07**	16	16	20,0	100	16,0	DC..070204	–	–	–	**MS1153**	T7
1097851	**SDJCR1616H11**	16	16	20,0	100	22,0	DC..11T308	**SKDP343**	**SRS3**	3.5 mm	**MS1156**	T15
1244974	**SDJCR2020K07**	20	20	25,0	125	16,0	DC..070204	–	–	–	**MS1153**	T7
1097853	**SDJCR2020K11**	20	20	25,0	125	22,0	DC..11T308	**SKDP343**	**SRS3**	3.5 mm	**MS1156**	T15
1097852	**SDJCR2020K15**	20	20	25,0	125	32,0	DC..150408	**SKDP453**	**SRS4**	4 mm	**MS1158**	T15
1097854	**SDJCR2525M11**	25	25	32,0	150	22,0	DC..11T308	**SKDP343**	**SRS3**	3.5 mm	**MS1156**	T15
1097855	**SDJCR2525M15**	25	25	32,0	150	32,0	DC..150408	**SKDP453**	**SRS4**	4 mm	**MS1158**	T15
corte à esquerda (L)												
1097997	**SDJCL0808L07**	8	8	10,0	140	16,0	DC..070204	–	–	–	**MS1153**	T7
1097998	**SDJCL1010M07**	10	10	12,0	150	16,0	DC..070204	–	–	–	**MS1153**	T7
1097999	**SDJCL1212N07**	12	12	16,0	160	16,0	DC..070204	–	–	–	**MS1153**	T7
1098000	**SDJCL1212N11**	12	12	16,0	160	22,0	DC..11T308	–	–	–	**MS1155**	T15
1244966	**SDJCL1616H07**	16	16	20,0	100	16,0	DC..070204	–	–	–	**MS1153**	T7
1098001	**SDJCL1616H11**	16	16	20,0	100	22,0	DC..11T308	**SKDP343**	**SRS3**	3.5 mm	**MS1156**	T15
1244968	**SDJCL2020K07**	20	20	25,0	125	16,0	DC..070204	–	–	–	**MS1153**	T7
1098003	**SDJCL2020K11**	20	20	25,0	125	22,0	DC..11T308	**SKDP343**	**SRS3**	3.5 mm	**MS1156**	T15
1192473	**SDJCL2525M11**	25	25	32,0	150	22,0	DC..11T308	**SKDP343**	**SRS3**	3.5 mm	**MS1156**	T15
1098004	**SDJCL2525M15**	25	25	32,0	150	32,0	DC..150408	**SKDP453**	**SRS4**	4 mm	**MS1158**	T15



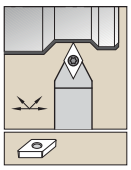


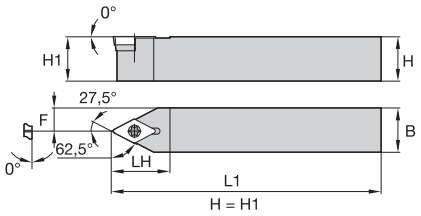


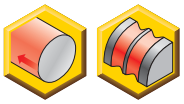
SDJC-F 93°



número para pedido	código do produto	H	B	F	L1	LH	B3	inserto padrão	calço	parafuso do calço	sexta-vada	parafuso do inserto	Torx
corte à direita (R)													
1772157	SDJCRF0808M07Q	8	8	8,0	150	16,0	1,5	DC..070204	–	–	–	MS1153	T7
1097844	SDJCRF1010M07Q	10	10	10,0	150	16,0	–	DC..070204	–	–	–	MS1153	T7
1097845	SDJCRF1212M07Q	12	12	12,0	150	16,0	–	DC..070204	–	–	–	MS1153	T7
1097846	SDJCRF1616K11Q	16	16	16,0	125	22,0	–	DC..11T308	SKDP343	SRS3	3.5 mm	MS1156	T15
corte à esquerda (L)													
1097996	SDJCLF1616K11Q	16	16	16,0	125	22,0	–	DC..11T308	SKDP343	SRS3	3.5 mm	MS1156	T15



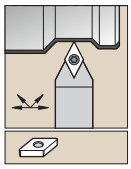


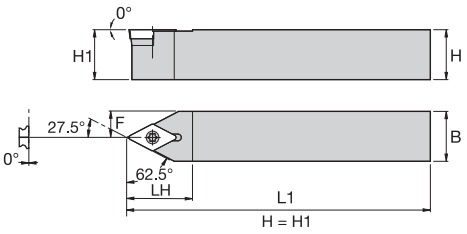


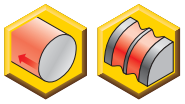
SDNC 62,5°



número para pedido	código do produto	H	B	F	L1	LH	inserto padrão	calço	parafuso do calço	sexta-vada	parafuso do inserto	Torx
corte à esquerda (L)												
1097856	SDNCN0808L07	8	8	4,0	140	16,0	DC..070204	–	–	–	MS1153	T7
1097857	SDNCN1010M07	10	10	5,0	150	16,0	DC..070204	–	–	–	MS1153	T7
1097858	SDNCN1212N07	12	12	6,0	160	16,0	DC..070204	–	–	–	MS1153	T7
1097859	SDNCN1616H11	16	16	8,0	100	22,0	DC..11T308	SKDP343	SRS3	3.5 mm	MS1156	T15
1097861	SDNCN2020K11	20	20	10,0	125	22,0	DC..11T308	SKDP343	SRS3	3.5 mm	MS1156	T15
1097860	SDNCN2020K15	20	20	10,0	125	28,0	DC..150408	SKDP453	SRS4	4 mm	MS1158	T15
1097862	SDNCN2525M15	25	25	12,5	150	28,0	DC..150408	SKDP453	SRS4	4 mm	MS1158	T15





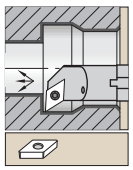


SDPC 62,5°

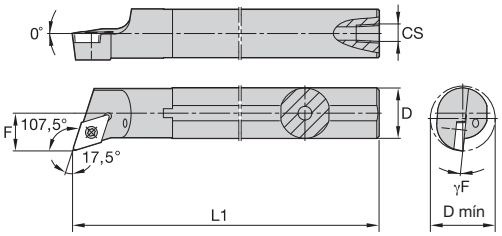


número para pedido	código do produto	H	B	F	L1	LH	inserto padrão	parafuso do inserto	Torx
1772173	**SDPCN1212M11Q**	12	12	6,0	150	22,0	DC..11T308	**MS1155**	T15

Barras de mandrilar Screw-On



Haste de aço com refrigeração interna.

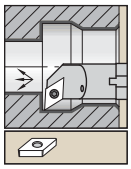




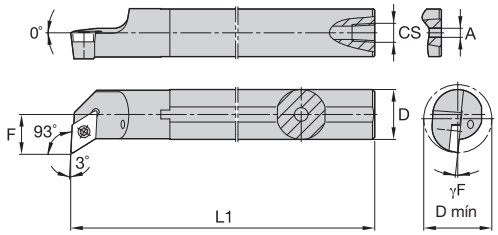
A-SDQC 107,5°



número para pedido	código do produto	D	D mín	F	L1	CS	γF°	inserto padrão	parafuso do inserto	Torx
corte à direita (R)										
1098188	**A12MSDQCR07**	12	16,0	9,0	150	1/16-27 NPT	-6.0	DC..070204	**MS1153**	T7
1098198	**A16RSDQCR07**	16	20,0	11,0	200	1/8-27 NPT	-5.0	DC..070204	**MS1153**	T7
1098147	**A20SSDQCR11**	20	25,0	13,0	250	1/8-27 NPT	-5.0	DC..11T308	**MS1155**	T15
1098260	**A25TSDQCR11**	25	32,0	17,0	300	1/4-18 NPT	-4.0	DC..11T308	**MS1155**	T15
corte à esquerda (L)										
1098193	**A12MSDQCL07**	12	16,0	9,0	150	1/16-27 NPT	-6.0	DC..070204	**MS1153**	T7
1098203	**A16RSDQCL07**	16	20,0	11,0	200	1/8-27 NPT	-5.0	DC..070204	**MS1153**	T7
1098149	**A20SSDQCL11**	20	25,0	13,0	250	1/8-27 NPT	-5.0	DC..11T308	**MS1155**	T15
1098264	**A25TSDQCL11**	25	32,0	17,0	300	1/4-18 NPT	-4.0	DC..11T308	**MS1155**	T15



Haste de aço com refrigeração interna.



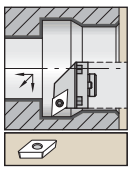


A-SDUC 93°

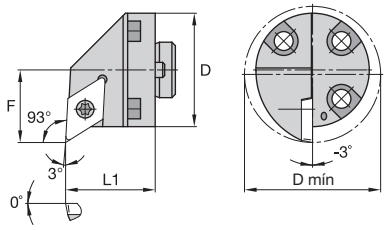


número para pedido	código do produto	D	D mín	F	L1	A	CS	γF°	inserto padrão	calço	parafuso do calço	sexta-vada	parafuso do inserto	Torx
corte à direita (R)														
1886506	**A10KSDUCR07**	10	13,0	7,0	125	3,2	–	-7.0	DC..070204	–	–	–	**MS1153**	T7
1098187	**A12MSDUCR07**	12	16,0	9,0	150	–	1/16-27 NPT	-4.0	DC..070204	–	–	–	**MS1153**	T7
1098197	**A16RSDUCR07**	16	20,0	11,0	200	–	1/8-27 NPT	-4.0	DC..070204	–	–	–	**MS1153**	T7
1886508	**A16RSDUCR11**	16	20,0	11,0	200	–	1/8-27 NPT	-6.0	DC..11T308	–	–	–	**MS1155**	T15
1098146	**A20SSDUCR11**	20	25,0	13,0	250	–	1/8-27 NPT	-5.0	DC..11T308	–	–	–	**MS1155**	T15
1098259	**A25TSDUCR11**	25	32,0	17,0	300	–	1/4-18 NPT	-4.0	DC..11T308	–	–	–	**MS1155**	T15
1098283	**A32TSDUCR15**	32	40,0	22,0	300	–	1/4-18 NPT	-7.0	DC..150408	**SKDP453**	**SRS4**	4 mm	**MS1158**	T15
corte à esquerda (L)														
1886505	**A10KSDUCL07**	10	13,0	7,0	125	3,2	–	-7.0	DC..070204	–	–	–	**MS1153**	T7
1098192	**A12MSDUCL07**	12	16,0	9,0	150	–	1/16-27 NPT	-4.0	DC..070204	–	–	–	**MS1153**	T7
1098202	**A16RSDUCL07**	16	20,0	11,0	200	–	1/8-27 NPT	-4.0	DC..070204	–	–	–	**MS1153**	T7
1886507	**A16RSDUCL11**	16	20,0	11,0	200	–	1/8-27 NPT	-6.0	DC..11T308	–	–	–	**MS1155**	T15
1098148	**A20SSDUCL11**	20	25,0	13,0	250	–	1/8-27 NPT	-5.0	DC..11T308	–	–	–	**MS1155**	T15
1098263	**A25TSDUCL11**	25	32,0	17,0	300	–	1/4-18 NPT	-4.0	DC..11T308	–	–	–	**MS1155**	T15
1098284	**A32TSDUCL15**	32	40,0	22,0	300	–	1/4-18 NPT	-7.0	DC..150408	**SKDP453**	**SRS4**	4 mm	**MS1158**	T15

Cabeças de mandrilar Screw-On



Com refrigeração interna.

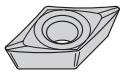


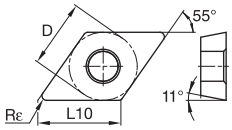
H-SDUC 93°



número para pedido	código do produto	D	D mín	F	L1	inserto padrão	parafuso do inserto	Torx
corte à direita (R)								
1772255	**H25SDUCR11**	25	32,0	17,0	20	DC..11T308	**MS1155**	T15
1772257	**H32SDUCR11**	32	40,0	22,0	25	DC..11T308	**MS1155**	T15
3612136	**H40SDUCR11**	40	50,0	27,0	41	DC..11T308	**MS1156**	T15
3612138	**H50SDUCR11**	50	63,0	35,0	41	DC..11T308	**MS1156**	T15
corte à esquerda (L)								
1772256	**H25SDUCL11**	25	32,0	17,0	20	DC..11T308	**MS1155**	T15
1772258	**H32SDUCL11**	32	40,0	22,0	25	DC..11T308	**MS1155**	T15
3612139	**H50SDUCL11**	50	63,0	35,0	41	DC..11T308	**MS1156**	T15

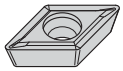
● primeira opção
○ opção alternativa

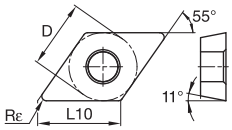




DPGT-HP

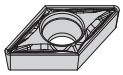
				KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35	KU10	K313	K68	KCS10	KCU10	KCU25	KC5010	KC5025	KC5410	KT315	KTP10
P				●	●	●	●	●	●	●	○	○	○	○	○	○	○	○	○	○	○	●	●	●		●	●	●	●		●	●
M										○							●	●	●	●	●	●	●	●	●	●	●	●		●	●	●
K				○	○	○	○	○			●	●	●	●	●	●						●	●	●		●	●	●	●		●	●
N																						●	●	●		●	●	●	●	●		
S																						●	●	●	●	●	●	●	●			
H																																
ISO código do produto	D	L10	Rε																													
DPGT070202HP	6,35	7,75	0,2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–
DPGT070204HP	6,35	7,75	0,4	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	●	●	–	●	–	–
DPGT070208HP	6,35	7,75	0,8	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	●	–	–	–	–	–
DPGT11T304HP	9,53	11,63	0,4	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	●	●	●	–	●	–	–
DPGT11T308HP	9,53	11,63	0,8	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	●	●	–	–	–	–

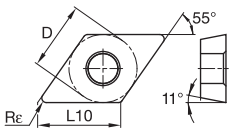




DPGT-LF

				KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35	KU10	K313	K68	KCS10	KCU10	KCU25	KC5010	KC5025	KC5410	KT315	KTP10
ISO código do produto	D	L10	Rε																													
DPGT070201LF	6,35	7,75	0,1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–
DPGT070202LF	6,35	7,75	0,2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	●	–	–	–	–
DPGT070204LF	6,35	7,75	0,4	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	●	●	–	–	–
DPGT11T301LF	9,53	11,63	0,1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–
DPGT11T302LF	9,53	11,63	0,2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	●	●	–	–	–
DPGT11T304LF	9,53	11,63	0,4	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	●	●	–	–	–
DPGT11T308LF	9,53	11,63	0,8	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	●	–	–	–	–



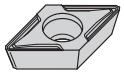


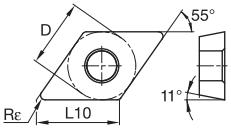
DPMT-FP

				KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35	KU10	K313	K68	KCS10	KCU10	KCU25	KC5010	KC5025	KC5410	KT315	KTP10
ISO código do produto	D	L10	Rε																													
DPMT070202FP	6,35	7,75	0,2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–	–	–
DPMT070204FP	6,35	7,75	0,4	–	–	●	–	●	–	–	–	–	–	–	–	–	–	●	–	–	–	–	–	–	●	●	–	–	–	–	●
DPMT070208FP	6,35	7,75	0,8	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	●	–	–	–	–	–
DPMT11T304FP	9,53	11,63	0,4	–	–	●	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	●	–	–	–	–	–
DPMT11T308FP	9,53	11,63	0,8	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–	–	●

● primeira opção
○ opção alternativa

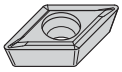
		KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35	KU10	K313	K68	KCS10	KCU10	KCU25	KC5010	KC5025	KC5410	KT315	KTP10
P		●	●	●	●	●	●	●	○	○	○	○	○	○	○	○	○	○	○	●	●	●		●	●	●	●		●	●
M								○							●	●	●	●	●	●	●	●	●	●	●	●	●		●	●
K		○	○	○	○	○			●	●	●	●	●	●						●	●	●		●	●	●	●		●	●
N																				●	●	●		●	●	●	●	●		
S																				●	●	●	●	●	●	●	●			
H																														

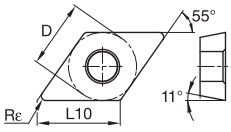




DPMT-FW

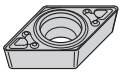
ISO código do produto	D	L10	Rε
DPMT070204FW	6,35	7,75	0,4
DPMT070208FW	6,35	7,75	0,8

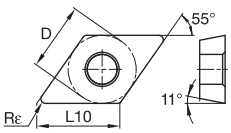




DPMT-LF

ISO código do produto	D	L10	Rε
DPMT070202LF	6,35	7,75	0,2
DPMT070204LF	6,35	7,75	0,4
DPMT11T302LF	9,53	11,63	0,2
DPMT11T304LF	9,53	11,63	0,4
DPMT11T308LF	9,53	11,63	0,8

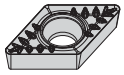


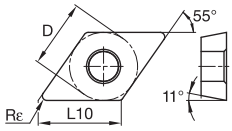


DPMT-MF

ISO código do produto	D	L10	Rε
DPMT11T308MF	9,53	11,63	0,8

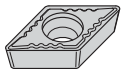
● primeira opção
○ opção alternativa

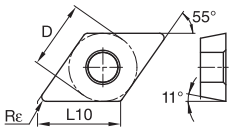




DPMT-MP

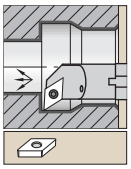
ISO código do produto	D	L10	Rε	KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35	KU10	K313	K68	KCS10	KCU10	KCU25	KC5010	KC5025	KC5410	KT315	KTP10
P				●	●	●	●	●	●	●	○	○	○	○	○	○	○	○	○	○	○	●	●	●		●	●	●	●		●	●
M										○							●	●	●	●	●	●	●	●	●	●	●	●	●		●	●
K				○	○	○	○	○			●	●	●	●	●	●						●	●	●		●	●	●	●		●	●
N																						●	●	●		●	●	●	●	●		
S																						●	●	●	●	●	●	●	●			
H																																
DPMT11T308MP	9,53	11,63	0,8	–	–	–	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–	–	–



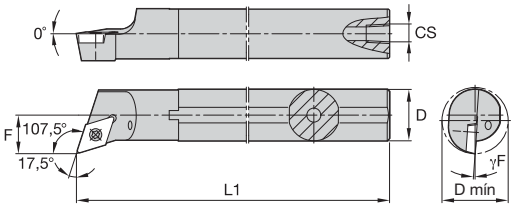


DPMT-UF

ISO código do produto	D	L10	Rε	KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35	KU10	K313	K68	KCS10	KCU10	KCU25	KC5010	KC5025	KC5410	KT315	KTP10
DPMT070204UF	6,35	7,75	0,4	–	–	–	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–
DPMT11T304UF	9,53	11,63	0,4	–	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
DPMT11T308UF	9,53	11,63	0,8	–	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–



Haste de aço com refrigeração interna.

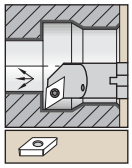




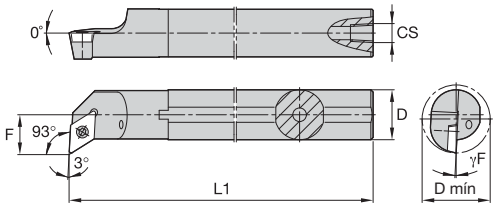
A-SDQP 107,5°



número para pedido	código do produto	D	D mín	F	L1	CS	γF°	inserto padrão	parafuso do inserto	Torx
corte à direita (R)										
1098186	**A12MSDQPR07**	12	16,0	9,0	150	1/16-27 NPT	-2.0	DP..070204	**MS1153**	T7
1098196	**A16RSDQPR07**	16	20,0	11,0	200	1/8-27 NPT	0.0	DP..070204	**MS1153**	T7
1098247	**A20SSDQPR11**	20	25,0	13,0	250	1/8-27 NPT	-2.0	DP..11T308	**MS1155**	T15
1098258	**A25TSDQPR11**	25	32,0	17,0	300	1/4-18 NPT	0.0	DP..11T308	**MS1155**	T15
corte à esquerda (L)										
1098191	**A12MSDQPL07**	12	16,0	9,0	150	1/16-27 NPT	-2.0	DP..070204	**MS1153**	T7
1098201	**A16RSDQPL07**	16	20,0	11,0	200	1/8-27 NPT	0.0	DP..070204	**MS1153**	T7
1098252	**A20SSDQPL11**	20	25,0	13,0	250	1/8-27 NPT	-2.0	DP..11T308	**MS1155**	T15
1098262	**A25TSDQPL11**	25	32,0	17,0	300	1/4-18 NPT	0.0	DP..11T308	**MS1155**	T15



Haste de aço com refrigeração interna.

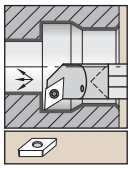




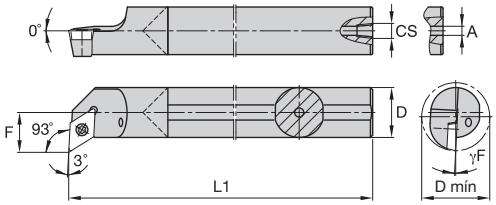
A-SDUP 93°



número para pedido	código do produto	D	D mín	F	L1	CS	γF°	inserto padrão	parafuso do inserto	Torx
corte à direita (R)										
1098184	**A12MSDUPR07**	12	16,0	9,0	150	1/16-27 NPT	-2.0	DP..070204	**MS1153**	T7
1098194	**A16RSDUPR07**	16	20,0	11,0	200	1/8-27 NPT	0.0	DP..070204	**MS1153**	T7
1098245	**A20SSDUPR11**	20	25,0	13,0	250	1/8-27 NPT	-2.0	DP..11T308	**MS1155**	T15
1098257	**A25TSDUPR11**	25	32,0	17,0	300	1/4-18 NPT	0.0	DP..11T308	**MS1155**	T15
corte à esquerda (L)										
1098189	**A12MSDUPL07**	12	16,0	9,0	150	1/16-27 NPT	-2.0	DP..070204	**MS1153**	T7
1098199	**A16RSDUPL07**	16	20,0	11,0	200	1/8-27 NPT	0.0	DP..070204	**MS1153**	T7
1098250	**A20SSDUPL11**	20	25,0	13,0	250	1/8-27 NPT	-2.0	DP..11T308	**MS1155**	T15



Haste de metal duro com refrigeração interna.

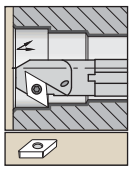




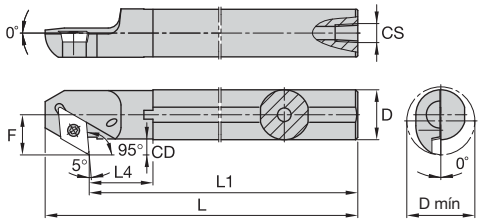
E-SDUP 93°



número para pedido	código do produto	D	D mín	F	L1	A	γF°	inserto padrão	parafuso do inserto	Torx
corte à direita (R)										
1152892	**E12QSDUPR07**	12	16,0	9,0	180	4,8	-2.0	DP..070204	**MS1153**	T7
1152894	**E16RSDUPR07**	16	20,0	11,0	200	5,5	0.0	DP..070204	**MS1153**	T7
1152906	**E20SSDUPR11**	20	25,0	13,0	250	7,1	-2.0	DP..11T308	**MS1155**	T15
corte à esquerda (L)										
1152893	**E12QSDUPL07**	12	16,0	9,0	180	4,8	-2.0	DP..070204	**MS1153**	T7
1152895	**E16RSDUPL07**	16	20,0	11,0	200	5,5	0.0	DP..070204	**MS1153**	T7
1152907	**E20SSDUPL11**	20	25,0	13,0	250	7,1	-2.0	DP..11T308	**MS1155**	T15



Haste de metal duro com refrigeração interna.

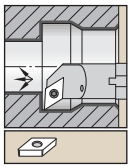




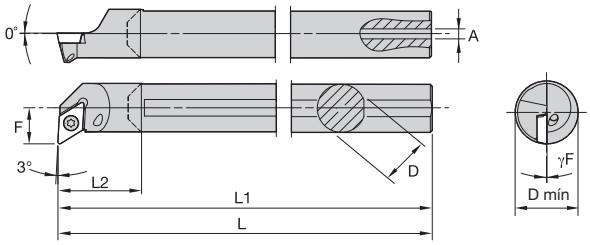
A-SDXP 95°



número para pedido	código do produto	D	D mín	F	L1	L	L4	CD	CS	inserto padrão	parafuso do inserto	Torx
corte à direita (R)												
1098185	**A12MSDXPR07**	12	16,0	9,0	150	162,0	–	3,09	1/16-27 NPT	DP..070204	**MS1153**	T7
1098195	**A16RSDXPR07**	16	20,0	11,0	200	212,0	–	3,20	1/8-27 NPT	DP..070204	**MS1153**	T7
1098246	**A20SSDXPR11**	20	25,0	13,0	250	270,0	48,44	4,31	1/8-27 NPT	DP..11T308	**MS1155**	T15
corte à esquerda (L)												
1098190	**A12MSDXPL07**	12	16,0	9,0	150	162,0	–	3,09	1/16-27 NPT	DP..070204	**MS1153**	T7
1098200	**A16RSDXPL07**	16	20,0	11,0	200	212,0	–	3,20	1/8-27 NPT	DP..070204	**MS1153**	T7
1098251	**A20SSDXPL11**	20	25,0	13,0	250	270,0	48,44	4,31	1/8-27 NPT	DP..11T308	**MS1155**	T15



Barra de metal pesado com refrigeração interna.

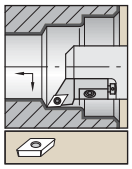


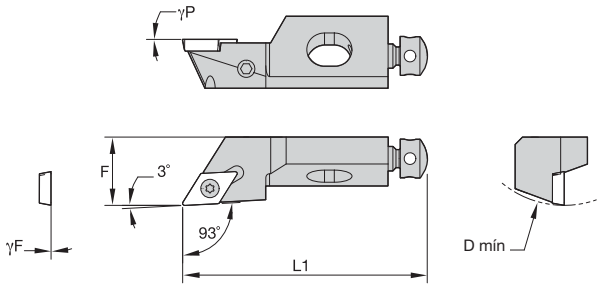


L-SDUP 93°



número para pedido	código do produto	D	D mín	F	L1	L	L2	A	γF°	inserto padrão	parafuso do inserto	Torx
corte à direita (R)												
3331116	**L12QSDUPR07**	12	16,0	9,0	181	181,2	22,4	4,0	-2.0	DP..070204..	**MS1153**	T7
3331117	**L20SSDUPR11**	20	25,0	13,0	251	251,5	33,6	4,0	-2.0	DP..11T308..	**MS1155**	T15
corte à esquerda (L)												
3331121	**L12QSDUPL07**	12	16,0	9,0	181	181,2	22,4	4,0	-2.0	DP..070204..	**MS1153**	T7





SDJP 93°

número para pedido	código do produto	D mín	F	L1	γF°	γP°	inserto padrão
corte à direita (R)							
1098757	**SDJPR10CA07**	40	14,0	50	0.0	0.0	DP..070204/DP..2151
corte à esquerda (L)							
1098758	**SDJPL10CA07**	40	14,0	50	0.0	0.0	DP..070204/DP..2151

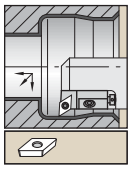
Peças de reposição

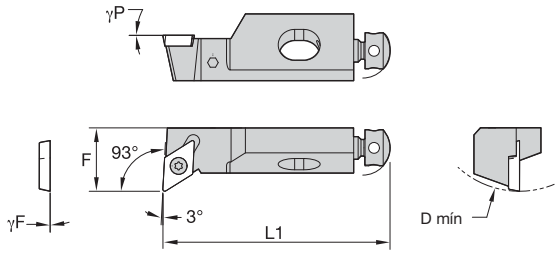






D mín	parafuso do inserto	Torx	parafuso de ajuste radial	sexta-vada	parafuso de ajuste axial	parafuso de montagem	sexta-vada	arruela
40	**MS1153**	T7	**KUAM28**	2 mm	**KUAM30**	**191.405**	4 mm	**CSWM 060 050**





SDUP 93°

número para pedido	código do produto	D mín	F	L1	γF°	γP°	inserto padrão
corte à direita (R)							
1098728	**SDUPR10CA07**	40	14,0	50	0.0	0.0	DP..070204/DP..2151

Peças de reposição

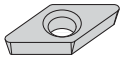


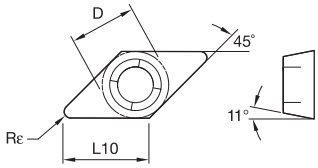




D mín	parafuso do inserto	Torx	parafuso de ajuste radial	sexta-vada	parafuso de ajuste axial	parafuso de montagem	sexta-vada	arruela
40	**MS1153**	T7	**KUAM28**	2 mm	**KUAM30**	**191.405**	4 mm	**CSWM 060 050**

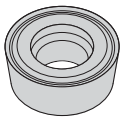
● primeira opção
○ opção alternativa

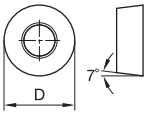




GPCD

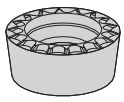
ISO código do produto	D	L10	Rε	KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35	KU10	K313	K68	KCS10	KCU10	KCU25	KC5010	KC5025	KC5410	KT315	KTP10
P				●	●	●	●	●	●	●	○	○	○	○	○	○	○	○	○	○	○	●	●	●		●	●	●	●		●	●
M										○							●	●	●	●	●	●	●	●	●	●	●	●	●		●	●
K				○	○	○	○	○			●	●	●	●	●	●						●	●	●		●	●	●	●		●	●
N																						●	●	●		●	●	●	●	●		
S																						●	●	●	●	●	●	●	●			
H																																
GPCD050102	3,97	5,61	0,2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	●	–	–	–
GPCD050104	3,97	5,61	0,4	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–	–	–

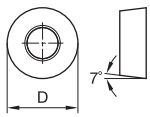




RCGH

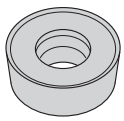
ISO código do produto	D	L10	Rε	KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35	KU10	K313	K68	KCS10	KCU10	KCU25	KC5010	KC5025	KC5410	KT315	KTP10
RCGH120400	12,70	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	●	–	–	–	–

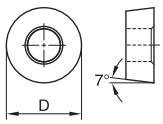




RCGH-MP

ISO código do produto	D	L10	Rε	KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35	KU10	K313	K68	KCS10	KCU10	KCU25	KC5010	KC5025	KC5410	KT315	KTP10
RCGH120400MP	12,70	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–	–	–	–



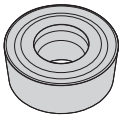


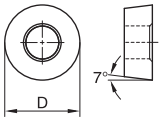
RCGT-HP

ISO código do produto	D	L10	Rε	KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35	KU10	K313	K68	KCS10	KCU10	KCU25	KC5010	KC5025	KC5410	KT315	KTP10
RCGT0803M0HP	8,00	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	●	–	–	●	●	–	●	–	–
RCGT10T3M0HP	10,00	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	●	●	●	●	●	–	–
RCGT1204M0HP	12,00	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	●	–	●	●	–	–	–

● primeira opção
○ opção alternativa

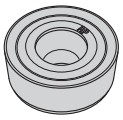
		KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35	KU10	K313	K68	KCS10	KCU10	KCU25	KC5010	KC5025	KC5410	KT315	KTP10
P		●	●	●	●	●	●	●	○	○	○	○	○	○	○	○	○	○	○	●	●	●		●	●	●	●		●	●
M								○							●	●	●	●	●	●	●	●	●	●	●	●	●		●	●
K		○	○	○	○	○			●	●	●	●	●	●						●	●	●		●	●	●	●		●	●
N																				●	●	●		●	●	●	●	●		
S																				●	●	●	●	●	●	●	●			
H																														

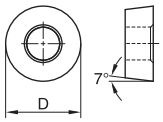




RCGT-MS

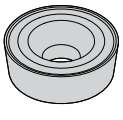
ISO código do produto	D	L10	Rε
RCGT0803M0MS	8,00	–	–
RCGT1204M0MS	12,00	–	–
RCGT1606M0MS	16,00	–	–

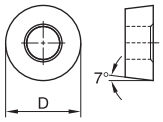




RCGT-RP

ISO código do produto	D	L10	Rε
RCGT0602M0RP	6,00	–	–
RCGT0803M0RP	8,00	–	–
RCGT1204M0RP	12,00	–	–

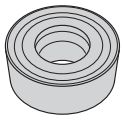


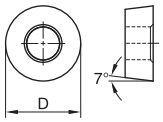


RCMH-K

ISO código do produto	D	L10	Rε
RCMH190600K	19,05	–	–

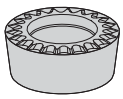
● primeira opção
○ opção alternativa

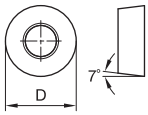




RCMT

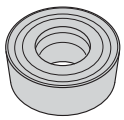
		KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35	KU10	K313	K68	KCS10	KCU10	KCU25	KC5010	KC5025	KC5410	KT315	KTP10
	P	●	●	●	●	●	●	●	○	○	○	○	○	○	○	○	○	○	○	●	●	●		●	●	●	●		●	●
	M							○							●	●	●	●	●	●	●	●	●	●	●	●	●		●	●
	K	○	○	○	○	○			●	●	●	●	●	●						●	●	●		●	●	●	●		●	●
	N																			●	●	●		●	●	●	●	●		
	S																			●	●	●	●	●	●	●	●			
	H																													
ISO código do produto	D	L10	Rε																											
RCMT0602M0	6,00	–	–	–	–	–	●	●	–	–	–	–	–	–	–	–	–	–	●	–	–	●	●	–	●	–	●	–	–	–	–
RCMT060200	6,35	–	–	–	–	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	●	–	–	–	–
RCMT0803M0	8,00	–	–	–	–	–	●	–	–	–	–	–	●	–	–	–	–	–	●	–	–	●	–	–	–	●	–	–	–	–
RCMT09T300	9,53	–	–	–	–	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	●	–	●	–	–	–	–
RCMT10T3M0	10,00	–	–	–	–	–	●	●	–	–	–	–	●	–	–	–	–	–	●	–	–	–	–	●	–	●	–	–	–	–
RCMT1204M0	12,00	–	–	–	–	–	–	●	–	–	–	●	–	●	–	–	–	–	●	–	–	●	–	●	–	●	–	–	–	–
RCMT120400	12,70	–	●	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–	●	–	–	–	–	–	–	●	–	–	–	–
RCMT1605M0	16,00	–	–	–	–	●	–	–	–	–	–	–	–	●	–	–	–	–	●	–	–	●	–	●	–	●	–	–	–	–
RCMT2006M0	20,00	–	–	–	–	●	–	–	–	–	–	–	●	–	–	–	–	–	●	–	–	●	–	●	–	●	–	–	–	–

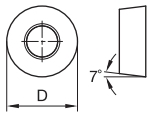




RCMT-MP

ISO código do produto	D	L10	Rε	KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35	KU10	K313	K68	KCS10	KCU10	KCU25	KC5010	KC5025	KC5410	KT315	KTP10
RCMT0803M0MP	8,00	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–	–	–	–
RCMT10T3M0MP	10,00	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–	–	–	–
RCMT1204M0MP	12,00	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–	–	–	–
RCMT120400MP	12,70	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–	–	–	–
RCMT1606M0MP	16,00	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–	–	–	–

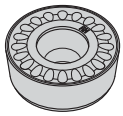


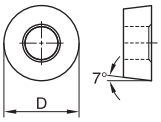


RCMT-M0

ISO código do produto	D	L10	Rε	KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35	KU10	K313	K68	KCS10	KCU10	KCU25	KC5010	KC5025	KC5410	KT315	KTP10
RCMT1204M0	12,00	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–

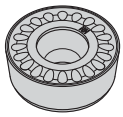
● primeira opção
○ opção alternativa

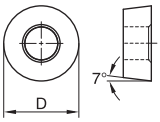




RCMT-RH

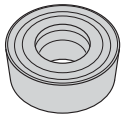
				KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35	KU10	K313	K68	KCS10	KCU10	KCU25	KC5010	KC5025	KC5410	KT315	KTP10
P				●	●	●	●	●	●	●	○	○	○	○	○	○	○	○	○	○	○	●	●	●		●	●	●	●		●	●
M										○							●	●	●	●	●	●	●	●	●	●	●	●	●		●	●
K				○	○	○	○	○			●	●	●	●	●	●						●	●	●		●	●	●	●		●	●
N																						●	●	●		●	●	●	●	●		
S																						●	●	●	●	●	●	●	●			
H																																
ISO código do produto	D	L10	Rε																													
RCMT2006M0RH	20,00	—	—	–	–	●	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–

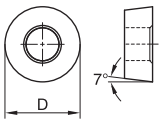




RCMX-RH

ISO código do produto	D	L10	Rε	KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35	KU10	K313	K68	KCS10	KCU10	KCU25	KC5010	KC5025	KC5410	KT315	KTP10
RCMX2507M0RH	25,00	—	—	–	–	●	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
RCMX3209M0RH	32,00	—	—	–	–	–	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–

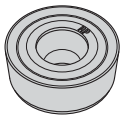


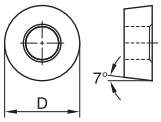


RCMT-RM

ISO código do produto	D	L10	Rε	KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35	KU10	K313	K68	KCS10	KCU10	KCU25	KC5010	KC5025	KC5410	KT315	KTP10
RCMT2006M0RM	20,00	—	—	–	–	–	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–

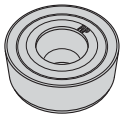
● primeira opção
○ opção alternativa

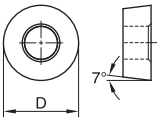




RCMT-RP

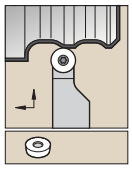
				KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35	KU10	K313	K68	KCS10	KCU10	KCU25	KC5010	KC5025	KC5410	KT315	KTP10
ISO código do produto	**D**	**L10**	**Rε**																													
RCMT1204M0RP	12,00	—	—	–	●	●	●	●	–	–	–	–	–	●	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
RCMT1606M0RP	16,00	—	—	–	–	–	●	●	–	–	–	–	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
RCMT2006M0RP	20,00	—	—	–	–	–	–	●	–	–	–	–	–	–	●	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–

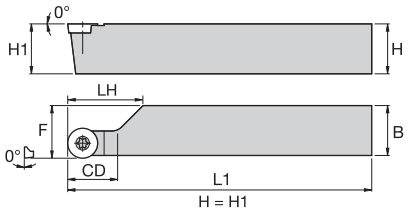




RCMX-RP

				KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35	KU10	K313	K68	KCS10	KCU10	KCU25	KC5010	KC5025	KC5410	KT315	KTP10
ISO código do produto	**D**	**L10**	**Rε**																													
RCMX1003M0RP	10,00	—	—	–	●	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
RCMX2507M0RP	25,00	—	—	–	–	–	–	●	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–



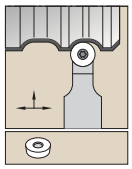


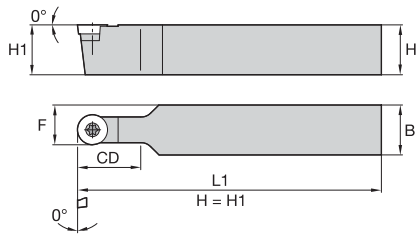


SRAC



número para pedido	código do produto	H	B	F	L1	LH	CD	inserto padrão	parafuso do inserto	Torx
corte à direita (R)										
1097887	SRACR1212N08	12	12	13,0	160	31,0	12,0	RC..0803M0	MS1154	T9
1097888	SRACR1616Q08	16	16	17,0	180	35,0	16,0	RC..0803M0	MS1154	T9







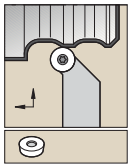
SRDC

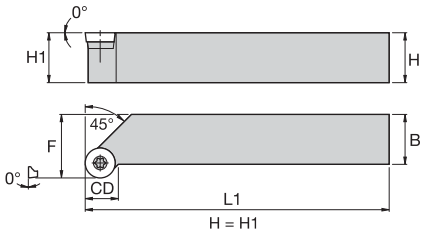






número para pedido	código do produto	H	B	F	L1	CD	inserto padrão	calço	parafuso do calço	sexta-vada	parafuso do inserto	Torx
1097892	SRDCN1212N06	12	12	9,0	160	12,0	RC..0602M0	–	–	–	MS1153	T7
1097891	SRDCN1212N08	12	12	10,0	160	12,0	RC..0803M0	–	–	–	MS1154	T9
1097899	SRDCN1616H06	16	16	11,0	100	16,0	RC..0602M0	–	–	–	MS1153	T7
1097897	SRDCN1616H08	16	16	12,0	100	16,0	RC..0803M0	–	–	–	MS1154	T9
1097898	SRDCN1616H10	16	16	13,0	100	16,0	RC..10T3M0	SKRN100300	SRS3	3.5 mm	MS1156	T15
1097893	SRDCN1616Q08	16	16	12,0	180	16,0	RC..0803M0	–	–	–	MS1154	T9
1097900	SRDCN2020K08	20	20	14,0	125	20,0	RC..0803M0	–	–	–	MS1154	T9
1097901	SRDCN2020K10	20	20	15,0	125	20,0	RC..10T3M0	SKRN100300	SRS3	3.5 mm	MS1156	T15
1097894	SRDCN2020K12	20	20	16,0	125	20,0	RC..1204M0	SKRN1203M0	SRS3	3.5 mm	MS1156	T15
1097903	SRDCN2525M08	25	25	16,5	150	25,0	RC..0803M0	–	–	–	MS1154	T9
1097902	SRDCN2525M10	25	25	17,5	150	25,0	RC..10T3M0	SKRN100300	SRS3	3.5 mm	MS1156	T15
1097895	SRDCN2525M12	25	25	18,5	150	25,0	RC..1204M0	SKRN1203M0	SRS3	3.5 mm	MS1156	T15
1097896	SRDCN2525M16	25	25	20,5	150	25,0	RC..1605M0	SKRN160400	SRS5	4 mm	MS1160	T15



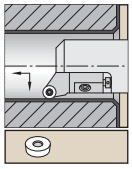


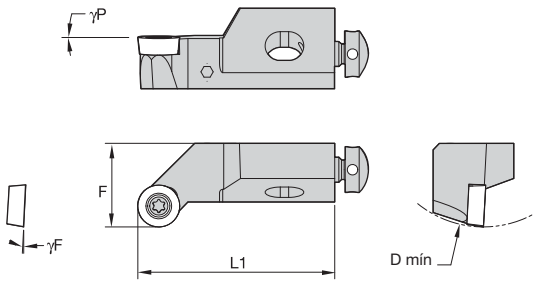


SRGC



número para pedido	código do produto	H	B	F	L1	CD	inserto padrão	calço	parafuso do calço	sexta-vada	parafuso do inserto	Torx
corte à direita (R)												
1097792	**SRGCR1616H06**	16	16	20,0	100	7,0	RC..0602M0	–	–	–	**MS1153**	T7
1097791	**SRGCR1616H10**	16	16	20,0	100	7,9	RC..10T3M0	**SKRN100300**	**SRS3**	3.5 mm	**MS1156**	T15
1097793	**SRGCR2020K08**	20	20	25,0	125	9,0	RC..0803M0	–	–	–	**MS1154**	T9
1097794	**SRGCR2020K10**	20	20	25,0	125	9,3	RC..10T3M0	**SKRN100300**	**SRS3**	3.5 mm	**MS1156**	T15
1097796	**SRGCR2525M08**	25	25	32,0	150	11,8	RC..0803M0	–	–	–	**MS1154**	T9
1097795	**SRGCR2525M10**	25	25	32,0	150	12,1	RC..10T3M0	**SKRN100300**	**SRS3**	3.5 mm	**MS1156**	T15
1097788	**SRGCR2525M12**	25	25	32,0	150	12,7	RC..1204M0	**SKRN1203M0**	**SRS3**	3.5 mm	**MS1156**	T15
corte à esquerda (L)												
1097937	**SRGCL1616H06**	16	16	20,0	100	7,0	RC..0602M0	–	–	–	**MS1153**	T7
1097936	**SRGCL1616H10**	16	16	20,0	100	7,9	RC..10T3M0	**SKRN100300**	**SRS3**	3.5 mm	**MS1156**	T15
1097938	**SRGCL2020K08**	20	20	25,0	125	9,0	RC..0803M0	–	–	–	**MS1154**	T9
1097941	**SRGCL2525M08**	25	25	32,0	150	11,8	RC..0803M0	–	–	–	**MS1154**	T9
1097940	**SRGCL2525M10**	25	25	32,0	150	12,1	RC..10T3M0	**SKRN100300**	**SRS3**	3.5 mm	**MS1156**	T15
1097933	**SRGCL2525M12**	25	25	32,0	150	12,7	RC..1204M0	**SKRN1203M0**	**SRS3**	3.5 mm	**MS1156**	T15





SRGC

número para pedido	código do produto	D mín	F	L1	γF°	γP°	inserto padrão
corte à direita (R)							
1098711	**SRGCR08CA06**	25	10,0	32	-4.0	0.0	RC..0602M0/RC..215
1098713	**SRGCR12CA10**	50	20,0	55	-3.0	0.0	RC..10T3M0/RC..10T3M0

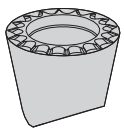
Peças de reposição

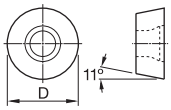


D mín	parafuso do inserto	Torx	parafuso de ajuste radial	sexta-vada	parafuso de ajuste axial	parafuso de montagem	parafuso de montagem	sexta-vada	arruela
25	**MS1153**	T7	**KUAM34**	1.5 mm	**KUAM20**	**MS2175**	**–**	2.5 mm	**CSWM 040 050**
50	**MS1155**	T15	**KUAM23**	2.5 mm	**KUAM31**	**–**	**191.406**	4 mm	**CSWM 060 050**

Insertos de metal duro ISO

● primeira opção
○ opção alternativa





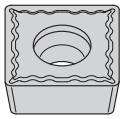
RPGT-MP

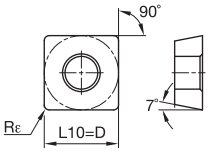
ISO código do produto	D	L10	Rε	KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35	KU10	K313	K68	KCS10	KCU10	KCU25	KC5010	KC5025	KC5410	KT315	KTP10
RPGT060400MP	6,35	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–	–	–	–

P		●	●	●	●	●	●	●	○	○	○	○	○	○	○	○	○	○	○	○	●	●	●		●	●	●	●		●	●
M								○							●	●	●	●	●	●	●	●	●	●	●	●	●	●		●	●
K		○	○	○	○	○			●	●	●	●	●	●								●	●	●		●	●	●	●		●	●
N																						●	●	●		●	●	●	●	●		
S																						●	●	●	●	●	●	●	●			
H																																

NOTA: Para suportes estilo V-Bottom, favor veja página B370.

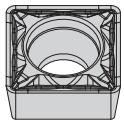
● primeira opção
○ opção alternativa

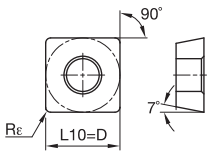




SCMT-11

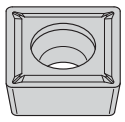
ISO código do produto	D	L10	Rε	KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35	KU10	K313	K68	KCS10	KCU10	KCU25	KC5010	KC5025	KC5410	KT315	KTP10
SCMT09T30411	9,53	9,53	0,4	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–
SCMT09T30811	9,53	9,53	0,8	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–
SCMT12040411	12,70	12,70	0,4	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–
SCMT12040811	12,70	12,70	0,8	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–

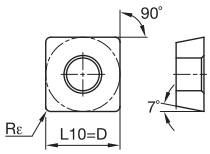




SCMT-FP

ISO código do produto	D	L10	Rε	KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35	KU10	K313	K68	KCS10	KCU10	KCU25	KC5010	KC5025	KC5410	KT315	KTP10
SCMT09T304FP	9,53	9,53	0,4	–	–	●	–	●	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–	–	●	●	–	–	–	–	–
SCMT09T308FP	9,53	9,53	0,8	–	–	●	●	●	–	–	–	–	–	–	–	●	–	●	–	–	–	–	–	–	–	●	●	–	–	–	–	●
SCMT120404FP	12,70	12,70	0,4	–	–	–	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–	–	–
SCMT120408FP	12,70	12,70	0,8	–	–	–	●	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–	–	●	–	–	–	–	–	–
SCMT120412FP	12,70	12,70	1,2	–	–	–	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–	–	–

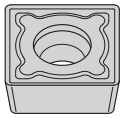


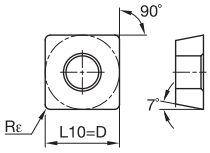


SCMT-LF

ISO código do produto	D	L10	Rε	KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35	KU10	K313	K68	KCS10	KCU10	KCU25	KC5010	KC5025	KC5410	KT315	KTP10
SCMT09T304LF	9,53	9,53	0,4	–	●	●	●	●	●	–	–	●	●	–	–	●	–	–	–	●	–	–	–	–	–	–	–	●	●	–	●	–
SCMT09T308LF	9,53	9,53	0,8	–	●	●	●	●	●	–	●	●	●	●	●	●	–	–	–	●	–	–	–	–	–	–	–	●	●	–	–	–
SCMT120404LF	12,70	12,70	0,4	–	–	●	–	●	●	–	–	–	–	–	–	–	–	–	●	–	–	–	–	–	–	–	–	●	–	–	–	–
SCMT120408LF	12,70	12,70	0,8	–	●	–	●	●	●	–	–	●	●	●	●	●	–	●	●	●	–	–	–	–	–	–	–	●	●	–	–	–
SCMT120412LF	12,70	12,70	1,2	–	●	–	●	–	–	–	–	–	–	–	–	●	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–

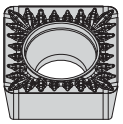
● primeira opção
○ opção alternativa

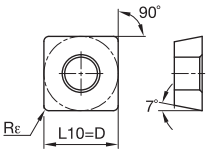




SCMT-MF

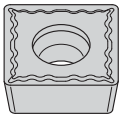
ISO código do produto	D	L10	Rε	KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35	KU10	K313	K68	KCS10	KCU10	KCU25	KC5010	KC5025	KC5410	KT315	KTP10
SCMT09T312MF	9,53	9,52	1,2	–	–	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
SCMT09T308MF	9,53	9,53	0,8	–	●	●	●	●	–	–	–	–	●	●	●	●	–	–	●	●	–	–	–	–	–	–	–	–	–	–	–	–
SCMT120408MF	12,70	12,70	0,8	–	–	●	●	●	●	–	–	–	●	●	●	●	–	●	●	●	●	–	–	–	–	–	–	–	–	–	–	–
SCMT120412MF	12,70	12,70	1,2	–	–	●	●	●	–	–	–	–	●	●	●	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–

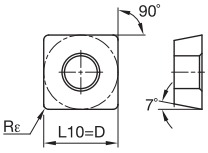




SCMT-MP

ISO código do produto	D	L10	Rε	KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35	KU10	K313	K68	KCS10	KCU10	KCU25	KC5010	KC5025	KC5410	KT315	KTP10
SCMT09T304MP	9,53	9,53	0,4	–	–	–	–	●	–	–	–	–	–	–	–	●	–	●	–	●	–	–	–	–	–	●	–	–	–	–	–	–
SCMT09T308MP	9,53	9,53	0,8	–	–	●	●	●	–	–	–	–	–	–	●	–	–	●	●	●	–	–	–	–	–	●	–	–	–	–	–	–
SCMT120404MP	12,70	12,70	0,4	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–	–	●	–	–	–	–	–	–
SCMT120408MP	12,70	12,70	0,8	–	–	●	–	●	–	–	–	–	–	–	●	●	–	–	●	●	–	–	–	–	–	●	–	–	–	–	–	–
SCMT120412MP	12,70	12,70	1,2	–	–	–	–	●	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–	–	–	–	–	–	–	–	–

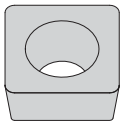


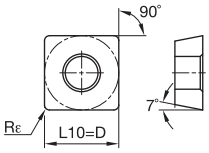


SCMT-UF

ISO código do produto	D	L10	Rε	KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35	KU10	K313	K68	KCS10	KCU10	KCU25	KC5010	KC5025	KC5410	KT315	KTP10
SCMT09T308UF	9,53	9,53	0,8	●	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–

● primeira opção
○ opção alternativa





SCMW

ISO código do produto	D	L10	Rε	KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35	KU10	K313	K68	KCS10	KCU10	KCU25	KC5010	KC5025	KC5410	KT315	KTP10
P				●	●	●	●	●	●	●	○	○	○	○	○	○	○	○	○	○	○	●	●	●		●	●	●	●		●	●
M										○							●	●	●	●	●	●	●	●	●	●	●	●		●	●
K				○	○	○	○	○			●	●	●	●	●	●						●	●	●		●	●	●	●		●	●
N																						●	●	●		●	●	●	●	●		
S																						●	●	●	●	●	●	●	●			
H																																
SCMW09T304	9,53	9,53	0,4	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
SCMW09T308	9,53	9,53	0,8	–	–	–	–	–	–	–	–	–	–	–	●	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
SCMW120408	12,70	12,70	0,8	–	–	–	–	–	–	–	–	–	–	–	●	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
SCMW120412	12,70	12,70	1,2	–	–	–	–	–	–	–	–	–	–	–	●	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–

Aplicativo Móvel

O aplicativo móvel da Kennametal proporciona acesso fácil a informações de produtos e calculadoras em ambos equipamentos, iPhone® e Android™. Destacamos algumas das principais características...

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Veja informações sobre velocidades de corte e avanços para produtos metalúrgicos.

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CALCULADORAS

Utilize nossa calculadora de usinagem para aplicações de fresamento e furação.

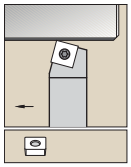


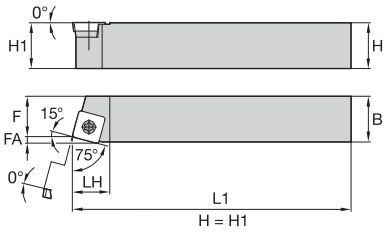
Ao digitalizar o código de barra da embalagem do inserto, você pode encontrar as condições de corte mais produtivas para vida útil e controle de cavaco.

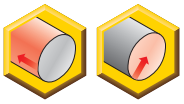
NOTA: O aplicativo está disponível somente na versão em Inglês. Nós temos planos para traduzir o aplicativo em diferentes idiomas para liberações futuras.

Google play

Available on the App Store



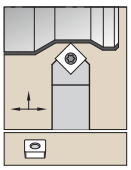


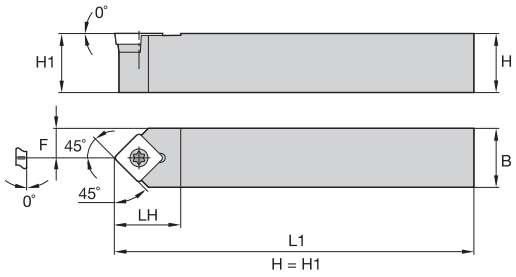


SSBC 75°



número para pedido	código do produto	H	B	F	L1	LH	FA	inserto padrão	calço	parafuso do calço	sexta-vada	parafuso do inserto	Torx
corte à direita (R)													
1097863	**SSBCR1212N09**	12	12	11,0	160	16,0	2,2	SC..09T308	–	–	–	**MS1155**	T15
1097867	**SSBCR2525M12**	25	25	22,0	150	21,0	3,1	SC..120408	**SKSP453**	**SRS4**	4 mm	**MS1158**	T15
corte à esquerda (L)													
1098009	**SSBCL1616H09**	16	16	13,0	100	16,0	2,2	SC..09T308	**SKSP343**	**SRS3**	3.5 mm	**MS1156**	T15



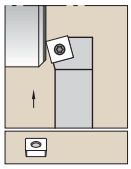


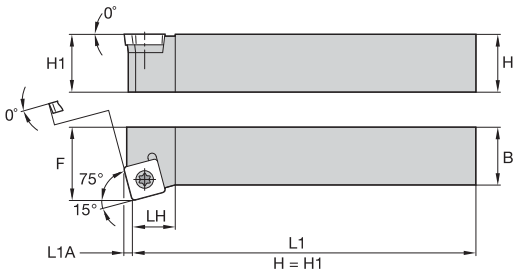


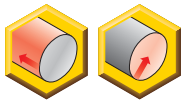
SSDC 45°



número para pedido	código do produto	H	B	F	L1	LH	inserto padrão	calço	parafuso do calço	sexta-vada	parafuso do inserto	Torx
1098005	**SSDCN1212N09**	12	12	6,0	160	18,0	SC..09T308	–	–	–	**MS1155**	T15
1098006	**SSDCN1616H09**	16	16	8,0	100	18,0	SC..09T308	**SKSP343**	**SRS3**	3.5 mm	**MS1156**	T15
1098007	**SSDCN2020K09**	20	20	10,0	125	18,0	SC..09T308	**SKSP343**	**SRS3**	3.5 mm	**MS1156**	T15



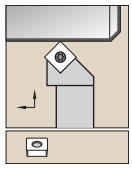


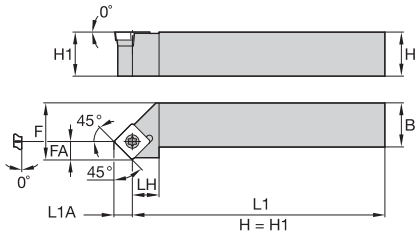


SSKC 75°



número para pedido	código do produto	H	B	F	L1	LH	L1A	inserto padrão	calço	parafuso do calço	sexta-vada	parafuso do inserto	Torx
corte à direita (R)													
1097882	**SSKCR1616H09**	16	16	20,0	100	16,0	2,2	SC..09T308	**SKSP343**	**SRS3**	3.5 mm	**MS1156**	T15
corte à esquerda (L)													
1098027	**SSKCL2020K12**	20	20	25,0	125	22,0	3,1	SC..120408	**SKSP453**	**SRS4**	4 mm	**MS1158**	T15



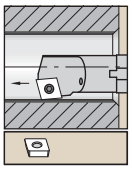




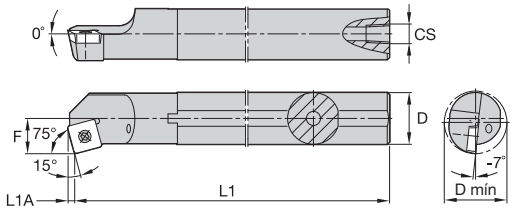
SSSC 45°



número para pedido	código do produto	H	B	F	L1	LH	FA	L1A	inserto padrão	calço	parafuso do calço	sexta-vada	parafuso do inserto	Torx
corte à direita (R)														
1097808	**SSSCR1212N09**	12	12	16,0	160	18,0	5,8	6,1	SC..09T308	–	–	–	**MS1155**	T15
1097809	**SSSCR1616H09**	16	16	20,0	100	18,0	6,1	6,1	SC..09T308	**SKSP343**	**SRS3**	3.5 mm	**MS1156**	T15
1097811	**SSSCR1616H12**	16	16	20,0	100	25,0	8,3	8,3	SC..120408	**SKSP453**	**SRS4**	4 mm	**MS1158**	T15
1097810	**SSSCR2020K12**	20	20	25,0	125	25,0	8,1	8,3	SC..120408	**SKSP453**	**SRS4**	4 mm	**MS1158**	T15
1244982	**SSSCR2525M12**	25	25	32,0	150	25,0	8,1	8,3	SC..120408	**SKSP453**	**SRS4**	4 mm	**MS1158**	T15
corte à esquerda (L)														
1097953	**SSSCL1212N09**	12	12	16,0	160	18,0	5,8	6,1	SC..09T308	–	–	–	**MS1155**	T15
1097954	**SSSCL1616H09**	16	16	20,0	100	18,0	5,8	6,1	SC..09T308	**SKSP343**	**SRS3**	3.5 mm	**MS1156**	T15
1097956	**SSSCL1616H12**	16	16	20,0	100	25,0	8,1	8,3	SC..120408	**SKSP453**	**SRS4**	4 mm	**MS1158**	T15
1097955	**SSSCL2020K12**	20	20	25,0	125	25,0	8,1	8,3	SC..120408	**SKSP453**	**SRS4**	4 mm	**MS1158**	T15
1514473	**SSSCL2525M12**	25	25	32,0	150	25,0	8,1	8,3	SC..120408	**SKSP453**	**SRS4**	4 mm	**MS1158**	T15



Haste de aço com refrigeração interna.

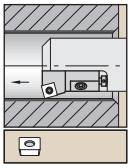


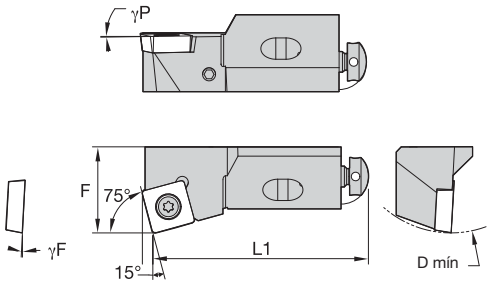
A-SSKC 75°



número para pedido	código do produto	D	D mín	F	L1	L1A	CS	inserto padrão	parafuso do inserto	Torx
corte à direita (R)										
1886510	**A16RSSKCR09**	16	20,0	11,0	200	2,2	1/8-27 NPT	SC..09T308	**MS1155**	T15

Cápsulas Screw-On





SSKC 75°

número para pedido	código do produto	D mín	F	L1	γF°	γP°	inserto padrão
corte à direita (R)							
1098719	**SSKCR12CA12**	50	20,0	55	-3.0	0.0	SC..120408/SC..432
1098720	**SSKCR16CA12**	60	25,0	63	-3.0	0.0	SC..120408/SC..432
corte à esquerda (L)							
1098721	**SSKCL12CA12**	50	20,0	55	-3.0	0.0	SC..120408/SC..432

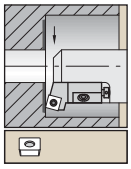
Peças de reposição

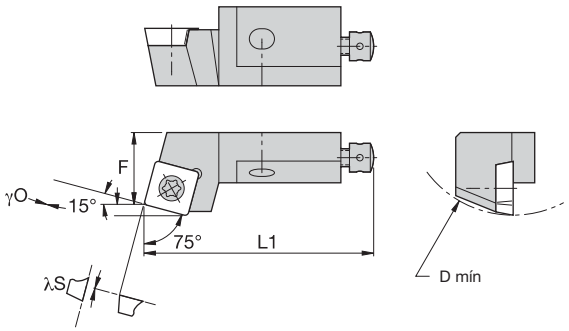






D mín	parafuso do inserto	Torx	parafuso de ajuste radial	sexta-vada	parafuso de ajuste axial	parafuso de montagem	sexta-vada	arruela
50	**MS1157**	T15	**KUAM23**	2.5 mm	**KUAM31**	**191.406**	4 mm	**CSWM 060 050**
60	**MS1157**	T15	**KUAM25**	2.5 mm	**KUAM32**	**191.407**	5 mm	**CSWM 080 050**





SSRC 75°

número para pedido	código do produto	D mín	F	L1	λS°	γO°	inserto padrão
corte à direita (R)							
1098723	**SSRCR12CA12**	50	20,0	55	-3.0	0.0	SC..120408/SC..432
corte à esquerda (L)							
1098725	**SSRCL12CA12**	50	20,0	55	-3.0	0.0	SC..120408/SC..432

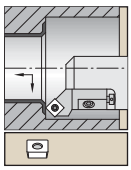
Peças de reposição

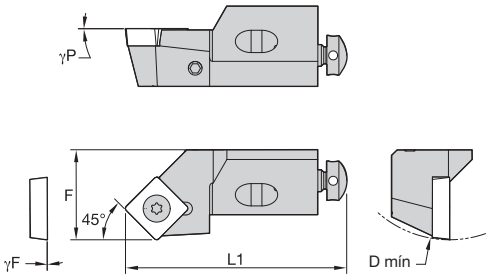






D mín	parafuso do inserto	Torx	parafuso de ajuste radial	sexta-vada	parafuso de ajuste axial	parafuso de montagem	sexta-vada	arruela
50	**MS1157**	T15	**KUAM23**	2.5 mm	**KUAM31**	**191.406**	4 mm	**CSWM 060 050**





SSSC 45°

número para pedido	código do produto	D mín	F	L1	γF°	γP°	inserto padrão
corte à direita (R)							
1098737	**SSSCR12CA12**	50	20,0	47	-3.0	0.0	SC..120408/SC..432
corte à esquerda (L)							
1098739	**SSSCL12CA12**	50	20,0	47	-3.0	0.0	SC..120408/SC..432

Peças de reposição

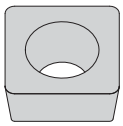


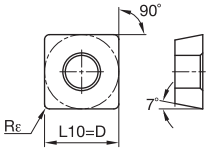




D mín	parafuso do inserto	Torx	parafuso de ajuste radial	sexta-vada	parafuso de ajuste axial	parafuso de montagem	sexta-vada	arruela
50	**MS1157**	T15	**KUAM23**	2.5 mm	**KUAM31**	**191.406**	4 mm	**CSWM 060 050**

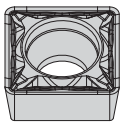
● primeira opção
○ opção alternativa

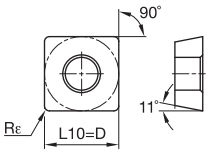




SPGT-LF

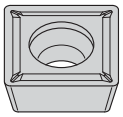
ISO código do produto	D	L10	Rε	KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35	KU10	K313	K68	KCS10	KCU10	KCU25	KC5010	KC5025	KC5410	KT315	KTP10
P				●	●	●	●	●	●	●	○	○	○	○	○	○	○	○	○	○	○	●	●	●		●	●	●	●		●	●
M										○							●	●	●	●	●	●	●	●	●	●	●	●	●		●	●
K				○	○	○	○	○			●	●	●	●	●	●						●	●	●		●	●	●	●		●	●
N																						●	●	●		●	●	●	●	●		
S																						●	●	●	●	●	●	●				
H																																
SPGT09T304LF	9,53	9,53	0,4	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	●	●	–	–	–
SPGT09T308LF	9,53	9,53	0,8	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	●	●	●	–	–

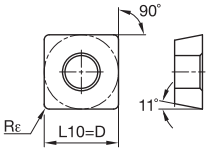




SPMT-FP

ISO código do produto	D	L10	Rε	KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35	KU10	K313	K68	KCS10	KCU10	KCU25	KC5010	KC5025	KC5410	KT315	KTP10
SPMT09T304FP	9,53	9,53	0,4	–	–	–	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	●	–	–	–	–	–
SPMT09T308FP	9,53	9,53	0,8	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–	–	–

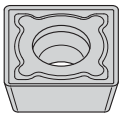


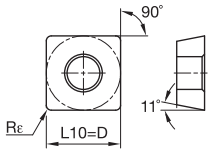


SPMT-LF

ISO código do produto	D	L10	Rε	KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35	KU10	K313	K68	KCS10	KCU10	KCU25	KC5010	KC5025	KC5410	KT315	KTP10
SPMT09T304LF	9,53	9,53	0,4	–	–	●	–	●	–	–	–	–	●	–	–	●	–	–	–	–	–	–	–	–	–	–	–	●	●	–	●	–
SPMT09T308LF	9,53	9,53	0,8	–	●	–	●	●	–	–	–	–	●	●	●	●	–	–	–	–	–	–	–	●	–	–	–	●	●	–	–	–

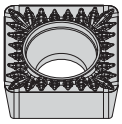
● primeira opção
○ opção alternativa

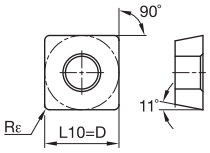




SPMT-MF

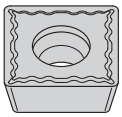
ISO código do produto	D	L10	Rε	KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35	KU10	K313	K68	KCS10	KCU10	KCU25	KC5010	KC5025	KC5410	KT315	KTP10
SPMT09T308MF	9,53	9,53	0,8	–	–	●	●	●	–	–	–	–	●	●	–	●	–	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–
SPMT120408MF	12,70	12,70	0,8	–	–	–	–	●	●	–	–	–	–	●	–	●	–	–	–	●	–	–	–	–	–	–	–	–	–	–	–	–

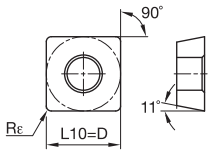




SPMT-MP

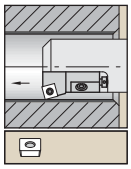
ISO código do produto	D	L10	Rε	KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35	KU10	K313	K68	KCS10	KCU10	KCU25	KC5010	KC5025	KC5410	KT315	KTP10
SPMT09T308MP	9,53	9,53	0,8	–	–	–	–	–	–	–	–	–	–	–	–	●	–	●	–	–	–	–	–	–	–	●	–	–	–	–	–	–
SPMT120408MP	12,70	12,70	0,8	–	–	–	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–	–	–

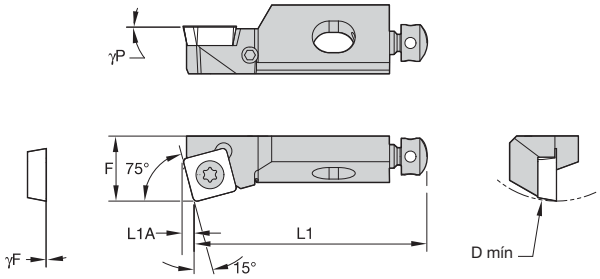




SPMT-UF

ISO código do produto	D	L10	Rε	KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35	KU10	K313	K68	KCS10	KCU10	KCU25	KC5010	KC5025	KC5410	KT315	KTP10
SPMT09T304UF	9,53	9,53	0,4	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–





SSKP 75°

número para pedido	código do produto	D mín	F	L1	λS°	γF°	γP°	inserto padrão
corte à direita (R)								
1098570	**SSKPR10CA09**	40	14,0	50	0.0	0.0	0.0	SP..09T308/SP..3252

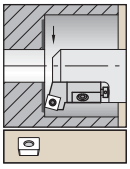
Peças de reposição

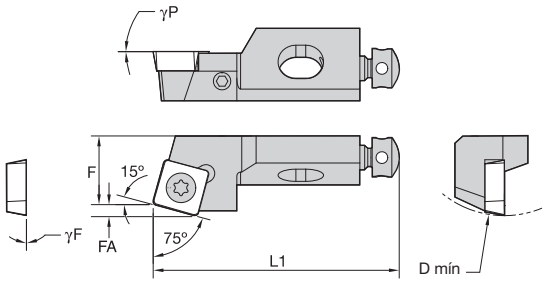






D mín	parafuso do inserto	Torx	parafuso de ajuste radial	sexta-vada	parafuso de ajuste axial	parafuso de montagem	sexta-vada	arruela
40	**MS1155**	T15	**KUAM28**	2 mm	**KUAM30**	**191.405**	4 mm	**CSWM 060 050**





SSRP 75°

número para pedido	código do produto	D mín	F	FA	L1	γF°	γP°	inserto padrão
corte à direita (R)								
1098574	**SSRPR10CA09**	40	14,0	2,2	50	0.0	0.0	SP..09T308/SP..3252

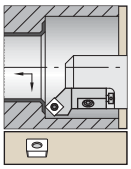
Peças de reposição

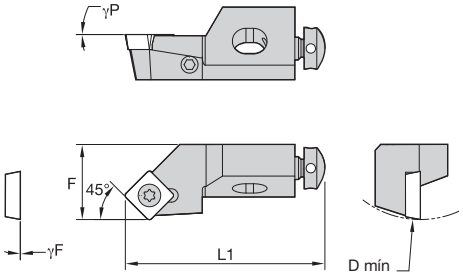






D mín	parafuso do inserto	Torx	parafuso de ajuste radial	sexta-vada	parafuso de ajuste axial	parafuso de montagem	sexta-vada	arruela
40	**MS1155**	T15	**KUAM28**	2 mm	**KUAM30**	**191.405**	4 mm	**CSWM 060 050**





SSSP 45°

número para pedido	código do produto	D mín	F	L1	γF°	γP°	inserto padrão
corte à direita (R)							
1098572	**SSSPR10CA09**	40	14,0	44	0.0	0.0	SP..09T308/SP..3252
corte à esquerda (L)							
1098764	**SSSPL10CA09**	40	14,0	44	0.0	0.0	SP..09T308/SP..3252

Peças de reposição



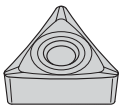


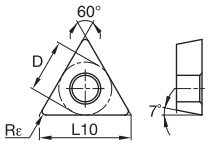


D mín	parafuso do inserto	Torx	parafuso de ajuste radial	sexta-vada	parafuso de ajuste axial	parafuso de montagem	sexta-vada	arruela
40	**MS1155**	T15	**KUAM28**	2 mm	**KUAM30**	**191.405**	4 mm	**CSWM 060 050**

● primeira opção
○ opção alternativa

		KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35	KU10	K313	K68	KCS10	KCU10	KCU25	KC5010	KC5025	KC5410	KT315	KTP10
P		●	●	●	●	●	●	●	○	○	○	○	○	○	○	○	○	○	○	●	●	●		●	●	●	●		●	●
M								○							●	●	●	●	●	●	●	●	●	●	●	●	●		●	●
K		○	○	○	○	○			●	●	●	●	●	●						●	●	●		●	●	●	●		●	●
N																				●	●	●		●	●	●	●	●		
S																				●	●	●	●	●	●	●	●			
H																														

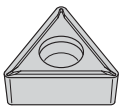


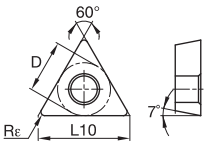


TCGT-HP

ISO código do produto	D	L10	Rε
TCGT110202HP	6,35	11,00	0,2
TCGT110204HP	6,35	11,00	0,4
TCGT110208HP	6,35	11,00	0,8
TCGT16T302HP	9,53	16,50	0,2
TCGT16T304HP	9,53	16,50	0,4
TCGT16T308HP	9,53	16,50	0,8

ISO código do produto	KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35	KU10	K313	K68	KCS10	KCU10	KCU25	KC5010	KC5025	KC5410	KT315	KTP10
TCGT110202HP	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	●	–	●	–	–
TCGT110204HP	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	●	●	●	●	●	–	–
TCGT110208HP	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–
TCGT16T302HP	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	●	–	–	–	–
TCGT16T304HP	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	●	–	●	●	●	–	–
TCGT16T308HP	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	●	–	●	●	●	–	–

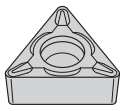


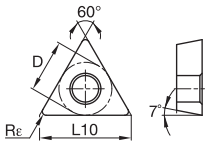


TCGT-LF

ISO código do produto	D	L10	Rε
TCGT110201LF	6,35	11,00	0,1
TCGT110204LF	6,35	11,00	0,4
TCGT16T301LF	9,53	16,50	0,1
TCGT16T302LF	9,53	16,50	0,2
TCGT16T304LF	9,53	16,50	0,4
TCGT16T308LF	9,53	16,50	0,8

ISO código do produto	KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35	KU10	K313	K68	KCS10	KCU10	KCU25	KC5010	KC5025	KC5410	KT315	KTP10
TCGT110201LF	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	●	–	–	–
TCGT110204LF	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	●	●	–	–	–
TCGT16T301LF	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–	–	–
TCGT16T302LF	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–
TCGT16T304LF	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	●	–	–	–	–
TCGT16T308LF	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	●	–	–	–	–



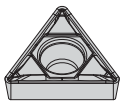


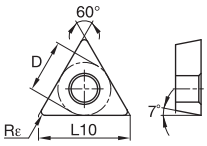
TCMT-11

ISO código do produto	D	L10	Rε
TCMT11020411	6,35	11,00	0,4
TCMT16T30411	9,53	16,50	0,4
TCMT16T30811	9,53	16,50	0,8

ISO código do produto	KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35	KU10	K313	K68	KCS10	KCU10	KCU25	KC5010	KC5025	KC5410	KT315	KTP10
TCMT11020411	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–
TCMT16T30411	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–
TCMT16T30811	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–

● primeira opção
○ opção alternativa



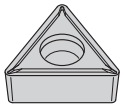


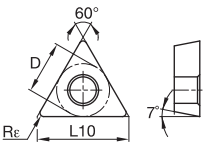
TCMT-FP

		KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35	KU10	K313	K68	KCS10	KCU10	KCU25	KC5010	KC5025	KC5410	KT315	KTP10
P		●	●	●	●	●	●	●	○	○	○	○	○	○	○	○	○	○	○	●	●	●		●	●	●	●		●	●
M								○							●	●	●	●	●	●	●	●	●	●	●	●	●		●	●
K		○	○	○	○	○			●	●	●	●	●	●						●	●	●		●	●	●	●		●	●
N																				●	●	●		●	●	●	●	●		
S																				●	●	●	●	●	●	●	●			
H																														

ISO código do produto	D	L10	Rε
TCMT090204FP	5,56	9,63	0,4
TCMT090208FP	5,56	9,63	0,8
TCMT110202FP	6,35	11,00	0,2
TCMT110204FP	6,35	11,00	0,4
TCMT110304FP	6,35	11,00	0,4
TCMT110208FP	6,35	11,00	0,8
TCMT110308FP	6,35	11,00	0,8
TCMT110312FP	6,35	11,00	1,2
TCMT16T304FP	9,53	16,50	0,4
TCMT16T308FP	9,53	16,50	0,8
TCMT16T312FP	9,53	16,50	1,2
TCMT220408FP	12,70	22,00	0,8

ISO código do produto	KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35	KU10	K313	K68	KCS10	KCU10	KCU25	KC5010	KC5025	KC5410	KT315	KTP10
TCMT110202FP	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–	●
TCMT110204FP	–	–	●	–	●	–	–	–	–	–	–	●	–	–	–	–	●	–	–	–	–	–	●	●	–	–	–	–	●
TCMT110304FP	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	●	–	–	–	–	–
TCMT110208FP	–	–	–	–	●	–	–	–	–	–	–	–	–	–	●	–	–	–	–	–	–	–	●	●	–	–	–	–	–
TCMT110308FP	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	●	–	–	–	–	–
TCMT110312FP	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–	–	–
TCMT16T304FP	–	–	●	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	●	–	–	–	–	–
TCMT16T308FP	–	–	●	–	●	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–	–	●	●	–	–	–	–	●
TCMT16T312FP	–	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	●	–	–	–	–	–
TCMT220408FP	●	–	–	–	●	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–	–	●	●	–	–	–	–	–



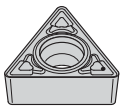


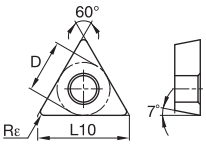
TCMT-LF

ISO código do produto	D	L10	Rε
TCMT110202LF	6,35	11,00	0,2
TCMT110204LF	6,35	11,00	0,4
TCMT110208LF	6,35	11,00	0,8
TCMT16T302LF	9,53	16,50	0,2
TCMT16T304LF	9,53	16,50	0,4
TCMT16T308LF	9,53	16,50	0,8
TCMT16T312LF	9,53	16,50	1,2
TCMT220408LF	12,70	22,00	0,8

ISO código do produto	KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35	KU10	K313	K68	KCS10	KCU10	KCU25	KC5010	KC5025	KC5410	KT315	KTP10
TCMT110202LF	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	●	–	–	–
TCMT110204LF	–	●	●	●	●	●	–	–	●	●	●	●	●	●	●	●	–	●	–	–	–	–	–	–	●	●	–	●	–
TCMT110208LF	–	–	●	●	●	●	–	–	●	●	●	●	●	–	●	●	–	–	–	–	–	–	–	–	●	●	–	●	–
TCMT16T302LF	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	●	–	–	–
TCMT16T304LF	–	●	●	●	●	–	–	–	●	–	●	●	●	–	●	●	●	●	–	–	–	–	–	–	●	●	–	●	–
TCMT16T308LF	–	●	●	●	●	●	–	●	–	●	●	●	●	–	–	●	●	●	–	–	–	–	–	–	●	●	–	●	–
TCMT16T312LF	–	●	–	–	●	–	–	–	–	–	●	●	●	–	–	–	●	–	–	–	–	–	–	–	●	–	–	–	–
TCMT220408LF	–	●	–	●	●	–	–	–	–	●	–	●	–	–	–	–	–	–	–	–	–	–	–	–	●	●	–	–	–

● primeira opção
○ opção alternativa

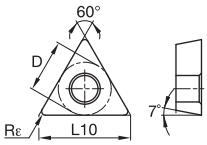




TCMT-MF

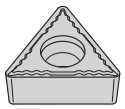
ISO código do produto	D	L10	Rε	KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35	KU10	K313	K68	KCS10	KCU10	KCU25	KC5010	KC5025	KC5410	KT315	KTP10
P				●	●	●	●	●	●	●	○	○	○	○	○	○	○	○	○	○	○	●	●	●		●	●	●	●		●	●
M										○							●	●	●	●	●	●	●	●	●	●	●	●	●		●	●
K				○	○	○	○	○			●	●	●	●	●	●						●	●	●		●	●	●	●		●	●
N																						●	●	●		●	●	●	●	●		
S																						●	●	●	●	●	●	●	●			
H																																
TCMT110208MF	6,35	11,00	0,8	–	–	–	●	●	–	–	–	–	–	●	●	●	–	–	●	–	–	–	–	–	–	–	–	–	–	–	–
TCMT16T308MF	9,53	16,50	0,8	–	–	●	●	●	●	–	–	–	●	●	●	●	–	–	●	●	●	–	–	–	–	–	–	–	–	–	–
TCMT16T312MF	9,53	16,50	1,2	–	–	●	●	–	–	–	–	–	–	–	●	●	–	–	●	–	–	–	–	–	–	–	–	–	–	–	–

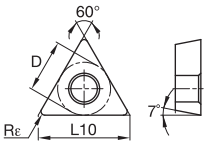




TCMT-MP

ISO código do produto	D	L10	Rε	KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35	KU10	K313	K68	KCS10	KCU10	KCU25	KC5010	KC5025	KC5410	KT315	KTP10
TCMT110208MP	6,35	11,00	0,8	–	–	–	–	●	–	–	–	–	–	–	●	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–	–	–
TCMT16T304MP	9,53	16,50	0,4	–	–	–	–	●	–	–	–	–	–	–	●	–	–	–	●	●	–	–	–	–	–	●	–	–	–	–	–	–
TCMT16T308MP	9,53	16,50	0,8	–	–	●	–	●	–	–	–	–	–	–	●	–	–	●	●	●	–	–	–	–	–	●	–	–	–	–	–	–
TCMT16T312MP	9,53	16,50	1,2	–	–	–	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–

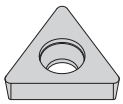


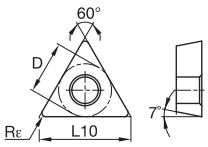


TCMT-UF

ISO código do produto	D	L10	Rε	KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35	KU10	K313	K68	KCS10	KCU10	KCU25	KC5010	KC5025	KC5410	KT315	KTP10
TCMT110204UF	6,35	11,00	0,4	–	–	–	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–
TCMT110208UF	6,35	11,00	0,8	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–
TCMT16T308UF	9,53	16,50	0,8	–	–	–	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–

● primeira opção
○ opção alternativa





TCMW

ISO código do produto	D	L10	Rε	KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35	KU10	K313	K68	KCS10	KCU10	KCU25	KC5010	KC5025	KC5410	KT315	KTP10
TCMW16T304	9,53	16,50	0,4	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
TCMW16T308	9,53	16,50	0,8	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–

P		●	●	●	●	●	●	●	○	○	○	○	○	○	○	○	○	○	○	○	○	●	●	●		●	●	●	●		●	●
M								○							●	●	●	●	●	●	●	●	●	●	●	●	●	●		●	●
K		○	○	○	○	○			●	●	●	●	●	●								●	●	●		●	●	●	●		●	●
N																						●	●	●		●	●	●	●	●		
S																						●	●	●	●	●	●	●	●			
H																																

Aplicativo Móvel

O aplicativo móvel da Kennametal proporciona acesso fácil a informações de produtos e calculadoras em ambos equipamentos, iPhone® e Android™. Destacamos algumas das principais características...

Há um aplicativo para isso.

VELOCIDADES DE CORTE & AVANÇOS

Veja informações sobre velocidades de corte e avanços para produtos metalúrgicos.

DISPONIBILIDADE DO PRODUTO

Verifique a disponibilidade global de produtos. Veja quantidades disponíveis fornecendo sua credencial de acesso do Konnect.

CALCULADORAS

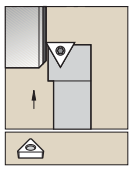
Utilize nossa calculadora de usinagem para aplicações de fresamento e furação.

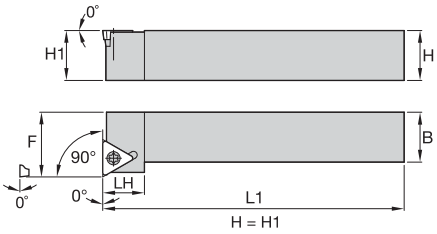


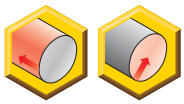
Ao digitalizar o código de barra da embalagem do inserto, você pode encontrar as condições de corte mais produtivas para vida útil e controle de cavaco.

NOTA: O aplicativo está disponível somente na versão em Inglês. Nós temos planos para traduzir o aplicativo em diferentes idiomas para liberações futuras.

Google play
Available on the App Store



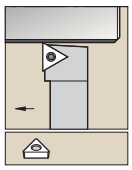


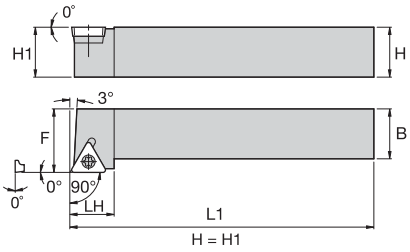


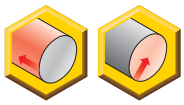
STFC 90°



número para pedido	código do produto	H	B	F	L1	LH	inserto padrão	calço	parafuso do calço	sexta-vada	parafuso do inserto	Torx
corte à direita (R)												
1244940	**STFCR1616H11**	16	16	20,0	100	16,0	TC..110204	–	–	–	**MS1153**	T7
1097880	**STFCR1616H16**	16	16	20,0	100	20,0	TC..16T308	**SKTP343**	**SRS3**	3.5 mm	**MS1156**	T15
1097877	**STFCR2020K16**	20	20	25,0	125	20,0	TC..16T308	**SKTP343**	**SRS3**	3.5 mm	**MS1156**	T15
1097878	**STFCR2525M16**	25	25	32,0	150	20,0	TC..16T308	**SKTP343**	**SRS3**	3.5 mm	**MS1156**	T15
corte à esquerda (L)												
1098022	**STFCL2020K16**	20	20	25,0	125	20,0	TC..16T308	**SKTP343**	**SRS3**	3.5 mm	**MS1156**	T15
1098023	**STFCL2525M16**	25	25	32,0	150	20,0	TC..16T308	**SKTP343**	**SRS3**	3.5 mm	**MS1156**	T15



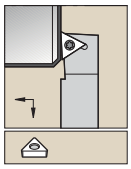


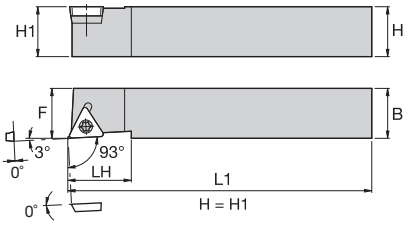


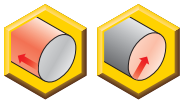
STGC 90°



número para pedido	código do produto	H	B	F	L1	LH	inserto padrão	calço	parafuso do calço	sexta-vada	parafuso do inserto	Torx
corte à direita (R)												
1097869	**STGCR1212N11**	12	12	16,0	160	16,0	TC..110204	–	–	–	**MS1153**	T7
1244944	**STGCR1616H11**	16	16	20,0	100	16,0	TC..110204	–	–	–	**MS1153**	T7
1097874	**STGCR1616H16**	16	16	20,0	100	20,0	TC..16T308	**SKTP343**	**SRS3**	3.5 mm	**MS1156**	T15
1097870	**STGCR2020K16**	20	20	25,0	125	20,0	TC..16T308	**SKTP343**	**SRS3**	3.5 mm	**MS1156**	T15
1097871	**STGCR2525M16**	25	25	32,0	150	20,0	TC..16T308	**SKTP343**	**SRS3**	3.5 mm	**MS1156**	T15
corte à esquerda (L)												
1098014	**STGCL1212N11**	12	12	16,0	160	16,0	TC..110204	–	–	–	**MS1153**	T7
1244943	**STGCL1616H11**	16	16	20,0	100	16,0	TC..110204	–	–	–	**MS1153**	T7
1098019	**STGCL1616H16**	16	16	20,0	100	20,0	TC..16T308	**SKTP343**	**SRS3**	3.5 mm	**MS1156**	T15
1098015	**STGCL2020K16**	20	20	25,0	125	20,0	TC..16T308	**SKTP343**	**SRS3**	3.5 mm	**MS1156**	T15
1098016	**STGCL2525M16**	25	25	32,0	150	20,0	TC..16T308	**SKTP343**	**SRS3**	3.5 mm	**MS1156**	T15



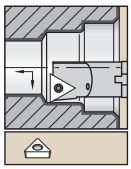




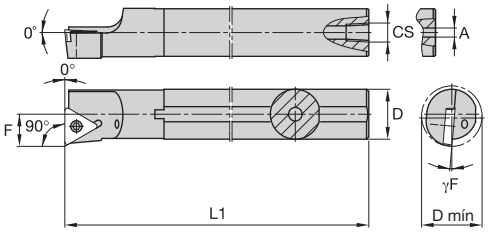
STJC-F 90°



número para pedido	código do produto	H	B	F	L1	LH	inserto padrão	parafuso do inserto	Torx
corte à direita (R)									
1772197	**STJCRF1212M11Q**	12	12	12,0	150	16,0	TC..110204	**MS1153**	T7
corte à esquerda (L)									
1772198	**STJCLF1212M11Q**	12	12	12,0	150	16,0	TC..110204	**MS1153**	T7



Haste de aço com refrigeração interna.



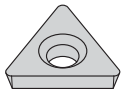


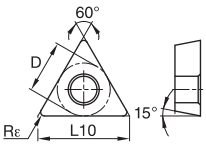
A-STFC 90°



número para pedido	código do produto	D	D mín	F	L1	A	CS	γF°	inserto padrão	calço	parafuso do calço	sexta-vada	parafuso do inserto	Torx
corte à direita (R)														
1098207	**A10KSTFCR11**	10	13,0	7,0	125	3,2	–	-7.0	TC..110204	–	–	–	**MS1153**	T7
1098211	**A12MSTFCR11**	12	16,0	9,0	150	–	1/16-27 NPT	-6.0	TC..110204	–	–	–	**MS1153**	T7
1098286	**A32TSTFCR16**	32	40,0	22,0	300	–	1/4-18 NPT	-2.0	TC..16T308	**SKTP343**	**SRS3**	3.5 mm	**MS1156**	T15
corte à esquerda (L)														
1098209	**A10KSTFCL11**	10	13,0	7,0	125	3,2	–	-7.0	TC..110204	–	–	–	**MS1153**	T7
1098213	**A12MSTFCL11**	12	16,0	9,0	150	–	1/16-27 NPT	-6.0	TC..110204	–	–	–	**MS1153**	T7

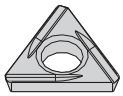
● primeira opção
○ opção alternativa

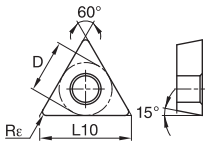




TDHB

ISO código do produto	D	L10	Rε	KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35	KU10	K313	K68	KCS10	KCU10	KCU25	KC5010	KC5025	KC5410	KT315	KTP10
P				●	●	●	●	●	●	●	○	○	○	○	○	○	○	○	○	○	○	●	●	●		●	●	●	●		●	●
M										○							●	●	●	●	●	●	●	●	●	●	●	●	●		●	●
K				○	○	○	○	○			●	●	●	●	●	●						●	●	●		●	●	●	●		●	●
N																						●	●	●		●	●	●	●	●		
S																						●	●	●	●	●	●	●	●			
H																																
TDHB07T12S0	4,06	7,04	0,1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	●	–	–	●	–
TDHB07T1202	4,06	7,04	0,2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	●	●	●	–	–	–
TDHB07T1204	4,06	7,04	0,4	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	●	●	●	–	●	–
TDHB07T1208	4,06	7,04	0,8	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–

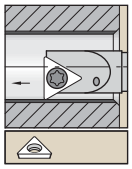




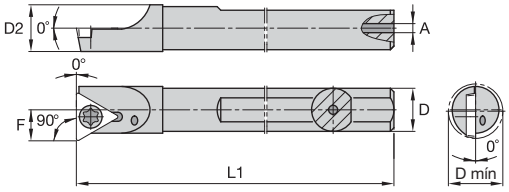
TDHH

ISO código do produto	D	L10	Rε	KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35	KU10	K313	K68	KCS10	KCU10	KCU25	KC5010	KC5025	KC5410	KT315	KTP10
TDHH07T1202L	4,06	7,04	0,2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	●	●	–	–	–	–
TDHH07T1202R	4,06	7,04	0,2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–	–	–
TDHH07T1204L	4,06	7,04	0,4	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	●	●	–	–	–	–
TDHH07T1204R	4,06	7,04	0,4	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–	–	–

NOTA: Inserto direito é usado em barras esquerdas. Inserto esquerdo é usado em barras direitas.



Haste de aço com refrigeração interna.

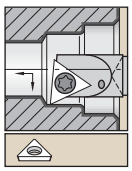




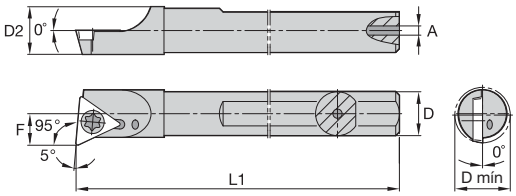
A-STFD 90°



número para pedido	código do produto	D	D mín	D2	F	L1	A	inserto padrão	parafuso do inserto	Torx
corte à direita (R)										
1288884	**A06HSTFDR07**	6	7,1	6,2	3,7	100	1,0	TD..07S102	**FC11**	T7
1288898	**A08HSTFDR07**	8	9,1	8,2	4,8	102	1,5	TD..07S102	**FC14**	T7
corte à esquerda (L)										
1930573	**A12MSTFDL11**	12	13,2	12,2	6,8	152	3,0	TP..110202	**QC26**	T9



Haste de aço com refrigeração interna.

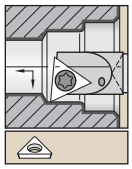




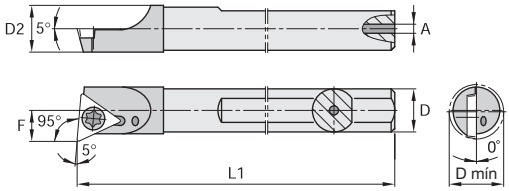
A-STLD 95°



número para pedido	código do produto	D	D mín	D2	F	L1	A	inserto padrão	parafuso do inserto	Torx
corte à direita (R)										
1288886	**A06HSTLDR07**	6	7,1	6,2	3,7	100	1,0	TD..07S102	**FC11**	T7
1288900	**A08HSTLDR07**	8	9,1	8,2	4,8	102	1,5	TD..07S102	**FC14**	T7



Haste de metal duro com refrigeração interna.

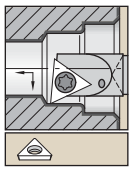




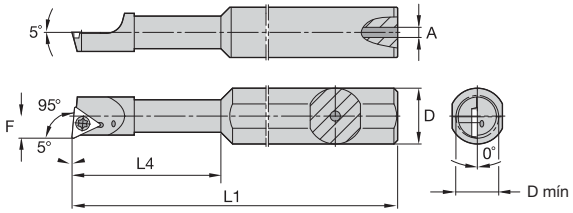
E-STLD 95°



número para pedido	código do produto	D	D mín	F	L1	A	inserto padrão	parafuso do inserto	Torx
corte à direita (R)									
1270982	**E06MSTLDR07**	6	7,1	3,7	152	1,2	TD..07S102	**FC11**	T7
1270992	**E08MSTLDR07**	8	9,2	4,8	152	2,4	TD..07S102	**FC11**	T7
corte à esquerda (L)									
1270981	**E06MSTLDL07**	6	7,1	3,7	152	1,2	TD..130805	**FC11**	T7
1270991	**E08MSTLDL07**	8	9,1	4,8	152	2,4	TD..07S102	**FC14**	T7



Haste de aço com pescoço com refrigeração interna.

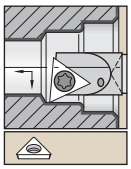




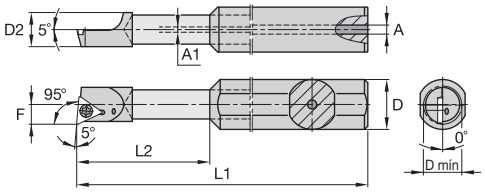
A-STLD 95° • Escalonado



número para pedido	código do produto	D	D mín	F	L1	L4	A	inserto padrão	parafuso do inserto	Torx
corte à direita (R)										
1289155	**A0612XSTLDR0731**	12	7,5	4,0	76	31,75	1,0	TD..07T1202	**FC11**	T7
corte à esquerda (L)										
1930492	**A0616HSTLDR0731**	16	7,5	4,0	102	31,75	1,0	TD..07S102	**FC14**	T7



Haste de metal duro com pescoço com refrigeração interna.



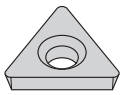


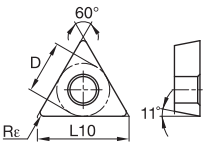
E-STLD 95° • Escalonado



número para pedido	código do produto	D	D mín	D2	F	L1	L2	A	A1	inserto padrão	parafuso do inserto	Torx
corte à direita (R)												
1930512	**E0812XSTLDR0738**	12	9,1	7,9	4,8	76	38,1	3,2	2,0	TD..07S102	**FC14**	T7

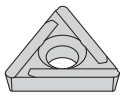
● primeira opção
○ opção alternativa

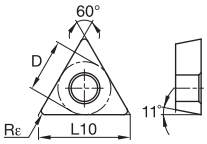




TPCB

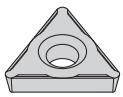
ISO código do produto	D	L10	Rε	KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35	KU10	K313	K68	KCS10	KCU10	KCU25	KC5010	KC5025	KC5410	KT315	KTP10
TPCB110202	6,35	–	0,2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–
TPCB160302	9,53	16,50	0,2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–
TPCB160304	9,53	16,50	0,4	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–
TD6P	9,53	16,50	0,8	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–	–	–	–	–
TPCB160308	9,53	16,50	0,8	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–

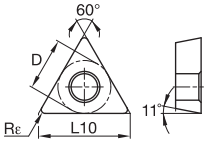




TPCG

ISO código do produto	D	L10	Rε	KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35	KU10	K313	K68	KCS10	KCU10	KCU25	KC5010	KC5025	KC5410	KT315	KTP10
TPCG110202L	6,35	11,00	0,2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–
TPCG110204L	6,35	11,00	0,4	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–
TPCG110208L	6,35	11,00	0,8	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–

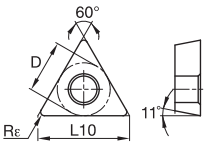




TPCH

ISO código do produto	D	L10	Rε	KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35	KU10	K313	K68	KCS10	KCU10	KCU25	KC5010	KC5025	KC5410	KT315	KTP10
TPCH110202	6,50	11,26	0,2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–
TPCH110204	6,50	11,26	0,4	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–

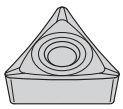


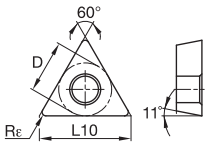


TPGH

ISO código do produto	D	L10	Rε	KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35	KU10	K313	K68	KCS10	KCU10	KCU25	KC5010	KC5025	KC5410	KT315	KTP10
TPGH160304	9,53	16,50	0,4	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	●	–	–	–	–	–
TPGH160308	9,53	16,50	0,8	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–

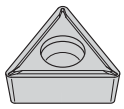
● primeira opção
○ opção alternativa

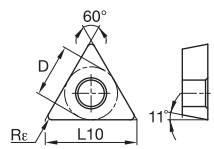




TPGT-HP

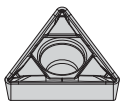
				KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35	KU10	K313	K68	KCS10	KCU10	KCU25	KC5010	KC5025	KC5410	KT315	KTP10
P				●	●	●	●	●	●	●	○	○	○	○	○	○	○	○	○	○	○	●	●	●		●	●	●	●		●	●
M										○							●	●	●	●	●	●	●	●	●	●	●	●	●		●	●
K				○	○	○	○	○			●	●	●	●	●	●						●	●	●		●	●	●	●		●	●
N																						●	●	●		●	●	●	●	●		
S																						●	●	●	●	●	●	●				
H																																
ISO código do produto	D	L10	Rε																													
TPGT110202HP	6,35	11,00	0,2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	●	●	–	–	–
TPGT110204HP	6,35	11,00	0,4	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	●	●	●	–	–
TPGT110208HP	6,35	11,00	0,8	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	●	–	–
TPGT16T302HP	9,53	16,50	0,2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	●	–	–	–	–
TPGT16T304HP	9,53	16,50	0,4	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	●	●	●	●	–	–
TPGT16T308HP	9,53	16,50	0,8	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	●	●	–	●	–	–

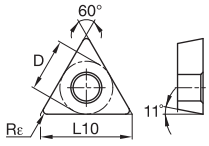




TPGT-LF

ISO código do produto	D	L10	Rε	KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35	KU10	K313	K68	KCS10	KCU10	KCU25	KC5010	KC5025	KC5410	KT315	KTP10
TPGT090204LF	5,56	9,62	0,4	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	●	●	●	–	–
TPGT090202LF	5,56	9,63	0,2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	●	–	–	–	–
TPGT110201LF	6,35	11,00	0,1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–	–	–
TPGT110202LF	6,35	11,00	0,2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	●	●	–	–	–
TPGT110204LF	6,35	11,00	0,4	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	●	●	●	–	–
TPGT110208LF	6,35	11,00	0,8	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	●	–	–	–	–
TPGT16T304LF	9,53	16,50	0,4	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	●	–	–	–
TPGT16T308LF	9,53	16,50	0,8	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	●	–	●	–	–

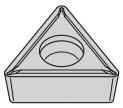


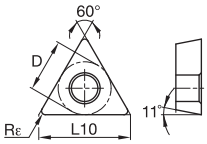


TPMT-FP

ISO código do produto	D	L10	Rε	KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35	KU10	K313	K68	KCS10	KCU10	KCU25	KC5010	KC5025	KC5410	KT315	KTP10
TPMT090204FP	5,56	9,63	0,4	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–	–	–
TPMT090208FP	5,56	9,63	0,8	–	–	–	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	●	–	–	–	–	–
TPMT110202FP	6,35	11,00	0,2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–	–	–
TPMT110204FP	6,35	11,00	0,4	–	–	●	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	●	–	–	–	–	–
TPMT110304FP	6,35	11,00	0,4	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	●	–	–	–	–	–
TPMT110208FP	6,35	11,00	0,8	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–	–	–
TPMT110308FP	6,35	11,00	0,8	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–	–	–
TPMT16T304FP	9,53	16,50	0,4	–	–	●	–	●	–	–	–	–	–	–	–	●	–	–	–	●	–	–	–	–	–	●	●	–	–	–	–	–
TPMT16T308FP	9,53	16,50	0,8	–	–	●	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–	–

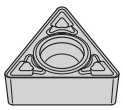
● primeira opção
○ opção alternativa

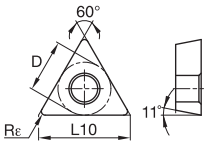




TPMT-LF

ISO código do produto	D	L10	Rε	KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35	KU10	K313	K68	KCS10	KCU10	KCU25	KC5010	KC5025	KC5410	KT315	KTP10
P				●	●	●	●	●	●	●	○	○	○	○	○	○	○	○	○	○	○	●	●	●		●	●	●	●		●	●
M										○							●	●	●	●	●	●	●	●	●	●	●	●	●		●	●
K				○	○	○	○	○			●	●	●	●	●	●						●	●	●		●	●	●	●		●	●
N																						●	●	●		●	●	●	●	●		
S																						●	●	●	●	●	●	●	●			
H																																
TPMT090202LF	5,56	9,63	0,2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–
TPMT090204LF	5,56	9,63	0,4	–	●	–	●	●	–	–	–	●	–	●	–	–	●	–	–	–	–	–	–	–	–	–	–	●	●	–	●	–
TPMT110202LF	6,35	11,00	0,2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–
TPMT110204LF	6,35	11,00	0,4	–	●	●	●	●	–	–	–	–	●	–	–	●	–	●	●	–	–	–	●	–	–	–	–	●	●	–	●	–
TPMT110208LF	6,35	11,00	0,8	–	●	–	●	●	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–	–	–	–	●	●	–	●	–
TPMT16T304LF	9,53	16,50	0,4	–	●	●	●	●	–	–	–	●	–	●	–	–	–	●	●	–	–	–	–	–	–	–	–	●	●	–	●	–
TPMT16T308LF	9,53	16,50	0,8	–	●	–	●	●	–	–	–	●	●	●	●	●	–	–	–	●	–	–	–	–	–	–	–	●	●	–	●	–
TPMT220408LF	12,70	22,00	0,8	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–	–	–	–	–	–	–	–	●	●	–	–	–

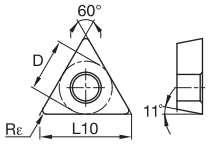




TPMT-MF

ISO código do produto	D	L10	Rε	KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35	KU10	K313	K68	KCS10	KCU10	KCU25	KC5010	KC5025	KC5410	KT315	KTP10
TPMT110208MF	6,35	11,00	0,8	–	–	–	●	●	–	–	–	–	–	●	–	●	–	–	–	●	–	–	–	–	–	–	–	–	–	–	–	–
TPMT16T308MF	9,53	16,50	0,8	–	–	●	–	●	●	–	–	–	–	●	–	●	–	●	●	–	–	–	–	–	–	–	–	–	–	–	–	–
TPMT16T312MF	9,53	16,50	1,2	–	–	–	–	●	–	–	–	–	–	●	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–

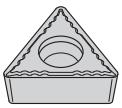


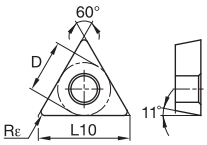


TPMT-MP

ISO código do produto	D	L10	Rε	KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35	KU10	K313	K68	KCS10	KCU10	KCU25	KC5010	KC5025	KC5410	KT315	KTP10
TPMT110208MP	6,35	11,00	0,8	–	–	–	–	●	–	–	–	–	–	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
TPMT16T308MP	9,53	16,50	0,8	–	–	–	–	●	–	–	–	–	–	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
TPMT16T312MP	9,53	16,50	1,2	–	–	–	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–

● primeira opção
○ opção alternativa



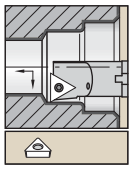


TPMT-UF

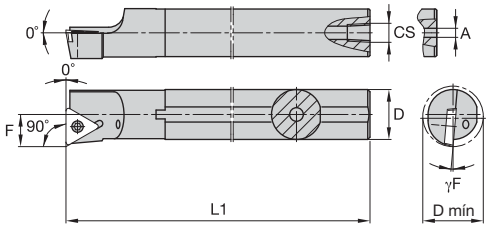
		KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35	KU10	K313	K68	KCS10	KCU10	KCU25	KC5010	KC5025	KC5410	KT315	KTP10
P		●	●	●	●	●	●	●	○	○	○	○	○	○	○	○	○	○	○	●	●	●		●	●	●	●		●	●
M								○							●	●	●	●	●	●	●	●	●	●	●	●	●		●	●
K		○	○	○	○	○			●	●	●	●	●	●						●	●	●		●	●	●	●		●	●
N																				●	●	●		●	●	●	●	●		
S																				●	●	●	●	●	●	●	●			
H																														

ISO código do produto	D	L10	Rε
TPMT110202UF	6,35	11,00	0,2
TPMT110204UF	6,35	11,00	0,4
TPMT16T308UF	9,53	16,50	0,8

		KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35	KU10	K313	K68	KCS10	KCU10	KCU25	KC5010	KC5025	KC5410	KT315	KTP10
TPMT110202UF		●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
TPMT110204UF		●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–
TPMT16T308UF		–	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–



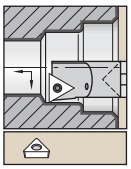
Haste de aço com refrigeração interna.



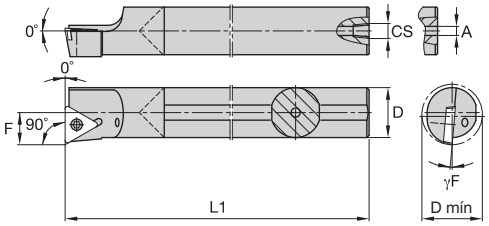
A-STFP 90°



número para pedido	código do produto	D	D mín	F	L1	A	CS	γF°	inserto padrão	calço	parafuso do calço	sexta-vada	parafuso do inserto	Torx
corte à direita (R)														
1098154	**A08JSTFPR09**	8	11,0	6,0	110	2,4	–	-8.0	TP..090204	–	–	–	**MS1933**	T7
1098204	**A10KSTFPR11**	10	13,0	7,0	125	3,2	–	-4.0	TP..110204	–	–	–	**MS1153**	T7
1098210	**A12MSTFPR11**	12	16,0	9,0	150	4,0	1/16-27 NPT	-2.0	TP..110204	–	–	–	**MS1153**	T7
1098214	**A16RSTFPR11**	16	20,0	11,0	200	4,0	1/8-27 NPT	0.0	TP..110204	–	–	–	**MS1153**	T7
1098255	**A20SSTFPR16**	20	25,0	13,0	250	4,0	1/8-27 NPT	-2.0	TP..16T308	–	–	–	**MS1155**	T15
1098273	**A25TSTFPR16**	25	32,0	17,0	300	6,4	1/4-18 NPT	0.0	TP..16T308	–	–	–	**MS1155**	T15
1098285	**A32TSTFPR16**	32	40,0	22,0	300	–	1/4-18 NPT	-2.0	TP..16T308	**SKTP343**	**SRS3**	3.5 mm	**MS1156**	T15
corte à esquerda (L)														
1098155	**A08JSTFPL09**	8	11,0	6,0	110	2,4	–	-8.0	TP..090204	–	–	–	**MS1933**	T7
1098208	**A10KSTFPL11**	10	13,0	7,0	125	3,2	–	-4.0	TP..110204	–	–	–	**MS1153**	T7
1098212	**A12MSTFPL11**	12	16,0	9,0	150	4,0	1/16-27 NPT	-2.0	TP..110204	–	–	–	**MS1153**	T7
1098215	**A16RSTFPL11**	16	20,0	11,0	200	4,0	1/8-27 NPT	0.0	TP..110204	–	–	–	**MS1153**	T7
1098256	**A20SSTFPL16**	20	25,0	13,0	250	4,0	1/8-27 NPT	-2.0	TP..16T308	–	–	–	**MS1155**	T15
1098276	**A25TSTFPL16**	25	32,0	17,0	300	6,4	1/4-18 NPT	0.0	TP..16T308	–	–	–	**MS1155**	T15



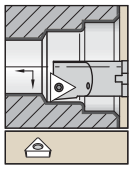
Haste de metal duro com refrigeração interna.



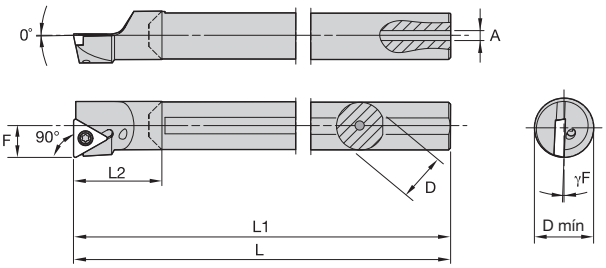
E-STFP 90°



número para pedido	código do produto	D	D mín	F	L1	A	γF°	inserto padrão	parafuso do inserto	Torx
corte à direita (R)										
1152860	**E08KSTFPR09A**	8	11,0	6,0	125	2,4	-6.0	TP..090204	**MS1933**	T7
1152862	**E10MSTFPR11A**	10	13,0	7,0	150	3,2	-4.0	TP..110204	**MS1153**	T7
1104311	**E12QSTFPR11**	12	16,0	9,0	180	4,8	-2.0	TP..110204	**MS1153**	T7
1152874	**E16RSTFPR11**	16	20,0	11,0	200	5,5	0.0	TP..110204	**MS1153**	T7
1152908	**E20SSTFPR16**	20	25,0	13,0	250	7,1	-2.0	TP..16T308	**MS1155**	T15
corte à esquerda (L)										
1152863	**E10MSTFPL11A**	10	13,0	7,0	150	3,2	-4.0	TP..110204	**MS1153**	T7
1152873	**E12QSTFPL11**	12	16,0	9,0	180	4,8	-2.0	TP..110204	**MS1153**	T7
1152875	**E16RSTFPL11**	16	20,0	11,0	200	5,5	0.0	TP..110204	**MS1153**	T7
1152909	**E20SSTFPL16**	20	25,0	13,0	250	7,1	-2.0	TP..16T308	**MS1155**	T15



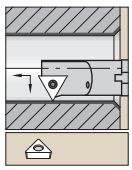
Barra de metal pesado com refrigeração interna.



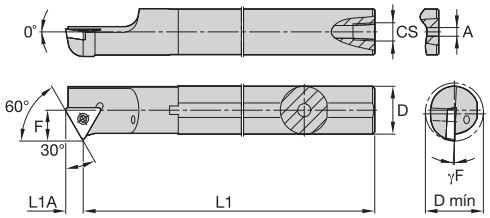
L-STFP 90°



número para pedido	código do produto	D	D mín	F	L1	L2	A	γF°	inserto padrão	parafuso do inserto	Torx
corte à direita (R)											
3331128	**L08KSTFPR09**	8	11,0	6,0	125	19,1	2,4	-6.0	TP..090204..	**MS1933**	T7
3331123	**L12QSTFPR11**	12	16,0	9,0	183	24,4	4,0	-2.0	TP..110204..	**MS1153**	T7
corte à esquerda (L)											
3331131	**L08KSTFPL09**	8	11,0	6,0	125	19,1	2,4	-6.0	TP..090204..	**MS1933**	T7



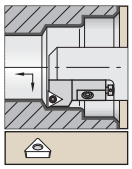
Haste de aço com refrigeração interna.

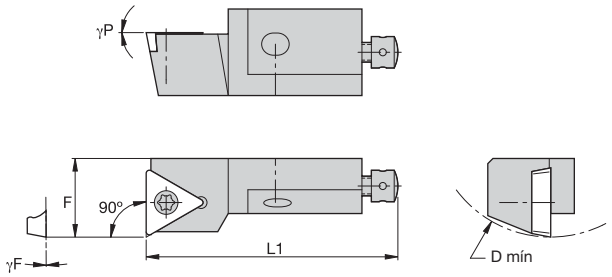


A-STWP 60°



número para pedido	código do produto	D	D mín	F	L1	L1A	A	CS	γF°	inserto padrão	parafuso do inserto	Torx
corte à direita (R)												
1098205	**A10KSTWPR11**	10	13,0	7,0	125	5,0	3,2	–	-4.0	TP..110204	**MS1153**	T7
1098216	**A12MSTWPR11**	12	16,0	9,0	150	–	4,0	1/16-27 NPT	-2.0	TP..110204	**MS1153**	T7
1098218	**A16RSTWPR11**	16	20,0	11,0	200	–	4,0	1/8-27 NPT	-2.0	TP..110204	**MS1153**	T7
corte à esquerda (L)												
1098206	**A10KSTWPL11**	10	13,0	7,0	125	–	3,2	–	-4.0	TP..110204	**MS1153**	T7





STFP 90°

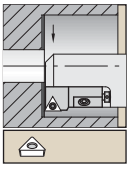
número para pedido	código do produto	D mín	F	L1	γF°	γP°	inserto padrão
corte à direita (R)							
1098565	**STFPR08CA09**	25	10,0	32	0.0	0.0	TP..090204/TP..18151
1098563	**STFPR10CA11**	40	14,0	50	0.0	0.0	TP..110204/TP..2151
1098562	**STFPR12CA16**	50	20,0	55	0.0	0.0	TP..16T308/TP..3252
corte à esquerda (L)							
1098561	**STFPL08CA09**	25	10,0	32	0.0	0.0	TP..090204/TP..18151
1098559	**STFPL10CA11**	40	14,0	50	0.0	0.0	TP..110204/TP..2151
1098558	**STFPL12CA16**	50	20,0	55	0.0	0.0	TP..16T308/TP..3252

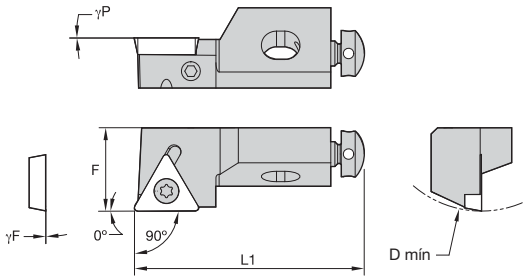
NOTA: Insertos de furo escareado de 60° compatíveis com ANSI/ISO.
Esta ferramenta também aceita insertos TPGM/TPGT/TPGW-21.5_.
Insertos de furo escareado de 60° compatíveis com ANSI/ISO (por exemplo, TPMT/TPGT/TPGW-32.5_).
Insertos de furo escareado de 90° (i.e., TPGM/TPGB-32.5_) são incompatíveis com esta ferramenta.

Peças de reposição



D mín	parafuso do inserto	Torx	parafuso de ajuste radial	sexta-vada	parafuso de ajuste axial	parafuso de montagem	parafuso de montagem	sexta-vada	arruela
25	**MS1152**	T7	**KUAM34**	1.5 mm	**KUAM20**	**MS2175**	**–**	2.5 mm	**CSWM 040 050**
40	**MS1153**	T7	**KUAM28**	2 mm	**KUAM30**	**191.405**	**–**	4 mm	**CSWM 060 050**
50	**MS1155**	T15	**KUAM23**	2.5 mm	**KUAM31**	**–**	**191.406**	4 mm	**CSWM 060 050**





STGP 90°

número para pedido	código do produto	D mín	F	L1	γF°	γP°	inserto padrão
corte à direita (R)							
1098567	**STGPR10CA11**	40	14,0	50	0.0	0.0	TP..110204/TP..2151
1098566	**STGPR12CA16**	50	20,0	55	0.0	0.0	TP..16T308/TP..3252
corte à esquerda (L)							
1098762	**STGPL08CA09**	25	10,0	32	0.0	0.0	TP..090204/TP..18151
1098760	**STGPL10CA11**	40	14,0	50	0.0	0.0	TP..110204/TP..2151

NOTA: Insertos de furo escareado de 60° compatíveis com ANSI/ISO.
Esta ferramenta também aceita insertos TPGM/TPGT/TPGW-21.5_.
Insertos de furo escareado de 60° compatíveis com ANSI/ISO (por exemplo, TPMT/TPGT/TPGW-32.5_).
Insertos de furo escareado de 90° (i.e., TPGM/TPGB-32.5_) são incompatíveis com esta ferramenta.

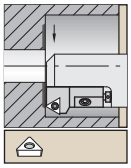
Peças de reposição

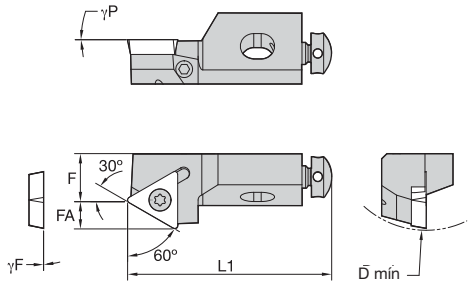







D mín	parafuso do inserto	Torx	parafuso de ajuste radial	sexta-vada	parafuso de ajuste axial	parafuso de montagem	parafuso de montagem	sexta-vada	arruela
25	**MS1152**	T7	**KUAM34**	1.5 mm	**KUAM20**	**MS2175**	**–**	2.5 mm	**CSWM 040 050**
40	**MS1153**	T7	**KUAM28**	2 mm	**KUAM30**	**191.405**	**–**	4 mm	**CSWM 060 050**
50	**MS1155**	T15	**KUAM23**	2.5 mm	**KUAM31**	**–**	**191.406**	4 mm	**CSWM 060 050**





STTP 60°

número para pedido	código do produto	D mín	F	L1	γF°	γP°	inserto padrão
corte à direita (R)							
1098744	**STTPR08CA09**	25	6,0	32	0.0	0.0	TP..090204/TP..18151
1098742	**STTPR10CA11**	40	9,0	50	0.0	0.0	TP..110204/TP..2151
1098741	**STTPR12CA16**	50	13,0	55	0.0	0.0	TP..16T308/TP..3252

NOTA: Insertos de furo escareado de 60° compatíveis com ANSI/ISO.
Esta ferramenta também aceita insertos TPGM/TPGT/TPGW-21.5_.

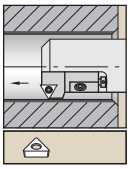
Peças de reposição

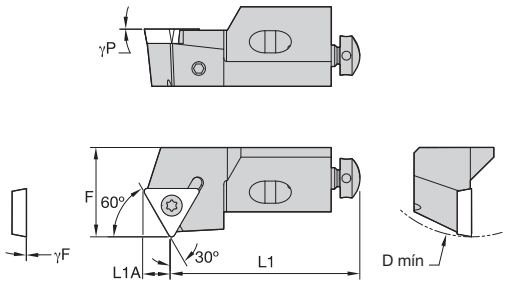







D mín	parafuso do inserto	Torx	parafuso de ajuste radial	sexta-vada	parafuso de ajuste axial	parafuso de montagem	parafuso de montagem	sexta-vada	arruela
25	**MS1152**	T7	**KUAM34**	1.5 mm	**KUAM20**	**MS2175**	**–**	2.5 mm	**CSWM 040 050**
40	**MS1153**	T7	**KUAM28**	2 mm	**KUAM30**	**191.405**	**–**	4 mm	**CSWM 060 050**
50	**MS1155**	T15	**KUAM23**	2.5 mm	**KUAM31**	**–**	**191.406**	4 mm	**CSWM 060 050**



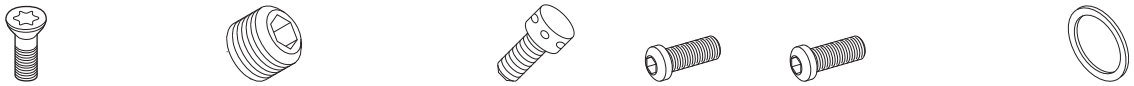


STWP 60°

número para pedido	código do produto	D mín	F	L1	γF°	γP°	inserto padrão
corte à direita (R)							
1098750	**STWPR10CA11**	40	14,0	44	0.0	0.0	TP..110204/TP..2151
1098749	**STWPR12CA16**	50	20,0	47	0.0	0.0	TP..16T308/TP..3252

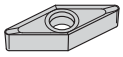
NOTA: Insertos de furo escareado de 60° compatíveis com ANSI/ISO.
Esta ferramenta também aceita insertos TPGM/TPGT/TPGW-21.5_.

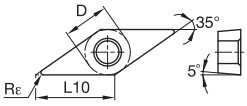
Peças de reposição



D mín	parafuso do inserto	Torx	parafuso de ajuste radial	sexta-vada	parafuso de ajuste axial	parafuso de montagem	parafuso de montagem	sexta-vada	arruela
40	**MS1153**	T7	**KUAM28**	2 mm	**KUAM30**	**191.405**	**–**	4 mm	**CSWM 060 050**
50	**MS1155**	T15	**KUAM23**	2.5 mm	**KUAM31**	**–**	**191.406**	4 mm	**CSWM 060 050**

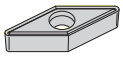
● primeira opção
○ opção alternativa

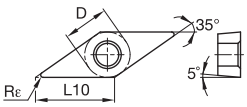




VBGT-HP

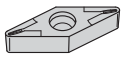
ISO código do produto	D	L10	Rε	KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35	KU10	K313	K68	KCS10	KCU10	KCU25	KC5010	KC5025	KC5410	KT315	KTP10
P				●	●	●	●	●	●	●	○	○	○	○	○	○	○	○	○	○	○	●	●	●		●	●	●	●		●	●
M										○							●	●	●	●	●	●	●	●	●	●	●	●	●		●	●
K				○	○	○	○	○			●	●	●	●	●	●						●	●	●		●	●	●	●		●	●
N																						●	●	●		●	●	●	●	●		
S																						●	●	●	●	●	●	●	●			
H																																
VBGT110302HP	6,35	11,07	0,2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	●	●	●	–	–
VBGT110304HP	6,35	11,07	0,4	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	●	●	●	●	–	–
VBGT160404HP	9,53	16,61	0,4	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	●	–	●	●	●	●	●	–	–
VBGT160408HP	9,53	16,61	0,8	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	●	●	●	●	●	–	–

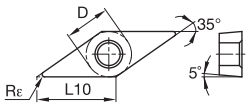




VBGT-LF

ISO código do produto	D	L10	Rε	KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35	KU10	K313	K68	KCS10	KCU10	KCU25	KC5010	KC5025	KC5410	KT315	KTP10
VBGT1103X0LF	6,35	11,07	0,0	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–
VBGT110301LF	6,35	11,07	0,1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	●	●	●	–	–
VBGT110302LF	6,35	11,07	0,2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	●	–	●	●	–	–	–
VBGT110304LF	6,35	11,07	0,4	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	●	–	●	●	–	–	–
VBGT1604X0LF	9,53	16,61	0,0	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–
VBGT160401LF	9,53	16,61	0,1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	●	●	–	–	–
VBGT160402LF	9,53	16,61	0,2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	●	–	●	●	●	–	–
VBGT160404LF	9,53	16,61	0,4	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	●	●	●	–	–

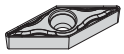


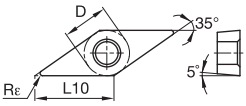


VBMT-11

ISO código do produto	D	L10	Rε	KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35	KU10	K313	K68	KCS10	KCU10	KCU25	KC5010	KC5025	KC5410	KT315	KTP10
VBMT11030211	6,35	11,07	0,2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–
VBMT11030411	6,35	11,07	0,4	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–
VBMT16040411	9,53	16,61	0,4	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–
VBMT16040811	9,53	16,61	0,8	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–

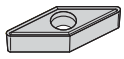
● primeira opção
○ opção alternativa

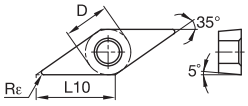




VBMT-FP

ISO código do produto	D	L10	Rε	KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35	KU10	K313	K68	KCS10	KCU10	KCU25	KC5010	KC5025	KC5410	KT315	KTP10
				P ●	●	●	●	●	●	●	○	○	○	○	○	○	○	○	○	○	○	●	●	●		●	●	●	●		●	●
				M							○						●	●	●	●	●	●	●	●	●	●	●	●	●		●	●
				K ○	○	○	○	○	○			●	●	●	●	●						●	●	●		●	●	●	●		●	●
				N																		●	●	●		●	●	●	●	●		
				S																		●	●	●	●	●	●	●	●			
				H																												
VBMT110302FP	6,35	11,07	0,2	–	–	–	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–	–	–
VBMT110304FP	6,35	11,07	0,4	–	–	●	–	●	–	–	–	–	–	–	–	–	–	●	–	●	–	–	–	–	–	●	●	–	–	–	–	●
VBMT110308FP	6,35	11,07	0,8	–	–	–	–	●	–	–	–	–	–	–	–	–	–	●	–	–	–	–	–	–	–	●	●	–	–	–	–	–
VBMT160402FP	9,53	16,61	0,2	–	–	–	–	●	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–	–	●	●	–	–	–	–	●
VBMT160404FP	9,53	16,61	0,4	●	●	●	●	●	–	–	–	–	–	–	●	–	–	●	–	●	–	–	–	–	–	●	●	–	–	–	–	●
VBMT160408FP	9,53	16,61	0,8	●	●	●	●	●	–	–	–	–	–	–	●	●	–	●	–	●	–	–	–	–	–	●	●	–	–	–	–	●
VBMT160412FP	9,53	16,61	1,2	–	●	–	●	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–

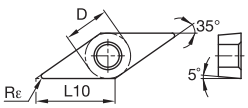




VBMT-LF

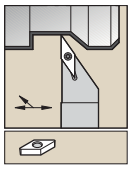
ISO código do produto	D	L10	Rε	KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35	KU10	K313	K68	KCS10	KCU10	KCU25	KC5010	KC5025	KC5410	KT315	KTP10
VBMT110302LF	6,35	11,07	0,2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	●	–
VBMT110304LF	6,35	11,07	0,4	●	●	●	●	●	–	–	–	●	–	–	–	–	–	●	●	–	–	–	●	–	–	–	–	●	●	–	●	–
VBMT110308LF	6,35	11,07	0,8	●	–	●	●	●	–	–	–	●	–	–	●	–	–	–	–	●	–	–	–	–	–	–	–	–	●	●	–	–	–
VBMT160402LF	9,53	16,61	0,2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–	●	●	–	●	–
VBMT160404LF	9,53	16,61	0,4	–	●	●	●	●	●	–	–	–	●	●	●	–	●	●	●	●	●	–	●	–	–	–	–	●	●	–	●	–
VBMT160408LF	9,53	16,61	0,8	●	●	●	●	●	●	–	–	●	●	●	–	●	●	●	●	●	●	–	●	–	–	–	–	●	●	–	●	–
VBMT160412LF	9,53	16,61	1,2	–	–	–	–	●	–	–	–	●	–	–	●	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–

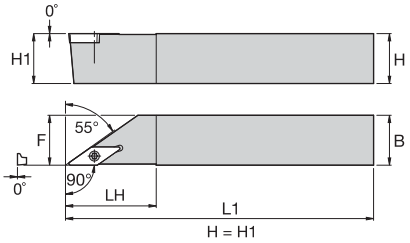


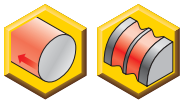


VBMT-MP

ISO código do produto	D	L10	Rε	KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35	KU10	K313	K68	KCS10	KCU10	KCU25	KC5010	KC5025	KC5410	KT315	KTP10
VBMT160404MP	9,53	16,61	0,4	–	–	–	●	●	–	–	–	–	–	–	●	–	–	–	●	●	–	–	–	–	–	–	–	–	–	–	–	–
VBMT160408MP	9,53	16,61	0,8	–	–	–	●	●	–	–	–	–	–	–	●	●	–	–	●	●	–	–	–	–	–	–	–	–	–	–	–	–



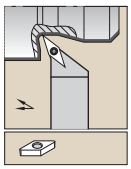


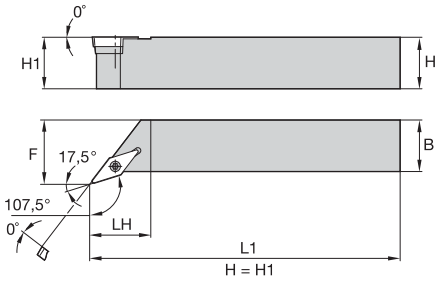


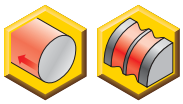
SVAB 90°



número para pedido	código do produto	H	B	F	L1	LH	inserto padrão	parafuso do inserto	Torx
corte à direita (R)									
1097722	**SVABR1010M11Q**	10	10	10,0	150	22,0	VB..110304	**MS1153**	T7
1097724	**SVABR1212M11Q**	12	12	12,0	150	22,0	VB..110304	**MS1153**	T7
1097726	**SVABR1616K16Q**	16	16	16,0	125	30,0	VB..160408	**MS1155**	T15
corte à esquerda (L)									
1097725	**SVABL1212M11Q**	12	12	12,0	150	22,0	VB..110304	**MS1153**	T7
1097727	**SVABL1616K16Q**	16	16	16,0	125	30,0	VB..160408	**MS1155**	T15







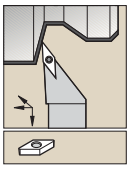
SVHB 107,5°

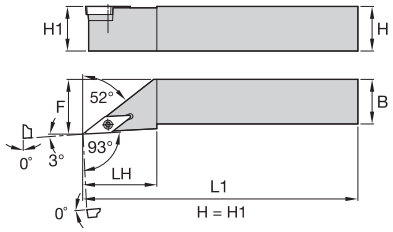


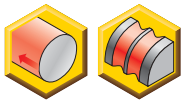




número para pedido	código do produto	H	B	F	L1	LH	inserto padrão	calço	parafuso do calço	sexta-vada	parafuso do inserto	Torx
corte à direita (R)												
1097804	**SVHBR1212N11**	12	12	16,0	160	19,0	VB..110304	**–**	**–**	–	**MS1153**	T7
1097805	**SVHBR1616H11**	16	16	20,0	100	19,0	VB..110304	**–**	**–**	–	**MS1153**	T7
1244953	**SVHBR2020K11**	20	20	25,0	125	26,0	VB..110304	**–**	**–**	–	**MS1153**	T7
1097806	**SVHBR2020K16**	20	20	25,0	125	28,0	VB..160408	**SKVN343**	**SRS3**	3.5 mm	**MS1156**	T15
1097807	**SVHBR2525M16**	25	25	32,0	150	28,0	VB..160408	**SKVN343**	**SRS3**	3.5 mm	**MS1156**	T15
corte à esquerda (L)												
1097949	**SVHBL1212N11**	12	12	16,0	160	19,0	VB..110304	**–**	**–**	–	**MS1153**	T7
1097950	**SVHBL1616H11**	16	16	20,0	100	19,0	VB..110304	**–**	**–**	–	**MS1153**	T7
1244949	**SVHBL2020K11**	20	20	25,0	125	26,0	VB..110304	**–**	**–**	–	**MS1153**	T7
1097951	**SVHBL2020K16**	20	20	25,0	125	28,0	VB..160408	**SKVN343**	**SRS3**	3.5 mm	**MS1156**	T15
1097952	**SVHBL2525M16**	25	25	32,0	150	28,0	VB..160408	**SKVN343**	**SRS3**	3.5 mm	**MS1156**	T15





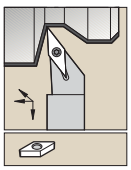


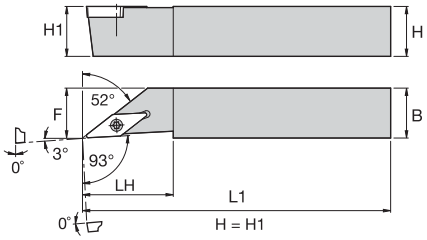
SVJB 93°

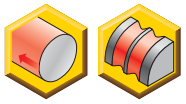




número para pedido	código do produto	H	B	F	L1	LH	inserto padrão	calço	parafuso do calço	sexta-vada	parafuso do inserto	Torx
corte à direita (R)												
1097800	**SVJBR1212N11**	12	12	16,0	160	22,0	VB..110304	–	–	–	**MS1153**	T7
1097801	**SVJBR1616H11**	16	16	20,0	100	22,0	VB..110304	–	–	–	**MS1153**	T7
1244959	**SVJBR1616H16**	16	16	20,0	100	35,0	VB..160408	**SKVN343**	**SRS3**	3.5 mm	**MS1156**	T15
1252235	**SVJBR2020K11**	20	20	25,0	125	26,0	VB..110304	–	–	–	**MS1153**	T7
1097802	**SVJBR2020K16**	20	20	25,0	125	35,0	VB..160408	**SKVN343**	**SRS3**	3.5 mm	**MS1156**	T15
1097803	**SVJBR2525M16**	25	25	32,0	150	35,0	VB..160408	**SKVN343**	**SRS3**	3.5 mm	**MS1156**	T15
1244992	**SVJBR3225P16**	32	25	32,0	170	35,0	VB..160408	**SKVN343**	**SRS3**	3.5 mm	**MS1156**	T15
corte à esquerda (L)												
1097945	**SVJBL1212N11**	12	12	16,0	160	22,0	VB..110304	–	–	–	**MS1153**	T7
1097946	**SVJBL1616H11**	16	16	20,0	100	22,0	VB..110304	–	–	–	**MS1153**	T7
1244957	**SVJBL1616H16**	16	16	20,0	100	35,0	VB..160408	**SKVN343**	**SRS3**	3.5 mm	**MS1156**	T15
1252234	**SVJBL2020K11**	20	20	25,0	125	26,0	VB..110304	–	–	–	**MS1153**	T7
1097947	**SVJBL2020K16**	20	20	25,0	125	35,0	VB..160408	**SKVN343**	**SRS3**	3.5 mm	**MS1156**	T15
1097948	**SVJBL2525M16**	25	25	32,0	150	35,0	VB..160408	**SKVN343**	**SRS3**	3.5 mm	**MS1156**	T15
1192560	**SVJBL3225P16**	32	25	32,0	170	35,0	VB..160408	**SKVN343**	**SRS3**	3.5 mm	**MS1156**	T15



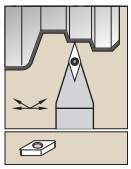


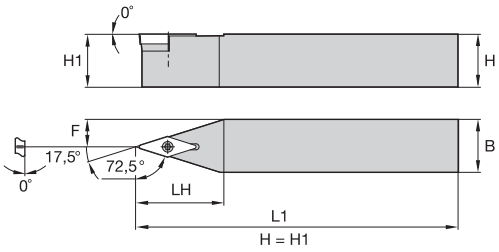


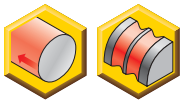
SVJB-F 93°



número para pedido	código do produto	H	B	F	L1	LH	inserto padrão	parafuso do inserto	Torx
corte à direita (R)									
1097797	**SVJBRF1010M11Q**	10	10	10,0	150	23,0	VB..110304	**MS1153**	T7
1097798	**SVJBRF1212M11Q**	12	12	12,0	150	23,0	VB..110304	**MS1153**	T7
1097799	**SVJBRF1616K16Q**	16	16	16,0	125	31,0	VB..160408	**MS1155**	T15
corte à esquerda (L)									
1097942	**SVJBLF1010M11Q**	10	10	10,0	150	23,0	VB..110304	**MS1153**	T7
1097943	**SVJBLF1212M11Q**	12	12	12,0	150	23,0	VB..110304	**MS1153**	T7
1097944	**SVJBLF1616K16Q**	16	16	16,0	125	31,0	VB..160408	**MS1155**	T15





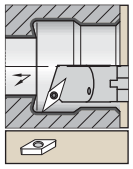


SVVB 72,5°

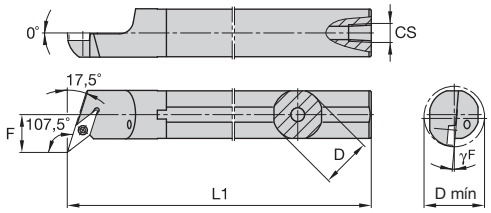


número para pedido	código do produto	H	B	F	L1	LH	inserto padrão	calço	parafuso do calço	sexta-vada	parafuso do inserto	Torx
1097990	**SVVBN1212N11**	12	12	6,0	160	26,0	VB..110304	**–**	**–**	–	**MS1153**	T7
1097991	**SVVBN1616H11**	16	16	8,0	100	26,0	VB..110304	**–**	**–**	–	**MS1153**	T7
1244961	**SVVBN1616H16**	16	16	8,0	100	33,0	VB..160408	**SKVN343**	**SRS3**	3.5 mm	**MS1156**	T15
1244962	**SVVBN2020K11**	20	20	10,0	125	26,0	VB..110304	**–**	**–**	–	**MS1153**	T7
1097992	**SVVBN2020K16**	20	20	10,0	125	33,0	VB..160408	**SKVN343**	**SRS3**	3.5 mm	**MS1156**	T15
1097993	**SVVBN2525M16**	25	25	12,5	150	33,0	VB..160408	**SKVN343**	**SRS3**	3.5 mm	**MS1156**	T15
1192561	**SVVBN3225P16**	32	25	12,5	170	33,0	VB..160408	**SKVN343**	**SRS3**	3.5 mm	**MS1156**	T15

Barras de mandrilar Screw-On



Haste de aço com refrigeração interna.

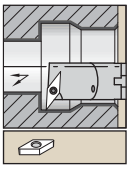




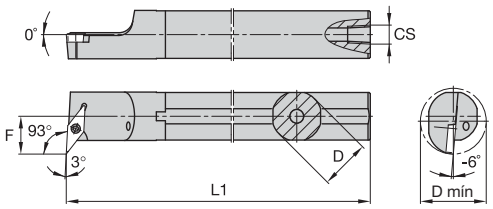
A-SVQB 107,5°



número para pedido	código do produto	D	D mín	F	L1	CS	γF°	inserto padrão	parafuso do inserto	Torx
corte à direita (R)										
1098232	**A16RSVQBR11**	16	20,0	11,0	200	1/8-27 NPT	-7.0	VB..110304	**MS1153**	T7
1098248	**A20SSVQBR11**	20	25,0	13,0	250	1/8-27 NPT	-6.0	VB..110304	**MS1153**	T7
1098274	**A25TSVQBR16**	25	32,0	17,0	300	1/4-18 NPT	-6.0	VB..160408	**MS1155**	T15
corte à esquerda (L)										
1098233	**A16RSVQBL11**	16	20,0	11,0	200	1/8-27 NPT	-7.0	VB..110304	**MS1153**	T7
1098253	**A20SSVQBL11**	20	25,0	13,0	250	1/8-27 NPT	-6.0	VB..110304	**MS1153**	T7
1098277	**A25TSVQBL16**	25	32,0	17,0	300	1/4-18 NPT	-6.0	VB..160408	**MS1155**	T15



Haste de aço com refrigeração interna.



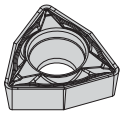


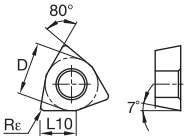
A-SVUB 93°



número para pedido	código do produto	D	D mín	F	L1	CS	inserto padrão	parafuso do inserto	Torx
corte à direita (R)									
1098249	**A20SSVUBR11**	20	25,0	13,0	250	1/8-27 NPT	VB..110304	**MS1153**	T7
1098275	**A25TSVUBR16**	25	32,0	17,0	300	1/4-18 NPT	VB..160408	**MS1155**	T15
corte à esquerda (L)									
1098254	**A20SSVUBL11**	20	25,0	13,0	250	1/8-27 NPT	VB..110304	**MS1153**	T7
1098278	**A25TSVUBL16**	25	32,0	17,0	300	1/4-18 NPT	VB..160408	**MS1155**	T15

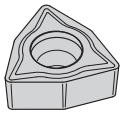
● primeira opção
○ opção alternativa

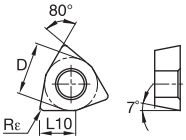




WCMT-FP

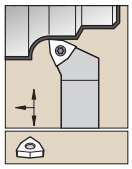
P		●	●	●	●	●	●	●	○	○	○	○	○	○	○	○	○	○	○	●	●	●		●	●	●	●		●	●			
M								○							●	●	●	●	●	●	●	●	●	●	●	●	●		●	●			
K		○	○	○	○	○			●	●	●	●	●	●						●	●	●		●	●	●	●		●	●			
N																				●	●	●		●	●	●	●	●					
S																				●	●	●	●	●	●	●	●						
H																																	
ISO código do produto	D	L10	Rε	KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35	KU10	K313	K68	KCS10	KCU10	KCU25	KC5010	KC5025	KC5410	KT315	KTP10		
WCMT040204FP	6,35	4,34	0,4	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	●	–	–	–	–	–	
WCMT06T308FP	9,53	6,52	0,8	–	–	–	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–	–	–	

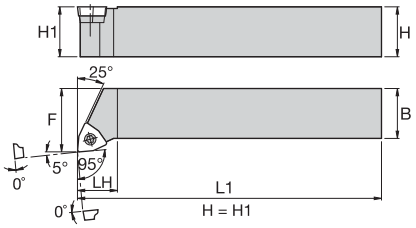




WCMT-LF

ISO código do produto	D	L10	Rε	KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35	KU10	K313	K68	KCS10	KCU10	KCU25	KC5010	KC5025	KC5410	KT315	KTP10
WCMT040204LF	6,35	4,34	0,4	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–
WCMT06T308LF	9,53	6,52	0,8	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	●	–	–	–





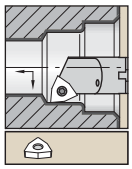


SWLC 95°

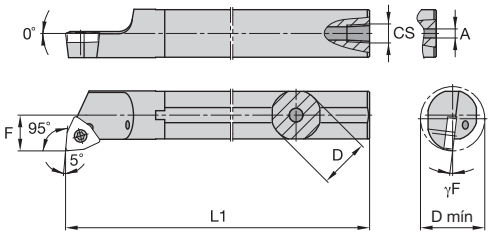


número para pedido	código do produto	H	B	F	L1	LH	inserto padrão	calço	parafuso do calço	sexta-vada	parafuso do inserto	Torx
corte à direita (R)												
1097732	**SWLCR2020K06**	20	20	25,0	125	16,0	WC..06T308	**SKWP343**	**SRS3**	3.5 mm	**MS1156**	T15

Barras de mandrilar Screw-On



Haste de aço com refrigeração interna.



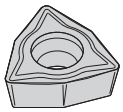


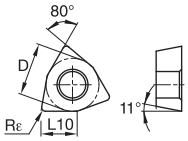
A-SWLC 95°



número para pedido	código do produto	D	D mín	F	L1	A	CS	γF°	inserto padrão	parafuso do inserto	Torx
corte à direita (R)											
1328642	**A06MSWLCR2**	10	12,2	6,4	152	3,2	—	-8.0	WC..2151	**MS1939**	T7
1328644	**A08RSWLCR2**	13	15,2	7,9	203	4,0	1/16-27 NPT	-6.0	WC..2151	**MS1153**	T7
1098062	**A10KSWLCR04**	10	13,0	7,0	125	3,0	—	-7.0	WC..040204	**MS1153**	T7
1328646	**A10SSWLCR3**	16	19,6	10,3	254	4,0	1/8-27 NPT	-7.0	WC..3252	**MS1155**	T15
1098063	**A12MSWLCR04**	12	16,0	9,0	150	—	1/16-27 NPT	-6.0	WC..040204	**MS1153**	T7
1098064	**A16RSWLCR06**	16	20,0	11,0	200	4,0	1/8-27 NPT	-7.0	WC..06T308	**MS1155**	T15
1098065	**A20SSWLCR06**	20	25,0	13,0	250	4,0	1/8-27 NPT	-5.0	WC..06T308	**MS1155**	T15
corte à esquerda (L)											
1098069	**A16RSWLCL06**	16	20,0	11,0	200	4,0	1/8-27 NPT	-7.0	WC..06T308	**MS1155**	T15

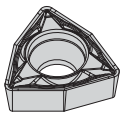
● primeira opção
○ opção alternativa

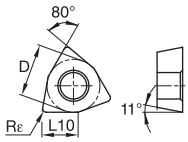




WPGT-UF

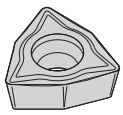
ISO código do produto	D	L10	Rε	KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35	KU10	K313	K68	KCS10	KCU10	KCU25	KC5010	KC5025	KC5410	KT315	KTP10
				P		●	●	●	●	●	●	●	○	○	○	○	○	○	○	○	○	○	●	●	●		●	●	●	●		●	●
				M								○							●	●	●	●	●	●	●	●	●	●	●	●		●	●
				K		○	○	○	○	○			●	●	●	●	●	●						●	●	●		●	●	●	●		●	●
				N																			●	●	●		●	●	●	●	●		
				S																			●	●	●	●	●	●	●	●			
				H																													
WPGTS30101UF	4,76	3,26	0,1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	●	–	–	–	–
WPGTS30102UF	4,76	3,26	0,2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	●	–	–	–	–
WPGT040202UF	6,35	4,34	0,2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–	–	–

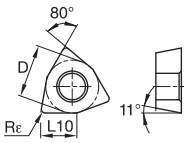




WPMT-FP

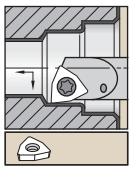
ISO código do produto	D	L10	Rε	KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35	KU10	K313	K68	KCS10	KCU10	KCU25	KC5010	KC5025	KC5410	KT315	KTP10
WPMTS3T104FP	4,76	3,25	0,4	–	–	–	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–	–	–
WPMT040204FP	6,35	4,34	0,4	–	–	–	–	●	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–	–	●	–	–	–	–	–	–
WPMT06T304FP	9,53	6,52	0,4	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–	–	–
WPMT06T308FP	9,53	6,52	0,8	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–	–	–



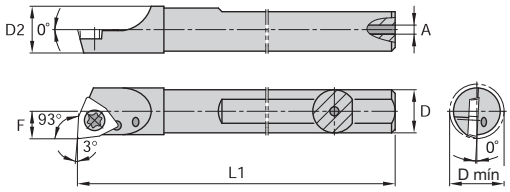


WPMT-LF

ISO código do produto	D	L10	Rε	KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35	KU10	K313	K68	KCS10	KCU10	KCU25	KC5010	KC5025	KC5410	KT315	KTP10
WPMTS3T104LF	4,76	3,25	0,4	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–
WPMT040204LF	6,35	4,34	0,4	–	–	●	–	–	–	–	–	–	–	–	–	●	–	–	–	–	–	–	–	–	–	–	–	●	●	–	–	–
WPMT06T304LF	9,53	6,52	0,4	–	–	–	–	●	–	–	–	–	–	–	–	–	●	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–
WPMT06T308LF	9,53	6,52	0,8	–	–	–	●	–	–	–	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–



Haste de aço com refrigeração interna.

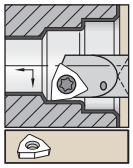




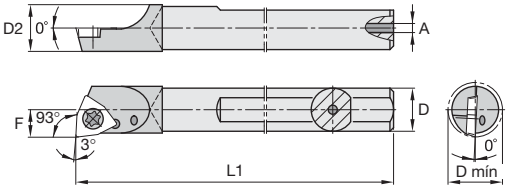
A-SWUP 93°



número para pedido	código do produto	D	D mín	D2	F	L1	A	inserto padrão	parafuso do inserto	Torx
corte à direita (R)										
1930544	**A06HSWUPRS3**	6	6,8	6,2	3,4	102	1,0	WP..S30104	**CT11**	T6
1930546	**A08HSWUPRS3**	8	8,8	8,2	4,4	102	2,4	WP..S30104	**CT11**	T6
1930556	**A12MSWUPR04**	12	12,9	12,2	6,6	152	4,0	WP..040204	**QTM20**	T7



Haste de metal duro com refrigeração interna.





E-SWUP 93°



número para pedido	código do produto	D	D mín	D2	F	L1	A	inserto padrão	parafuso do inserto	Torx
corte à direita (R)										
1930550	**E06MSWUPRS3**	6	6,8	6,2	3,4	152	1,2	WP..S30104	**CT11**	T6
1930552	**E08MSWUPRS3**	8	8,8	–	4,4	152	2,4	WP..S30104	**CT11**	T6
1930558	**E10SSWUPR04**	10	11,0	–	5,6	254	3,2	WP..040204	**QTM20**	T7
1930560	**E12SSWUPR04**	12	12,9	–	6,6	254	4,7	WP..040204	**QTM20**	T7
corte à esquerda (L)										
1930549	**E06MSWUPLS3**	6	6,8	6,2	3,4	152	1,2	WP..S30104	**CT11**	T6

Torneamento com insertos de materiais avançados

Insertos cerâmicos, de PcBN e PCD

Insertos de torneamento fabricados com materiais avançados, como cerâmica, PcBN (nitreto cúbico de boro policristalino), e PCD (diamante policristalino), podem ser aplicados em torneamento de peças rígidas e usinagem de ferro fundido, materiais endurecidos, ligas de alta temperatura e materiais não ferrosos.

Os insertos cerâmicos, de PcBN e PCD oferecem:
- Performance melhorada.
- Maior resistência a desgaste.



Insertos de cerâmica

- Cerâmica baseada em nitreto de silício para a usinagem de ferro fundido.
- Cerâmica mista para usinagem difícil e acabamento de ferro fundido.
- Cerâmica de whisker filamentoso para ligas de alta temperatura e usinagem dura.

KYK25



KYS30

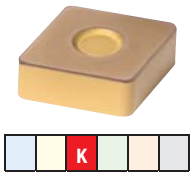


PcBN

Insertos inteiriços

- Os insertos são feitos somente com PcBN.
- Sem emendas de solda.
- Melhor capacidade de absorção de calor.
- Pode trabalhar nas mais altas temperaturas.

KBK45



Insertos com ponta soldada

- É necessário um suporte e uma ponta de PcBN.
- As pontas são soldadas a um suporte.
- O substrato necessita de um encaixe que acomodará e dará suporte à ponta.

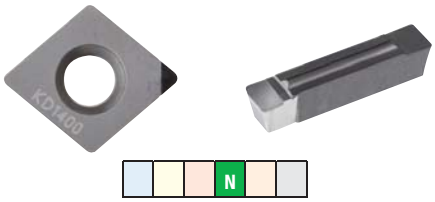
KBH20™



PCD

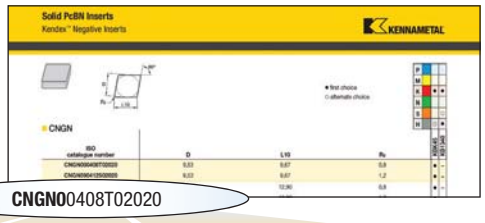
- Usinagem voltada para materiais não ferrosos.
- Vantagem significativa em termos de dureza em relação a ferramentas de metal duro.
- Produtividade aumentada por meio de maiores velocidades e maior vida útil da ferramenta.
- Uso aprimorado no processamento de materiais que não são usináveis com ferramentas convencionais.

KD1400



Como funcionam os números de catálogo?

Cada caractere no nosso número de catálogo significa uma característica específica daquele produto. Use as colunas-chave a seguir e as imagens correspondentes para fazer uma identificação fácil do atributo a ser aplicado.



C	N	G	N	O
Formato do inserto	Ângulo de folga do inserto	Classe de tolerância	Características do inserto	Tamanho

Formato do inserto

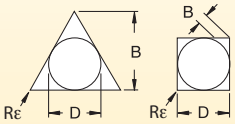
H	Hexágono	120°
O	Octágono	135°
P	Pentágono	108°
R	Redondo	—
S	Quadrado	90°
T	Triangular	60°
C	Romboide	80°
D		55°
E		75°
M		86°
V		35°
W	Trígono	80° com ângulos de cantos ampliados
L	Retângulo	90°
A	Paralelogramo	85°
B		82°
N/K		55°

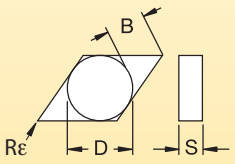
Ângulo de folga do inserto

A	3°
B	5°
C	7°
D	15°
E	20°
F	25°
G	30°
N	0°
P	11°
O	Para outros ângulos de folga que precisam de descrições.

Classe de tolerância

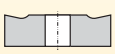
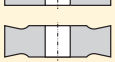
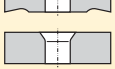
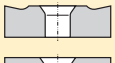
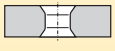
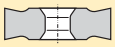
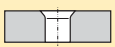
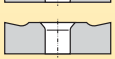
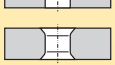
A tolerância se aplica antes da preparação e do revestimento da aresta





D = Diâmetro teórico do círculo inscrito do inserto
S = Espessura
B = Ver figuras abaixo

Características do inserto

N	
R	
F	
A	
M	
G	
W	
T	
Q	
U	
B	
H	
C	
J	
X V	Design especial

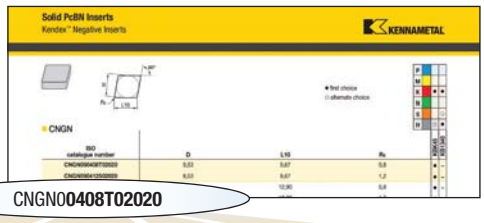
Tamanho

"D" mm	Código para o comprimento métrico da aresta de corte "L10" C	D	R	S	T	V	W
3,97	S4	04	03	03	06	—	—
4,76	04	05	04	04	08	08	S3
5,56	05	06	05	05	09	09	03
6,00	—	—	06	—	—	—	—
6,35	06	07	06	06	11	11	04
7,94	08	09	07	07	13	13	05
8,00	—	—	08	—	—	—	—
9,52	09	11	09	09	16	16	06
10,00	—	—	10	—	—	—	—
11,11	11	13	11	11	19	19	07
12,00	—	—	12	—	—	—	—
12,70	12	15	12	12	22	22	08
14,29	14	17	14	14	24	24	09
15,88	16	19	15	15	27	27	10
16,00	—	—	16	—	—	—	—
17,46	17	21	17	17	30	30	11
19,05	19	23	19	19	33	33	13
20,00	—	—	20	—	—	—	—
22,22	22	27	22	22	38	38	15
25,00	—	—	25	—	—	—	—
25,40	25	31	25	25	44	44	17
31,75	32	38	31	31	54	54	21
32,00	—	—	32	—	—	—	—

classe de tolerância*	tolerância para "D"	tolerância para "B"	tolerância para "S"
C	±0,025	±0,013	±0,025
H	±0,013	±0,013	±0,025
E	±0,025	±0,025	±0,025
G	±0,025	±0,025	±0,013
M	Veja as tabelas na próxima página		±0,013
U	Veja as tabelas na próxima página		±0,013

* A tolerância é aplicada antes da preparação e do revestimento da aresta.

Consultando este guia fácil de usar, você pode identificar o produto correto para atender às suas necessidades.



04	08		T	020	20		
Espessura "S"	Raio de canto "Rε"	Sentido do inserto *(opcional)*	Aresta de corte *(opcional)*	Largura da área T *(opcional)*	Ângulo da área T *(opcional)*	Estilo da ponta *(opcional)*	Quebra-cavacos *(opcional)*

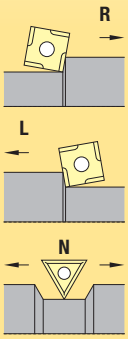
símbolo	espessura
mm	mm
—	0,79
T0	1,00
01	11,59
T1	1,98
02	2,38
03	3,18
T3	3,97
04	4,76
05	5,56
06	6,35
07	7,94
09	9,52
11	11,11
12	12,70

símbolo	raio de canto
mm	mm
X0	0,4
01	0,1
02	0,2
04	0,4
08	0,8
12	1,2
16	1,6
20	2,0
24	2,4
28	2,8
32	3,2
00	inserto redondo
M0	

R = Sentido de rotação à direita

L = Sentido de rotação à esquerda

N = Neutro



F* Afiado

E Arredondado

T* Chanfrado

S* Chanfrado e arredondado

K Chanfrado duplo

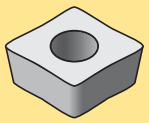
P Chanfrado duplo e arredondado

* Também disponíveis no estilo wiper.

símbolo ISO	tamanho
	mm
010	0,01
020	0,02

símbolo	tamanho
10	10°
15	15°
20	20°
25	25°
30	30°

símbolo	uso
C	topos completos
M	míni ponta
MT	ponta múltipla
ST	ponta simples



FW = Wiper de acabamento

MW = Wiper médio

"D"	± tolerância para "D"			
	Tolerância da classe M			Tolerância da classe U
	Formas S, T, C, R, & W	Forma D	Forma V	Formas S, T, & C
mm	mm	mm	mm	mm
3,97	0,05	–	–	–
4,76	0,05	–	–	0,08
5,56	0,05	0,05	0,05	0,08
6,35	0,05	0,05	0,05	0,08
7,94	0,05	0,05	0,05	0,08
9,52	0,05	0,05	0,05	0,08
11,11	0,08	0,08	0,08	0,13
12,70	0,08	0,08	0,08	0,13
14,29	0,08	0,08	0,08	0,13
15,88	0,10	0,10	0,10	0,18
17,46	0,10	0,10	0,10	0,18
19,05	0,10	0,10	0,10	0,18
22,22	0,13	–	–	0,25
25,40	0,13	–	–	0,25
31,75	0,15	–	–	0,25

"D"	± tolerância para "B"			
	Tolerância da classe M			Tolerância da classe U
	Formas S, T, C, R, & W	Forma D	Forma V	Formas S, T, & C
mm	mm	mm	mm	mm
3,97	0,08	–	–	–
4,76	0,08	–	–	0,13
5,56	0,08	0,11	–	0,13
6,35	0,08	0,11	–	0,13
7,94	0,08	0,11	–	0,13
9,52	0,08	0,11	0,18	0,13
11,11	0,13	0,15	–	–
12,70	0,13	0,15	0,25	0,20
14,29	0,13	0,15	–	–
15,88	0,15	0,18	–	0,27
17,46	0,15	0,18	–	0,27
19,05	0,15	0,18	–	0,27
22,22	0,15	–	–	0,38
25,40	0,18	–	–	0,38
31,75	0,20	–	–	0,38

Materiais avançados para usinagem de ferro fundido

Aplicação principal

Os materiais avançados da Kennametal, utilizando a tecnologia Beyond™, oferecem grande resistência a desgaste e tenacidade de acordo com o trabalho a ser realizado.

Os insertos de cerâmica KYK são a primeira opção para aplicações de torneamento de alta velocidade, contínuo e ligeiramente interrompido em materiais de ferro fundido. As vantagens incluem melhor resistência a quebra e ao desgaste, e maior gama de aplicações. Combinando as classes com covertura KYK10™ e KYK25™ com revestimento CVD com as nossas outras classes de cerâmica para ferro fundido, a Kennametal fornece um portfólio de cerâmica completo e de alta performance, que pode reduzir os tempos de ciclo de usinagem e diminuir os custos de fabricação.

As classes SiAlON da Kennametal, como a KYK10, podem ser aplicadas em altas velocidades de corte até o alcance do PcBN e em material de ferro fundido de usinabilidade variada. Combinando a ciência do material SiAlON, a tecnologia do revestimento de CVD e classes de PcBN para usinagem de ferro fundido, a Kennametal fornece um portfólio completo e de alta performance, que pode reduzir o tempo de ciclo e os custos da usinagem.

Características e benefícios

Insertos de PcBN sólido

Classe KBK45™

- Desenvolvido para elevada resistência a abrasão.
- Classe definitiva para fabricação com custo por peça.
- Para desbaste e acabamento.
- Cor dourada para melhor monitoramento da utilização.

Classe KB1340™

- Desenvolvido para elevada resistência a abrasão.
- Resistência à alta temperatura.
- Para desbaste e acabamento.

Insertos PcBN com ponta

Classe KB5630™

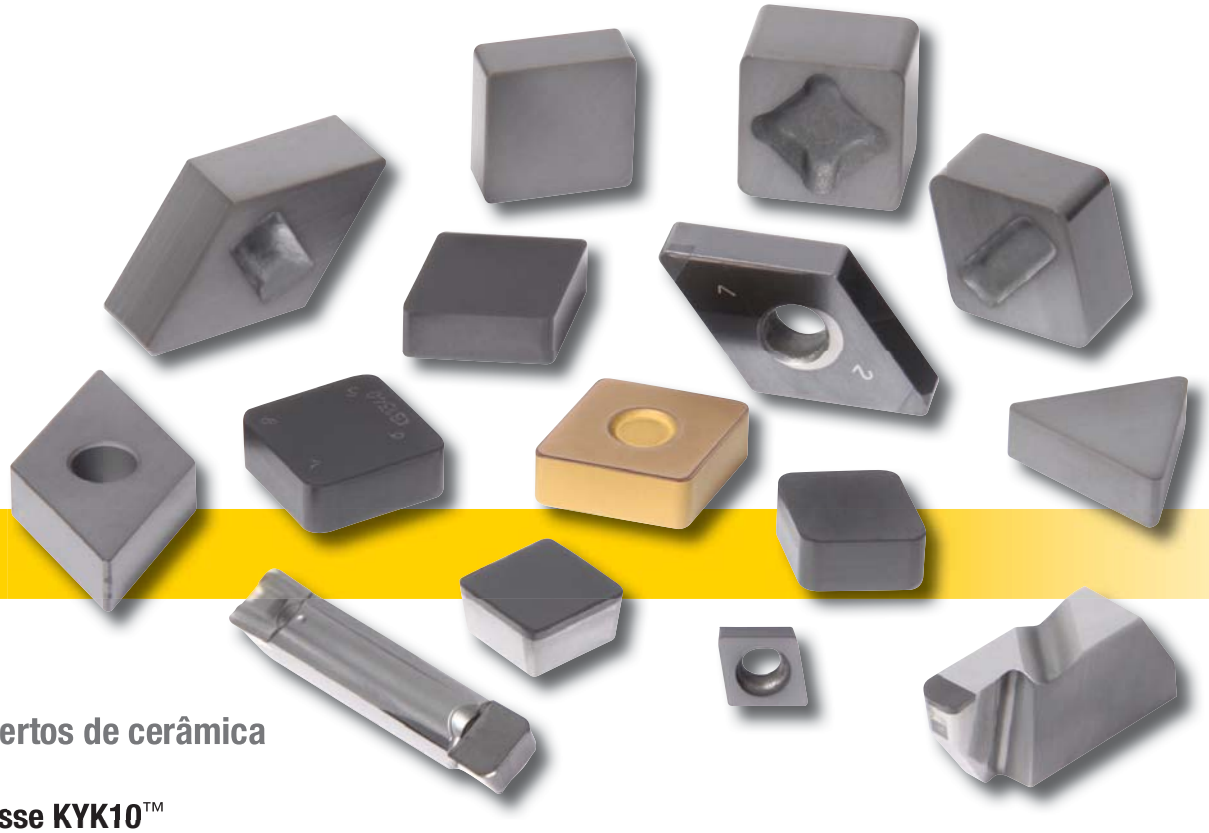
- Material laminado para acabamento fino.
- Excelente estabilidade da aresta.
- Revestimento PVD para uma vida útil da ferramenta confiável, até mesmo em material de usinabilidade variada.

Classe KB1345™

- Classe de conteúdo CBN com ponta com alta resistência a abrasão.
- Estrutura PcBN muito fina compatível com aplicações de acabamento fino.

A classe KBK45™ fornece o melhor custo por peça em ferro fundido.

A classe KB5630™ tem melhor resistência à abrasão para aços coquilhados (brancos) e endurecidos.



Insertos de cerâmica

Classe KYK10™

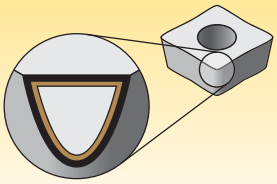
- Resistência ao desgaste e tenacidade melhoradas com até 20% mais vida útil que a atual classe KY1310™.
- Mais adequadas para torneamento contínuo de materiais de ferro fundido e cortes ligeiramente interrompidos.

Classe KYK25™

- O revestimento de 12 mícrons de espessura fornece excelente resistência a desgaste e o tratamento pré-revestimento permite vida útil da ferramenta e performance muito constantes para aplicações em ferros fundidos.
- Até 30% a mais de vida útil da ferramenta comparado com as classes de cerâmica com revestimento CVD dos concorrentes.

Classe KY3500™

- Excelente para operações desde desbaste até acabamento em cortes com e sem refrigeração com velocidades de até 1000 m/min.
- Trabalha bem em cortes interrompidos difíceis em ferros fundidos maleáveis ou nodulares (resistência a tensão <70 KSI) em velocidades de 250–450 m/min.



Os revestimentos proporcionam capacidade de alta velocidade e são projetados para acabamento e desbaste leve.

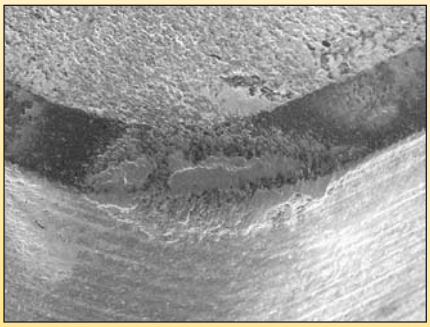
P	Aço
M	Aço inoxidável
K	Ferro fundido
N	Materiais não ferrosos
S	Ligas resistentes a altas temperaturas
H	Materiais endurecidos

resistência a desgaste ⟷ dureza

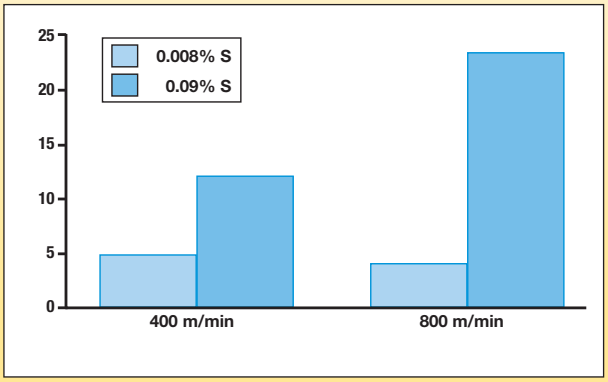
	Revestimento		Descrição da classe		05	10	15	20	25	30	35	40	45
Classes de PcBN sólido	KBK45	—	**Composição:** Um inserto de PcBN sólido com revestimento PVD TIN de alto teor de CBN, com múltiplas arestas de corte. **Aplicação:** Aplicado do desbaste ao acabamento de ferro fundido duro e cinzento. Usada também para acabamento de ferros fundidos coquilhados e totalmente perlíticos. O inserto inteiriço de PCBN oferece melhores segurança e resistência ao choque que as dos insertos com pontas de PCBN, ao mesmo tempo que permite uma maior profundidade de corte. beyond	K			■	■	■	■	■	■	
	KB1340	—	**Composição:** Inserto inteiriço de PcBN de alto teor de CBN, com múltiplas arestas de corte. **Aplicação:** Aplicado em desbaste para acabamento de ferro fundido cinzento totalmente perlítico, ferros resfriados, aços-liga de cromo alto e cortes pesados em aços endurecidos (>45 HRC). O inserto inteiriço de PcBN oferece melhor segurança e resistência ao choque que os insertos com pontas de PcBN, ao mesmo tempo que permite uma maior profundidade de corte.	K		■	■	■	■	■			
Classes PcBN com ponta	KB1345	—	**Composição:** Um alto teor de CBN, ponta de PcBN soldada em um inserto de metal duro. **Aplicação:** Aplicado em desbaste para acabamento de ferro fundido cinzento totalmente perlítico, ferros resfriados, aços-liga de alto cromo, metal sinterizado em pó e cortes pesados em aços endurecidos (>45 HRC). Usada também para acabamento de ferros fundidos coquilhados e totalmente perlíticos. O inserto com ponta soldada de PcBN está disponível em uma ampla gama de estilo de inserto, incluindo geometrias de ângulo de saída positivo, ideais para aplicações de mandrilamento.	K				■	■	■	■	■	■
				H								■	
	KB5630	—	**Composição:** Classe com alto teor de PcBN com um revestimento PVD de AlTiN, proporcionando mais resistência a desgaste. **Aplicação:** Elaborado para desbaste a acabamento em aços endurecidos (>45 HRC), materiais das peças abrasivas, como materiais sinterizados de sede de válvula, aços de metalurgia do pó e ferros fundidos com liga alta endurecidos. O revestimento PVD oferece resistência a desgaste por craterização e maior resistência a cavacos. Uma ampla gama de estilos está disponível, incluindo geometrias Screw-On, que são ideais para aplicações de mandrilamento.	K	■	■	■						
				S		■	■						
				H					■	■	■		
Classes de cerâmica	KYK10	—	**Composição:** Uma classe avançada de cerâmica SiAlON. **Aplicação:** Proporciona a máxima resistência a desgaste. Usado para torneamento contínuo em alta velocidade em ferro fundido cinzento, incluindo escama de fundição. Para ser usado em usinabilidade de ferro fundido variada. beyond	K	■	■	■						
	KYK25	—	**Composição:** Revestimento de CVD de alumina sobre um substrato de cerâmica de nitreto de silício puro. **Aplicação:** Excelente combinação de dureza e resistência a desgaste da aresta. Utilizado para a usinagem de uso geral de ferro fundido cinzento, maleável ou nodular. Para ser usado em usinabilidade de ferro fundido variada. beyond	K		■	■	■					
	KY3500	—	**Composição:** Classe com nitreto de silício puro. **Aplicação:** Dureza máxima. Usada com altas taxas de avanço para a usinagem de desbaste de ferros fundidos cinzentos, incluindo a usinagem com cortes interrompidos.	K		■	■	■	■	■			

Usinabilidade de ferro fundido

- Fundidos não envelhecidos são difíceis de usinar e geram menores vidas úteis da ferramenta.
- Baixo teor de enxofre geram menores vidas úteis da ferramenta.
- Alto teor de titânio diminui a vida útil da ferramenta significativamente.
- Alto teor de ferrite leva a alto desgaste químico e a uma vida útil da ferramenta significativamente menor.
- Ferros fundidos de grafite compactado exibem alto desgaste químico.



Aplicação adequada da KB1340™ - formação de uma camada protetora; a vida útil da ferramenta deverá exceder uma distância de percurso de 70 km.

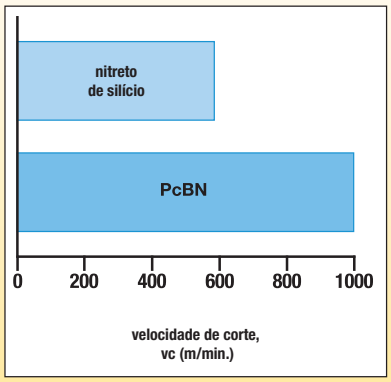


Comparação entre a vida útil de ferramentas de corte com PcBN na usinagem de dois tipos diferentes de ferros fundidos cinzentos, diferindo principalmente no teor de enxofre.

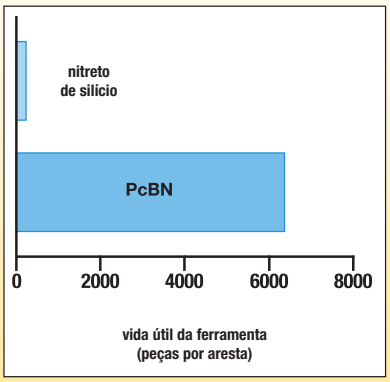
Usinagem de disco de freio de ferro fundido cinzento • Cerâmica x PcBN



(a)



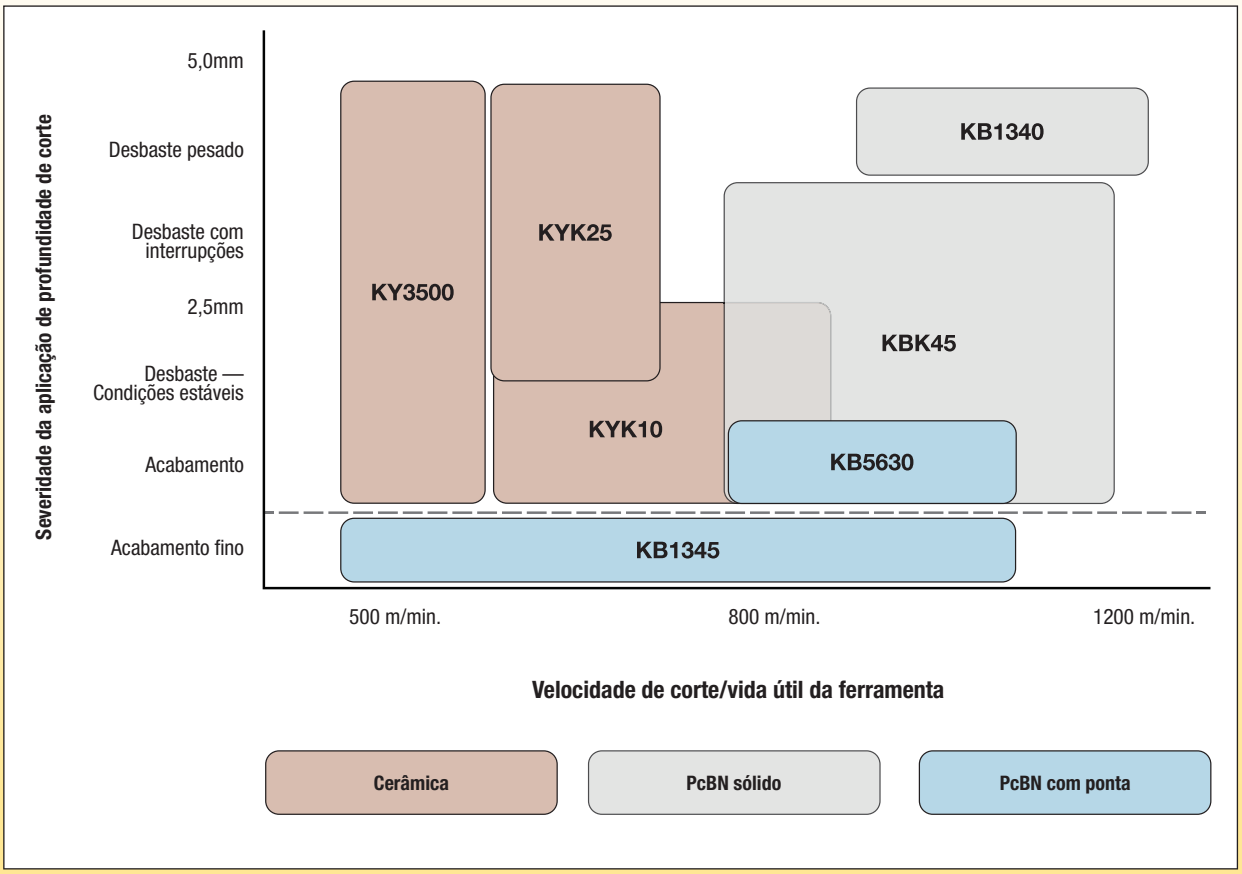
(b)



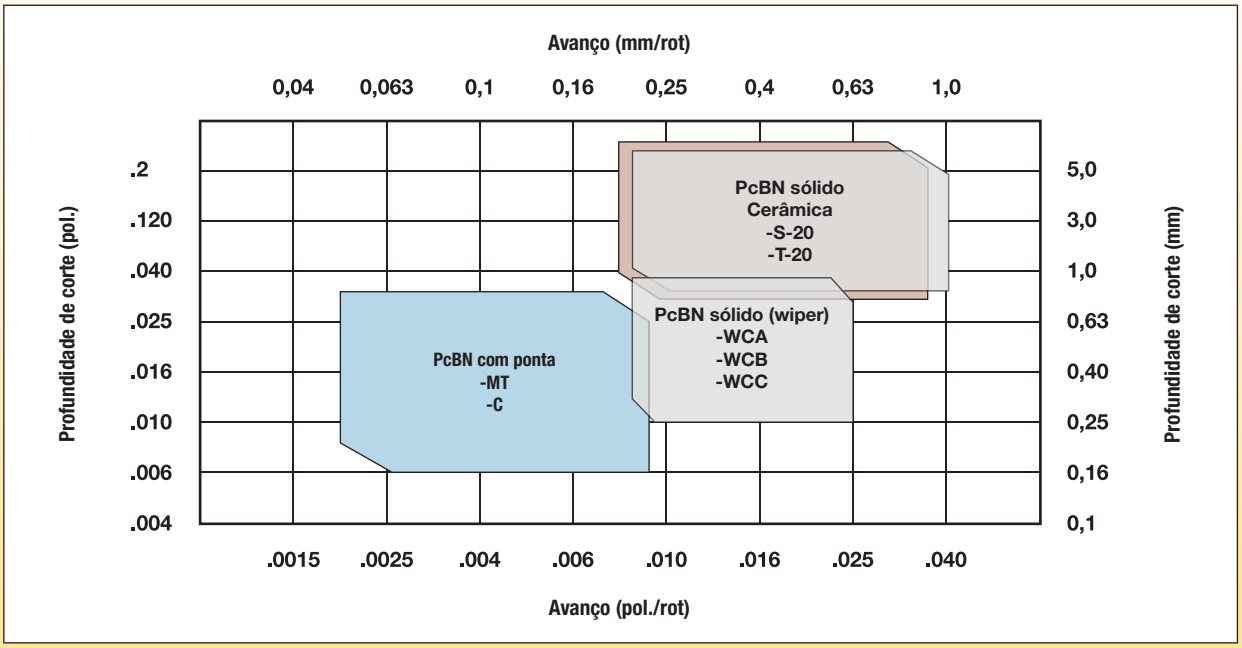
(c)

O PcBN aumenta a produtividade na usinagem de discos de freio de ferro fundido cinzento (a) em termos de velocidade de corte (b) e vida útil da ferramenta (c) em comparação com a cerâmica de nitreto de silício.

Selecione o material de corte



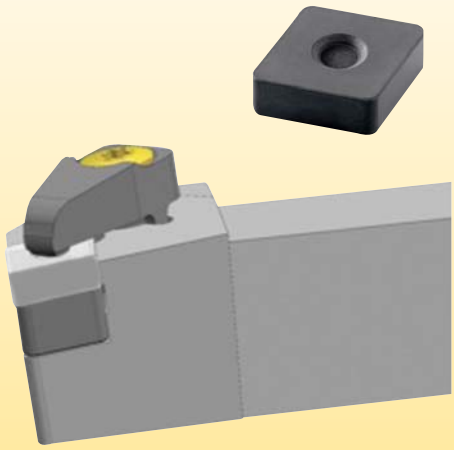
Profundidade de corte



Fixação côncava para estabilidade extra

Aplicação padrão

A contínua pressão para redução de custos força os fabricantes de discos de freio de ferro fundido cinzento a buscarem soluções para reduzi-los. Os insertos de CBN proporcionam alta produtividade e longa vida útil da ferramenta. A Kennametal desenvolveu a classe inteiriça e de alto teor KB1340™, que proporciona uma performance superior na usinagem de componentes de ferro fundido cinzento, tais como discos de freio ou volantes.
Para garantir um encaixe seguro no porta-ferramenta, os insertos estão disponíveis com fixação côncava. Os grampos se adaptam aos suportes da Ceramtec, o que torna a conversão para o ferramental Kennametal mais fácil.



Produtividade e lucratividade superiores

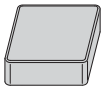
- Garante uma fixação firme e rígida.
- O inserto côncavo com fixação especial oferece maior estabilidade no alojamento.
- Ideal para aplicações em usinagem pesada.
- Grampos revestidos para uma maior resistência contra o desgaste pelo fluxo de cavaco estão disponíveis sob pedido.
- O design côncavo superficial permite o uso dos insertos de 4,76mm (3/16") de espessura, de custo mais baixo.
- O design côncavo redondo trabalha com ferramentas customizadas, onde a direção de fixação deve ser compensada devido à limitação de espaço.

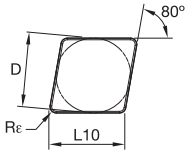
Tabela de seleção de grampo

inserto		grampo	
código do produto	ISO código do produto	código do produto	número para pedido
CNGX433S0415	CNGX120412S01015	551.718–100° Corner	3968904
CNGX433S0415FW	CNGX120412S01015FW	551.718–100° Corner	3968904
CNGX434S0820	CNGX120416S02020	551.718–100° Corner	3968904
CNGF432	CNGF120408	551.718–100° Corner	3968904
DNGX434S0820	DNGX150416S02020	551.720	4094234
SNGX434S0820	SNGX120416S02020	551.718	3968904
SNGX534S0820	SNGX150416S02020	551.718	3968904
VNGX333S0820	VNGX160412S02020	551.721	4094236
TNGX333EFW	TNGX160412EFW	551.733	4094235

Wipers pra usinagem de ferro fundido

WCA
Wiper para usinagem de ferro fundido para uma taxa de avanço de até f = 0.25 mm/rot.
WCB
Wiper para usinagem de ferro fundido para uma taxa de avanço de até f = 0.45 mm/rot.
WCC
Wiper para usinagem de ferro fundido para uma taxa de avanço de até f = 0.65 mm/rot.



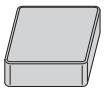


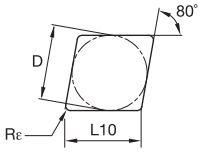
● primeira opção
○ opção alternativa

P		
M		
K	●	●
N		
S		○
H	○	●

CNGN

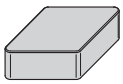
ISO código do produto	D	L10	Rε	KBK45	KB1340
CNGN090408T02020	9,53	9,67	0,8	●	–
CNGN090412S02020	9,53	9,67	1,2	●	–
CNGN120408T02020	12,70	12,90	0,8	●	–
CNGN120412S02020	12,70	12,90	1,2	●	–
CNGN120416S02020	12,70	12,90	1,6	●	–

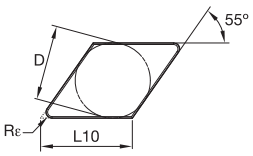




CNMN

ISO código do produto	D	L10	Rε	KBK45	KB1340
CNMN120408S02020	12,70	12,90	0,8	–	●
CNMN120412S02020	12,70	12,90	1,2	–	●

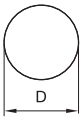




DNGN

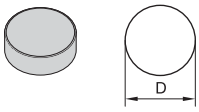
ISO código do produto	D	L10	Rε	KBK45	KB1340
DNGN120408S02020	10,00	12,21	0,8	●	–
DNGN120412S02020	10,00	12,21	1,2	●	–





RNGN

ISO código do produto	D	L10	Rε	KBK45	KB1340
RNGN090400S02020	9,53	–	–	●	–
RNGN120400S02020	12,70	–	–	●	–



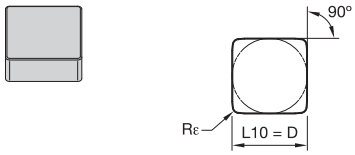
● primeira opção
○ opção alternativa



RNMN

ISO código do produto	D	L10	Rε	KBK45	KB1340
RNMN090300S02020	9,53	–	–	–	●
RNMN120300S02020	12,70	–	–	–	●
RNMN120400S02020	12,70	–	–	–	●

Insertos positivos Kendex™



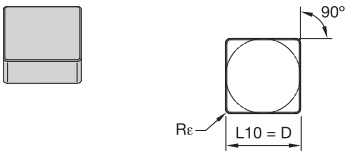
● primeira opção
○ opção alternativa



SNGN

ISO código do produto	D	L10	Rε	KBK45	KB1340
SNGN120408T02020	12,70	12,70	0,8	●	–
SNGN120412S02020	12,70	12,70	1,2	●	–
SNGN120416S02020	12,70	12,70	1,6	●	–

Inserto positivos Kendex com wiper

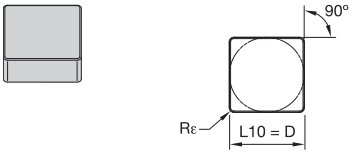


● primeira opção
○ opção alternativa



SNGN-WCB

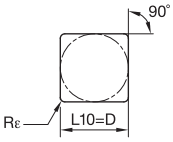
ISO código do produto	D	L10	Rε	KBK45	KB1340
SNGN090408S01015WCB	9,53	9,52	0,8	●	–



SNGN-WCC

ISO código do produto	D	L10	Rε	KBK45	KB1340
SNGN090408S01015WCC	9,53	9,53	0,8	●	–





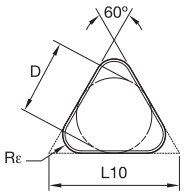
● primeira opção
○ opção alternativa

P			
M			
K		●	●
N			
S			○
H		○	●

SNMN

ISO código do produto	D	L10	Rε	KBK45	KB1340
SNMN090308S02020	9,53	9,53	0,8	–	●
SNMN090316S02020	9,53	9,53	1,6	–	●
SNMN120316S02020	12,70	12,70	1,6	–	●
SNMN120416T02020	12,70	12,70	1,6	–	●

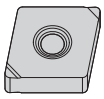


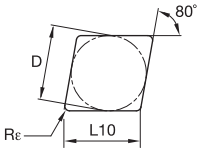


TNGN

ISO código do produto	D	L10	Rε	KBK45	KB1340
TNGN110416S02020	6,35	11,00	1,6	●	–
TNGN160416S02020	9,53	16,50	1,6	●	–

Insertos côncavos negativos Kendex™





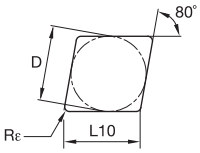
● primeira opção
○ opção alternativa

P			
M			
K		●	●
N			
S			○
H		○	●

CNGF

ISO código do produto	D	L10	Rε	KBK45	KB1340
CNGF120408	12,70	12,90	0,8	–	●



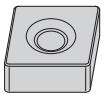


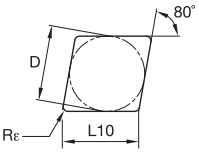
● primeira opção
○ opção alternativa

P			
M			
K	●	●	
N			
S		○	
H	○	●	

CNGX

ISO código do produto	D	L10	Rε	KBK45	KB1340
CNGX120408T02020	12,70	12,90	0,8	●	–
CNGX120412S01015	12,70	12,90	1,2	–	●
CNGX120412S02020	12,70	12,90	1,2	●	–
CNGX120416S02020	12,70	12,90	1,6	●	●

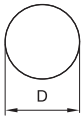




CNGX-FW

ISO código do produto	D	L10	Rε	KBK45	KB1340
CNGX120412S01015FW	12,70	12,90	1,2	–	●

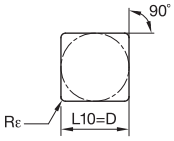




RNGX

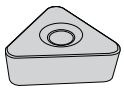
ISO código do produto	D	L10	Rε	KBK45	KB1340
RNGX120400S02020	12,70	–	–	●	–

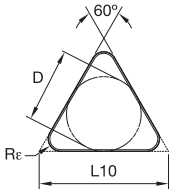




SNGX

ISO código do produto	D	L10	Rε	KBK45	KB1340
SNGX120408T02020	12,70	12,70	0,8	●	–
SNGX120412S02020	12,70	12,70	1,2	●	–
SNGX120416S02020	12,70	12,70	1,6	●	●





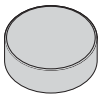
● primeira opção
○ opção alternativa

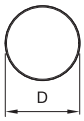
P		
M		
K	●	●
N		
S		○
H	○	●

TNGX

ISO código do produto	D	L10	Rε	KBK45	KB1340
TNGX160416S02020	9,53	16,50	1,6	●	–

Insertos positivos Kendex™





● primeira opção
○ opção alternativa

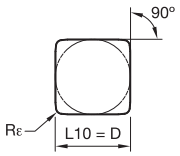
P		
M		
K	●	●
N		
S		○
H	○	●

RCGN

ISO código do produto	D	L10	Rε	KBK45	KB1340
RCGN090400T01015	9,53	–	–	●	–

Insertos negativos Kendex com wiper





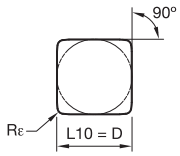
● primeira opção
○ opção alternativa

P		
M		
K	●	●
N		
S		○
H	○	●

SCGN-WCB

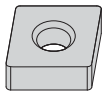
ISO código do produto	D	L10	Rε	KBK45	KB1340
SCGN090408S01015WCB	9,53	9,52	0,8	●	–

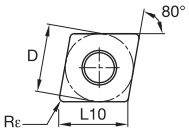




SCGN-WCC

ISO código do produto	D	L10	Rε	KBK45	KB1340
SCGN090408S01015WCC	9,53	9,52	0,8	●	–





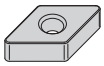
● primeira opção
○ opção alternativa

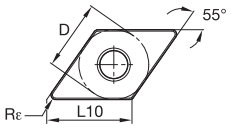
P	
M	
K	●
N	
S	
H	○

CNMA

ISO código do produto	D	L10	Rε	KBK45	KB1340
CNMA120408S02020	12,70	12,90	0,8	–	●
CNMA120412S02020	12,70	12,90	1,2	–	●

NOTA: Para suportes e barras internas, consulte páginas B58–B73.



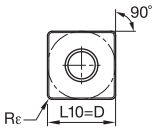


DNMA

ISO código do produto	D	L10	Rε	KBK45	KB1340
DNMA110408S02020	9,53	11,63	0,8	–	●
DNMA110412S02020	9,53	11,63	1,2	–	●

NOTA: Para suportes e barras internas, consulte páginas B85–B93.





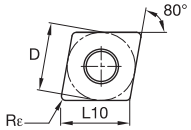
SNMA

ISO código do produto	D	L10	Rε	KBK45	KB1340
SNMA120412S02020	12,70	12,70	1,2	–	●

NOTA: Para suportes e barras internas, consulte páginas B105–B121.

Insertos de material avançado • Materiais para torneamento duroInsertos Kenloc™





● primeira opção
○ opção alternativa

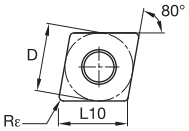
P	
M	
K	●
N	
S	○
H	●

CNGA-FWMT

ISO código do produto	D	L10	Rε	KB1345	KB5630
CNGA120404S01025FWMT	12,70	12,90	0,4	–	●
CNGA120408S01025FWMT	12,70	12,90	0,8	–	●

NOTA: Para suportes e barras internas, consulte páginas B58–B73.





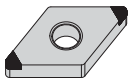
● primeira opção
○ opção alternativa

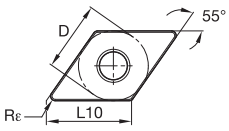
P			
M			
K	●	●	
N			
S	○	●	
H	●	●	

CNGA-MT

ISO código do produto	D	L10	Rε	KB1345	KB5630
CNGA120404S01025MT	12,70	12,90	0,4	–	●
CNGA120408S01020MT	12,70	12,90	0,8	●	–
CNGA120408S01025MT	12,70	12,90	0,8	–	●
CNGA120408S02020MT	12,70	12,90	0,8	●	–
CNGA120412S01020MT	12,70	12,90	1,2	–	●
CNGA120412S01025MT	12,70	12,90	1,2	–	●

NOTA: Para suportes e barras internas, consulte páginas B58–B73.





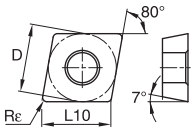
DNGA-MT

ISO código do produto	D	L10	Rε	KB1345	KB5630
DNGA150404S01025MT	12,70	15,50	0,4	–	●
DNGA150408S01020MT	12,70	15,50	0,8	●	–
DNGA150408S01025MT	12,70	15,50	0,8	–	●

NOTA: Para suportes e barras internas, consulte páginas B85–B93.

Insertos de material avançado • Materiais para torneamento duro





● primeira opção
○ opção alternativa

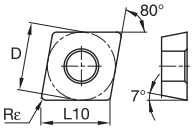
P			
M			
K	●	●	
N			
S	○	●	
H	●	●	

CCGW-C

ISO código do produto	D	L10	Rε	KB1345	KB5630
CCGW060202S01015C	6,35	6,45	0,2	–	●
CCGW060204S01015C	6,35	6,45	0,4	–	●
CCGW09T308EC	9,53	9,67	0,8	●	–

NOTA: Para suportes e barras internas, consulte páginas B179–B183.





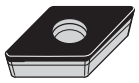
● primeira opção
○ opção alternativa

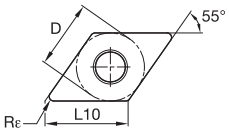
P		
M		
K	●	●
N		
S	○	●
H	●	●

CCGW-MT

ISO código do produto	D	L10	Rε	KB1345	KB5630
CCGW09T304S01015MT	9,53	9,67	0,4	–	●
CCGW09T308S01015MT	9,53	9,67	0,8	–	●

NOTA: Para suportes e barras internas, consulte páginas B179–B183.



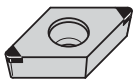


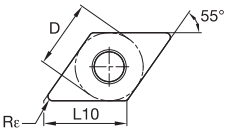
DCGW-C

ISO código do produto	D	L10	Rε	KB1345	KB5630
DCGW070202S01015C	6,35	7,75	0,2	–	●
DCGW070204S01015C	6,35	7,75	0,4	–	●

NOTA: Para suportes e barras internas, consulte páginas B209–B213.

Insertos PcBN com ponta • Pastilhas fixadas com parafuso





● primeira opção
○ opção alternativa

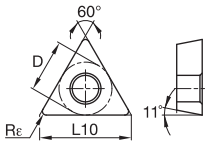
P		
M		
K	●	●
N		
S	○	●
H	●	●

DCGW-MT

ISO código do produto	D	L10	Rε	KB1345	KB5630
DCGW11T304S01015MT	9,53	11,63	0,4	●	●
DCGW11T308S01015MT	9,53	11,63	0,8	●	●

NOTA: Para suportes e barras internas, consulte páginas B209–B213.

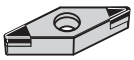


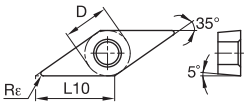


TPGW-C

ISO código do produto	D	L10	Rε	KB1345	KB5630
TPGW110204EC	6,35	11,00	0,4	●	–
TPGW110208S01015C	6,35	11,00	0,8	–	●

NOTA: Para suportes e barras internas, consulte páginas B257–B263.





● primeira opção
○ opção alternativa

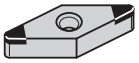
P			
M			
K		●	●
N			
S		○	●
H		●	●

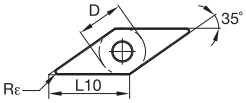
VBGW-MT

ISO código do produto	D	L10	Rε	KB1345	KB5630
VBGW160404S01015MT	9,53	16,61	0,4	–	●
VBGW160408S01015MT	9,53	16,61	0,8	–	●

NOTA: Para suportes e barras internas, consulte páginas B266–B269.

Insertos Kenloc™





● primeira opção
○ opção alternativa

P			
M			
K		●	●
N			
S		○	●
H		●	●

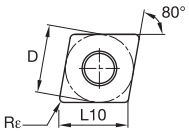
VNGA-MT

ISO código do produto	D	L10	Rε	KB1345	KB5630
VNGA160404S01025MT	9,53	16,61	0,4	–	●
VNGA160408S01025MT	9,53	16,61	0,8	–	●

NOTA: Para suportes e barras internas, consulte páginas B149–B153.

Insertos de cerâmica ISO • Insertos Kenloc™





● primeira opção
○ opção alternativa

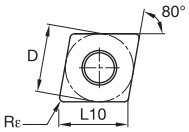
P			
M			
K		●	●
N			
S			
H			

CNGA

ISO código do produto	D	L10	Rε	KYK25	KYK10	KY3500
CNGA120408T02020	12,70	12,90	0,8	●	●	●
CNGA120412T02020	12,70	12,90	1,2	●	●	●
CNGA120416T02020	12,70	12,90	1,6	●	●	●
CNGA160612T02020	15,88	16,12	1,2	●	–	●
CNGA160616T02020	15,88	16,12	1,6	–	–	●
CNGA190612T02020	19,05	19,34	1,2	–	–	●
CNGA190616T02020	19,05	19,34	1,6	●	–	●

NOTA: Para suportes e barras internas, consulte páginas B58–B73.





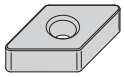
● primeira opção
○ opção alternativa

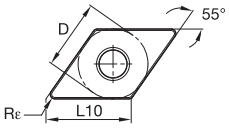
P			
M			
K	●	●	●
N			
S			
H			

CNGA-FW

ISO código do produto	D	L10	Rε	KYK25	KYK10	KY3500
CNGA120408T01020FW	12,70	12,90	0,8	●	–	●
CNGA120412T01020FW	12,70	12,90	1,2	●	●	●
CNGA120412T02020FW	12,70	12,90	1,2	–	●	–
CNGA120416T01020FW	12,70	12,90	1,6	–	–	●

NOTA: Para suportes e barras internas, consulte páginas B58–B73.



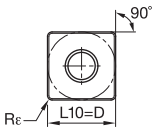


DNGA

ISO código do produto	D	L10	Rε	KYK25	KYK10	KY3500
DNGA150408T02020	12,70	15,50	0,8	–	–	●
DNGA150412T02020	12,70	15,50	1,2	–	–	●
DNGA150416T02020	12,70	15,50	1,6	●	●	●
DNGA150608T02020	12,70	15,50	0,8	–	–	●
DNGA150612T02020	12,70	15,50	1,2	–	–	●

NOTA: Para suportes e barras internas, consulte páginas B85–B93.

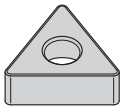


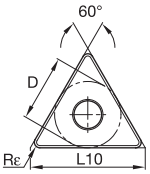


SNGA

ISO código do produto	D	L10	Rε	KYK25	KYK10	KY3500
SNGA120408T02020	12,70	12,70	0,8	●	●	●
SNGA120412T02020	12,70	12,70	1,2	●	–	●
SNGA120416T02020	12,70	12,70	1,6	–	–	●
SNGA150612T02020	15,88	15,88	1,2	–	–	●
SNGA150612T02020	15,88	15,88	1,2	●	–	–
SNGA150616T02020	15,88	15,88	1,6	–	–	●
SNGA190612T02020	19,05	19,05	1,2	–	–	●

NOTA: Para suportes e barras internas, consulte páginas B105–B121.





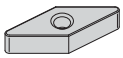
● primeira opção
○ opção alternativa

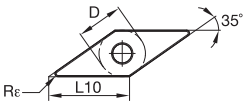
P				
M				
K	●	●	●	
N				
S				
H				

TNGA

ISO código do produto	D	L10	Rε	KYK25	KYK10	KY3500
TNGA160408T02020	9,53	16,50	0,8	–	●	●
TNGA160412T02020	9,53	16,50	1,2	–	–	●
TNGA160416T02020	9,53	16,50	1,6	–	–	●

NOTA: Para suportes e barras internas, consulte páginas B132–B142.

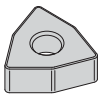


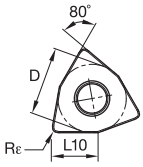


VNGA

ISO código do produto	D	L10	Rε	KYK25	KYK10	KY3500
VNGA160408T02020	9,53	16,61	0,8	–	–	●
VNGA220408T02020	12,70	22,14	0,8	●	–	–

NOTA: Para suportes e barras internas, consulte páginas B149–B153.

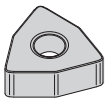


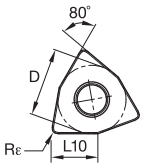


WNGA

ISO código do produto	D	L10	Rε	KYK25	KYK10	KY3500
WNGA080408T02020	12,70	8,69	0,8	●	–	●
WNGA080412T02020	12,70	8,69	1,2	●	–	●
WNGA080416T02020	12,70	8,69	1,6	–	–	●

NOTA: Para suportes e barras internas, consulte páginas B161–B165.



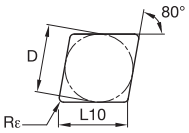


WNGA-FW

ISO código do produto	D	L10	Rε	KYK25	KYK10	KY3500
WNGA080408T01020FW	12,70	8,69	0,8	–	–	●

NOTA: Para suportes e barras internas, consulte páginas B161–B16.



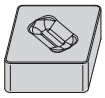


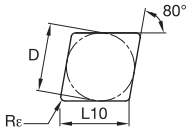
● primeira opção
○ opção alternativa

P				
M				
K	●	●	●	
N				
S				
H				

CNGN

ISO código do produto	D	L10	Rε	KYK25	KYK10	KY3500
CNGN120408T02020	12,70	12,90	0,8	–	–	●
CNGN120412T02020	12,70	12,90	1,2	–	–	●
CNGN120416T02020	12,70	12,90	1,6	–	–	●
CNGN120712T02020	12,70	12,90	1,2	–	–	●
CNGN120716T02020	12,70	12,90	1,6	–	●	–

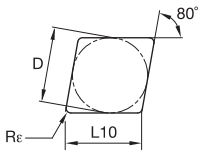




CNGX-FW

ISO código do produto	D	L10	Rε	KYK25	KYK10	KY3500
CNGX120708T01020FW	12,70	12,90	0,8	–	–	●
CNGX120712T01020FW	12,70	12,90	1,2	–	–	●
CNGX120716T01020FW	12,70	12,90	1,6	–	–	●



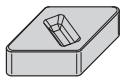


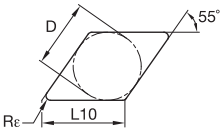
CNMX

ISO código do produto	D	L10	Rε	KYK25	KYK10	KY3500
CNMX120708T02020	12,70	12,90	0,8	–	–	●
CNMX120712T02020	12,70	12,90	1,2	–	–	●
CNMX120716T02020	12,70	12,90	1,6	–	–	●

● primeira opção
○ opção alternativa

P			
M			
K	●	●	●
N			
S			
H			

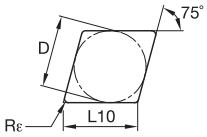




DNGX

ISO código do produto	D	L10	Rε	KYK25	KYK10	KY3500
DNGX120708T02020	10,00	12,21	0,8	–	–	●
DNGX120712T02020	10,00	12,21	1,2	●	–	●
DNGX120716T02020	10,00	12,21	1,6	–	–	●
DNGX150708T02020	12,70	15,50	0,8	–	–	●
DNGX150712T02020	12,70	15,50	1,2	●	–	●
DNGX150716T02020	12,70	15,50	1,6	–	–	●

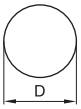




ENGX

ISO código do produto	D	L10	Rε	KYK25	KYK10	KY3500
ENGX130716T02020	12,70	13,15	1,6	–	–	●

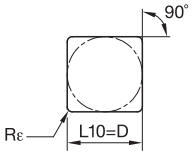




RNGN

ISO código do produto	D	L10	Rε	KYK25	KYK10	KY3500
RNGN120400T02020	12,70	–	–	–	●	●
RNGN120700T02020	12,70	–	–	–	–	●
RNGN190700T02020	19,05	–	–	–	–	●





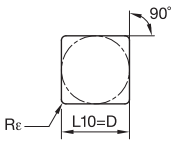
● primeira opção
○ opção alternativa

P	
M	
K	● ● ●
N	
S	
H	

SNGN

ISO código do produto	D	L10	Rε	KYK25	KYK10	KY3500
SNGN090308T02020	9,53	9,53	0,8	–	–	●
SNGN120408T02020	12,70	12,70	0,8	●	–	●
SNGN120412T02020	12,70	12,70	1,2	●	–	●
SNGN120416T02020	12,70	12,70	1,6	–	–	●
SNGN120432T02020	12,70	12,70	3,2	–	–	●
SNGN120712T02020	12,70	12,70	1,2	●	–	–
SNGN120716T02020	12,70	12,70	1,6	–	–	●
SNGN190416T02020	19,05	19,05	1,6	–	–	●

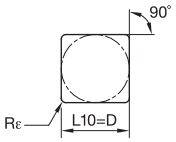




SNGX

ISO código do produto	D	L10	Rε	KYK25	KYK10	KY3500
SNGX120712T02020	12,70	12,70	1,2	●	●	●
SNGX120716T02020	12,70	12,70	1,6	●	●	●
SNGX150716T02020	15,88	15,88	1,6	–	–	●
SNGX150724T02020	15,88	15,88	2,4	–	–	●



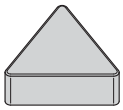


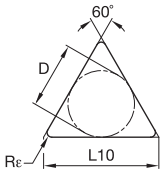
● primeira opção
○ opção alternativa

P				
M				
K	●	●	●	
N				
S				
H				

SNMX

ISO código do produto	D	L10	Rε	KYK25	KYK10	KY3500
SNMX120712T02020	12,70	12,70	1,2	–	–	●
SNMX120716T02020	12,70	12,70	1,6	–	–	●
SNMX150716T02020	15,88	15,88	1,6	–	–	●

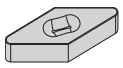


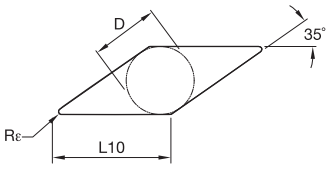


TNGN

ISO código do produto	D	L10	Rε	KYK25	KYK10	KY3500
TNGN160408T02020	9,53	16,50	0,8	–	–	●
TNGN220416T02020	12,70	22,00	1,6	–	–	●

Insertos côncavos negativos Kendex™





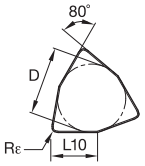
● primeira opção
○ opção alternativa

P				
M				
K	●	●	●	
N				
S				
H				

VNGX

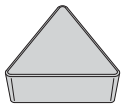
ISO código do produto	D	L10	Rε	KYK25	KYK10	KY3500
VNGX160712T02020	9,52	16,61	1,2	–	–	●
VNGX160716T02020	9,53	16,61	1,6	–	–	●

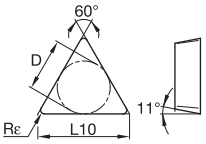




WNGX

ISO código do produto	D	L10	Rε	KYK25	KYK10	KY3500
WNGX080712T02020	12,70	8,69	1,2	–	●	●



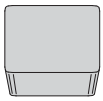


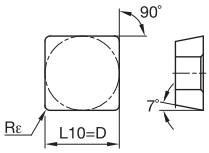
● primeira opção
○ opção alternativa

P				
M				
K	●	●	●	
N				
S				
H				

TPGN

ISO código do produto	D	L10	Rε	KYK25	KYK10	KY3500
TPGN160308T02020	9,53	16,50	0,8	–	–	●
TPGN160312T02020	9,53	16,50	1,2	–	●	●
TPGN220408T02020	12,70	22,00	0,8	–	–	●
TPGN220412T02020	12,70	22,00	1,2	–	–	●



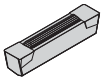


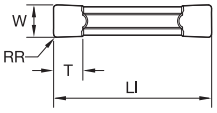
SCGN-FW

ISO código do produto	D	L10	Rε	KYK25	KYK10	KY3500
SCGN090408EFW	9,53	9,53	0,8	–	–	●

Tabela de seleção de grampo

número para pedido	código do produto	grampo	
3960807	CNGX120412S01015	551.718–100° Corner	551.716–80° Corner
3960808	CNGX120412S01015FW	551.718–100° Corner	551.716–80° Corner
3960806	CNGX120416S02020	551.718–100° Corner	551.716–80° Corner
3960811	DNGX150416S02020	551.720	551.720
3960812	SNGX120416S02020	551.718	551.718
3960823	SNGX150416S02020	551.718	551.718
3876843	CNGF120408	551.718–100° Corner	551.716–80° Corner
3960825	TNGX160412EFW	551.733	551.733





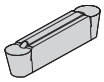
● primeira opção
○ opção alternativa

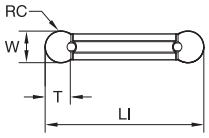
P		
M		
K		●
N		
S		
H		

A4G-P-T

ISO código do produto	tamanho do inserto	W	RR	LI	T	KY3500
A4G0300M03P04T01025	3	3,00	0,4	20	3,4	●
A4G125I03P1T0425	3	3,18	0,4	20	3,4	●
A4G0400M04P04T01025	4	4,00	0,4	20	3,4	●
A4G0500M05P08T01025	5	5,00	0,8	25	4,2	●
A4G0600M06P08T01025	6	6,00	0,8	30	4,8	●
A4G250I06P2T0425	6	6,35	0,8	30	4,9	●
A4G0800M08P08T01025	8	8,00	0,8	30	6,4	●

NOTA: Para suportes, barras internas e lâminas A4, consulte páginas C104–C135.





A4R-P-T

ISO código do produto	tamanho do inserto	W	RC	LI	T	KY3500
A4R0300M03P00T01025	3	3,00	1,5	20	2,4	●
A4R0500M05P00T01025	5	5,00	2,5	25	4,1	●
A4R0600M06P00T01025	6	6,00	3,0	30	4,3	●
A4R250I06P00T0425	6	6,35	3,2	30	4,8	●
A4R0800M08P00T01025	8	8,00	4,0	30	6,4	●

NOTA: Para suportes, barras internas e lâminas A4, consulte páginas C104–C135.

A Kennametal na internet

kennametal.com

ENCONTRE AS ÚLTIMAS INFORMAÇÕES SOBRE OS PRODUTOS

Se a sua atividade é torneamento, fresamento ou holemaking, as marcas da Kennametal são as ferramentas de alta performance que você precisa. Oferecemos soluções padrão e customizadas para uma ampla gama de aplicações.

Encontre informações sobre as nossas mais recentes campanhas e catálogos.

Registre-se no Konnect para obter as funcionalidades completas do site de pedidos on-line da Kennametal.



ENTRE EM CONTATO CONOSCO

Nossos clientes são importantes para nós. Nós queremos proporcionar a você o melhor atendimento ao cliente do setor. Se você tiver um comentário ou uma pergunta, envie para nós. Faremos o possível para responder a todas as consultas dentro de 24 horas.

ENCONTRE UM DISTRIBUIDOR AUTORIZADO LOCAL EM SUA ÁREA

A Kennametal oferece produtos e serviços de classe mundial em todo o mundo. Nossos distribuidores nos conhecem e, mais importante, eles conhecem você. Eles sabem melhor que qualquer pessoa no setor como fazer a potência global da Kennametal trabalhar para você — na sua indústria, na sua região e para seus negócios.

Torneamento duro

Insertos com alto e baixo teor de PcBN

A atenção do ambiente global de usinagem de metais atual está voltada para a alta produtividade e para a redução de custos resultantes das ferramentas de corte. Esta demanda leva ao rápido crescimento e à implementação das ferramentas de corte usando materiais superduros. Como o nome indica (Torneamento duro), esses materiais têm uma vantagem significativa em dureza em relação aos aços-ferramenta convencionais. Para o usuário final, isto se traduz em produtividade aumentada (maiores velocidades de corte, maior vida útil da ferramenta, etc.), menor custo ferramental por peça e a habilidade de processar materiais que não eram anteriormente usináveis com as ferramentas convencionais.

A Kennametal está na vanguarda no desenvolvimento e implementação de materiais superduros em suas soluções de ferramentas padrão e especiais em todas as linhas de produtos. Nossa abordagem às ferramentas superduras tem início com as necessidades e dificuldades dos clientes. Desse modo, desenvolvemos as melhores soluções de dureza para as necessidades específicas dos clientes.



O PcBN é termicamente estável até aproximadamente 1.200° C e tem alta resistência ao ataque químico. Consequentemente, temperaturas muito elevadas, tais como as que ocorrem durante a usinagem de metais ferrosos endurecidos, não apresentam dificuldades e podem ser usadas para facilitar cortes quentes autoinduzidos. Isto promove benefícios técnicos e de produtividade, especialmente quando comparado à retificação. Na maioria dos casos, a performance é significativamente melhorada do que aquela obtida com aços-ferramenta convencionais, como metal duro de tungstênio e cerâmica.

Porém, existem limitações para o PcBN na usinagem de aços austeníticos e ferros fundidos ferríticos, a qual pode causar desgaste aumentado da aresta de PcBN.

Insertos PcBN

Classe KBH10™

Alto volume

- Uma nova classe patenteada com baixo teor de PcBN para operações de torneamento contínuo.
- Excelente desempenho na usinagem de aços endurecidos com baixo teor de inclusão de metal duro.
- Disponível em insertos com ponta PcBN soldado e sólido.

Classe KBH20™

Produtividade e lucratividade superiores



- Substrato recentemente desenvolvido que permite a aplicação em uma ampla gama de operações difíceis.
- Revestimento nano-compósito que aumenta a capacidade de velocidade e a vida útil da ferramenta. Tecnologia de preparação de aresta melhorada proporcionando maior vida útil da ferramenta, performance confiável, melhor acabamento superficial e tolerâncias precisas da peça.
- Amplo portfólio padrão.
- Quebra-cavacos CB1 com geometrias positiva e negativa, resolvendo os problemas da quebra e do controle do cavaco.

Classe KB5630™

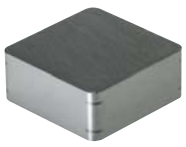


- Melhor aplicação em condições de corte severas e interrupções pesadas.
- Excelente resistência à abrasão.
- O revestimento em PVD fornece uma barreira térmica para reduzir o desgaste por craterização e aumenta a vida útil da ferramenta.
- Performance excelente na usinagem de aços endurecidos e metais sinterizados.
- Disponível em insertos com ponta e com face total de PcBN.

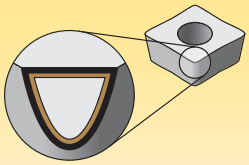
Insertos de cerâmica

Classe KY1615

Baixo volume e variações maiores de processo



- Cerâmica mista (preta).
- Excelente resistência a desgaste, combinada com as ótimas propriedades de dureza.
- Performance excelente no acabamento e semiacabamento de aços endurecidos e materiais baseados em ferro.



Os revestimentos proporcionam capacidade de alta velocidade e são projetados para acabamento e desbaste leve.

P	Aço
M	Aço inoxidável
K	Ferro fundido
N	Materiais não ferrosos
S	Ligas resistentes a altas temperaturas
H	Materiais endurecidos

resistência ao desgaste ⟷ tenacidade

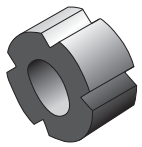
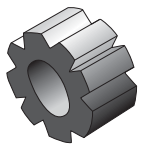
PcBN — Classes de nitreto cúbico de boro policristalino

Revestimento	Descrição da classe	05	10	15	20	25	30	35	40	45
KBH20 —	**Composição:** Classe com baixo teor de PcBN com revestimento PVD de TiN/AlTiN, proporcionando mais resistência a desgaste. **Aplicação:** A KBH20™ é a classe ideal para o torneamento duro com PcBN nas aplicações de corte contínuo ou ligeiramente interrompido. A estrutura e também as diferentes preparações de aresta permitem tolerâncias da peça repetidas, excelente acabamentos superficiais e integridade de superfície. As aplicações típicas são componentes em aço cementados, tais como as engrenagens, eixos e outros componentes do sistema de transmissão.									
KBH10 —	**Composição:** Uma classe com baixo teor de PcBN com uma estrutura ligante patenteada. **Aplicação:** Projetada para usinagem precisa de aços endurecidos (>45 HRc). Pode ser efetivamente aplicada em aço rolamento, aço ferramenta para trabalho frio e quente, aço rápido, aço para matriz, aço cementado, ferro nitretado e cementado, e algumas coberturas duras. Disponível em formato multi-tip com uma grande faixa de preparações de aresta, estilos de inserto e geometrias alisadoras.									
KB5630 —	**Composição:** Classe com alto teor de PcBN com um revestimento PVD de AlTiN, proporcionando mais resistência a desgaste. **Aplicação:** Elaborado para desbaste a acabamento em aços endurecidos (>45 HRC), materiais das peças abrasivas, como materiais sinterizados de sede de válvula, aços de metalurgia do pó e ferros fundidos com liga alta endurecidos. O revestimento PVD oferece resistência a desgaste por craterização e maior resistência a cavacos. Uma ampla gama de estilos está disponível, incluindo geometrias Screw-On, que são ideais para aplicações de mandrilamento.									

Classes de cerâmica

Revestimento	Descrição da classe	05	10	15	20	25	30	35	40	45
KY1615 —	**Composição:** Uma classe avançada de cerâmica preta de alumina/TiC. **Aplicação:** Ótima combinação de dureza e resistência a desgaste; usado para aços de ligas de usinagem, aços ferramenta, e aços inoxidáveis até 60 HRC (653 HB). Também é aplicado em torneamento de acabamento e mandrilamento de ferro fundido.									

Informações sobre testes de ferramentas

	Classe	Afiado	Aresta de Corte Fina Métrico Polegada	Aresta de Corte Standard Métrico Polegada	Aresta de Corte Reforçada Métrico Polegada
	KBH10*	E	10 25 04 15	12 25 05 25	personalizado
	KBH20*	personalizado	10 15 04 15	12 25 05 25	17 35 07 35
	KB5630***	personalizado	personalizado	10 25 04 25	17 35 07 35

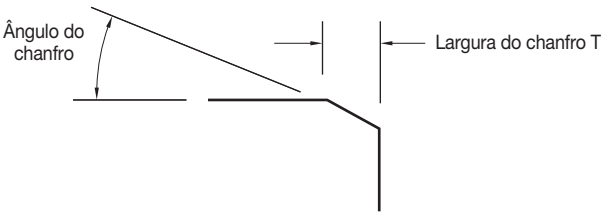
- ✗ Desgaste por craterização
- ✔ Lascamento
- ✔ Quebras
- ✔ Estabilidade

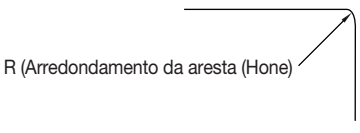
- ✔ Desgaste por craterização
- ✗ Lascamento
- ✔ Quebras
- ✗ Estabilidade

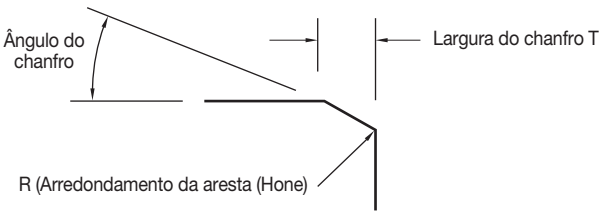
NOTA: Insertos KBH20™ com 1225 (0525 em polegadas) são os insertos de escolha para os testes iniciais.
Para o ajuste fino, permaneça na mesma classe, mas use arestas mais afiadas em cortes leves ou arestas mais grossas, se necessário, para superar interrupções e variações.
Se o KBH20 estiver falhando, mude a classe para uma –resistência maior ao desgaste ou –resistência à fratura.
* Dureza mínima
** Dureza média
*** Dureza máxima

E = Arredondamento da aresta (Hone)
T = Chanfro T com ângulo
S = Chanfro T com ângulo e Arredondamento da aresta (Hone)

Exemplo: S01015 é uma área T de 100 µm a 15 graus com arredondamento de aresta.







Etapa 1 • Escolha a geometria do inserto

Insertos Wiper negativos



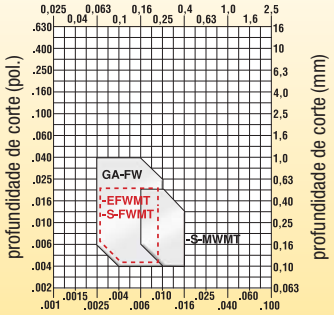
-S..MWMT (multipontas)
Wiper médio

..MS (multipontas)
Wiper de acabamento



-S..FWMT (multipontas)
Wiper de acabamento

taxas de avanço (mm/rot)



Insertos Wiper positivos

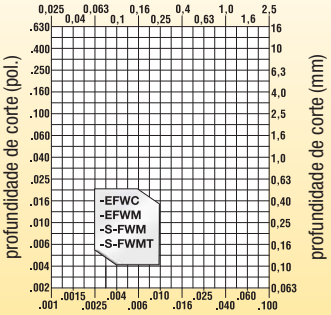


-EFWC (face completa)
-EFWM (ponta simples)
Wiper de acabamento



-S..FWM (ponta única)
-S..FWMT (multipontas)
Wiper de acabamento fino

taxas de avanço (mm/rot)



Etapa 2 • Escolha a classe

condições de corte		Geometria do inserto negativa -S..FWMT	Geometria do inserto negativa -EFWMT	Geometria do inserto positiva -S..FWMT	Geometria do inserto positiva -S..FWM -S..FWMT	Geometria do inserto positiva -EFWM -EFWC
corte altamente interrompido		KB5630	KB1625	–	–	–
corte ligeiramente interrompido		KB5630/KBH20	KB5625	KBH20	KBH20	KBH20
profundidade de corte, fundição ou superfície de forja variável		KBH20	KB1610/KBH10	KBH20	KBH20	KBH20
corte liso, superfície pré-torneada		KBH10	KBH10	KBH10	KBH10	KBH10

Etapa 1 • Escolha a geometria do inserto

Insertos Wiper negativos



-S-20
Usinagem média



-S..ST (ponta simples)
-S..MT (multipontas)
Acabamento

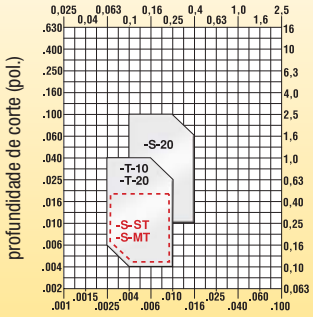


-T..10
-T.20



-T..10
-T.20
Acabamento fino

taxas de avanço (mm/rot)



Insertos Wiper positivos



-T-15
Usinagem média



-EC (face completa)
-EM (ponta simples)
-EMT (multipontas)
Acabamento

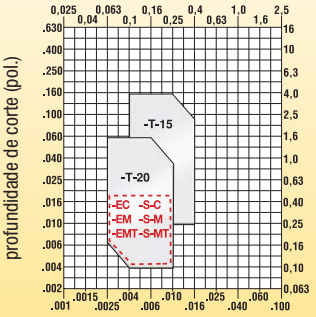


-T-20



-S....C (face completa)
-S....M (ponta única)
-S....MT (multipontas)
Acabamento fino

taxas de avanço (mm/rot)



Etapa 2 • Escolha a classe

condições de corte		Geometria do inserto negativa -T.10 -T.20	Geometria do inserto positiva -T-15
corte altamente interrompido		–	–
corte ligeiramente interrompido		–	KY1615
profundidade de corte, fundição ou superfície de forja variável		KY1615	KY1615
corte liso, superfície pré-torneada		KY1615	KY1615

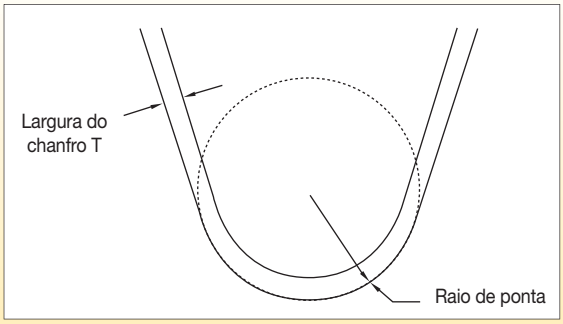
Etapa 1 • Escolha a velocidade de corte

grupo de materiais	classe	velocidade — m/min. (SFM) 15 (50)	45 (150)	75 (250)	110 (350)	140 (450)	170 (550)	200 (650)	230 (750)	260 (850)	Condições iniciais m/min	SFM
H1	KBH20				◁▷						155	510
	KB5610					◁▷					150	490
	KB5630				◁▷						105	345
	KY1615				◁▷						100	325

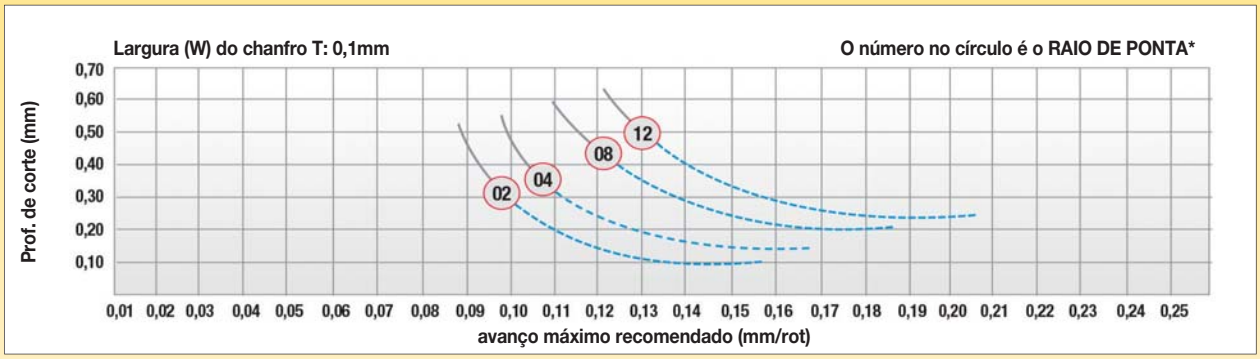
Largura do chanfro T

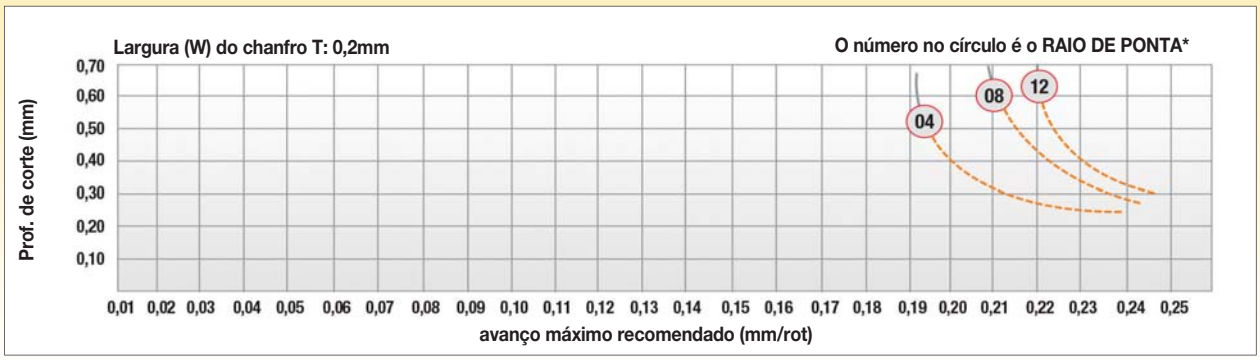
Exemplo 1: Se o avanço, a profundidade de corte e o raio de ponta estiverem definidos, use estes valores para verificar qual largura do chanfro T deverá ser usada.

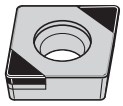
Exemplo 2: Se você deseja usar uma largura do chanfro T ou aresta com hone específico, use a tabela abaixo para verificar quais avanços e profundidades de corte máximos são recomendados para os diferentes raios de ponta.

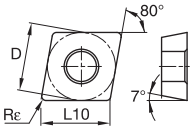












● primeira opção
○ opção alternativa

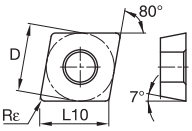
P			●	
M				
K			●	
N				
S			●	
H	●	●	●	●

CCGM

ISO código do produto	D	L10	Rε	KBH10	KBH20	KB5630	KY1615
CCGM09T304S01325MTCB1	9,53	9,67	0,4	–	●	–	–
CCGM09T308S01325MTCB1	9,53	9,67	0,8	–	●	–	–

NOTA: Para suportes e barras internas, consulte páginas B179–B183.

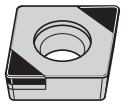


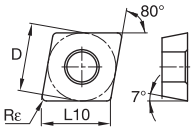


CCGW-C

ISO código do produto	D	L10	Rε	KBH10	KBH20	KB5630	KY1615
CCGW060202S01015C	6,35	6,45	0,2	–	–	●	–
CCGW060204S01015C	6,35	6,45	0,4	–	–	●	–

NOTA: Para suportes e barras internas, consulte páginas B179–B183.

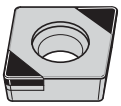


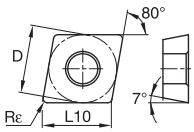


CCGW-FWMT

ISO código do produto	D	L10	Rε	KBH10	KBH20	KB5630	KY1615
CCGW09T304S01015FWMT	9,53	9,67	0,4	–	●	–	–
CCGW09T308S01015FWMT	9,53	9,67	0,8	●	●	–	–

NOTA: Para suportes e barras internas, consulte páginas B179–B183.

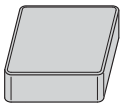


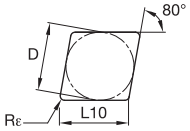


CCGW-MT

ISO código do produto	D	L10	Rε	KBH10	KBH20	KB5630	KY1615
CCGW060202S01015MT	6,35	6,45	0,2	●	–	–	–
CCGW060202S01225MT	6,35	6,45	0,2	–	●	–	–
CCGW060204S01015MT	6,35	6,45	0,4	●	–	–	–
CCGW060204S01225MT	6,35	6,45	0,4	–	●	–	–
CCGW09T302S01015MT	9,53	9,67	0,2	●	–	–	–
CCGW09T302S01225MT	9,53	9,67	0,2	–	●	–	–
CCGW09T304S01015MT	9,53	9,67	0,4	●	●	●	–
CCGW09T304S01225MT	9,53	9,67	0,4	●	●	–	–
CCGW09T308S01015MT	9,53	9,67	0,8	●	●	●	–
CCGW09T308S01225MT	9,53	9,67	0,8	●	●	–	–
CCGW120408S01015MT	12,70	12,90	0,8	–	●	–	–

NOTA: Para suportes e barras internas, consulte páginas B179–B183.



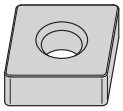


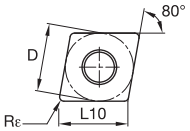
● primeira opção
○ opção alternativa

P				●	
M					
K				●	
N					
S				●	
H		●	●	●	●

CNGN

ISO código do produto	D	L10	Rε	KBH10	KBH20	KB5630	KY1615
CNGN120404T02020	12,70	12,90	0,4	–	–	–	●
CNGN120408T02020	12,70	12,90	0,8	–	–	–	●
CNGN120708T02020	12,70	12,90	0,8	–	–	–	●
CNGN120412T02020	12,70	12,90	1,2	–	–	–	●
CNGN120712T02020	12,70	12,90	1,2	–	–	–	●
CNGN120716T02020	12,70	12,90	1,6	–	–	–	●
CNGN160716T02020	15,88	16,12	1,6	–	–	–	●
CNGN160716T05015	15,88	16,12	1,6	–	–	–	●

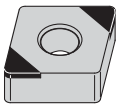


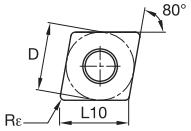


CNGA

ISO código do produto	D	L10	Rε	KBH10	KBH20	KB5630	KY1615
CNGA120404T02020	12,70	12,90	0,4	–	–	–	●
CNGA120408T00520	12,70	12,90	0,8	–	–	–	●
CNGA120408T02020	12,70	12,90	0,8	–	–	–	●
CNGA120412T02020	12,70	12,90	1,2	–	–	–	●
CNGA120416T02020	12,70	12,90	1,6	–	–	–	●
CNGA160612T02020	15,88	16,12	1,2	–	–	–	●
CNGA190612T02020	19,05	19,34	1,2	–	–	–	●
CNGA190616T02020	19,05	19,34	1,6	–	–	–	●

NOTA: Para suportes e barras internas, consulte páginas B58–B73.





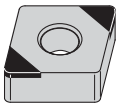
● primeira opção
○ opção alternativa

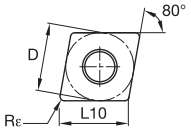
P			●	
M				
K			●	
N				
S			●	
H	●	●	●	●

CNGA-FWMT

ISO código do produto	D	L10	Rε	KBH10	KBH20	KB5630	KY1615
CNGA120404S01015FWMT	12,70	12,90	0,4	●	●	–	–
CNGA120404S01025FWMT	12,70	12,90	0,4	–	–	●	–
CNGA120408S01015FWMT	12,70	12,90	0,8	●	●	–	–
CNGA120408S01025FWMT	12,70	12,90	0,8	–	–	●	–
CNGA120408S01225FWMT	12,70	12,90	0,8	●	–	–	–
CNGA120412S01015FWMT	12,70	12,90	1,2	–	●	–	–
CNGA120412S01225FWMT	12,70	12,90	1,2	●	–	–	–

NOTA: Para suportes e barras internas, consulte páginas B58–B73.

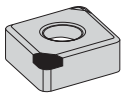


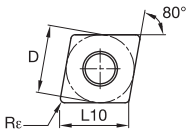


CNGA-MT

ISO código do produto	D	L10	Rε	KBH10	KBH20	KB5630	KY1615
CNGA120404S01015MT	12,70	12,90	0,4	●	●	–	–
CNGA120404S01025MT	12,70	12,90	0,4	–	–	●	–
CNGA120404S01225MT	12,70	12,90	0,4	–	●	–	–
CNGA120404S01735MT	12,70	12,90	0,4	–	●	–	–
CNGA120408S01015MT	12,70	12,90	0,8	●	●	–	–
CNGA120408S01025MT	12,70	12,90	0,8	–	–	●	–
CNGA120408S01225MT	12,70	12,90	0,8	●	●	–	–
CNGA120408S01735MT	12,70	12,90	0,8	●	●	–	–
CNGA120412S01015MT	12,70	12,90	1,2	●	●	–	–
CNGA120412S01020MT	12,70	12,90	1,2	–	–	●	–
CNGA120412S01025MT	12,70	12,90	1,2	–	–	●	–
CNGA120412S01225MT	12,70	12,90	1,2	●	●	–	–
CNGA120412S01735MT	12,70	12,90	1,2	●	●	–	–

NOTA: Para suportes e barras internas, consulte páginas B58–B73.

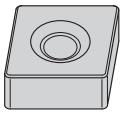


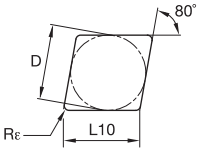


CNGM-CB1

ISO código do produto	D	L10	Rε	KBH10	KBH20	KB5630	KY1615
CNGM120404S01325MTCB1	12,70	12,90	0,4	–	●	–	–
CNGM120408S01325MTCB1	12,70	12,90	0,8	–	●	–	–
CNGM120412S01325MTCB1	12,70	12,90	1,2	–	●	–	–

NOTA: Para suportes e barras internas, consulte páginas B58–B73.





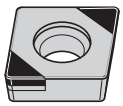
● primeira opção
○ opção alternativa

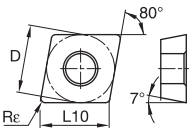
P				●	
M					
K				●	
N					
S				●	
H		●	●	●	●

CNGX

ISO código do produto	D	L10	Rε	KBH10	KBH20	KB5630	KY1615
CNGX120708T02020	12,70	12,90	0,8	–	–	–	●
CNGX120712T02020	12,70	12,90	1,2	–	–	–	●

NOTA: Para suportes e barras internas, consulte páginas B58–B73.

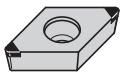


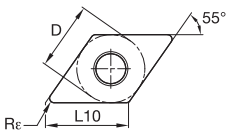


CPGW-MT

ISO código do produto	D	L10	Rε	KBH10	KBH20	KB5630	KY1615
CPGW09T304S01015MT	9,53	9,67	0,4	–	–	●	–
CPGW09T308S01015MT	9,53	9,67	0,8	–	–	●	–

NOTA: Para suportes e barras internas, consulte páginas B192–B205.

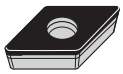


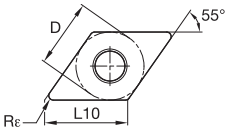


DCGM

ISO código do produto	D	L10	Rε	KBH10	KBH20	KB5630	KY1615
DCGM11T304S01325MTCB1	9,53	11,63	0,4	–	●	–	–

NOTA: Para suportes e barras internas, consulte páginas B209–B213.





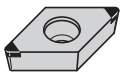
● primeira opção
○ opção alternativa

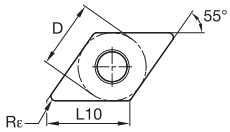
P			●	
M				
K			●	
N				
S			●	
H	●	●	●	●

DCGW-C

ISO código do produto	D	L10	Rε	KBH10	KBH20	KB5630	KY1615
DCGW070202S01015C	6,35	7,75	0,2	–	–	●	–
DCGW070204S01015C	6,35	7,75	0,4	–	–	●	–

NOTA: Para suportes e barras internas, consulte páginas B209–B213.

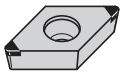


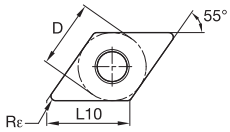


DCGW-FWMT

ISO código do produto	D	L10	Rε	KBH10	KBH20	KB5630	KY1615
DCGW11T308S01015FWMT	9,53	11,63	0,4	●	●	–	–
DCGW11T308S01225FWMT	9,53	11,63	0,4	●	–	–	–

NOTA: Para suportes e barras internas, consulte páginas B209–B213.

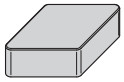


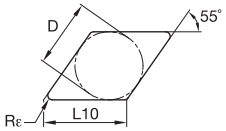


DCGW-MT

ISO código do produto	D	L10	Rε	KBH10	KBH20	KB5630	KY1615
DCGW070202S01225MT	6,35	7,75	0,2	–	●	–	–
DCGW070204S01015MT	6,35	7,75	0,4	–	●	–	–
DCGW070204S01225MT	6,35	7,75	0,4	–	●	–	–
DCGW70202S01015MT	6,35	7,75	0,4	●	–	–	–
DCGW70204S01015MT	6,35	7,75	0,4	●	–	–	–
DCGW70204S01225MT	6,35	7,75	0,4	●	–	–	–
DCGW11T302S01015MT	9,53	11,63	0,2	●	–	–	–
DCGW11T302S01225MT	9,53	11,63	0,2	–	●	–	–
DCGW11T304S01225MT	9,53	11,63	0,4	●	●	–	–
DCGW11T304S01015MT	9,53	11,63	0,4	●	●	●	–
DCGW11T308S01015MT	9,53	11,63	0,8	●	●	●	–
DCGW11T308S01225MT	9,53	11,63	0,8	●	●	–	–

NOTA: Para suportes e barras internas, consulte páginas B209–B213.



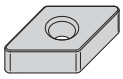


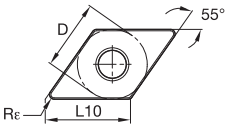
● primeira opção
○ opção alternativa

P	●
M	
K	●
N	
S	●
H	● ● ● ●

DNGN/DNG

ISO código do produto	D	L10	Rε	KBH10	KBH20	KB5630	KY1615
DNGN150704T02020	12,70	15,50	0,4	–	–	–	●
DNGN150708T02020	12,70	15,50	0,8	–	–	–	●
DNGN150712T02020	12,70	15,50	1,2	–	–	–	●
DNGN150716T02020	12,70	15,50	1,6	–	–	–	●

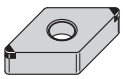


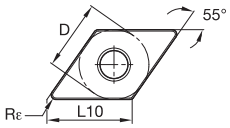


DNGA

ISO código do produto	D	L10	Rε	KBH10	KBH20	KB5630	KY1615
DNGA150404T02020	12,70	15,50	0,4	–	–	–	●
DNGA150604T02020	12,70	15,50	0,4	–	–	–	●
DNGA150408T02020	12,70	15,50	0,8	–	–	–	●
DNGA150608T02020	12,70	15,50	0,8	–	–	–	●
DNGA150412T02020	12,70	15,50	1,2	–	–	–	●
DNGA150612T02020	12,70	15,50	1,2	–	–	–	●
DNGA150416T02020	12,70	15,50	1,6	–	–	–	●

NOTA: Para suportes e barras internas, consulte páginas B85–B93.

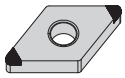


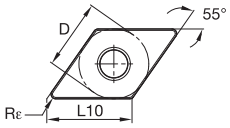


DNGA-FWMT

ISO código do produto	D	L10	Rε	KBH10	KBH20	KB5630	KY1615
DNGA150408S01015FWMT	12,70	15,50	0,4	●	●	–	–
DNGA150408S01225FWMT	12,70	15,50	0,4	●	–	–	–
DNGA150412S01015FWMT	12,70	15,50	0,8	–	●	–	–
DNGA150412S01225FWMT	12,70	15,50	0,8	●	–	–	–

NOTA: Para suportes e barras internas, consulte páginas B85–B93.





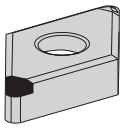
● primeira opção
○ opção alternativa

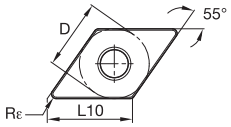
P				●	
M					
K				●	
N					
S				●	
H		●	●	●	●

DNGA-MT

ISO código do produto	D	L10	Rε	KBH10	KBH20	KB5630	KY1615
DNGA150404S01015MT	12,70	15,50	0,4	●	●	–	–
DNGA150404S01025MT	12,70	15,50	0,4	–	–	●	–
DNGA150404S01225MT	12,70	15,50	0,4	–	●	–	–
DNGA150404S01735MT	12,70	15,50	0,4	–	●	–	–
DNGA150604S01015MT	12,70	15,50	0,4	●	●	–	–
DNGA150604S01225MT	12,70	15,50	0,4	–	●	–	–
DNGA150604S01735MT	12,70	15,50	0,4	–	●	–	–
DNGA150408S01735MT	12,70	15,50	0,8	●	●	–	–
DNGA150408S01015MT	12,70	15,50	0,8	●	●	–	–
DNGA150408S01025MT	12,70	15,50	0,8	–	–	●	–
DNGA150408S01225MT	12,70	15,50	0,8	●	●	–	–
DNGA150608S01015MT	12,70	15,50	0,8	●	●	–	–
DNGA150608S01225MT	12,70	15,50	0,8	●	●	–	–
DNGA150608S01735MT	12,70	15,50	0,8	–	●	–	–
DNGA150412S01015MT	12,70	15,50	1,2	●	●	–	–
DNGA150412S01225MT	12,70	15,50	1,2	●	●	–	–
DNGA150412S01735MT	12,70	15,50	1,2	●	●	–	–
DNGA150612S01015MT	12,70	15,50	1,2	●	●	–	–
DNGA150612S01225MT	12,70	15,50	1,2	●	●	–	–
DNGA150612S01735MT	12,70	15,50	1,2	–	●	–	–

NOTA: Para suportes e barras internas, consulte páginas B85–B93.





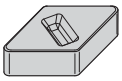
DNGM-CB1

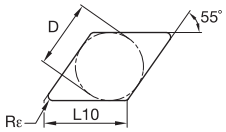
ISO código do produto	D	L10	Rε	KBH10	KBH20	KB5630	KY1615
DNGM150408S01325MTCB1	12,70	15,50	0,8	–	●	–	–
DNGM150412S01325MTCB1	12,70	15,50	1,2	–	●	–	–
DNGM150608S01325MTCB1	12,70	15,50	0,8	–	●	–	–
DNGM150612S01325MTCB1	12,70	15,50	1,2	–	●	–	–

NOTA: Para suportes e barras internas, consulte páginas B85–B93.

P				●	
M					
K				●	
N					
S				●	
H		●	●	●	●

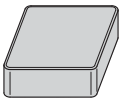
● primeira opção
○ opção alternativa

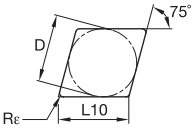




DNGX

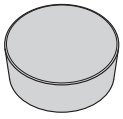
ISO código do produto	D	L10	Rε	KBH10	KBH20	KB5630	KY1615
DNGX150708T02020	12,70	15,50	0,8	–	–	–	●

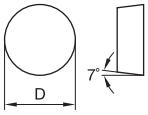




ENGN

ISO código do produto	D	L10	Rε	KBH10	KBH20	KB5630	KY1615
ENGN130704T02020	12,70	13,15	0,4	–	–	–	●
ENGN130708T02020	12,70	13,15	0,8	–	–	–	●
ENGN130712T02020	12,70	13,15	1,2	–	–	–	●
ENGN130716T02020	12,70	13,15	1,6	–	–	–	●



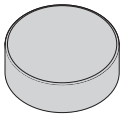
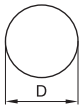


RCGX

ISO código do produto	D	L10	Rε	KBH10	KBH20	KB5630	KY1615
RCGX090700T01020	9,53	–	–	–	–	–	●
RCGX090700T02020	9,53	–	–	–	–	–	●
RCGX090700T10015	9,53	–	–	–	–	–	●
RCGX090700T20015	9,53	–	–	–	–	–	●
RCGX120700T02020	12,70	–	–	–	–	–	●
RCGX120700T10015	12,70	–	–	–	–	–	●
RCGX120700T20015	12,70	–	–	–	–	–	●
RCGX151000T20015	15,88	–	–	–	–	–	●
RCGX191000T20015	19,05	–	–	–	–	–	●
RCGX251200T20015	25,40	–	–	–	–	–	●

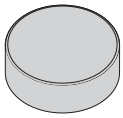
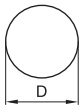
● primeira opção
○ opção alternativa

P				●	
M					
K				●	
N					
S				●	
H		●	●	●	●

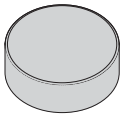
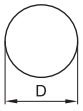
RCGW-T

ISO código do produto	D	L10	Rε	KBH10	KBH20	KB5630	KY1615
RCGW1204M0T01020	12,00	–	–	–	–	–	●

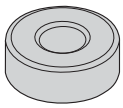
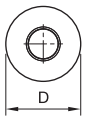
RCGX

ISO código do produto	D	L10	Rε	KBH10	KBH20	KB5630	KY1615
RCGX0907-001	9,53	–	–	–	–	–	●

RNGN

ISO código do produto	D	L10	Rε	KBH10	KBH20	KB5630	KY1615
RNGN090300T02020	9,53	–	–	–	–	–	●
RNGN090400T02020	9,53	–	–	–	–	–	●
RNGN120300T02020	12,70	–	–	–	–	–	●
RNGN120400T02020	12,70	–	–	–	–	–	●
RNGN120700T02020	12,70	–	–	–	–	–	●
RNGN120700T10015	12,70	–	–	–	–	–	●
RNGN120700T20015	12,70	–	–	–	–	–	●
RNGN190700T02020	19,05	–	–	–	–	–	●

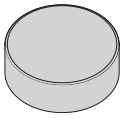
RNGA

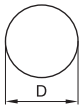
ISO código do produto	D	L10	Rε	KBH10	KBH20	KB5630	KY1615
RNGA090300T02020	9,53	–	–	–	–	–	●
RNGA120400T02020	12,70	–	–	–	–	–	●

NOTA: Para suportes e barras internas, consulte página B95.

● primeira opção
○ opção alternativa

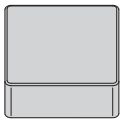
P				●	
M					
K				●	
N					
S				●	
H		●	●	●	●

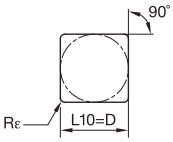




RNGN-C

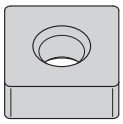
ISO código do produto	D	L10	Rε	KBH10	KBH20	KB5630	KY1615
RNGN090300S02015C	9,53	—	—	–	–	●	–

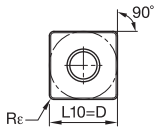




SNGN

ISO código do produto	D	L10	Rε	KBH10	KBH20	KB5630	KY1615
SNGN090308T02020	9,53	9,53	0,8	–	–	–	●
SNGN120704T02020	12,70	12,70	0,4	–	–	–	●
SNGN120408T00520	12,70	12,70	0,8	–	–	–	●
SNGN120408T02020	12,70	12,70	0,8	–	–	–	●
SNGN120708T02020	12,70	12,70	0,8	–	–	–	●
SNGN120412T02020	12,70	12,70	1,2	–	–	–	●
SNGN120712T02020	12,70	12,70	1,2	–	–	–	●
SNGN120416T02020	12,70	12,70	1,6	–	–	–	●
SNGN120716T02020	12,70	12,70	1,6	–	–	–	●
SNGN120720T02020	12,70	12,70	2,0	–	–	–	●
SNGN120720T10015	12,70	12,70	2,0	–	–	–	●
SNGN120720T20015	12,70	12,70	2,0	–	–	–	●
SNGN150716T02020	15,88	15,88	1,6	–	–	–	●





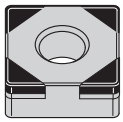
SNGA

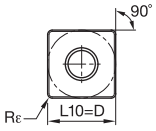
ISO código do produto	D	L10	Rε	KBH10	KBH20	KB5630	KY1615
SNGA120408T02020	12,70	12,70	0,8	–	–	–	●
SNGA120412T02020	12,70	12,70	1,2	–	–	–	●

NOTA: Para suportes e barras internas, consulte páginas B105–B121.

● primeira opção
○ opção alternativa

P			●	
M				
K			●	
N				
S			●	
H	●	●	●	●

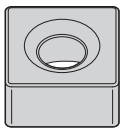


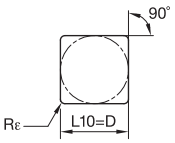


SNGA-MT

ISO código do produto	D	L10	Rε	KBH10	KBH20	KB5630	KY1615
SNGA120408S01015MT	12,70	12,70	0,8	●	–	–	–
SNGA120408S01225MT	12,70	12,70	0,8	●	●	–	–
SNGA120412S01225MT	12,70	12,70	1,2	●	●	–	–

NOTA: Para suportes e barras internas, consulte páginas B105–B121.

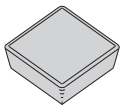


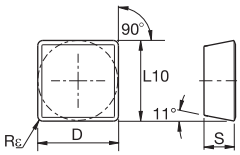


SNGX

ISO código do produto	D	L10	Rε	KBH10	KBH20	KB5630	KY1615
SNGX120712T02020	12,70	12,70	1,2	–	–	–	●

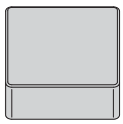
NOTA: Para suportes e barras internas, consulte páginas B105–B12.

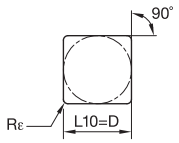




SPG-T

ISO código do produto	D	L10	Rε	KBH10	KBH20	KB5630	KY1615
SPGN090308T01020	9,53	9,53	0,8	–	–	–	●
SPGN120308T01020	12,70	12,70	0,8	–	–	–	●





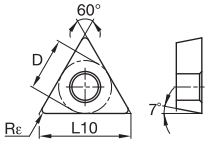
SPU-T

ISO código do produto	D	L10	Rε	KBH10	KBH20	KB5630	KY1615
SPUN120308T00520	12,70	12,70	0,8	–	–	–	●

● primeira opção
○ opção alternativa

P	●
M	
K	●
N	
S	●
H	● ● ● ●

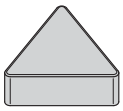


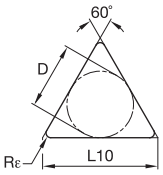


TCGW-MT

ISO código do produto	D	L10	Rε	KBH10	KBH20	KB5630	KY1615
TCGW090202S01015MT	5,56	9,62	0,2	–	●	–	–
TCGW090204S01015 MT	5,56	9,62	0,4	–	●	–	–
TCGW110202S01015MT	6,35	11,00	0,2	●	●	–	–
TCGW110204S01015MT	6,35	11,00	0,4	●	●	–	–
TCGW110204S01225MT	6,35	11,00	0,4	●	–	–	–
TCGW110208S01015MT	6,35	11,00	0,8	●	●	–	–
TCGW110208S01225MT	6,35	11,00	0,8	●	–	–	–

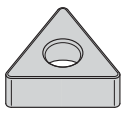
NOTA: Para suportes e barras internas, consulte páginas B247–B248.

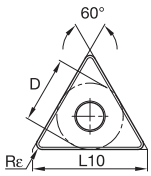




TNGN

ISO código do produto	D	L10	Rε	KBH10	KBH20	KB5630	KY1615
TNGN110308T02020	6,35	11,00	0,8	–	–	–	●
TNGN160404T02020	9,53	16,50	0,4	–	–	–	●
TNGN160408T02020	9,53	16,50	0,8	–	–	–	●
TNGN160708T02020	9,53	16,50	0,8	–	–	–	●
TNGN160412T02020	9,53	16,50	1,2	–	–	–	●
TNGN160712T02020	9,53	16,50	1,2	–	–	–	●
TNGN160416T02020	9,53	16,50	1,6	–	–	–	●
TNGN220408T02020	12,70	22,00	0,8	–	–	–	●

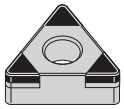


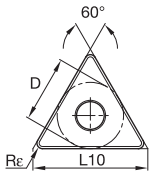


TNGA

ISO código do produto	D	L10	Rε	KBH10	KBH20	KB5630	KY1615
TNGA160408T02020	9,53	16,50	0,8	–	–	–	●
TNGA160412T02020	9,53	16,50	1,2	–	–	–	●
TNGA220408T02020	12,70	22,00	0,8	–	–	–	●
TNGA220412T02020	12,70	22,00	1,2	–	–	–	●

NOTA: Para suportes e barras internas, consulte páginas B132–B142.





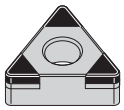
● primeira opção
○ opção alternativa

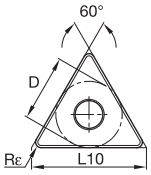
P			●	
M				
K			●	
N				
S			●	
H	●	●	●	●

TNGA-MT

ISO código do produto	D	L10	Rε	KBH10	KBH20	KB5630	KY1615
TNGA160404S01015MT	9,53	16,50	0,4	●	●	–	–
TNGA160404S01225MT	9,53	16,50	0,4	–	●	–	–
TNGA160404S01735MT	9,53	16,50	0,4	–	●	–	–
TNGA160408S01015MT	9,53	16,50	0,8	●	●	–	–
TNGA160408S01225MT	9,53	16,50	0,8	●	●	–	–
TNGA160408S01735MT	9,53	16,50	0,8	●	●	–	–
TNGA160412S01015MT	9,53	16,50	1,2	●	●	–	–
TNGA160412S01225MT	9,53	16,50	1,2	●	●	–	–
TNGA160412S01735MT	9,53	16,50	1,2	●	●	–	–

NOTA: Para suportes e barras internas, consulte páginas B132–B142.

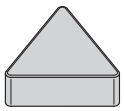


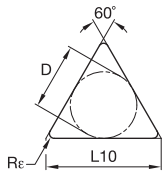


TNGM • Usinagem média

ISO código do produto	D	L10	Rε	KBH10	KBH20	KB5630	KY1615
TNGM160408S01325MTCB1	9,53	16,50	0,8	–	●	–	–

NOTA: Para suportes e barras internas, consulte páginas B132–B142.





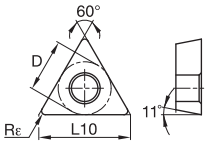
TPGN

ISO código do produto	D	L10	Rε	KBH10	KBH20	KB5630	KY1615
TPGN110304T01020	6,35	11,00	0,4	–	–	–	●
TPGN110308T01020	6,35	11,00	0,8	–	–	–	●
TPGN110312T01020	6,35	11,00	1,2	–	–	–	●
TPGN160304T00520	9,53	16,50	0,4	–	–	–	●
TPGN160304T01020	9,53	16,50	0,4	–	–	–	●
TPGN160308T00520	9,53	16,50	0,8	–	–	–	●
TPGN160308T01020	9,53	16,50	0,8	–	–	–	●
TPGN160312T01020	9,53	16,50	1,2	–	–	–	●

● primeira opção
○ opção alternativa

P				●	
M					
K				●	
N					
S				●	
H		●	●	●	●



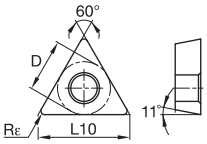


TPGW-C

ISO código do produto	D	L10	Rε	KBH10	KBH20	KB5630	KY1615
TPGW110208S01015C	6,35	11,00	0,8	–	–	●	–

NOTA: Para suportes e barras internas, consulte páginas B257–B263.

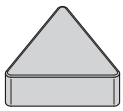


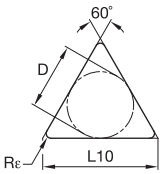


TPGW-MT

ISO código do produto	D	L10	Rε	KBH10	KBH20	KB5630	KY1615
TPGW110308S01225MT	6,35	10,96	0,8	●	–	–	–
TPGW110202S01015MT	6,35	11,00	0,2	–	●	–	–
TPGW110304S01015MT	6,35	11,00	0,4	●	–	–	–
TPGW110304S01225MT	6,35	11,00	0,4	●	–	–	–
TPGW110204S01015MT	6,35	11,00	0,4	–	●	–	–
TPGW110208S01015MT	6,35	11,00	0,8	–	●	–	–
TPGW160404S01015MT	9,53	16,50	0,4	●	–	–	–
TPGW160404S01225MT	9,53	16,50	0,4	●	–	–	–
TPGW16T304S01015MT	9,53	16,50	0,4	–	●	–	–
TPGW160408S01015MT	9,53	16,50	0,8	●	–	–	–
TPGW160408S01225MT	9,53	16,50	0,8	●	–	–	–
TPGW16T308S01015MT	9,53	16,50	0,8	–	●	–	–
TPGW16T308S01225MT	9,53	16,50	0,8	–	●	–	–

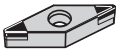
NOTA: Para suportes e barras internas, consulte páginas B257–B263.

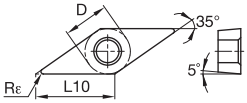




TPU-T

ISO código do produto	D	L10	Rε	KBH10	KBH20	KB5630	KY1615
TPUN110304T00520	6,35	11,00	0,4	–	–	–	●
TPUN110308T00520	6,35	11,00	0,8	–	–	–	●
TPUN160304T00520	9,53	16,50	0,4	–	–	–	●
TPUN160308T00520	9,53	16,50	0,8	–	–	–	●
TPUN160312T00520	9,53	16,50	1,2	–	–	–	●





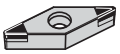
● primeira opção
○ opção alternativa

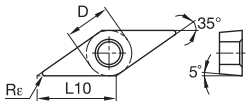
P			●	
M				
K			●	
N				
S			●	
H	●	●	●	●

VBGW-MT

ISO código do produto	D	L10	Rε	KBH10	KBH20	KB5630	KY1615
VBGW110304S01015MT	6,35	11,07	0,4	●	●	–	–
VBGW110304S01225MT	6,35	11,07	0,4	–	●	–	–
VBGW110308S01015MT	6,35	11,07	0,8	●	–	–	–
VBGW110308S01225MT	6,35	11,07	0,8	–	●	–	–
VBGW160404S01015MT	9,53	16,61	0,4	●	–	●	–
VBGW160408S01015MT	9,53	16,61	0,8	●	●	●	–
VBGW160412S01015MT	9,53	16,61	1,2	–	●	–	–

NOTA: Para suportes e barras internas, consulte páginas B266–B269.

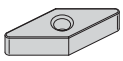


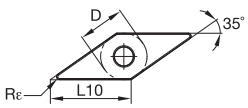


VCGW • Usinagem leve

ISO código do produto	D	L10	Rε	KBH10	KBH20	KB5630	KY1615
VCGW160404S01015MT	9,53	16,61	0,4	–	●	–	–
VCGW160404S01225MT	9,53	16,61	0,4	–	●	–	–
VCGW160408S01015MT	9,53	16,61	0,8	–	●	–	–
VCGW160408S01225MT	9,53	16,61	0,8	–	●	–	–

NOTA: Para suportes e barras internas, consulte páginas B266–B269.

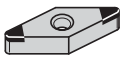


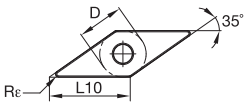


VNGA

ISO código do produto	D	L10	Rε	KBH10	KBH20	KB5630	KY1615
VNGA160404T02020	9,53	16,61	0,4	–	–	–	●
VNGA160408T02020	9,53	16,61	0,8	–	–	–	●
VNGA160412T02020	9,53	16,61	1,2	–	–	–	●
VNGA220408T02020	12,70	22,14	0,8	–	–	–	●

NOTA: Para suportes e barras internas, consulte páginas B149–B153.





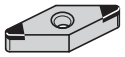
● primeira opção
○ opção alternativa

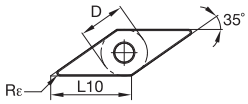
P			●	
M				
K			●	
N				
S			●	
H		●	●	●	●

VNGA-MT

ISO código do produto	D	L10	Rε	KBH10	KBH20	KB5630	KY1615
VNGA160404S01015MT	9,53	16,61	0,4	●	●	–	–
VNGA160404S01025MT	9,53	16,61	0,4	–	–	●	–
VNGA160404S01225MT	9,53	16,61	0,4	●	●	–	–
VNGA160404S01735MT	9,53	16,61	0,4	–	●	–	–
VNGA160408S01015MT	9,53	16,61	0,8	●	●	–	–
VNGA160408S01025MT	9,53	16,61	0,8	–	–	●	–
VNGA160408S01225MT	9,53	16,61	0,8	●	●	–	–
VNGA160408S01735MT	9,53	16,61	0,8	–	●	–	–
VNGA160412S01225MT	9,53	16,61	1,2	–	●	–	–

NOTA: Para suportes e barras internas, consulte páginas B149–B153.

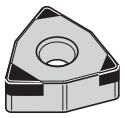


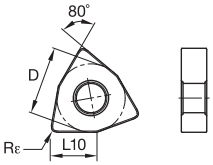


VNGM

ISO código do produto	D	L10	Rε	KBH10	KBH20	KB5630	KY1615
VNGM160408S01325MTCB1	9,53	16,61	0,8	–	●	–	–
VNGM160412S01325MTCB1	9,53	16,61	1,2	–	●	–	–

NOTA: Para suportes e barras internas, consulte páginas B149–B153.

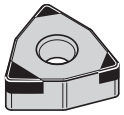


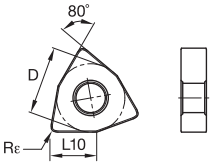


WNGA

ISO código do produto	D	L10	Rε	KBH10	KBH20	KB5630	KY1615
WNGA080408S01015FWMT	12,70	8,69	0,8	–	●	–	–

NOTA: Para suportes e barras internas, consulte páginas B161–B165.





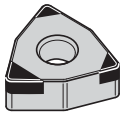
● primeira opção
○ opção alternativa

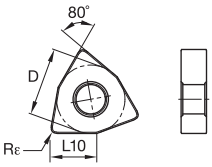
P			●	
M				
K			●	
N				
S			●	
H	●	●	●	●

WNGA-FWMT

ISO código do produto	D	L10	Rε	KBH10	KBH20	KB5630	KY1615
WNGA080408S01015FWHBMT	12,70	8,69	0,8	–	●	–	–

NOTA: Para suportes e barras internas, consulte páginas B161–B165.





WNGA-MT

ISO código do produto	D	L10	Rε	KBH10	KBH20	KB5630	KY1615
WNGA080404S01015MT	12,70	8,69	0,4	–	●	–	–
WNGA080408S01015MT	12,70	8,69	0,8	–	●	–	–
WNGA080408S01225MT	12,70	8,69	0,8	–	●	–	–
WNGA080408S01735MT	12,70	8,69	0,8	–	●	–	–
WNGA80408S01015MT	12,70	8,69	0,8	●	–	–	–
WNGA80408S01225MT	12,70	8,69	0,8	●	–	–	–

NOTA: Para suportes e barras internas, consulte páginas B161–B165.

Ferramentas A4™ e insertos Beyond™



Escolha as ferramentas A4 para as aplicações de torneamento, faceamento, abertura de canal, abertura de canal de face e corte em uma ampla variedade de materiais das peças. Sistema de fixação único e geometria de inserto versátil proporcionam uma taxa de remoção de material muito alta.

CARACTERÍSTICAS E BENEFÍCIOS

Sistema de abertura de canal e torneamento A4

- Uma ferramenta para torneamento, faceamento, abertura de canal e corte em aplicações de diâmetro externo e interno significa tempos de ciclo excepcionalmente rápidos, sem indexar a torre!
- Área de fixação extra longa, superfície inferior retificada do alojamento prismático de 120° e um trilho guia superior exclusivo combinados para proporcionar uma estabilidade inigualável em abertura de canal e torneamento lateral!
- O posicionamento preciso do inserto é garantido para cortes precisos!
- A fixação rígida trava firmemente o inserto no lugar através dos mais duros cortes.
- Um design versátil permite que um único sistema faça operações de abertura de canal no diâmetro interno ou externo e de face, de torneamento reverso, de rebaixamento e até de rosqueamento.
- Os insertos com controle do cavaco proporcionam excelente evacuação de cavacos na abertura de canal e oferecem melhor controle de cavaco no torneamento multidirecional.

Experimente as vantagens no seu distribuidor autorizado da Kennametal ou no site **kennametal.com**.

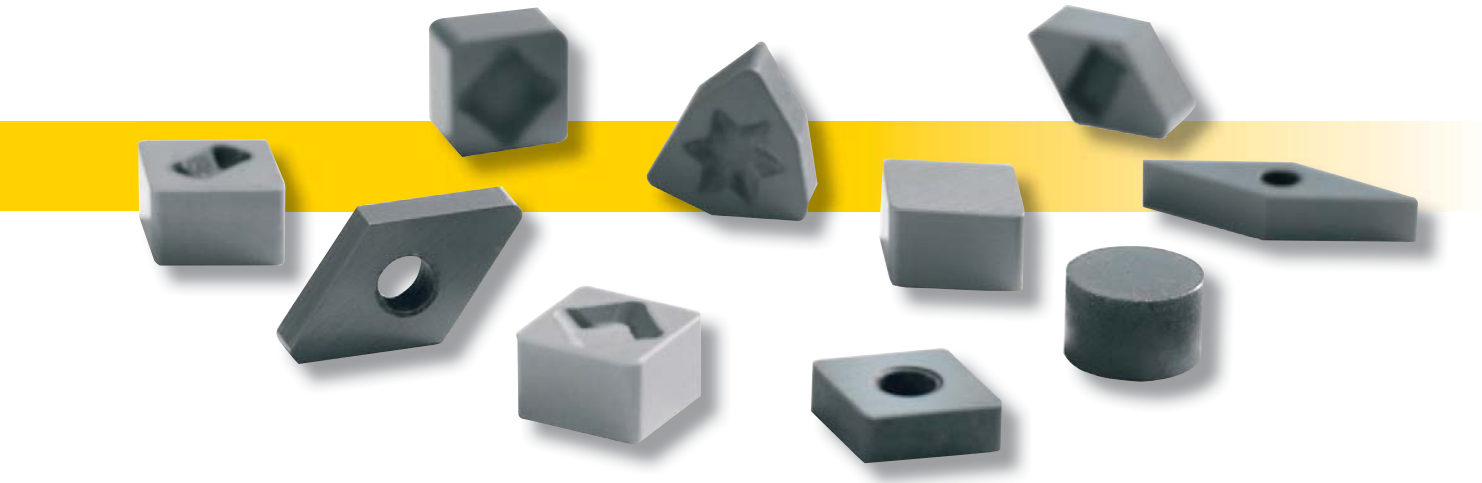
KENNAMETAL®

kennametal.com

Usinagem de ligas resistentes à altas temperaturas com cerâmica e PcBN

Os materiais avançados da Kennametal, utilizando a tecnologia Beyond™, oferecem grande resistência a desgaste e tenacidade, de acordo com o trabalho a ser realizado.

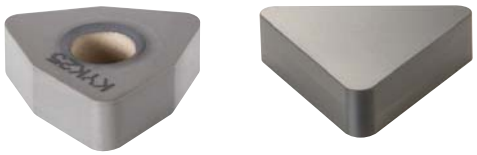
Os insertos de cerâmica KYS são a primeira opção para aplicações de alta velocidade em ligas resistentes a altas temperaturas. O revestimento multicamadas proporciona uma melhor resistência a desgaste químico comparado com as classes sem revestimento. Um substrato de cerâmica SiAlON de qualidade superior fornece excelente resistência a desgaste por entalhe no flanco comparado com uma cerâmica reforçada com whisker filamentoso.



Insertos de cerâmica

KYS25™

- Excelente acabamento superficial, menores forças de corte, e velocidades superiores.
- O revestimento de CVD fornece uma excelente resistência química e de desgaste por entalhe no flanco.



KYS30™

- Vida útil da ferramenta longa e uniforme.
- Excelente dureza e resistência a desgaste por entalhe no flanco.
- Realiza uma ampla variedade de condições de usinagem, incluindo cortes interrompidos e aplicações que envolvem carepas.

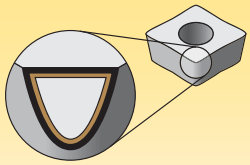


Insertos PcBN com ponta

KB1630

- Vida útil da ferramenta longa e uniforme.
- Excelente dureza e resistência a desgaste por entalhe no flanco.
- Realiza uma ampla variedade de condições de usinagem, incluindo cortes interrompidos e aplicações que envolvem carepas.





Os revestimentos proporcionam capacidade de alta velocidade e são projetados para acabamento e desbaste leve.

P	Aço
M	Aço inoxidável
K	Ferro fundido
N	Materiais não ferrosos
S	Ligas resistentes a altas temperaturas
H	Materiais endurecidos

resistência ao desgaste ← → **tenacidade**

	Revestimento	Descrição da classe		05	10	15	20	25	30	35	40	45
Classes de cerâmica	KYS25	**Composição:** Cerâmica SiAlON com um revestimento de alumina-TiCN CVD em camadas múltiplas. **Aplicação:** Complementa a classe KYS30™ na usinagem de ligas resistentes a altas temperaturas, à base de níquel e metais fundidos com alta dureza Brinell. Esse revestimento avançado de CVD fornece excelente resistência química e a desgaste por entalhe no flanco comparado com o whisker cerâmico.	S									
			H									
	KYS30	**Composição:** Material de SiAlON mais moderno e avançado desenvolvido. **Aplicação:** Combina excelentes propriedades de resistência ao desgaste, resistência a quebra e resistência ao choque térmico para usinagem em geral e de acabamento de ligas resistentes a altas temperaturas. Fornece excelente resistência ao desgaste por entalhe comparado com o whisker cerâmico.	S									
PcBN – Classes de nitreto cúbico de boro policristalino	KB1630	**Composição:** Uma classe de alto conteúdo de PcBN não revestido. Ponta de PcBN soldada em um inserto de metal duro. **Aplicação:** Projetada para ser usada do desbaste ao acabamento em cortes interrompidos em aços endurecidos (>45 HRC). Também pode ser aplicada em ferros fundidos cinzentos, ferros fundidos coquilhados, liças de aço com alto teor de cromo, ligas de alta temperatura e metais sinterizados. Os insertos com pontas de PcBN estão disponíveis em uma variedade de estilos, incluindo as geometrias Top Notch™ e Screw-On.	K									
			S									
			H									

O NOVO SABE PROCURAR

A procura por uma ferramenta foi melhorada através de funções de Aconselhamento e seleção do NOVO™, economizando tempo e dinheiro.

SUGERIR

Utiliza uma abordagem baseada em regras para fornecer recomendações de ferramenta de corte:

- Definir recurso de usinagem (fresamento de face, canais, furo cego etc.)
- Aplicar requisitos de limitação (geometria, material, tolerância etc.)
- Definir sequência de usinagem (operações de etapa única ou múltiplas, desbaste e acabamento etc.)
- Receber os resultados em ranking

SELECIONAR

Um método de selecionar ferramenta de corte de uma estrutura em árvore por meio de uma busca hierárquica ou paramétrica:

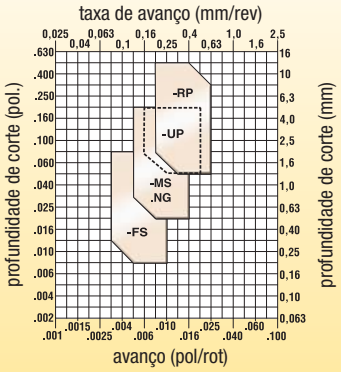
- Se você sabe qual é produto que está procurando, uma busca rápida pode ser feita somente com o número de catálogo ou descrição do produto.
- Filtros inteligentes reduzem significativamente a quantidade de potenciais soluções de ferramental.
- Após a ferramenta ter sido selecionada, o NOVO também fornece opções de itens de corte e adaptação que combinam com a sua solução.

O NOVO pode garantir que você tenha as ferramentas certas no seu maquinário, na sequência certa. Resultando em execução perfeita que acelera todos os trabalhos e maximiza todos os turnos. **kennametal.com/novo**

Etapa 1 • Escolha a geometria do inserto

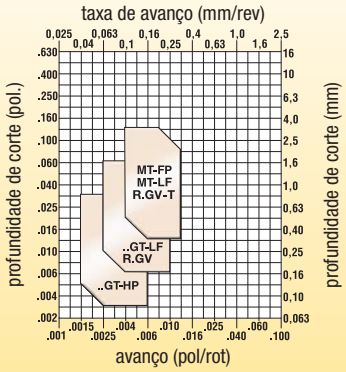
Insertos negativos





Insertos positivos





Etapa 2 • Escolha a classe

condições de corte	Geometria do inserto negativa .NG
corte altamente interrompido	–
corte ligeiramente interrompido	KYS30/KY1540
profundidade de corte, fundição ou superfície de forja variável	KYS30/KY1540/KYS25/KY4300
corte liso, superfície pré-torneada	KYS25/KY4300

condições de corte	Geometria do inserto positiva R.GV-T
corte altamente interrompido	–
corte ligeiramente interrompido	KYS30/KY1540
profundidade de corte, fundição ou superfície de forja variável	KYS30/KY1540/KYS25/KY4300
corte liso, superfície pré-torneada	KYS25/KY4300

Etapa 3 • Escolha a velocidade de corte

Ligas resistentes a altas temperaturas à base de ferro (de 135 a 320 HB) (≤ 34 HRC) — velocidade — m/min. (SFM) — Condições iniciais ◁▷

grupo de materiais	classe	15 (50)	45 (150)	75 (250)	105 (350)	140 (450)	170 (550)	200 (650)	230 (750)	260 (850)	290 (950)	310 (1050)	350 (1150)	380 (1250)	m/min.	SFM
S1	KB1630									◁▷					260	850
	KYS25/KY4300								◁▷						200	650
	KYS30/KY1540							◁▷							170	550

Ligas resistentes a altas temperaturas, à base de cobalto (150 a 425 HB) (≤45 HRC) — velocidade — m/min. (SFM) — Condições iniciais ◁▷

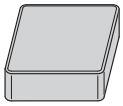
grupo de materiais	classe	15 (50)	45 (150)	75 (250)	105 (350)	140 (450)	170 (550)	200 (650)	230 (750)	260 (850)	290 (950)	310 (1050)	350 (1150)	380 (1250)	m/min.	SFM
S2	KB1630									◁▷					260	850
	KYS25/KY4300								◁▷						220	720
	KYS30/KY1540							◁▷							185	600

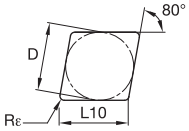
Ligas resistentes a altas temperaturas à base de níquel (de 140 a 475 HB) (≤ 48 HRC) — velocidade — m/min. (SFM) — Condições iniciais ◁▷

grupo de materiais	classe	15 (50)	45 (150)	75 (250)	105 (350)	140 (450)	170 (550)	200 (650)	230 (750)	260 (850)	290 (950)	310 (1050)	350 (1150)	380 (1250)	m/min.	SFM
S3	KB1630									◁▷					260	850
	KYS25/KY4300									◁▷					250	820
	KYS30/KY1540								◁▷						215	700

● primeira opção
○ opção alternativa

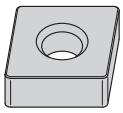
P			
M			
K			
N			
S	●	●	○
H	○		●

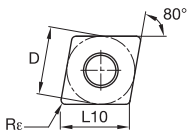




CNGN

ISO código do produto	D	L10	Rε	KYS25	KYS30	KB1630
CNGN120416T01020	12,70	12,90	1,6	●	–	–
CNGN120712T01020	12,70	12,90	1,2	●	●	–
CNGN120716T01020	12,70	12,90	1,6	–	●	–

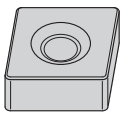


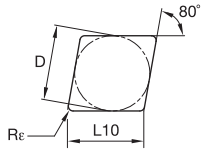


CNGA

ISO código do produto	D	L10	Rε	KYS25	KYS30	KB1630
CNGA120408E	12,70	12,90	0,8	●	●	–
CNGA120408T01020	12,70	12,90	0,8	●	●	–
CNGA120412T01020	12,70	12,90	1,2	●	●	–

NOTA: Para suportes e barras internas, consulte páginas B58–B73.

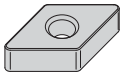


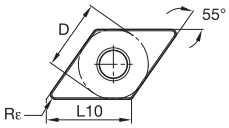


CNGX

ISO código do produto	D	L10	Rε	KYS25	KYS30	KB1630
CNGX120708T01020	12,70	12,90	0,8	●	●	–
CNGX120712T01020	12,70	12,90	1,2	●	●	–
CNGX120716E	12,70	12,90	1,6	–	●	–

NOTA: Para suportes e barras internas, consulte páginas B58–B73.





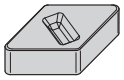
● primeira opção
○ opção alternativa

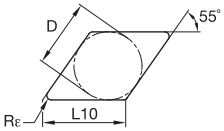
	KYS25	KYS30	KB1630
P			
M			
K			
N			
S	●	●	○
H	○		●

DNGA

ISO código do produto	D	L10	Rε	KYS25	KYS30	KB1630
DNGA150408T01020	12,70	15,50	0,8	–	●	–
DNGA150412T01020	12,70	15,50	1,2	–	●	–

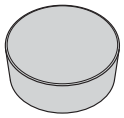
NOTA: Para suportes e barras internas, consulte páginas B85–B93.

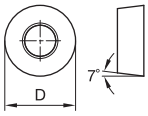




DNGX

ISO código do produto	D	L10	Rε	KYS25	KYS30	KB1630
DNGX150708T01020	12,70	15,50	0,8	●	–	–
DNGX150712T01020	12,70	15,50	1,2	●	●	–
DNGX150716T01020	12,70	15,50	1,6	–	●	–



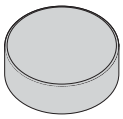


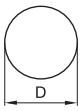
RCGX

ISO código do produto	D	L10	Rε	KYS25	KYS30	KB1630
RCGX060400E	6,35	–	–	●	●	–
RCGX090700E	9,53	–	–	●	●	–
RCGX090700T00525	9,53	–	–	–	●	–
RCGX090700T01020	9,53	–	–	●	●	–
RCGX120700E	12,70	–	–	●	●	–
RCGX120700T01020	12,70	–	–	●	●	–
RCGX120700T01025	12,70	–	–	●	●	–

● primeira opção
○ opção alternativa

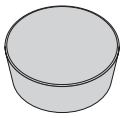
P			
M			
K			
N			
S	●	●	○
H	○		●

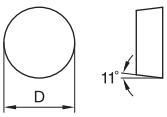




RNGN

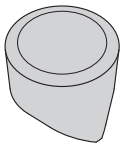
ISO código do produto	D	L10	Rε	KYS25	KYS30	KB1630
RNGN120400T01020	12,70	–	–	–	●	–
RNGN120700T00525	12,70	–	–	–	●	–
RNGN120700T01020	12,70	–	–	–	●	–
RNGN120700T01025	12,70	–	–	●	●	–
RNGN190700T01020	19,05	–	–	–	●	–

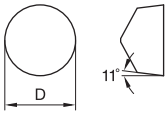




RPGN

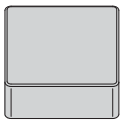
ISO código do produto	D	L10	Rε	KYS25	KYS30	KB1630
RPGN060200E	6,35	–	–	–	●	–
RPGN090300E	9,53	–	–	–	●	–
RPGN090300T01020	9,53	–	–	–	●	–
RPGN120400E	12,70	–	–	–	●	–
RPGN120400T01020	12,70	–	–	–	●	–

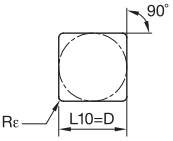




RPGX

ISO código do produto	D	L10	Rε	KYS25	KYS30	KB1630
RPGX090700E	9,53	–	–	●	●	–
RPGX090700T01020	9,53	–	–	–	●	–
RPGX120700E	12,70	–	–	●	●	–
RPGX120700T01020	12,70	–	–	–	●	–



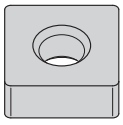


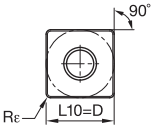
● primeira opção
○ opção alternativa

P			
M			
K			
N			
S	●	●	○
H	○		●

SNGN

ISO código do produto	D	L10	Rε	KYS25	KYS30	KB1630
SNGN120408T01020	12,70	12,70	0,8	–	●	–
SNGN120412T01020	12,70	12,70	1,2	–	●	–
SNGN120416T01020	12,70	12,70	1,6	●	●	–
SNGN120716T01020	12,70	12,70	1,6	–	●	–
SNGN190616E	19,05	19,05	1,6	●	–	–
SNGN190616T01020	19,05	19,05	1,6	–	●	–
SNGN190724E	19,05	19,05	2,4	–	●	–

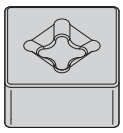


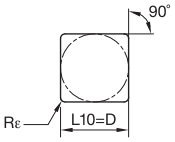


SNGA

ISO código do produto	D	L10	Rε	KYS25	KYS30	KB1630
SNGA120412T01020	12,70	12,70	1,2	●	●	–

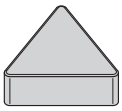
NOTA: Para suportes e barras internas, consulte páginas B105–B121.

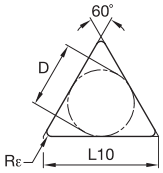




SNGX

ISO código do produto	D	L10	Rε	KYS25	KYS30	KB1630
SNGX120712T01020	12,70	12,70	1,2	–	●	–
SNGX120716T01020	12,70	12,70	1,6	–	●	–



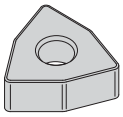


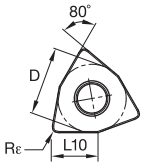
● primeira opção
○ opção alternativa

P			
M			
K			
N			
S	●	●	○
H	○		●

TNGN

ISO código do produto	D	L10	Rε	KYS25	KYS30	KB1630
TNGN220412T01020	12,70	22,00	1,2	●	–	–
TNGN220416T01020	12,70	22,00	1,6	●	–	–

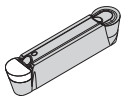


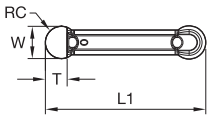


WNGA

ISO código do produto	D	L10	Rε	KYS25	KYS30	KB1630
WNGA080408T01020	12,70	8,69	0,8	–	●	–
WNGA080416T01020	12,70	8,69	1,6	–	●	–

NOTA: Para suportes e barras internas, consulte páginas B161–B165.





● primeira opção
○ opção alternativa

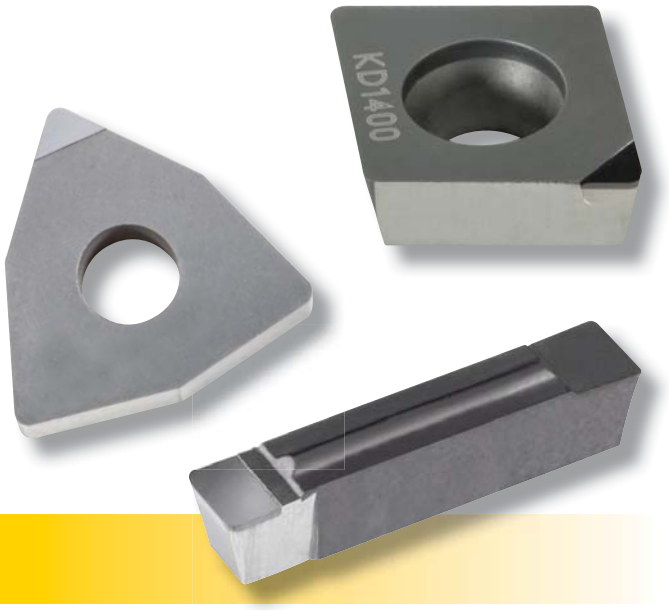
		KCU10	KCU25	KCP10	KCP25	KCK20	K313	KC5010	KC5025	KY3500	KT315	KB1630	KB5625	KD1405
P		●	●	●	●	○		○	○		●			
M		●	●				○	●	○					
K		○	○	○	○	●	○	○	○	●	○	○		
N		●	○				●	●	○					●
S		●	●				●	○	○			○		
H		○						○				●	●	

Precisão de topo plano com raio total retificada • PcBN

código do produto	tamanho do inserto	W	RC	LI	T	KCU10	KCU25	KCP10	KCP25	KCK20	K313	KC5010	KC5025	KY3500	KT315	KB1630	KB5625	KD1405
A4R0300M03P00EST	3	3,00	1,5	20	2,2	–	–	–	–	–	–	–	–	–	–	●	–	–
A4R0400M04P00EST	4	4,00	2,0	20	2,9	–	–	–	–	–	–	–	–	–	–	●	–	–
A4R0500M05P00EST	5	5,00	2,5	25	3,7	–	–	–	–	–	–	–	–	–	–	●	–	–
A4R0600M06P00EST	6	6,00	3,0	30	4,4	–	–	–	–	–	–	–	–	–	–	●	–	–

NOTA: Para suportes, barras internas e lâminas A4, consulte páginas C104–C135.

Insertos de diamante policristalino



Insertos de diamante policristalino (PCD)

- Usados para usinagem de ligas resistentes a altas temperaturas e em usinagem direcionada a materiais não ferrosos.
- Vantagem significativa de dureza em comparação com os insertos de metal duro.
- Produtividade aumentada por meio de velocidades maiores e maior vida útil da ferramenta.
- Melhor utilização no processamento de materiais que não podem ser usinados com as ferramentas convencionais.

Classe KD1400™

- Ideal para torneamento de propósitos gerais de materiais não ferrosos.
- Uso em ligas de alumínio com baixo e médio teor de silício, em ligas não metálicas, de cobre e baseadas em latão e zinco.
- Excelente resistência ao choque mecânico.
- Usado em uma ampla variedade de cortes contínuos a interrompidos, onde o acabamento superficial é necessário.



Classe KD1405™

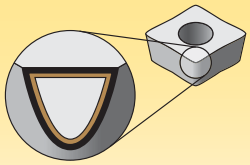
- É o material de ferramentas de maior resistência à abrasão para materiais não ferrosos e não metálicos da Kennametal.
- Usado quando a resistência à abrasão é necessária na aplicação.
- Classe CVD diamante.



Classe KD1425™

- Projetado para a obtenção de resistência extrema à abrasão.
- Ótima resistência de aresta em aplicações exigentes.
- É a escolha ideal para ligas de alumínio de alto teor de silício, materiais bimetálicos, plásticos reforçados com fibra de carbono e outros materiais não metálicos abrasivos.



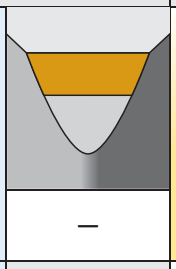
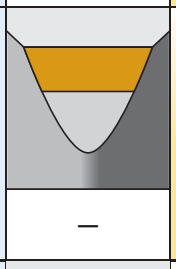
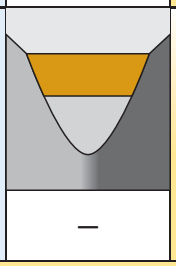


Os revestimentos proporcionam capacidade de alta velocidade e são projetados para acabamento e desbaste leve.

P	Aço
M	Aço inoxidável
K	Ferro fundido
N	Materiais não ferrosos
S	Ligas resistentes a altas temperaturas
H	Materiais endurecidos

resistência ao desgaste ← → **tenacidade**

PCD — Classes de diamante policristalino

Revestimento	Descrição da classe		05	10	15	20	25	30	35	40	45
KD1400 	**Composição:** Inserto com ponta soldada de diamante policristalino (PCD) com grãos ultrafinos. **Aplicação:** Projetado para torneamento em geral de materiais basicamente não ferrosos. Pode ser aplicado em uma ampla gama de cortes contínuos e interrompidos onde é necessário um excelente acabamento superficial. Use em ligas de alumínio com baixo a médio teor de silício, ligas não metálicas, ligas à base de cobre, de bronze e de zinco. O tamanho de partícula de grãos ultrafinos permite acabamentos superficiais excelentes, ao mesmo tempo que garantem a melhor resistência a choques mecânicos em relação a qualquer ferramenta de corte de PCD.	N	■	■	■						
		S	■								
KD1405 	**Composição:** Inserto com ponta de lâmina de diamante puro diretamente soldada com revestimento CVD. **Aplicação:** O KD1405™ é o material para ferramentas da Kennametal mais resistente à abrasão na usinagem de materiais não ferrosos e não metálicos. Melhor aplicado quando a resistência à abrasão é o recurso desejado.	N	■	■							
		S	■								
KD1425 	**Composição:** Inserto com ponta soldada de diamante policristalino (PCD) multimodal com variedade de tamanhos de grãos. **Aplicação:** Desenvolvido para extrema resistência à abrasão combinada com boa resistência da aresta em aplicações difíceis. A opção ideal para ligas de alumínio com alto teor de silício, materiais bimetálicos (AL/GCI), MMC, plásticos reforçados com fibra de carbono (CFRP) e outros materiais abrasivos não metálicos.	N		■	■	■					

Classes PVD Beyond™



Os revestimentos avançados PVD Beyond™ resistem adequadamente a altas temperaturas associadas à usinagem de ligas tenazes. Esses revestimentos oferecem uma maior vida útil da ferramenta e um impulso na produtividade para os mercados de engenharia geral, transportes, aeroespacial, energia e terraplenagem. Use a força dos revestimentos Beyond PVD e a ampla oferta de produtos para realizar o torneamento, operações de canal e corte em uma variedade de materiais e aplicações. Os revestimentos Beyond PVD ajudam a manter o controle de consistência do cavaco e minimiza o desgaste da aresta do inserto.

beyond™

KCU10™

- Classe com revestimento PVD com excelente resistência a desgaste. De acabamento até aplicações médias.
- Use em todos os materiais, especialmente em aços inoxidáveis e ligas resistentes a altas temperaturas.

KCU25™

- Classe com revestimento PVD com dureza da aresta superior e excelente resistência a desgaste. Aplicações desde usinagem média até aplicações orientadas para desbaste.
- Use em todos os materiais.

Conheça as vantagens no seu distribuidor autorizado da Kennametal ou no site **kennametal.com**.

KENNAMETAL®

kennametal.com

Etapa 1 • Escolha a geometria do inserto

Insertos negativos

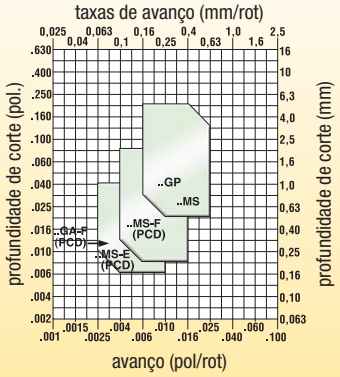


..MS-E (PCD) Acabamento

..GA-F (PCD) Acabamento



..GA-E (PCD) Acabamento fino

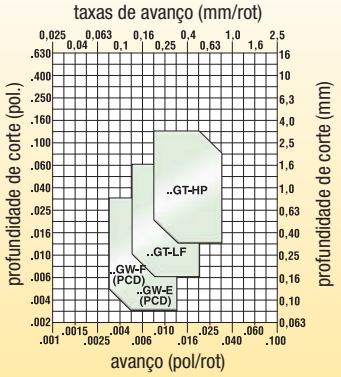


Insertos positivos



..GW-F (PCD)

..GW-E (PCD)



Etapa 2 • Escolha a classe

condições de corte	Geometria do inserto negativa ..GA-E (PCD)	..MS-E (PCD)	Geometria do inserto positiva ..GA-F (PCD)	..GW-E (PCD)	..GW-F (PCD)
corte altamente interrompido	–	–	KD1400	–	KD1400
corte ligeiramente interrompido	KD1405	KD1405	KD1400	KD1405	KD1400
profundidade de corte, fundição ou superfície de forja variável	KD1405	KD1405	KD1425	KD1405	KD1425
corte liso, superfície pré-torneada	KD1405	KD1405	KD1425	KD1405	KD1425

Etapa 3 • Escolha a velocidade de corte

Ligas de alumínio de baixo teor de silício (Hipoeutético <12,2% Si) e ligas magnéticas

grupo de materiais	classe	velocidade — m/min. (SFM) 250 (800)	500 (1600)	750 (2400)	1000 (3200)	1250 (4000)	1500 (4800)	1750 (5600)	2000 (6400)	2250 (7200)	2500 (8000)	Condições iniciais m/min.	SFM
N1	KD1400			◁▷								765	2500

Ligas de alumínio com alto teor de silício (Hipereutético >12,2% Si) e ligas magnéticas

grupo de materiais	classe	velocidade — m/min. (SFM) 250 (800)	500 (1600)	750 (2400)	1000 (3200)	Condições iniciais m/min.	SFM
N3	KD1405		◁▷			550	1800
	KD1425		◁▷			765	2500

Recomendações de velocidade de corte adicionais para materiais das peças variados

Faixa do índice de usinabilidade com base em zinco, latão e cobre de 70 a 100 — velocidade — m/min. (SFM) — Condições iniciais ◁▷

grupo de materiais	classe	250 (800)	500 (1600)	750 (2400)	1000 (3200)	m/min.	SFM
N4	KD1400/KD1405		◁▷			520	1700
	KD1425		◁▷			500	1600

Náilon, plásticos, borrachas, fenóis, resinas, fibra de vidro e vidro — velocidade — m/min. (SFM) — Condições iniciais ◁▷

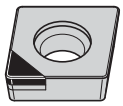
grupo de materiais	classe	250 (800)	500 (1600)	750 (2400)	1000 (3200)	m/min.	SFM
N5	KD1400/KD1405		◁▷			400	1300
	KD1425	◁▷				365	1200

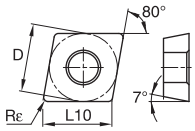
Compósitos de grafite e carbono:
Ligas escovadas, Kevlar e grafite (280 a 400 HB) (30 a 43 HRC) — velocidade — m/min. (SFM) — Condições iniciais ◁▷

grupo de materiais	classe	250 (800)	500 (1600)	750 (2400)	1000 (3200)	m/min.	SFM
N6	KD1400/KD1405			◁▷		760	2500

MMCs (Composto de matriz de metal à base de alumínio) — velocidade — m/min. (SFM) — Condições iniciais ◁▷

grupo de materiais	classe	250 (800)	500 (1600)	750 (2400)	1000 (3200)	m/min.	SFM
N7	KD1405		◁▷			460	1500
	KD1400		◁▷			365	1200





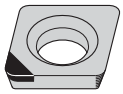
● primeira opção
○ opção alternativa

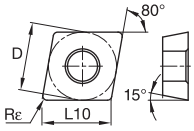
P			
M			
K			
N	●	○	●
S		●	●
H			

CCGW-FST

ISO código do produto	D	L10	Rε	KD1400	KD1405	KD1425
CCGW060204FST	6,35	6,45	0,4	●	–	●
CCGW09T304FST	9,53	9,67	0,4	●	–	●
CCGW09T308FST	9,53	9,67	0,8	●	–	●

NOTA: Para suportes e barras internas, consulte páginas B179–B183.

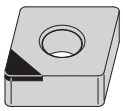


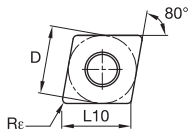


CDHB-FST

ISO código do produto	D	L10	Rε	KD1400	KD1405	KD1425
CDHBS4T002FST	3,97	4,03	0,2	●	–	●
CDHBS4T0X0FST	3,97	4,03	0,1	●	–	–

NOTA: Para suportes e barras internas, consulte páginas B185–B187.

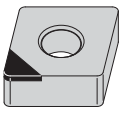


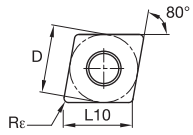


CNGA

ISO código do produto	D	L10	Rε	KD1400	KD1405	KD1425
CNGA120404E	12,70	12,90	0,4	–	●	–
CNGA120408E	12,70	12,90	0,8	–	●	–

NOTA: Para suportes e barras internas, consulte páginas B58–B73.

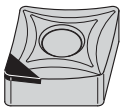


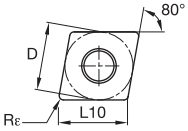


CNGA-FST

ISO código do produto	D	L10	Rε	KD1400	KD1405	KD1425
CNGA120404FST	12,70	12,90	0,4	●	–	●
CNGA120408FST	12,70	12,90	0,8	●	–	●

NOTA: Para suportes e barras internas, consulte páginas B58–B73.





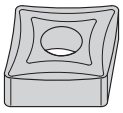
● primeira opção
○ opção alternativa

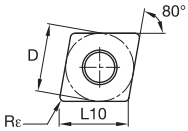
P			
M			
K			
N	●	○	●
S		●	●
H			

CNMS-E

ISO código do produto	D	L10	Rε	KD1400	KD1405	KD1425
CNMS120408E	12,70	12,90	0,8	–	●	–

NOTA: Para suportes e barras internas, consulte páginas B58–B73.

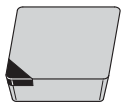


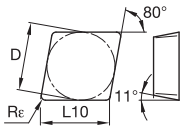


CNMS-FST

ISO código do produto	D	L10	Rε	KD1400	KD1405	KD1425
CNMS120404FST	12,70	12,90	0,4	●	–	–
CNMS120408FST	12,70	12,90	0,8	●	–	●

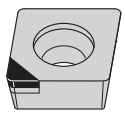
NOTA: Para suportes e barras internas, consulte páginas B58–B73.

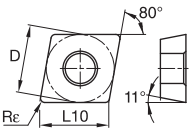




CPGN

ISO código do produto	D	L10	Rε	KD1400	KD1405	KD1425
CPGN120304F	12,70	12,90	0,4	–	–	●
CPGN120308F	12,70	12,90	0,8	–	–	●

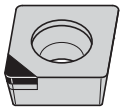


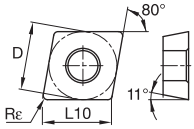


CPGW-E-F

ISO código do produto	D	L10	Rε	KD1400	KD1405	KD1425
CPGW060204E	6,35	6,45	0,4	–	●	–
CPGW09T304E	9,53	9,67	0,4	–	●	–

NOTA: Para suportes e barras internas, consulte páginas B192–B205.





● primeira opção
○ opção alternativa

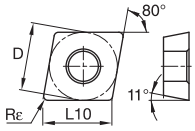
P			
M			
K			
N	●	○	●
S		●	●
H			

CPGW-FWST

ISO código do produto	D	L10	Rε	KD1400	KD1405	KD1425
CPGW060204FWST	6,35	6,45	0,4	●	–	●
CPGW09T308FWST	9,53	9,67	0,8	●	–	●
CPGW120408FWST	12,70	12,90	0,8	●	–	●

NOTA: Para suportes e barras internas, consulte páginas B192–B205.

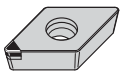


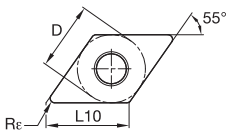


CPGW-ST

ISO código do produto	D	L10	Rε	KD1400	KD1405	KD1425
CPGW060202FST	6,35	6,45	0,2	●	–	●
CPGW060204FST	6,35	6,45	0,4	●	–	●
CPGW060208FST	6,35	6,45	0,8	●	–	●
CPGW09T304FST	9,53	9,67	0,4	●	–	●
CPGW09T308FST	9,53	9,67	0,8	●	–	●

NOTA: Para suportes e barras internas, consulte páginas B192–B205.

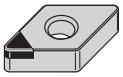


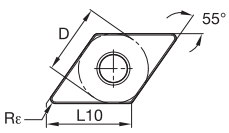


DCGW-ST

ISO código do produto	D	L10	Rε	KD1400	KD1405	KD1425
DCGW070204FST	6,35	7,75	0,4	●	–	●
DCGW11T304FST	9,53	11,63	0,4	●	–	●

NOTA: Para suportes e barras internas, consulte páginas B209–B213.





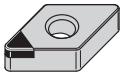
DNGA

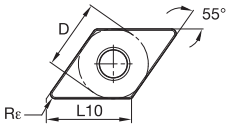
ISO código do produto	D	L10	Rε	KD1400	KD1405	KD1425
DNGA150404E	12,70	15,50	0,4	–	●	–

NOTA: Para suportes e barras internas, consulte páginas B85–B93.

● primeira opção
○ opção alternativa

P			
M			
K			
N	●	○	●
S		●	●
H			

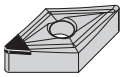


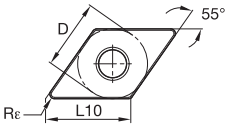


DNGA-FST

ISO código do produto	D	L10	Rε	KD1400	KD1405	KD1425
DNGA150404FST	12,70	15,50	0,4	●	–	●
DNGA150408FST	12,70	15,50	0,8	●	–	●

NOTA: Para suportes e barras internas, consulte páginas B192–B205.

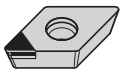


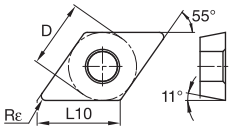


DNMS-FST

ISO código do produto	D	L10	Rε	KD1400	KD1405	KD1425
DNMS150404FST	12,70	15,50	0,4	●	–	–
DNMS150408FST	12,70	15,50	0,8	●	–	●

NOTA: Para suportes e barras internas, consulte páginas B192–B205.





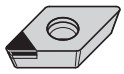
DPGW-E

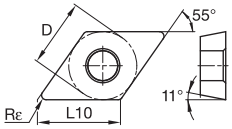
ISO código do produto	D	L10	Rε	KD1400	KD1405	KD1425
DPGW11T304E	9,53	11,63	0,4	–	●	–

NOTA: Para suportes e barras internas, consulte páginas B217–B221.

● primeira opção
○ opção alternativa

P				
M				
K				
N	●	○	●	
S		●	●	
H				

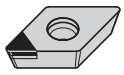


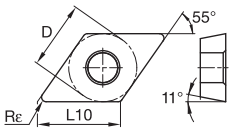


DPGW-FST

ISO código do produto	D	L10	Rε	KD1400	KD1405	KD1425
DPGW070202FST	6,35	7,75	0,2	●	–	●
DPGW070204FST	6,35	7,75	0,4	●	–	●
DPGW11T304FST	9,53	11,63	0,4	●	–	●

NOTA: Para suportes e barras internas, consulte páginas B217–B221.

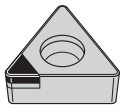


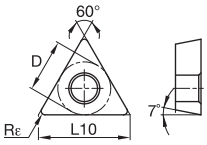


DPGW-FWST

ISO código do produto	D	L10	Rε	KD1400	KD1405	KD1425
DPGW11T304FWST	9,53	11,63	0,2	–	–	●

NOTA: Para suportes e barras internas, consulte páginas B217–B221.

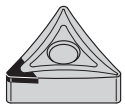


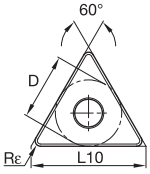


TCGW-FST

ISO código do produto	D	L10	Rε	KD1400	KD1405	KD1425
TCGW110204FST	6,35	11,00	0,4	●	–	●
TCGW16T304FST	9,53	16,50	0,4	●	–	–

NOTA: Para suportes e barras internas, consulte páginas B247–B248.

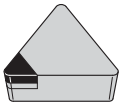


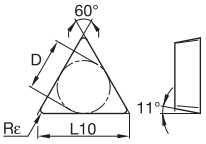


TNMS-FST

ISO código do produto	D	L10	Rε	KD1400	KD1405	KD1425
TNMS160404FST	9,53	16,50	0,4	●	–	●
TNMS160408FST	9,53	16,50	0,8	●	–	●

NOTA: Para suportes e barras internas, consulte páginas B132–B142.



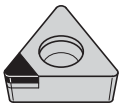


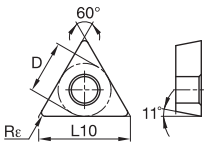
● primeira opção
○ opção alternativa

P				
M				
K				
N	●	○	●	
S		●	●	
H				

TPGN

ISO código do produto	D	L10	Rε	KD1400	KD1405	KD1425
TPGN110304F	6,35	11,00	0,4	–	–	●
TPGN160304F	9,53	16,50	0,4	–	–	●
TPGN160308F	9,53	16,50	0,8	–	–	●
TPGN220408F	12,70	22,00	0,8	–	–	●

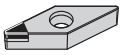


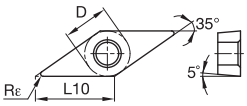


TPGW-FST

ISO código do produto	D	L10	Rε	KD1400	KD1405	KD1425
TPGW110204FST	6,35	11,00	0,4	●	–	●
TPGW110208FST	6,35	11,00	0,8	●	–	–
TPGW16T304FST	9,53	16,50	0,4	–	–	●
TPGW16T308FST	9,53	16,50	0,8	●	–	●

NOTA: Para suportes e barras internas, consulte páginas B257–B263.





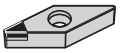
VBGW-E

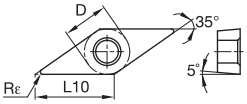
ISO código do produto	D	L10	Rε	KD1400	KD1405	KD1425
VBGW160408E	9,53	16,61	0,8	–	●	–

NOTA: Para suportes e barras internas, consulte páginas B266–B269.

● primeira opção
○ opção alternativa

P				
M				
K				
N	●	○	●	
S		●	●	
H				

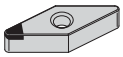


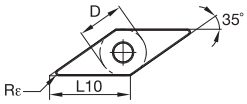


VBGW-FST

ISO código do produto	D	L10	Rε	KD1400	KD1405	KD1425
VBGW110304FST	6,35	11,07	0,4	●	–	●
VBGW160404FST	9,53	16,61	0,4	●	–	●

NOTA: Para suportes e barras internas, consulte páginas B266–B269.

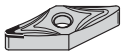


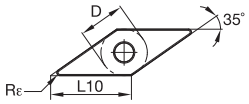


VNGA-FST

ISO código do produto	D	L10	Rε	KD1400	KD1405	KD1425
VNGA160404FST	9,53	16,61	0,4	●	–	–
VNGA160408FST	9,53	16,61	0,8	●	–	●

NOTA: Para suportes e barras internas, consulte páginas B149–B153.

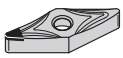


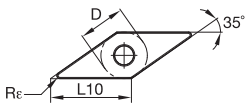


VNMS-E

ISO código do produto	D	L10	Rε	KD1400	KD1405	KD1425
VNMS160404E	9,53	16,61	0,4	–	●	–
VNMS160408E	9,53	16,61	0,8	–	●	–

NOTA: Para suportes e barras internas, consulte páginas B149–B153.

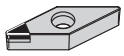


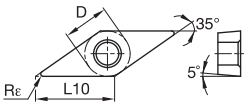


VNMS-FST

ISO código do produto	D	L10	Rε	KD1400	KD1405	KD1425
VNMS160404FST	9,53	16,61	0,4	●	–	●
VNMS160408FST	9,53	16,61	0,8	●	–	●

NOTA: Para suportes e barras internas, consulte páginas B149–B153.



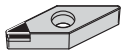


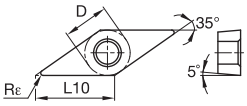
● primeira opção
○ opção alternativa

P				
M				
K				
N	●	○	●	
S		●	●	
H				

VPGN

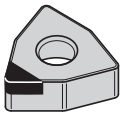
ISO código do produto	D	L10	Rε	KD1400	KD1405	KD1425
VCGN160404	9,53	16,61	0,4	–	–	●
VCGN160408	9,53	16,61	0,8	–	–	●

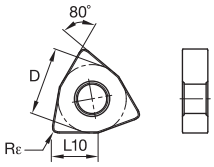




VPGR

ISO código do produto	D	L10	Rε	KD1400	KD1405	KD1425
VCGR160404	9,53	16,61	0,4	–	–	●
VCGR160408	9,52	16,61	0,8	–	–	●
VCGR160412	9,53	16,61	1,2	–	–	●

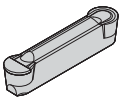


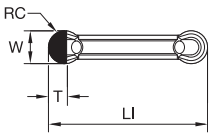


WNGA-FST

ISO código do produto	D	L10	Rε	KD1400	KD1405	KD1425
WNGA080408FST	12,70	8,69	0,8	–	–	●

NOTA: Para suportes e barras internas, consulte páginas B161–B165.





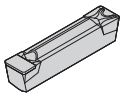
● primeira opção
○ opção alternativa

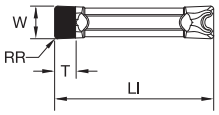
		KCU10	KCU25	KCP10	KCP25	KCK20	K313	KC5010	KC5025	KY3500	KT315	KB1630	KB5625	KD1405
P		●	●	●	●	○		○	○		●			
M		●	●				○	●	○					
K		○	○	○	○	●	○	○	○	●	○	○		
N		●	○				●	●	○					●
S		●	●				●	○	○			○		
H		○						○				●	●	

Retificado de precisão de topo plano com raio completo • PcD

código do produto	tamanho do inserto	W	RC	LI	T	KCU10	KCU25	KCP10	KCP25	KCK20	K313	KC5010	KC5025	KY3500	KT315	KB1630	KB5625	KD1405
A4R0500M05P00E	5	5,00	2,5	25	3,0	–	–	–	–	–	–	–	–	–	–	–	–	●

NOTA: Para suportes, barras internas e lâminas A4, consulte páginas C104–C135.

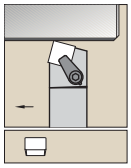


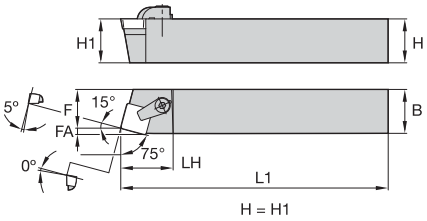


Precisão de topo plano retificada • PCD

código do produto	tamanho do inserto	W	RR	LI	T	KCU10	KCU25	KCP10	KCP25	KCK20	K313	KC5010	KC5025	KY3500	KT315	KB1630	KB5625	KD1405
A4G0300M03P04E	3	3,00	0,4	20	3,0	–	–	–	–	–	–	–	–	–	–	–	–	●
A4G0400M04P04E	4	4,00	0,4	20	3,0	–	–	–	–	–	–	–	–	–	–	–	–	●
A4G0500M05P08E	5	5,00	0,8	25	3,0	–	–	–	–	–	–	–	–	–	–	–	–	●

NOTA: Para suportes, barras internas e lâminas A4, consulte páginas C104–C135.

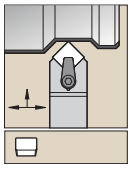


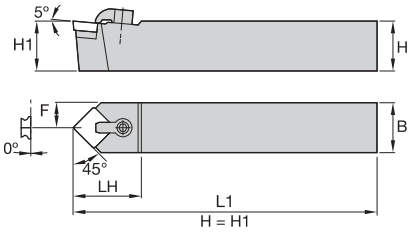


CSBP 75°



número para pedido	código do produto	H	B	F	L1	LH	FA	inserto padrão	calço	parafuso do calço	sexta-vada	grampo	parafuso do grampo	sexta-vada
corte à direita (R)														
1097750	**CSBPR2020K12**	20	20	17,0	125	30,0	3,1	SP..120308	**SM840**	**MS111**	2 mm	**CKM10**	**STCM8**	4 mm

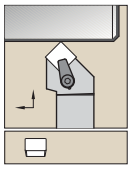


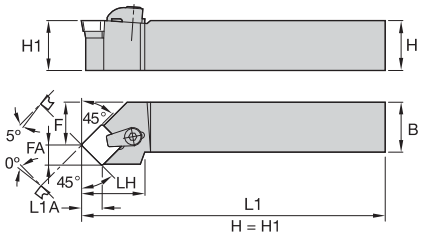


CSDP 45°



número para pedido	código do produto	H	B	F	L1	LH	inserto padrão	calço	parafuso do calço	sexta-vada	grampo	parafuso do grampo	sexta-vada
1097754	**CSDPN2020K12**	20	20	10,0	125	32,0	SP..120308	**SM840**	**MS111**	2 mm	**CKM10**	**STCM8**	4 mm
1097755	**CSDPN2525M12**	25	25	12,5	150	32,0	SP..120308	**SM840**	**MS111**	2 mm	**CKM9**	**STCM4**	4 mm

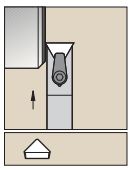


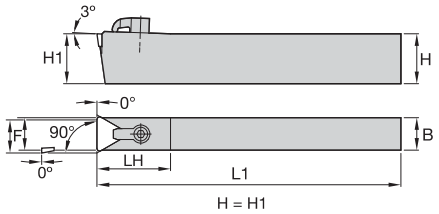


CSSP 45°



número para pedido	código do produto	H	B	F	L1	LH	FA	L1A	inserto padrão	calço	parafuso do calço	sexta-vada	grampo	parafuso do grampo	sexta-vada
corte à direita (R)															
1244605	**CSSPR2020K12**	20	20	25,0	125	32,0	8,7	8,3	SP..120308	**SM840**	**MS111**	2 mm	**CKM10**	**STCM8**	4 mm
1244606	**CSSPR2525M12**	25	25	32,0	150	32,0	8,7	8,3	SP..120308	**SM840**	**MS111**	2 mm	**CKM9**	**STCM4**	4 mm
corte à esquerda (L)															
1244604	**CSSPL2525M12**	25	25	32,0	150	32,0	8,7	8,3	SP..120308	**SM840**	**MS111**	2 mm	**CKM9**	**STCM4**	4 mm

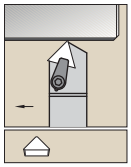


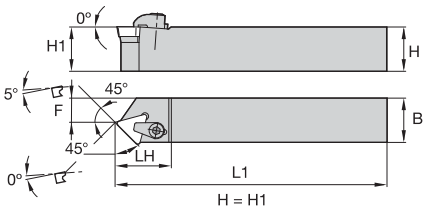


CTCPN 90°



número para pedido	código do produto	H	B	F	L1	LH	inserto padrão	calço	parafuso do calço	sexta-vada	grampo	parafuso do grampo	sexta-vada
1097775	**CTCPN2510M11**	25	10	10,0	150	26,0	TP..110304	**SM819**	**MS960**	–	**CKM7**	**STCM5**	2.5 mm
1097776	**CTCPN2514M16**	25	14	14,4	150	28,0	TP..160308	**SM841**	**MS111**	2 mm	**CKM13**	**STCM4**	4 mm
1097781	**CTCPN2518M22**	25	18	19,2	150	41,0	TP..220408	**SM837**	**MS125**	2.5 mm	**CKM13**	**STCM4**	4 mm
1097778	**CTCPN2520M22**	25	20	20,2	150	41,0	TP..220408	**SM837**	**MS125**	2.5 mm	**CKM13**	**STCM4**	4 mm



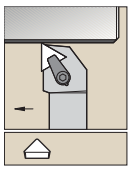


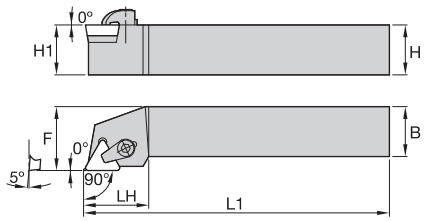
CTDP 45°






número para pedido	código do produto	H	B	F	L1	LH	inserto padrão	calço	parafuso do calço	grampo	parafuso do grampo	sexta-vada
corte à direita (R)												
1244613	**CTDPR1212F11**	12	12	6,0	80	22,0	TP..110304	**SM819**	**MS960**	**CKM19**	**STCM9**	2.5 mm



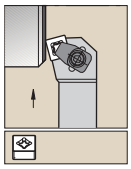


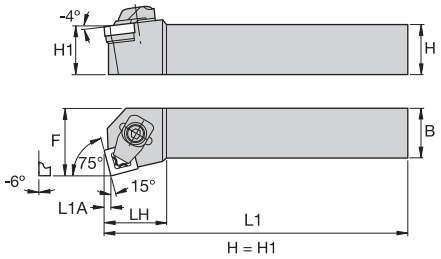
CTGP 90°






número para pedido	código do produto	H	B	F	L1	LH	inserto padrão	calço	parafuso do calço	sexta-vada	grampo	parafuso do grampo	sexta-vada
corte à direita (R)													
1097762	**CTGPR1212F11**	12	12	16,0	80	20,0	TP..110304	**SM819**	**MS960**	–	**CKM19**	**STCM9**	2.5 mm
1097763	**CTGPR1616H11**	16	16	20,0	100	20,0	TP..110304	**SM819**	**MS960**	–	**CKM19**	**STCM9**	2.5 mm
1244595	**CTGPR2020K11**	20	20	25,0	125	20,0	TP..110304	**SM819**	**MS960**	–	**CKM19**	**STCM9**	2.5 mm
1097764	**CTGPR2020K16**	20	20	25,0	125	26,0	TP..160308	**SM841**	**MS111**	2 mm	**CKM10**	**STCM8**	4 mm
1097765	**CTGPR2525M16**	25	25	32,0	150	26,0	TP..160308	**SM841**	**MS111**	2 mm	**CKM9**	**STCM4**	4 mm
corte à esquerda (L)													
1097916	**CTGPL1212F11**	12	12	16,0	80	20,0	TP..110304	**SM819**	**MS960**	–	**CKM19**	**STCM9**	2.5 mm
1097918	**CTGPL2020K16**	20	20	25,0	125	26,0	TP..160308	**SM841**	**MS111**	2 mm	**CKM10**	**STCM8**	4 mm
1097919	**CTGPL2525M16**	25	25	32,0	150	26,0	TP..160308	**SM841**	**MS111**	2 mm	**CKM9**	**STCM4**	4 mm





CCKN 75° • MX

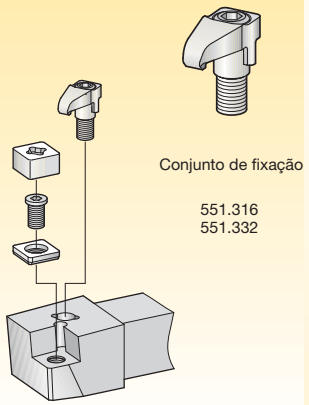




número para pedido	código do produto	H	B	F	L1	LH	L1A	inserto padrão	calço	parafuso do calço	sexta-vada	conjunto do grampo	sexta-vada
corte à direita (R)													
2891706	**CCKNR2525M12MX7**	25	25	32,0	150	32,0	3,1	CNGX120708	**552.221**	**554.252**	2.5 mm	**551.013**	4 mm
corte à esquerda (L)													
2891727	**CCKNL2525M12MX7**	25	25	32,0	150	32,0	3,1	CNGX120708	**552.221**	**554.252**	2.5 mm	**551.013**	4 mm

Acessórios • Versões de fixação -MX, -MN, -MF e -MA

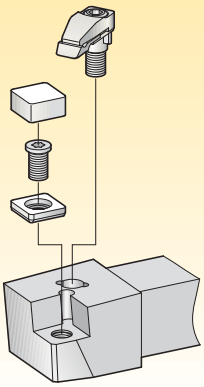
Modo de fixação MX



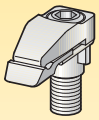
Conjunto de fixação

551.316
551.332

Modo de fixação MN

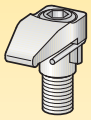


Elementos de fixação individual



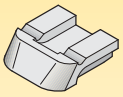
Conjunto de fixação

551.251
551.255



Grampo de fixação

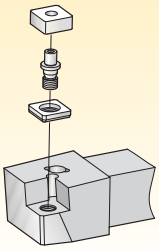
551.333
551.317

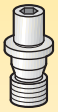


Placa de pressão

557.111
557.111

Modo de fixação MA

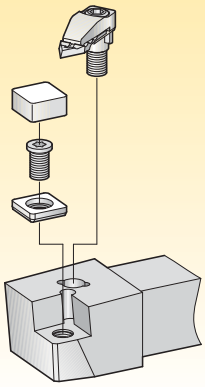




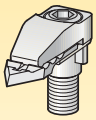
Pino de trava

554.016
554.017
554.018

Modo de fixação MF

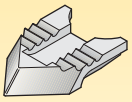


Elementos de fixação individual



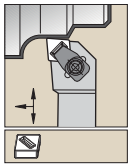
Conjunto de fixação

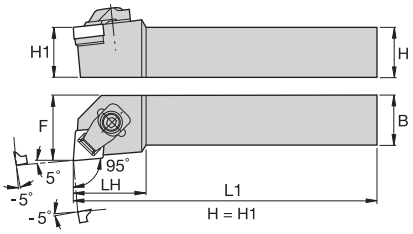
551.252
551.253
551.254
551.256
551.257
551.258
551.260
551.261



Quebra-cavacos

557.125
557.126
557.127
557.120
557.121
557.122
557.123
557.124





CCLN 95° • MX





número para pedido	código do produto	H	B	F	L1	LH	inserto padrão	calço	parafuso do calço	sexta-vada	conjunto do grampo	sexta-vada
corte à direita (R)												
1260025	**CCLNR2525M12-MX7**	25	25	32,0	150	32,0	CN.X120708	**552.221**	**554.252**	2.5 mm	**551.316**	4 mm
1260028	**CCLNR3225P12-MX7**	32	25	32,0	170	32,0	CN.X120708	**552.221**	**554.252**	2.5 mm	**551.316**	4 mm
corte à esquerda (L)												
1260017	**CCLNL2525M12-MX7**	25	25	32,0	150	30,0	CN.X120708	**552.221**	**554.252**	2.5 mm	**551.316**	4 mm
1260020	**CCLNL3225P12-MX7**	32	25	32,0	170	32,0	CN.X120708	**552.221**	**554.252**	2.5 mm	**551.316**	4 mm

CCLN 95° • MN

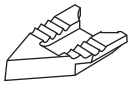





número para pedido	código do produto	H	B	F	L1	LH	inserto padrão	calço	parafuso do calço	sexta-vada	placa de pressão	conjunto do grampo	sexta-vada
corte à direita (R)													
1260023	**CCLNR2525M12-MN4**	25	25	32,0	150	32,0	CN.N120408	**552.220**	**554.252**	2.5 mm	**557.111**	**551.317**	4 mm
1260024	**CCLNR2525M12-MN7**	25	25	32,0	150	32,0	CN.N120708	**552.221**	**554.252**	2.5 mm	**557.111**	**551.317**	4 mm
1504937	**CCLNR3225P12-MN4**	32	25	32,0	170	32,0	CN.N120408	**552.220**	**554.252**	2.5 mm	**557.111**	**551.317**	4 mm
1260027	**CCLNR3225P12-MN7**	32	25	32,0	170	32,0	CN.N120708	**552.221**	**554.252**	2.5 mm	**557.111**	**551.317**	4 mm
corte à esquerda (L)													
1260015	**CCLNL2525M12-MN4**	25	25	32,0	150	32,0	CN.N120408	**552.220**	**554.252**	2.5 mm	**557.111**	**551.317**	4 mm
1260016	**CCLNL2525M12-MN7**	25	25	32,0	150	32,0	CN.N120708	**552.221**	**554.252**	2.5 mm	**557.111**	**551.317**	4 mm
1504931	**CCLNL3225P12-MN7**	32	25	32,0	170	32,0	CN.N120708	**552.221**	**554.252**	2.5 mm	**557.111**	**551.317**	4 mm

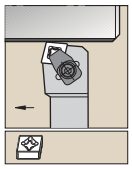
CCLN 95° • MF

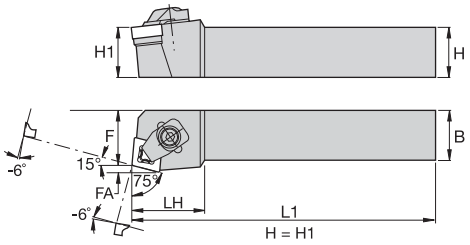




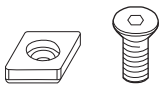
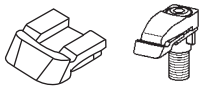

número para pedido	código do produto	H	B	F	L1	LH	inserto padrão	calço	parafuso do calço	sexta-vada	quebra-cavacos	conjunto do grampo	sexta-vada
corte à direita (R)													
1260022	**CCLNR2525M12-MF4**	25	25	32,0	150	32,0	CN.N120408	**552.220**	**554.252**	2.5 mm	**557.125**	**551.317**	4 mm
1503826	**CCLNR2525M12-MF7**	25	25	32,0	150	32,0	CN.N120708	**552.221**	**554.252**	2.5 mm	**557.125**	**551.317**	4 mm
corte à esquerda (L)													
1260014	**CCLNL2525M12-MF4**	25	25	32,0	150	32,0	CN.N120408	**552.220**	**554.252**	2.5 mm	**557.125**	**551.317**	4 mm
1504935	**CCLNL2525M12-MF7**	25	25	32,0	150	32,0	CN.N120708	**552.221**	**554.252**	2.5 mm	**557.125**	**551.317**	4 mm

NOTA: A versão de fixação mostrada é a MX.
O suporte básico pode ser pedido separadamente:
V.CLN R/L 2525M12
V.CLN R/L 3225P12
V.CLN R/L 3225P16



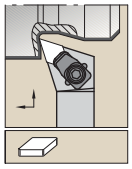


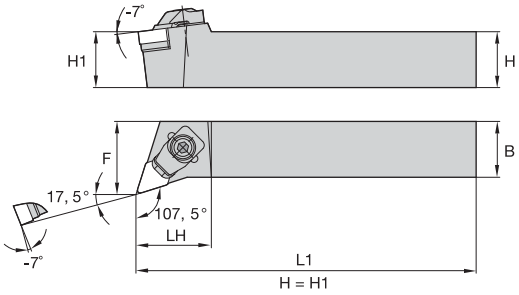
CCRN 75° • MN

número para pedido	código do produto	H	B	F	L1	LH	FA	inserto padrão	calço	parafuso do calço	sexta-vada	placa de pressão	conjunto do grampo	sexta-vada
corte à direita (R)														
1504885	**CCRNR3225P12-MN7**	32	25	27,0	170	35,0	3,1	CN.N120708	**552.221**	**554.252**	2.5 mm	**557.111**	**551.317**	4 mm
corte à esquerda (L)														
1503827	**CCRNL2525M12-MN7**	25	25	27,0	150	35,0	3,1	CN.N120708	**552.221**	**554.252**	2.5 mm	**557.111**	**551.317**	4 mm

NOTA: A versão de fixação mostrada é a MX.
O suporte básico pode ser pedido separadamente:
V.CRN R/L 2525M12
V.CRN R/L 3225P12
V.CRN R/L 3225P16





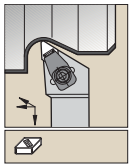
CDHN 107,5° • MX

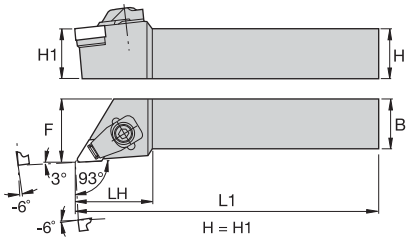




número para pedido	código do produto	H	B	F	L1	LH	inserto padrão	calço	parafuso do calço	sexta-vada	conjunto do grampo	sexta-vada
corte à direita (R)												
1505504	**CDHNR2525M12-MX7**	25	25	32,0	150	30,0	DN.X120708	**552.225**	**554.254**	2.5 mm	**551.316**	4 mm

NOTA: A versão de fixação mostrada é a MN.
O suporte básico pode ser pedido separadamente:
V.DHN R/L 2525M12
V.DHN R/L 2525M15
V.DHN R/L 3225P15





CDJN 93° • MX





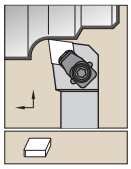
número para pedido	código do produto	H	B	F	L1	LH	inserto padrão	calço	parafuso do calço	sexta-vada	conjunto do grampo	sexta-vada
corte à direita (R)												
1260177	**CDJNR2525M15-MX7**	25	25	32,0	150	38,0	DN.X150708	**552.228**	**554.252**	2.5 mm	**551.332**	4 mm
corte à esquerda (L)												
1260172	**CDJNL2525M12-MX7**	25	25	32,0	150	38,0	DN.X120708	**552.225**	**554.254**	2.5 mm	**551.316**	4 mm
1504968	**CDJNL2525M15MX7**	25	25	32,0	150	38,0	DN.X150708	**552.228**	**554.252**	2.5 mm	**551.332**	4 mm

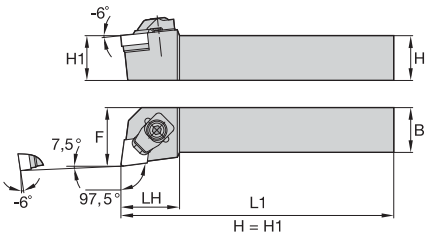
CDJN 93° • MN






número para pedido	código do produto	H	B	F	L1	LH	inserto padrão	calço	parafuso do calço	sexta-vada	placa de pressão	conjunto do grampo	sexta-vada
corte à direita (R)													
1260176	**CDJNR2525M15MN7**	25	25	32,0	150	38,0	DN.N150708	**552.228**	**554.252**	2.5 mm	**557.111**	**551.317**	4 mm
1327362	**CDJNR3225P15MN7**	32	25	32,0	170	38,0	DN.N150708	**552.228**	**554.252**	2.5 mm	**557.111**	**551.317**	4 mm
corte à esquerda (L)													
1504969	**CDJNL2525M15MN7**	25	25	32,0	150	38,0	DN.N150708	**552.228**	**554.252**	2.5 mm	**557.111**	**551.317**	4 mm
1327363	**CDJNL3225P15MN7**	32	25	32,0	170	38,0	DN.N150708	**552.228**	**554.252**	2.5 mm	**557.111**	**551.317**	4 mm





CELN 97,5° • MX





número para pedido	código do produto	H	B	F	L1	LH	inserto padrão	calço	parafuso do calço	sexta-vada	conjunto do grampo	sexta-vada
corte à direita (R)												
1505803	**CELNR2525M13-MX7**	25	25	32,0	150	32,0	EN.X130708	**552.240**	**554.252**	2.5 mm	**551.316**	4 mm

CELN 97,5° • MN

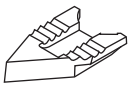





número para pedido	código do produto	H	B	F	L1	LH	inserto padrão	calço	parafuso do calço	sexta-vada	placa de pressão	conjunto do grampo	sexta-vada
corte à direita (R)													
1501222	**CELNR2525M13MN7**	25	25	32,0	150	32,0	EN.N130708	**552.240**	**554.252**	2.5 mm	**557.111**	**551.317**	4 mm
corte à esquerda (L)													
1501221	**CELNL2525M13MN7**	25	25	32,0	150	32,0	EN.N130708	**552.240**	**554.252**	2.5 mm	**557.111**	**551.317**	4 mm

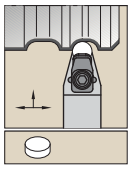
CELN 97,5° • MF

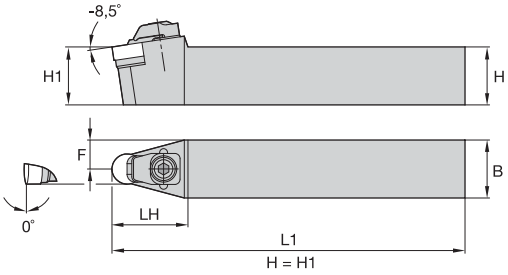





número para pedido	código do produto	H	B	F	L1	LH	inserto padrão	calço	parafuso do calço	sexta-vada	quebra-cavacos	conjunto do grampo	sexta-vada
corte à direita (R)													
1331458	**CELNR2525M13MF7**	25	25	32,0	150	32,0	EN.N130708	**552.240**	**554.252**	2.5 mm	**557.125**	**551.317**	4 mm

NOTA: A versão de fixação mostrada é a MN.
O suporte básico pode ser pedido separadamente:
V.ELN R/L 2525M13
V.ELN R/L 3225P13



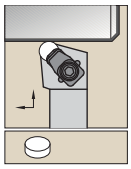


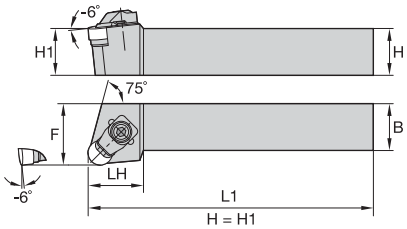
CRDN • MN



número para pedido	código do produto	H	B	F	L1	LH	inserto padrão	calço	parafuso do calço	sexta-vada	placa de pressão	conjunto do grampo	sexta-vada
1510281	**CRDNN2525M12MN4**	25	25	12,5	150	30,0	RN.N120400	**552.229**	**554.252**	2.5 mm	**557.111**	**551.333**	4 mm
1313053	**CRDNN2525M12MN7**	25	25	12,5	150	30,0	RN.N120700	**552.230**	**554.252**	2.5 mm	**557.111**	**551.333**	4 mm
1502204	**CRDNN3225P12MN4**	32	25	12,5	170	30,0	RN.N120400	**552.229**	**554.252**	2.5 mm	**557.111**	**551.333**	4 mm
1320407	**CRDNN3225P12MN7**	32	25	12,5	170	30,0	RN.N120700	**552.230**	**554.252**	2.5 mm	**557.111**	**551.333**	4 mm

NOTA: A versão de fixação mostrada é a MN.
O suporte básico pode ser pedido separadamente:
V.RDN N 2525M12
V.RDN N 3225M12



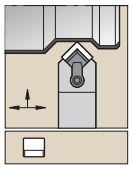


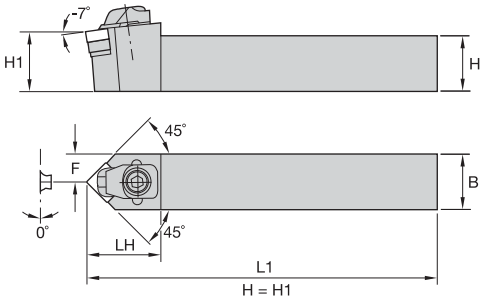
CRSN • MN



número para pedido	código do produto	H	B	F	L1	LH	inserto padrão	calço	parafuso do calço	sexta-vada	placa de pressão	conjunto do grampo	sexta-vada
corte à direita (R)													
1510285	**CRSNR2525M12-MN4**	25	25	32,0	150	26,0	RN.N120400	**552.229**	**554.252**	2.5 mm	**557.111**	**551.333**	4 mm
1324116	**CRSNR2525M12MN7**	25	25	32,0	150	26,0	RN.N120700	**552.230**	**554.252**	2.5 mm	**557.111**	**551.333**	4 mm
1510286	**CRSNR3225P12MN4**	32	25	32,0	170	26,0	RN.N120400	**552.229**	**554.252**	2.5 mm	**557.111**	**551.333**	4 mm
1261273	**CRSNR3225P12MN7**	32	25	32,0	170	26,0	RN.N120700	**552.230**	**554.252**	2.5 mm	**557.111**	**551.333**	4 mm
corte à esquerda (L)													
1510282	**CRSNL2525M12-MN4**	25	25	32,0	150	26,0	RN.N120400	**552.229**	**554.252**	2.5 mm	**557.111**	**551.333**	4 mm
1510283	**CRSNL2525M12MN7**	25	25	32,0	150	26,0	RN.N120700	**552.230**	**554.252**	2.5 mm	**557.111**	**551.333**	4 mm
1510284	**CRSNL3225P12MN4**	32	25	32,0	170	26,0	RN.N120400	**552.229**	**554.252**	2.5 mm	**557.111**	**551.333**	4 mm
1331597	**CRSNL3225P12MN7**	32	25	32,0	170	26,0	RN.N120700	**552.230**	**554.252**	2.5 mm	**557.111**	**551.333**	4 mm

NOTA: A versão de fixação mostrada é a MN.
O suporte pode ser pedido separadamente:
V.RSN R/L 2525M12
V.RSN R/L 3225P12

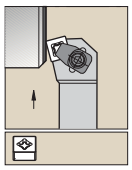


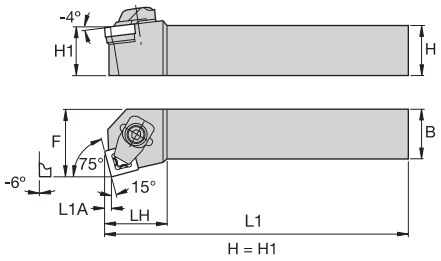


CSDN • MX



número para pedido	código do produto	H	B	F	L1	LH	inserto padrão	calço	parafuso do calço	sexta-vada	conjunto do grampo	sexta-vada
2891696	**CSDNN2525M12MX7**	25	25	12,5	151	36,0	SNGX120708	**552.232**	**554.252**	2.5 mm	**551.316**	4 mm



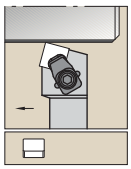


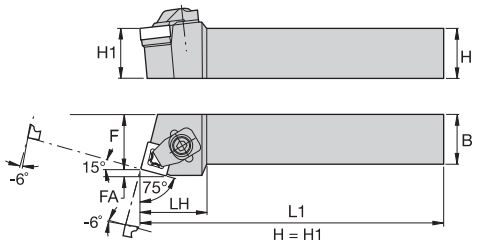
CSKN 75° • MN



número para pedido	código do produto	H	B	F	L1	LH	L1A	inserto padrão	calço	parafuso do calço	sexta-vada	placa de pressão	conjunto do grampo	sexta-vada
corte à direita (R)														
1261315	**CSKNR2525M12-MN7**	25	25	32,0	150	27,0	3,0	SN.N120708	**552.232**	**554.252**	2.5 mm	**557.111**	**551.317**	4 mm
corte à esquerda (L)														
1261299	**CSKNL2525M12-MN4**	25	25	32,0	150	27,0	3,0	SN.N120408	**552.231**	**554.252**	2.5 mm	**557.111**	**551.317**	4 mm
1261300	**CSKNL2525M12-MN7**	25	25	32,0	150	27,0	3,0	SN.N120708	**552.232**	**554.252**	2.5 mm	**557.111**	**551.317**	4 mm

NOTA: A versão de fixação mostrada é a MX.
O porta-ferramentas básico pode ser pedido separadamente:
V.SKN R/L 2525M12



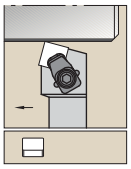


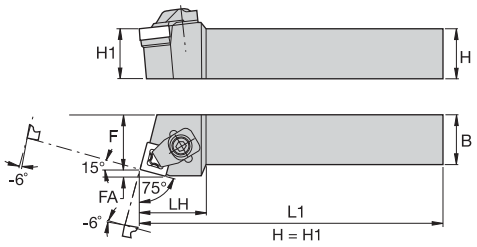
CSRN 75° • MX



número para pedido	código do produto	H	B	F	L1	LH	FA	inserto padrão	calço	parafuso do calço	sexta-vada	conjunto do grampo	sexta-vada
corte à esquerda (L)													
1510300	**CSRNL3225P15-MX7**	32	25	27,0	170	34,0	4,1	SN.X150708	**552.234**	**554.253**	3 mm	**551.316**	4 mm

NOTA: A versão de fixação mostrada é a MX —.
O suporte básico pode ser pedido separadamente:
V.SRN R/L 2525M12
V.SRN R/L 3225P12
V.SRN R/L 3225P15

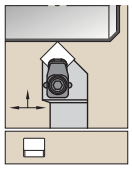


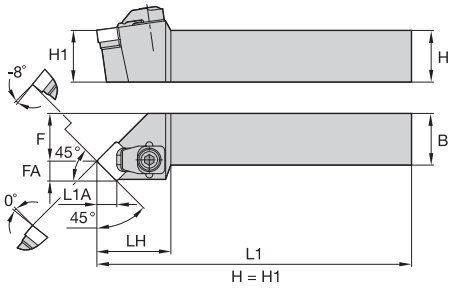


CSRN 75° • MN



número para pedido	código do produto	H	B	F	L1	LH	FA	inserto padrão	calço	parafuso do calço	sexta-vada	placa de pressão	conjunto do grampo	sexta-vada
corte à direita (R)														
1510303	**CSRNR2525M12-MN4**	25	25	27,0	150	32,0	3,1	SN.N120408	**552.231**	**554.252**	2.5 mm	**557.111**	**551.317**	4 mm
1261336	**CSRNR2525M12-MN7**	25	25	27,0	150	32,0	3,1	SN.N120708	**552.232**	**554.252**	2.5 mm	**557.111**	**551.317**	4 mm
corte à esquerda (L)														
1510291	**CSRNL2525M12-MN4**	25	25	27,0	150	32,0	3,1	SN.N120408	**552.231**	**554.252**	2.5 mm	**557.111**	**551.317**	4 mm
1510292	**CSRNL2525M12-MN7**	25	25	27,0	150	32,0	3,1	SN.N120708	**552.232**	**554.252**	2.5 mm	**557.111**	**551.317**	4 mm
1261334	**CSRNL3225P12-MN7**	32	25	27,0	170	32,0	3,1	SN.N120708	**552.232**	**554.252**	2.5 mm	**557.111**	**551.317**	4 mm





CSSN 45° • MX

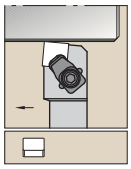


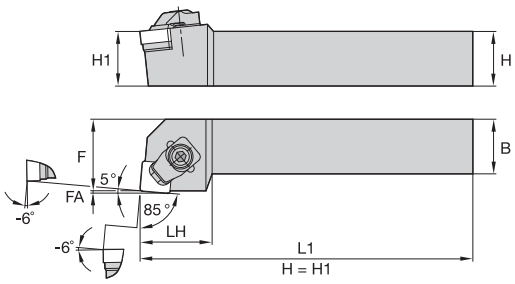
número para pedido	código do produto	H	B	F	L1	LH	FA	L1A	inserto padrão	calço	parafuso do calço	sexta-vada	conjunto do grampo	sexta-vada
corte à direita (R)														
1261367	**CSSNR2525M12-MX7**	25	25	32,0	150	35,0	8,3	8,3	SN.X120708	**552.232**	**554.252**	2.5 mm	**551.316**	4 mm
1261378	**CSSNR3225P15-MX7**	32	25	32,0	159	37,0	10,6	10,6	SN.X150708	**552.234**	**554.253**	3 mm	**551.316**	4 mm
corte à esquerda (L)														
1261350	**CSSNL2525M12-MX7**	25	25	23,7	150	35,0	8,6	8,3	SN.X120708	**552.232**	**554.252**	2.5 mm	**551.316**	4 mm

CSSN 45° • MN

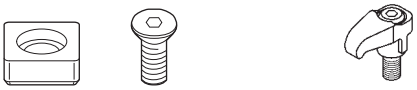


número para pedido	código do produto	H	B	F	L1	LH	FA	L1A	inserto padrão	calço	parafuso do calço	sexta-vada	placa de pressão	conjunto do grampo	sexta-vada
corte à direita (R)															
1261366	**CSSNR2525M12-MN7**	25	25	32,0	142	35,0	8,3	8,3	SN.N120708	**552.232**	**554.252**	2.5 mm	**557.111**	**551.317**	4 mm
1261370	**CSSNR3225P12-MN4**	32	25	32,0	162	35,0	8,3	8,3	SN.N120408	**552.231**	**554.252**	2.5 mm	**557.111**	**551.317**	4 mm
1261371	**CSSNR3225P12-MN7**	32	25	32,0	162	35,0	8,3	8,3	SN.N120708	**552.232**	**554.252**	2.5 mm	**557.111**	**551.317**	4 mm
corte à esquerda (L)															
1261349	**CSSNL2525M12-MN7**	25	25	32,0	142	35,0	8,3	8,3	SN.N120708	**552.232**	**554.252**	2.5 mm	**557.111**	**551.317**	4 mm
1261353	**CSSNL3225P12-MN4**	32	25	32,0	162	35,0	8,3	8,3	SN.N120408	**552.231**	**554.252**	2.5 mm	**557.111**	**551.317**	4 mm
1261354	**CSSNL3225P12-MN7**	32	25	32,0	162	35,0	8,3	8,3	SN.N120708	**552.232**	**554.252**	2.5 mm	**557.111**	**551.317**	4 mm





CSXN 85° • MX

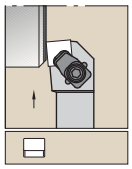


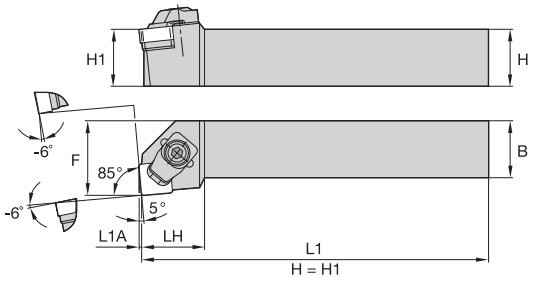
número para pedido	código do produto	H	B	F	L1	LH	FA	inserto padrão	calço	parafuso do calço	sexta-vada	conjunto do grampo	sexta-vada
corte à direita (R)													
1510334	**CSXNR3225P12-MX7**	32	25	32,0	170	30,0	1,1	SN.X120708	**552.232**	**554.252**	2.5 mm	**551.316**	4 mm

CSXN 85° • MN



número para pedido	código do produto	H	B	F	L1	LH	FA	inserto padrão	calço	parafuso do calço	sexta-vada	placa de pressão	conjunto do grampo	sexta-vada
corte à direita (R)														
1510327	**CSXNR2525M12-MN4**	25	25	32,0	150	30,0	1,1	SN.N120408	**552.231**	**554.252**	2.5 mm	**557.111**	**551.317**	4 mm
corte à esquerda (L)														
1510313	**CSXNL2525M12-MN4**	25	25	32,0	150	30,0	1,1	SN.N120408	**552.231**	**554.252**	2.5 mm	**557.111**	**551.317**	4 mm





CSYN 85° • MX



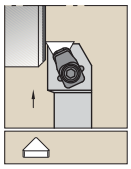
número para pedido	código do produto	H	B	F	L1	LH	L1A	inserto padrão	calço	parafuso do calço	sexta-vada	conjunto do grampo	sexta-vada
corte à esquerda (L)													
1261414	**CSYNL3225P12-MX7**	32	25	32,0	170	27,0	1,0	SN.X120708	**552.232**	**554.252**	2.5 mm	**551.316**	4 mm

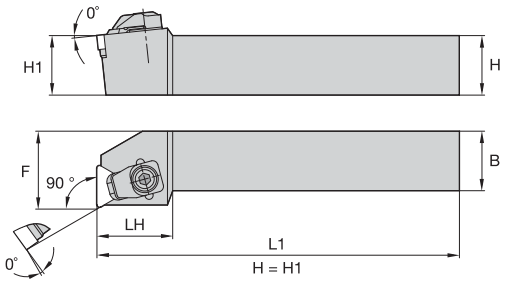
CSYN 85° • MN



número para pedido	código do produto	H	B	F	L1	LH	L1A	inserto padrão	calço	parafuso do calço	sexta-vada	placa de pressão	conjunto do grampo	sexta-vada
corte à direita (R)														
1261423	**CSYNR2525M12-MN7**	25	25	32,0	150	27,0	1,1	SN.N120708	**552.232**	**554.252**	2.5 mm	**557.111**	**551.317**	4 mm
corte à esquerda (L)														
1261408	**CSYNL2525M12-MN7**	25	25	32,0	150	27,0	1,1	SN.N120708	**552.232**	**554.252**	2.5 mm	**557.111**	**551.317**	4 mm

NOTA: A versão de fixação MN — é exibida.
O suporte básico pode ser pedido separadamente:
V.SYN R/L 2525M12
V.SYN R/L 3225P12



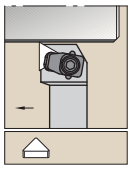


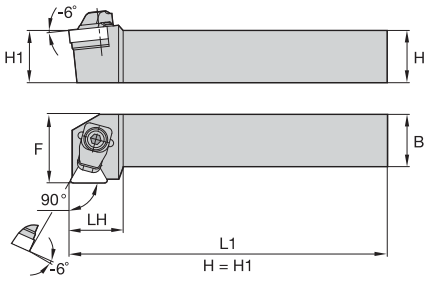
CTFN 90° • MN



número para pedido	código do produto	H	B	F	L1	LH	inserto padrão	calço	parafuso do calço	sexta-vada	placa de pressão	conjunto do grampo	sexta-vada
corte à direita (R)													
1510344	**CTFNR2525M16-MN4**	25	25	32,0	150	29,0	TN.N160408	**552.235-H**	**554.254**	2.5 mm	**557.111**	**551.333**	4 mm
corte à esquerda (L)													
1510341	**CTFNL2525M16-MN4**	25	25	32,0	150	29,0	TN.N160408	**552.235-H**	**554.254**	2.5 mm	**557.111**	**551.333**	4 mm

NOTA: A versão de fixação MN — é exibida.
O porta-ferramentas básico pode ser pedido separadamente:
V.TFN R/L 2525M16



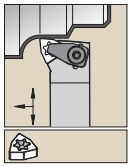


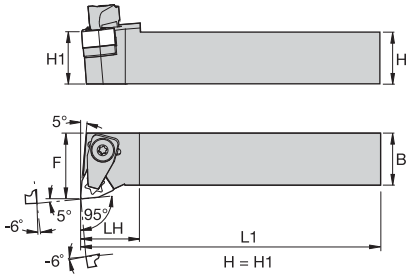
CTGN 90° • MN



número para pedido	código do produto	H	B	F	L1	LH	inserto padrão	calço	parafuso do calço	sexta-vada	placa de pressão	conjunto do grampo	sexta-vada
corte à direita (R)													
1261482	**CTGNR2525M16-MN4**	25	25	32,0	150	20,0	TN.N160408	**552.235-H**	**554.254**	2.5 mm	**557.111**	**551.333**	4 mm
1261483	**CTGNR2525M16-MN7**	25	25	32,0	150	20,0	TN.N160708	**552.236**	**554.254**	2.5 mm	**557.111**	**551.333**	4 mm
corte à esquerda (L)													
1261478	**CTGNL2525M16-MN4**	25	25	32,0	150	20,0	TN.N160408	**552.235-H**	**554.254**	2.5 mm	**557.111**	**551.333**	4 mm
1261479	**CTGNL2525M16-MN7**	25	25	32,0	150	20,0	TN.N160708	**552.236**	**554.254**	2.5 mm	**557.111**	**551.333**	4 mm

NOTA: A versão de fixação MN — é exibida.
O porta-ferramentas básico pode ser pedido separadamente:
V.TGN R/L 2525M16



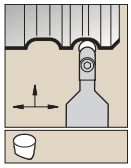


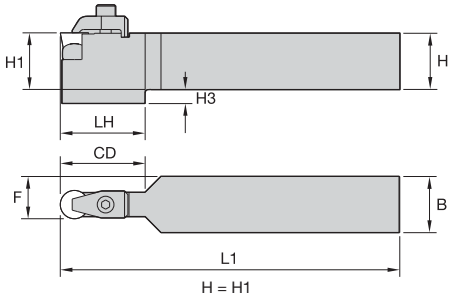
CWLN 95° • MX



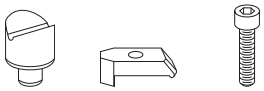


número para pedido	código do produto	H	B	F	L1	LH	inserto padrão	calço	parafuso do calço	sexta-vada	conjunto do grampo	sexta-vada
corte à direita (R)												
1873227	**CWLNR3225P08-MX7**	32	25	32,0	170	32,0	WN.X080708	**552.210**	**554.252**	2.5 mm	**551.316**	4 mm
corte à esquerda (L)												
1873224	**CWLNL2525M08-MX7**	25	25	32,0	150	32,0	WN.X080708	**552.210**	**554.252**	2.5 mm	**551.316**	4 mm



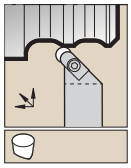


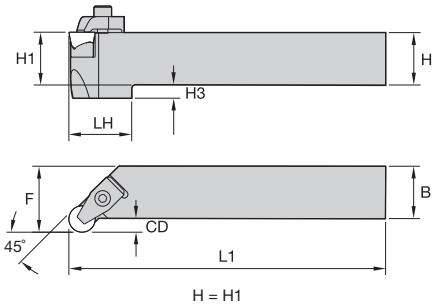
CRDP



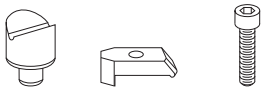
número para pedido	código do produto	H	B	F	L1	LH	H3	CD	inserto padrão	assento	grampo	parafuso do grampo	sexta-vada
3642247	**CRDPN2525M06V**	25	25	12,5	151	—	—	19,0	RPGX060400E	**NST1**	**CM214**	**MS1321**	2.5 mm
3642249	**CRDPN3232P09V**	32	32	16,0	171	—	—	29,0	RPGX090700E	**NST2**	**CM219**	**CS412**	3.5 mm
3642248	**CRDPN2525M09V**	25	25	12,5	151	—	—	29,0	RPGX090700E	**NST2**	**CM219**	**CS412**	3.5 mm
3642251	**CRDPN3232P12V**	32	32	16,0	171	—	—	38,0	RPGX120700E	**NST3**	**CM216**	**CS412**	3.5 mm
3642252	**CRDPN3232P15V**	32	32	16,0	171	38,1	6,4	38,0	RPGX151000	**NST4**	**CM217**	**MS1294**	6 mm

NOTA: Os porta-ferramentas CRDP podem usar os estilos de insertos RPGX e RCGX.



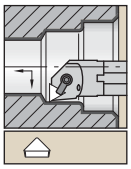


CRGP

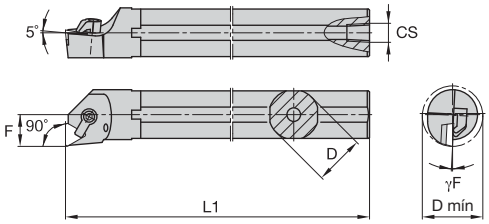


número para pedido	código do produto	H	B	F	L1	CD	inserto padrão	assento	grampo	parafuso do grampo	sexta-vada
corte à direita (R)											
3642276	**CRGPR2525M06V**	25	25	32,0	151	7,0	RPGX060400E	**NST1**	**CM214**	**MS1321**	2.5 mm
3642280	**CRGPR3232P09V**	32	32	40,0	171	8,0	RPGX090700E	**NST2**	**CM219**	**CS412**	3.5 mm
corte à esquerda (L)											
3642277	**CRGPL2525M06V**	25	25	32,0	151	7,0	RPGX060400E	**NST1**	**CM214**	**MS1321**	2.5 mm
3642281	**CRGPL3232P09V**	32	32	40,0	171	8,0	RPGX090700E	**NST2**	**CM219**	**CS412**	3.5 mm

NOTA: Os porta-ferramentas CRGP podem usar os estilos de insertos RPGX e RCGX.



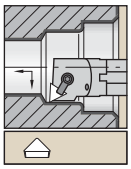
Haste de aço com refrigeração interna.



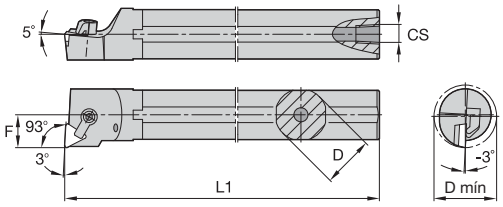
A-CTFP 90°



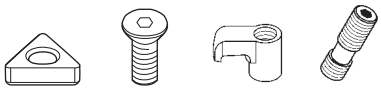
número para pedido	código do produto	D	D mín	F	L1	CS	γF°	inserto padrão	calço	parafuso do calço	sexta-vada	grampo	parafuso do grampo	sexta-vada
corte à direita (R)														
1886492	**A16RCTFPR11**	16	20,0	11,0	200	1/8-27 NPT	-4.0	TP..110304	**–**	**–**	–	**CKM19**	**STCM9**	2.5 mm
1098051	**A20QCTFPR11**	20	25,0	13,0	180	1/8-27 NPT	0.0	TP..110304	**SM815**	**MS961**	–	**CKM19**	**STCM9**	2.5 mm
1098053	**A25RCTFPR16**	25	32,0	17,0	200	1/4-18 NPT	-3.0	TP..160308	**SM841**	**MS110**	2 mm	**CKM10**	**STCM8**	4 mm
1098055	**A32SCTFPR16**	32	40,0	22,0	250	1/4-18 NPT	-3.0	TP..160308	**SM841**	**MS110**	2 mm	**CKM10**	**STCM8**	4 mm
1886494	**A40VCTFPR16**	40	48,0	27,0	400	1/4-18 NPT	-3.0	TP..160308	**SM841**	**MS110**	2 mm	**CKM10**	**STCM8**	4 mm
corte à esquerda (L)														
1098054	**A25RCTFPL16**	25	32,0	17,0	200	1/4-18 NPT	-3.0	TP..160308	**SM841**	**MS110**	2 mm	**CKM10**	**STCM8**	4 mm
1098056	**A32SCTFPL16**	32	40,0	22,0	250	1/4-18 NPT	-3.0	TP..160308	**SM841**	**MS110**	2 mm	**CKM10**	**STCM8**	4 mm



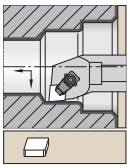
Haste de aço com refrigeração interna.



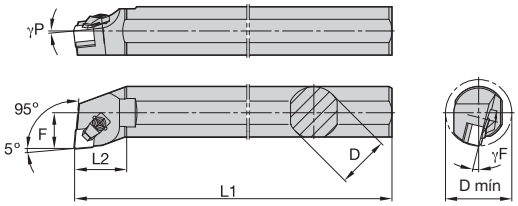
A-CTUP 93°



número para pedido	código do produto	D	D mín	F	L1	CS	inserto padrão	calço	parafuso do calço	grampo	parafuso do grampo	sexta-vada
corte à direita (R)												
1098057	**A16MCTUPR11**	16	20,0	11,0	150	1/8-27 NPT	TP..110304	**SM815**	**MS961**	**CKM19**	**STCM9**	2.5 mm
corte à esquerda (L)												
1098058	**A16MCTUPL11**	16	20,0	11,0	150	1/8-27 NPT	TP..110304	**SM815**	**MS961**	**CKM19**	**STCM9**	2.5 mm



Haste de aço com refrigeração interna



S-CCLN 95° • MX



número para pedido	código do produto	D	D mín	F	L1	L2	γF°	γP°	inserto padrão	calço	parafuso do calço	sexta-vada	conjunto do grampo	sexta-vada
corte à direita (R)														
2890773	**S32SCCLNR12MX7**	32	40,0	22,0	251	43	-14.0	-5.0	CN.X120708	**–**	**–**	–	**551.316**	4 mm
1289077	**S40T-CCLNR12-MX7**	40	55,0	27,0	300	40	-14.0	-6.0	CN.X120708	**552.221**	**554.252**	2.5 mm	**551.316**	4 mm
corte à esquerda (L)														
1510401	**S40T-CCLNL12-MX7**	40	55,0	27,0	300	40	-14.0	-6.0	CN.X120708	**552.221**	**554.252**	2.5 mm	**551.316**	4 mm

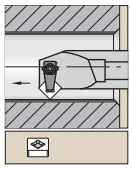
NOTA: A versão de fixação MN – é exibida.
A barra básica pode ser pedida separadamente:
S40T-V.CLN R/L 12

S-CCLN 95° • MN

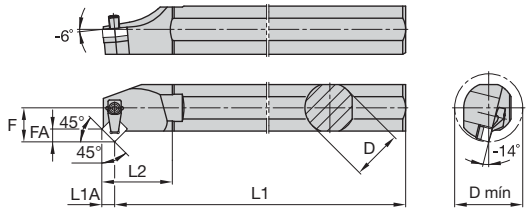


número para pedido	código do produto	D	D mín	F	L1	L2	γF°	γP°	inserto padrão	calço	parafuso do calço	sexta-vada	placa de pressão	conjunto do grampo	sexta-vada
corte à direita (R)															
1289075	**S40T-CCLNR12-MN4**	40	55,0	27,0	300	40	-14.0	-6.0	CN.N120408	**552.220**	**554.252**	2.5 mm	**557.111**	**551.317**	4 mm
1289076	**S40T-CCLNR12-MN7**	40	55,0	27,0	300	40	-14.0	-6.0	CN.N120708	**552.221**	**554.252**	2.5 mm	**557.111**	**551.317**	4 mm
corte à esquerda (L)															
1289072	**S40T-CCLNL12-MN7**	40	55,0	27,0	300	40	-14.0	-6.0	CN.N120708	**552.221**	**554.252**	2.5 mm	**557.111**	**551.317**	4 mm

NOTA: A versão de fixação MN – é exibida.
O suporte básico pode ser pedido separadamente:
S40T-V.SSN R/L 12



Haste de aço sem refrigeração interna.

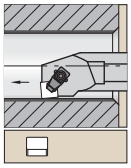


S-CSSN 45° • MX

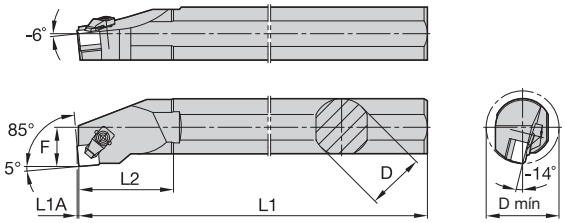


número para pedido	código do produto	D	D mín	F	L1	L2	L1A	FA	inserto padrão	calço	parafuso do calço	sexta-vada	conjunto do grampo	sexta-vada
corte à direita (R)														
1873498	**S40T-CSSNR12-MX7**	40	55,0	27,0	300	67,0	8,3	8,3	SN.X120708	**552.232**	**554.252**	2.5 mm	**551.316**	4 mm
corte à esquerda (L)														
1873499	**S40T-CSSNL12-MX7**	40	55,0	27,0	300	67,0	8,3	8,3	SN.X120708	**552.232**	**554.252**	2.5 mm	**551.316**	4 mm

NOTA: A versão de fixação mostrada é a MX –.
O suporte básico pode ser pedido separadamente:
S40T-V.SSN R/L 12



Haste de aço sem refrigeração interna.



S-CSYN 85° • MN

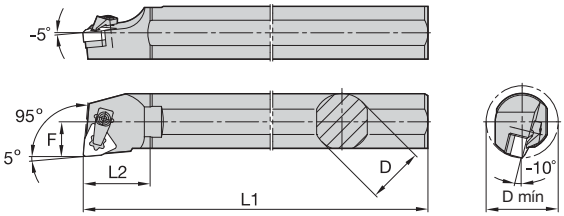


número para pedido	código do produto	D	D mín	F	L1	L2	L1A	inserto padrão	calço	parafuso do calço	sexta-vada	placa de pressão	conjunto do grampo	sexta-vada
corte à direita (R)														
1245016	**S40T-CSYNR12-MN7**	40	55,0	27,0	300	67,0	1,0	SN.N120708	**552.232**	**554.252**	2.5 mm	**557.111**	**551.317**	4 mm

NOTA: A versão de fixação MN – é exibida.
O suporte básico pode ser pedido separadamente:
S40T-V.SYN R/L 08



Haste de aço sem refrigeração interna.



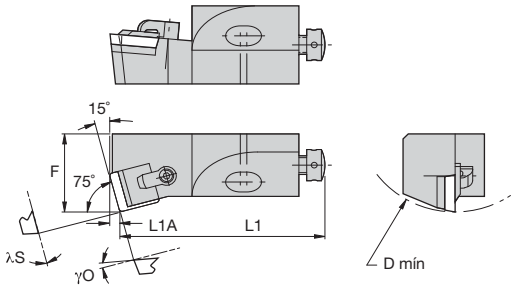
S-CWLN 95° • MX



número para pedido	código do produto	D	D mín	F	L1	L2	γF°	inserto padrão	calço	parafuso do calço	sexta-vada	conjunto do grampo	sexta-vada
corte à esquerda (L)													
1873496	**S40T-CWLNL08-MX7**	40	80,0	27,0	300	55,0	-10.0 deg	WN.X080708	**552.210**	**554.252**	2.5 mm	**551.316**	4 mm

NOTA: O suporte básico pode ser pedido separadamente:
S40T-V. WLN R/L 12





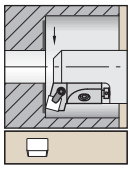
CSKP 75°

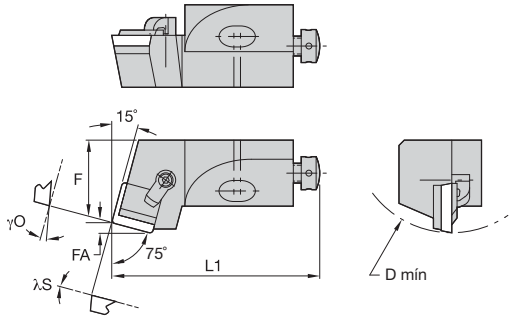
número para pedido	código do produto	D mín	F	L1	L1A	λS°	γO°	inserto padrão
corte à direita (R)								
1261328	**CSKPR12CA12**	50	20,0	55	3,1	0.0	5.0	SP..120308/SP..422

Peças de reposição



D mín	calço	grampo	parafuso do grampo	sexta-vada	parafuso de ajuste radial	sextavada	parafuso de ajuste axial	parafuso de montagem	sexta-vada	arruela
50	–	**CKM34**	**STCM38**	2 mm	**KUAM22**	2 mm	**KUAM31**	**191.406**	4 mm	**CSWM 060 050**





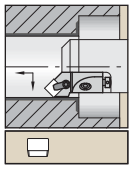
CSRP 75°

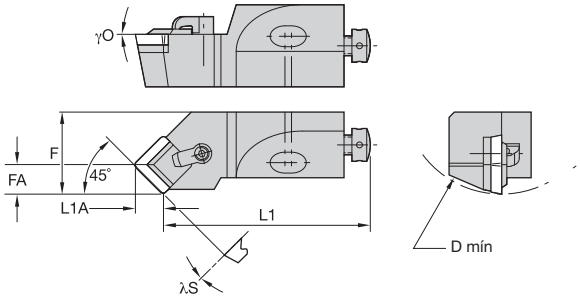
número para pedido	código do produto	D mín	F	L1	FA	λS°	γO°	inserto padrão
corte à direita (R)								
3331132	**CSRPR10CA09**	40	14,0	50	2,2	0.0	0.0	SP..090308/SP..322

Peças de reposição



D mín	grampo	parafuso do grampo	sexta-vada	parafuso de ajuste radial	sexta-vada	parafuso de ajuste axial	parafuso de montagem	sexta-vada	arruela
40	**CKM34**	**STCM38**	2 mm	**KUAM28**	2 mm	**KUAM30**	**191.405**	4 mm	**CSWM 060 050**





CSSP 45°

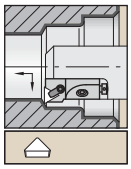
número para pedido	código do produto	D mín	F	L1	FA	L1A	λS°	γO°	inserto padrão
corte à direita (R)									
1261379	**CSSPR10CA09**	40	14,0	44	6,5	6,1	0.0	0.0	SP..090308/SP..322
corte à esquerda (L)									
3331143	**CSSPL10CA09**	40	14,0	44	6,5	6,1	0.0	0.0	SP..090308/SP..322

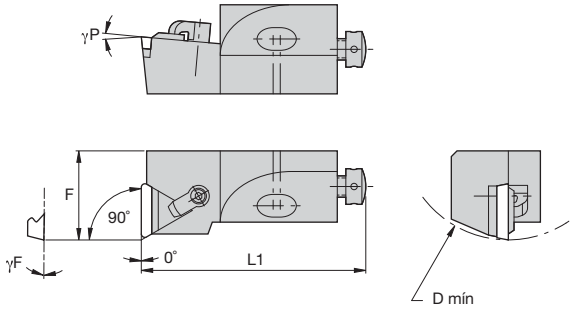
NOTA: Escolha as peças de reposição com base no D mín. e no tamanho do inserto escolhido.

Peças de reposição



D mín	grampo	parafuso do grampo	sexta-vada	parafuso de ajuste radial	sexta-vada	parafuso de ajuste axial	parafuso de montagem	sexta-vada	arruela
40	**CKM34**	**STCM38**	2 mm	**KUAM28**	2 mm	**KUAM30**	**191.405**	4 mm	**CSWM 060 050**

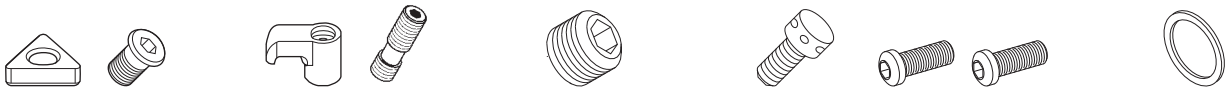




CTFP 90°

número para pedido	código do produto	D mín	F	L1	γF°	γP°	inserto padrão
corte à direita (R)							
2116588	**CTFPR10CA11**	40	14,0	50	0.0	5.0	TP..110304/TP..221
1746442	**CTFPR12CA16**	50	20,0	55	0.0	5.0	TP..160308/TP..322
2582207	**CTFPR20CA22**	70	25,0	70	0.0	5.0	TP..220408/TP..432
corte à esquerda (L)							
2114034	**CTFPL10CA11**	40	14,0	50	0.0	5.0	TP..110304/TP..221

Peças de reposição



D mín	calço	parafuso do calço	sexta-vada	grampo	parafuso do grampo	sexta-vada	parafuso de ajuste radial	sexta-vada	parafuso de ajuste axial	parafuso de montagem	parafuso de montagem	sexta-vada	arruela
40	**–**	**–**	–	**CKM34**	**STCM38**	2 mm	**KUAM28**	2 mm	**KUAM30**	**191.405**	**–**	4 mm	**CSWM 060 050**
50	**–**	**–**	–	**CKM34**	**STCM38**	2 mm	**KUAM22**	2 mm	**KUAM31**	**–**	**191.406**	4 mm	**CSWM 060 050**
70	**SM837**	**MS125**	2.5 mm	**CKM35**	**STCM8**	4 mm	**KUAM25**	2.5 mm	**KUAM32**	**–**	**191.407**	5 mm	**CSWM 080 050**

Insertos Beyond™ Drive™

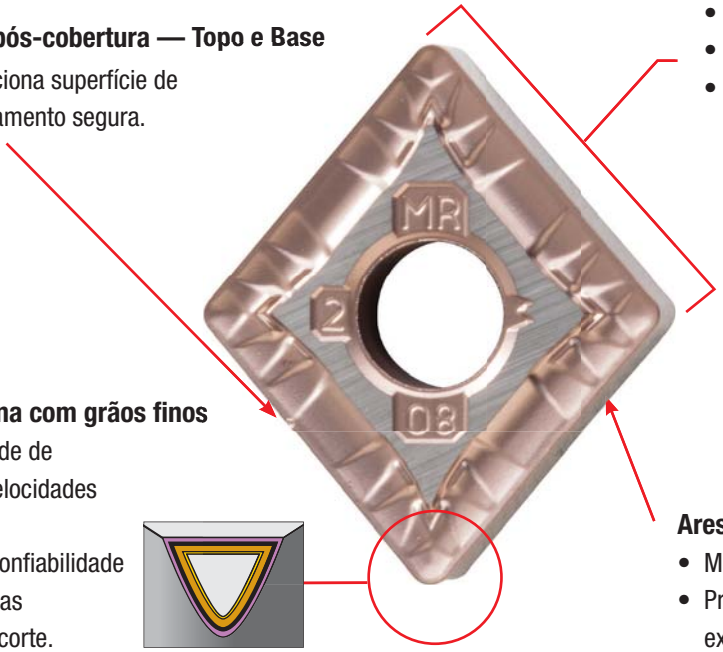
- Planejado para proporcionar uma produtividade aumentada.
- O tratamento pós-revestimento reduz o stress e melhora a adesão do revestimento.
- Excelente dureza e resistência a desgaste.
- Melhor detecção do desgaste do inserto.

Retífica pós-cobertura — Topo e Base

- Proporciona superfície de assentamento segura.

Tratamento pós-revestimento

- Melhora a dureza das arestas.
- vida útil da ferramenta previsível e longa.
- Reduz o desgaste por entalhe no flanco.
- Ampla faixa de aplicações.



Camada de alumina com grãos finos

- Oferece integridade de revestimento a velocidades elevadas.
- Produtividade e confiabilidade superiores em altas temperaturas de corte.

TiN/MT-TiCN/TiCN/Al_2O_3/TiOCN

Arestas micropolidas

- Melhora a dureza das arestas.
- Proporciona uma superfície externa mais lisa, resultando na redução das forças, do atrito e da aderência do material da peça.

Experimente as vantagens no seu distribuidor autorizado da Kennametal ou no site **kennametal.com**.

KENNAMETAL®

kennametal.com

Barras de torneamento interno ajustáveis

Com adaptador dianteiro de troca rápida KM™

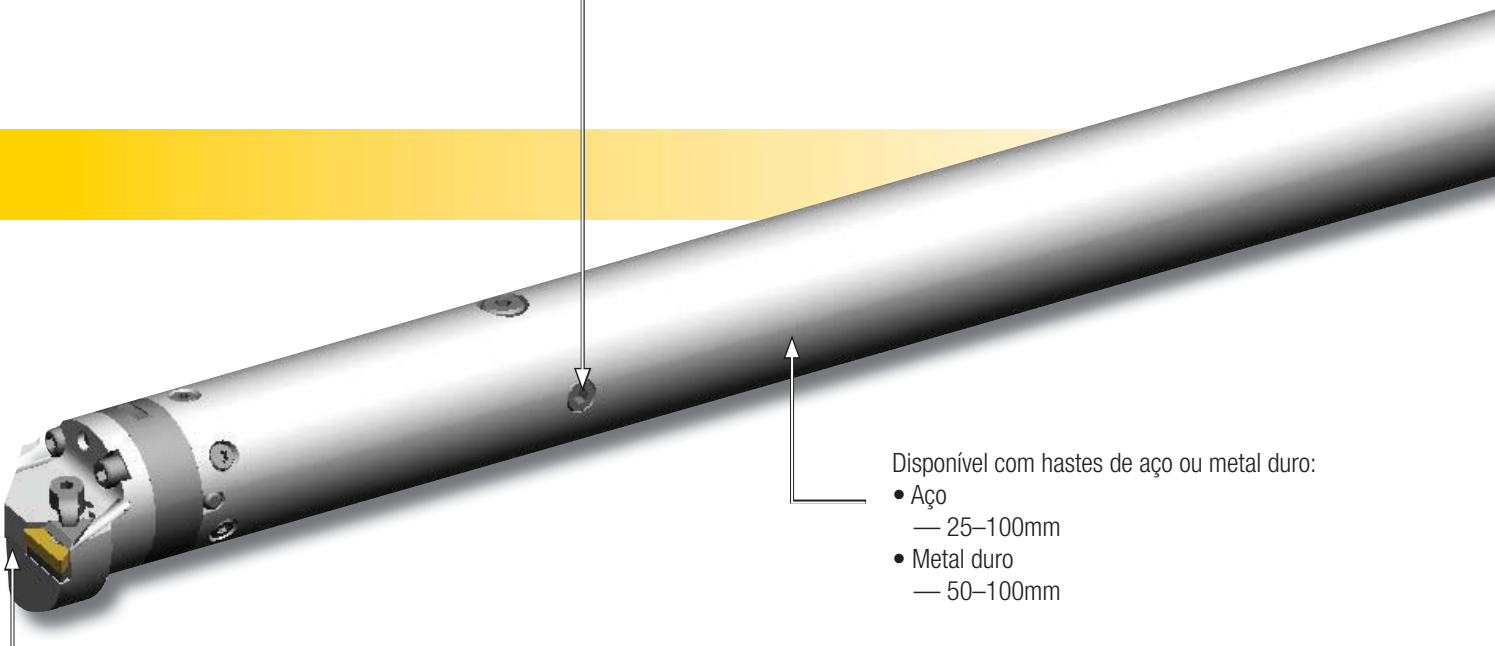
Reduz as vibrações e aumenta a produtividade em aplicações de mandrilamento profundo com cabeças de troca rápida KM e barras de mandrilamento ajustáveis.

Características, Função, e Benefício

Características	Função	Benefício
Pacote robusto de fixação interna	• Elimina a vibração por ressonância e vibração. • Maior taxa de remoção de metal. • Maior profundidade de corte.	• Alta qualidade superficial. • Baixa taxa de refugos. • Maior produtividade. • Menor exposição a ruídos.
Mecanismo de fixação ajustável	A barra pode ser ajustada na máquina somente girando um parafuso.	Características de amortecimento otimizadas para todos os tipos de condições de usinagem.
Adaptador dianteiro de troca rápida KM™	• Sistema de fixação raiado. • Ampla seleção de unidades de corte de troca rápida KM.	Sistema flexível reduz o estoque de ferramental e os tempos de configuração.

Kennametal tem feito muitas melhorias em nosso portfolio atual de barras internas ajustáveis:

- Processo de ajuste melhorado na planta de manufatura permite que as barras sejam precisamente ajustadas no balanço máximo.
- Nitretação do aço das barras ajustáveis para eliminar os efeitos da passagem do cavaco.
- Eliminação dos rebaixos planos nas barras ajustáveis melhora a estabilidade e promove fixação adequada da ferramenta.
- Adição de pequenos rebaixos planos na conexão do colar permite a verificação da altura e centro da ferramenta.
- Processo de montagem melhorada.



Aparência das barras de torneamento interno ajustáveis

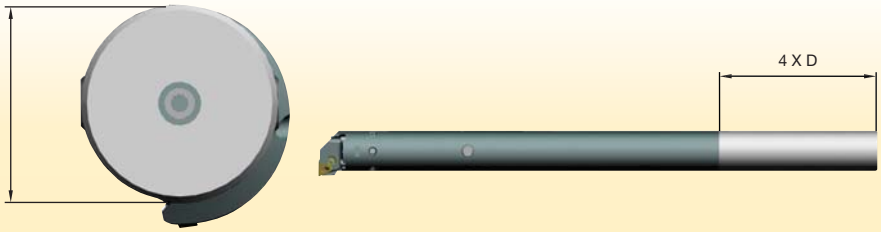
- **NOVO** Todas as barras de furo ajustável são ajustadas nas instalações da fábrica e fornecidas ao cliente com o ajuste especificado na projeção máxima da barra.
- **NOVO** Todas as barras ajustáveis de aço passam por um processo de nitruração para ajudar a prevenir o dano de lavagem do cavaco até a barra e prolongar a vida útil da ferramenta da barra.
- O processo de nitruração das barras de furo ajustáveis de aço de óxido preto proporciona uma tonalidade azulada às hastes. Essas barras permitem a passagem de fluido refrigerante e usam cabeças aparafusadas ou adaptadores de corte de troca rápida KM™. Existe um parafuso para ajustar a barra.
- Barras de furo ajustáveis com hastes de metal duro terão uma coloração cinza. Essas barras permitem a passagem de fluido refrigerante e usam adaptadores de corte de troca rápida KM. Existe um parafuso para ajustar a barra.

Recomendações para aplicação

- Escolha a maior barra de mandrilar possível, mas tenha espaço suficiente para a evacuação de cavacos.
- Equilibre os ajustes de usinagem para evitar vibrações incontroláveis.
- Mantenha a menor relação comprimento/diâmetro possível.
- A barra é pré-ajustada, mas pode ser ajustada à mão.

1 Fixando a barra

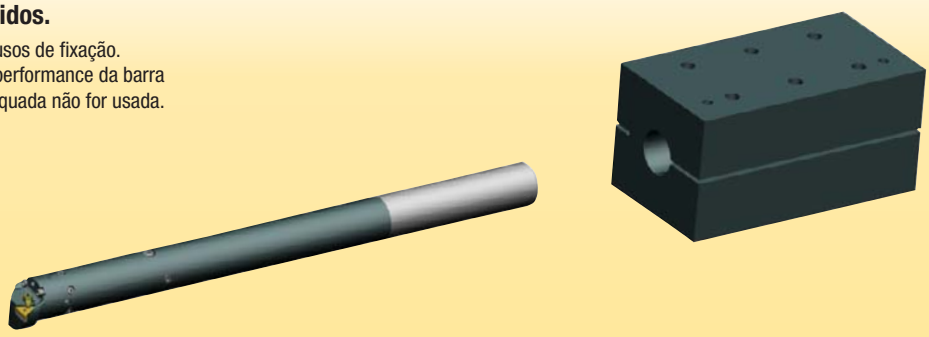
- Segure a barra corretamente. A Kennametal recomenda um apoio de barra em 4 x D.



2 A Kennametal recomenda o apoio da barra de mandrilar em um suporte de estilo dividido, com um redutor de estilo dividido se necessário, com uma tolerância diametral de ISO H7.

3 NOVO: Todos os rebaixos das barras de torneamento interno ajustáveis forma removidos.

- Não fixe as barras com parafusos de fixação.
- A Kennametal não garante a performance da barra de mandrilar se a fixação adequada não for usada.

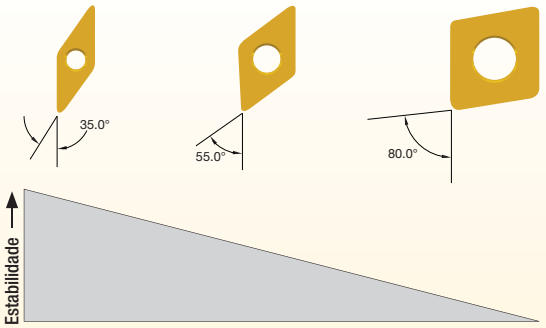


4 As barras de torneamento interno ajustáveis são planejadas e pré-ajustadas em projeção máxima

- Barras de aço: pré-ajustadas a 10 x D; use tão próximo quanto 6 x D.
- Barras de compósito de metal duro: pré-ajustadas a 15 x D; use tão próximo quanto 12 x D.
- Um novo torneamento pode ser necessário se a barra de mandrilar não for usada na sua projeção pré-ajustada.
- Nunca fixe ou opere a barra de mandrilar abaixo de sua projeção mínima.

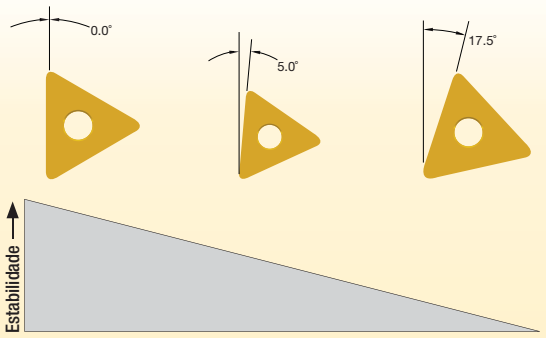
5 Ângulo do inserto

- Ângulos de ponta menores produzem tamanho de cavacos mais regulares e aumentam o alívio do mandrilamento para melhor evacuação de cavacos.
- Ângulos de ponta maiores podem causar fricção devido a arestas de corte maiores que podem resultar em vibração.



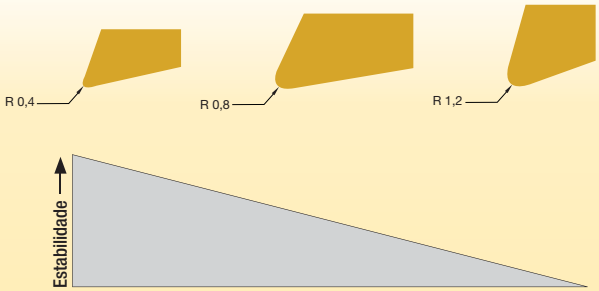
6 Ângulo de posição

- Escolha um ângulo de posição o mais próximo de 90º quanto for possível para obter mais estabilidade.



7 Raio de ponta

- Escolha um pequeno raio de ponta para obter mais estabilidade.
- A profundidade de corte deve ser maior do que o raio de ponta.



8 Geometrias do inserto

- Use geometrias de inserto positivo e de fluxo livre e preparações de arestas afiadas para reduzir as forças de corte.
- Use insertos de PVD como primeira escolha porque o revestimento mais fino mantém a preparação da aresta menor.

9 Altura do corte central

- As tolerâncias de altura de corte são +/-.005".
- A Kennametal recomenda o uso do novo kit de ferramentas para alinhamento da altura central. O kit inclui um imã, uma base e um localizador de ângulo que podem ser montados em uma faceta pequena localizada no anel de conexão da barra de furo ajustável.

10 Evacuação de cavacos

- Novos cortes e o acúmulo de cavacos podem causar vibração indesejável em um processo de mandrilar.
- Use refrigeração para remover cavacos e manter o elemento de amortecimento refrigerado.
- Use geometrias de inserto e os parâmetros de corte que produzam cavacos pequenos.
- Como opção, a barra de mandrilar pode ser usada de maneira invertida para auxiliar na evacuação de cavacos.

Recomendações de torneamento

- Solte os dois parafusos de trava na barra.
- Gire o parafuso de ajuste no sentido horário até que o parafuso pare de girar livremente e a massa esteja na posição travada.
- Agora já é possível ajustar a barra.
- Gire o parafuso de ajuste no sentido anti-horário em incrementos de um quarto de volta para ajustar.
- Depois que o ajuste tiver sido concluído, aperte os parafusos de trava.

Procedimento de alinhamento da altura central da barra de torneamento interno ajustável da Kennametal

O procedimento seguinte acompanhará o usuário durante a configuração da barra de torneamento interno ajustável no centro sem o uso de facetas na haste.

Equipamentos

- Localizador de ângulo digital.
- Base do localizador de ângulo.
- Barra de mandrilar a ser usada.



Figura 1: Base do localizador de ângulo (esquerda) e localizador de ângulo digital (direita)

Montagem

- Certifique-se de que não há sujeira, cavacos, fragmentos etc. nas superfícies de montagem do localizador de ângulo digital ou nas superfícies correspondentes da base do localizador de ângulo.
- Monte o localizador de ângulo digital na base do localizador de ângulo, certificando-se que esteja nivelado em relação à parte traseira da base do localizador de ângulo.

Calibração

- Limpe uma área no eixo X do torno para criar uma superfície de referência para calibração.
- Limpe a sujeira, cavacos, fragmentos etc. do imã na parte de baixo da base do localizador de ângulo.
- Posicione a montagem do localizador de ângulo no eixo X do torno.
  - — Mantenha a montagem do localizador de ângulo paralela ao eixo.
  - — Às vezes é útil fixar a montagem contra o compartimento do torno, para ajudar a mantê-lo paralelo ao eixo X.
- Ative o localizador de ângulo digital ao pressionar o botão liga/desliga.
- Zere o localizador de ângulo digital ao pressionar o botão zerar.

NOTA: O localizador de ângulo agora está calibrado para o eixo X do torno e medirá ângulos correspondentes para este eixo.



Figura 2: Calibração do eixo X

Alinhamento da barra de mandrilar

- Com a barra de mandrilar já posicionada no suporte e definida para a projeção correta, limpe qualquer sujeira, cavacos, fragmentos etc. da faceta pequena no anel da barra de mandrilar.
- Posicione a montagem do localizador de ângulo na barra de mandrilar ao alinhar o imã pequeno na parte inferior da montagem com a faceta pequena no anel da barra de mandrilar.
  - — Certifique-se de que a montagem do localizador de ângulo esteja perpendicular ao eixo da barra de mandrilar.
  - — Certifique-se de que a montagem do localizador de ângulo esteja orientada na mesma direção em que estava quando foi calibrada para o eixo X do torno.



Figura 3: Faceta do anel da barra de mandrilar

- Gire a barra de mandrilar até o localizador de ângulo digital indicar zero grau.



Figura 4: Alinhando a barra de mandrilar

- Ajuste o suporte da barra de mandrilar para travar a posição das barras de mandrilar.
  - — Certifique-se de que o localizador de ângulo digital ainda esteja indicando zero após a fixação da barra.
- A barra de mandrilar agora deve estar no centro.

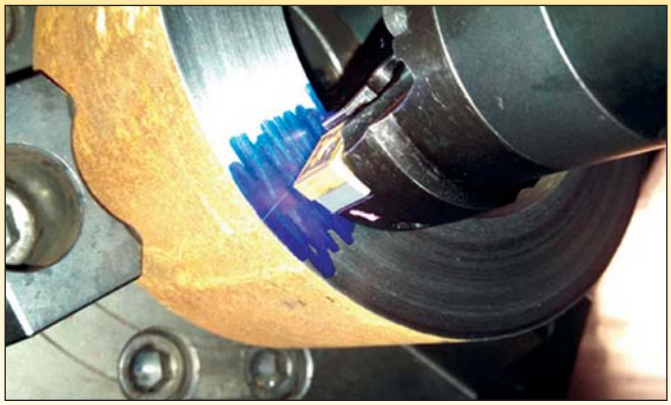
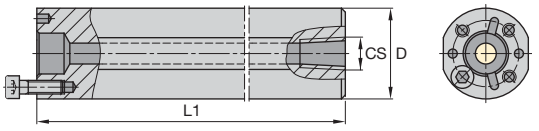


Figura 5: Altura central da barra de mandrilar

Faça o pedido do kit de ferramentas da Kennametal de alinhamento para altura central

O kit de ferramentas de alinhamento da altura central já está disponível. Use o número para pedido 6141867 ou o número de catálogo KIT-BB-AF.

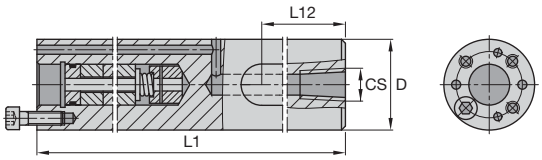


Haste de aço com refrigeração interna.
Relação máx. de balanço de 4:1.



BS

número para pedido	código do produto	D	L1	CS	parafuso requerido 3	parafuso	sexta-vada
1098078	**BS32S**	32	210	RP3/8	**MS412**	**MS330**	4 mm
1098079	**BS40T**	40	260	RP3/8	**MS412**	**MS330**	4 mm
1098080	**BS50U**	50	310	RP3/8	**MS337**	**MS339**	5 mm

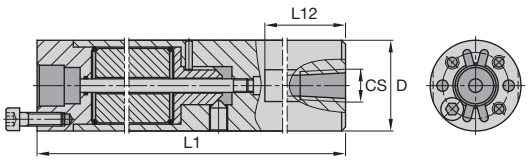


Haste de aço DeVibrator com refrigeração interna.
Relação máx. de balanço de 6:1



BSD

número para pedido	código do produto	D	L1	CS	L12	L1 min	parafuso requerido 3	parafuso	sexta-vada
1098150	**BSD32U**	32	310	RP3/8	200	200	**MS330**	**MS412**	4 mm
1098151	**BSD40V**	40	360	RP3/8	248	228	**MS330**	**MS412**	4 mm
1098152	**BSD50W**	50	410	RP3/8	280	276	**MS339**	**MS337**	5 mm

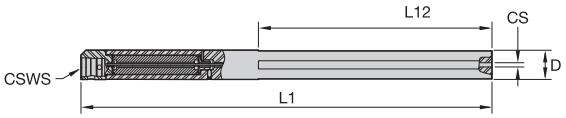


Haste de aço antivibratória ajustável com refrigeração interna.



D...TTB

número para pedido	código do produto	D	L1	CS	L12	L1 min	parafuso requerido 3	parafuso	sexta-vada
1772222	**D25MTTB400**	25	381	RP1/4	203	227	**MS1499**	**MS319**	3 mm
1772223	**D32MTTB447**	32	422	RP3/8	267	332	**MS325**	**MS1130**	4 mm
1772224	**D40MTTB530**	40	492	RP3/8	305	300	**MS326**	**MS330**	4 mm
1772230	**D50MTTB700**	50	670	RP3/8	470	309	**MS337**	**MS337**	5 mm

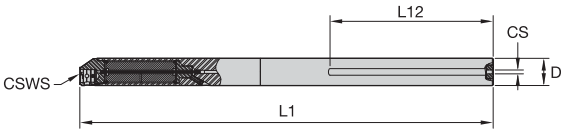


Haste de aço anti-vibratória ajustável com refrigeração interna e unidade de fixação frontal KM™.



D...TTB-KM • Métrica

número para pedido	código do produto	D	L1	CS	L12	L1 min	Tamanho do sistema CSWS
3637636	**D40MTTB560KM40**	40	520	RP 3/8-19	305	330	KM40
3637637	**D50MTTB737KM40**	50	697	RP 3/8-19	470	337	KM40
3637638	**D60MTTB1000KM40**	60	976	RP 3/8-19	686	396	KM40
3642134	**D80MTTB1120KM63**	80	1060	RP 3/8-19	610	560	KM63
3642135	**D100MTTB1330KM63**	100	1384	RP 3/8-19	622	695	KM63



Barra interna ajustável de metal duro com conexão de troca rápida KM™



G-TTB-KM • Métrico

número para pedido	código do produto	D	L1	CS	L12	Tamanho do sistema CSWS
3954298	**G50MTTB1026KM40**	50	986	RP 3/8-19	300	KM40
3954300	**G80MTTB1564KM63**	80	1504	RP 3/8-19	480	KM63


KENNAMETAL
F5BN
beyond EVOLUTION
MADE IN INDIA

Canal e corte

Beyond Evolution • Abertura de canal, torneamento e corte C2–C77

Diretrizes para aplicação C76–C77

Canal e torneamento A4 ..... C78–C135

Top Notch • Canal raso C136–C179

Diretrizes para aplicação C172–C179

Guia de primeiros passos do kit **EASY**

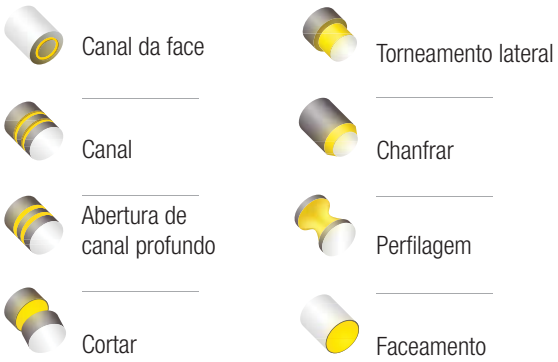
beyond™ EVOLUTION™

O seu dia **MAIS FÁCIL**

Escolher o ferramental certo pode ser difícil e demorado. Projetado com simplicidade, desenvolvemos uma nova ferramenta que FACILITA a vida de qualquer operador de máquinas.

Evitando sacrificar a performance ou as aplicações, a Kennametal apresenta a Beyond™ Evolution™.

A Beyond™ Evolution™ é a nova ferramenta de canal e corte de aresta única que também executa torneamento multidirecional.



Produtividade **FACILITADA**

Controle Ativo de Refrigeração

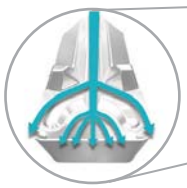
Se o seu fornecimento de refrigerante for normal para o mercado, você pode estar aplicando mais calor ao seu inserto do que imagina. Isto reduz a vida útil da ferramenta e aumenta o tempo de ciclo.

Com a Beyond™ Evolution™, você não precisará trocar o seu equipamento atual. Independentemente de estar usando um fornecimento de refrigerante de alta ou baixa pressão, a Beyond™ Evolution™, com o Controle Ativo de Refrigeração, oferece maior vida útil da ferramenta e taxas de remoção de material (MRR) superiores.



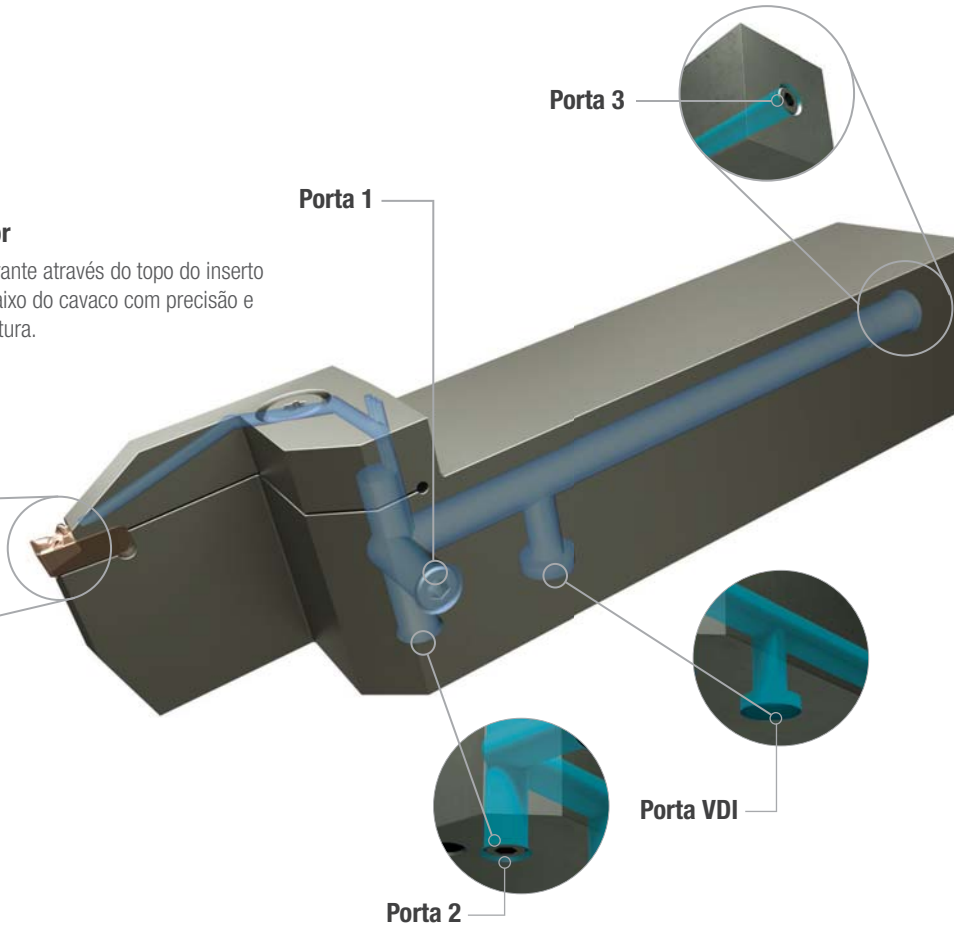
Efeito ventilador

Direciona o refrigerante através do topo do inserto à área de corte abaixo do cavaco com precisão e controla a temperatura.



Efeito de quebra-cavacos

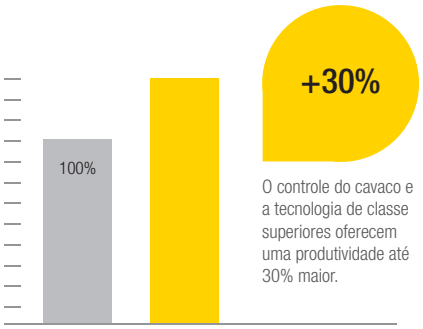
Aumente o controle do cavaco em todas as aplicações de canal, corte e torneamento multidirecional.



Acabamento superficial liso com FACILIDADE

Alojamento Triple-V

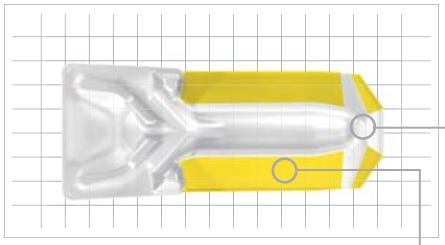
Problema: Sistemas de canais e corte tradicionais de aresta única não podem oferecer um acabamento superficial liso devido à falta de estabilidade.
Solução: O novo recurso de alojamento Triple-V exclusivo da Beyond™ Evolution™ fornece estabilidade funcional e minimiza a vibração.
As três superfícies de contato fornecem estabilidade incomparável: Quando combinado com os quebra-cavacos GUP e CF, o alojamento Triple-V fornece excelente acabamento superficial.



O controle do cavaco e a tecnologia de classe superiores oferecem uma produtividade até 30% maior.

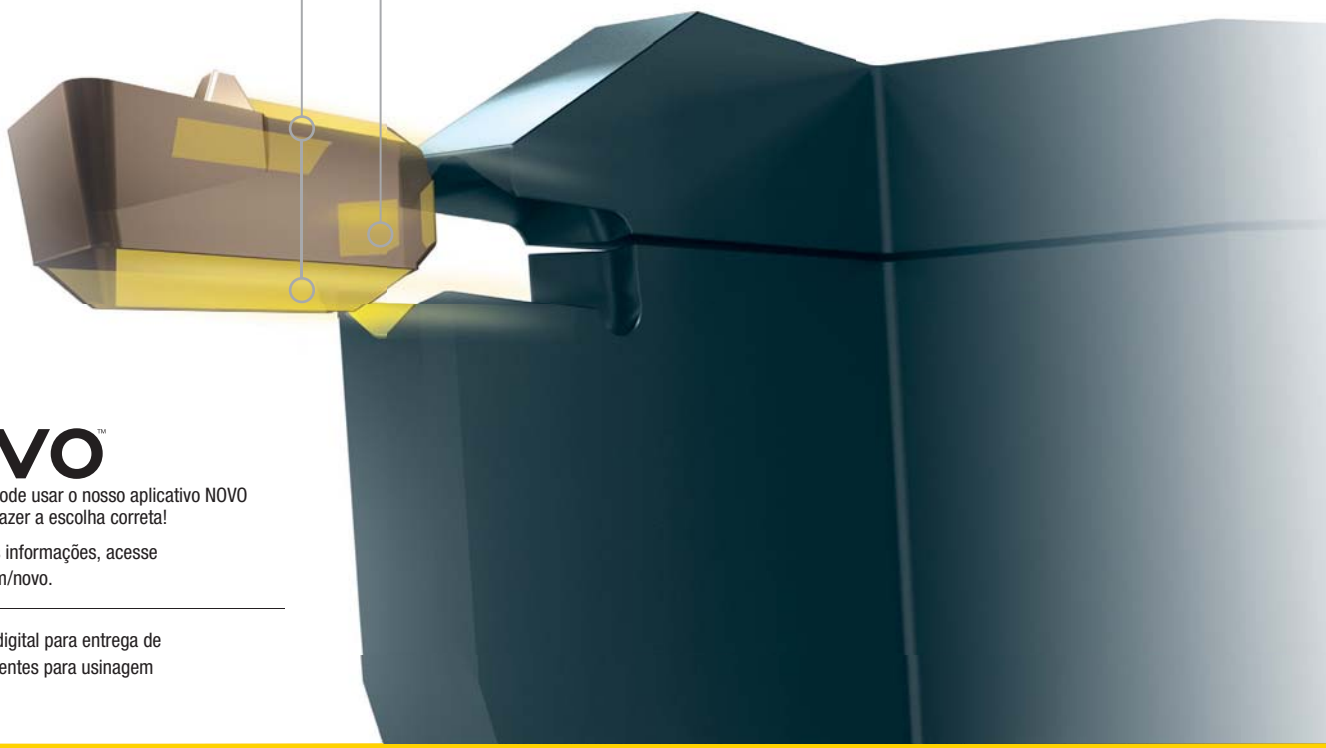
Poupar dinheiro ficou **FÁCIL**

As classes Beyond™ Evolution™, com Controle Ativo de Refrigeração, alojamento Triple-V e Beyond™ Drive™ com Tecnologia de Detecção de Desgaste, proporcionam longa vida útil da ferramenta, estabilidade máxima e maiores taxas de remoção de material (MRR), resultando em produtividade até 30% maior.



Design V-Back
Incomparável estabilidade para carga de canal, corte e torneamento multidirecional.

V superior e inferior
Posicionamento do inserto preciso e seguro para rigidez e precisão dimensional melhoradas.



NOVO™

Você também pode usar o nosso aplicativo NOVO para ajudálo a fazer a escolha correta!

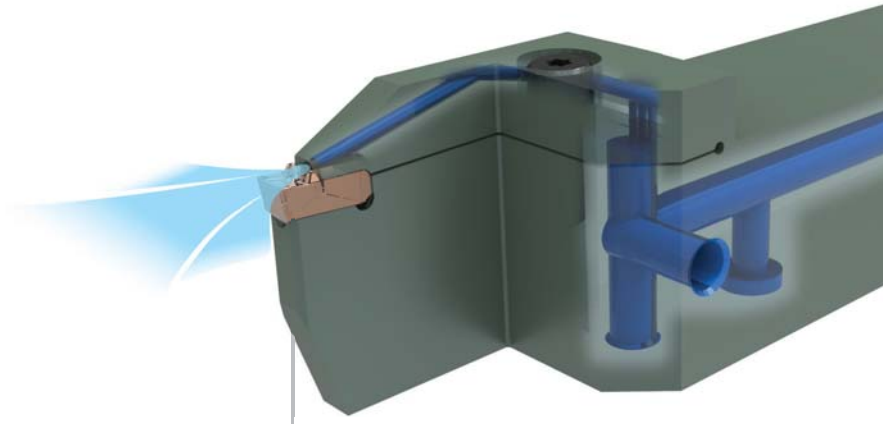
Para obter mais informações, acesse kennametal.com/novo.

NOVO: A fonte digital para entrega de soluções inteligentes para usinagem

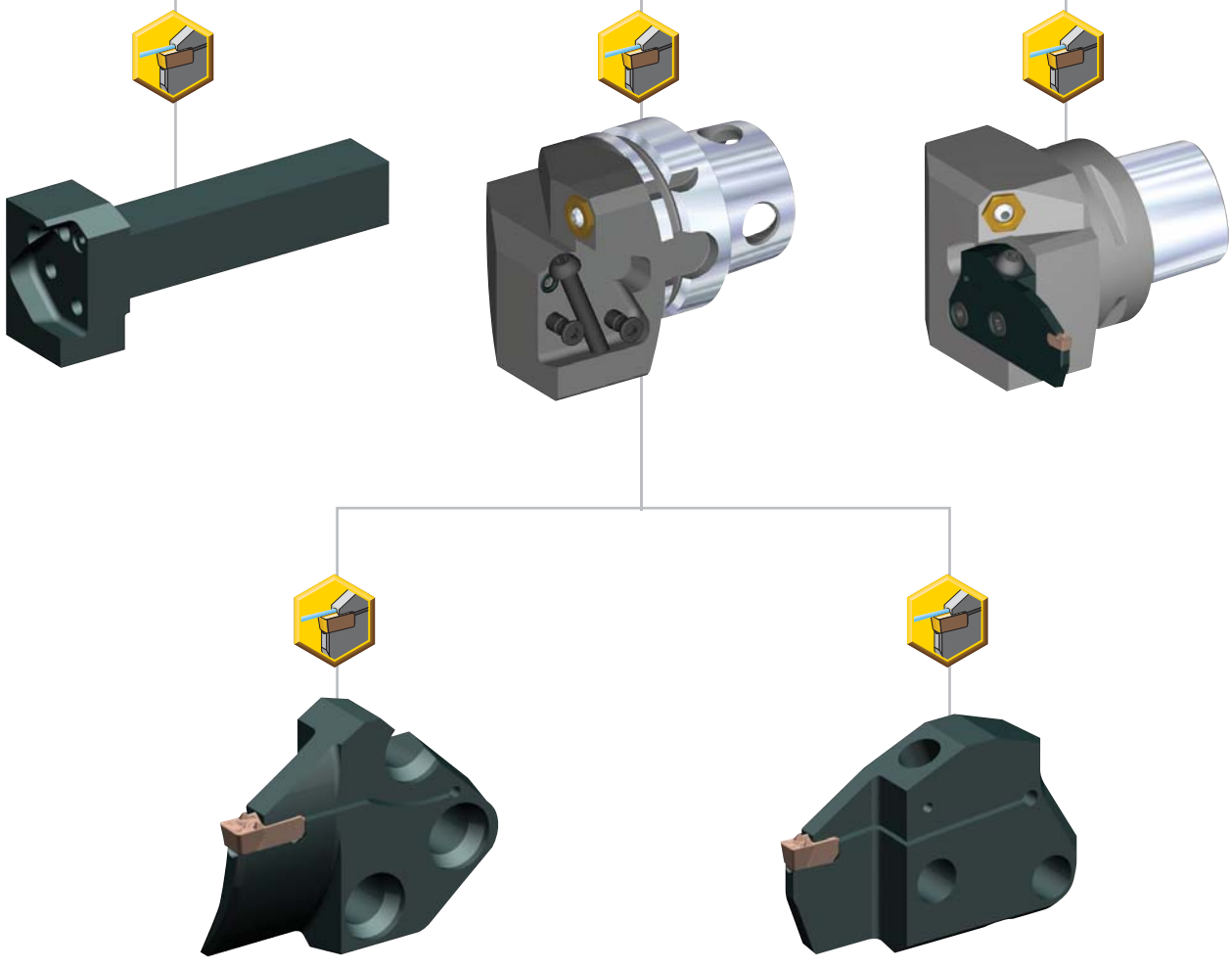
O seu dia **FACILITADO** —



Fornecimento de refrigerante eficiente. Disponível no tamanho de alojamento 3 e superiores.

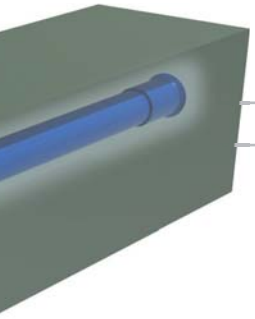


Modular com refrigeração interna



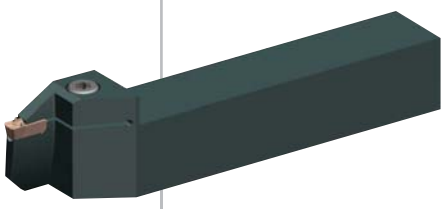
beyond™ EVOLUTION™

sistema de alta performance.



Canal de face
com refrigeração
interna

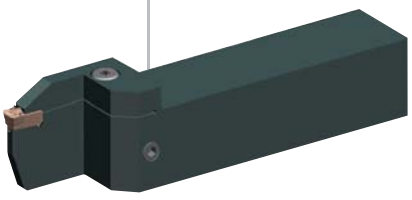
Barra de mandrilar
interna

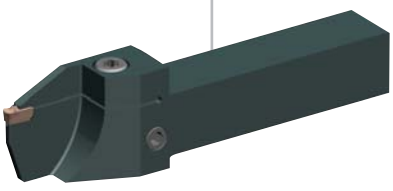




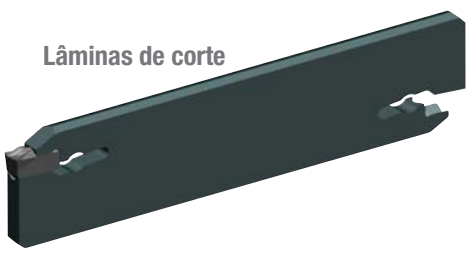


Haste quadrada
com refrigeração
interna





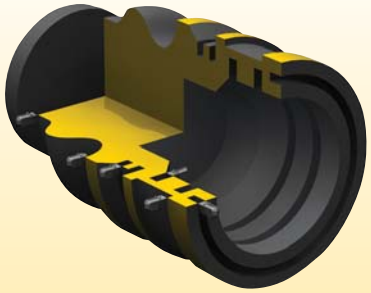
Lâminas de corte



Etapa 1 • Identifique sua aplicação de canal ou corte

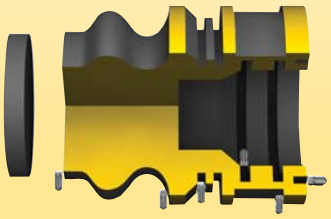
O que você precisa saber:

- Profundidade, largura e perfil da ranhura.
- Material sendo usinado.
- Aplicação a ser realizada (Canal, torneamento, canal de face e corte do O.D. e I.D.).
- Requisitos do tamanho da haste da usinagem.



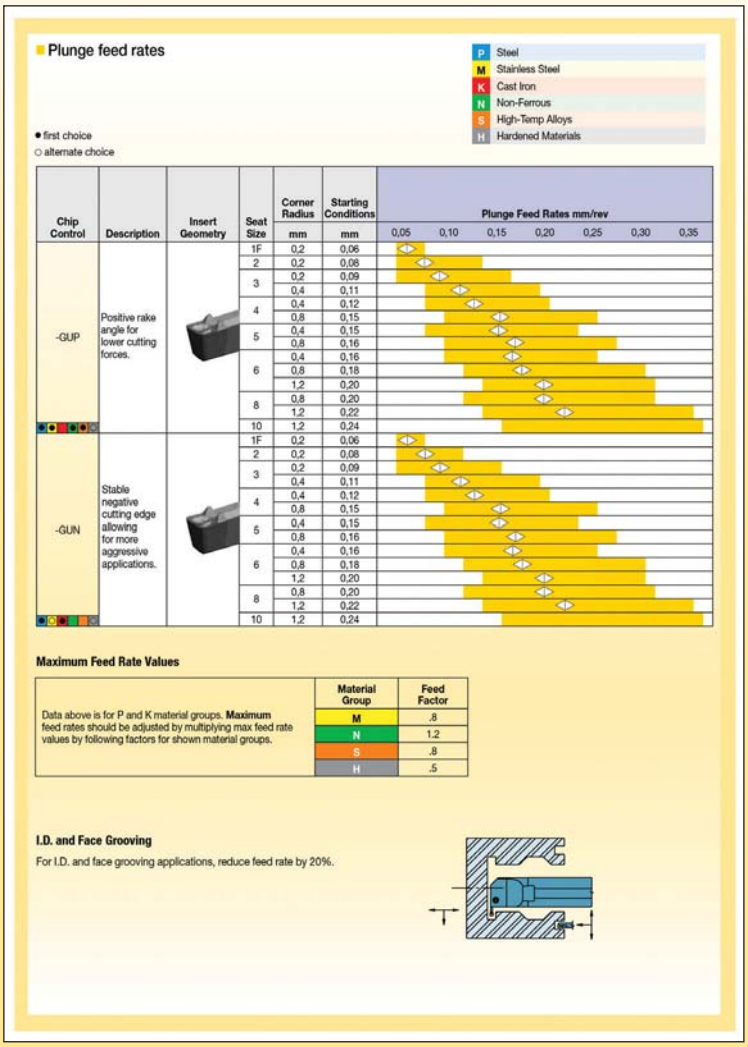
Recomendações gerais para selecionar o tamanho do inserto

para peças com diâmetro	tamanho do alojamento do inserto
<25 mm	3
25–50 mm	4
>50 mm	5–10



Etapa 2 • Selecione o estilo de quebra-cavacos e a taxa de avanço

Com base na aplicação e no tamanho do alojamento, determine a geometria e a taxa de avanço inicial recomendadas.



Plunge feed rates

P Steel
M Stainless Steel
K Cast Iron
N Non-Ferrous
S High-Temp Alloys
H Hardened Materials

● first choice
○ alternate choice

Chip Control	Description	Insert Geometry	Seat Size	Corner Radius mm	Starting Conditions mm	Plunge Feed Rates mm/rev 0,05 0,10 0,15 0,20 0,25 0,30 0,35
-GUP	Positive rake angle for lower cutting forces.		1F	0,2	0,06	●
			2	0,2	0,08	○
			3	0,2	0,09	●
				0,4	0,11	○
			4	0,4	0,12	●
				0,8	0,15	○
			5	0,4	0,15	●
				0,8	0,16	○
			6	0,4	0,16	●
				0,8	0,18	○
				1,2	0,20	●
			8	0,8	0,20	○
				1,2	0,22	●
			10	1,2	0,24	○
-GUN	Stable negative cutting edge allowing for more aggressive applications.		1F	0,2	0,06	●
			2	0,2	0,08	○
			3	0,2	0,09	●
				0,4	0,11	○
			4	0,4	0,12	●
				0,8	0,15	○
			5	0,4	0,15	●
				0,8	0,16	○
			6	0,4	0,16	●
				0,8	0,18	○
				1,2	0,20	●
			8	0,8	0,20	○
				1,2	0,22	●
			10	1,2	0,24	○

Maximum Feed Rate Values

Data above is for P and K material groups. **Maximum** feed rates should be adjusted by multiplying max feed rate values by following factors for shown material groups.

Material Group	Feed Factor
M	.8
N	1.2
S	.8
H	.5

I.D. and Face Grooving

For I.D. and face grooving applications, reduce feed rate by 20%.

Etapa 3 • Selecione a velocidade inicial

Com base no material e na classe, identifique a velocidade de corte (vc) inicial. A primeira opção está em negrito.

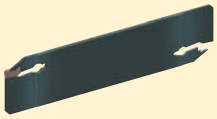
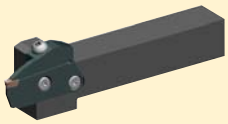
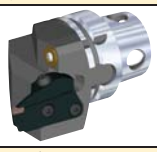
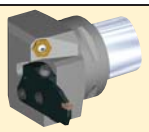
A Com base no grupo de materiais e na classe, identifique a velocidade inicial (vc).
B A primeira opção de velocidade inicial está em **negrito**.

Recommended Starting Speeds [m/min]

Material Group		K313			KCU10			KCU25			KCM35B			KCP10B			KCP25B			
P	0–1	–	–	–	140	**280**	350	110	**225**	270	90	**180**	213	185	**400**	450	145	**290**	365	A
	2	–	–	–	140	**200**	300	110	**160**	260	90	**130**	155	185	**270**	350	145	**200**	305	
	3	–	–	–	140	**155**	245	110	**125**	235	90	**100**	155	170	**190**	260	140	**155**	245	
	4	–	–	–	75	**110**	170	60	**90**	160	50	**70**	110	90	**145**	200	75	**110**	180	
	5	–	–	–	120	**200**	260	100	**160**	210	80	**130**	165	150	**220**	305	120	**200**	270	
	6	–	–	–	110	**150**	230	85	**120**	185	70	**100**	145	120	**180**	275	110	**150**	230	
M	1	60	**90**	120	140	**210**	280	90	**170**	245	75	**120**	135	–	–	–	–	–	–	
	2	45	**75**	110	120	**200**	245	90	**150**	245	75	**110**	135	–	–	B –	–	–	–	
	3	35	**65**	100	120	**180**	245	90	**140**	210	75	**90**	135	–	–	–	–	–	–	
K	1	30	**75**	120	120	**180**	245	100	**145**	225	–	–	–	170	**245**	440	140	**200**	360	
	2	25	**70**	110	90	**150**	240	70	**120**	170	–	–	–	120	**195**	340	100	**160**	280	
	3	20	**60**	90	60	**110**	150	50	**85**	120	–	–	–	120	**170**	270	100	**140**	220	
	1–2	150	**370**	610	150	**550**	975	120	**440**	780	–	–	–	–	–	–	–	–	–	

Etapa 4 • Selecione o porta-ferramenta com base na aplicação

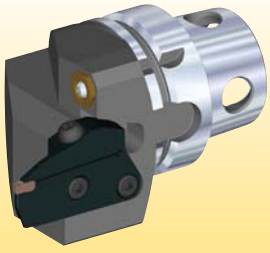
Escolha o suporte de alta performance com base em sua aplicação de canal ou corte específica, com o tamanho do alojamento correspondente.

Estilo		Aplicação
	**Barra de mandrilar**	• Para uso em aplicações de canal interna.
	**Lâmina de corte**	• Permite que o usuário varie a profundidade de corte.
	**Porta-ferramenta — Integral**	• Oferece a estabilidade máxima em relação à outros estilos.
	**Porta-ferramenta — Modular**	• Lâminas intercambiáveis para versatilidade.
	**KM™ — Modular** **KM4X™ — Modular**	• KM, melhor plataforma de troca rápida.
	**PSC — Modular**	• O sistema modular na plataforma PSC de troca rápida.

Etapa 5 • Selecione a pastilha e o suporte na página do catálogo

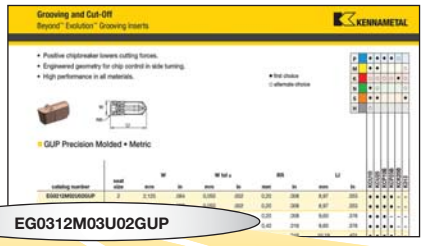
Parabéns!

Você maximizou a sua produtividade com sucesso, selecionando as melhores especificações de geometria, classe e corte do inserto para a sua aplicação!



Como funcionam os números de catálogo?

Cada caractere no nosso número de catálogo significa uma característica específica daquele produto. Use as colunas-chave a seguir e as imagens correspondentes para uma identificação fácil do atributo a ser aplicado.



EG0312M03U02GUP

E	G	0312	M	03	U	02	GUP
Nome da família	Tipo de pastilha	Largura da ranhura	Unidade	Tamanho do alojamento	Tolerância	Raio de canto	Quebra-cavacos/ Condição da aresta

E — Nome da família
- Beyond™ Evolution™

G — Tipo de pastilha
- **G** = Quadrado
- **R** = Raio completo

0312 — Largura da ranhura
- **Métrico** = 1/100mm
- **Polegada** = 1/1000"

M — Unidade
- **M** = Métrico
- **I** = Polegada

03 — Tamanho do alojamento

tamanho do alojamento	largura da ranhura	
	mm	polegada
1B	1,40	0.055
1F	1,60–1,99	0.063–0.078
02	2,00–2,99	0.079–0.117
03	3,00–3,99	0.118–0.156
04	4,00–4,99	0.157–0.196
05	5,00–5,99	0.197–0.235
06	6,00–7,99	0.236–0.314
08	8,00–8,99	0.315–0.353
10	9,00–10,12	0.354–0.398

* .312 = Tamanho do alojamento 08

U — Tolerância
- **U** = Precisão moldada
- **P** = Retificado de precisão

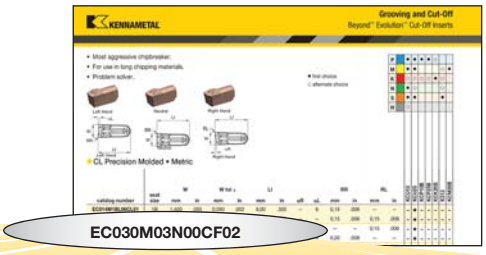
02 — Raio de canto

mm	
00	raio completo
01	0,1
02	0,2
04	0,4
08	0,8
12	1,2

polegada	
00	raio completo
05	.008
1	.016
2	.032
3	.047

GUP — Quebra-cavacos/ Condição da aresta
- **GUP** = Torneamento de ranhura positivo universal
- **GUN** = Torneamento de ranhura negativo universal
- **FB** = Blank de topo plano
- **PB** = Blank de controle do cavaco positivo

Consultando este guia fácil de usar, você pode identificar o produto correto para atender às suas necessidades.

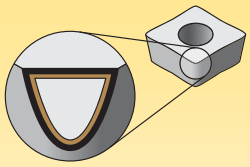


E	C	030	M	03	N	00	CF	02
Nome da família	Tipo de pastilha	Largura da aresta de corte	Unidade	Tamanho do alojamento	Direção da pastilha	Ângulo de inclinação	Quebra-cavacos	Raio de canto
Beyond™ Evolution™	**C** = Corte		**M** = Métrico **I** = Polegada		**N** = Neutro **L** = Esquerda **R** = Direita	**00** = neutro **06** = 6°	**CL** = Corte com avanço baixo **CF** = Corte fino **CM** = Corte médio **CR** = Corte de desbaste	

Largura da aresta de corte	mm	polegada
014	1,4	.055
020	2,0	.079
030	3,0	.118
040	4,0	.157
050	5,0	.197
060	6,0	.236
070	7,0	.279
080	8,0	.315

Tamanho do alojamento	mm	polegada
1B	1,4	.055
1F	2,0	.079
02	3,0	.118
03	4,0	.157
04	5,0	.197
05	6,0	.236
06	7,0	.279
08	8,0	.315

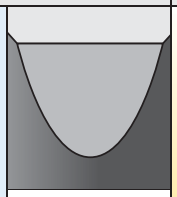
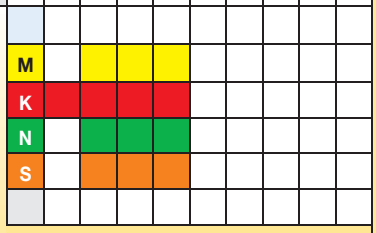
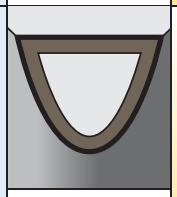
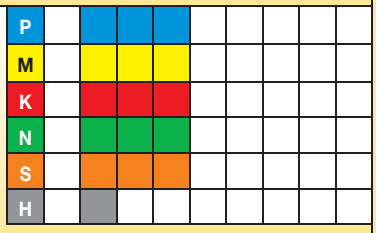
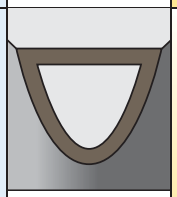
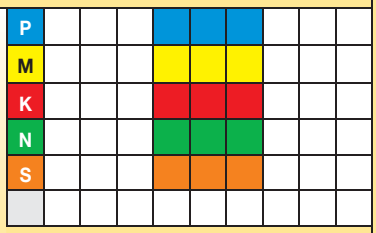
Raio de canto	mm	polegada
01	0,1	.004
02	0,2	.008
04	0,4	.016

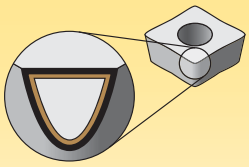


Os revestimentos proporcionam capacidade de alta velocidade e são projetados para acabamento e desbaste leve.

P	Aço
M	Aço inoxidável
K	Ferro fundido
N	Materiais não ferrosos
S	Ligas resistentes a altas temperaturas
H	Materiais endurecidos

Classes

Revestimento	Descrição da classe	resistência ao desgaste → tenacidade
K313  —	**Composição:** Classe dura, com baixo teor de aglutinante e sem liga, com grãos finos de WC/Co. **Aplicação:** Excepcional resistência a desgaste da aresta combinada com altíssima resistência para a usinagem de titânio, ferros fundidos, aços inoxidáveis austenísticos, metais não ferrosos, não metais e a maioria das ligas resistentes a altas temperaturas. Excelente resistência à deformação térmica e ao desgaste por entalhe no flanco. A estrutura do grão é bem controlada, proporcionando furos e facetas mínimas, o que contribui para um serviço durável e confiável.	
KCU10  —	**Composição:** Revestimento avançado PVD multicamadas sobre um substrato de metal duro sem liga e muito resistente à deformação. O revestimento novo e melhorado aumenta a estabilidade da aresta, com capacidade para uma ampla faixa de velocidades e avanços. **Aplicação:** A classe KCU10 é ideal para usinagem de acabamento até usinagem em geral da maioria dos materiais das peças em uma ampla faixa de capacidades de velocidades e avanços. Excelente para usinar a maior parte dos aços, aços inoxidáveis, ferros fundidos, materiais não ferrosos e superligas, com dureza da aresta melhorada e com capacidade para maiores velocidades de corte e avanços.	
KCU25  —	**Composição:** Uma classe de revestimento avançado PVD com AlTiN duro e substrato sem liga de grãos finos. O revestimento novo e melhorado aumenta a estabilidade da aresta, com capacidade para uma ampla faixa de velocidades e avanços. **Aplicação:** A classe KCU25™ é ideal para a usinagem em geral da maior parte dos aços, aços inoxidáveis, ligas resistentes a altas temperaturas, titânio, ferros fundidos e materiais não ferrosos em uma ampla faixa de velocidades e avanços, com dureza da aresta melhorada para cortes interrompidos e altas faixas de avanço.	

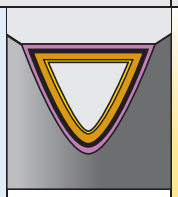
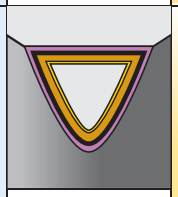
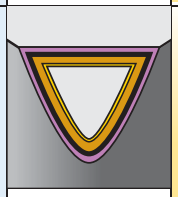
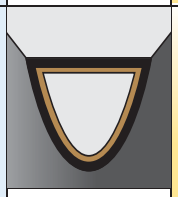


Os revestimentos proporcionam capacidade de alta velocidade e são projetados para acabamento e desbaste leve.

P	Aço
M	Aço inoxidável
K	Ferro fundido
N	Materiais não ferrosos
S	Ligas resistentes a altas temperaturas
H	Materiais endurecidos

Classes com revestimento CVD sobre um substrato de metal duro

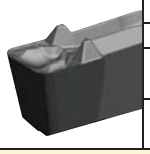
resistência ao desgaste ⟷ tenacidade

Revestimento	Descrição da classe	05	10	15	20	25	30	35	40	45
KCP10B  —	**Composição:** Uma classe de metal duro projetada especialmente para ser resistente ao desgaste com um revestimento MTCVD-TiCn-Al_2O_3-TiOCN recém-criado em várias camadas com aresta postiça entre camadas. **Aplicação:** Excelente classe para usinagem desde acabamento a usinagem média, para diversos materiais das peças, inclusive a maior parte dos aços, aços inoxidáveis ferríticos, martensíticos e PH, além de ferros fundidos. O substrato enriquecido com cobalto oferece uma combinação equilibrada de resistência à deformação e dureza, enquanto as espessas camadas de revestimento oferecem extraordinária resistência à abrasão e resistência a desgaste por craterização na usinagem em altas velocidades. O revestimento liso fornece resistência à formação de aresta postiça e à ocorrência de microlascamentos, além de produzir excelentes acabamentos superficiais.	P		■	■	■					
		K					■	■			
		beyond DRIVE™								
KCP25B  —	**Composição:** Uma classe de metal duro enriquecido com cobalto tenaz com multicamada recém-desenhada com revestimento MTCVD-TiCN-Al_2O_3-TiOCN e com adesão intercamadas superior. **Aplicação:** Melhor classe para uso geral em torneamento da maioria dos aços e de aços inoxidáveis ferríticos e martensíticos. O projeto do substrato garante uma adequada resistência à deformação com excelente comprimento da aresta do inserto. As camadas do revestimento oferecem boa resistência a desgaste em uma ampla gama de condições de usinagem, e o tratamento pós-revestimento minimiza a ocorrência de microlascamentos e melhora a aresta postiça do revestimento ao substrato, levando a uma maior vida útil da ferramenta e a melhores acabamentos da peça.	P				■	■	■		
		K					■	■	■	
		beyond DRIVE™								
KCK20B  —	**Composição:** Um revestimento de camadas múltiplas com camadas espessas MTCVD TiCn-Al_2O_3-TiOCN aplicadas em um substrato de metal duro especialmente elaborado para ferros fundidos. **Aplicação:** Proporciona uma performance consistente na usinagem em alta velocidade de ferros dúcteis cinzentos e nodulares. O projeto do substrato permite que a pastilha permaneça no corte por muito tempo em velocidades altas e com a mínima deformação. O revestimento de CVD espesso e o tratamento pós-revestimento oferecem resistência superior ao desgaste, garantindo uma vida útil da ferramenta longa e consistente. Pode ser aplicada tanto em cortes contínuos quanto ligeiramente interrompidos.	P	■	■							
		K			■	■	■	■			
		beyond DRIVE™								
KCM35B  —	**Composição:** Um revestimento de CVD de TiN-MT-TiCN-Al_2O_3-TiOCN CVD sobre um substrato super resistente. **Aplicação:** KCM35B é uma excelente opção de uso geral para classe de desbaste para usinagem de aço inoxidável e desbaste de aços em aplicações de torneamento e corte. O substrato fornece uma melhor dureza, enquanto as camadas de revestimento oferecem uma maior resistência à abrasão e confiabilidade em elevadas temperaturas de corte, juntamente com a identificação de desgaste. A superfície polida melhora a dureza da aresta e fornece uma superfície externa lisa para reduzir as forças e resistir ao acúmulo de peça na aresta de corte, mesmo em baixas velocidades de corte. A classe está disponível em tamanhos e geometrias de insertos apropriados para avanços maiores e grandes profundidades de corte.	P							■	■	■
		M						■	■	■	
		S					■	■		
		beyond DRIVE™								

Selecione a geometria

P	Aço
M	Aço inoxidável
K	Ferro fundido
N	Materiais não ferrosos
S	Ligas resistentes a altas temperaturas
H	Materiais endurecidos

● primeira opção
○ opção alternativa

Controle de cavacos	Descrição	Geometria do Inserto	tamanho do alojamento	Raio de canto pol. (mm)	Condições Iniciais pol. (mm)	Taxas de avanço para abertura de canal em mergulho pol/rev (mm/rot) .0020 (0,05)	.0040 (0,10)	.0060 (0,15)	.0080 (0,20)	.0100 (0,25)	.0120 (0,30)
-GUP	Ângulo de saída positivo para forças de corte inferiores.		1F	.008 (0,2)	.0024 (0,06)	◇					
			2	.008 (0,2)	.0031 (0,08)	◇					
			3	.008 (0,2)	.0035 (0,09)	◇					
				.016 (0,4)	.0043 (0,11)	◇					
			4	.016 (0,4)	.0047 (0,12)	◇					
				.031 (0,8)	.0059 (0,15)	◇					

Desenho do inserto

Raio de canto

Avanços recomendados iniciais da taxa de avanço

Taxas de avanço para fresamento em mergulho

Tamanho do alojamento

Intervalo recomendado da taxa de avanço

Grupo de materiais das peças

P	Aço
M	Aço inoxidável
K	Ferro fundido
N	Materiais não ferrosos
S	Ligas resistentes a altas temperaturas
H	Materiais endurecidos

● primeira opção
○ opção alternativa

Designação da geometria de controle de cavacos

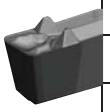
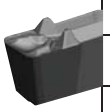
Valores máximos da taxa de avanço

	Grupo de material	Fator de avanço
Os dados acima são para grupos de material P e K. As taxas de avanço máximas devem ser ajustadas ao multiplicar os valores máximos da taxa de avanço pelos seguintes fatores para grupos de material exibidos.	M	.8
	N	1.2
	S	.8
	H	.5

Taxas de avanço para torneamento em mergulho

P	Aço
M	Aço inoxidável
K	Ferro fundido
N	Materiais não ferrosos
S	Ligas resistentes a altas temperaturas
H	Materiais endurecidos

● primeira opção
○ opção alternativa

Controle de cavacos	Descrição	Geometria do Inserto	tamanho do alojamento	Raio de canto mm	Condições Iniciais mm	Taxas de avanço para abertura de canal em mergulho mm/rot 0,05 0,10 0,15 0,20 0,25 0,30 0,35
-GUP	Ângulo de saída positivo para forças de corte inferiores.		1F	0,2	0,06	
			2	0,2	0,08	
			3	0,2	0,09	
				0,4	0,11	
			4	0,4	0,12	
				0,8	0,15	
			5	0,4	0,15	
				0,8	0,16	
			6	0,4	0,16	
				0,8	0,18	
				1,2	0,20	
			8	0,8	0,20	
				1,2	0,22	
●●●●●○			10	1,2	0,24	
-GUN	Arestas de corte negativas estáveis permitem aplicações mais agressivas.		1F	0,2	0,06	
			2	0,2	0,08	
			3	0,2	0,09	
				0,4	0,11	
			4	0,4	0,12	
				0,8	0,15	
			5	0,4	0,15	
				0,8	0,16	
			6	0,4	0,16	
				0,8	0,18	
				1,2	0,20	
			8	0,8	0,20	
				1,2	0,22	
●○●●●○			10	1,2	0,24	

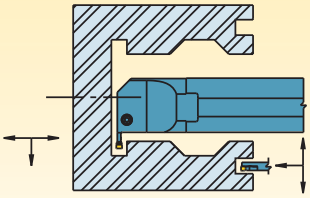
Valores máximos da taxa de avanço

Os dados acima são para grupos de material P e K. As taxas de avanço máximas devem ser ajustadas ao multiplicar os valores máximos da taxa de avanço pelos seguintes fatores para grupos de material exibidos.

Grupo de material	Fator de avanço
M	.8
N	1.2
S	.8
H	.5

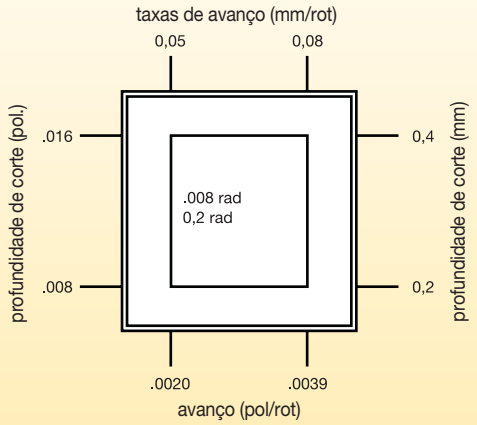
I.D. e canal de face

Para as aplicações de diâmetro interno e canal de face, reduz a taxa de avanço em 20%.

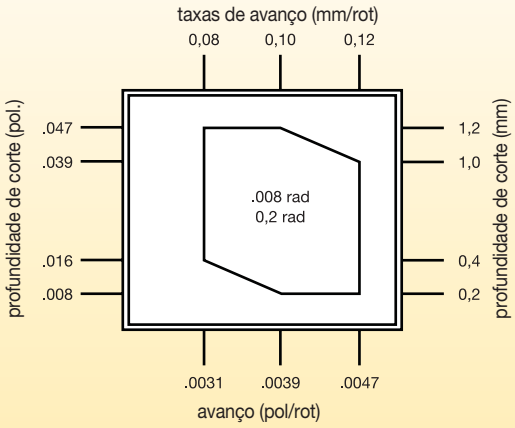


Taxas de avanço de torneamento e de perfil

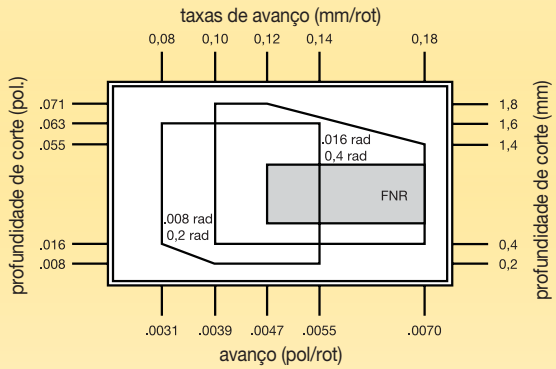
Tamanho do alojamento 1F



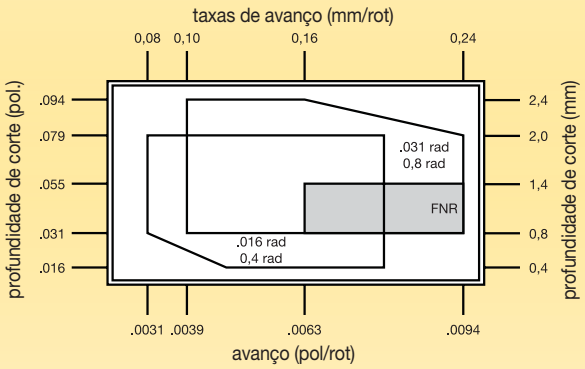
Tamanho do alojamento 2



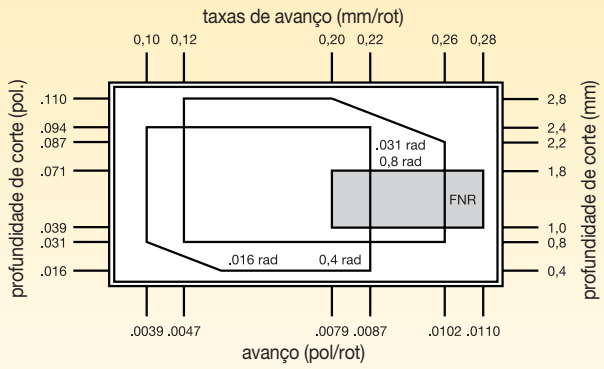
Tamanho do alojamento 3



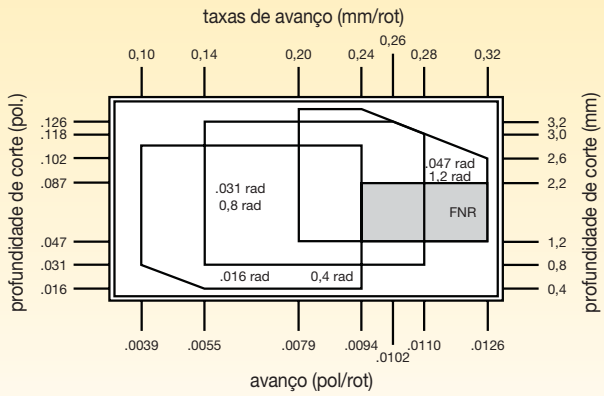
Tamanho do alojamento 4



Tamanho do alojamento 5



Tamanho do alojamento 6

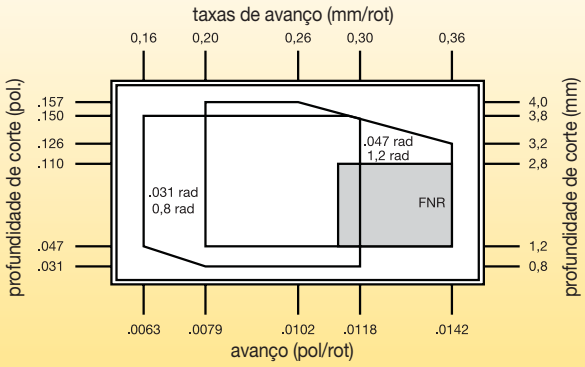


* FNR = Raio total da ponta

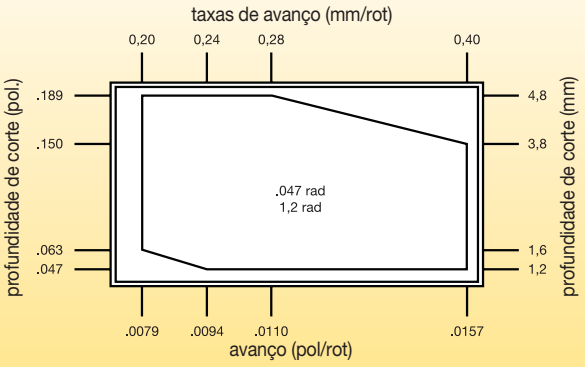
(continuação)

(Taxas de avanço de torneamento e de perfil — continuação)

Tamanho do alojamento 8



Tamanho do alojamento 10

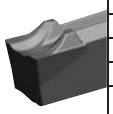
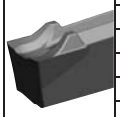
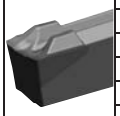
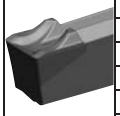


Taxas de avanço de corte

Taxas de avanço para torneamento em mergulho

● primeira opção
○ opção alternativa

P	Aço
M	Aço inoxidável
K	Ferro fundido
N	Materiais não ferrosos
S	Ligas resistentes a altas temperaturas
H	Materiais endurecidos

Geometria	Descrição	Geometria do Inserto	tamanho do alojamento	Condições Iniciais mm	Taxas de avanço para corte mm/rot 0,05 0,10 0,15 0,20 0,25 0,30 0,35 0,40
-CL	Geometria agressiva para cavacos difíceis de quebrar.		1B	0,06	
			2	0,07	
			3	0,08	
			4	0,09	
-CF	Geometria positiva para forças de corte reduzidas.		1B	0,06	
			2	0,07	
			3	0,09	
			4	0,11	
			5	0,13	
-CM	Aresta de corte estável para taxas de avanço agressivas. Principalmente em ferro fundido.		1B	0,06	
			2	0,07	
			3	0,09	
			4	0,11	
			5	0,14	
			6	0,16	
			8	0,14	
-CR	Aresta de corte mais estável para aço.		2	0,10	
			3	0,14	
			4	0,16	
			5	0,19	
			6	0,21	
			8	0,23	

NOTA: Para insertos de corte com um ângulo de posição, a taxa de avanço máxima deve ser reduzida em até 40%.

Valores máximos da taxa de avanço

	Grupo de material	Fator de avanço
Os dados acima são para grupos de material P e K. As taxas de avanço **máximas** devem ser ajustadas ao multiplicar os valores máximos da taxa de avanço pelos seguintes fatores para grupos de material exibidos.	M	.8
	N	1.2
	S	.8
	H	.5

Canal e corte

Velocidades iniciais recomendadas [m/min.]

Grupo de material		K313			KCU10			KCU25			KCM35B			KCP10B			KCP25B			KCK20B		
P	0–1	–	–	–	140	**280**	350	110	**225**	270	90	**180**	213	185	**400**	450	145	**290**	365	200	**440**	490
	2	–	–	–	140	**200**	300	110	**160**	260	90	**130**	155	185	**270**	350	145	**200**	305	200	**300**	380
	3	–	–	–	140	**155**	245	110	**125**	235	90	**100**	155	170	**190**	260	140	**155**	245	600	**200**	280
	4	–	–	–	75	**110**	170	60	**90**	160	50	**70**	110	90	**145**	200	75	**110**	180	100	**160**	220
	5	–	–	–	120	**200**	260	100	**160**	210	80	**130**	165	150	**220**	305	120	**200**	270	165	**240**	330
	6	–	–	–	110	**150**	230	85	**120**	185	70	**100**	145	120	**180**	275	110	**150**	230	130	**190**	300
M	1	60	**90**	120	140	**210**	280	90	**170**	245	75	**120**	135	–	–	–	–	–	–	–	–	–
	2	45	**75**	110	120	**200**	245	90	**150**	245	75	**110**	135	–	–	–	–	–	–	–	–	–
	3	35	**65**	100	120	**180**	245	90	**140**	210	75	**90**	135	–	–	–	–	–	–	–	–	–
K	1	30	**75**	120	120	**180**	245	100	**145**	225	–	–	–	170	**245**	440	140	**200**	360	210	**305**	550
	2	25	**70**	110	90	**150**	240	70	**120**	170	–	–	–	120	**195**	340	100	**160**	280	150	**245**	430
	3	20	**60**	90	60	**110**	150	50	**85**	120	–	–	–	120	**170**	270	100	**140**	220	150	**210**	335
N	1–2	150	**370**	610	150	**550**	975	120	**440**	780	–	–	–	–	–	–	–	–	–	–	–	–
	3	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	4	120	**275**	430	120	**365**	700	100	**290**	490	–	–	–	–	–	–	–	–	–	–	–	–
	5	45	**90**	150	90	**170**	245	70	**135**	195	–	–	–	–	–	–	–	–	–	–	–	–
	6	40	**75**	150	120	**210**	305	100	**170**	245	–	–	–	–	–	–	–	–	–	–	–	–
S	1	8	**30**	75	15	**55**	135	8	**40**	60	8	**35**	60	–	–	–	–	–	–	–	–	–
	2	8	**35**	75	15	**60**	135	8	**30**	75	8	**30**	60	–	–	–	–	–	–	–	–	–
	3	8	**40**	75	15	**70**	150	15	**40**	75	15	**35**	60	–	–	–	–	–	–	–	–	–
	4	8	**45**	75	15	**70**	170	8	**50**	110	15	**45**	90	–	–	–	–	–	–	–	–	–
H	1	–	–	–	30	**45**	60	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	2	–	–	–	15	**30**	45	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	3	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–

NOTA: A PRIMEIRA opção de velocidade inicial está em **negrito**.
À medida que o valor médio da espessura do cavaco aumenta, a velocidade diminui.

Aplicativo Móvel

O aplicativo móvel da Kennametal proporciona acesso fácil a informações de produtos e calculadoras em ambos equipamentos, iPhone® e Android™. Destacamos algumas das principais características...

Há um aplicativo para isso.

VELOCIDADES DE CORTE & AVANÇOS

Veja informações sobre velocidades de corte e avanços para produtos metalúrgicos.

DISPONIBILIDADE DO PRODUTO

Verifique a disponibilidade global de produtos. Veja quantidades disponíveis fornecendo sua credencial de acesso do Konnect.

CALCULADORAS

Utilize nossa calculadora de usinagem para aplicações de fresamento e furação.



Ao digitalizar o código de barra da embalagem do inserto, você pode encontrar as condições de corte mais produtivas para vida útil e controle de cavaco.

NOTA: O aplicativo está disponível somente na versão em Inglês. Nós temos planos para traduzir o aplicativo em diferentes idiomas para liberações futuras.

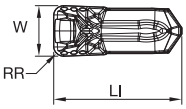
Google play | Available on the App Store

- O quebra-cavacos positivo reduz as forças de corte.
- Geometria projetada para controle do cavaco em torneamento lateral.
- Alta performance em todos os materiais.

● primeira opção
○ opção alternativa

		KCU10	KCU25	KCP10B	KCP25B	KCK20B	KCM35B	K313
P		●	●	●	●	○		
M		●	●				●	○
K		○	○	○	○	●		○
N		●	○					●
S		●	●					●
H		○						





Precisão GUP moldada • Métrico

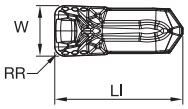
código do produto	tamanho do inserto	W	W tol ±	RR	LI	KCU10	KCU25	KCP10B	KCP25B	KCK20B	KCM35B	K313
EG0212M02U02GUP	2	2,125	0,050	0,20	8,97	●	●	●	●	–	–	–
EG0251M02U02GUP	2	2,511	0,050	0,20	8,97	●	●	●	●	–	–	–
EG0312M03U02GUP	3	3,125	0,075	0,20	9,60	●	●	●	–	–	–	–
EG0312M03U04GUP	3	3,125	0,075	0,40	9,60	●	●	●	●	–	–	–
EG0412M04U04GUP	4	4,125	0,075	0,40	10,19	●	●	●	●	–	–	–
EG0412M04U08GUP	4	4,125	0,075	0,80	10,19	●	●	●	●	–	–	–
EG0512M05U04GUP	5	5,125	0,075	0,40	12,25	●	●	●	●	–	–	–
EG0512M05U08GUP	5	5,125	0,075	0,80	12,25	●	●	●	●	–	–	–
EG0612M06U04GUP	6	6,125	0,075	0,40	14,60	●	●	●	●	–	–	–
EG0612M06U08GUP	6	6,125	0,075	0,80	14,60	●	●	●	●	–	–	–
EG0712M06U08GUP	6	7,125	0,075	0,80	14,60	●	●	●	●	–	–	–
EG0812M08U08GUP	8	8,125	0,075	0,80	17,47	●	●	●	●	–	–	–
EG0812M08U12GUP	8	8,125	0,075	1,18	17,45	●	●	●	●	–	–	–
EG1012M10U12GUP	10	10,125	0,075	1,20	20,80	●	●	●	●	–	–	–

- O quebra-cavacos positivo reduz as forças de corte.
- Geometria projetada para controle do cavaco em torneamento lateral.
- Alta performance em todos os materiais.
- Larguras mais precisas e maior confiabilidade.

● primeira opção
○ opção alternada

		KCU10	KCU25	KCP10B	KCP25B	KCK20B	KCM35B	K313
P		●	●	●	●	○		
M		●	●				●	○
K		○	○	○	○	●		○
N		●	○					●
S		●	●					●
H		○						





Precisão GUP retificada • Métrico

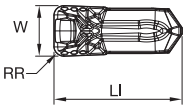
código do produto	tamanho do inserto	W	W tol ±	RR	LI	KCU10	KCU25	KCP10B	KCP25B	KCK20B	KCM35B	K313
EG0200M02P02GUP	2	2,000	0,025	0,20	8,80	●	●	–	–	–	–	●
EG0300M03P02GUP	3	3,000	0,025	0,20	9,40	●	●	–	–	–	–	●
EG0300M03P04GUP	3	3,000	0,025	0,40	9,60	●	●	–	–	–	–	●
EG0400M04P04GUP	4	4,000	0,025	0,40	10,10	●	●	–	–	–	–	●
EG0400M04P08GUP	4	4,000	0,025	0,80	10,10	●	●	–	–	–	–	●
EG0500M05P04GUP	5	5,000	0,025	0,40	12,20	●	●	–	–	–	–	●
EG0500M05P08GUP	5	5,000	0,025	0,80	12,20	●	●	–	–	–	–	●
EG0600M06P04GUP	6	6,000	0,025	0,40	14,50	●	●	–	–	–	–	●
EG0600M06P08GUP	6	6,000	0,025	0,80	14,50	●	●	–	–	–	–	●
EG0700M06P08GUP	6	7,000	0,025	0,80	14,50	●	●	–	–	–	–	●
EG0800M08P08GUP	8	8,000	0,025	0,80	17,40	●	●	–	–	–	–	●
EG0800M08P12GUP	8	8,000	0,025	1,20	17,40	●	●	–	–	–	–	●
EG1000M10P12GUP	10	10,000	0,025	1,20	20,70	●	●	–	–	–	–	●

- O quebra-cavacos positivo reduz as forças de corte.
- Geometria projetada para controle do cavaco em torneamento lateral.
- Alta performance em todos os materiais.

● primeira opção
○ opção alternativa

		KCU10	KCU25	KCP10B	KCP25B	KCK20B	KCM35B	K313
P		●	●	●	●	○		
M		●	●				●	○
K		○	○	○	○	●		○
N		●	○					●
S		●	●					●
H		○						





Precisão GUP moldada • Polegada

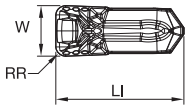
código do produto	tamanho do inserto	W	W tol ±	RR	LI	KCU10	KCU25	KCP10B	KCP25B	KCK20B	KCM35B	K313
EG130I03U05GUP	3	3,301	0,075	0,20	9,60	●	●	●	●	–	–	–
EG130I03U1GUP	3	3,301	0,075	0,40	9,60	●	●	●	●	–	–	–
EG192I04U1GUP	4	4,877	0,075	0,40	10,19	●	●	●	●	–	–	–
EG192I04U2GUP	4	4,877	0,075	0,79	10,19	●	●	●	●	–	–	–
EG255I06U1GUP	6	6,478	0,075	0,40	14,58	●	●	●	●	–	–	–
EG255I06U2GUP	6	6,478	0,075	0,80	14,58	●	●	●	●	–	–	–
EG317I08U3GUP	8	8,051	0,075	1,19	17,46	●	●	●	●	–	–	–
EG380I10U3GUP	10	9,651	0,075	1,19	20,80	●	●	●	●	–	–	–

- O quebra-cavacos positivo reduz as forças de corte.
- Geometria projetada para controle do cavaco em torneamento lateral.
- Alta performance em todos os materiais.
- Larguras mais precisas e maior confiabilidade.

● primeira opção
○ opção alternativa

		KCU10	KCU25	KCP10B	KCP25B	KCK20B	KCM35B	K313
P		●	●	●	●	○		
M		●	●				●	○
K		○	○	○	○	●		○
N		●	○					●
S		●	●					●
H		○						



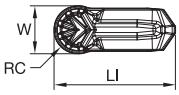


Retificado de precisão GUP • Polegada

código do produto	tamanho do inserto	W	W tol ±	RR	LI	KCU10	KCU25	KCP10B	KCP25B	KCK20B	KCM35B	K313
EG063I1FP05GUP	1F	1,600	0,025	0,20	9,00	●	●	–	–	–	–	●
EG094I02P05GUP	2	2,388	0,025	0,20	8,88	●	●	–	–	–	–	●
EG125I03P05GUP	3	3,175	0,025	0,20	9,40	●	●	–	–	–	–	●
EG125I03P1GUP	3	3,175	0,025	0,40	9,40	●	●	–	–	–	–	●
EG187I04P1GUP	4	4,760	0,025	0,40	10,10	●	●	–	–	–	–	●
EG187I04P2GUP	4	4,762	0,025	0,79	10,10	●	●	–	–	–	–	●
EG250I06P1GUP	6	6,350	0,025	0,40	14,50	●	●	–	–	–	–	●
EG250I06P2GUP	6	6,350	0,025	0,80	14,50	●	●	–	–	–	–	●
EG312I08P3GUP	8	7,920	0,025	1,20	17,40	●	●	–	–	–	–	●
EG375I10P3GUP	10	9,525	0,025	1,20	20,70	●	●	–	–	–	–	●

- Primeira opção para perfilagem.
- Aresta de corte de >180°.
- Alta performance em todos os materiais.





Precisão GUP de raio completo moldada • Métrico

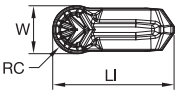
código do produto	tamanho do inserto	W	W tol ±	RC	LI	KCU10	KCU25	KCP10B	KCP25B	KCK20B	KCM35B	K313
ER0312M03U00GUP	3	3,125	0,075	1,560	9,60	●	●	●	●	–	–	–
ER0412M04U00GUP	4	4,125	0,075	2,060	10,20	●	●	●	●	–	–	–
ER0512M05U00GUP	5	5,125	0,075	2,560	12,20	●	●	●	●	–	–	–
ER0612M06U00GUP	6	6,125	0,075	3,060	14,60	●	●	●	●	–	–	–
ER0812M08U00GUP	8	8,125	0,075	4,060	17,50	●	●	●	●	–	–	–

- Primeira opção para perfilagem.
- Aresta de corte de >180°.
- Alta performance em todos os materiais.
- Larguras mais precisas e maior confiabilidade.

● primeira opção
○ opção alternada

		KCU10	KCU25	KCP10B	KCP25B	KCK20B	KCM35B	K313
P		●	●	●	●	○		
M		●	●				●	○
K		○	○	○	○	●		○
N		●	○					●
S		●	●					●
H		○						



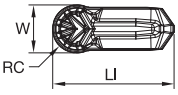


Precisão GUP de raio completo retificada • Métrico

código do produto	tamanho do inserto	W	W tol ±	RC	LI	KCU10	KCU25	KCP10B	KCP25B	KCK20B	KCM35B	K313
ER0300M03P00GUP	3	3,000	0,025	1,500	9,50	●	●	–	–	–	–	●
ER0400M04P00GUP	4	4,000	0,025	2,000	10,10	●	●	–	–	–	–	●
ER0500M05P00GUP	5	5,000	0,025	2,500	12,20	●	●	–	–	–	–	●
ER0600M06P00GUP	6	6,000	0,025	3,000	14,50	●	●	–	–	–	–	●
ER0800M08P00GUP	8	8,000	0,025	4,000	17,40	●	●	–	–	–	–	●

- Primeira opção para perfilagem.
- Aresta de corte de >180°.
- Alta performance em todos os materiais.





Precisão GUP de raio completo moldada • Polegada

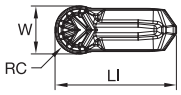
código do produto	tamanho do inserto	W	W tol ±	RC	LI	KCU10	KCU25	KCP10B	KCP25B	KCK20B	KCM35B	K313
ER130I03U00GUP	3	3,302	0,075	1,650	9,60	●	●	●	●	–	–	–
ER192I04U00GUP	4	4,878	0,075	2,440	10,20	●	●	●	●	–	–	–
ER255I06U00GUP	6	6,478	0,075	3,240	14,60	●	●	●	●	–	–	–
ER317I08U00GUP	8	8,052	0,075	4,030	17,50	●	●	●	●	–	–	–

- Primeira opção para perfilagem.
- Aresta de corte de >180°.
- Alta performance em todos os materiais.
- Larguras mais precisas e maior confiabilidade.

● primeira opção
○ opção alternativa

		KCU10	KCU25	KCP10B	KCP25B	KCK20B	KCM35B	K313
P		●	●	●	●	○		
M		●	●				●	○
K		○	○	○	○	●		○
N		●	○					●
S		●	●					●
H		○						



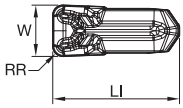


Retificado de precisão GUP de raio completo • Polegada

código do produto	tamanho do inserto	W	W tol ±	RC	LI	KCU10	KCU25	KCP10B	KCP25B	KCK20B	KCM35B	K313
ER125I03P00GUP	3	3,175	0,025	1,590	9,50	●	●	–	–	–	–	●
ER187I04P00GUP	4	4,762	0,025	2,380	10,10	●	●	–	–	–	–	●
ER250I06P00GUP	6	6,350	0,025	3,170	14,50	●	●	–	–	–	–	●
ER312I08P00GUP	8	7,920	0,025	3,960	17,40	●	●	–	–	–	–	●

- Face de ângulo negativo para uma aresta de corte mais resistente.
- Aplicações mais agressivas.
- Vantagens em aplicações de baixo avanço e profundidade de corte.





Precisão GUN moldada • Métrico

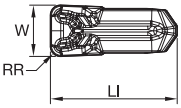
código do produto	tamanho do inserto	W	W tol ±	RR	LI	KCU10	KCU25	KCP10B	KCP25B	KCK20B	KCM35B	K313
EG0212M02U02GUN	2	2,125	0,050	0,20	8,97	●	●	●	●	●	–	–
EG0251M02U02GUN	2	2,510	0,050	0,20	8,97	●	●	●	●	●	–	–
EG0312M03U02GUN	3	3,125	0,075	0,20	9,60	●	●	●	●	●	–	–
EG0312M03U04GUN	3	3,125	0,075	0,40	9,60	●	●	●	●	●	–	–
EG0412M04U04GUN	4	4,125	0,075	0,40	10,19	●	●	●	●	●	–	–
EG0412M04U08GUN	4	4,125	0,075	0,80	10,19	●	●	●	●	●	–	–
EG0512M05U04GUN	5	5,125	0,075	0,40	12,20	●	●	●	●	●	–	–
EG0512M05U08GUN	5	5,125	0,075	0,80	12,20	●	●	●	●	●	–	–
EG0612M06U04GUN	6	6,125	0,075	0,40	14,60	●	●	●	–	●	–	–
EG0612M06U08GUN	6	6,125	0,075	0,80	14,60	●	●	–	●	●	–	–
EG0812M08U08GUN	8	8,125	0,075	0,80	17,50	●	●	●	●	●	–	–
EG0812M08U12GUN	8	8,125	0,075	1,20	17,50	●	●	●	●	●	–	–
EG1012M10U12GUN	10	10,125	0,075	1,20	20,80	●	●	●	●	●	–	–

- Face de ângulo negativo para uma aresta de corte mais resistente.
- Aplicações mais agressivas.
- Vantagens em aplicações de baixo avanço e profundidade de corte.

● primeira opção
○ opção alternativa

		KCU10	KCU25	KCP10B	KCP25B	KCK20B	KCM35B	K313
P		●	●	●	●	○		
M		●	●				●	○
K		○	○	○	○	●		○
N		●	○					●
S		●	●					●
H		○						



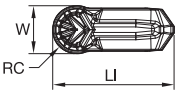


Precisão GUN moldada • Polegada

código do produto	tamanho do inserto	W	W tol ±	RR	LI	KCU10	KCU25	KCP10B	KCP25B	KCK20B	KCM35B	K313
EG063I1FU05GUN	1F	1,600	0,050	0,20	9,00	●	●	●	●	●	–	–
EG130I03U05GUN	3	3,302	0,075	0,20	9,60	●	●	●	●	●	–	–
EG130I03U1GUN	3	3,302	0,075	0,40	9,60	●	●	●	●	●	–	–
EG192I04U1GUN	4	4,877	0,075	0,40	10,19	●	●	●	●	●	–	–
EG192I04U2GUN	4	4,878	0,075	0,79	10,19	●	●	●	●	●	–	–
EG255I06U1GUN	6	6,477	0,075	0,40	14,58	●	●	●	●	●	–	–
EG255I06U2GUN	6	6,477	0,075	0,80	14,58	●	●	●	●	●	–	–
EG317I08U3GUN	8	8,052	0,075	1,19	17,46	●	●	●	●	●	–	–
EG380I10U3GUN	10	9,651	0,075	1,20	20,80	●	●	●	●	●	–	–

- Face de ângulo negativo para uma aresta de corte mais resistente.
- Primeira opção para perfilagem.
- Aresta de corte de >180°.
- Alta performance em todos os materiais.





Precisão GUN de raio completo moldada • Métrico

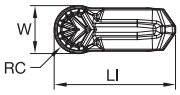
código do produto	tamanho do inserto	W	W tol ±	RC	LI	KCU10	KCU25	KCP10B	KCP25B	KCK20B	KCM35B	K313
ER0312M03U00GUN	3	3,125	0,075	1,560	9,60	●	●	●	●	●	–	–
ER0412M04U00GUN	4	4,125	0,075	2,060	10,20	●	●	●	●	●	–	–
ER0512M05U00GUN	5	5,125	0,075	2,560	12,20	●	●	●	●	●	–	–
ER0612M06U00GUN	6	6,125	0,075	3,060	14,60	●	●	●	●	●	–	–
ER0812M08U00GUN	8	8,125	0,075	4,060	17,47	●	●	●	●	●	–	–

- Face de ângulo negativo para uma aresta de corte mais resistente.
- Primeira opção para perfilagem.
- Aresta de corte de >180°.
- Alta performance em todos os materiais.

● primeira opção
○ opção alternativa

		KCU10	KCU25	KCP10B	KCP25B	KCK20B	KCM35B	K313
P		●	●	●	●	○		
M		●	●				●	○
K		○	○	○	○	●		○
N		●	○					●
S		●	●					●
H		○						





Precisão GUN de raio completo moldada • Polegada

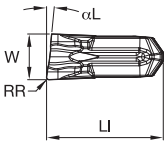
código do produto	tamanho do inserto	W	W tol ±	RC	LI	KCU10	KCU25	KCP10B	KCP25B	KCK20B	KCM35B	K313
ER094I02U00GUN	2	2,387	0,050	1,190	8,97	●	●	●	●	●	–	–
ER125I03U00GUN	3	3,177	0,075	1,590	9,60	●	●	●	●	●	–	–
ER130I03U00GUN	3	3,300	0,075	1,650	9,60	●	●	●	●	●	–	–
ER187I04U00GUN	4	4,750	0,075	2,370	10,20	●	●	●	●	●	–	–
ER192I04U00GUN	4	4,873	0,075	2,440	10,20	●	●	●	●	●	–	–
ER250I06U00GUN	6	6,346	0,075	3,170	14,60	●	●	●	●	●	–	–
ER255I06U00GUN	6	6,473	0,075	3,240	14,60	●	●	●	●	●	–	–
ER312I08U00GUN	8	7,925	0,075	3,960	17,50	●	●	●	●	●	–	–
ER317I08U00GUN	8	8,052	0,075	4,030	17,50	●	●	●	●	●	–	–

- O quebra-cavacos positivo reduz as forças de corte.
- Primeira opção para aço e aço inoxidável.
- Excelente acabamento superficial.

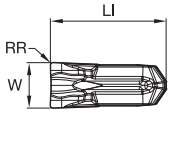

corte à esquerda (L)


Neutro

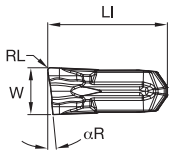

corte à direita (R)



corte à esquerda (L)



Neutro



corte à direita (R)

Precisão CF moldada • Métrico

código do produto	tamanho do inserto	W	W tol ±	LI	αR	αL	RR	RL	KCU10	KCU25	KCP10B	KCP25B	KCK20B	KCM35B	K313
EC014M1BL06CF01	1B	1,404	0,050	9,00	–	6	0,15	–	–	●	–	–	–	●	–
EC014M1BN00CF01	1B	1,400	0,050	9,00	–	–	0,15	0,15	–	●	–	–	–	●	–
EC014M1BR06CF01	1B	1,404	0,050	9,00	6	–	–	0,15	–	●	–	–	–	●	–
EC020M02L06CF02	2	2,000	0,050	8,97	–	6	0,20	–	–	●	–	–	–	●	–
EC020M02N00CF02	2	2,000	0,050	8,97	–	–	0,20	0,20	–	●	–	–	–	●	–
EC020M02R06CF02	2	2,000	0,050	8,97	6	–	–	0,20	–	●	–	–	–	●	–
EC030M03L06CF02	3	3,000	0,075	9,60	–	6	0,20	–	–	●	–	–	–	●	–
EC030M03N00CF02	3	3,000	0,075	9,60	–	–	0,20	0,20	–	●	–	–	–	●	–
EC030M03R06CF02	3	3,000	0,075	9,60	6	–	–	0,20	–	●	–	–	–	●	–
EC040M04L06CF02	4	4,000	0,075	10,19	–	6	0,20	–	–	●	–	–	–	●	–
EC040M04N00CF02	4	4,000	0,075	10,19	–	–	0,20	0,20	–	●	–	–	–	●	–
EC040M04R06CF02	4	4,000	0,075	10,19	6	–	–	0,20	–	●	–	–	–	●	–
EC050M05N00CF03	5	5,000	0,075	12,20	–	–	0,30	0,30	–	●	–	–	–	●	–

- Quebra-cavacos mais agressivo.
- Para uso em materiais de cavacos longos.
- Solucionador de problemas.

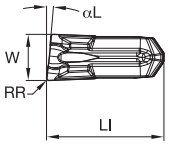
● primeira opção
○ opção alternada

		KCU10	KCU25	KCP10B	KCP25B	KCK20B	KCM35B	K313
P		●	●	●	●	○		
M		●	●				●	○
K		○	○	○	○	●		○
N		●	○					●
S		●	●					●
H		○						

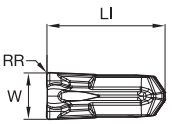

corte à esquerda (L)


Neutro

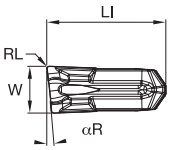

corte à direita (R)



corte à esquerda (L)



Neutro



corte à direita (R)

Precisão CL moldada • Métrico

código do produto	tamanho do inserto	W	W tol ±	LI	αR	αL	RR	RL	KCU10	KCU25	KCP10B	KCP25B	KCK20B	KCM35B	K313
EC014M1BL06CL01	1B	1,400	0,050	9,00	–	6	0,15	–	–	●	–	–	–	●	–
EC014M1BN00CL01	1B	1,400	0,050	9,00	–	–	0,15	0,15	–	●	–	–	–	●	–
EC014M1BR06CL01	1B	1,400	0,050	9,00	6	–	–	0,15	–	●	–	–	–	●	–
EC020M02L06CL02	2	2,000	0,050	8,96	–	6	0,20	–	–	●	–	–	–	●	–
EC020M02N00CL02	2	2,000	0,050	8,97	–	–	0,20	0,20	–	●	–	–	–	●	–
EC020M02R06CL02	2	2,000	0,050	8,96	6	–	–	0,20	–	●	–	–	–	●	–
EC030M03L06CL02	3	3,000	0,075	9,59	–	6	0,20	–	–	●	–	–	–	●	–
EC030M03N00CL02	3	3,000	0,075	9,60	–	–	0,20	0,20	–	●	–	–	–	●	–
EC030M03R06CL02	3	3,000	0,075	9,59	6	–	–	0,20	–	●	–	–	–	●	–
EC040M04L06CL02	4	4,000	0,075	10,19	–	6	0,20	–	–	●	–	–	–	–	–
EC040M04N00CL02	4	4,000	0,075	10,20	–	–	0,20	0,20	–	●	–	–	–	●	–
EC040M04R06CL02	4	4,000	0,075	10,19	6	–	–	0,20	–	●	–	–	–	–	–

- Solução definitiva em estabilidade da aresta.
- Útil para cortes interrompidos ou superfície endurecida.
- Primeira opção para ferro fundido.

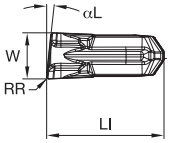
● primeira opção
○ opção alternativa

		KCU10	KCU25	KCP10B	KCP25B	KCK20B	KCM35B	K313
P		●	●	●	●	○		
M		●	●				●	○
K		○	○	○	○	●		○
N		●	○					●
S		●	●					●
H		○						

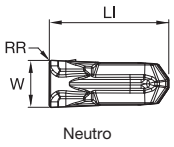

corte à esquerda (L)


Neutro

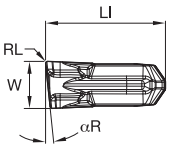

corte à direita (R)



corte à esquerda (L)



Neutro



corte à direita (R)

Precisão CM moldada • Métrico

código do produto	tamanho do inserto	W	W tol ±	LI	αR	αL	RR	RL	KCU10	KCU25	KCP10B	KCP25B	KCK20B	KCM35B	K313
EC014M1BL06CM01	1B	1,400	0,050	9,00	–	6	0,20	–	–	●	–	–	–	–	–
EC014M1BN00CM01	1B	1,400	0,050	9,00	–	–	0,15	0,15	–	●	–	–	–	–	–
EC014M1BR06CM01	1B	1,400	0,050	9,00	6	–	–	0,20	–	●	–	–	–	–	–
EC020M02L06CM02	2	2,000	0,050	9,00	–	6	0,20	–	–	●	–	–	–	–	–
EC020M02N00CM02	2	2,000	0,050	8,98	–	–	0,20	0,20	–	●	–	–	–	–	–
EC020M02R06CM02	2	2,000	0,050	9,00	6	–	–	0,20	–	●	–	–	–	–	–
EC030M03L06CM02	3	3,000	0,075	9,60	–	6	0,20	–	–	●	–	–	–	–	–
EC030M03N00CM02	3	3,000	0,075	9,60	–	–	0,20	0,20	–	●	–	–	–	–	–
EC030M03R06CM02	3	3,000	0,075	9,60	6	–	–	0,20	–	●	–	–	–	–	–
EC040M04L06CM02	4	4,000	0,075	10,20	–	6	0,20	–	–	●	–	–	–	–	–
EC040M04N00CM02	4	4,000	0,075	10,20	–	–	0,20	0,20	–	●	–	–	–	–	–
EC040M04R06CM02	4	4,000	0,075	10,20	6	–	–	0,20	–	●	–	–	–	–	–
EC050M05N00CM03	5	5,000	0,075	12,20	–	–	0,30	0,30	–	●	–	–	–	–	–
EC060M06N00CM03	6	6,000	0,075	14,59	–	–	0,30	0,30	–	●	–	–	–	–	–
EC070M06N00CM04	6	7,000	0,075	14,60	–	–	0,40	0,40	–	●	–	–	–	–	–
EC080M08N00CM04	8	8,000	0,075	17,50	–	–	0,40	0,40	–	●	–	–	–	–	–

- Controle do cavaco resistente devido à aresta côncava.
- Primeira opção em aço quando estabilidade adicional é necessária.
- Pode aplicar taxas de velocidade mais agressivas.

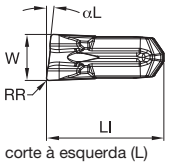
● primeira opção
○ opção alternativa

		KCU10	KCU25	KCP10B	KCP25B	KCK20B	KCM35B	K313
P		●	●	●	●	○		
M		●	●				●	○
K		○	○	○	○	●		○
N		●	○					●
S		●	●					●
H		○						

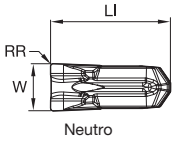

corte à esquerda (L)


Neutro

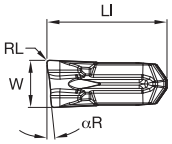

corte à direita (R)



corte à esquerda (L)



Neutro



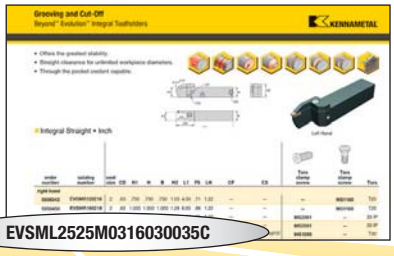
corte à direita (R)

Precisão CR moldada • Métrico

código do produto	tamanho do inserto	W	W tol ±	LI	αR	αL	RR	RL	KCU10	KCU25	KCP10B	KCP25B	KCK20B	KCM35B	K313
EC020M02L06CR02	2	2,000	0,050	9,00	–	6	0,20	–	–	●	–	–	–	–	–
EC020M02N00CR02	2	2,000	0,050	8,98	–	–	0,20	0,20	–	●	–	–	–	–	–
EC020M02R06CR02	2	2,000	0,050	9,00	6	–	–	0,20	–	●	–	–	–	–	–
EC030M03L06CR02	3	3,000	0,075	9,60	–	6	0,20	–	–	●	–	–	–	–	–
EC030M03N00CR02	3	3,000	0,075	9,60	–	–	0,20	0,20	–	●	–	–	–	–	–
EC030M03R06CR02	3	3,000	0,075	9,60	6	–	–	0,20	–	●	–	–	–	–	–
EC040M04L06CR02	4	4,000	0,075	10,20	–	6	0,20	–	–	●	–	–	–	–	–
EC040M04N00CR02	4	4,000	0,075	10,20	–	–	0,20	0,20	–	●	–	–	–	–	–
EC040M04R06CR02	4	4,000	0,075	10,20	6	–	–	0,20	–	●	–	–	–	–	–
EC050M05N00CR03	5	5,000	0,075	12,25	–	–	0,30	0,30	–	●	–	–	–	–	–
EC060M06L06CR04	6	6,000	0,075	14,59	–	6	0,40	–	–	●	–	–	–	–	–
EC060M06N00CR03	6	6,000	0,075	14,59	–	–	0,30	0,30	–	●	–	–	–	–	–
EC060M06R06CR04	6	6,000	0,075	14,59	6	–	–	0,40	–	●	–	–	–	–	–
EC070M06N00CR04	6	7,000	0,075	14,60	–	–	0,40	0,40	–	●	–	–	–	–	–
EC080M08L06CR04	8	8,000	0,075	17,50	–	6	0,40	–	–	●	–	–	–	–	–
EC080M08N00CR04	8	8,000	0,075	17,50	–	–	0,40	0,40	–	●	–	–	–	–	–
EC080M08R06CR04	8	8,000	0,075	17,50	6	–	–	0,40	–	●	–	–	–	–	–

Como funcionam os números de catálogo?

Cada caractere no nosso número de catálogo significa uma característica específica daquele produto. Use as colunas-chave a seguir e as imagens correspondentes para uma identificação fácil do atributo a ser aplicado.



EVSML2525M0316030035C

EV	S	M	L	2525M	03	16	030035	C
Nome da família	Estilo da ferramenta	Tipo de suporte	Sentido	Tamanho da haste	Tamanho do alojamento	Profundidade máxima da ranhura	Diâmetros do canal de face	Refrigerante
Beyond™ Evolution™	**S** = Montagem reta		**L** = Esquerda **R** = Direita		**1B** **1F** **02** **03** **04** **05** **06** **08** **10**	em milímetros	**030** = Diâmetro mínimo em mm **035** = Diâmetro máximo em mm	**C** = Com refrigeração pelo alojamento

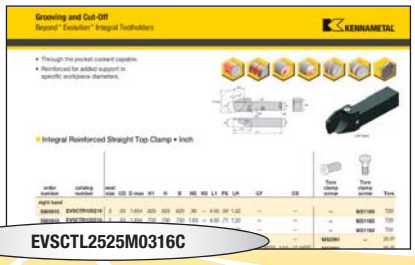
M = Suporte máximo para larguras específicas de ranhura e alívio reto para peças com diâmetros ilimitados

A = Deslocamento da face para canal interno

B = Deslocamento da face para canal externo

Métrico = Altura x largura em mm; a letra indica o comprimento da ferramenta em conformidade com a norma ISO

Consultando este guia fácil de usar, você pode identificar o produto correto para atender às suas necessidades.



EVSCTL2525M0316C

EV	S	C	T	L	2525M	03	16	C
Nome da família	Estilo da ferramenta	Tipo de suporte	Posição do parafuso de fixação	Sentido de rotação	Tamanho da haste	Tamanho do alojamento	Profundidade máxima da ranhura	Refrigerante
Beyond™ Evolution™	**S** = Montagem reta		**T** = Superior **F** = Frente	**L** = Esquerda **R** = Direita		**1B** **1F** **02** **03** **04** **05** **06** **08** **10**	em milímetros	**C** = Com refrigeração pelo alojamento

C = Suporte reforçado

Métrico = Altura x largura em mm; a letra indica o comprimento da ferramenta em conformidade com a norma ISO

Como funcionam os números de catálogo?

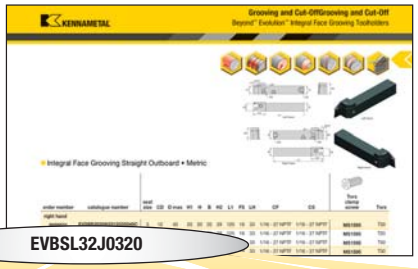
Cada caractere no nosso número de catálogo significa uma característica específica daquele produto. Use as colunas-chave a seguir e as imagens correspondentes para uma identificação fácil do atributo a ser aplicado.



A16REVEMR0310M030035

A	16	R	EV	E	M	R	03	10	M	030035
Barra de aço com refrigeração	Diâmetro da barra	Comprimento da barra	Plataforma	Tipo de ferramenta	Tipo de suporte	Sentido da ferramenta	Tamanho do alojamento da pastilha	Profundidade máxima de corte	Unidades da ferramenta	Diâmetros do canal de face
Barra de mandrilar em aço com capacidade de refrigerante	**Métrico** = Diâmetro em mm **Polegada** = Diâmetro em incrementos de 1/16"		Beyond™ Evolution™	**E** = Montagem de topo (90º) **S** = Montagem reta	**M** = Suporte máximo **A** = Canal de face com deslocamento interno	**R** = Direita **L** = Esquerda	**1F** **02** **03** **04** **05** **06** **08** **10**	em milímetros	**M** = Métrico **I** = Polegada	**030** = Diâmetro mínimo em mm **035** = Diâmetro máximo em mm

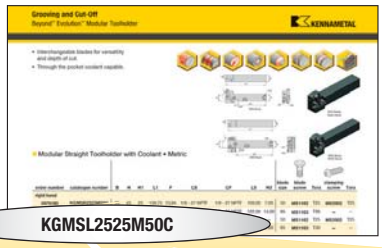
Símbolo	mm	polegada
K	125	5
M	150	6
Q	180	7
R	200	8
S	250	10
T	300	12



EVBSL32J0320

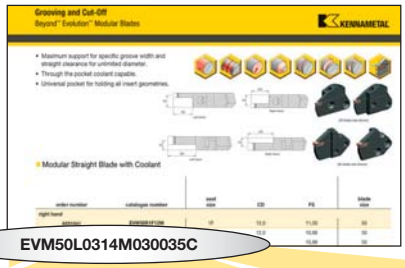
EV	B	S	L	32	J	03	20
Nome da família	Estilo da ferramenta	Tipo de suporte	Sentido de rotação	Altura da lâmina	Comprimento total	Tamanho do alojamento	Profundidade máxima de corte
Beyond™ Evolution™	**B** = Lâmina de 2 alojamentos	**S** = Padrão **C** = Reforçado	**N** = Neutro **L** = Esquerda **R** = Direita	em milímetros	Em conformidade com a norma ISO **G** = 90 mm **J** = 110 mm **M** = 150 mm **X** = Especial	**1B** **1F** **02** **03** **04** **05** **06** **08** **10**	em milímetros

Consultando este guia fácil de usar, você pode identificar o produto correto para atender às suas necessidades.



KGMSL2525M50C

KGM	S	L	2525M	50	C
Nome da família	Estilo da ferramenta	Sentido de rotação	Tamanho da haste	Tamanho da lâmina	Refrigerante
Sistema de canal modular	**S** = Montagem reta **E** = Montagem de topo (90º)	**L** = Esquerda **R** = Direita	**Métrico** = Altura x largura em mm; a letra indica o comprimento da ferramenta em conformidade com a norma ISO	**50** **65**	**C** = Com refrigeração pelo alojamento



EVM50L0314M030035C

EVM	50	L	03	14	M	030035	C
Nome da família	Tamanho da lâmina	Sentido de rotação	Tamanho do alojamento	Profundidade máxima do canal	Tipo de suporte	Diâmetros do canal de face	Refrigeração
Lâmina Beyond™ Evolution™ modular	**50** **65**	**L** = Esquerda **R** = Direita	**1B** **1F** **02** **03** **04** **05** **06** **08** **10**	em milímetros	**M** = Suporte máximo para larguras específicas de ranhura e alívio reto para diâmetros ilimitados **A** = Deslocamento da face para canal interno **B** = Deslocamento da face para canal externo	**030** = Diâmetro mínimo em mm **035** = Diâmetro máximo em mm	**C** = Com refrigeração pelo alojamento

Como funcionam os números de catálogo?

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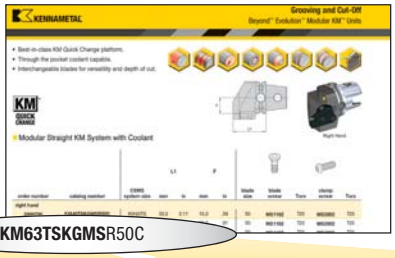


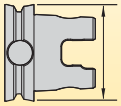
KM63TSKGMSR50C

KM
Troca rápida KM™

KM
KM4X™
PSC

63
Tamanho do sistema

40 = 40mm
50 = 50mm
63 = 63mm
80 = 80mm
100 = 100mm

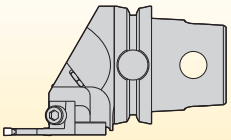


TS
Característica

TS
XMZ

KGM
Método de fixação do inserto

KGM



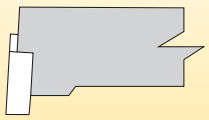
Canal modular

S
Localização do inserto

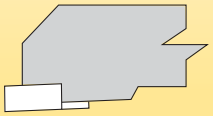
E = Montagem de topo

S = Montagem lateral

E



S



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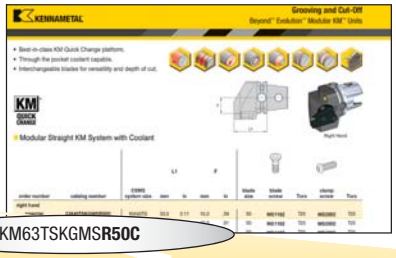
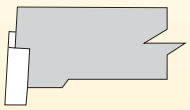


KM63TSKGMS**R50C**

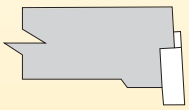
R	50	C	
Sentido da ferramenta	Tamanho da lâmina	Refrigeração	Características especiais
R = Sentido de rotação à direita **L** = Sentido de rotação à esquerda	**50** **60**	**C** = Com refrigeração pelo alojamento	**Y** = Mazak® INTEGREX®

Montagem de topo

R

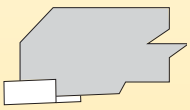


L

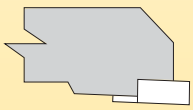


Montagem lateral

R



L



Como funcionam os números de catálogo?

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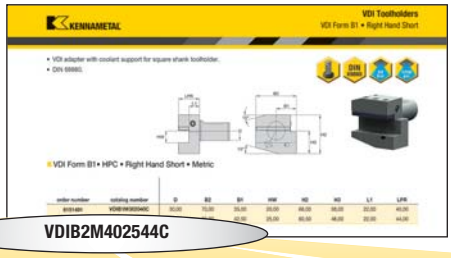


VDIB2M402544C

VDI	B2	M	40	25	44	C
Conexão	Estilo	Métrico	Diâmetro da haste VDI	Tamanho da haste do porta-ferramenta	Comprimento da projeção	Refrigeração interna

O NOVO SABE PROCURAR

A procura por uma ferramenta foi melhorada através de funções de Aconselhamento e seleção do NOVO™, economizando tempo e dinheiro.

SUGERIR

Utiliza uma abordagem baseada em regras para fornecer recomendações de ferramenta de corte:

- Definir recurso de usinagem (fresamento de face, canais, furo cego etc.)
- Aplicar requisitos de limitação (geometria, material, tolerância etc.)
- Definir sequência de usinagem (operações de etapa única ou múltiplas, desbaste e acabamento etc.)
- Receber os resultados em ranking

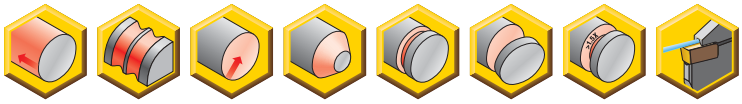
SELECIONAR

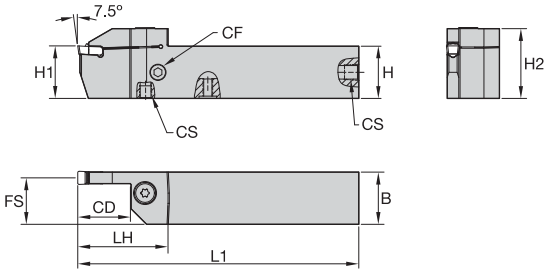
Um método de selecionar ferramenta de corte de uma estrutura em árvore por meio de uma busca hierárquica ou paramétrica:

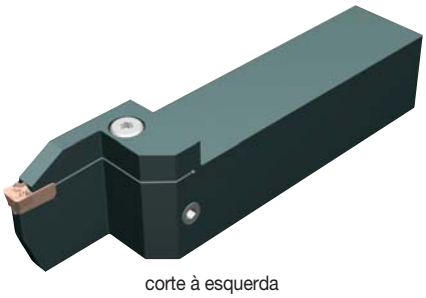
- Se você sabe qual é produto que está procurando, uma busca rápida pode ser feita somente com o número de catálogo ou descrição do produto.
- Filtros inteligentes reduzem significativamente a quantidade de potenciais soluções de ferramental.
- Após a ferramenta ter sido selecionada, o NOVO também fornece opções de itens de corte e adaptação que combinam com a sua solução.

O NOVO pode garantir que você tenha as ferramentas certas no seu maquinário, na sequência certa. Resultando em execução perfeita que acelera todos os trabalhos e maximiza todos os turnos. **kennametal.com/novo**

- Oferece a melhor estabilidade.
- Folga direta para diâmetros de peça ilimitados.
- Com refrigeração através do encaixe.

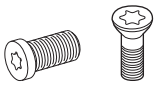






corte à esquerda

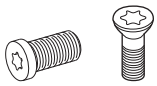
Integral • Métrico



número para pedido	código do produto	tamanho do inserto	CD	H1	H	B	H2	L1	FS	LH	CF	CS	Parafuso Torx para fixação	Parafuso Torx para fixação	Torx
corte à direita (R)															
5953960	**EVSMR2020K0216**	2	16	20	20	20	27	125	19	31	–	–	**–**	**MS1160**	T20
5953958	**EVSMR2525M0216**	2	16	25	25	25	32	150	24	31	–	–	**–**	**MS1160**	T20
6401854	**EVSMR2020K0216C**	2	16	20	20	20	28	125	19	35	M8X1	M8X1	**MS2091**	**–**	25 IP
6401855	**EVSMR2525M0216C**	2	16	25	25	25	33	150	24	35	G1/8 - 28	G1/8 - 28	**MS2091**	**–**	25 IP
5953959	**EVSMR2020K0222**	2	22	20	20	20	29	125	19	38	–	–	**MS2091**	**–**	25 IP
6401857	**EVSMR2020K0222C**	2	22	20	20	20	29	125	19	41	M8X1	M8X1	**MS2091**	**–**	25 IP
5953957	**EVSMR2525M0226**	2	26	25	25	25	34	150	24	42	–	–	**MS2091**	**–**	25 IP
6401856	**EVSMR2525M0226C**	2	26	25	25	25	34	150	24	45	G1/8 - 28	G1/8 - 28	**MS2091**	**–**	25 IP
5939452	**EVSMR2020K0316C**	3	16	20	20	20	29	125	19	37	1/16 - 27 NPTF	1/16 - 27 NPTF	**MS1595**	**–**	T30
5939448	**EVSMR2525M0316C**	3	16	25	25	25	34	150	24	37	1/8 - 27 NPTF	1/8 - 27 NPTF	**MS1595**	**–**	T30
5939451	**EVSMR2020K0322C**	3	22	20	20	20	29	125	19	43	1/16 - 27 NPTF	1/16 - 27 NPTF	**MS1595**	**–**	T30
5939447	**EVSMR2525M0326C**	3	26	25	25	25	34	150	24	47	1/8 - 27 NPTF	1/8 - 27 NPTF	**MS1595**	**–**	T30
5939450	**EVSMR2020K0416C**	4	16	20	20	20	29	125	18	37	1/16 - 27 NPTF	1/16 - 27 NPTF	**MS1595**	**–**	T30
5939446	**EVSMR2525M0416C**	4	16	25	25	25	34	150	23	37	1/8 - 27 NPTF	1/8 - 27 NPTF	**MS1595**	**–**	T30
5939449	**EVSMR2020K0422C**	4	22	20	20	20	29	125	18	43	1/16 - 27 NPTF	1/16 - 27 NPTF	**MS1595**	**–**	T30
5939445	**EVSMR2525M0426C**	4	26	25	25	25	34	150	23	47	1/8 - 27 NPTF	1/8 - 27 NPTF	**MS1595**	**–**	T30
5939444	**EVSMR3232P0426C**	4	26	32	32	32	42	170	30	47	1/8 - 27 NPTF	1/8 - 27 NPTF	**MS1970**	**–**	T30
5939443	**EVSMR3232P0432C**	4	32	32	32	32	42	170	30	53	1/8 - 27 NPTF	1/8 - 27 NPTF	**MS1970**	**–**	T30
5954258	**EVSMR2020K0516C**	5	16	20	20	20	29	125	18	37	1/16 - 27 NPTF	1/16 - 27 NPTF	**MS1595**	**–**	T30
5954254	**EVSMR2525M0516C**	5	16	25	25	25	34	150	23	37	1/8 - 27 NPTF	1/8 - 27 NPTF	**MS1970**	**–**	T30
5954257	**EVSMR2020K0522C**	5	22	20	20	20	29	125	18	43	1/16 - 27 NPTF	1/16 - 27 NPTF	**MS1595**	**–**	T30
5954253	**EVSMR2525M0526C**	5	26	25	25	25	34	150	23	47	1/8 - 27 NPTF	1/8 - 27 NPTF	**MS1970**	**–**	T30
5954249	**EVSMR3232P0526C**	5	26	32	32	32	42	170	30	47	1/8 - 27 NPTF	1/8 - 27 NPTF	**MS1970**	**–**	T30

(continuação)

(Integral • Métrico — continuação)



número para pedido	código do produto	tamanho do inserto	CD	H1	H	B	H2	L1	FS	LH	CF	CS	Parafuso Torx para fixação	Parafuso Torx para fixação	Torx
5954248	EVSMR3232P0532C	5	32	32	32	32	42	170	30	53	1/8 - 27 NPTF	1/8 - 27 NPTF	MS1970	–	T30
5954256	EVSMR2020K0616C	6	16	20	20	20	29	125	20	37	1/16 - 27 NPTF	1/16 - 27 NPTF	MS1595	–	T30
5954252	EVSMR2525M0616C	6	16	25	25	25	34	150	25	37	1/8 - 27 NPTF	1/8 - 27 NPTF	MS1970	–	T30
5954255	EVSMR2020K0622C	6	22	20	20	20	29	125	20	43	1/16 - 27 NPTF	1/16 - 27 NPTF	MS1595	–	T30
5954251	EVSMR2525M0626C	6	26	25	25	25	34	150	25	47	1/8 - 27 NPTF	1/8 - 27 NPTF	MS1970	–	T30
5954247	EVSMR3232P0626C	6	26	32	32	32	42	170	32	47	1/8 - 27 NPTF	1/8 - 27 NPTF	MS1970	–	T30
5954246	EVSMR3232P0632C	6	32	32	32	32	43	170	29	55	1/8 - 27 NPTF	1/8 - 27 NPTF	MS1490	–	T45
5954242	EVSMR4040R0640C	6	40	40	40	40	51	200	37	63	1/8 - 27 NPTF	1/8 - 27 NPTF	MS1490	–	T45
5954250	EVSMR2525M0826C	8	26	25	25	25	35	150	21	49	1/8 - 27 NPTF	1/8 - 27 NPTF	MS1490	–	T45
5954245	EVSMR3232P0826C	8	26	32	32	32	43	170	28	49	1/8 - 27 NPTF	1/8 - 27 NPTF	MS1490	–	T45
5954244	EVSMR3232P0832C	8	32	32	32	32	43	170	28	55	1/8 - 27 NPTF	1/8 - 27 NPTF	MS1490	–	T45
5954241	EVSMR4040R0840C	8	40	40	40	40	51	200	36	63	1/8 - 27 NPTF	1/8 - 27 NPTF	MS1490	–	T45
5954243	EVSMR3232P1032C	10	32	32	32	32	43	170	28	55	1/8 - 27 NPTF	1/8 - 27 NPTF	MS1490	–	T45
5954240	EVSMR4040R1040C	10	40	40	40	40	51	200	36	63	1/8 - 27 NPTF	1/8 - 27 NPTF	MS1490	–	T45
corte à esquerda (L)															
5953956	EVSML2020K0216	2	16	20	20	20	27	125	19	31	–	–	–	MS1160	T20
5953954	EVSML2525M0216	2	16	25	25	25	32	150	24	31	–	–	–	MS1160	T20
6401881	EVSML2525M0216C	2	16	25	25	25	33	150	24	35	G1/8 - 28	G1/8 - 28	MS2091	–	25 IP
5953955	EVSML2020K0222	2	22	20	20	20	29	125	19	38	–	–	MS2091	–	25 IP
5953953	EVSML2525M0226	2	26	25	25	25	34	150	24	42	–	–	MS2091	–	25 IP
5939442	EVSML2020K0316C	3	16	20	20	20	29	125	19	37	1/16 - 27 NPTF	1/16 - 27 NPTF	MS1595	–	T30
5939438	EVSML2525M0316C	3	16	25	25	25	34	150	24	37	1/8 - 27 NPTF	1/8 - 27 NPTF	MS1595	–	T30
5939441	EVSML2020K0322C	3	22	20	20	20	29	125	19	43	1/16 - 27 NPTF	1/16 - 27 NPTF	MS1595	–	T30
5939437	EVSML2525M0326C	3	26	25	25	25	34	150	24	47	1/8 - 27 NPTF	1/8 - 27 NPTF	MS1595	–	T30
5939440	EVSML2020K0416C	4	16	20	20	20	29	125	18	37	1/16 - 27 NPTF	1/16 - 27 NPTF	MS1595	–	T30
5939436	EVSML2525M0416C	4	16	25	25	25	34	150	23	37	1/8 - 27 NPTF	1/8 - 27 NPTF	MS1595	–	T30
5939439	EVSML2020K0422C	4	22	20	20	20	29	125	18	43	1/16 - 27 NPTF	1/16 - 27 NPTF	MS1595	–	T30
5939435	EVSML2525M0426C	4	26	25	25	25	34	150	23	47	1/8 - 27 NPTF	1/8 - 27 NPTF	MS1595	–	T30
5939433	EVSML3232P0426C	4	26	32	32	32	42	170	30	47	1/8 - 27 NPTF	1/8 - 27 NPTF	MS1970	–	T30
5939432	EVSML3232P0432C	4	32	32	32	32	42	170	30	53	1/8 - 27 NPTF	1/8 - 27 NPTF	MS1970	–	T30
5954239	EVSML2020K0516C	5	16	20	20	20	29	125	18	37	1/16 - 27 NPTF	1/16 - 27 NPTF	MS1595	–	T30
5954235	EVSML2525M0516C	5	16	25	25	25	34	150	23	37	1/8 - 27 NPTF	1/8 - 27 NPTF	MS1970	–	T30
5954238	EVSML2020K0522C	5	22	20	20	20	29	125	18	43	1/16 - 27 NPTF	1/16 - 27 NPTF	MS1595	–	T30
5954234	EVSML2525M0526C	5	26	25	25	25	34	150	23	47	1/8 - 27 NPTF	1/8 - 27 NPTF	MS1970	–	T30
5954220	EVSML3232P0526C	5	26	32	32	32	42	170	30	47	1/8 - 27 NPTF	1/8 - 27 NPTF	MS1970	–	T30
5954219	EVSML3232P0532C	5	32	32	32	32	42	170	30	53	1/8 - 27 NPTF	1/8 - 27 NPTF	MS1970	–	T30
5954237	EVSML2020K0616C	6	16	20	20	20	29	125	17	37	1/16 - 27 NPTF	1/16 - 27 NPTF	MS1595	–	T30
5954233	EVSML2525M0616C	6	16	25	25	25	34	150	22	37	1/8 - 27 NPTF	1/8 - 27 NPTF	MS1970	–	T30
5954236	EVSML2020K0622C	6	22	20	20	20	29	125	17	43	1/16 - 27 NPTF	1/16 - 27 NPTF	MS1595	–	T30
5954232	EVSML2525M0626C	6	26	25	25	25	34	150	22	47	1/8 - 27 NPTF	1/8 - 27 NPTF	MS1970	–	T30

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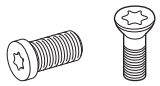
(Integral • Métrico — continuação)

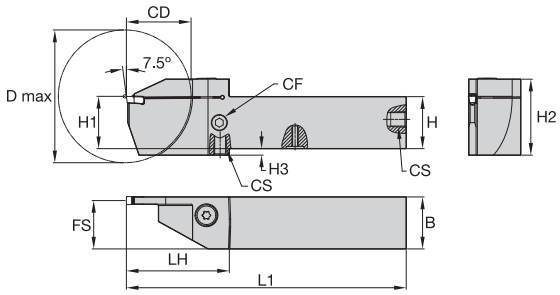


número para pedido	código do produto	tamanho do inserto	CD	H1	H	B	H2	L1	FS	LH	CF	CS	Parafuso Torx para fixação	Parafuso Torx para fixação	Torx
5954218	**EVSML3232P0626C**	6	26	32	32	32	42	170	29	47	1/8 - 27 NPTF	1/8 - 27 NPTF	**MS1970**	–	T30
5954217	**EVSML3232P0632C**	6	32	32	32	32	43	170	29	55	1/8 - 27 NPTF	1/8 - 27 NPTF	**MS1490**	–	T45
5954213	**EVSML4040R0640C**	6	40	40	40	40	51	200	37	63	1/8 - 27 NPTF	1/8 - 27 NPTF	**MS1490**	–	T45
5954231	**EVSML2525M0826C**	8	26	25	25	25	35	150	21	49	1/8 - 27 NPTF	1/8 - 27 NPTF	**MS1490**	–	T45
5954216	**EVSML3232P0826C**	8	26	32	32	32	43	170	28	49	1/8 - 27 NPTF	1/8 - 27 NPTF	**MS1490**	–	T45
5954215	**EVSML3232P0832C**	8	32	32	32	32	43	170	28	55	1/8 - 27 NPTF	1/8 - 27 NPTF	**MS1490**	–	T45
5954212	**EVSML4040R0840C**	8	40	40	40	40	51	200	36	63	1/8 - 27 NPTF	1/8 - 27 NPTF	**MS1490**	–	T45
5954214	**EVSML3232P1032C**	10	32	32	32	32	43	170	28	55	1/8 - 27 NPTF	1/8 - 27 NPTF	**MS1490**	–	T45
5954211	**EVSML4040R1040C**	10	40	40	40	40	51	200	36	63	1/8 - 27 NPTF	1/8 - 27 NPTF	**MS1490**	–	T45

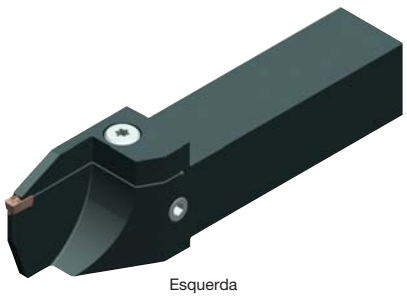
parafuso	parafuso	torque				Chave	Chave
código do produto	número para pedido	Nm	pol. lbs.	rosca	soquete	código do produto	número para pedido
MS1160	**1099645**	7	62	M5	T20	**KT20**	**1022703**
MS1162	**1127019**	9	80	M6	T25	**KT25**	**1022725**
MS1163	**1124104**	18	159	M8	T30	**KT30L**	**1099676**
MS1273	**1020977**	4	35.4	M4	T15	**KT15**	**1022701**
MS1490	**2263299**	17	151	M8	T45	**KT45**	**1018227**
MS1595	**1094300**	12	106	M6	T30	**KT30**	**1099676**
MS1970	**1106668**	12	106	M6	T30	**KT30**	**1099676**
MS2002	**1621087**	9	80	M6	T25	**KT25**	**1022725**
MS2091	**1931147**	9	80	M5	25IP	**K25IP**	**2050113**

- Com refrigeração através do encaixe.
- Reforçado para suporte adicional em diâmetros de peça específicos.



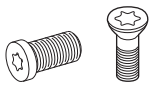


CD = Profundidade de corte máxima para barras sólidas.
D max = Diâmetro máximo de barra para canais profundos ou corte de tubos.



Esquerda

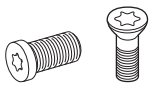
Fixação superior reta reforçada integral • Métrico



número para pedido	código do produto	tamanho do inserto	CD	D máx	H1	H	B	H2	H3	L1	FS	LH	CF	CS	Parafuso Torx para fixação	Parafuso Torx para fixação	Torx
corte à direita (R)																	
6179757	**EVSCTR1212K1B16**	1B	16	42	12	12	12	23	4	125	11	31	—	—	**—**	**MS1160**	T20
6179758	**EVSCTR1212K1F16**	1F	16	42	12	12	12	23	4	125	11	31	—	—	**—**	**MS1160**	T20
6179759	**EVSCTR1212K0216**	2	16	42	12	12	12	23	4	125	11	31	—	—	**—**	**MS1160**	T20
5980139	**EVSCTR1616K0216**	2	16	42	16	16	16	23	—	125	15	31	—	—	**—**	**MS1160**	T20
5980762	**EVSCTR2020K0216**	2	16	42	20	20	20	27	—	125	19	31	—	—	**—**	**MS1160**	T20
5980767	**EVSCTR2525M0216**	2	16	42	25	25	25	32	—	150	24	31	—	—	**—**	**MS1160**	T20
5980768	**EVSCTR2525M0226**	2	26	62	25	25	25	34	—	150	24	42	—	—	**MS2091**	**—**	25 IP
6179755	**EVSCTR1212K0316C**	3	16	52	12	12	12	23	4	125	11	34	M8X1.25	M8X1.25	**MS1944**	**—**	T25
5980140	**EVSCTR1616K0316C**	3	16	52	16	16	16	24	—	125	15	36	1/16 - 27 NPTF	1/16 - 27 NPTF	**MS2091**	**—**	25 IP
5980763	**EVSCTR2020K0316C**	3	16	52	20	20	20	29	—	125	19	37	1/16 - 27 NPTF	1/16 - 27 NPTF	**MS1595**	**—**	T30
5980138	**EVSCTR2525M0316C**	3	16	62	25	25	25	34	—	150	24	37	1/8 - 27 NPTF	1/8 - 27 NPTF	**MS1595**	**—**	T30
5980764	**EVSCTR2020K0326C**	3	26	62	20	20	20	33	4	125	19	47	1/16 - 27 NPTF	1/16 - 27 NPTF	**MS1595**	**—**	T30
5980769	**EVSCTR2525M0326C**	3	26	62	25	25	25	34	—	150	24	47	1/8 - 27 NPTF	1/8 - 27 NPTF	**MS1595**	**—**	T30
5980761	**EVSCTR1616K0416C**	4	16	52	16	16	16	24	—	125	14	36	1/16 - 27 NPTF	1/16 - 27 NPTF	**MS2091**	**—**	25 IP
5980765	**EVSCTR2020K0416C**	4	16	52	20	20	20	29	—	125	18	37	1/16 - 27 NPTF	1/16 - 27 NPTF	**MS1595**	**—**	T30
5980766	**EVSCTR2020K0426C**	4	26	62	20	20	20	33	—	125	18	47	1/16 - 27 NPTF	1/16 - 27 NPTF	**MS1595**	**—**	T30
5980770	**EVSCTR2525M0426C**	4	26	62	25	25	25	34	—	150	23	47	1/8 - 27 NPTF	1/8 - 27 NPTF	**MS1595**	**—**	T30
5980771	**EVSCTR2525M0432C**	4	32	64	25	25	25	38	4	150	23	53	1/8 - 27 NPTF	1/8 - 27 NPTF	**MS1595**	**—**	T30
5980774	**EVSCTR3232P0432C**	4	32	64	32	32	32	42	—	170	30	53	1/8 - 27 NPTF	1/8 - 27 NPTF	**MS1970**	**—**	T30
5980772	**EVSCTR2525M0526C**	5	26	62	25	25	25	34	—	150	23	47	1/8 - 27 NPTF	1/8 - 27 NPTF	**MS1970**	**—**	T30
5980773	**EVSCTR2525M0532C**	5	32	64	25	25	25	39	4	150	23	53	1/8 - 27 NPTF	1/8 - 27 NPTF	**MS1970**	**—**	T30
5980775	**EVSCTR3232P0540C**	5	40	82	32	32	32	47	4	170	30	63	G 1/8 - 28	G 1/8 - 28	**MS1490**	**—**	T45

(continuação)

(Fixação superior reta reforçada integral • Métrico — continuação)

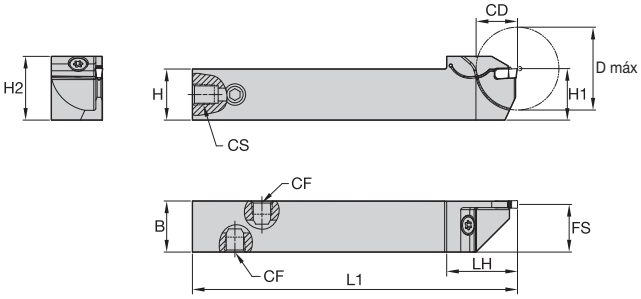


número para pedido	código do p roduto	tamanho do inserto	CD	D máx	H1	H	B	H2	H3	L1	FS	LH	CF	CS	Parafuso Torx para fixação	Parafuso Torx para fixação	Torx
corte à esquerda (L)																	
6179760	**EVSCTL1212K1B16**	1B	16	42	12	12	12	23	4	125	11	31	—	—	—	**MS1160**	T20
6179761	**EVSCTL1212K1F16**	1F	16	42	12	12	12	23	4	125	11	31	—	—	—	**MS1160**	T20
6179762	**EVSCTL1212K0216**	2	16	42	12	12	12	23	4	125	11	31	—	—	—	**MS1160**	T20
5980777	**EVSCTL1616K0216**	2	16	42	16	16	16	23	—	125	15	31	—	—	—	**MS1160**	T20
5980780	**EVSCTL2020K0216**	2	16	42	20	20	20	27	—	125	19	31	—	—	—	**MS1160**	T20
5980805	**EVSCTL2525M0216**	2	16	42	25	25	25	32	—	150	24	31	—	—	—	**MS1160**	T20
5980806	**EVSCTL2525M0226**	2	26	62	25	25	25	34	—	150	24	42	—	—	**MS2091**	—	25 IP
6179756	**EVSCTL1212K0316C**	3	16	52	12	12	12	23	4	125	11	34	M8X1.25	M8X1.25	**MS1944**	—	T25
5980778	**EVSCTL1616K0316C**	3	16	52	16	16	16	24	—	125	15	36	1/16 - 27 NPTF	1/16 - 27 NPTF	**MS2091**	—	25 IP
5980801	**EVSCTL2020K0316C**	3	16	52	20	20	20	29	—	125	19	37	1/16 - 27 NPTF	1/16 - 27 NPTF	**MS1595**	—	T30
5980776	**EVSCTL2525M0316C**	3	16	62	25	25	25	34	—	150	24	37	1/8 - 27 NPTF	1/8 - 27 NPTF	**MS1595**	—	T30
5980802	**EVSCTL2020K0326C**	3	26	62	20	20	20	33	4	125	19	47	1/16 - 27 NPTF	1/16 - 27 NPTF	**MS1595**	—	T30
5980807	**EVSCTL2525M0326C**	3	26	62	25	25	25	34	—	150	24	47	1/8 - 27 NPTF	1/8 - 27 NPTF	**MS1595**	—	T30
5980779	**EVSCTL1616K0416C**	4	16	52	16	16	16	24	—	125	14	36	1/16 - 27 NPTF	1/16 - 27 NPTF	**MS2091**	—	25 IP
5980803	**EVSCTL2020K0416C**	4	16	52	20	20	20	29	—	125	18	37	1/16 - 27 NPTF	1/16 - 27 NPTF	**MS1595**	—	T30
5980804	**EVSCTL2020K0426C**	4	26	62	20	20	20	33	—	125	18	47	1/16 - 27 NPTF	1/16 - 27 NPTF	**MS1595**	—	T30
5980808	**EVSCTL2525M0426C**	4	26	62	25	25	25	34	—	150	23	47	1/8 - 27 NPTF	1/8 - 27 NPTF	**MS1595**	—	T30
5980809	**EVSCTL2525M0432C**	4	32	64	25	25	25	38	4	150	23	53	1/8 - 27 NPTF	1/8 - 27 NPTF	**MS1595**	—	T30
5980812	**EVSCTL3232P0432C**	4	32	64	32	32	32	42	—	170	30	53	1/8 - 27 NPTF	1/8 - 27 NPTF	**MS1970**	—	T30
5980810	**EVSCTL2525M0526C**	5	26	62	25	25	25	34	—	150	23	47	1/8 - 27 NPTF	1/8 - 27 NPTF	**MS1970**	—	T30
5980811	**EVSCTL2525M0532C**	5	32	64	25	25	25	39	4	150	23	53	1/8 - 27 NPTF	1/8 - 27 NPTF	**MS1970**	—	T30
5980813	**EVSCTL3232P0540C**	5	40	82	32	32	32	47	4	170	30	63	G 1/8 - 28	G 1/8 - 28	**MS1490**	—	T45

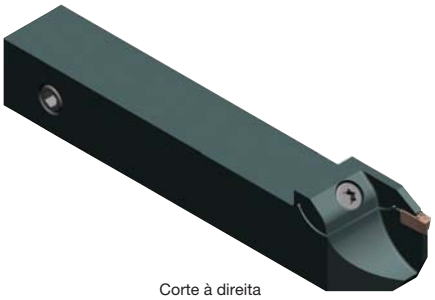
NOTA: Refrigeração através do encaixe disponível para o tamanho do alojamento 3 e superior.

parafuso	parafuso	torque				Chave	Chave
código do produto	número para pedido	Nm	pol. lbs.	rosca	soquete	código do produto	número para pedido
MS1160	**1099645**	7	62	M5	T20	**KT20**	**1022703**
MS1162	**1127019**	9	80	M6	T25	**KT25**	**1022725**
MS1163	**1124104**	18	159	M8	T30	**KT30L**	**1099676**
MS1273	**1020977**	4	35.4	M4	T15	**KT15**	**1022701**
MS1490	**2263299**	17	151	M8	T45	**KT45**	**1018227**
MS1595	**1094300**	12	106	M6	T30	**KT30**	**1099676**
MS1970	**1106668**	12	106	M6	T30	**KT30**	**1099676**
MS2002	**1621087**	9	80	M6	T25	**KT25**	**1022725**
MS2091	**1931147**	9	80	M5	25IP	**K25IP**	**2050113**





CD = Profundidade de corte máxima para barras sólidas.
D max = Diâmetro máximo de barra para canais profundos ou corte de tubos.



Corte à direita

Fixação frontal reforçada integral • Métrico



número para pedido	código do produto	tamanho do inserto	CD	D máx	H1	H	B	H2	L1	FS	LH	CF	CS	Parafuso Torx para fixação	Torx
corte à direita (R)															
6179763	**EVSCFR1010K1B10**	1B	10	20	10	10	10	14	125	9	21	–	–	**191.916**	T15
6179766	**EVSCFR1212K1B10**	1B	10	20	12	12	12	16	125	11	21	–	–	**191.916**	T15
6179767	**EVSCFR1212K1B13**	1B	13	26	12	12	12	16	125	11	24	–	–	**191.916**	T15
6179774	**EVSCFR1616K1B16**	1B	16	32	16	16	16	21	125	15	27	–	–	**MS1160**	T20
6179778	**EVSCFR2020K1B16**	1B	16	32	20	20	20	25	125	19	27	–	–	**MS1160**	T20
6179764	**EVSCFR1010K1F10**	1F	10	20	10	10	10	14	125	9	21	–	–	**191.916**	T15
6179768	**EVSCFR1212K1F10**	1F	10	20	12	12	12	16	125	11	21	–	–	**191.916**	T15
6179769	**EVSCFR1212K1F13**	1F	13	26	12	12	12	16	125	11	24	–	–	**191.916**	T15
6179775	**EVSCFR1616K1F16**	1F	16	32	16	16	16	21	125	15	27	–	–	**MS1160**	T20
6179779	**EVSCFR2020K1F16**	1F	16	32	20	20	20	25	125	19	27	–	–	**MS1160**	T20
6179765	**EVSCFR1010K0210**	2	10	20	10	10	10	14	125	9	21	–	–	**191.916**	T15
6179770	**EVSCFR1212K0210**	2	10	20	12	12	12	16	125	11	21	–	–	**191.916**	T15
6179771	**EVSCFR1212K0216**	2	16	32	12	12	12	16	125	11	27	–	–	**191.916**	T15
6179776	**EVSCFR1616K0216**	2	16	32	16	16	16	21	125	15	27	–	–	**MS1160**	T20
6179780	**EVSCFR2020K0216**	2	16	32	20	20	20	25	125	19	27	–	–	**MS1160**	T20
6179772	**EVSCFR1212K0310C**	3	10	20	12	12	12	17	125	11	22	M8X1	M8X1	**191.916**	T15
6179773	**EVSCFR1212K0316C**	3	16	32	12	12	12	17	125	11	28	M8X1	M8X1	**191.916**	T15
6179777	**EVSCFR1616K0316C**	3	16	32	16	16	16	21	125	15	28	M8X1	M8X1	**MS1160**	T20
6179781	**EVSCFR2020K0316C**	3	16	32	20	20	20	25	125	19	28	M8X1	M8X1	**MS1160**	T20

(continuação)

(Fixação frontal reforçada integral • Métrico — continuação)

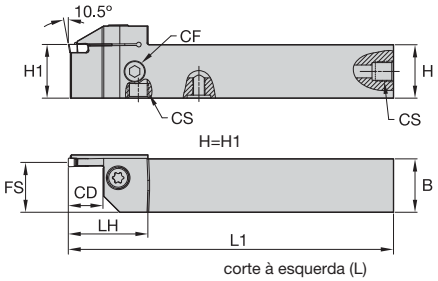


número para pedido	código do produto	tamanho do inserto	CD	D máx	H1	H	B	H2	L1	FS	LH	CF	CS	Parafuso Torx para fixação	Torx
corte à esquerda (L)															
6179709	**EVSCFL1010K1B10**	1B	10	20	10	10	10	14	125	9	21	—	—	**191.916**	T15
6179922	**EVSCFL1212K1B10**	1B	10	20	12	12	12	16	125	11	21	—	—	**191.916**	T15
6179923	**EVSCFL1212K1B13**	1B	13	26	12	12	12	16	125	11	24	—	—	**191.916**	T15
6179930	**EVSCFL1616K1B16**	1B	16	32	16	16	16	21	125	15	27	—	—	**MS1160**	T20
6179934	**EVSCFL2020K1B16**	1B	16	32	20	20	20	25	125	19	27	—	—	**MS1160**	T20
6179710	**EVSCFL1010K1F10**	1F	10	20	10	10	10	14	125	9	21	—	—	**191.916**	T15
6179924	**EVSCFL1212K1F10**	1F	10	20	12	12	12	16	125	11	21	—	—	**191.916**	T15
6179925	**EVSCFL1212K1F13**	1F	13	26	12	12	12	16	125	11	24	—	—	**191.916**	T15
6179931	**EVSCFL1616K1F16**	1F	16	32	16	16	16	21	125	15	27	—	—	**MS1160**	T20
6179935	**EVSCFL2020K1F16**	1F	16	32	20	20	20	25	125	19	27	—	—	**MS1160**	T20
6179921	**EVSCFL1010K0210**	2	10	20	10	10	10	14	125	9	21	—	—	**191.916**	T15
6179926	**EVSCFL1212K0210**	2	10	20	12	12	12	16	125	11	21	—	—	**191.916**	T15
6179927	**EVSCFL1212K0216**	2	16	32	12	12	12	16	125	11	27	—	—	**191.916**	T15
6179932	**EVSCFL1616K0216**	2	16	32	16	16	16	21	125	15	27	—	—	**MS1160**	T20
6179936	**EVSCFL2020K0216**	2	16	32	20	20	20	25	125	19	27	—	—	**MS1160**	T20
6179928	**EVSCFL1212K0310C**	3	10	20	12	12	12	17	125	11	22	M8X1	M8X1	**191.916**	T15
6179929	**EVSCFL1212K0316C**	3	16	32	12	12	12	17	125	11	28	M8X1	M8X1	**191.916**	T15
6179933	**EVSCFL1616K0316C**	3	16	32	16	16	16	21	125	15	28	M8X1	M8X1	**MS1160**	T20
6179937	**EVSCFL2020K0316C**	3	16	32	20	20	20	25	125	19	28	M8X1	M8X1	**MS1160**	T20

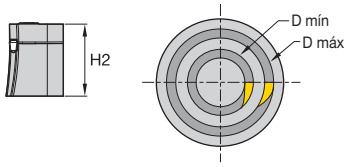
NOTA: Refrigeração através do encaixe disponível para o tamanho do alojamento 3 e superior.

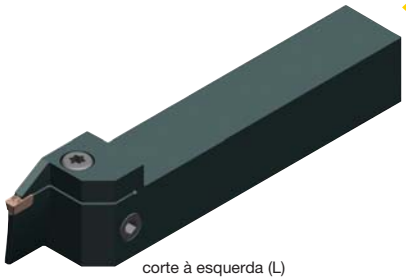
parafuso	parafuso	torque				Chave	Chave
código do produto	número para pedido	Nm	pol. lbs.	rosca	soquete	código do produto	número para pedido
MS1160	**1099645**	7	62	M5	T20	**KT20**	**1022703**
MS1162	**1127019**	9	80	M6	T25	**KT25**	**1022725**
MS1163	**1124104**	18	159	M8	T30	**KT30L**	**1099676**
MS1273	**1020977**	4	35.4	M4	T15	**KT15**	**1022701**
MS1490	**2263299**	17	151	M8	T45	**KT45**	**1018227**
MS1595	**1094300**	12	106	M6	T30	**KT30**	**1099676**
MS1970	**1106668**	12	106	M6	T30	**KT30**	**1099676**
MS2002	**1621087**	9	80	M6	T25	**KT25**	**1022725**
MS2091	**1931147**	9	80	M5	25IP	**K25IP**	**2050113**

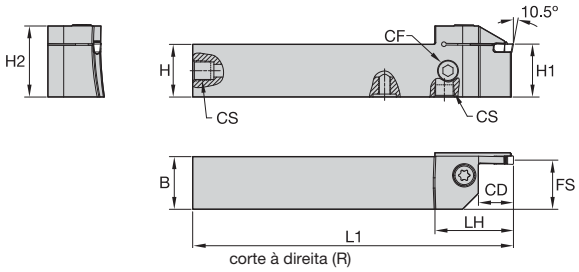




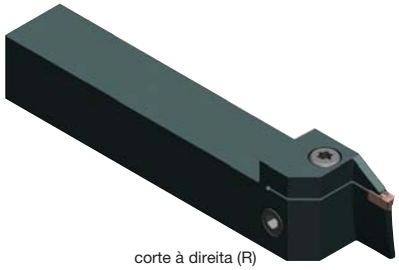
corte à esquerda (L)




corte à esquerda (L)



corte à direita (R)


corte à direita (R)

Abertura de canal de face reto externo integral • Métrico



número para pedido	código do produto	tamanho do inserto	CD	D máx	D mín	W mín	B	H2	L1	FS	LH	CF	CS	Parafuso Torx para fixação	Torx
corte à direita (R)															
6080031	**EVSBR2020K0312035040C**	3	12	40	35	20	20	29	125	19	33	1/16 - 27 NPTF	1/16 - 27 NPTF	**MS1595**	T30
6116561	**EVSBR2020K0312040050C**	3	12	50	40	20	20	29	125	19	33	1/16 - 27 NPTF	1/16 - 27 NPTF	**MS1595**	T20
6116563	**EVSBR2020K0312050060C**	3	12	60	50	20	20	29	125	19	33	1/16 - 27 NPTF	1/16 - 27 NPTF	**MS1595**	T30
6116567	**EVSBR2020K0312060075C**	3	12	75	60	20	20	29	125	19	33	1/16 - 27 NPTF	1/16 - 27 NPTF	**MS1595**	T30
6116569	**EVSBR2020K0312075100C**	3	12	100	75	20	20	29	125	19	33	1/16 - 27 NPTF	1/16 - 27 NPTF	**MS1595**	T30
6080067	**EVSBR2525M0312100180C**	3	12	180	100	25	25	34	150	24	33	1/8 - 27 NPTF	1/8 - 27 NPTF	**MS1970**	T30
6080069	**EVSBR2525M0312180250C**	3	12	250	180	25	25	34	150	24	33	1/8 - 27 NPTF	1/8 - 27 NPTF	**MS1970**	T30
6080053	**EVSBR2525M0320060075C**	3	20	75	60	25	25	34	150	24	41	1/8 - 27 NPTF	1/8 - 27 NPTF	**MS1970**	T30
6080055	**EVSBR2525M0320075100C**	3	20	100	75	25	25	34	150	24	41	1/8 - 27 NPTF	1/8 - 27 NPTF	**MS1970**	T30
6080057	**EVSBR2525M0320100180C**	3	20	180	100	25	25	34	150	24	41	1/8 - 27 NPTF	1/8 - 27 NPTF	**MS1970**	T30
6080060	**EVSBR2525M0320180250C**	3	20	250	180	25	25	35	150	24	41	1/8 - 27 NPTF	1/8 - 27 NPTF	**MS1970**	T30
6080033	**EVSBR2020K0416040050C**	4	16	50	40	20	20	29	125	18	37	1/16 - 27 NPTF	1/16 - 27 NPTF	**MS1595**	T30
6080040	**EVSBR2020K0416050060C**	4	16	60	50	20	20	29	125	18	37	1/16 - 27 NPTF	1/16 - 27 NPTF	**MS1595**	T30
6116571	**EVSBR2020K0416060075C**	4	16	75	60	20	20	29	125	18	37	1/16 - 27 NPTF	1/16 - 27 NPTF	**MS1595**	T30
6116573	**EVSBR2020K0416075100C**	4	16	100	75	20	20	29	125	18	37	1/16 - 27 NPTF	1/16 - 27 NPTF	**MS1595**	T30
6116587	**EVSBR2525M0416100180C**	4	16	180	100	25	25	34	150	23	37	1/8 - 27 NPTF	1/8 - 27 NPTF	**MS1970**	T30
6116589	**EVSBR2525M0416180250C**	4	16	250	180	25	25	34	150	23	37	1/8 - 27 NPTF	1/8 - 27 NPTF	**MS1970**	T30
6116575	**EVSBR2525M0426060075C**	4	26	75	60	25	25	34	150	23	47	1/8 - 27 NPTF	1/8 - 27 NPTF	**MS1970**	T30
6116577	**EVSBR2525M0426075100C**	4	26	100	75	25	25	34	150	23	47	1/8 - 27 NPTF	1/8 - 27 NPTF	**MS1970**	T30
6116579	**EVSBR2525M0426100180C**	4	26	180	100	25	25	34	150	23	47	1/8 - 27 NPTF	1/8 - 27 NPTF	**MS1970**	T30
6116581	**EVSBR2525M0426180250C**	4	26	250	180	25	25	34	150	23	47	1/8 - 27 NPTF	1/8 - 27 NPTF	**MS1970**	T30
6080035	**EVSBR2525M0516050060C**	5	16	60	50	25	25	34	150	23	37	1/8 - 27 NPTF	1/8 - 27 NPTF	**MS1970**	T30
6124200	**EVSBR2525M0516060075C**	5	16	60	60	25	25	34	150	23	37	1/8 - 27 NPTF	1/8 - 27 NPTF	**MS1970**	T30

(continuação)

(Abertura de canal de face reto externo integral • Métrico — continuação)



número para pedido	código do produto	tamanho do inserto	CD	D máx	D mín	W mín	B	H2	L1	FS	LH	CF	CS	Parafuso Torx para fixação	Torx
6124214	EVSBR2525M0516075100C	5	16	100	75	25	25	34	150	23	37	1/8 - 27 NPTF	1/8 - 27 NPTF	MS1970	T30
6124218	EVSBR2525M0516100180C	5	16	180	100	25	25	34	150	23	37	1/8 - 27 NPTF	1/8 - 27 NPTF	MS1970	T30
6124222	EVSBR2525M0516180250C	5	16	250	180	25	25	34	150	23	37	1/8 - 27 NPTF	1/8 - 27 NPTF	MS1970	T30
6124226	EVSBR2525M0516250350C	5	16	350	250	25	25	34	150	23	37	1/8 - 27 NPTF	1/8 - 27 NPTF	MS1970	T30
6124230	EVSBR2525M0516350999C	5	16	999	350	25	25	34	150	23	37	1/8 - 27 NPTF	1/8 - 27 NPTF	MS1970	T30
6124198	EVSBR2525M0526050060C	5	26	60	50	25	25	35	150	23	47	1/8 - 27 NPTF	1/8 - 27 NPTF	MS1970	T30
6124212	EVSBR2525M0526060075C	5	26	60	60	25	25	35	150	23	47	1/8 - 27 NPTF	1/8 - 27 NPTF	MS1970	T30
6124216	EVSBR2525M0526075100C	5	26	100	75	25	25	35	150	23	47	1/8 - 27 NPTF	1/8 - 27 NPTF	MS1970	T30
6124235	EVSBR3232P0532100180C	5	32	180	100	32	32	42	170	30	53	1/8 - 27 NPTF	1/8 - 27 NPTF	MS1970	T30
6124237	EVSBR3232P0532180250C	5	32	250	180	32	32	42	170	30	53	1/8 - 27 NPTF	1/8 - 27 NPTF	MS1970	T30
6124239	EVSBR3232P0532250350C	5	32	350	250	32	32	42	170	30	53	1/8 - 27 NPTF	1/8 - 27 NPTF	MS1970	T30
6124241	EVSBR3232P0532350999C	5	32	999	350	32	32	42	170	30	53	1/8 - 27 NPTF	1/8 - 27 NPTF	MS1970	T30
6124605	EVSBR2525M0616060075C	6	16	75	60	25	25	35	150	22	37	1/8 - 27 NPTF	1/8 - 27 NPTF	MS1970	T30
6124609	EVSBR2525M0616075100C	6	16	100	75	25	25	35	150	22	37	1/8 - 27 NPTF	1/8 - 27 NPTF	MS1970	T30
6124673	EVSBR2525M0616100180C	6	16	180	100	25	25	31	150	22	37	1/8 - 27 NPTF	1/8 - 27 NPTF	MS1970	T30
6124677	EVSBR2525M0616180250C	6	16	250	180	25	25	34	150	22	37	1/8 - 27 NPTF	1/8 - 27 NPTF	MS1970	T30
6124681	EVSBR2525M0616250350C	6	16	350	250	25	25	34	150	22	37	1/8 - 27 NPTF	1/8 - 27 NPTF	MS1970	T30
6124685	EVSBR2525M0616350999C	6	16	999	350	25	25	34	150	22	37	1/8 - 27 NPTF	1/8 - 27 NPTF	MS1970	T30
6124607	EVSBR2525M0626060075C	6	26	75	60	25	25	35	150	22	47	1/8 - 27 NPTF	1/8 - 27 NPTF	MS1970	T30
6124671	EVSBR2525M0626075100C	6	26	100	75	25	25	35	150	22	47	1/8 - 27 NPTF	1/8 - 27 NPTF	MS1970	T30
6124689	EVSBR3232P0632100180C	6	32	180	100	32	32	43	170	29	55	1/8 - 27 NPTF	1/8 - 27 NPTF	MS1490	T45
6124691	EVSBR3232P0632180250C	6	32	250	180	32	32	43	170	29	55	1/8 - 27 NPTF	1/8 - 27 NPTF	MS1490	T45
6124693	EVSBR3232P0632250350C	6	32	350	250	32	32	43	170	29	55	1/8 - 27 NPTF	1/8 - 27 NPTF	MS1490	T45
6124695	EVSBR3232P0632350999C	6	32	999	350	32	32	43	170	29	55	1/8 - 27 NPTF	1/8 - 27 NPTF	MS1490	T45
corte à esquerda (L)															
6080037	EVSBL2020K0312035040C	3	12	40	35	20	20	29	125	19	33	1/16 - 27 NPTF	1/16 - 27 NPTF	MS1595	T30
6116562	EVSBL2020K0312040050C	3	12	50	40	20	20	29	125	19	33	1/16 - 27 NPTF	1/16 - 27 NPTF	MS1595	T30
6116564	EVSBL2020K0312050060C	3	12	60	50	20	20	29	125	19	33	1/16 - 27 NPTF	1/16 - 27 NPTF	MS1595	T30
6116568	EVSBL2020K0312060075C	3	12	75	60	20	20	29	125	19	33	1/16 - 27 NPTF	1/16 - 27 NPTF	MS1595	T30
6116570	EVSBL2020K0312075100C	3	12	100	75	20	20	29	125	19	33	1/16 - 27 NPTF	1/16 - 27 NPTF	MS1595	T30
6080068	EVSBL2525M0312100180C	3	12	180	100	25	25	34	150	24	33	1/8 - 27 NPTF	1/8 - 27 NPTF	MS1970	T30
6080070	EVSBL2525M0312180250C	3	12	250	180	25	25	34	150	24	33	1/8 - 27 NPTF	1/8 - 27 NPTF	MS1970	T30
6080054	EVSBL2525M0320060075C	3	20	75	60	25	25	35	150	24	41	1/8 - 27 NPTF	1/8 - 27 NPTF	MS1970	T30
6080056	EVSBL2525M0320075100C	3	20	100	75	25	25	35	150	24	41	1/8 - 27 NPTF	1/8 - 27 NPTF	MS1970	T30
6080059	EVSBL2525M0320100180C	3	20	180	100	25	25	35	150	24	41	1/8 - 27 NPTF	1/8 - 27 NPTF	MS1970	T30
6080061	EVSBL2525M0320180250C	3	20	250	180	25	25	35	150	24	41	1/8 - 27 NPTF	1/8 - 27 NPTF	MS1970	T30
6080038	EVSBL2020K0416040050C	4	16	50	40	20	20	29	125	18	37	1/16 - 27 NPTF	1/16 - 27 NPTF	MS1595	T30
6080051	EVSBL2020K0416050060C	4	16	60	50	20	20	29	125	18	37	1/16 - 27 NPTF	1/16 - 27 NPTF	MS1595	T30
6116572	EVSBL2020K0416060075C	4	16	75	60	20	20	29	125	18	37	1/16 - 27 NPTF	1/16 - 27 NPTF	MS1595	T30
6116574	EVSBL2020K0416075100C	4	16	100	75	20	20	29	125	18	37	1/16 - 27 NPTF	1/16 - 27 NPTF	MS1595	T30
6116588	EVSBL2525M0416100180C	4	16	180	100	25	25	34	150	23	37	1/8 - 27 NPTF	1/8 - 27 NPTF	MS1970	T30
6116590	EVSBL2525M0416180250C	4	16	250	180	25	25	34	150	23	37	1/8 - 27 NPTF	1/8 - 27 NPTF	MS1970	T30
6116576	EVSBL2525M0426060075C	4	26	75	60	25	25	35	150	23	47	1/8 - 27 NPTF	1/8 - 27 NPTF	MS1970	T30
6116578	EVSBL2525M0426075100C	4	26	100	75	25	25	35	150	23	47	1/8 - 27 NPTF	1/8 - 27 NPTF	MS1970	T30

(continuação)

(Abertura de canal de face reto externo integral • Métrico — continuação)



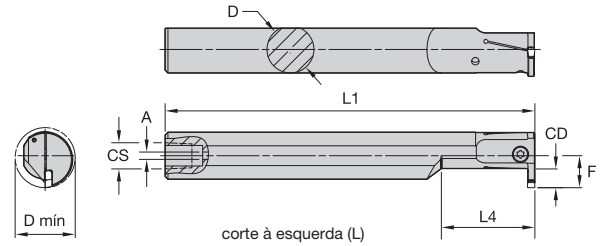
número para pedido	código do produto	tamanho do inserto	CD	D máx	D mín	W mín	B	H2	L1	FS	LH	CF	CS	Parafuso Torx para fixação	Torx
6116580	EVSBL2525M0426100180C	4	26	180	100	25	25	35	150	23	47	1/8 - 27 NPTF	1/8 - 27 NPTF	MS1970	T30
6116582	EVSBL2525M0426180250C	4	26	250	180	25	25	35	150	23	47	1/8 - 27 NPTF	1/8 - 27 NPTF	MS1970	T30
6080039	EVSBL2525M0516050060C	5	16	60	50	25	25	34	150	23	37	1/8 - 27 NPTF	1/8 - 27 NPTF	MS1970	T30
6124211	EVSBL2525M0516060075C	5	16	60	60	25	25	34	150	23	37	1/8 - 27 NPTF	1/8 - 27 NPTF	MS1970	T30
6124215	EVSBL2525M0516075100C	5	16	100	75	25	25	34	150	23	37	1/8 - 27 NPTF	1/8 - 27 NPTF	MS1970	T30
6124219	EVSBL2525M0516100180C	5	16	180	100	25	25	34	150	23	37	1/8 - 27 NPTF	1/8 - 27 NPTF	MS1970	T30
6124223	EVSBL2525M0516180250C	5	16	250	180	25	25	34	150	23	37	1/8 - 27 NPTF	1/8 - 27 NPTF	MS1970	T30
6124227	EVSBL2525M0516250350C	5	16	350	250	25	25	34	150	23	37	1/8 - 27 NPTF	1/8 - 27 NPTF	MS1970	T30
6124232	EVSBL2525M0516350999C	5	16	999	350	25	25	34	150	23	37	1/8 - 27 NPTF	1/8 - 27 NPTF	MS1970	T30
6124199	EVSBL2525M0526050060C	5	26	60	50	25	25	35	150	23	47	1/8 - 27 NPTF	1/8 - 27 NPTF	MS1970	T30
6124213	EVSBL2525M0526060075C	5	26	60	60	25	25	35	150	23	47	1/8 - 27 NPTF	1/8 - 27 NPTF	MS1970	T30
6124217	EVSBL2525M0526075100C	5	26	100	75	25	25	35	150	23	47	1/8 - 27 NPTF	1/8 - 27 NPTF	MS1970	T30
6124236	EVSBL3232P0532100180C	5	32	180	100	32	32	42	170	30	53	1/8 - 27 NPTF	1/8 - 27 NPTF	MS1970	T30
6124238	EVSBL3232P0532180250C	5	32	250	180	32	32	42	170	30	53	1/8 - 27 NPTF	1/8 - 27 NPTF	MS1970	T30
6124240	EVSBL3232P0532250350C	5	32	350	250	32	32	42	170	30	53	1/8 - 27 NPTF	1/8 - 27 NPTF	MS1970	T30
6124242	EVSBL3232P0532350999C	5	32	999	350	32	32	42	170	30	53	1/8 - 27 NPTF	1/8 - 27 NPTF	MS1970	T30
6124606	EVSBL2525M0616060075C	6	16	75	60	25	25	35	150	22	37	1/8 - 27 NPTF	1/8 - 27 NPTF	MS1970	T30
6124610	EVSBL2525M0616075100C	6	16	100	75	25	25	35	150	22	37	1/8 - 27 NPTF	1/8 - 27 NPTF	MS1970	T30
6124674	EVSBL2525M0616100180C	6	16	180	100	25	25	35	150	22	37	1/8 - 27 NPTF	1/8 - 27 NPTF	MS1970	T30
6124678	EVSBL2525M0616180250C	6	16	250	180	25	25	35	150	22	37	1/8 - 27 NPTF	1/8 - 27 NPTF	MS1970	T30
6124682	EVSBL2525M0616250350C	6	16	350	250	25	25	35	150	22	37	1/8 - 27 NPTF	1/8 - 27 NPTF	MS1970	T30
6124686	EVSBL2525M0616350999C	6	16	999	350	25	25	35	150	22	37	1/8 - 27 NPTF	1/8 - 27 NPTF	MS1970	T30
6124608	EVSBL2525M0626060075C	6	26	75	60	25	25	35	150	22	47	1/8 - 27 NPTF	1/8 - 27 NPTF	MS1970	T30
6124672	EVSBL2525M0626075100C	6	26	100	75	25	25	35	150	22	47	1/8 - 27 NPTF	1/8 - 27 NPTF	MS1970	T30
6124690	EVSBL3232P0632100180C	6	32	180	100	32	32	43	170	29	55	1/8 - 27 NPTF	1/8 - 27 NPTF	MS1490	T45
6124692	EVSBL3232P0632180250C	6	32	250	180	32	32	43	170	29	55	1/8 - 27 NPTF	1/8 - 27 NPTF	MS1490	T45
6124694	EVSBL3232P0632250350C	6	32	350	250	32	32	43	170	29	55	1/8 - 27 NPTF	1/8 - 27 NPTF	MS1490	T45
6124696	EVSBL3232P0632350999C	6	32	999	350	32	32	43	170	29	55	1/8 - 27 NPTF	1/8 - 27 NPTF	MS1490	T45

NOTA: Refrigeração através do encaixe disponível para o tamanho do alojamento 3 e superior.

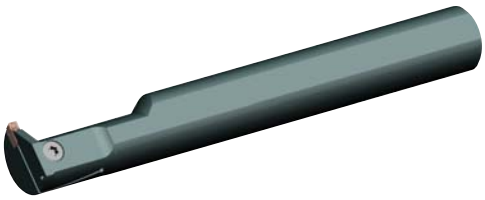
parafuso	parafuso	torque				Chave	Chave
código do produto	número para pedido	Nm	pol. lbs.	rosca	soquete	código do produto	número para pedido
MS1160	1099645	7	62	M5	T20	KT20	1022703
MS1162	1127019	9	80	M6	T25	KT25	1022725
MS1163	1124104	18	159	M8	T30	KT30L	1099676
MS1273	1020977	4	35.4	M4	T15	KT15	1022701
MS1490	2263299	17	151	M8	T45	KT45	1018227
MS1595	1094300	12	106	M6	T30	KT30	1099676
MS1970	1106668	12	106	M6	T30	KT30	1099676
MS2002	1621087	9	80	M6	T25	KT25	1022725
MS2091	1931147	9	80	M5	25IP	K25IP	2050113

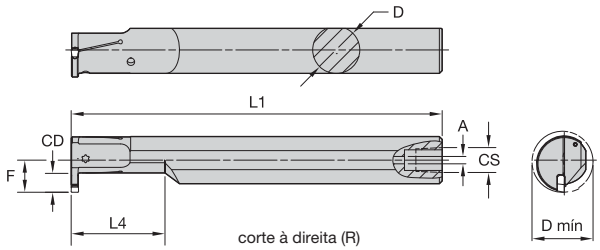
- Para uso em aplicações de canal de diâmetro interno.
- Suporte máximo.
- Barra de mandrilar em aço com capacidade de refrigerante.





corte à esquerda (L)

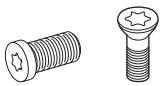

corte à esquerda



corte à direita (R)


corte à direita

Barra de mandrilar em aço • Métrico



número para pedido	código do produto	tamanho do inserto	CD	D	D mín	L1	F	L4	A	CS	Parafuso Torx para fixação	Parafuso Torx para fixação	Torx
corte à direita (R)													
5980518	**A12KEVEMR1F05M**	1F	5,00	12	16	125	9	24,0	4,00	1/16 - 27 NPT	–	**MS1285**	T15
5980520	**A16MEVEMR1F07M**	1F	7,00	16	20	150	11	32,0	4,00	1/8 - 27 NPT	–	**MS1273**	T15
5980622	**A20QEVEMR1F07M**	1F	7,00	20	25	180	13	40,0	4,00	1/8 - 27 NPTF	–	**MS1160**	T20
5980519	**A12KEVEMR0205M**	2	5,00	12	16	125	9	24,0	4,00	1/16 - 27 NPTF	–	**MS1285**	T15
5980621	**A16MEVEMR0207M**	2	7,00	16	20	150	11	32,0	4,00	1/8 - 27 NPTF	–	**MS1273**	T15
5980623	**A20QEVEMR0207M**	2	7,00	20	25	180	13	40,0	4,00	1/8 - 27 NPTF	–	**MS1160**	T20
5980624	**A25REVEMR0210M**	2	10,00	25	32	200	18	50,0	6,40	1/4 - 18 NPT	–	**MS1162**	T25
5954259	**A16MEVEMR0307M**	3	7,00	16	20	150	11	40,3	4,00	1/8 - 27 NPT	–	**MS1273**	T15
5954260	**A20QEVEMR0307M**	3	7,00	20	25	180	13	40,3	4,00	1/8 - 27 NPT	–	**MS1160**	T20
5954281	**A25REVEMR0310M**	3	10,00	25	32	200	17	50,3	6,40	1/4 - 18 NPT	–	**MS1162**	T25
5954283	**A32SEVEMR0312M**	3	12,00	32	40	250	22	64,0	6,40	1/4 - 18 NPT	**MS1595**	–	T30
5954282	**A25REVEMR0410M**	4	10,00	25	32	200	17	50,3	6,40	1/4 - 18 NPT	–	**MS1162**	T25
5954284	**A32SEVEMR0412M**	4	12,00	32	40	250	22	64,0	6,40	1/4 - 18 NPT	**MS1595**	–	T30

(continuação)

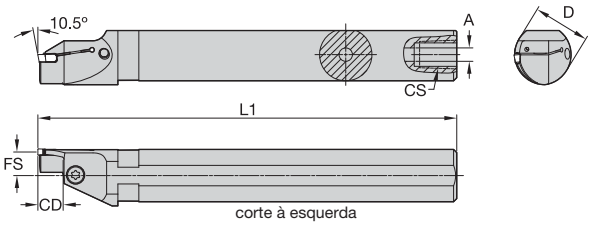
(Barra de mandrilar em aço • Métrico — continuação)

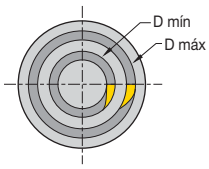


número para pedido	código do produto	tamanho do inserto	CD	D	D mín	L1	F	L4	A	CS	Parafuso Torx para fixação	Parafuso Torx para fixação	Torx
corte à esquerda (L)													
5980625	**A12KEVEML1F05M**	1F	5,00	12	16	125	9	24,0	4,00	1/16 - 27 NPTF	–	**MS1285**	T15
5980627	**A16MEVEML1F07M**	1F	7,00	16	20	150	11	32,0	4,00	1/8 - 27 NPTF	–	**MS1273**	T15
5980629	**A20QEVEML1F07M**	1F	7,00	20	25	180	13	40,0	4,00	1/8 - 27 NPTF	–	**MS1160**	T20
5980626	**A12KEVEML0205M**	2	5,00	12	16	125	9	24,0	4,00	1/16 - 27 NPTF	–	**MS1285**	T15
5980628	**A16MEVEML0207M**	2	7,00	16	20	150	11	32,0	4,00	1/8 - 27 NPTF	–	**MS1273**	T15
5980630	**A20QEVEML0207M**	2	7,00	20	25	180	13	40,0	4,00	1/8 - 27 NPTF	–	**MS1160**	T20
5980631	**A25REVEML0210M**	2	10,00	25	32	200	18	50,0	6,40	1/4 - 18 NPT	–	**MS1162**	T25
5954285	**A16MEVEML0307M**	3	7,00	16	20	150	11	40,3	4,00	1/8 - 27 NPT	–	**MS1273**	T15
5954286	**A20QEVEML0307M**	3	7,00	20	25	180	13	40,3	4,00	1/8 - 27 NPT	–	**MS1160**	T20
5954287	**A25REVEML0310M**	3	10,00	25	32	200	17	50,3	6,40	1/4 - 27 NPT	–	**MS1162**	T25
5954289	**A32SEVEML0312M**	3	12,00	32	40	250	22	64,0	6,40	1/4 - 27 NPT	**MS1595**	–	T30
5954288	**A25REVEML0410M**	4	10,00	25	32	200	17	50,3	6,40	1/4 - 18 NPT	–	**MS1162**	T25
5954290	**A32SEVEML0412M**	4	12,00	32	40	250	22	64,0	6,40	1/4 - 18 NPT	**MS1595**	–	T30

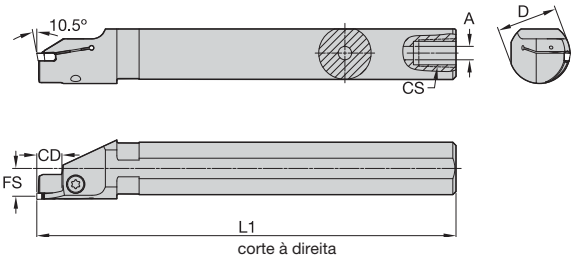
parafuso	parafuso	torque				Chave	Chave
código do produto	número para pedido	Nm	pol. lbs.	rosca	soquete	código do produto	número para pedido
MS1160	**1099645**	7	62	M5	T20	**KT20**	**1022703**
MS1162	**1127019**	9	80	M6	T25	**KT25**	**1022725**
MS1163	**1124104**	18	159	M8	T30	**KT30L**	**1099676**
MS1273	**1020977**	4	35.4	M4	T15	**KT15**	**1022701**
MS1490	**2263299**	17	151	M8	T45	**KT45**	**1018227**
MS1595	**1094300**	12	106	M6	T30	**KT30**	**1099676**
MS1970	**1106668**	12	106	M6	T30	**KT30**	**1099676**
MS2002	**1621087**	9	80	M6	T25	**KT25**	**1022725**
MS2091	**1931147**	9	80	M5	25IP	**K25IP**	**2050113**








corte à esquerda




corte à direita

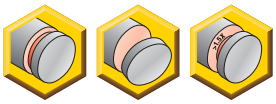
Barra de mandrilar em aço de abertura de canal de face • Métrico

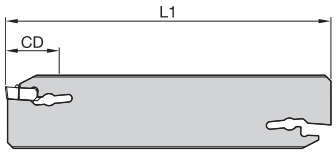


número para pedido	código do produto	tamanho do inserto	CD	D	D mín	D máx	L1	F	CS	Parafuso Torx para fixação	Torx
corte à direita (R)											
6116521	**A25REVSAR0212M026030**	2	12,00	25	26	30	200	13	1/4-18 NPT	**MS1160**	T20
6116522	**A25REVSAR0312M030035**	3	12,00	25	30	35	200	13	—	**MS1162**	T25
6116297	**A32SEVSAR0312M033042**	3	12,00	32	33	42	250	16	1/4-18 NPT	**MS1162**	T25
6116299	**A40TEVSAR0312M041050**	3	12,00	40	41	50	300	20	1/4-18 NPT	**MS1162**	T25
corte à esquerda (L)											
6116527	**A25REVSAL0212M026030**	2	12,00	25	26	30	200	13	1/4-18 NPT	**MS1160**	T20
6116528	**A25REVSAL0312M030035**	3	12,00	25	30	35	200	13	1/4-18 NPT	**MS1162**	T25
6116298	**A32SEVSAL0312M033042**	3	12,00	32	33	42	250	16	1/4-18 NPT	—	T25
6116300	**A40TEVSAL0312M041050**	3	12,00	40	41	50	300	20	1/4-18 NPT	**MS1162**	T25

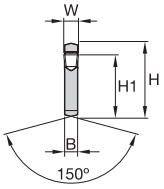
parafuso código do produto	parafuso número para pedido	torque Nm	torque pol. lbs.	rosca	soquete	Chave código do produto	Chave número para pedido
MS1160	**1099645**	7	62	M5	T20	**KT20**	**1022703**
MS1162	**1127019**	9	80	M6	T25	**KT25**	**1022725**
MS1163	**1124104**	18	159	M8	T30	**KT30L**	**1099676**
MS1273	**1020977**	4	35.4	M4	T15	**KT15**	**1022701**
MS1490	**2263299**	17	151	M8	T45	**KT45**	**1018227**
MS1595	**1094300**	12	106	M6	T30	**KT30**	**1099676**
MS1970	**1106668**	12	106	M6	T30	**KT30**	**1099676**
MS2002	**1621087**	9	80	M6	T25	**KT25**	**1022725**
MS2091	**1931147**	9	80	M5	25IP	**K25IP**	**2050113**

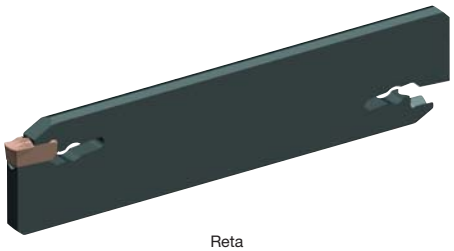
- Para aplicações de canal profundo e corte.
- Encaixe universal compatível com todas as geometrias de inserto.



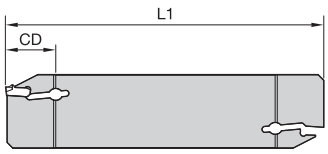


Reta

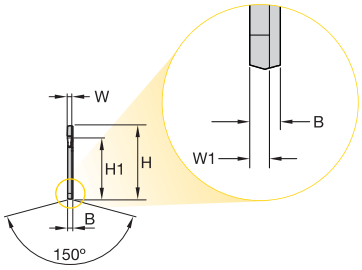


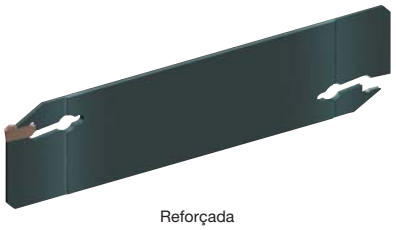


Reta



Reforçada





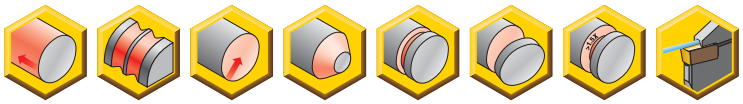
Reforçada

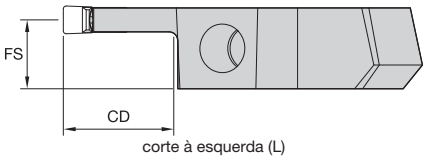
Lâmina de corte com ponta dupla

número para pedido	código do produto	tamanho do inserto	H	W	W1	H1	L1	B	CD	chave de montagem
corte à esquerda (L)										
5941706	**EVBSN19G1B14**	1B	19	1,4	1,15	15,5	90	1,80	14	**SCW5E**
5941708	**EVBSN26J1B15**	1B	26	1,4	1,15	21,5	110	1,80	15	**SCW5E**
5955391	**EVBSN19G1F16**	1F	19	1,6	1,30	15,5	90	1,80	16	**SCW5E**
5955392	**EVBSN26J1F17**	1F	26	1,6	1,30	21,5	110	1,80	17	**SCW5E**
5941707	**EVBSN19G0220**	2	19	2,0	–	15,5	90	1,65	–	**SCW5E**
5941709	**EVBSN26J0230**	2	26	2,0	–	21,5	110	1,65	–	**SCW5E**
5941710	**EVBSN26M0230**	2	26	2,0	–	21,5	150	1,65	–	**SCW5E**
5941724	**EVBSN32M0250**	2	32	2,0	–	25,1	150	1,65	–	**SCW5E**
5941721	**EVBSN26J0340**	3	26	3,0	–	21,5	110	2,40	–	**SCW5E**
5941722	**EVBSN26M0340**	3	26	3,0	–	21,5	150	2,40	–	**SCW5E**
5941725	**EVBSN32M0350**	3	32	3,0	–	25,1	150	2,40	–	**SCW5E**
5941723	**EVBSN26J0440**	4	26	4,0	–	21,5	110	3,40	–	**SCW5E**
5941726	**EVBSN32M0450**	4	32	4,0	–	25,1	150	3,40	–	**SCW5E**
5977635	**EVBSN26J0540**	5	26	5,0	–	21,5	110	4,40	–	**SCW5E**
5977637	**EVBSN32M0560**	5	32	5,0	–	25,1	150	4,40	–	**SCW5E**
5977636	**EVBSN26J0640**	6	26	6,0	–	21,5	110	5,40	–	**SCW8E**
5977638	**EVBSN32M0660**	6	32	6,0	–	25,1	150	5,40	–	**SCW8E**
5977640	**EVBSN52X06120**	6	53	6,0	–	45,3	260	5,40	–	**SCW8E**
5977639	**EVBSN32M0860**	8	32	8,0	–	25,1	150	7,00	–	**SCW8E**
5977721	**EVBSN52X08120**	8	53	8,0	–	45,3	260	7,00	–	**SCW8E**

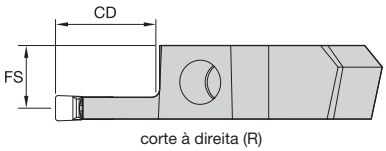
NOTA: Chave de montagem fornecida com a lâmina.

- Suporte máximo para larguras específicas de canal e folga direta para diâmetros ilimitados.
- Com refrigeração através do encaixe.
- Encaixe universal compatível com todas as geometrias de inserto.





corte à esquerda (L)

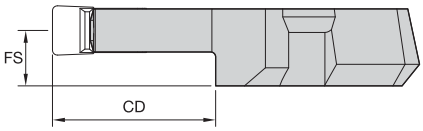


corte à direita (R)

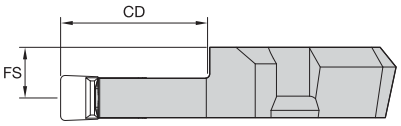

corte à esquerda (L)


corte à direita (R)

Tamanho da lâmina M50 exibido

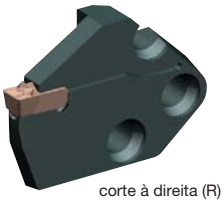


corte à esquerda (L)



corte à direita (R)


corte à esquerda (L)


corte à direita (R)

Tamanho da lâmina M65 exibido

Lâmina modular direta com refrigeração

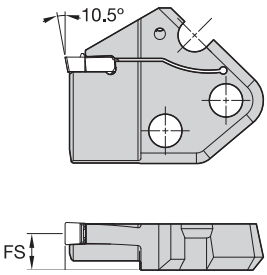
número para pedido	código do produto	tamanho do inserto	CD	FS	tamanho da lâmina
corte à direita (R)					
6031041	**EVM50R1F12M**	1F	12,0	11,00	50
6030969	**EVM50R0212M**	2	12,0	10,88	50
5955423	**EVM50R0216M**	2	16,0	10,88	50
5979200	**EVM50R0312MC**	3	12,0	10,43	50
5979010	**EVM50R0316MC**	3	16,0	10,43	50
5979181	**EVM50R0322MC**	3	22,0	10,43	50
5979201	**EVM50R0412MC**	4	12,0	9,93	50
5979182	**EVM50R0416MC**	4	16,0	9,93	50
5979183	**EVM50R0422MC**	4	22,0	9,93	50
5979198	**EVM50R0426MC**	4	26,0	9,93	50
5979184	**EVM50R0432MC**	4	32,0	9,93	50
6031031	**EVM50R0512MC**	5	12,0	9,43	50
6031033	**EVM50R0516MC**	5	16,0	9,43	50
5955415	**EVM50R0526MC**	5	26,0	9,43	50
5955416	**EVM50R0532MC**	5	32,0	9,43	50
6031035	**EVM65R0616MC**	6	16,0	9,88	65
5955417	**EVM65R0626MC**	6	26,0	9,88	65
6031037	**EVM65R0632MC**	6	32,0	9,88	65
6031039	**EVM65R0816MC**	8	16,0	9,00	65
5955418	**EVM65R0826MC**	8	26,0	9,00	65

(continuação)

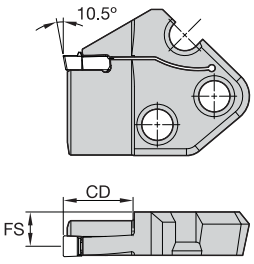
(Lâmina modular direta com refrigeração — continuação)

número para pedido	código do produto	tamanho do inserto	CD	FS	tamanho da lâmina
corte à esquerda (L)					
6031042	**EVM50L1F12M**	1F	12,0	11,00	50
6030970	**EVM50L0212M**	2	12,0	10,88	50
5955424	**EVM50L0216M**	2	16,0	10,88	50
5979202	**EVM50L0312MC**	3	12,0	10,43	50
5979185	**EVM50L0316MC**	3	16,0	10,43	50
5979186	**EVM50L0322MC**	3	22,0	10,43	50
5979203	**EVM50L0412MC**	4	12,0	9,93	50
5979187	**EVM50L0416MC**	4	16,0	9,93	50
5979188	**EVM50L0422MC**	4	22,0	9,93	50
5979199	**EVM50L0426MC**	4	26,0	9,93	50
5979189	**EVM50L0432MC**	4	32,0	9,93	50
6031032	**EVM50L0512MC**	5	12,0	9,93	50
6031034	**EVM50L0516MC**	5	16,0	9,43	50
5955419	**EVM50L0526MC**	5	26,0	9,43	50
5955420	**EVM50L0532MC**	5	32,0	9,43	50
6031036	**EVM65L0616MC**	6	16,0	9,88	65
5955421	**EVM65L0626MC**	6	26,0	9,88	65
6031038	**EVM65L0632MC**	6	32,0	9,88	65
6031040	**EVM65L0816MC**	8	16,0	9,00	65
5955422	**EVM65L0826MC**	8	26,0	9,00	65

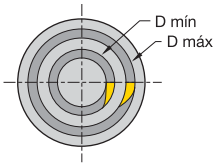
NOTA: Refrigeração através do encaixe disponível para o tamanho do alojamento 3 e superior.



corte à esquerda



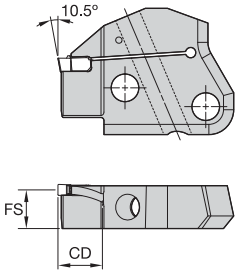
corte à direita



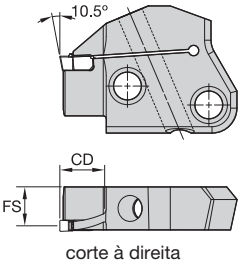

corte à esquerda


corte à direita

Tamanho da lâmina M65 exibido



corte à esquerda



corte à direita


corte à esquerda


corte à direita

Tamanho da lâmina M50 exibido

Lâmina de abertura de canal de face modular interna com refrigeração

número para pedido	código do produto	tamanho do inserto	D mín	D máx	CD	FS	tamanho da lâmina
corte à direita (R)							
6097181	**EVM50R0312A035040C**	3	35	40	12,0	10,50	50
6097182	**EVM50R0312A040050C**	3	40	50	12,0	10,50	50
6097183	**EVM50R0312A050060C**	3	50	60	12,0	10,50	50
6097184	**EVM50R0312A060075C**	3	60	75	12,0	10,50	50
6116789	**EVM50R0312A075100C**	3	75	100	12,0	10,50	50
6117063	**EVM50R0312A100180C**	3	100	180	12,0	10,50	50
6117067	**EVM50R0312A180250C**	3	180	250	12,0	10,50	50
6117071	**EVM50R0312A250350C**	3	250	350	12,0	10,50	50
6117075	**EVM50R0312A350999C**	3	350	999	12,0	10,50	50
6097185	**EVM50R0320A075100C**	3	75	100	20,0	10,50	50
6097186	**EVM50R0320A100180C**	3	100	180	20,0	10,50	50
6097187	**EVM50R0320A180250C**	3	180	250	20,0	10,50	50
6097188	**EVM50R0320A250350C**	3	250	350	20,0	10,50	50
6097189	**EVM50R0320A350999C**	3	350	999	20,0	10,50	50
6079480	**EVM50R0416A040050C**	4	40	50	16,0	10,00	50
6079481	**EVM50R0416A050060C**	4	50	60	16,0	10,00	50
6079482	**EVM50R0416A060075C**	4	60	75	16,0	10,00	50
6079483	**EVM50R0416A075100C**	4	75	100	16,0	10,00	50
6117079	**EVM50R0416A100180C**	4	100	180	16,0	10,00	50
6117093	**EVM50R0416A180250C**	4	180	250	16,0	10,00	50
6117097	**EVM50R0416A250350C**	4	250	350	16,0	10,00	50
6117101	**EVM50R0416A350999C**	4	350	999	16,0	10,00	50
6079484	**EVM50R0426A100180C**	4	100	180	26,0	10,00	50

(continuação)

(Lâmina de abertura de canal de face modular interna com refrigeração — continuação)

número para pedido	código do produto	tamanho do inserto	D mín	D máx	CD	FS	tamanho da lâmina
6079485	EVM50R0426A180250C	4	180	250	26,0	10,00	50
6079486	EVM50R0426A250350C	4	250	350	26,0	10,00	50
6079487	EVM50R0426A350999C	4	350	999	26,0	10,00	50
6079488	EVM50R0520A050060C	5	50	60	20,0	9,50	50
6079489	EVM50R0520A060075C	5	60	75	20,0	9,50	50
6079490	EVM50R0520A075100C	5	75	100	20,0	9,50	50
6079491	EVM50R0520A100180C	5	100	180	20,0	9,50	50
6079492	EVM50R0520A180250C	5	180	250	20,0	9,50	50
6079493	EVM50R0520A250350C	5	250	350	20,0	9,50	50
6079494	EVM50R0520A350999C	5	350	999	20,0	9,50	50
6079223	EVM65R0620A060075C	6	60	75	20,0	9,88	65
6079224	EVM65R0620A075100C	6	75	100	20,0	9,88	65
6079225	EVM65R0620A100180C	6	100	180	20,0	9,88	65
6079226	EVM65R0620A180250C	6	180	250	20,0	9,88	65
6079227	EVM65R0620A250350C	6	250	350	20,0	9,88	65
6079228	EVM65R0620A350999C	6	350	999	20,0	9,88	65
6079229	EVM65R0820A080180C	8	80	180	20,0	9,00	65
6079230	EVM65R0820A180999C	8	180	999	20,0	9,00	65
corte à esquerda (L)							
6097190	EVM50L0312A035040C	3	35	40	12,0	10,50	50
6097191	EVM50L0312A040050C	3	40	50	12,0	10,50	50
6097192	EVM50L0312A050060C	3	50	60	12,0	10,50	50
6097193	EVM50L0312A060075C	3	60	75	12,0	10,50	50
6116790	EVM50L0312A075100C	3	75	100	12,0	10,50	50
6117064	EVM50L0312A100180C	3	100	180	12,0	10,50	50
6117068	EVM50L0312A180250C	3	180	250	12,0	10,50	50
6117072	EVM50L0312A250350C	3	250	350	12,0	10,50	50
6117076	EVM50L0312A350999C	3	350	999	12,0	10,50	50
6097194	EVM50L0320A075100C	3	75	100	20,0	10,50	50
6097195	EVM50L0320A100180C	3	100	180	20,0	10,50	50
6097196	EVM50L0320A180250C	3	180	250	20,0	10,50	50
6097197	EVM50L0320A250350C	3	250	350	20,0	10,50	50
6097198	EVM50L0320A350999C	3	350	999	20,0	10,50	50
6079495	EVM50L0416A040050C	4	40	50	16,0	10,00	50
6079496	EVM50L0416A050060C	4	50	60	16,0	10,00	50
6079497	EVM50L0416A060075C	4	60	75	16,0	10,00	50
6079498	EVM50L0416A075100C	4	75	100	16,0	10,00	50
6117080	EVM50L0416A100180C	4	100	180	16,0	10,00	50
6117094	EVM50L0416A180250C	4	180	250	16,0	10,00	50
6117098	EVM50L0416A250350C	4	250	350	16,0	10,00	50
6117102	EVM50L0416A350999C	4	350	999	16,0	10,00	50
6079499	EVM50L0426A100180C	4	100	180	26,0	10,00	50
6079500	EVM50L0426A180250C	4	180	250	26,0	10,00	50
6079501	EVM50L0426A250350C	4	250	350	26,0	10,00	50

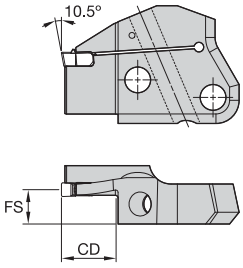
(continuação)

(Lâmina de abertura de canal de face modular interna com refrigeração — continuação)

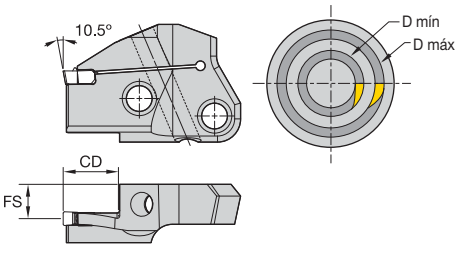
número para pedido	código do produto	tamanho do inserto	D mín	D máx	CD	FS	tamanho da lâmina
6079502	EVM50L0426A350999C	4	350	999	26,0	10,00	50
6079503	EVM50L0520A050060C	5	50	60	20,0	9,50	50
6079504	EVM50L0520A060075C	5	60	75	20,0	9,50	50
6079505	EVM50L0520A075100C	5	75	100	20,0	9,50	50
6079506	EVM50L0520A100180C	5	100	180	20,0	9,50	50
6079507	EVM50L0520A180250C	5	180	250	20,0	9,50	50
6079508	EVM50L0520A250350C	5	250	350	20,0	9,50	50
6079509	EVM50L0520A350999C	5	350	999	20,0	9,50	50
6079234	EVM65L0620A060075C	6	60	75	20,0	9,88	65
6079235	EVM65L0620A075100C	6	75	100	20,0	9,88	65
6079236	EVM65L0620A100180C	6	100	180	20,0	9,88	65
6079237	EVM65L0620A180250C	6	180	250	20,0	9,88	65
6079238	EVM65L0620A250350C	6	250	350	20,0	9,88	65
6079239	EVM65L0620A350999C	6	350	999	20,0	9,88	65
6079240	EVM65L0820A080180C	8	80	180	20,0	9,00	65
6079241	EVM65L0820A180999C	8	180	999	20,0	9,00	65

NOTA: Refrigeração através do encaixe disponível para o tamanho do alojamento 3 e superior.

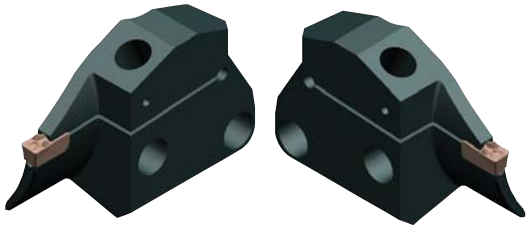




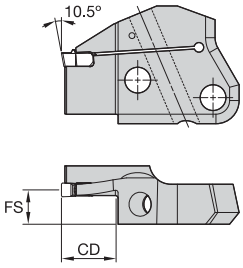
corte à esquerda



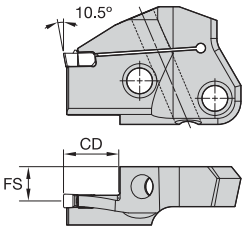
corte à direita


corte à esquerda corte à direita

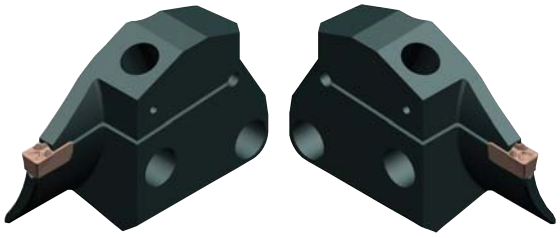
Tamanho da lâmina M65 exibido



corte à esquerda



corte à direita


corte à esquerda corte à direita

Tamanho da lâmina M50 exibido

Lâmina de abertura de canal de face modular externa com refrigeração

número para pedido	código do produto	tamanho do inserto	D mín	D máx	CD	FS	tamanho da lâmina
corte à direita (R)							
6079340	**EVM50R0312B035040C**	3	35	40	12,0	10,50	50
6079411	**EVM50R0312B040050C**	3	40	50	12,0	10,50	50
6079412	**EVM50R0312B050060C**	3	50	60	12,0	10,50	50
6079413	**EVM50R0312B060075C**	3	60	75	12,0	10,50	50
6117061	**EVM50R0312B075100C**	3	75	100	12,0	10,50	50
6117065	**EVM50R0312B100180C**	3	100	180	12,0	10,50	50
6117069	**EVM50R0312B180250C**	3	180	250	12,0	10,50	50
6117073	**EVM50R0312B250350C**	3	250	350	12,0	10,50	50
6117077	**EVM50R0312B350999C**	3	350	999	12,0	10,50	50
6079414	**EVM50R0320B075100C**	3	75	100	20,0	10,50	50
6079415	**EVM50R0320B100180C**	3	100	180	20,0	10,50	50
6079416	**EVM50R0320B180250C**	3	180	250	20,0	10,50	50
6079417	**EVM50R0320B250350C**	3	250	350	20,0	10,50	50
6079418	**EVM50R0320B350999C**	3	350	999	20,0	10,50	50
6079429	**EVM50R0416B040050C**	4	40	50	16,0	10,00	50
6079430	**EVM50R0416B050060C**	4	50	60	16,0	10,00	50
6079451	**EVM50R0416B060075C**	4	60	75	16,0	10,00	50
6079452	**EVM50R0416B075100C**	4	75	100	16,0	10,00	50
6117091	**EVM50R0416B100180C**	4	100	180	16,0	10,00	50
6117095	**EVM50R0416B180250C**	4	180	250	16,0	10,00	50
6117099	**EVM50R0416B250350C**	4	250	350	16,0	10,00	50
6117103	**EVM50R0416B350999C**	4	350	999	16,0	10,00	50
6079453	**EVM50R0426B100180C**	4	100	180	26,0	10,00	50

(continuação)

(Lâmina de abertura de canal de face modular externa com refrigeração — continuação)

número para pedido	código do produto	tamanho do inserto	D mín	D máx	CD	FS	tamanho da lâmina
6079454	EVM50R0426B180250C	4	180	250	26,0	10,00	50
6079455	EVM50R0426B250350C	4	250	350	26,0	10,00	50
6079456	EVM50R0426B350999C	4	350	999	26,0	10,00	50
6079457	EVM50R0520B050060C	5	50	60	20,0	9,50	50
6079458	EVM50R0520B060075C	5	60	75	20,0	9,50	50
6079459	EVM50R0520B075100C	5	75	100	20,0	9,50	50
6079460	EVM50R0520B100180C	5	100	180	20,0	9,50	50
6079461	EVM50R0520B180250C	5	180	250	20,0	9,50	50
6079462	EVM50R0520B250350C	5	250	350	20,0	9,50	50
6079463	EVM50R0520B350999C	5	350	999	20,0	9,50	50
6079246	EVM65R0620B060075C	6	60	75	20,0	9,88	65
6079247	EVM65R0620B075100C	6	75	100	20,0	9,88	65
6079248	EVM65R0620B100180C	6	100	180	20,0	9,88	65
6079249	EVM65R0620B180250C	6	180	250	20,0	9,88	65
6079250	EVM65R0620B250350C	6	250	350	20,0	9,88	65
6079261	EVM65R0620B350999C	6	350	999	20,0	9,88	65
6079262	EVM65R0820B080180C	8	80	180	20,0	9,00	65
6079263	EVM65R0820B180999C	8	180	999	20,0	9,00	65
corte à esquerda (L)							
6079420	EVM50L0312B035040C	3	35	40	12,0	10,50	50
6079421	EVM50L0312B040050C	3	40	50	12,0	10,50	50
6079422	EVM50L0312B050060C	3	50	60	12,0	10,50	50
6079423	EVM50L0312B060075C	3	60	75	12,0	10,50	50
6117062	EVM50L0312B075100C	3	75	100	12,0	10,50	50
6117066	EVM50L0312B100180C	3	100	180	12,0	10,50	50
6117070	EVM50L0312B180250C	3	180	250	12,0	10,50	50
6117074	EVM50L0312B250350C	3	250	350	12,0	10,50	50
6117078	EVM50L0312B350999C	3	350	999	12,0	10,50	50
6079424	EVM50L0320B075100C	3	75	100	20,0	10,50	50
6079425	EVM50L0320B100180C	3	100	180	20,0	10,50	50
6079426	EVM50L0320B180250C	3	180	250	20,0	10,50	50
6079427	EVM50L0320B250350C	3	250	350	20,0	10,50	50
6079428	EVM50L0320B350999C	3	350	999	20,0	10,50	50
6079464	EVM50L0416B040050C	4	40	50	16,0	10,00	50
6079465	EVM50L0416B050060C	4	50	60	16,0	10,00	50
6079466	EVM50L0416B060075C	4	60	75	16,0	10,00	50
6079467	EVM50L0416B075100C	4	75	100	16,0	10,00	50
6117092	EVM50L0416B100180C	4	100	180	16,0	10,00	50
6117096	EVM50L0416B180250C	4	180	250	16,0	10,00	50
6117100	EVM50L0416B250350C	4	250	350	16,0	10,00	50
6117104	EVM50L0416B350999C	4	350	999	16,0	10,00	50
6079468	EVM50L0426B100180C	4	100	180	26,0	10,00	50
6079469	EVM50L0426B180250C	4	180	250	26,0	10,00	50
6079470	EVM50L0426B250350C	4	250	350	26,0	10,00	50

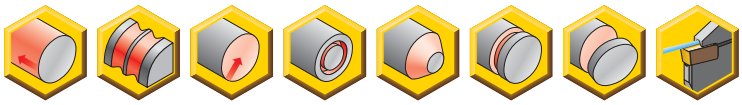
(continuação)

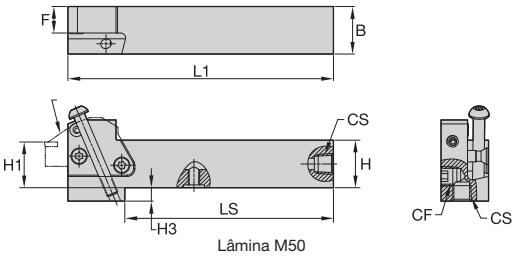
(Lâmina de abertura de canal de face modular externa com refrigeração — continuação)

número para pedido	código do produto	tamanho do inserto	D mín	D máx	CD	FS	tamanho da lâmina
6079471	EVM50L0426B350999C	4	350	999	26,0	10,00	50
6079472	EVM50L0520B050060C	5	50	60	20,0	9,50	50
6079473	EVM50L0520B060075C	5	60	75	20,0	9,50	50
6079474	EVM50L0520B075100C	5	75	100	20,0	9,50	50
6079475	EVM50L0520B100180C	5	100	180	20,0	9,50	50
6079476	EVM50L0520B180250C	5	180	250	20,0	9,50	50
6079477	EVM50L0520B250350C	5	250	350	20,0	9,50	50
6079478	EVM50L0520B350999C	5	350	999	20,0	9,50	50
6079266	EVM65L0620B060075C	6	60	75	20,0	9,88	65
6079267	EVM65L0620B075100C	6	75	100	20,0	9,88	65
6079268	EVM65L0620B100180C	6	100	180	20,0	9,88	65
6079269	EVM65L0620B180250C	6	180	250	20,0	9,88	65
6079270	EVM65L0620B250350C	6	250	350	20,0	9,87	65
6079271	EVM65L0620B350999C	6	350	999	20,0	9,88	65
6079272	EVM65L0820B080180C	8	80	180	20,0	9,00	65
6079273	EVM65L0820B180999C	8	180	999	20,0	9,00	65

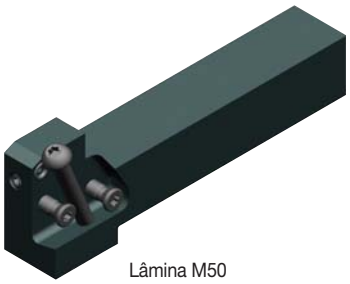
NOTA: Refrigeração através do encaixe disponível para o tamanho do alojamento 3 e superior.

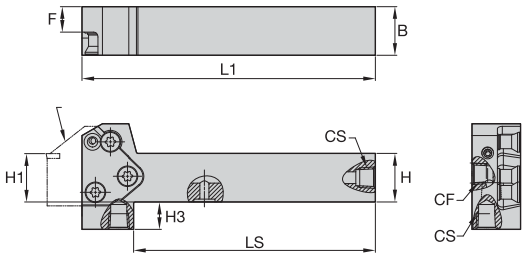
- Lâminas intercambiáveis para versatilidade e profundidade de corte.
- Com refrigeração através do encaixe.



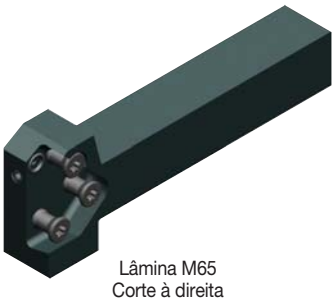


Lâmina M50


Lâmina M50
Corte à direita



Lâmina M65


Lâmina M65
Corte à direita

Porta-ferramenta modular reto com refrigeração • Métrico

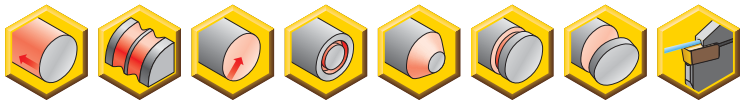


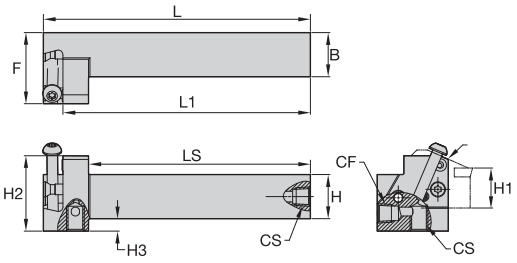

número para pedido	código do produto	B	H	H1	L1	F	CS	CF	LS	H3	tamanho da lâmina	parafuso da lâmina	Torx	parafuso de fixação	Torx
corte à direita (R)															
5979190	**KGMSR2525M50C**	25	25	25	138,75	13,84	G 1/8	G 1/8	109,00	7,00	50	**MS1162**	T25	**MS2002**	T25
5979745	**KGMSR2525M65C**	25	25	25	150,00	13,00	G 1/8	G 1/8	122,00	14,00	65	**MS1163**	T30	**–**	–
5979746	**KGMSR3232P50C**	32	32	32	158,75	20,81	G 1/8	G 1/8	133,62	–	50	**MS1162**	T25	**MS2002**	T25
5979747	**KGMSR3232P65C**	32	32	32	170,00	20,00	G 1/8	G 1/8	138,50	7,00	65	**MS1163**	T30	**–**	–
corte à esquerda (L)															
5979191	**KGMSL2525M50C**	25	25	25	138,75	13,84	G 1/8	G 1/8	109,00	7,00	50	**MS1162**	T25	**MS2002**	T25
5979748	**KGMSL2525M65C**	25	25	25	150,00	13,00	G 1/8	G 1/8	122,00	14,00	65	**MS1163**	T30	**–**	–
5979749	**KGMSL3232P50C**	32	32	32	158,75	20,80	G 1/8	G 1/8	133,62	–	50	**MS1162**	T25	**MS2002**	T25
5979750	**KGMSL3232P65C**	32	32	32	170,00	20,00	G 1/8	G 1/8	142,00	7,00	65	**MS1163**	T30	**–**	–

NOTA: KGMS..: Suportes com sentido à direita usam lâminas com sentido à direita.
KGME..: Suportes com sentido à direita usam lâminas com sentido à esquerda.
O torque do parafuso de fixação e da lâmina M50 deve estar entre 8–10 Nm (71–88 pol. lbs.).
O torque do parafuso de fixação e da lâmina M65 deve estar entre 18–20 Nm (159–177 pol. lbs.).

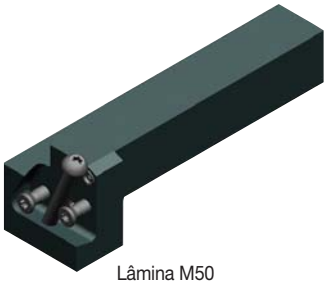
parafuso	parafuso	torque				Chave	Chave
código do produto	número para pedido	Nm	pol. lbs.	rosca	soquete	código do produto	número para pedido
MS1160	**1099645**	7	62	M5	T20	**KT20**	**1022703**
MS1162	**1127019**	9	80	M6	T25	**KT25**	**1022725**
MS1163	**1124104**	18	159	M8	T30	**KT30L**	**1099676**
MS1273	**1020977**	4	35.4	M4	T15	**KT15**	**1022701**
MS1490	**2263299**	17	151	M8	T45	**KT45**	**1018227**
MS1595	**1094300**	12	106	M6	T30	**KT30**	**1099676**
MS1970	**1106668**	12	106	M6	T30	**KT30**	**1099676**
MS2002	**1621087**	9	80	M6	T25	**KT25**	**1022725**
MS2091	**1931147**	9	80	M5	25IP	**K25IP**	**2050113**

- Lâminas intercambiáveis para versatilidade e profundidade de corte.
- Com refrigeração através do encaixe.

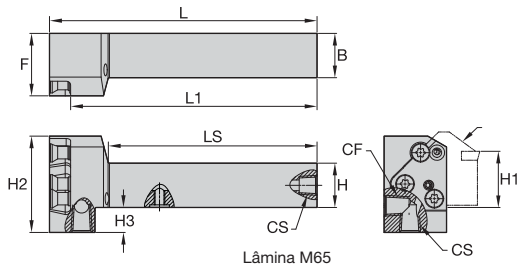




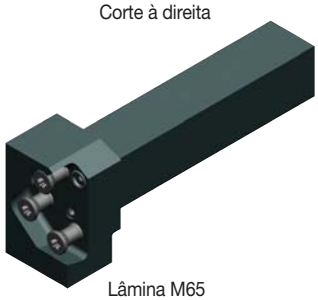
Lâmina M50



Lâmina M50
Corte à direita



Lâmina M65



Lâmina M65
Corte à direita

Porta-ferramenta de montagem de topo reto com refrigeração • Métrico

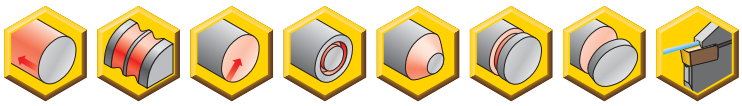


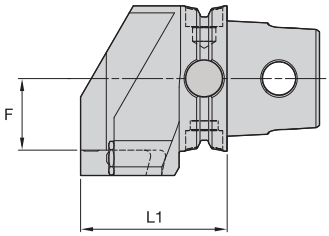
número para pedido	código do produto	B	H	H1	L1	F	CS	CF	LS	H3	tamanho da lâmina	parafuso da lâmina	Torx	parafuso de fixação	Torx
corte à direita (R)															
5979765	**KGMER2525M65C**	25	25	25	138,15	35,00	G 1/8	G 1/8	117,00	14,00	65	**MS1163**	T30	**–**	–
5979192	**KGMER2525M50C**	25	25	25	139,25	40,00	G 1/8	G 1/8	124,85	7,00	50	**MS1162**	T25	**MS2002**	T25
5979767	**KGMER3232P65C**	32	32	32	158,15	35,00	G 1/8	G 1/8	137,00	7,00	65	**MS1163**	T30	**–**	–
5979766	**KGMER3232P50C**	32	32	32	159,25	40,00	G 1/8	G 1/8	145,25	–	50	**MS1162**	T25	**MS2002**	T25
corte à esquerda (L)															
5979768	**KGMEL2525M65C**	25	25	25	138,15	35,00	G 1/8	G 1/8	117,00	14,00	65	**MS1163**	T30	**–**	–
5979193	**KGMEL2525M50C**	25	25	25	139,25	40,00	G 1/8	G 1/8	124,85	7,00	50	**MS1162**	T25	**MS2002**	T25
5979770	**KGMEL3232P65C**	32	32	32	158,15	35,00	G 1/8	G 1/8	137,00	7,00	65	**MS1163**	T30	**–**	–
5979769	**KGMEL3232P50C**	32	32	32	159,25	40,00	G 1/8	G 1/8	145,25	–	50	**MS1162**	T25	**MS2002**	T25

NOTA: KGMS..: Suportes com sentido à direita usam lâminas com sentido à direita.
KGME..: Suportes com sentido à direita usam lâminas com sentido à esquerda.
O torque do parafuso de fixação e da lâmina M50 deve estar entre 8–10 Nm (71–88 pol. lbs.).
O torque do parafuso de fixação e da lâmina M65 deve estar entre 18–20 Nm (159–177 pol. lbs.).

parafuso	parafuso	torque				Chave	Chave
código do produto	número para pedido	Nm	pol. lbs.	rosca	soquete	código do produto	número para pedido
MS1160	**1099645**	7	62	M5	T20	**KT20**	**1022703**
MS1162	**1127019**	9	80	M6	T25	**KT25**	**1022725**
MS1163	**1124104**	18	159	M8	T30	**KT30L**	**1099676**
MS1273	**1020977**	4	35.4	M4	T15	**KT15**	**1022701**
MS1490	**2263299**	17	151	M8	T45	**KT45**	**1018227**
MS1595	**1094300**	12	106	M6	T30	**KT30**	**1099676**
MS1970	**1106668**	12	106	M6	T30	**KT30**	**1099676**
MS2002	**1621087**	9	80	M6	T25	**KT25**	**1022725**
MS2091	**1931147**	9	80	M5	25IP	**K25IP**	**2050113**

- Melhor plataforma KM de troca rápida.
- Com refrigeração através do encaixe.
- Lâminas intercambiáveis para versatilidade e profundidade de corte.






corte à direita (R)

KM QUICK CHANGE

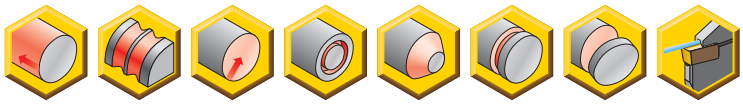
Sistema KM modular direto com refrigeração

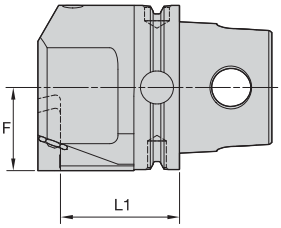



número para pedido	código do produto	Tamanho do sistema CSMS	L1	F	tamanho da lâmina	parafuso da lâmina	Torx	parafuso do grampo	Torx
corte à direita (R)									
5999790	**KM40TSKGMSR50C**	KM40TS	53,5	15,0	50	**MS1162**	T25	**MS2002**	T25
6000422	**KM50TSKGMSR65C**	KM50TS	53,5	22,0	65	**MS1163**	T30	**–**	–
5999864	**KM50TSKGMSR50C**	KM50TS	58,5	23,0	50	**MS1162**	T25	**MS2002**	T25
6000431	**KM63TSKGMSR65C**	KM63TS	58,5	30,0	65	**MS1163**	T30	**–**	–
5999948	**KM63TSKGMSR50C**	KM63TS	63,5	31,0	50	**MS1162**	T25	**MS2002**	T25
5999972	**KM63XMZKGMSR50CY**	KM63XMZ	63,5	31,0	50	**MS1162**	T25	**MS2002**	T25
6017695	**KM80TSKGMSR65C**	KM80TS	63,5	40,0	65	**MS1163**	T30	**–**	–
6000018	**KM80ATCKGMSR50C**	KM80ATC	66,5	41,0	50	**MS1162**	T25	**MS2002**	T25
6000014	**KM80TSKGMSR50C**	KM80TS	66,5	41,0	50	**MS1162**	T25	**MS2002**	T25
corte à esquerda (L)									
5999861	**KM40TSKGMSL50C**	KM40TS	53,5	15,0	50	**MS1162**	T25	**MS2002**	T25
6000424	**KM50TSKGMSL65C**	KM50TS	53,5	22,0	65	**MS1163**	T30	**–**	–
5999865	**KM50TSKGMSL50C**	KM50TS	58,5	23,0	50	**MS1162**	T25	**MS2002**	T25
6000433	**KM63TSKGMSL65C**	KM63TS	58,5	30,0	65	**MS1163**	T30	**–**	–
5999949	**KM63TSKGMSL50C**	KM63TS	63,5	31,0	50	**MS1162**	T25	**MS2002**	T25
5999973	**KM63XMZKGMSLF50CY**	KM63XMZ	63,5	31,0	50	**MS1162**	T25	**MS2002**	T25
6017696	**KM80TSKGMSL65C**	KM80TS	63,5	40,0	65	**MS1163**	T30	**–**	–
6000019	**KM80ATCKGMSL50C**	KM80ATC	66,5	41,0	50	**MS1162**	T25	**MS2002**	T25
6000015	**KM80TSKGMSL50C**	KM80TS	66,5	41,0	50	**MS1162**	T25	**MS2002**	T25

NOTA: KGMS..: Suportes com sentido à direita usam lâminas com sentido à direita.
KGME..: Suportes com sentido à direita usam lâminas com sentido à esquerda.
O torque do parafuso de fixação e da lâmina M50 deve estar entre 8–10 Nm (71–88 pol. lbs.).
O torque do parafuso de fixação e da lâmina M65 deve estar entre 18–20 Nm (159–177 pol. lbs.).

- Melhor plataforma KM de troca rápida.
- Com refrigeração através do encaixe.
- Lâminas intercambiáveis para versatilidade e profundidade de corte.






corte à direita

KM™ QUICK CHANGE

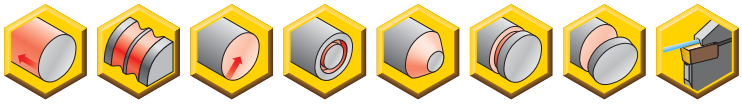
Sistema KM de montagem de topo modular com refrigeração • Métrico

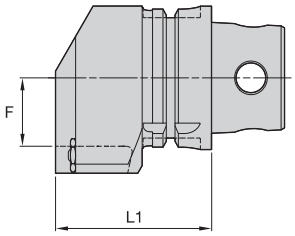


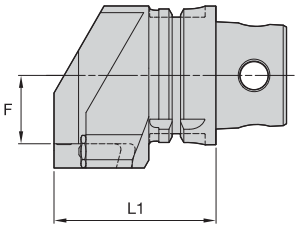

número para pedido	código do produto	Tamanho do sistema CSMS	L1	F	tamanho da lâmina	parafuso da lâmina	Torx	parafuso do grampo	Torx
corte à direita (R)									
5999788	**KM40TSKGMER50C**	KM40TS	28,0	20,50	50	**MS1162**	T25	**MS2002**	T25
5999862	**KM50TSKGMER50C**	KM50TS	38,0	25,50	50	**MS1162**	T25	**MS2002**	T25
6000410	**KM50TSKGMER65C**	KM50TS	47,0	25,50	65	**MS1163**	T30	–	–
6000425	**KM63TSKGMER65C**	KM63TS	47,0	32,52	65	**MS1163**	T30	–	–
5999946	**KM63TSKGMER50C**	KM63TS	48,0	32,50	50	**MS1162**	T25	**MS2002**	T25
6000434	**KM63XMZKGMER65CY**	KM63XMZ	47,0	32,50	65	**MS1163**	T30	–	–
5999950	**KM63XMZKGMER50CY**	KM63XMZ	48,0	32,50	50	**MS1162**	T25	**MS2002**	T25
6017697	**KM80ATCKGMER65C**	KM80ATC	57,0	40,50	65	**MS1163**	T30	–	–
6000016	**KM80ATCKGMER50C**	KM80ATC	58,0	40,50	50	**MS1162**	T25	**MS2002**	T25
6017693	**KM80TSKGMER65C**	KM80TS	57,0	40,50	65	**MS1163**	T30	–	–
6000012	**KM80TSKGMER50C**	KM80TS	58,0	40,50	50	**MS1162**	T25	**MS2002**	T25
corte à esquerda (L)									
5999789	**KM40TSKGMEL50C**	KM40TS	28,0	20,50	50	**MS1162**	T25	**MS2002**	T25
5999863	**KM50TSKGMEL50C**	KM50TS	38,0	25,50	50	**MS1162**	T25	**MS2002**	T25
6000421	**KM50TSKGMEL65C**	KM50TS	47,0	25,50	65	**MS1163**	T30	–	–
6000430	**KM63TSKGMEL65C**	KM63TS	47,0	32,52	65	**MS1163**	T30	–	–
5999947	**KM63TSKGMEL50C**	KM63TS	48,0	32,50	50	**MS1162**	T25	**MS2002**	T25
6000436	**KM63XMZKGMELF65CY**	KM63XMZ	47,0	32,50	65	**MS1163**	T30	–	–
5999971	**KM63XMZKGMELF50CY**	KM63XMZ	48,0	32,50	50	**MS1162**	T25	**MS2002**	T25
6017698	**KM80ATCKGMEL65C**	KM80ATC	57,0	40,50	65	**MS1163**	T30	–	–
6000017	**KM80ATCKGMEL50C**	KM80ATC	58,0	40,50	50	**MS1162**	T25	**MS2002**	T25
6017694	**KM80TSKGMEL65C**	KM80TS	57,0	40,50	65	**MS1163**	T30	–	–
6000013	**KM80TSKGMEL50C**	KM80TS	58,0	40,50	50	**MS1162**	T25	**MS2002**	T25

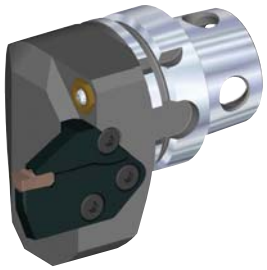
NOTA: KGMS..: Suportes com sentido à direita usam lâminas com sentido à direita.
KGME..: Suportes com sentido à direita usam lâminas com sentido à esquerda.
O torque do parafuso de fixação e da lâmina M50 deve estar entre 8–10 Nm (71–88 pol. lbs.).
O torque do parafuso de fixação e da lâmina M65 deve estar entre 18–20 Nm (159–177 pol. lbs.).

- Com refrigeração através do encaixe.
- Lâminas intercambiáveis para versatilidade e profundidade de corte.









corte à direita

Sistema KM4X™ modular direto com refrigeração

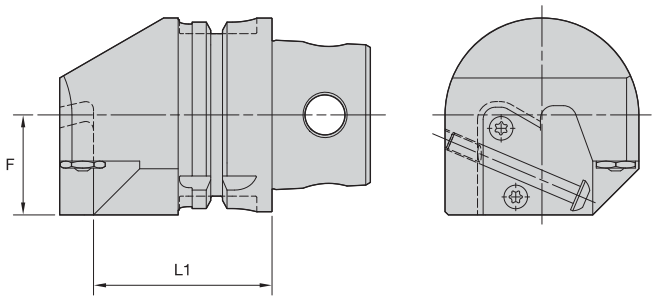


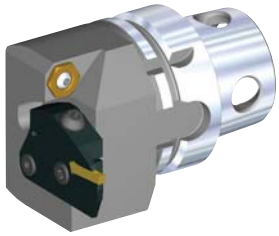


número para pedido	código do produto	Tamanho do sistema CSMS	L1	F	tamanho da lâmina	parafuso da lâmina	Torx	parafuso do grampo	Torx
corte à direita (R)									
5543560	**KM4X63KGMSR65C**	KM4X63	68,5	30,0	65	**MS1163**	T30	**–**	–
6000407	**KM4X63KGMSR50C**	KM4X63	73,5	31,0	50	**MS1162**	T25	**MS2002**	T25
corte à esquerda (L)									
5543558	**KM4X63KGMSL65C**	KM4X63	68,5	30,0	65	**MS1163**	T30	**–**	–
6000408	**KM4X63KGMSL50C**	KM4X63	73,5	31,0	50	**MS1162**	T25	**MS2002**	T25

NOTA: KGMS..: Suportes com sentido à direita usam lâminas com sentido à direita.
KGME..: Suportes com sentido à direita usam lâminas com sentido à esquerda.
O torque do parafuso de fixação e da lâmina M50 deve estar entre 8–10 Nm (71–88 pol. lbs.).
O torque do parafuso de fixação e da lâmina M65 deve estar entre 18–20 Nm (159–177 pol. lbs.).

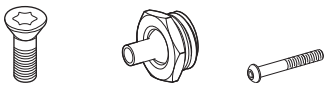






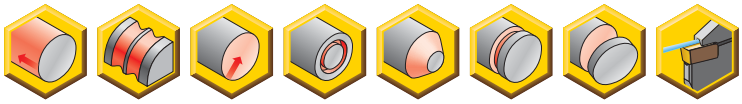
corte à direita

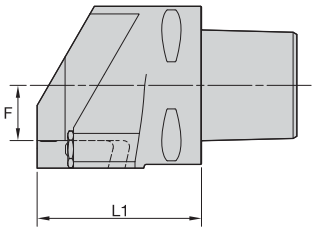
Sistema KM4X™ de montagem de topo modular com refrigeração

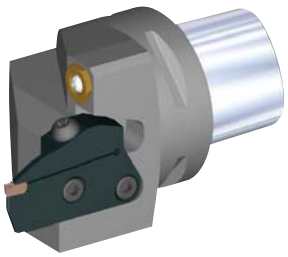


número para pedido	código do produto	Tamanho do sistema CSMS	L1	F	tamanho da cápsula	parafuso da lâmina	bocal	parafuso do grampo	kgs	lbs
corte à direita (R)										
5543555	**KM4X63KGMER65C**	KM4X63	57,0	32,5	65	**MS1163**	**PMT04525**	**–**	1,87	4.13
6000404	**KM4X63KGMER50C**	KM4X63	58,0	32,5	50	**MS1162**	**PMT04525**	**MS2002**	1,85	4.08
6000407	**KM4X63KGMSR50C**	KM4X63	73,5	31,0	50	**MS1162**	**PMT04525**	**MS2002**	1,86	4.11
corte à esquerda (L)										
5543553	**KM4X63KGMEL65C**	KM4X63	57,0	32,5	65	**MS1163**	**PMT04525**	**–**	1,87	4.13
6000405	**KM4X63KGMEL50C**	KM4X63	58,0	32,5	50	**MS1162**	**PMT04525**	**MS2002**	1,85	4.08
6000408	**KM4X63KGMSL50C**	KM4X63	73,5	31,0	50	**MS1162**	**PMT04525**	**MS2002**	1,86	4.11

- Plataforma de troca rápida padrão PSC.
- Com refrigeração através do encaixe.
- Lâminas intercambiáveis para versatilidade e profundidade de corte.







corte à direita

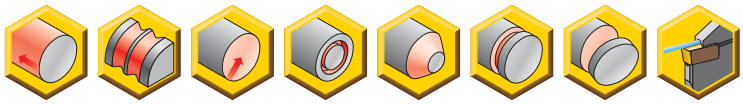
Sistema PSC modular direto com refrigeração

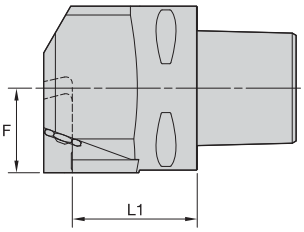


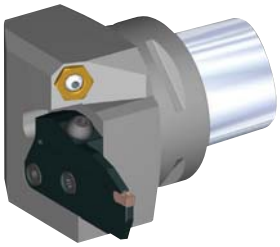


número para pedido	código do produto	Tamanho do sistema CSMS	L1	F	tamanho da lâmina	parafuso da lâmina	Torx	parafuso do grampo	Torx
corte à direita (R)									
6000028	**PSC40KGMSR50C**	PSC40	63,5	10,0	50	**MS1162**	T25	**MS2002**	T25
5405654	**PSC50KGMSR65C**	PSC50	49,0	25,5	65	**MS1163**	T30	**–**	–
6000152	**PSC50KGMSR50C**	PSC50	63,5	15,0	50	**MS1162**	T25	**MS2002**	T25
6000464	**PSC63KGMSR65C**	PSC63	60,5	21,0	65	**MS1163**	T30	**–**	–
6000211	**PSC63KGMSR50C**	PSC63	65,5	22,0	50	**MS1162**	T25	**MS2002**	T25
6000468	**PSC80KGMSR65C**	PSC80	68,5	29,0	65	**MS1163**	T30	**–**	–
6000216	**PSC80KGMSR50C**	PSC80	73,5	30,0	50	**MS1162**	T25	**MS2002**	T25
corte à esquerda (L)									
6000029	**PSC40KGMSL50C**	PSC40	63,5	10,0	50	**MS1162**	T25	**MS2002**	T25
5405655	**PSC50KGMSL65C**	PSC50	49,0	25,5	65	**MS1163**	T30	**–**	–
6000153	**PSC50KGMSL50C**	PSC50	63,5	15,0	50	**MS1162**	T25	**MS2002**	T25
6000465	**PSC63KGMSL65C**	PSC63	60,5	21,0	65	**MS1163**	T30	**–**	–
6000213	**PSC63KGMSL50C**	PSC63	65,5	22,0	50	**MS1162**	T25	**MS2002**	T25
6000469	**PSC80KGMSL65C**	PSC80	68,5	29,0	65	**MS1163**	T30	**–**	–
6000217	**PSC80KGMSL50C**	PSC80	73,5	30,0	50	**MS1162**	T25	**MS2002**	T25

- Plataforma de troca rápida padrão PSC.
- Com refrigeração através do encaixe.
- Lâminas intercambiáveis para versatilidade e profundidade de corte.







corte à direita

Sistema PSC de montagem de topo modular com refrigeração





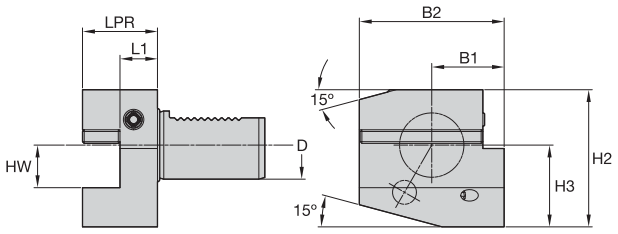
número para pedido	código do produto	Tamanho do sistema CSMS	L1	F	tamanho da lâmina	parafuso da lâmina	Torx	parafuso do grampo	Torx
corte à direita (R)									
6000026	**PSC40KGMER50C**	PSC40	33,0	20,5	50	**MS1162**	T25	**MS2002**	T25
6000030	**PSC50KGMER50C**	PSC50	43,0	25,5	50	**MS1162**	T25	**MS2002**	T25
5405652	**PSC50KGMER65C**	PSC50	55,5	22,0	65	**MS1163**	T30	**–**	–
6000159	**PSC63KGMER50C**	PSC63	48,0	32,5	50	**MS1162**	T25	**MS2002**	T25
6000462	**PSC63KGMER65C**	PSC63	49,0	32,5	65	**MS1163**	T30	**–**	–
6000466	**PSC80KGMER65C**	PSC80	57,0	40,5	65	**MS1163**	T30	**–**	–
6000214	**PSC80KGMER50C**	PSC80	58,0	40,5	50	**MS1162**	T25	**MS2002**	T25
corte à esquerda (L)									
6000027	**PSC40KGMEL50C**	PSC40	33,0	20,5	50	**MS1162**	T25	**MS2002**	T25
6000151	**PSC50KGMEL50C**	PSC50	43,0	25,5	50	**MS1162**	T25	**MS2002**	T25
5405653	**PSC50KGMEL65C**	PSC50	55,5	22,0	65	**MS1163**	T30	**–**	–
6000160	**PSC63KGMEL50C**	PSC63	48,0	32,5	50	**MS1162**	T25	**MS2002**	T25
6000463	**PSC63KGMEL65C**	PSC63	49,0	32,5	65	**MS1163**	T30	**–**	–
6000467	**PSC80KGMEL65C**	PSC80	57,0	40,5	65	**MS1163**	T30	**–**	–
6000215	**PSC80KGMEL50C**	PSC80	58,0	40,5	50	**MS1162**	T25	**MS2002**	T25

Porta-ferramenta VDI



- Adaptador VDI com suporte à refrigeração para porta-ferramenta de haste quadrada.
- ISO 10889.





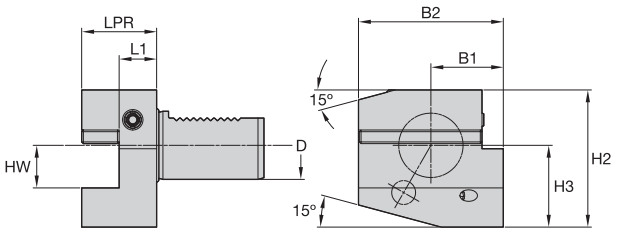


VDI Forma B1 • HPC • Direito curto • Métrico

número para pedido	código do produto	D	B2	B1	HW	H2	H3	L1	LPR
6151491	**VDIB1M302040C**	30,00	70,00	35,00	20,00	66,00	38,00	22,00	40,00
6151492	**VDIB1M402544C**	40,00	85,00	42,50	25,00	80,50	48,00	22,00	44,00

- Adaptador VDI com suporte à refrigeração para porta-ferramenta de haste quadrada.
- ISO 10889.







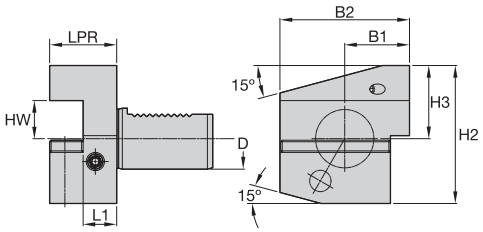
A arte exibe ferramenta com sentido de corte à direita. Ferramenta com sentido de corte à esquerda espelhada invertidamente.

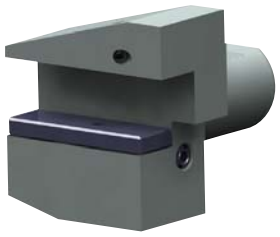
VDI Forma B2 • HPC • Esquerdo curto • Métrico

número para pedido	código do produto	D	B2	B1	HW	H2	H3	L1	LPR
6151493	**VDIB2M302040C**	30,00	70,00	35,00	20,00	66,00	38,00	22,00	40,00
6151494	**VDIB2M402544C**	40,00	85,00	42,50	25,00	80,50	48,00	22,00	44,00

- Adaptador VDI com suporte à refrigeração para porta-ferramenta de haste quadrada.
- ISO 10889.







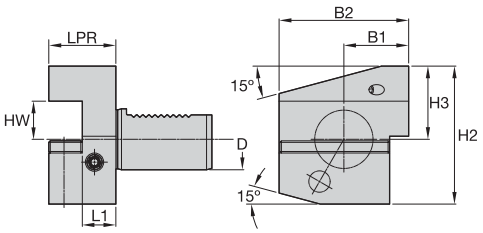
VDI Forma B3 • HPC • Direito curto invertido • Métrico

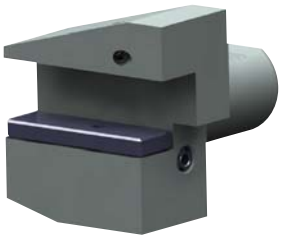
número para pedido	código do produto	D	B2	B1	HW	H2	H3	L1	LPR
6151495	**VDIB3M302040C**	30,00	70,00	35,00	20,00	73,00	38,00	22,00	40,00
6151497	**VDIB3M402544C**	40,00	85,00	42,50	25,00	90,50	48,00	22,00	44,00

VDI Forma B4 • Esquerdo curto invertido

- Adaptador VDI com suporte à refrigeração para porta-ferramenta de haste quadrada.
- ISO 10889.







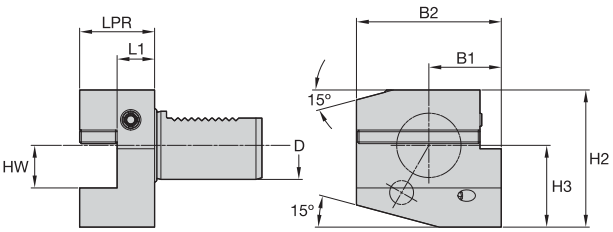
A arte exibe ferramenta com sentido de corte à direita. Ferramenta com sentido de corte à esquerda espelhada invertidamente.

VDI Forma B4 • HPC • Esquerdo curto invertido • Métrico

número para pedido	código do produto	D	B2	B1	HW	H2	H3	L1	LPR
6151498	**VDIB4M302040C**	30,00	70,00	35,00	20,00	73,00	38,00	22,00	40,00
6151499	**VDIB4M402544C**	40,00	85,00	42,50	25,00	90,50	48,00	22,00	44,00

- Adaptador VDI com suporte à refrigeração para porta-ferramenta de haste quadrada.
- ISO 10889.







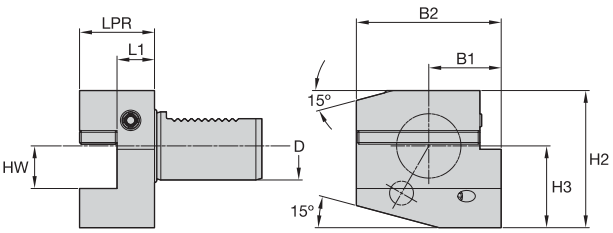
VDI Forma B5 • HPC • Direito longo • Métrico

número para pedido	código do produto	D	B2	B1	HW	H2	H3	L1	LPR
6151500	**VDIB5M302040C**	30,00	100,00	65,00	20,00	66,00	38,00	22,00	40,00
6151511	**VDIB5M402544C**	40,00	118,00	75,50	25,00	80,50	48,00	22,00	44,00

VDI Forma B6 • Esquerdo longo

- Adaptador VDI com suporte à refrigeração para porta-ferramenta de haste quadrada.
- ISO 10889.







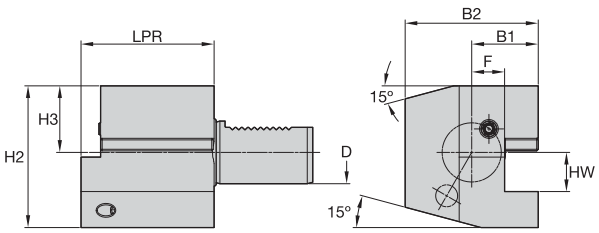
A arte exibe ferramenta com sentido de corte à direita. Ferramenta com sentido de corte à esquerda espelhada invertidamente.

VDI Forma B6 • HPC • Esquerdo longo • Métrico

número para pedido	código do produto	D	B2	B1	HW	H2	H3	L1	LPR
6151512	**VDIB6M302040C**	30,00	100,00	65,00	20,00	66,00	38,00	22,00	40,00
6151513	**VDIB6M402544C**	40,00	118,00	75,50	25,00	80,50	48,00	22,00	44,00

- Adaptador VDI com suporte à refrigeração para porta-ferramenta de haste quadrada.
- ISO 10889.







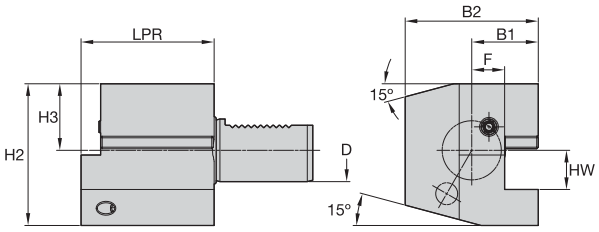
VDI Forma C1 • HPC • Direito • Métrico

número para pedido	código do produto	D	B2	B1	F	HW	H2	H3	LPR
6151514	**VDIC1M302070C**	30,00	70,00	35,00	17,00	20,00	66,00	38,00	70,00
6151515	**VDIC1M402585C**	40,00	85,00	42,50	21,00	25,00	80,50	48,00	85,00

VDI Forma C2 • Esquerdo

- Adaptador VDI com suporte à refrigeração para porta-ferramenta de haste quadrada.
- ISO 10889.







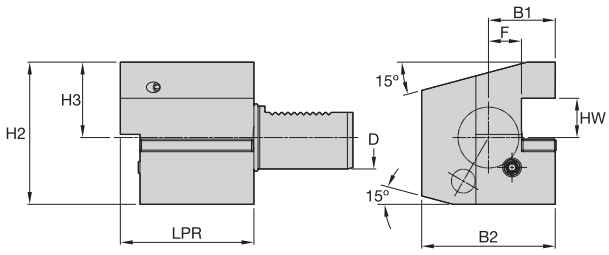
A arte exibe ferramenta com sentido de corte à direita. Ferramenta com sentido de corte à esquerda espelhada invertidamente.

VDI Forma C2 • HPC • Esquerdo • Métrico

número para pedido	código do produto	D	B2	B1	F	HW	H2	H3	LPR
6151516	**VDIC2M302070C**	30,00	76,00	41,00	23,00	20,00	66,00	38,00	70,00
6151517	**VDIC2M402585C**	40,00	90,00	47,50	25,50	25,00	80,50	48,00	85,00

- Adaptador VDI com suporte à refrigeração para porta-ferramenta de haste quadrada.
- ISO 10889.







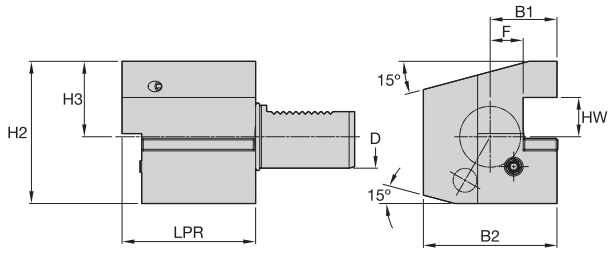
VDI Forma C3 • HPC • Direito invertido • Métrico

número para pedido	código do produto	D	B2	B1	F	HW	H2	H3	LPR
6151518	**VDIC3M302070C**	30,00	70,00	35,00	17,00	20,00	73,00	38,00	70,00
6151519	**VDIC3M402585C**	40,00	85,00	42,50	21,00	25,00	90,50	48,00	85,00

VDI Forma C4 • Esquerdo invertido

- Adaptador VDI com suporte à refrigeração para porta-ferramenta de haste quadrada.
- ISO 10889.





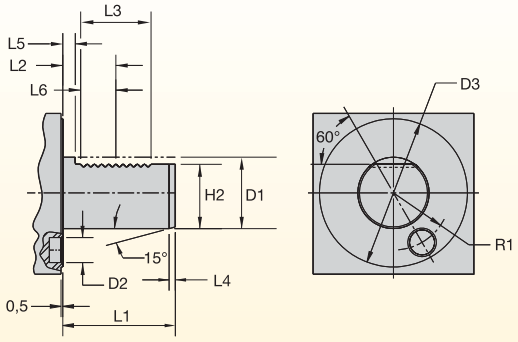


A arte exibe ferramenta com sentido de corte à direita. Ferramenta com sentido de corte à esquerda espelhada invertidamente.

VDI Forma C4 • HPC • Esquerdo invertido • Métrico

número para pedido	código do produto	D	B2	B1	F	HW	H2	H3	LPR
6151520	**VDIC4M302070C**	30,00	70,00	35,00	17,00	20,00	73,00	38,00	70,00
6151521	**VDIC4M402585C**	40,00	85,00	42,50	21,00	25,00	90,50	48,00	85,00

Especificações de haste



	D1	D2	D3	L1	L2	L3	L4	L5	L6	H2	R1
30	30,00	14,00	68,00	55,00	29,70	40,00	2,00	7,00	20,00	27,00	25,00
	1.181	0.551	2.677	2.165	1.169	1.575	0.079	0.276	0.787	1.063	0.984
40	40,00	14,00	83,00	63,00	29,70	40,00	3,00	7,00	20,00	36,00	32,00
	1.575	0.551	3.268	2.480	1.169	1.575	0.118	0.276	0.787	1.417	1.260
50	50,00	16,00	98,00	78,00	35,70	48,00	3,00	8,00	24,00	45,00	37,00
	1.969	0.630	3.858	3.071	1.406	1.890	0.118	0.315	0.945	1.772	1.457
60	60,00	16,00	123,00	94,00	43,70	56,00	4,00	10,00	28,00	55,00	48,00
	2.362	0.630	4.843	3.701	1.720	2.205	0.157	0.394	1.102	2.165	1.890

Ferramentas A4™ e insertos Beyond™



Escolha as ferramentas A4 para as aplicações de torneamento, faceamento, abertura de canal, abertura de canal de face e corte em uma ampla variedade de materiais das peças. Sistema de fixação único e geometria de inserto versátil proporcionam uma taxa de remoção de material muito alta.

CARACTERÍSTICAS E BENEFÍCIOS

Sistema de abertura de canal e torneamento A4

- Uma ferramenta para torneamento, faceamento, abertura de canal e corte em aplicações de diâmetro externo e interno significa tempos de ciclo excepcionalmente rápidos, sem indexar a torre!
- Área de fixação extra longa, superfície inferior retificada do alojamento prismático de 120° e um trilho guia superior exclusivo combinados para proporcionar uma estabilidade inigualável em abertura de canal e torneamento lateral!
- O posicionamento preciso do inserto é garantido para cortes precisos!
- A fixação rígida trava firmemente o inserto no lugar através dos mais duros cortes.
- Um design versátil permite que um único sistema faça operações de abertura de canal no diâmetro interno ou externo e de face, de torneamento reverso, de rebaixamento e até de rosqueamento.
- Os insertos com controle do cavaco proporcionam excelente evacuação de cavacos na abertura de canal e oferecem melhor controle de cavaco no torneamento multidirecional.

Experimente as vantagens no seu distribuidor autorizado da Kennametal ou no site **kennametal.com**.

KENNAMETAL®

kennametal.com



beyond™ EVOLUTION™

É fácil conectar a ferramenta à sua máquina. Apenas selecione um dos conjuntos de mangueira e o Controle Ativo de Refrigeração começará a funcionar sem demora!

Não sabe exatamente do que você precisa?

Para conectar as ferramentas Beyond™ Evolution™ nas máquinas mais comuns da indústria, os kits de refrigeração universais da Kennametal são os ideiais! Cada pacote contém as medidas de rosca mais comuns, com variedade de estilos de conexões para máxima flexibilidade.

Conjunto de refrigeração universal de 200mm

número para pedido	código do produto	quantidade	descrição
6145372	COOL-KIT-101	1	Conexão 1/16 NPTF macho a 7/16 JIC macho
		1	Conexão 1/8 NPTF macho a 7/16 JIC macho
		1	Conexão G1/8 macho a 7/16 JIC macho
		1	Conexão M10 x 1,5 macho a 7/16 JIC macho
		2	Cotovelo articulável JIC macho a JIC fêmea
		1	Mangueira fêmea JIC de 200mm a JIC fêmea

Conjunto de refrigeração universal de 300mm

número para pedido	código do produto	quantidade	descrição
6145373	COOL-KIT-201	1	Conexão 1/16 NPTF macho a 7/16 JIC macho
		1	Conexão 1/8 NPTF macho a 7/16 JIC macho
		1	Conexão G1/8 macho a 7/16 JIC macho
		1	Conexão M10 x 1,5 macho a 7/16 JIC macho
		2	Cotovelo articulável JIC macho a JIC fêmea
		1	Mangueira fêmea JIC de 300mm a JIC fêmea

Você sabe do que precisa?

Cada componente é disponibilizado individualmente, incluindo conexões menos comuns. Saber precisamente quais componentes são necessários permitirá que você escolha somente as conexões de que precisa!

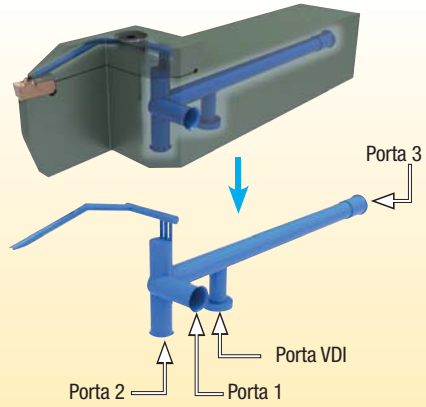
Acessórios da mangueira de refrigeração

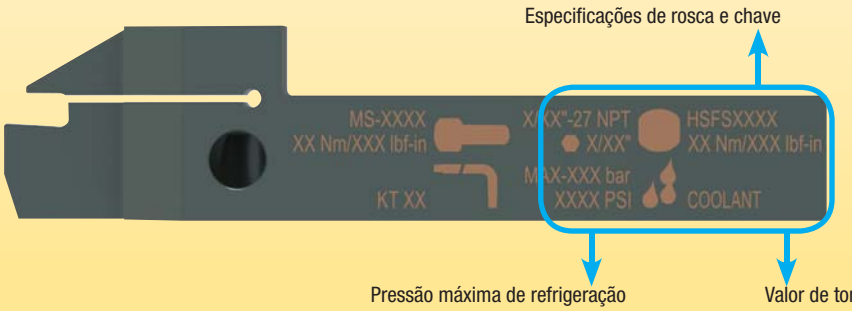
número para pedido	código do produto	descrição
6145374	1-16NPTF-JIC	Conexão 1/16 NPTF macho a 7/16 JIC macho
6145375	1-8NPTF-JIC	Conexão 1/8 NPTF macho a 7/16 JIC macho
6145376	G18-JIC	Conexão G1/8 macho a 7/16 JIC macho
6145377	M10-JIC	Conexão M10 x 1,0 macho a 7/16 JIC macho
6145379	JICM-JICF-ELB	Cotovelo articulável JIC macho a JIC fêmea
6145380	COOL-HOSE-200	JIC fêmea de 200mm a JIC fêmea
6145381	COOL-HOSE-300	JIC fêmea de 300mm a JIC fêmea
6145382	M6-JIC	Conexão M6 x 1,0 macho a 7/16 JIC macho
6145378	M8-JIC	Conexão M8 x 1,25 macho a 7/16 JIC macho
6145383	JICM-JICM-STR	Adaptador 7/16 JIC macho a 7/16 JIC macho
6145386	G14-G18-RED	Redutor G1/4 macho a G1/8 fêmea
6432549	COOL-HOSE-200-FLEX	Mangueira de Refrigeração Flexível Universal de 200mm
6432550	COOL-HOSE-300-FLEX	Mangueira de Refrigeração Flexível Universal de 300mm



Diretrizes do Controle Ativo de Refrigeração

1. O sistema Beyond™ Evolution™ tem capacidade de 350 bar (5076 psi).
2. Porta-ferramenta entregue com quatro furos de entrada.
3. Um sistema de filtragem de qualidade é necessário para evitar bloqueios no porta-ferramenta que vai afetar o fluxo e a performance da refrigeração.
4. Máquinas sem um sistema de filtragem adequado podem precisar de alteração ou de um filtro em linha.
   - Para pressão >70 bar [1015 psi], use filtro de 10–20 µm.
   - Para pressão <70 bar [1015 psi], 50–100 µm.
   - Usar filtros finos em aplicações de baixa pressão pode afetar a taxa de fluxo.





Diretrizes gerais de segurança

1. Para evitar qualquer perigo para o operador em caso de falha, todas as portas e mecanismos de segurança devem estar posicionados antes de testar a refrigeração interna.
2. Use os acessórios de tubo corretos para conectar os suportes do sistema. Garanta que a pressão máxima recomendada para os acessórios não seja ultrapassada.
3. Ao implementar a pressão >80 bar [1160 psi], aumente a pressão em etapas para garantir o funcionamento adequado da fixação do inserto e a ausência de vazamento nas juntas.
4. Na indexação dos insertos, garanta que o encaixe esteja livre de cavacos e/ou sujeira. Além disso, inspecione o inserto para que não haja bloqueio no canal de refrigeração.
5. Periodicamente, verifique todas as mangueiras à procura de danos e desgaste, garantindo o funcionamento adequado do sistema. Esta verificação também deve incluir os filtros.

Performance do Controle Ativo de Refrigeração

A refrigeração interna oferece uma clara vantagem na vida útil da ferramenta e na formação/evacuação de cavacos em comparação à refrigeração externa em condições difíceis e em refrigeração de alta pressão.
Exemplo: Quebra de cavaco em mergulho de aço.

Refrigeração externa | Refrigeração interna





75 bar
(1.087 psi)



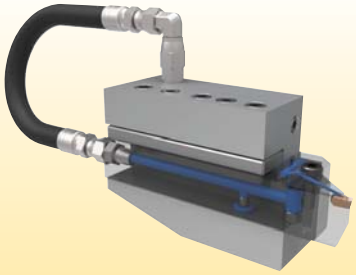
200 bar
(2.900 psi)

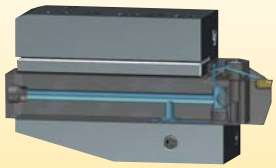
Material de aço ST52;
Tamanho do inserto 6 mm; f = 0,25 mm/U

Baixa pressão — Se a performance estiver em risco devido à baixa pressão do refrigerante, aplique refrigeração interna em combinação com a refrigeração externa para aumentar o volume.

Recomendação para melhorar a vida útil da ferramenta e/ou a produtividade: Aplicar refrigeração de alta pressão: Recomenda-se 80–350 bar.

Montagens VDI
O Controle Ativo de Refrigeração Beyond Evolution pode ser utilizado com os sistemas de suporte VDI, tanto com conexões de refrigeração tradicionais ou de troca rápida.





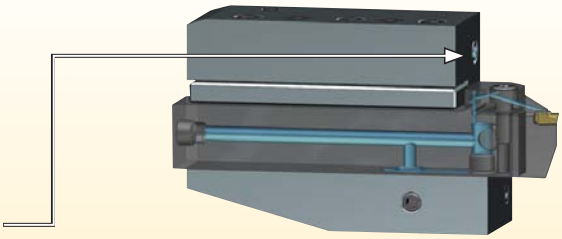


O fluxo de refrigeração transferido do adaptador VDI para o porta-ferramenta

Um marcador no porta-ferramenta deve permanecer dentro da faixa de refrigeração indicada no sistema VDI para transferência de refrigerante ininterrupta.

Detalhes técnicos

Limite de pressão de 80 bar.



O conjunto de bico vem pré-montado.
Para aplicação do suporte com refrigeração interna apenas o bico pode ser plugado pelo parafuso M5 (fornecido). Use selante Loc Tite leve, resistência média ou veda-rosca.

Suporte	Área de deslizar	Máx. Pressão	Torque (Parafuso de pressão)
VDI 30	22mm	80 bar	20 Nm
VDI 40	30mm	80 bar	35 Nm

Conjuntos de reposição	
Bocal	PKGNLAL 1205M
Conjunto de parafuso de pressão, placa de pressão, mola	Veja cada tipo separadamente na lista de materiais

Ferramentas A4™ e insertos Beyond™

Para todas as suas aplicações de diâmetro externo e interno

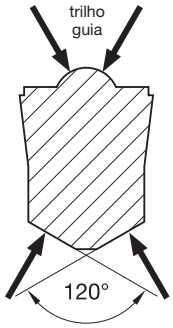
Aplicação principal

Escolha as ferramentas A4 para as aplicações de torneamento, faceamento, abertura de canal, abertura de canal de face e corte em uma ampla variedade de materiais das peças. Sistema de fixação único e geometria de inserto versátil proporcionam uma taxa de remoção de material muito alta.

Características e benefícios

Sistema de abertura de canal e torneamento A4

- Uma ferramenta para torneamento, faceamento, abertura de canal e corte em aplicações de diâmetro externo e interno significa tempos de ciclo excepcionalmente rápidos, sem indexar o torno!
- Área de fixação extra longa, superfície inferior retificada do alojamento prismático de 120° e um trilho guia superior exclusivo combinados para proporcionar uma estabilidade inigualável em abertura de canal e torneamento lateral!
- O posicionamento preciso do inserto é garantido para cortes precisos!
- A fixação rígida trava firmemente o inserto no lugar através dos mais duros cortes.
- Um design versátil permite que um único sistema faça operações de abertura de canal no diâmetro interno ou externo e de face, de torneamento reverso, de rebaixamento e até de rosqueamento.
- Os insertos com controle do cavaco proporcionam excelente evacuação de cavacos na abertura de canal e oferecem melhor controle de cavaco no torneamento multidirecional.



Quebra-cavacos A4


Quebra-cavaco GMN


Quebra-cavaco GMP


Quebra-cavaco GMN


Quebra-cavaco GMP


Quebra-cavaco GUP





O sistema A4™ aumenta a produtividade

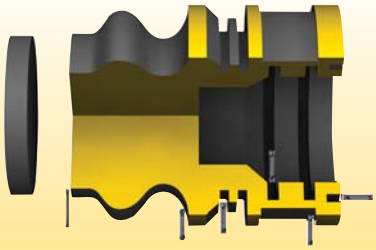
- Abrange múltiplas aplicações.
- Reduz o custo da ferramenta.
- Minimiza o tempo de usinagem.







Etapa 1 • Escolha o tamanho A4 para aplicações de abertura de canal e torneamento



O que você precisa saber:

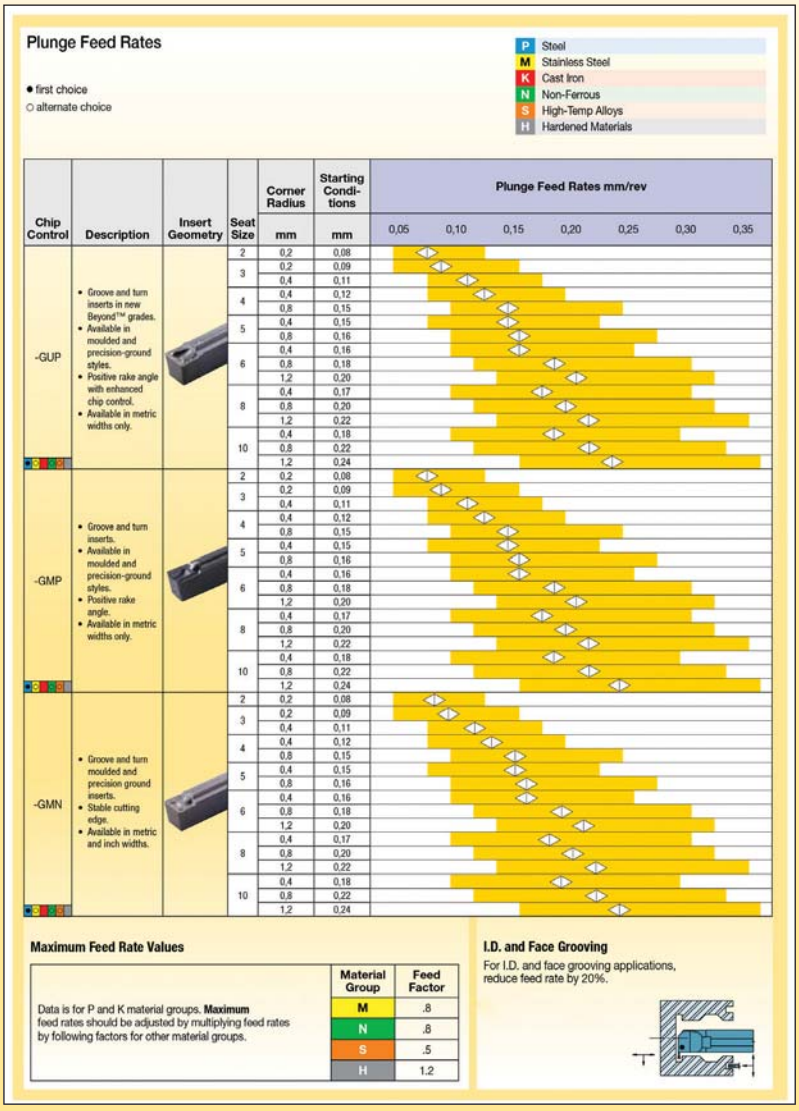
- Profundidade, largura e perfil do canal.
- Material a ser usinado.
- Aplicação a ser realizada (corte, canal de face, torneamento, canal de D.I. e D.E.).

Recomendações gerais para selecionar o tamanho do inserto

para peças com diâmetro	tamanho do alojamento do inserto
<25mm	3
25–50mm	4
>50mm	5–10

Etapa 2 • Selecione o estilo de quebra-cavacos e a taxa de avanço

Com base na aplicação e no tamanho do alojamento, determine a geometria e a taxa de avanço inicial recomendadas.



Etapa 3 • Selecione a velocidade inicial

Com base no material e na classe, identifique a velocidade de corte (vc) inicial. A primeira opção está em **negrito**.

A Com base no grupo de materiais e na classe, identifique a velocidade inicial (vc).
B A primeira opção de velocidade inicial está em **negrito**.

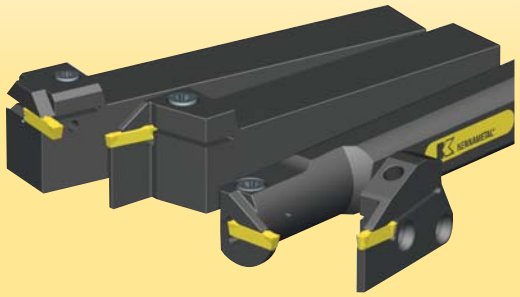
Recommended Starting Speeds [m/min]

Material Group		K313			KCU10/KC5010			KCU25/KC5025			KCP10			KCP25			KCK20B			KY3500		
P	0-1	–	–	–	140	**280**	335	110	**225**	270	185	**400**	450	145	**290**	365	200	**440**	490	–	–	–
	2	–	–	–	140	**200**	245	110	**160**	195	185	**270**	350	145	**200**	305	200	**300**	380	–	–	–
	3	–	–	–	140	**155**	245	110	**125**	195	170	**190**	260	140	**155**	245	600	**200**	280	–	–	–
	4	–	–	–	75	**110**	170	60	**90**	135	90	**145**	200	75	**110**	180	100	**160**	220	–	–	–
	5	–	–	–	120	**200**	260	100	**160**	210	150	**220**	305	120	**200**	270	165	**240**	330	–	–	–
	6	–	–	–	110	**150**	230	85	**120**	185	120	**180**	275	110	**150**	230	130	**190**	300	–	–	–
M	1	60	**90**	120	140	**210**	260	90	**170**	245	–	–	–	–	–	–	–	–	–	–	–	–
	2	45	**75**	110	120	**200**	245	90	**150**	245	–	–	–	–	–	–	–	–	–	–	–	–
	3	35	**65**	100	120	**180**	245	90	**140**	210	–	–	–	–	–	–	–	–	–	– **A**	–	–
K	1	30	**75**	120	120	**180**	245	100	**145**	195	170	**245**	440	140	**200**	360	210	**305**	550	180	**760**	1040
	2	25	**70**	110	90	**150**	210	70	**120**	170	120	**195**	340	100	**160**	280	150	**245**	430	275	**365**	500
	3	20	**60**	90	60	**110**	150	50	**85**	120	120	**170**	270	100	**140**	220	150	**210**	335	–	–	–
N	1–2	150	**370**	610	150	**550**	975	120	**440**	780	–	–	–	–	–	–	–	–	–	–	–	–
	3	–	–	–	**B**	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	4	120	**275**	430	120	**365**	610	100	**290**	490	–	–	–	–	–	–	–	–	–	–	–	–
	5	45	**90**	150	90	**170**	245	70	**135**	195	–	–	–	–	–	–	–	–	–	–	–	–
	6	40	**75**	150	120	**210**	305	100	**170**	245	–	–	–	–	–	–	–	–	–	–	–	–
S	1	8	**30**	75	15	**55**	135	8	**40**	60	–	–	–	–	–	–	–	–	–	–	–	–
	2	8	**35**	75	15	**60**	135	8	**30**	75	–	–	–	–	–	–	–	–	–	–	–	–
	3	8	**40**	75	15	**70**	135	15	**40**	75	–	–	–	–	–	–	–	–	–	–	–	–
	4	8	**45**	75	15	**70**	170	8	**50**	110	–	–	–	–	–	–	–	–	–	–	–	–
H	1	–	–	–	30	**45**	60	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	2	–	–	–	15	**30**	45	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	3	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	4	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–

Etapa 4 • Selecione o porta-ferramenta com base na aplicação

Escolha o suporte de alta performance com base em sua aplicação de canal ou corte específica, com o tamanho do alojamento correspondente.

	porta-ferramentas convencionais	lâminas modulares
Abertura de canal no diâmetro externo, corte e torneamento	1a opção	2a opção
Canal da face	1a opção	2a opção
Abertura de canal no diâmetro interno, corte e torneamento	1a opção	—



NOTA: O tamanho do alojamento do inserto deve corresponder ao tamanho do alojamento do porta-ferramentas escolhido.

Etapa 5 • Escolha o inserto e o suporte na página do catálogo

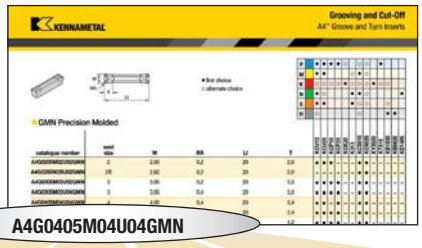


Parabéns!

Você maximizou a sua produtividade com sucesso, selecionando as melhores especificações de geometria, classe e corte do inserto para a sua aplicação!

Como funcionam os números de catálogo?

Cada caractere no número de catálogo significa uma característica específica daquele produto. Use as colunas-chave a seguir e as imagens correspondentes para fazer uma identificação fácil do atributo a ser aplicado.



A4G0405M04U04GMN

Insertos para abertura de canal e torneamento

A4	G	0405	M	04	U	04	GMN
Sistema de ferramental	Tipo de inserto	Largura da ranhura	Unidade de medida para a largura do canal	Tamanho do alojamento	Tolerância do inserto	Raios de canto	Tipo de quebra-cavacos/ preparação da aresta
A4 = Canal e torneamento	**G** = Quadrado **R** = Raio completo **C** = Corte	Expresso em 1/100 mm ou .00"	**M** = Métrico				

tamanho do alojamento do encaixe	largura de corte (mm)
02	2,00–2,62
2B	2,39–2,62
03	3,0–3,05
04	4,0–4,05
05	5,0–5,05
06	6,0–6,05
08	8,0–8,05
10	10,0–10,05
2S	2,00–2,62
3S	3,00–3,05
4S	4,00–4,05
5S	5,00–5,05

P = Tolerância de largura do canal retificado de precisão: 0,025mm (± 0,001 pol.)

U = Tolerância de largura do canal moldado:
3,05–4,05: +0,15mm / -0
5,05–10,05: +0,25mm / -0

mm
01 = 0,1
02 = 0,2
04 = 0,4
08 = 0,8
12 = 1,2
raio completo = 00

GMN = aresta de corte estável de usinagem média de canal e torneamento

GMP = ângulos de saída positivo de usinagem média de canal e torneamento

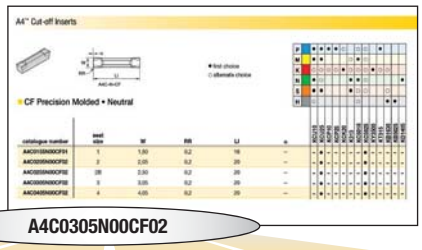
GUP = geometria positiva alta de canal e torneamento. Especialmente em aço inoxidável e ligas resistentes a altas temperaturas

B = topo plano para formas e aplicações especiais

E = topo plano, aresta levemente honeada

S = inclinação negativa mais arredondamento da aresta (Hone)

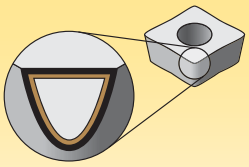
ST = ponta única



A4C0305N00CF02

Canal e corte

A4	C	0305	N	00	CF	02
Sistema de ferramental	Tipo de inserto	Largura de corte	Sentido de rotação do inserto	Ângulo de posição da aresta de corte principal	Tipo de geometria de quebra-cavacos	Raio de canto
A4 = Abertura de canal e torneamento	**C** = Corte	Expresso em 1/100 mm	**R** = sentido de rotação à direita **L** = sentido de rotação à esquerda **N** = neutro	**00** = neutro **06** = 6° **10** = 10°	**CF** = Ângulo de saída positivo de corte fino	mm 02 = 0,2

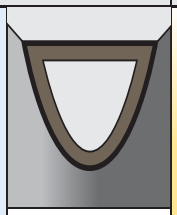
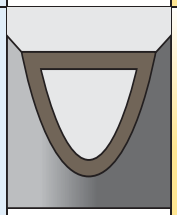
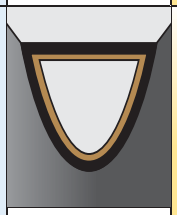
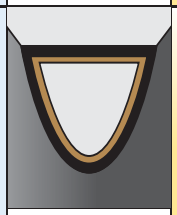
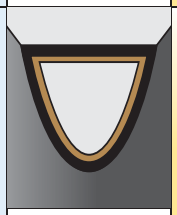


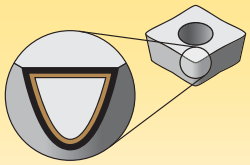
Os revestimentos proporcionam capacidade de alta velocidade e são projetados para acabamento e desbaste leve.

P	Aço
M	Aço inoxidável
K	Ferro fundido
N	Materiais não ferrosos
S	Ligas resistentes a altas temperaturas
H	Materiais endurecidos

resistência ao desgaste ⟷ tenacidade

Classes

Revestimento	Descrição da classe	05	10	15	20	25	30	35	40	45
KCU10  —	**Composição:** Revestimento avançado PVD multicamadas sobre um substrato de metal duro sem liga e muito resistente à deformação. O revestimento novo e melhorado aumenta a estabilidade da aresta, com capacidade para uma ampla faixa de velocidades e avanços. **Aplicação:** A classe KCU10 é ideal para usinagem de acabamento até usinagem em geral da maioria dos materiais das peças em uma ampla faixa de capacidades de velocidades e avanços. Excelente para usinar a maior parte dos aços, aços inoxidáveis, ferros fundidos, materiais não ferrosos e ligas resistentes a altas temperaturas, com dureza da aresta melhorada, resistência de entalhamento e com capacidade para maiores velocidades de corte e avanços.	P	M	K	N	S	H					
KCU25  —	**Composição:** Uma classe PVD avançada com revestimento AlTiN duro e substrato sem liga de grãos finos. O revestimento novo e melhorado aumenta a estabilidade da aresta, com capacidade para uma ampla faixa de velocidades e avanços. **Aplicação:** A classe KCU25™ é ideal para a usinagem em geral da maior parte dos aços, aços inoxidáveis, ligas resistentes a altas temperaturas, titânio, ferros fundidos e materiais não ferrosos em uma ampla faixa de velocidades e avanços, com dureza da aresta melhorada para cortes interrompidos e altas faixas de avanço.	P	M	K	N	S						
KCP10  —	**Composição:** Classe especialmente projetada com um espesso revestimento CVD de MT-TiCN-Al_2O_3 sobre um substrato de metal duro enriquecido com cobalto, oferecendo a máxima resistência a desgaste. **Aplicação:** Excelente classe para usinagem desde acabamento a usinagem média, para diversos materiais das peças, inclusive a maior parte dos aços, aços inoxidáveis ferríticos, martensíticos e PH, além de ferros fundidos. O substrato enriquecido com cobalto oferece uma combinação equilibrada de resistência à deformação e dureza, enquanto as camadas espessas de revestimento oferecem extraordinária resistência à abrasão e resistência a desgaste por craterização na usinagem em altas velocidades. O revestimento uniforme fornece resistência à formação de aresta postiça e à ocorrência de microlascamentos, além de produzir excelentes acabamentos superficiais.	P		K								
KCP25  –	**Composição:** Classe de metal duro tenaz com um moderno revestimento CVD multicamadas de MT-TiCN-Al_2O_3 com excelente adesão entre as camadas, sobre um substrato de metal duro enriquecido com cobalto. **Aplicação:** Melhor classe para uso geral em torneamento da maioria dos aços e de aços inoxidáveis ferríticos e martensíticos. O projeto do substrato garante uma adequada resistência à deformação com excelente comprimento da aresta do inserto. As camadas do revestimento oferecem boa resistência a desgaste em uma ampla gama de condições de usinagem, e o tratamento pós-revestimento minimiza a ocorrência de microlascamentos e melhora a aresta postiça do revestimento ao substrato, levando a uma maior vida útil da ferramenta e a melhores acabamentos da peça.	P		K								
KCK20  —	**Composição:** Revestimento CVD de MT-TICN-Al_2O_3 com tenacidade especial sobre um substrato resistente ao desgaste. **Aplicação:** Especificamente desenvolvida para maximizar a adesão do revestimento e a resistência da aresta, tornando essa classe ideal para cortes interrompidos com refrigeração de ferros fundidos dúctil e cinzento. Ela pode ser usada em uma ampla gama de aplicações, de acabamento a desbaste, para maximizar a produtividade onde quer que resistência e confiabilidade sejam necessárias.	P		K								

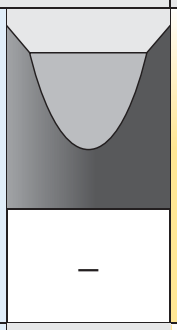
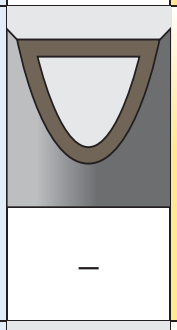
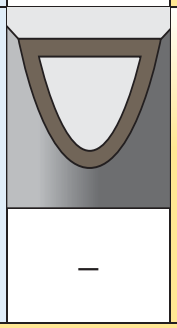


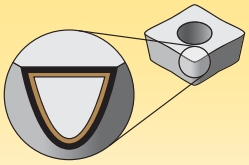
Os revestimentos proporcionam capacidade de alta velocidade e são projetados para acabamento e desbaste leve.

P	Aço
M	Aço inoxidável
K	Ferro fundido
N	Materiais não ferrosos
S	Ligas resistentes a altas temperaturas
H	Materiais endurecidos

resistência ao desgaste ⟷ **tenacidade**

Classes

Revestimento	Descrição da classe		05	10	15	20	25	30	35	40	45
K313 	**Composição:** Classe dura, com baixo teor de aglutinante e sem liga, com grãos finos de WC/Co. **Aplicação:** Excepcional resistência a desgaste da aresta combinada com altíssima resistência para a usinagem de titânio, ferros fundidos, aços inoxidáveis austeníticos, metais não ferrosos, não metais e a maioria das ligas resistentes a altas temperaturas. Excelente resistência à deformação térmica e ao desgaste por entalhe no flanco. A estrutura do grão é bem controlada, proporcionando furos e facetas mínimas, o que contribui para um serviço durável e confiável.										
		M									
		K									
		N									
		S									
KC5010 	**Composição:** Revestimento avançado PVD de AlTiN sobre um substrato de metal duro sem liga e muito resistente à deformação. **Aplicação:** A classe KC5010™ é ideal para acabamento de usinagem geral da maioria de materiais das peças em velocidades mais altas. Excelente para usinar a maior parte dos aços, aços inoxidáveis, ferros fundidos, materiais não ferrosos e ligas resistentes a altas temperaturas sob condições estáveis. Também desempenha bem na usinagem de materiais endurecidos e de cavacos curtos.	P									
		M									
		K									
		N									
		S									
		H									
KC5025 	**Composição:** Classe com revestimento avançado PVD de AlTiN sobre um substrato tenaz, sem liga e de grão ultrafino. **Aplicação:** Para usinagem em geral da maior parte dos aços, aços inoxidáveis, ligas resistentes a altas temperaturas, titânio, ferros fundidos e materiais não ferrosos. As velocidades podem variar de baixa até média e admitem cortes interrompidos e altas taxas de avanço.	P									
		M									
		K									
		N									
		S									



Os revestimentos proporcionam capacidade de alta velocidade e são projetados para acabamento e desbaste leve.

P	Aço
M	Aço inoxidável
K	Ferro fundido
N	Materiais não ferrosos
S	Ligas resistentes a altas temperaturas
H	Materiais endurecidos

resistência ao desgaste ← → **tenacidade**

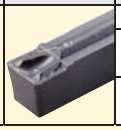
Classes

Revestimento	Descrição da classe	05	10	15	20	25	30	35	40	45
KY3500	**Composição:** Classe com nitreto de silício puro. **Aplicação:** Dureza máxima. Usada com altas taxas de avanço para a usinagem de desbaste de ferros fundidos cinzentos, incluindo a usinagem com cortes interrompidos.									
KT315	**Composição:** Classe com revestimento de PVD multicamadas de TiN/TiCN/TiN sobre um substrato de cermet, para torneamento. **Aplicação:** Ideal para acabamento de alta velocidade para usinagem média da maioria dos aços carbono, aços-liga e aços inoxidáveis. Funciona muito bem também em aplicações para ferros fundidos cinzentos e dúcteis. Possibilita uma longa e uniforme vida útil da ferramenta e produzirá excelentes acabamentos nas peças.									
KB1630	**Composição:** Uma classe de alto conteúdo de PcBN não revestido. Ponta de PcBN soldada em um inserto de metal duro. **Aplicação:** Projetada para ser usada do desbaste ao acabamento em cortes interrompidos em aços endurecidos (>45 HRC). Também pode ser aplicada em ferros fundidos cinzentos, ferros fundidos coquilhados, ligas de aço com alto teor de cromo, ligas de alta temperatura e metais sinterizados. Os insertos com pontas de PcBN estão disponíveis em uma variedade de estilos, incluindo as geometrias Top Notch™ e Screw-On.									
KB5625	**Composição:** Classe com alto teor médio de PcBN com um revestimento PVD-TiN/AlTiN, proporcionando mais resistência a desgaste. **Aplicação:** Desenvolvido para uso de desbaste a acabamento de aços endurecidos (>45 HRC). Use em aços para rolamento, aços para ferramenta com usinagem a quente e frio, aços de alta velocidade, aços forjados, aços endurecidos, ferros nitretados e carburados e alguns revestimentos duros.									
KD1405	**Composição:** Inserto com ponta de lâmina de diamante puro diretamente soldada com revestimento CVD. **Aplicação:** O KD1405™ é o material para ferramentas da Kennametal mais resistente à abrasão na usinagem de materiais não ferrosos e não metálicos. Melhor aplicado quando a resistência à abrasão é o recurso desejado.									

Selecione a geometria

P	Aço
M	Aço inoxidável
K	Ferro fundido
N	Materiais não ferrosos
S	Ligas resistentes a altas temperaturas
H	Materiais endurecidos

● primeira opção
○ opção alternativa

Controle de cavacos	Descrição	Geometria do Inserto	tamanho do alojamento	Raio de canto mm	Condições Iniciais mm	Taxas de avanço para abertura de canal em mergulho mm/rot 0,05 0,10 0,15 0,20 0,25 0,30 0,35
-GUP	Insertos para abertura de canal e torneamento em novas classes Beyond™.		2	0,2	0,08	
			3	0,2	0,09	
				0,4	0,11	
			4	0,4	0,12	
				0,8	0,15	

Desenho do inserto

Raio de canto

Avanços recomendados iniciais da taxa de avanço

Tamanho do alojamento

Intervalo recomendado da taxa de avanço

Taxas de avanço para fresamento em mergulho

Grupo de materiais das peças

P	Aço
M	Aço inoxidável
K	Ferro fundido
N	Materiais não ferrosos
S	Ligas resistentes a altas temperaturas
H	Materiais endurecidos

● primeira opção
○ opção alternativa

Designação da geometria de controle de cavacos

Valores máximos da taxa de avanço

	Grupo de material	Fator de avanço
Os dados acima são para grupos de material P e K. As taxas de avanço **máximas** devem ser ajustadas ao multiplicar os valores máximos da taxa de avanço pelos seguintes fatores para grupos de material exibidos.	M	.8
	N	1.2
	S	.8
	H	.5

Taxas de avanço para fresamento em mergulho

● primeira opção
○ opção alternativa

P	Aço
M	Aço inoxidável
K	Ferro fundido
N	Materiais não ferrosos
S	Ligas resistentes a altas temperaturas
H	Materiais endurecidos

Controle de cavacos	Descrição	Geometria do Inserto	tamanho do alojamento	Raio de canto mm	Condições Iniciais mm	Taxas de avanço para abertura de canal em mergulho mm/rot 0,05 0,10 0,15 0,20 0,25 0,30 0,35
-GUP	• Insertos para abertura de canal e torneamento em novas classes Beyond™. • Disponíveis nos estilos moldado e retificado de precisão. • Ângulo de saída positivo com controle aprimorado do cavaco. • Larguras disponíveis somente no sistema métrico.		2	0,2	0,08	
			3	0,2	0,09	
				0,4	0,11	
			4	0,4	0,12	
				0,8	0,15	
			5	0,4	0,15	
				0,8	0,16	
			6	0,4	0,16	
				0,8	0,18	
				1,2	0,20	
			8	0,4	0,17	
				0,8	0,20	
				1,2	0,22	
			10	0,4	0,18	
				0,8	0,22	
				1,2	0,24	
-GMP	• Insertos para abertura de canal e torneamento. • Disponíveis nos estilos moldado e retificado de precisão. • Ângulo de inclinação positivo. • Larguras disponíveis somente no sistema métrico.		2	0,2	0,08	
			3	0,2	0,09	
				0,4	0,11	
			4	0,4	0,12	
				0,8	0,15	
			5	0,4	0,15	
				0,8	0,16	
			6	0,4	0,16	
				0,8	0,18	
				1,2	0,20	
			8	0,4	0,17	
				0,8	0,20	
				1,2	0,22	
			10	0,4	0,18	
				0,8	0,22	
				1,2	0,24	
-GMN	• Insertos para abertura de canal e torneamento, moldados e retificados de precisão. • Aresta de corte estável. • Larguras disponíveis no sistema métrico e em polegada.		2	0,2	0,08	
			3	0,2	0,09	
				0,4	0,11	
			4	0,4	0,12	
				0,8	0,15	
			5	0,4	0,15	
				0,8	0,16	
			6	0,4	0,16	
				0,8	0,18	
				1,2	0,20	
			8	0,4	0,17	
				0,8	0,20	
				1,2	0,22	
			10	0,4	0,18	
				0,8	0,22	
				1,2	0,24	

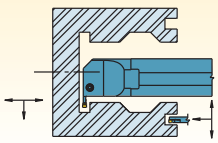
Valores máximos da taxa de avanço

Os dados acima são para grupos de material P e K. As taxas de avanço **máximas** devem ser ajustadas ao multiplicar os valores máximos da taxa de avanço pelos seguintes fatores para grupos de material exibidos..

Grupo de material	Fator de avanço
M	.8
N	.8
S	.5
H	1.2

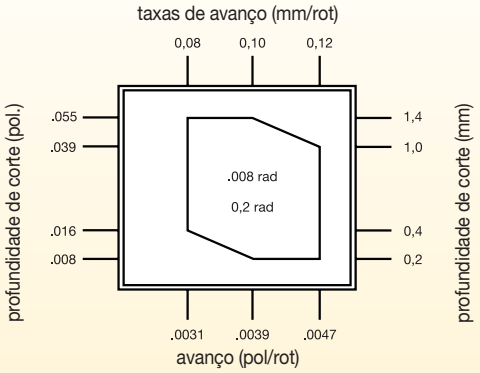
I.D. e canal de face

Para as aplicações de diâmetro interno e canal de face, reduz a taxa de avanço em 20%.

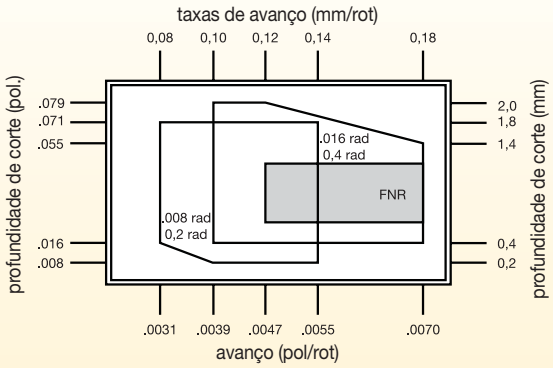


Torneamento e taxas de avanço de perfil • Geometrias GUP/GMP

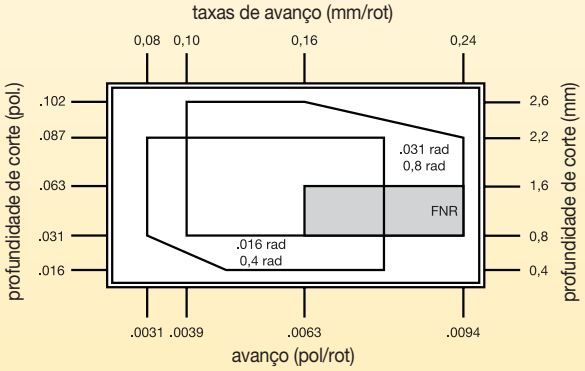
Tamanho do alojamento 2



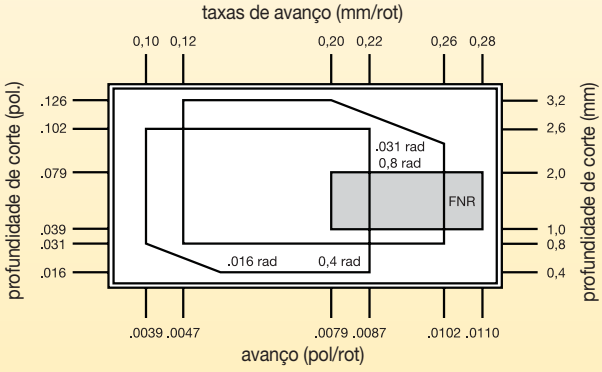
Tamanho do alojamento 3



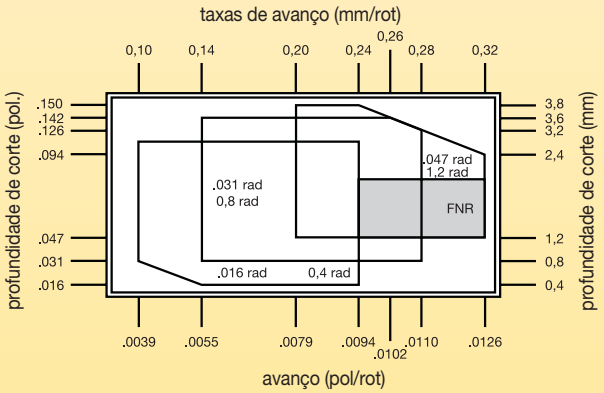
Tamanho do alojamento 4



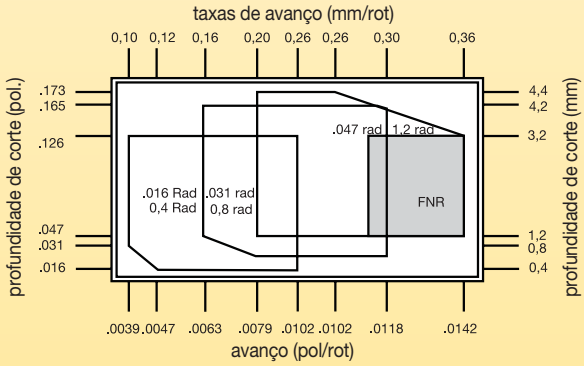
Tamanho do alojamento 5



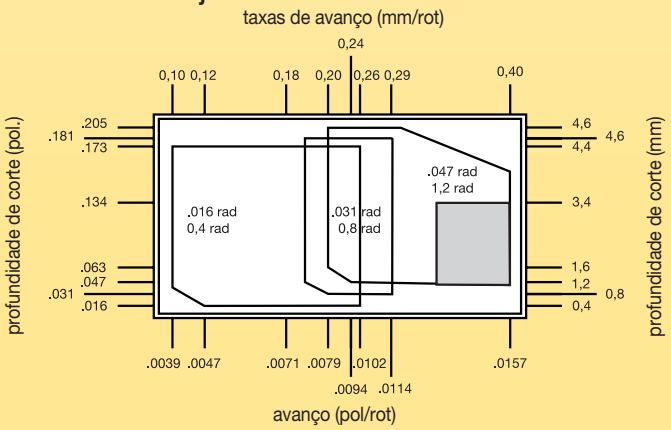
Tamanho do alojamento 6



Tamanho do alojamento 8

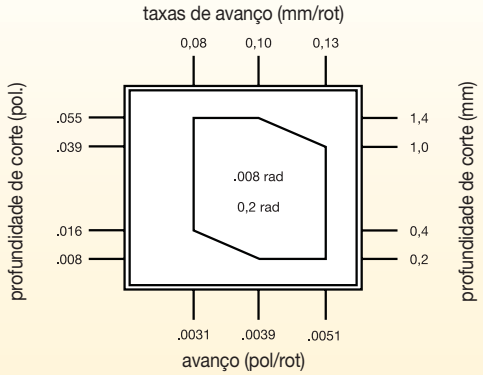


Tamanho do alojamento 10

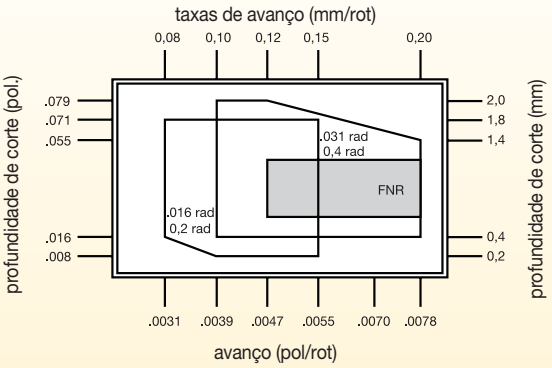


Torneamento e taxas de avanço de perfil • Geometrias GMN

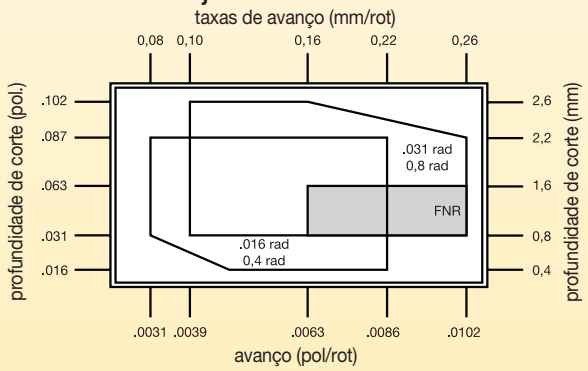
Tamanho do alojamento 2



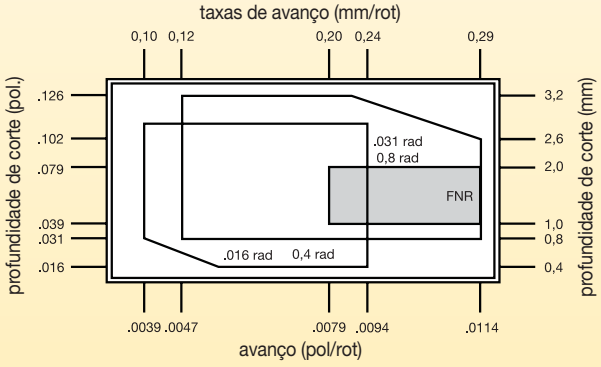
Tamanho do alojamento 3



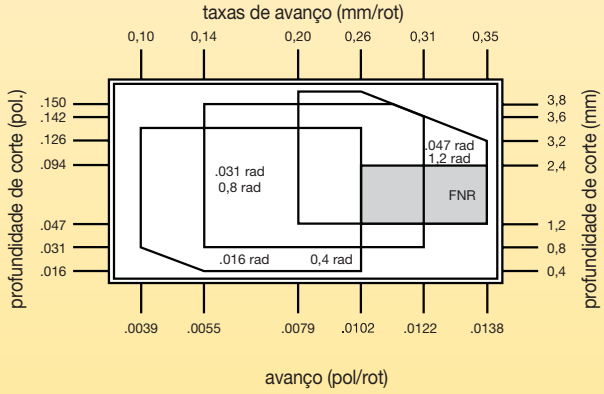
Tamanho do alojamento 4



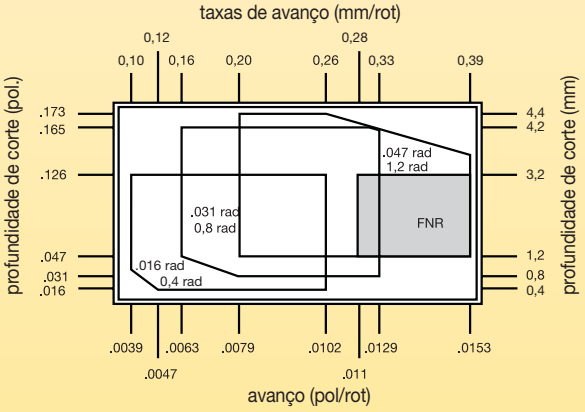
Tamanho do alojamento 5



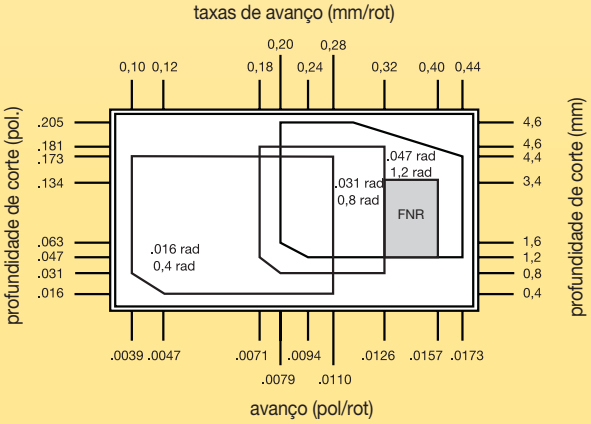
Tamanho do alojamento 6



Tamanho do alojamento 8



Tamanho do alojamento 10



Taxas de avanço de corte

P	Aço
M	Aço inoxidável
K	Ferro fundido
N	Materiais não ferrosos
S	Ligas resistentes a altas temperaturas
H	Materiais endurecidos

● primeira opção
○ opção alternativa

Controle de cavacos	Descrição	Geometria do Inserto	tamanho do alojamento	Condições Iniciais mm	Taxas de avanço para corte mm/rot 0,05 0,10 0,15 0,20
-A4C-CF	• Ângulo de saída altamente positivo. • Arestas de corte afiadas. • Disponível com ângulo de posição neutro nos estilos de 6° e 10°, com sentido de rotação à direita ou esquerda.		1	0,06	
			2/2B	0,07	
			3	0,09	
			4	0,11	

Valores máximos da taxa de avanço

	Grupo de material	Fator de avanço
Os dados acima são para grupos de material P e K. As taxas de avanço máximas devem ser ajustadas ao multiplicar os valores máximos da taxa de avanço pelos seguintes fatores para grupos de material exibidos..	M	.8
	N	.8
	S	.5
	H	1.2

Aplicativo Móvel

O aplicativo móvel da Kennametal proporciona acesso fácil a informações de produtos e calculadoras em ambos equipamentos, iPhone® e Android™. Destacamos algumas das principais características...

Há um aplicativo para isso.

VELOCIDADES DE CORTE & AVANÇOS
Veja informações sobre velocidades de corte e avanços para produtos metalúrgicos.

DISPONIBILIDADE DO PRODUTO
Verifique a disponibilidade global de produtos. Veja quantidades disponíveis fornecendo sua credencial de acesso do Konnect.

CALCULADORAS
Utilize nossa calculadora de usinagem para aplicações de fresamento e furação.



Ao digitalizar o código de barra da embalagem do inserto, você pode encontrar as condições de corte mais produtivas para vida útil e controle de cavaco.

NOTA: O aplicativo está disponível somente na versão em Inglês. Nós temos planos para traduzir o aplicativo em diferentes idiomas para liberações futuras.

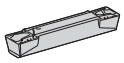
Google play
Available on the App Store

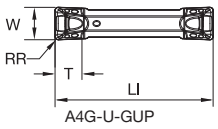
Velocidades iniciais recomendadas [m/min.]

Grupo de material		K313			KCU10/KC5010			KCU25/KC5025			KCP10			KCP25			KCK20B			KY3500		
P	0–1	–	–	–	140	**280**	335	110	**225**	270	185	**400**	450	145	**290**	365	200	**440**	490	–	–	–
	2	–	–	–	140	**200**	245	110	**160**	195	185	**270**	350	145	**200**	305	200	**300**	380	–	–	–
	3	–	–	–	140	**155**	245	110	**125**	195	170	**190**	260	140	**155**	245	600	**200**	280	–	–	–
	4	–	–	–	75	**110**	170	60	**90**	135	90	**145**	200	75	**110**	180	100	**160**	220	–	–	–
	5	–	–	–	120	**200**	260	100	**160**	210	150	**220**	305	120	**200**	270	165	**240**	330	–	–	–
	6	–	–	–	110	**150**	230	85	**120**	185	120	**180**	275	110	**150**	230	130	**190**	300	–	–	–
M	1	60	**90**	120	140	**210**	260	90	**170**	245	–	–	–	–	–	–	–	–	–	–	–	–
	2	45	**75**	110	120	**200**	245	90	**150**	245	–	–	–	–	–	–	–	–	–	–	–	–
	3	35	**65**	100	120	**180**	245	90	**140**	210	–	–	–	–	–	–	–	–	–	–	–	–
K	1	30	**75**	120	120	**180**	245	100	**145**	195	170	**245**	440	140	**200**	360	210	**305**	550	180	**760**	1040
	2	25	**70**	110	90	**150**	210	70	**120**	170	120	**195**	340	100	**160**	280	150	**245**	430	275	**365**	500
	3	20	**60**	90	60	**110**	150	50	**85**	120	120	**170**	270	100	**140**	220	150	**210**	335	–	–	–
N	1–2	150	**370**	610	150	**550**	975	120	**440**	780	–	–	–	–	–	–	–	–	–	–	–	–
	3	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	4	120	**275**	430	120	**365**	610	100	**290**	490	–	–	–	–	–	–	–	–	–	–	–	–
	5	45	**90**	150	90	**170**	245	70	**135**	195	–	–	–	–	–	–	–	–	–	–	–	–
	6	40	**75**	150	120	**210**	305	100	**170**	245	–	–	–	–	–	–	–	–	–	–	–	–
S	1	8	**30**	75	15	**55**	135	8	**40**	60	–	–	–	–	–	–	–	–	–	–	–	–
	2	8	**35**	75	15	**60**	135	8	**30**	75	–	–	–	–	–	–	–	–	–	–	–	–
	3	8	**40**	75	15	**70**	135	15	**40**	75	–	–	–	–	–	–	–	–	–	–	–	–
	4	8	**45**	75	15	**70**	170	8	**50**	110	–	–	–	–	–	–	–	–	–	–	–	–
H	1	–	–	–	30	**45**	60	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	2	–	–	–	15	**30**	45	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	3	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	4	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–

Grupo de material		KT315			KB5625			KB1630			KD1405		
P	0–1	180	**440**	475	–	–	–	–	–	–	–	–	–
	2	195	**270**	400	–	–	–	–	–	–	–	–	–
	3	180	**210**	275	–	–	–	–	–	–	–	–	–
	4	75	**160**	210	–	–	–	–	–	–	–	–	–
	5	150	**250**	310	–	–	–	–	–	–	–	–	–
	6	140	**200**	300	–	–	–	–	–	–	–	–	–
M	1	–	–	–	–	–	–	–	–	–	–	–	–
	2	–	–	–	–	–	–	–	–	–	–	–	–
	3	–	–	–	–	–	–	–	–	–	–	–	–
K	1	60	**275**	550	–	–	–	180	**760**	1040	–	–	–
	2	135	**275**	360	–	–	–	–	–	–	–	–	–
	3	180	**230**	360	–	–	–	–	–	–	–	–	–
N	1–2	–	–	–	–	–	–	–	–	–	365	**610**	1040
	3	–	–	–	–	–	–	–	–	–	275	**480**	800
	4	–	–	–	–	–	–	–	–	–	300	**550**	920
	5	–	–	–	–	–	–	–	–	–	275	**610**	1070
	6	–	–	–	–	–	–	–	–	–	150	**460**	760
S	1	–	–	–	–	–	–	120	**200**	275	–	–	–
	2	–	–	–	–	–	–	120	**215**	275	–	–	–
	3	–	–	–	–	–	–	120	**250**	275	–	–	–
	4	–	–	–	–	–	–	–	–	–	–	–	–
H	1	–	–	–	45	**150**	230	45	**120**	170	–	–	–
	2	–	–	–	45	**140**	230	45	**110**	170	–	–	–
	3	–	–	–	45	**130**	230	45	**100**	170	–	–	–
	4	–	–	–	45	**120**	230	45	**90**	170	–	–	–

NOTA: A PRIMEIRA opção de velocidades iniciais está em **negrito**.
À medida que o valor médio da espessura do cavaco aumenta, a velocidade diminui.



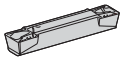


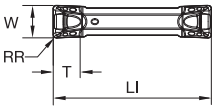
● primeira opção
○ opção alternativa

		KCU10	KCU25	KCP10	KCP25	KCK20	K313	KC5010	KC5025	KY3500	KT315	KB1630	KB5625	KD1405
P		●	●	●	●	○		○	○		●			
M		●	●				○	●	○					
K		○	○	○	○	●	○	○	○	●	○	○		
N		●	○				●	●	○					●
S		●	●				●	○	○			○		
H		○						○				●	●	

Precisão GUP moldada

código do produto	tamanho do inserto	W	RR	LI	T	KCU10	KCU25	KCP10	KCP25	KCK20	K313	KC5010	KC5025	KY3500	KT315	KB1630	KB5625	KD1405
A4G0205M02U02GUP	2	2,05	0,2	20	2,0	●	●	●	●	–	–	–	–	–	–	–	–	–
A4G0305M03U02GUP	3	3,05	0,2	20	3,0	●	●	●	●	–	–	–	–	–	–	–	–	–
A4G0305M03U04GUP	3	3,05	0,4	20	3,0	●	●	●	●	–	–	–	–	–	–	–	–	–
A4G0405M04U04GUP	4	4,05	0,4	20	3,4	●	●	●	●	–	–	–	–	–	–	–	–	–
A4G0405M04U08GUP	4	4,05	0,8	20	3,4	●	●	●	●	–	–	–	–	–	–	–	–	–
A4R0405M04U00GUP	4	4,05	–	20	–	–	●	–	–	–	–	–	–	–	–	–	–	–
A4G0505M05U04GUP	5	5,05	0,4	25	4,2	●	●	●	●	–	–	–	–	–	–	–	–	–
A4G0505M05U08GUP	5	5,05	0,8	25	4,2	●	●	●	●	–	–	–	–	–	–	–	–	–
A4G0605M06U04GUP	6	6,05	0,4	30	4,5	●	●	●	●	–	–	–	–	–	–	–	–	–
A4G0605M06U08GUP	6	6,05	0,8	30	4,5	●	●	●	●	–	–	–	–	–	–	–	–	–
A4G0605M06U12GUP	6	6,05	1,2	30	4,5	●	●	●	●	–	–	–	–	–	–	–	–	–
A4R0605M06U00GUP	6	6,05	–	30	4,9	–	●	–	–	–	–	–	–	–	–	–	–	–
A4G0805M08U08GUP	8	8,05	0,8	30	6,0	●	●	●	●	–	–	–	–	–	–	–	–	–
A4G0805M08U12GUP	8	8,05	1,2	30	6,0	●	●	●	●	–	–	–	–	–	–	–	–	–
A4R0805M08U00GUP	8	8,05	–	30	6,5	–	●	–	–	–	–	–	–	–	–	–	–	–
A4G1005M10U08GUP	10	10,05	0,8	30	6,0	●	●	●	–	–	–	–	–	–	–	–	–	–
A4G1005M10U12GUP	10	10,05	1,2	30	6,1	–	●	–	●	–	–	–	–	–	–	–	–	–





A4G-P-GUP

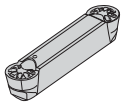
● primeira opção
○ opção alternativa

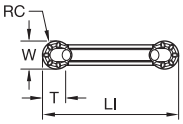
Retificado de precisão GUP

		KCU10	KCU25	KCP10	KCP25	KCK20	K313	KC5010	KC5025	KY3500	KT315	KB1630	KB5625	KD1405
P		●	●	●	●	○		○	○		●			
M		●	●				○	●	○					
K		○	○	○	○	●	○	○	○	●	○	○		
N		●	○				●	●	○					●
S		●	●				●	○	○			○		
H		○						○				●	●	

código do produto	tamanho do inserto	W	RR	LI	T												
A4G0200M02P02GUP	2	2,00	0,2	20	1,9	●	●	–	–	–	–	–	–	–	–	–	–
A4G094I2BP05GUP	2B	2,38	0,2	20	1,9	–	●	–	–	–	–	–	–	–	–	–	–
A4G0300M03P02GUP	3	3,00	0,2	20	2,9	●	●	–	–	–	–	–	–	–	–	–	–
A4G0300M03P04GUP	3	3,00	0,4	20	2,9	●	●	–	–	–	–	–	–	–	–	–	–
A4G125I03P05GUP	3	3,18	0,2	20	2,9	–	●	–	–	–	–	–	–	–	–	–	–
A4G125I03P1GUP	3	3,18	0,4	20	2,9	–	●	–	–	–	–	–	–	–	–	–	–
A4G0400M04P02GUP	4	4,00	0,2	20	3,3	●	●	–	–	–	–	–	–	–	–	–	–
A4G0400M04P04GUP	4	4,00	0,4	20	3,3	●	●	–	–	–	–	–	–	–	–	–	–
A4G0400M04P08GUP	4	4,00	0,8	20	3,3	●	●	–	–	–	–	–	–	–	–	–	–
A4G187I04P1GUP	4	4,76	0,4	20	3,3	–	●	–	–	–	–	–	–	–	–	–	–
A4G0500M05P04GUP	5	5,00	0,4	25	4,1	●	●	–	–	–	–	–	–	–	–	–	–
A4G0500M05P08GUP	5	5,00	0,8	25	4,1	●	●	–	–	–	–	–	–	–	–	–	–
A4G0600M06P04GUP	6	6,00	0,4	30	4,5	●	●	–	–	–	–	–	–	–	–	–	–
A4G0600M06P08GUP	6	6,00	0,8	30	4,5	●	●	–	–	–	–	–	–	–	–	–	–
A4G250I06P1GUP	6	6,35	0,4	30	4,4	–	●	–	–	–	–	–	–	–	–	–	–
A4G250I06P2GUP	6	6,35	0,8	30	4,4	–	●	–	–	–	–	–	–	–	–	–	–
A4G312I08P1GUP	8	7,94	0,4	30	5,9	–	●	–	–	–	–	–	–	–	–	–	–
A4G0800M08P08GUP	8	8,00	0,8	30	6,0	●	●	–	–	–	–	–	–	–	–	–	–
A4G0800M08P12GUP	8	8,00	1,2	30	6,0	●	●	–	–	–	–	–	–	–	–	–	–
A4G375I10P1GUP	10	9,53	0,4	30	5,9	–	●	–	–	–	–	–	–	–	–	–	–
A4G1000M10P08GUP	10	10,00	0,8	30	6,0	●	●	–	–	–	–	–	–	–	–	–	–
A4G1000M10P12GUP	10	10,00	1,2	30	6,0	●	●	–	–	–	–	–	–	–	–	–	–

● primeira opção
○ opção alternativa

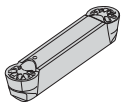


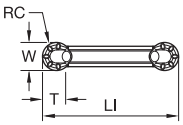


A4R-P-GUP

Precisão GUP de raio completo moldada

código do produto	tamanho do inserto	W	RC	LI	T	KCU10	KCU25	KCP10	KCP25	KCK20	K313	KC5010	KC5025	KY3500	KT315	KB1630	KB5625	KD1405
A4R0305M03U00GUP	3	3,05	1,5	20	–	●	●	–	–	–	–	–	–	–	–	–	–	–
A4R0505M05U00GUP	5	5,05	2,5	25	–	●	●	–	–	–	–	–	–	–	–	–	–	–
A4R1005M10U00GUP	10	10,05	5,0	30	–	●	●	–	–	–	–	–	–	–	–	–	–	–





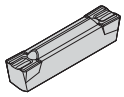
A4R-P-GUP

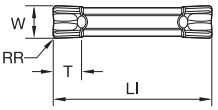
Retificado de precisão GUP de raio completo

código do produto	tamanho do inserto	W	RC	LI	T	KCU10	KCU25	KCP10	KCP25	KCK20	K313	KC5010	KC5025	KY3500	KT315	KB1630	KB5625	KD1405
A4R0300M03P00GUP	3	3,00	1,5	20	–	●	●	–	–	–	–	–	–	–	–	–	–	–
A4R125I03P00GUP	3	3,18	1,6	20	–	●	●	–	–	–	–	–	–	–	–	–	–	–
A4R0400M04P00GUP	4	4,00	2,0	20	–	–	●	–	–	–	–	–	–	–	–	–	–	–
A4R187I04P00GUP	4	4,76	2,4	20	–	–	●	–	–	–	–	–	–	–	–	–	–	–
A4R0500M05P00GUP	5	5,00	2,5	25	–	–	●	–	–	–	–	–	–	–	–	–	–	–
A4R0600M06P00GUP	6	6,00	3,0	30	–	●	●	–	–	–	–	–	–	–	–	–	–	–
A4R250I06P00GUP	6	6,35	3,2	30	–	●	●	–	–	–	–	–	–	–	–	–	–	–
A4R312I08P00GUP	8	7,94	4,0	30	–	●	–	–	–	–	–	–	–	–	–	–	–	–
A4R0800M08P00GUP	8	8,00	4,0	30	–	–	●	–	–	–	–	–	–	–	–	–	–	–
A4R1000M10P00GUP	10	10,00	5,0	30	–	●	●	–	–	–	–	–	–	–	–	–	–	–

● primeira opção
○ opção alternativa

		KCU10	KCU25	KCP10	KCP25	KCK20	K313	KC5010	KC5025	KY3500	KT315	KB1630	KB5625	KD1405
P		●	●	●	●	○		○	○		●			
M		●	●				○	●	○					
K		○	○	○	○	●	○	○	○	●	○	○		
N		●	○				●	●	○					●
S		●	●				●	○	○			○		
H		○						○				●	●	

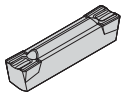


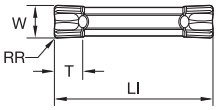


A4G-U-GMP

Precisão moldada GMP

código do produto	tamanho do inserto	W	RR	LI	T	KCU10	KCU25	KCP10	KCP25	KCK20	K313	KC5010	KC5025	KY3500	KT315	KB1630	KB5625	KD1405
A4G0205M02U02GMP	2	2,05	0,2	20	2,0	–	●	–	–	–	–	●	●	–	–	–	–	–
A4G0255M2BU02GMP	2B	2,62	0,2	20	2,0	–	●	–	–	–	–	–	●	–	–	–	–	–
A4G0305M03U02GMP	3	3,05	0,2	20	3,5	●	●	–	–	–	–	●	●	–	●	–	–	–
A4G0305M03U04GMP	3	3,05	0,4	20	3,5	●	●	–	–	–	–	●	●	–	●	–	–	–
A4G0405M04U04GMP	4	4,05	0,4	20	3,4	●	●	●	●	–	–	●	●	–	●	–	–	–
A4G0405M04U08GMP	4	4,05	0,8	20	3,4	–	●	–	–	–	–	●	●	–	●	–	–	–
A4G0505M05U04GMP	5	5,05	0,4	25	4,2	●	●	●	–	–	–	●	●	–	–	–	–	–
A4G0505M05U08GMP	5	5,05	0,8	25	4,2	–	●	●	–	–	–	●	●	–	–	–	–	–
A4G0605M06U04GMP	6	6,05	0,4	30	4,9	–	–	–	●	–	–	●	●	–	–	–	–	–
A4G0605M06U08GMP	6	6,05	0,8	30	4,9	–	–	–	–	–	–	●	●	–	–	–	–	–
A4G0805M08U08GMP	8	8,05	0,8	30	6,1	–	●	–	–	–	–	–	●	–	–	–	–	–
A4G1005M10U08GMP	10	10,05	0,8	30	8,1	●	●	–	–	–	–	–	–	–	–	–	–	–

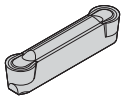


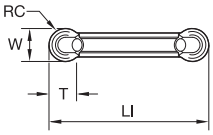


A4G-P-GMP

Retificado de precisão GMP

código do produto	tamanho do inserto	W	RR	LI	T	KCU10	KCU25	KCP10	KCP25	KCK20	K313	KC5010	KC5025	KY3500	KT315	KB1630	KB5625	KD1405
A4G0200M02P02GMP	2	2,00	0,2	20	2,0	●	●	–	–	–	–	●	●	–	–	–	–	–
A4G0250M2BP02GMP	2B	2,50	0,2	20	2,0	●	–	–	–	–	–	●	–	–	–	–	–	–
A4G0300M03P02GMP	3	3,00	0,2	20	3,5	●	●	–	–	–	●	●	●	–	–	–	–	–
A4G0300M03P04GMP	3	3,00	0,4	20	3,5	●	●	–	–	–	●	●	●	–	–	–	–	–
A4G0400M04P02GMP	4	4,00	0,2	20	–	●	●	–	–	–	●	●	●	–	–	–	–	–
A4G0400M04P04GMP	4	4,00	0,4	20	3,5	●	●	–	–	–	●	●	●	–	–	–	–	–
A4G0400M04P08GMP	4	4,00	0,8	20	3,5	●	●	–	–	–	–	●	●	–	–	–	–	–
A4G0500M05P04GMP	5	5,00	0,4	25	–	●	●	–	–	–	●	●	●	–	–	–	–	–
A4G0500M05P08GMP	5	5,00	0,8	25	–	●	–	–	–	–	●	●	●	–	–	–	–	–
A4G0600M06P04GMP	6	6,00	0,4	30	4,9	●	●	–	–	–	–	●	–	–	–	–	–	–
A4G0600M06P08GMP	6	6,00	0,8	30	4,9	●	●	–	–	–	–	●	●	–	–	–	–	–
A4G0800M08P08GMP	8	8,00	0,8	30	6,4	–	●	–	–	–	–	●	–	–	–	–	–	–
A4G0800M08P12GMP	8	8,00	1,2	30	6,4	●	–	–	–	–	–	–	–	–	–	–	–	–





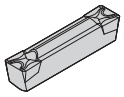
A4R-P-GMP

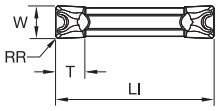
● primeira opção
○ opção alternativa

		KCU10	KCU25	KCP10	KCP25	KCK20	K313	KC5010	KC5025	KY3500	KT315	KB1630	KB5625	KD1405
P		●	●	●	●	○		○	○		●			
M		●	●				○	●	○					
K		○	○	○	○	●	○	○	○	●	○	○		
N		●	○				●	●	○					●
S		●	●				●	○	○			○		
H		○						○				●	●	

Retificado de precisão GMP de raio completo

código do produto	tamanho do inserto	W	RC	LI	T	KCU10	KCU25	KCP10	KCP25	KCK20	K313	KC5010	KC5025	KY3500	KT315	KB1630	KB5625	KD1405
A4R0200M02P00GMP	2	2,00	1,0	20	1,7	●	●	–	–	–	–	●	●	–	–	–	–	–
A4R0300M03P00GMP	3	3,00	1,5	20	2,5	●	●	–	–	–	●	●	●	–	–	–	–	–
A4R0400M04P00GMP	4	4,00	2,0	20	–	●	●	–	–	–	●	●	●	–	–	–	–	–
A4R0500M05P00GMP	5	5,00	2,5	25	4,1	●	●	–	–	–	●	●	●	–	–	–	–	–
A4R0600M06P00GMP	6	6,00	3,0	30	4,8	●	●	–	–	–	–	●	●	–	–	–	–	–
A4R0800M08P00GMP	8	8,00	4,0	30	6,4	●	●	–	–	–	–	●	–	–	–	–	–	–

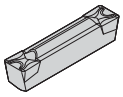


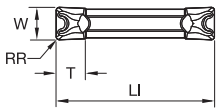


A4G-U-GMN

Precisão moldada GMN

código do produto	tamanho do inserto	W	RR	LI	T	KCU10	KCU25	KCP10	KCP25	KCK20	K313	KC5010	KC5025	KY3500	KT315	KB1630	KB5625	KD1405
A4G0205M02U02GMN	2	2,05	0,2	20	2,0	●	●	●	–	–	–	●	●	–	–	–	–	–
A4G0255M2BU02GMN	2B	2,62	0,2	20	2,0	–	–	–	–	–	–	–	●	–	–	–	–	–
A4G0305M03U02GMN	3	3,05	0,2	20	3,5	●	●	●	●	–	–	●	●	–	–	–	–	–
A4G0305M03U04GMN	3	3,05	0,4	20	3,5	●	●	●	●	–	–	●	●	–	–	–	–	–
A4G0405M04U04GMN	4	4,05	0,4	20	3,4	●	●	–	●	–	–	●	●	–	–	–	–	–
A4G0405M04U08GMN	4	4,05	0,8	20	3,4	●	●	●	●	–	–	●	●	–	–	–	–	–
A4G0505M05U04GMN	5	5,05	0,4	25	4,2	●	●	●	●	–	–	●	●	–	–	–	–	–
A4G0505M05U08GMN	5	5,05	0,8	25	4,2	●	●	●	●	–	–	●	●	–	–	–	–	–
A4G0605M06U04GMN	6	6,05	0,4	30	4,9	●	●	●	●	–	–	●	●	–	–	–	–	–
A4G0605M06U08GMN	6	6,05	0,8	30	4,9	●	●	●	●	–	–	●	●	–	●	–	–	–
A4G0605M06U12GMN	6	6,05	1,2	30	4,9	–	–	–	●	–	–	●	●	–	–	–	–	–
A4G0805M08U08GMN	8	8,05	0,8	30	6,4	●	●	●	●	–	–	●	–	–	–	–	–	–
A4G0805M08U12GMN	8	8,05	1,2	30	6,4	–	●	●	●	–	–	●	–	–	–	–	–	–
A4G1005M10U08GMN	10	10,05	0,8	30	8,1	–	●	●	●	–	–	–	●	–	–	–	–	–
A4G1005M10U12GMN	10	10,05	1,2	30	8,1	–	–	–	●	–	–	–	●	–	–	–	–	–





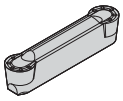
A4G-P-GMN

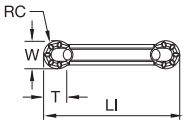
● primeira opção
○ opção alternativa

		KCU10	KCU25	KCP10	KCP25	KCK20	K313	KC5010	KC5025	KY3500	KT315	KB1630	KB5625	KD1405
P		●	●	●	●	○		○	○		●			
M		●	●				○	●	○					
K		○	○	○	○	●	○	○	○	●	○	○		
N		●	○				●	●	○					●
S		●	●				●	○	○			○		
H		○						○				●	●	

Retificado de precisão GMN

código do produto	tamanho do inserto	W	RR	LI	T	KCU10	KCU25	KCP10	KCP25	KCK20	K313	KC5010	KC5025	KY3500	KT315	KB1630	KB5625	KD1405
A4G094I2BP05GMN	2B	2,39	0,2	20	1,9	●	–	–	–	–	–	●	–	–	–	–	–	–
A4G125I03P05GMN	3	3,18	0,2	20	3,4	●	●	–	–	–	–	●	●	–	–	–	–	–
A4G125I03P1GMN	3	3,18	0,4	20	3,4	●	●	–	–	–	–	●	●	–	–	–	–	–
A4G187I04P1GMN	4	4,76	0,4	20	3,5	●	●	–	–	–	–	●	–	–	–	–	–	–
A4G187I04P2GMN	4	4,76	0,8	20	3,5	●	●	–	–	–	–	●	●	–	–	–	–	–
A4G250I06P1GMN	6	6,35	0,4	30	4,7	●	●	–	–	–	–	●	–	–	–	–	–	–
A4G250I06P2GMN	6	6,35	0,8	30	4,7	●	●	–	–	–	–	●	–	–	–	–	–	–
A4G312I08P1GMN	8	7,94	0,4	30	6,2	–	●	–	–	–	–	●	–	–	–	–	–	–
A4G375I10P1GMN	10	9,53	0,4	30	7,9	–	–	–	–	–	–	●	–	–	–	–	–	–
A4G375I10P2GMN	10	9,53	0,8	30	7,9	●	–	–	–	–	–	●	–	–	–	–	–	–

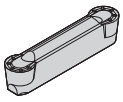


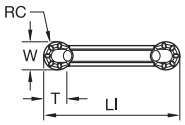


A4R-U-GMN

Precisão GMN de raio completo moldada

código do produto	tamanho do inserto	W	RC	LI	T	KCU10	KCU25	KCP10	KCP25	KCK20	K313	KC5010	KC5025	KY3500	KT315	KB1630	KB5625	KD1405
A4R0205M02U00GMN	2	2,05	1,1	20	1,8	–	●	●	–	–	–	●	●	–	–	–	–	–
A4R0305M03U00GMN	3	3,05	1,5	20	2,6	●	●	●	●	–	–	●	●	–	–	–	–	–
A4R0405M04U00GMN	4	4,05	2,0	20	3,5	●	●	●	●	–	–	●	●	–	–	–	–	–
A4R0505M05U00GMN	5	5,05	2,5	25	4,2	●	●	●	●	–	–	●	●	–	–	–	–	–
A4R0605M06U00GMN	6	6,05	3,0	30	4,9	●	●	●	●	–	–	●	●	–	–	–	–	–
A4R0805M08U00GMN	8	8,05	4,0	30	6,5	●	●	●	●	–	–	●	●	–	–	–	–	–
A4R1005M10U00GMN	10	10,05	5,0	30	8,2	●	●	–	●	–	–	–	–	–	–	–	–	–

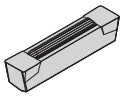


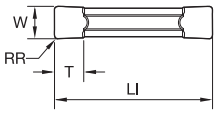


A4R-P-GMN

Retificado de precisão GMN de raio completo

código do produto	tamanho do inserto	W	RC	LI	T	KCU10	KCU25	KCP10	KCP25	KCK20	K313	KC5010	KC5025	KY3500	KT315	KB1630	KB5625	KD1405
A4R125I03P00GMN	3	3,18	1,6	20	2,7	●	●	–	–	–	–	●	●	–	–	–	–	–
A4R187I04P00GMN	4	4,76	2,4	20	3,8	●	●	–	–	–	–	●	●	–	–	–	–	–
A4R250I06P00GMN	6	6,35	3,2	30	5,3	●	●	–	–	–	–	●	●	–	–	–	–	–
A4R312I08P00GMN	8	7,94	4,0	30	6,4	●	–	–	–	–	–	–	–	–	–	–	–	–
A4R375I10P00GMN	10	9,53	4,8	30	7,3	–	–	–	–	–	–	–	●	–	–	–	–	–





A4G-U-B

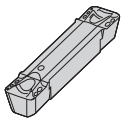
● primeira opção
○ opção alternativa

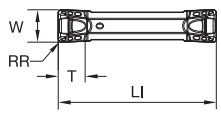
P	● ● ● ● ○ ○ ○ ● ○ ○
M	● ● ○ ● ○ ○ ○ ○ ○ ○
K	○ ○ ○ ○ ● ○ ○ ○ ● ○ ○
N	● ○ ○ ● ● ○ ○ ○ ○ ○ ●
S	● ● ○ ● ○ ○ ○ ○ ○ ○ ○
H	○ ○ ○ ○ ○ ○ ○ ○ ● ● ○

Precisão de topo plano moldada

código do produto	tamanho do inserto	W	RR	LI	T	KCU10	KCU25	KCP10	KCP25	KCK20	K313	KC5010	KC5025	KY3500	KT315	KB1630	KB5625	KD1405
A4G0305M03U02B	3	3,05	0,2	20	3,5	–	●	–	–	●	–	–	●	–	–	–	–	–
A4G0405M04U04B	4	4,05	0,4	20	3,4	–	–	–	–	●	–	–	●	–	–	–	–	–
A4G0505M05U04B	5	5,05	0,4	25	4,2	–	●	–	–	●	–	–	–	–	–	–	–	–
A4G0605M06U04B	6	6,05	0,4	30	4,9	–	●	–	–	●	–	–	–	–	–	–	–	–
A4G0805M08U08B	8	8,05	0,8	30	6,4	–	–	–	–	●	–	–	–	–	–	–	–	–
A4G1005M10U08B	10	10,05	0,8	30	8,1	–	–	–	–	●	–	–	–	–	–	–	–	–

Insertos de canal e torneamento A4™ • Canal de face de diâmetro Pequeno





A4G-SP-GUP

● primeira opção
○ opção alternativa

P	● ● ● ● ○ ○ ○ ● ○ ○
M	● ● ○ ● ○ ○ ○ ○ ○ ○
K	○ ○ ○ ○ ● ○ ○ ○ ● ○ ○
N	● ○ ○ ● ● ○ ○ ○ ○ ○ ●
S	● ● ○ ● ○ ○ ○ ○ ○ ○ ○
H	○ ○ ○ ○ ○ ○ ○ ○ ● ● ○

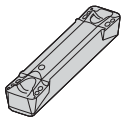
Precisão GUP moldada • Canal de face de diâmetro pequeno

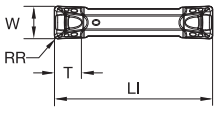
código do produto	tamanho do inserto	W	RR	LI	T	KCU10	KCU25	KCP10	KCP25	KCK20	K313	KC5010	KC5025	KY3500	KT315	KB1630	KB5625	KD1405
A4G0200M2SP02GUP	2S	2,00	0,2	20	1,9	●	●	–	–	–	–	–	–	–	–	–	–	–
A4G0300M3SP02GUP	3S	3,00	0,2	20	2,9	●	●	–	–	–	–	–	–	–	–	–	–	–
A4G0300M3SP04GUP	3S	3,00	0,4	20	2,9	●	●	–	–	–	–	–	–	–	–	–	–	–
A4G0400M4SP04GUP	4S	4,00	0,4	20	3,4	●	–	–	–	–	–	–	–	–	–	–	–	–
A4G0400M4SP08GUP	4S	4,00	0,8	20	3,4	●	–	–	–	–	–	–	–	–	–	–	–	–
A4G0500M5SP04GUP	5S	5,00	0,4	25	4,1	–	●	–	–	–	–	–	–	–	–	–	–	–
A4G0500M5SP08GUP	5S	5,00	0,8	25	4,1	●	–	–	–	–	–	–	–	–	–	–	–	–

NOTA: Os insertos A4-S são os insertos A4 com a altura reduzida. Por exemplo, um suporte com o tamanho do alojamento 2S não aceitará um inserto com tamanho do alojamento 2.

● primeira opção
○ opção alternativa

		KCU10	KCU25	KCP10	KCP25	KCK20	K313	KC5010	KC5025	KY3500	KT315	KB1630	KB5625	KD1405
P		●	●	●	●	○		○	○		●			
M		●	●				○	●	○					
K		○	○	○	○	●	○	○	○	●	○	○		
N		●	○				●	●	○					●
S		●	●				●	○	○			○		
H		○						○				●	●	



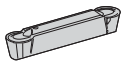


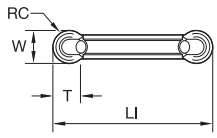
A4G-SU-GUP

Precisão GUP retificada • Canal de face de diâmetro pequeno

código do produto	tamanho do inserto	W	RR	LI	T	KCU10	KCU25	KCP10	KCP25	KCK20	K313	KC5010	KC5025	KY3500	KT315	KB1630	KB5625	KD1405
A4G0205M2SU02GUP	2S	2,05	0,2	20	2,0	●	●	–	–	–	–	–	–	–	–	–	–	–
A4G0305M3SU02GUP	3S	3,05	0,2	20	3,0	●	●	–	–	–	–	–	–	–	–	–	–	–
A4G0305M3SU04GUP	3S	3,05	0,4	20	3,0	●	●	–	–	–	–	–	–	–	–	–	–	–
A4G0405M4SU04GUP	4S	4,05	0,4	20	3,4	●	●	–	–	–	–	–	–	–	–	–	–	–
A4G0505M5SU04GUP	5S	5,05	0,4	25	4,2	●	●	–	–	–	–	–	–	–	–	–	–	–
A4G0505M5SU08GUP	5S	5,05	0,8	25	4,2	–	●	–	–	–	–	–	–	–	–	–	–	–

NOTA: Os insertos A4-S são os insertos A4 com a altura reduzida. Por exemplo, um suporte com o tamanho do alojamento 2S não aceitará um inserto com tamanho do alojamento 2.



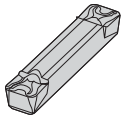


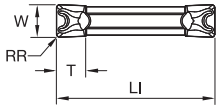
A4R-SP-GMP

Precisão de raio total GMP retificada • Canal de face de diâmetro pequeno

código do produto	tamanho do inserto	W	RC	LI	T	KCU10	KCU25	KCP10	KCP25	KCK20	K313	KC5010	KC5025	KY3500	KT315	KB1630	KB5625	KD1405
A4R0200M2SP00GMP	2S	2,00	1,0	20	1,6	–	●	–	–	–	–	–	–	–	–	–	–	–
A4R0300M3SP00GMP	3S	3,00	1,5	20	2,5	–	●	–	–	–	–	–	–	–	–	–	–	–
A4R0500M5SP00GMP	5S	5,00	2,5	25	4,1	–	●	–	–	–	–	–	–	–	–	–	–	–

NOTA: Os insertos A4-S são os insertos A4 com a altura reduzida. Por exemplo, um suporte com o tamanho do alojamento 2S não aceitará um inserto com tamanho do alojamento 2.



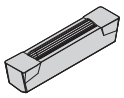


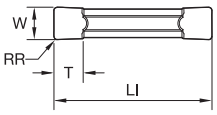
A4G-SU-GMN

Precisão GMN moldada • Canal de face de diâmetro pequeno

código do produto	tamanho do inserto	W	RR	LI	T	KCU10	KCU25	KCP10	KCP25	KCK20	K313	KC5010	KC5025	KY3500	KT315	KB1630	KB5625	KD1405
A4G0205M2SU02GMN	2S	2,05	0,2	20	2,0	●	●	–	–	–	–	–	–	–	–	–	–	–
A4G0305M3SU02GMN	3S	3,05	0,2	20	3,5	–	●	–	–	–	–	–	–	–	–	–	–	–
A4G0305M3SU04GMN	3S	3,05	0,4	20	3,5	●	●	–	–	–	–	–	–	–	–	–	–	–
A4G0405M4SU04GMN	4S	4,05	0,4	20	3,6	●	●	–	–	–	–	–	–	–	–	–	–	–
A4G0405M4SU08GMN	4S	4,05	0,8	20	3,6	–	●	–	–	–	–	–	–	–	–	–	–	–
A4G0505M5SU04GMN	5S	5,05	0,4	25	4,2	●	●	–	–	–	–	–	–	–	–	–	–	–

NOTA: Os insertos A4-S são os insertos A4 com a altura reduzida. Por exemplo, um suporte com o tamanho do alojamento 2S não aceitará um inserto com tamanho do alojamento 2.





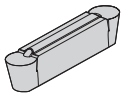
A4G-P-T

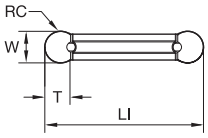
● primeira opção
○ opção alternativa

P	
M	
K	●
N	
S	
H	

Retificado de precisão de topo plano • Cerâmica

ISO código do produto	tamanho do inserto	W	RR	LI	T	KY3500
A4G0300M03P04T01025	3	3,00	0,4	20	3,4	●
A4G125I03P1T0425	3	3,18	0,4	20	3,4	●
A4G0400M04P04T01025	4	4,00	0,4	20	3,4	●
A4G0500M05P08T01025	5	5,00	0,8	25	4,2	●
A4G0600M06P08T01025	6	6,00	0,8	30	4,8	●
A4G250I06P2T0425	6	6,35	0,8	30	4,9	●
A4G0800M08P08T01025	8	8,00	0,8	30	6,4	●

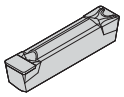


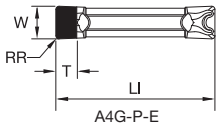


A4R-P-T

Retificado de precisão de topo plano com raio completo • Cerâmica

ISO código do produto	tamanho do inserto	W	RC	LI	T	KY3500
A4R0300M03P00T01025	3	3,00	1,5	20	2,4	●
A4R0500M05P00T01025	5	5,00	2,5	25	4,1	●
A4R0600M06P00T01025	6	6,00	3,0	30	4,3	●
A4R250I06P00T0425	6	6,35	3,2	30	4,8	●
A4R0800M08P00T01025	8	8,00	4,0	30	6,4	●





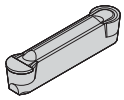
A4G-P-E

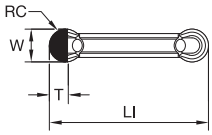
● primeira opção
○ opção alternativa

P		●	●	●	●	○		○	○		●			
M		●	●				○	●	○					
K		○	○	○	○	●	○	○	○	●	○	○		
N		●	○				●	●	○					●
S		●	●				●	○	○			○		
H		○						○				●	●	

Precisão de topo plano retificada • PCD

ISO código do produto	tamanho do inserto	W	RR	LI	T	KCU10	KCU25	KCP10	KCP25	KCK20	K313	KC5010	KC5025	KY3500	KT315	KB1630	KB5625	KD1405
A4G0300M03P04E	3	3,00	0,4	20	3,0	–	–	–	–	–	–	–	–	–	–	–	–	●
A4G0400M04P04E	4	4,00	0,4	20	3,0	–	–	–	–	–	–	–	–	–	–	–	–	●
A4G0500M05P08E	5	5,00	0,8	25	3,0	–	–	–	–	–	–	–	–	–	–	–	–	●





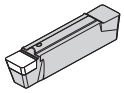
A4R-P-E

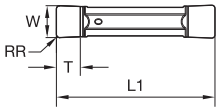
● primeira opção
○ opção alternativa

		KCU10	KCU25	KCP10	KCP25	KCK20	K313	KC5010	KC5025	KY3500	KT315	KB1630	KB5625	KD1405
P		●	●	●	●	○		○	○		●			
M		●	●				○	●	○					
K		○	○	○	○	●	○	○	○	●	○	○		
N		●	○				●	●	○					●
S		●	●				●	○	○			○		
H		○						○				●	●	

Retificado de precisão de topo plano com raio completo • PcD

código do produto	tamanho do inserto	W	RC	LI	T	KCU10	KCU25	KCP10	KCP25	KCK20	K313	KC5010	KC5025	KY3500	KT315	KB1630	KB5625	KD1405
A4R0500M05P00E	5	5,00	2,5	25	3,0	–	–	–	–	–	–	–	–	–	–	–	–	●

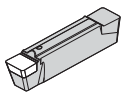


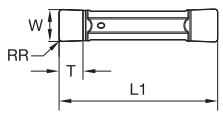


A4G-P-E-ST

Precisão de topo plano retificada • PcBN

código do produto	tamanho do inserto	W	RR	LI	T	KCU10	KCU25	KCP10	KCP25	KCK20	K313	KC5010	KC5025	KY3500	KT315	KB1630	KB5625	KD1405
A4G0300M03P04EST	3	3,00	0,4	20	3,0	–	–	–	–	–	–	–	–	–	–	●	–	–
A4G0500M05P08EST	5	5,00	0,8	25	3,5	–	–	–	–	–	–	–	–	–	–	●	–	–
A4G0600M06P08EST	6	6,00	0,8	30	4,0	–	–	–	–	–	–	–	–	–	–	●	–	–

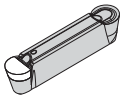


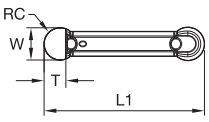


A4G-P-S-ST

Precisão de topo plano retificada • Área T • PcBN

código do produto	tamanho do inserto	W	RR	LI	T	KCU10	KCU25	KCP10	KCP25	KCK20	K313	KC5010	KC5025	KY3500	KT315	KB1630	KB5625	KD1405
A4G0300M03P04S02025ST	3	3,00	0,4	20	3,0	–	–	–	–	–	–	–	–	–	–	●	●	–
A4G0400M04P04S02025ST	4	4,00	0,4	20	3,3	–	–	–	–	–	–	–	–	–	–	●	●	–
A4G0500M05P08S02025ST	5	5,00	0,8	25	3,5	–	–	–	–	–	–	–	–	–	–	–	●	–
A4G0600M06P08S02025ST	6	6,00	0,8	30	4,0	–	–	–	–	–	–	–	–	–	–	–	●	–





A4R-P-E-ST

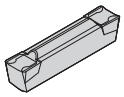
● primeira opção
○ opção alternativa

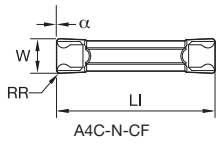
		KCU10	KCU25	KCP10	KCP25	KCK20	K313	KC5010	KC5025	KY3500	KT315	KB1630	KB5625	KD1405
P		●	●	●	●	○		○	○		●			
M		●	●				○	●	○					
K		○	○	○	○	●	○	○	○	●	○	○		
N		●	○				●	●	○					●
S		●	●				●	○	○			○		
H		○						○				●	●	

Precisão de topo plano com raio total retificada • PcBN

código do produto	tamanho do inserto	W	RC	LI	T	KCU10	KCU25	KCP10	KCP25	KCK20	K313	KC5010	KC5025	KY3500	KT315	KB1630	KB5625	KD1405
A4R0300M03P00EST	3	3,00	1,5	20	2,2	–	–	–	–	–	–	–	–	–	–	●	–	–
A4R0400M04P00EST	4	4,00	2,0	20	2,9	–	–	–	–	–	–	–	–	–	–	●	–	–
A4R0500M05P00EST	5	5,00	2,5	25	3,7	–	–	–	–	–	–	–	–	–	–	●	–	–
A4R0600M06P00EST	6	6,00	3,0	30	4,4	–	–	–	–	–	–	–	–	–	–	●	–	–

Insertos de corte A4™





A4C-N-CF

● primeira opção
○ opção alternativa

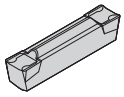
		KCU10	KCU25	KCP10	KCP25	KCK20	K313	KC5010	KC5025	KY3500	KT315	KB1630	KB5625	KD1405
P		●	●	●	●	○		○	○		●			
M		●	●				○	●	○					
K		○	○	○	○	●	○	○	○	●	○	○		
N		●	○				●	●	○					●
S		●	●				●	○	○			○		
H		○						○				●	●	

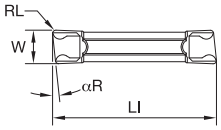
Precisão CF moldada • Corte neutro

código do produto	tamanho do inserto	W	RR	LI	α	KCU10	KCU25	KCP10	KCP25	KCK20	K313	KC5010	KC5025	KY3500	KT315	KB1630	KB5625	KD1405
A4C0155N00CF01	1	1,50	0,2	16	–	–	●	–	–	–	–	–	●	–	–	–	–	–
A4C0205N00CF02	2	2,05	0,2	20	–	–	●	–	–	–	–	–	●	–	–	–	–	–
A4C0255N00CF02	2B	2,50	0,2	20	–	–	●	–	–	–	–	–	●	–	–	–	–	–
A4C0305N00CF02	3	3,05	0,2	20	–	–	●	–	–	–	–	–	●	–	–	–	–	–
A4C0405N00CF02	4	4,05	0,2	20	–	–	●	–	–	–	–	–	●	–	–	–	–	–

● primeira opção
○ opção alternativa

		KCU10	KCU25	KCP10	KCP25	KCK20	K313	KC5010	KC5025	KY3500	KT315	KB1630	KB5625	KD1405
P		●	●	●	●	○		○	○		●			
M		●	●				○	●	○					
K		○	○	○	○	●	○	○	○	●	○	○		
N		●	○				●	●	○					●
S		●	●				●	○	○			○		
H		○						○				●	●	

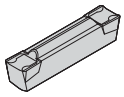


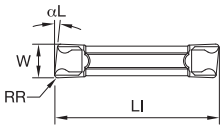


A4C-R-CF

Precisão CF moldada • Corte à direita

código do produto	tamanho do inserto	W	RL	LI	αR	KCU10	KCU25	KCP10	KCP25	KCK20	K313	KC5010	KC5025	KY3500	KT315	KB1630	KB5625	KD1405
A4C0155R06CF01	1	1,50	0,2	16	6.0	–	–	–	–	–	–	–	●	–	–	–	–	–
A4C0155R10CF01	1	1,50	0,2	16	10.0	–	●	–	–	–	–	–	–	–	–	–	–	–
A4C0155R16CF01	1	1,50	0,2	16	16.0	–	–	–	–	–	–	–	●	–	–	–	–	–
A4C0205R06CF02	2	1,99	0,2	20	6.0	–	●	–	–	–	–	–	●	–	–	–	–	–
A4C0205R10CF02	2	1,99	0,2	20	10.0	–	●	–	–	–	–	–	–	–	–	–	–	–
A4C0255R06CF02	2B	2,49	0,2	20	6.0	–	–	–	–	–	–	–	●	–	–	–	–	–
A4C0305R06CF02	3	3,05	0,2	20	6.0	–	●	–	–	–	–	–	●	–	–	–	–	–
A4C0305R10CF02	3	3,05	0,2	20	10.0	–	●	–	–	–	–	–	●	–	–	–	–	–
A4C0405R06CF02	4	4,05	0,2	20	6.0	–	●	–	–	–	–	–	–	–	–	–	–	–
A4C0405R10CF02	4	4,05	0,2	20	10.0	–	●	–	–	–	–	–	●	–	–	–	–	–





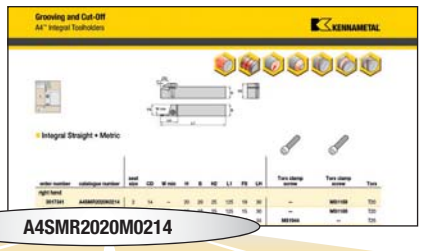
A4C-L-CF

Precisão CF moldada • Corte à esquerda

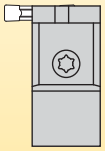
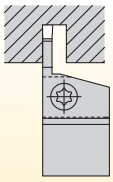
código do produto	tamanho do inserto	W	RR	LI	αL	KCU10	KCU25	KCP10	KCP25	KCK20	K313	KC5010	KC5025	KY3500	KT315	KB1630	KB5625	KD1405
A4C0155L06CF01	1	1,50	0,2	16	6.0	–	–	–	–	–	–	–	●	–	–	–	–	–
A4C0205L06CF02	2	1,99	0,2	20	6.0	–	●	–	–	–	–	–	–	–	–	–	–	–
A4C0205L10CF02	2	1,99	0,2	20	10.0	–	–	–	–	–	–	–	●	–	–	–	–	–
A4C0305L06CF02	3	3,05	0,2	20	6.0	–	●	–	–	–	–	–	●	–	–	–	–	–
A4C0305L10CF02	3	3,05	0,2	20	10.0	–	●	–	–	–	–	–	–	–	–	–	–	–
A4C0405L06CF02	4	4,05	0,2	20	6.0	–	●	–	–	–	–	–	–	–	–	–	–	–
A4C0405L10CF02	4	4,05	0,2	20	10.0	–	●	–	–	–	–	–	–	–	–	–	–	–

Como funcionam os números de catálogo?

Cada caractere no nosso número de catálogo significa uma característica específica daquele produto. Use as colunas-chave a seguir e as imagens correspondentes para fazer uma identificação fácil do atributo a ser aplicado.



A4SMR2020M0214

A4	S	M	R	2020M	02	14
Sistema de ferramental	Estilo da ferramenta	Tipo de suporte	Sentido de rotação da ferramenta	Tamanho da haste	Tamanho do alojamento	Profundidade máxima do canal
A4 = Abertura de canal e torneamento	 **S** = Reto  **E** = Montagem posterior (90°)		 **R** = sentido de rotação à direita **L** = sentido de rotação à esquerda **N** = neutro		**02** **03** **04** **05** **06** **08** **10**	em milímetros

M =
Suporte máximo para larguras específicas de canal e alívio reto para peças com diâmetros ilimitados

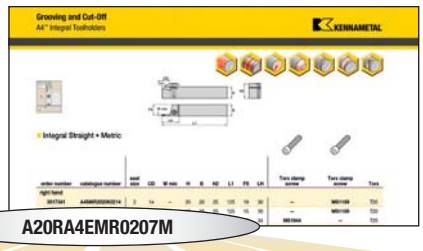
E =
Sem suporte a aço para o canal de face

C =
Suporte reforçado

sistema métrico:
Altura x largura em mm, a letra indica o comprimento da ferramenta de acordo com a norma ISO

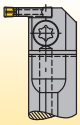
comprimento da ferramenta no sistema métrico (mm)
K = 125
M = 150
P = 170

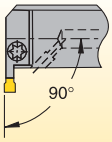
Consultando este guia fácil de usar, você pode identificar o produto correto para atender às suas necessidades.



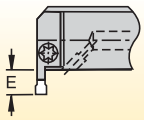
A20RA4EMR0207M

A	20	R	A4	E	M	R	02	07	M
Barra de aço com refrigeração	Diâmetro da barra	Comprimento da barra	Sistema de abertura de canal e torneamento A4™	Estilo da ferramenta	Tipo de suporte	Sentido de rotação da ferramenta	Tamanho do alojamento do inserto	Profundidade da abertura de canal em mm	Unidades da ferramenta

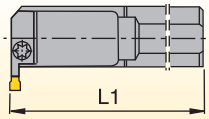




E = Montagem posterior (90°)

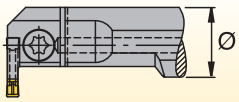


mm
7mm
10mm
12mm
16mm

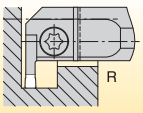


barras em milímetros:
R = 200mm
S = 150mm
T = 300mm

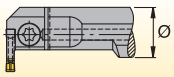
tamanho do alojamento do encaixe	largura de corte (mm)
02	2,00–2,62
2B	2,39–2,62
03	3,0–3,05
04	4,0–4,05
05	5,0–5,05
06	6,0–6,05
08	8,0–8,05
10	10,0–10,05



barras em milímetros:
Diâmetro da barra em milímetros



R = Sentido de rotação à direita

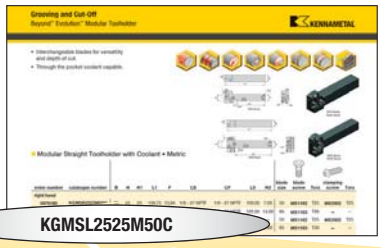


L = Sentido de rotação à esquerda

M = Suporte máximo

Como funcionam os números de catálogo?

Cada caractere no nosso número de catálogo significa uma característica específica daquele produto. Use as colunas-chave a seguir e as imagens correspondentes para uma identificação fácil do atributo a ser aplicado.



KGMSL2525M50C

KGM	S	L	2525M	50	C
Nome da família	Estilo da ferramenta	Sentido de rotação	Tamanho da haste	Tamanho da lâmina	Refrigerante
Sistema de canal modular	**S** = Montagem reta **E** = Montagem de topo (90º)	**L** = Esquerda **R** = Direita	**Métrico** = Altura x largura em mm; a letra indica o comprimento da ferramenta em conformidade com a norma ISO	**50** **65**	**C** = Com refrigeração pelo alojamento

Ferramenta de canais e insertos **Beyond**™ para as suas operações de canal raso e torneamento

Top Notch™



A abertura de canal Top Notch é a solução comprovada para alta produtividade. O sistema Top Notch fornece uma performance constante da ferramenta, indexação precisa e fixação excepcional, proporcionando um excelente acabamento superficial e maior vida útil da ferramenta.

CARACTERÍSTICAS E BENEFÍCIOS

- As classes Beyond com revestimento PVD foram projetadas para cortar uma variedade de materiais das peças.
- Fixação rígida trava firmemente o inserto no lugar através dos mais duros cortes.
- Um design versátil permite que um único sistema faça operações de abertura de canal no diâmetro interno ou externo e de face, de torneamento reverso, de rebaixamento e até de rosqueamento.
- Os insertos com controle do cavaco proporcionam excelente evacuação de cavacos na abertura de canal e oferecem melhor controle de cavaco no torneamento multidirecional.

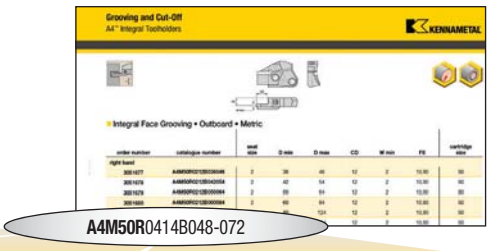
Experimente as vantagens no seu distribuidor autorizado da Kennametal ou no site **kennametal.com**.

KENNAMETAL®

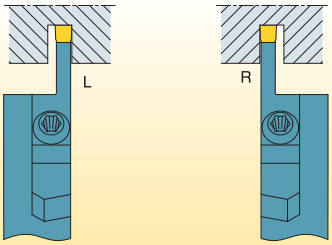
kennametal.com

Como funcionam os números de catálogo?

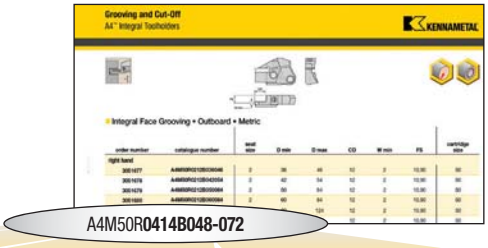
Cada caractere no nosso número de catálogo significa uma característica específica daquele produto. Use as colunas-chave a seguir e as imagens correspondentes para fazer uma identificação fácil do atributo a ser aplicado.



A4M50R0414B048-072

A4M	50	R
Nome da família	Tamanho do sistema modular	Sentido de rotação da ferramenta
Lâmina modular A4	50 65	

Consultando este guia fácil de usar, você pode identificar o produto correto para atender às suas necessidades.



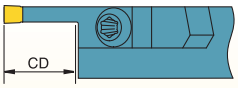
04

Tamanho do alojamento

tamanho do alojamento do encaixe	largura de corte mm
02	2,00–2,62
2B	2,39–2,62
03	3,0–3,05
04	4,0–4,05
05	5,0–5,05
06	6,0–6,05
08	8,0–8,05
10	10,0–10,05

14

Profundidade máxima do canal



mm

14mm

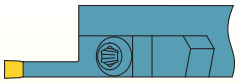
19mm

20mm

26mm

B

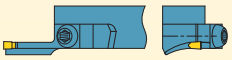
Estilo da ferramenta



M = Suporte máximo para larguras específicas de canal e alívio reto para peças com diâmetros ilimitados



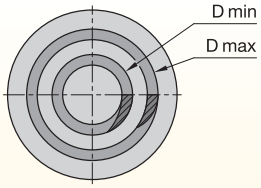
A = Porta-ferramentas para abertura de canal de face com curvatura para dentro



B = Porta-ferramentas para abertura de canal de face com curvatura para fora

048–072

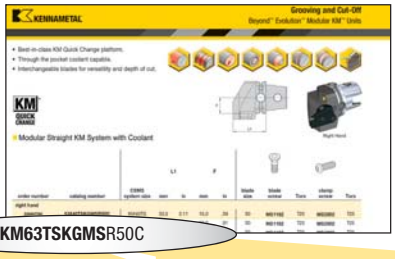
Intervalo de diâmetro da abertura de canal de face



os diâmetros são mín. e máx. para o diâmetro do canal de face 999 = D ilimitado máx.

Como funcionam os números de catálogo?

Cada caractere no nosso número de catálogo significa uma característica específica daquele produto. Use as colunas-chave a seguir e as imagens correspondentes para fazer uma identificação fácil do atributo a ser aplicado.



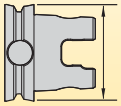
KM63TSKGMSR50C

KM
Troca rápida KM™

KM
KM4X™
PSC

63
Tamanho do sistema

40 = 40mm
50 = 50mm
63 = 63mm
80 = 80mm
100 = 100mm

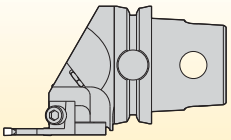


TS
Característica

TS
XMZ

KGM
Método de fixação do inserto

KGM



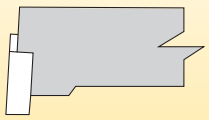
Canal modular

S
Localização do inserto

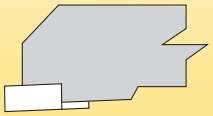
E = Montagem de topo

S = Montagem lateral

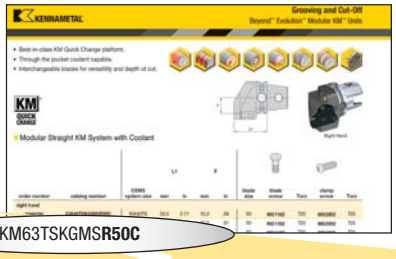
E



S



Consultando este guia fácil de usar, você pode identificar o produto correto para atender às suas necessidades.

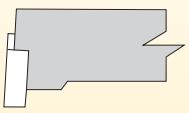


KM63TSKGMS**R50C**

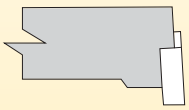
R	50	C	
Sentido da ferramenta	Tamanho da lâmina	Refrigeração	Características especiais
R = Sentido de rotação à direita **L** = Sentido de rotação à esquerda	**50** **60**	**C** = Com refrigeração pelo alojamento	**Y** = Mazak® INTEGREX®

Montagem de topo

R

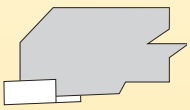


L

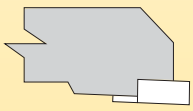


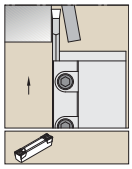
Montagem lateral

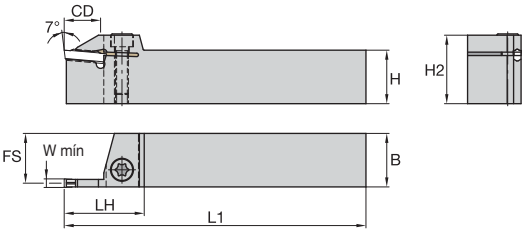
R



L







corte à direita (R)

Fixação integral direta • Métrico

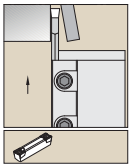
número para pedido	código do produto	tamanho do inserto	CD	W mín	H	B	H2	L1	FS	LH	parafuso do grampo	parafuso do grampo	Torx
corte à direita (R)													
3017341	**A4SMR2020K0214**	2	14	–	20	20	25	125	19	30	–	**MS1160**	T20
3017342	**A4SMR1616K0214**	2	14	2	16	16	25	125	15	30	–	**MS1160**	T20
2974425	**A4SMR2020K0217**	2	17	2	20	20	31	125	19	34	**MS1944**	–	T25
3017340	**A4SMR2525M0214**	2	14	2	25	25	30	150	24	30	–	**MS1160**	T20
3017339	**A4SMR2525M0217**	2	17	2	25	25	31	150	24	34	**MS1944**	–	T25
1949633	**A4SMR1616K0314**	3	14	3	16	16	27	125	15	35	**MS2091**	–	T25
2503557	**A4SMR2016K0317**	3	17	3	20	16	32	125	15	37	**MS1970**	–	T30
1949635	**A4SMR2020K0314**	3	14	3	20	20	27	125	19	35	**MS1595**	–	T30
2503551	**A4SMR2020K0317**	3	17	3	20	20	32	125	19	37	**MS1970**	–	T30
1949637	**A4SMR2525M0317**	3	17	3	25	25	32	150	24	37	**MS1970**	–	T30
2503559	**A4SMR2016K0417**	4	17	4	20	16	32	125	14	37	**MS1970**	–	T30
1949639	**A4SMR2020K0414**	4	14	4	20	20	27	125	18	35	**MS1595**	–	T30
2503553	**A4SMR2020K0417**	4	17	4	20	20	32	125	18	37	**MS1970**	–	T30
1949641	**A4SMR2525M0417**	4	17	4	25	25	32	150	23	37	**MS1970**	–	T30
1949643	**A4SMR3225P0417**	4	17	4	32	25	40	170	23	37	**MS1970**	–	T30
1949645	**A4SMR2020K0519**	5	19	5	20	20	28	125	18	40	**MS1595**	–	T30
1949647	**A4SMR2525M0520**	5	20	5	25	25	33	150	23	40	**MS1970**	–	T30
1949649	**A4SMR3225P0522**	5	22	5	32	25	40	170	23	42	**MS1970**	–	T30
2503555	**A4SMR2020K0620**	6	20	6	20	20	33	125	17	40	**MS1970**	–	T30
2245484	**A4SMR2525M0620**	6	20	6	25	25	33	150	22	40	**MS1970**	–	T30
2263089	**A4SMR3225P0626**	6	26	6	32	25	40	170	22	45	**MS1970**	–	T30
2245485	**A4SMR2525M0820**	8	20	8	25	25	34	150	21	43	**MS1490**	–	T45
2263091	**A4SMR3225P0826**	8	26	8	32	25	41	170	21	47	**MS1490**	–	T45
2263173	**A4SMR3225P1026**	10	26	10	32	25	41	170	21	47	**MS1490**	–	T45

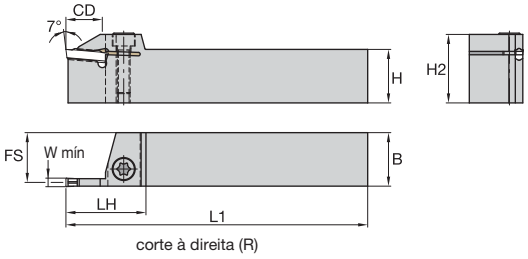
(continuação)

(Fixação integral direta • Métrico — continuação)




número para pedido	código do produto	tamanho do inserto	CD	W mín	H	B	H2	L1	FS	LH	parafuso do grampo	parafuso do grampo	Torx
corte à esquerda (L)													
3017336	**A4SML2020K0214**	2	14	–	20	20	25	125	19	30	**–**	**MS1160**	T20
3017338	**A4SML1616K0214**	2	14	2	16	16	25	125	15	30	**–**	**MS1160**	T20
3017337	**A4SML2020K0217**	2	17	2	20	20	31	125	19	34	**MS1944**	**–**	T25
3017335	**A4SML2525M0214**	2	14	2	25	25	30	150	24	30	**–**	**MS1160**	T20
3017334	**A4SML2525M0217**	2	17	2	25	25	31	150	24	34	**MS1944**	**–**	T25
1949634	**A4SML1616K0314**	3	14	3	16	16	27	125	15	35	**MS2091**	**–**	T25
2503556	**A4SML2016K0317**	3	17	3	20	16	32	125	15	37	**MS1970**	**–**	T30
1949636	**A4SML2020K0314**	3	14	3	20	20	27	125	19	35	**MS1595**	**–**	T30
2503550	**A4SML2020K0317**	3	17	3	20	20	32	125	19	37	**MS1970**	**–**	T30
1949638	**A4SML2525M0317**	3	17	3	25	25	32	150	24	37	**MS1970**	**–**	T30
1949640	**A4SML2020K0414**	4	14	4	20	20	27	125	18	35	**MS1595**	**–**	T30
2503552	**A4SML2020K0417**	4	17	4	20	20	32	125	18	37	**MS1970**	**–**	T30
1949642	**A4SML2525M0417**	4	17	4	25	25	32	150	23	37	**MS1970**	**–**	T30
1949644	**A4SML3225P0417**	4	17	4	32	25	40	170	23	37	**MS1970**	**–**	T30
1949646	**A4SML2020K0519**	5	19	5	20	20	28	125	18	40	**MS1595**	**–**	T30
1949648	**A4SML2525M0520**	5	20	5	25	25	33	150	23	40	**MS1970**	**–**	T30
1949650	**A4SML3225P0522**	5	22	5	32	25	40	170	23	42	**MS1970**	**–**	T30
2503554	**A4SML2020K0620**	6	20	6	20	20	33	125	17	40	**MS1970**	**–**	T30
2245486	**A4SML2525M0620**	6	20	6	25	25	33	150	22	40	**MS1970**	**–**	T30
2263090	**A4SML3225P0626**	6	26	6	32	25	40	170	22	45	**MS1970**	**–**	T30
2245487	**A4SML2525M0820**	8	20	8	25	25	34	150	21	43	**MS1490**	**–**	T45
2263092	**A4SML3225P0826**	8	26	8	32	25	41	170	21	47	**MS1490**	**–**	T45
2263174	**A4SML3225P1026**	10	26	10	32	25	41	170	21	47	**MS1490**	**–**	T45

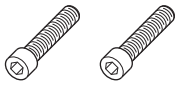




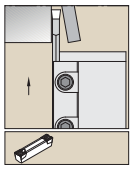
corte à direita (R)

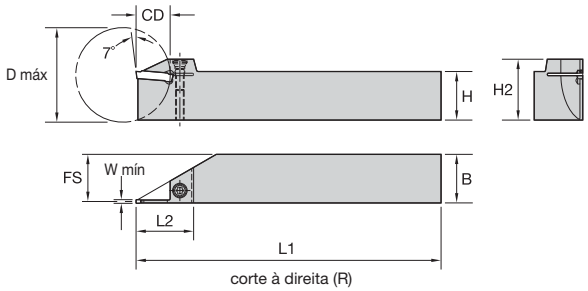


Fixação integral direta • Porta-ferramentas de projeção curta • Sistema métrico

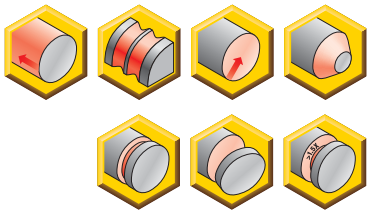


número para pedido	código do produto	tamanho do inserto	CD	W mín	H	B	H2	L1	FS	LH	parafuso do grampo	parafuso do grampo	Torx
corte à direita (R)													
3854265	**A4SMR2020K0208**	2	8	2	20	20	24	125	19	26	–	**MS1160**	T20
3854267	**A4SMR2020K0308**	3	8	3	20	20	27	125	19	28	**MS1595**	–	T30
3854269	**A4SMR2020K0408**	4	8	4	20	20	27	125	18	28	**MS1595**	–	T30
3854271	**A4SMR2525M0510**	5	10	5	25	25	33	150	23	32	**MS1970**	–	T30
3854273	**A4SMR2525M0610**	6	10	6	25	25	33	150	22	37	**MS1970**	–	T30
corte à esquerda (L)													
3854266	**A4SML2020K0208**	2	8	2	20	20	24	125	19	26	–	**MS1160**	T20
3854268	**A4SML2020K0308**	3	8	3	20	20	27	125	19	28	**MS1595**	–	T30
3854270	**A4SML2020K0408**	4	8	4	20	20	27	125	18	28	**MS1595**	–	T30
3854272	**A4SML2525M0510**	5	10	5	25	25	33	150	23	32	**MS1970**	–	T30
3854274	**A4SML2525M0610**	6	10	6	25	25	33	150	22	37	**MS1970**	–	T30

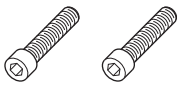




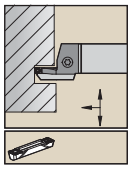
corte à direita (R)



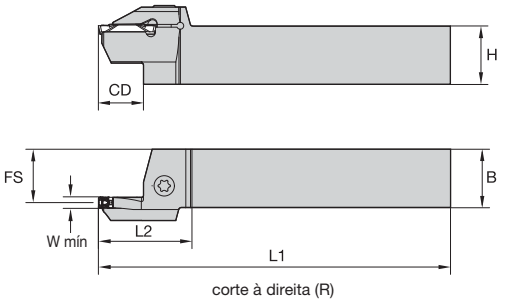
Fixação superior reta integral • Métrico



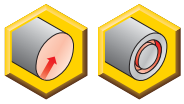
número para pedido	código do produto	tamanho do inserto	D máx	CD	W mín	H	B	H2	L1	FS	LH	parafuso do grampo	parafuso do grampo	tamanho da chave do parafuso de fixação
corte à direita (R)														
2982224	**A4SCR1010K0113**	1	27	13,500	1,50	10	10	21	125	9,40	25	**MS1156**	–	T15
2978378	**A4SCR1212K0113**	1	27	13,500	1,50	12	12	21	125	11,40	25	**MS1156**	–	T15
2982223	**A4SCR1616K0113**	1	27	13,500	1,50	16	16	21	125	15,40	25	**MS1156**	–	T15
2982172	**A4SCR2020K0113**	1	27	13,500	1,50	20	20	25	125	19,40	25	**MS1156**	–	T15
4169745	**A4SCR1212K0214**	2	28	14,000	2,00	12	12	21	125	11,17	28	**MS1160**	–	T20
4169746	**A4SCR1616K0217**	2	34	17,000	2,00	16	16	26	125	15,20	31	–	**MS1944**	T25
4169747	**A4SCR1212K0314**	3	28	14,000	3,00	12	12	23	125	10,72	30	–	**MS2091**	25 IP
4169748	**A4SCR1616K0317**	3	34	17,000	3,00	16	16	27	125	14,72	33	–	**MS2091**	25 IP
corte à esquerda (L)														
2982170	**A4SCL1212K0113**	1	27	13,500	1,50	12	12	21	125	11,40	25	**MS1156**	–	T15
2982169	**A4SCL1616K0113**	1	27	13,500	1,50	16	16	21	125	15,40	25	**MS1156**	–	T15
2982168	**A4SCL2020K0113**	1	27	13,500	1,50	20	20	25	125	19,40	25	**MS1156**	–	T15
4169749	**A4SCL1212K0214**	2	28	14,000	2,00	12	12	21	125	11,17	28	**MS1160**	–	T20
4169750	**A4SCL1616K0217**	2	34	17,000	2,00	16	16	26	125	15,20	31	–	**MS1944**	T25
4169752	**A4SCL1616K0317**	3	34	17,000	3,00	16	16	27	125	14,72	33	–	**MS2091**	25 IP



Corte à direita mostrado.



corte à direita (R)



Canal de face integral • Externo • Sistema métrico



número para pedido	código do produto	tamanho do inserto	CD	D mín	D máx	W mín	H	B	H2	L1	FS	LH	parafuso do grampo	Torx
corte à direita (R)														
3865920	**A4SBR2020K2S12016020**	2S	12	16	20	2,00	20	20	25	125	19,20	28	–	T20
3865921	**A4SBR2020K2S12020025**	2S	12	20	25	2,00	20	20	25	125	19,20	28	–	T20
3865922	**A4SBR2020K2S12025036**	2S	12	25	36	2,00	20	20	25	125	19,20	28	–	T20
3865923	**A4SBR2020K3S14020025**	3S	14	20	25	3,00	20	20	28	125	18,70	35	**MS1595**	T30
3865924	**A4SBR2020K3S14025036**	3S	14	25	36	3,00	20	20	28	125	18,70	35	**MS1595**	T30
3865926	**A4SBR2020K4S14035048**	4S	14	35	48	4,00	20	20	28	125	18,20	35	**MS1595**	T30
3865927	**A4SBR2525M5S19028038**	5S	19	28	38	5,00	25	25	33	150	22,70	40	**MS1970**	T30
3865928	**A4SBR2525M5S19038058**	5S	19	38	58	5,00	25	25	33	150	22,70	40	**MS1970**	T30
corte à esquerda (L)														
3865929	**A4SBL2020K2S12016020**	2S	12	16	20	2,00	20	20	25	125	19,20	28	–	T20
3865931	**A4SBL2020K2S12025036**	2S	12	25	36	2,00	20	20	25	125	19,20	28	–	T20
3865932	**A4SBL2020K3S14020025**	3S	14	20	25	3,00	20	20	28	125	18,70	35	**MS1595**	T30
3865934	**A4SBL2020K4S14025035**	4S	14	25	35	4,00	20	20	28	125	18,20	35	**MS1595**	T30
3865937	**A4SBL2525M5S19038058**	5S	19	38	58	5,00	25	25	33	150	22,70	40	**MS1970**	T30

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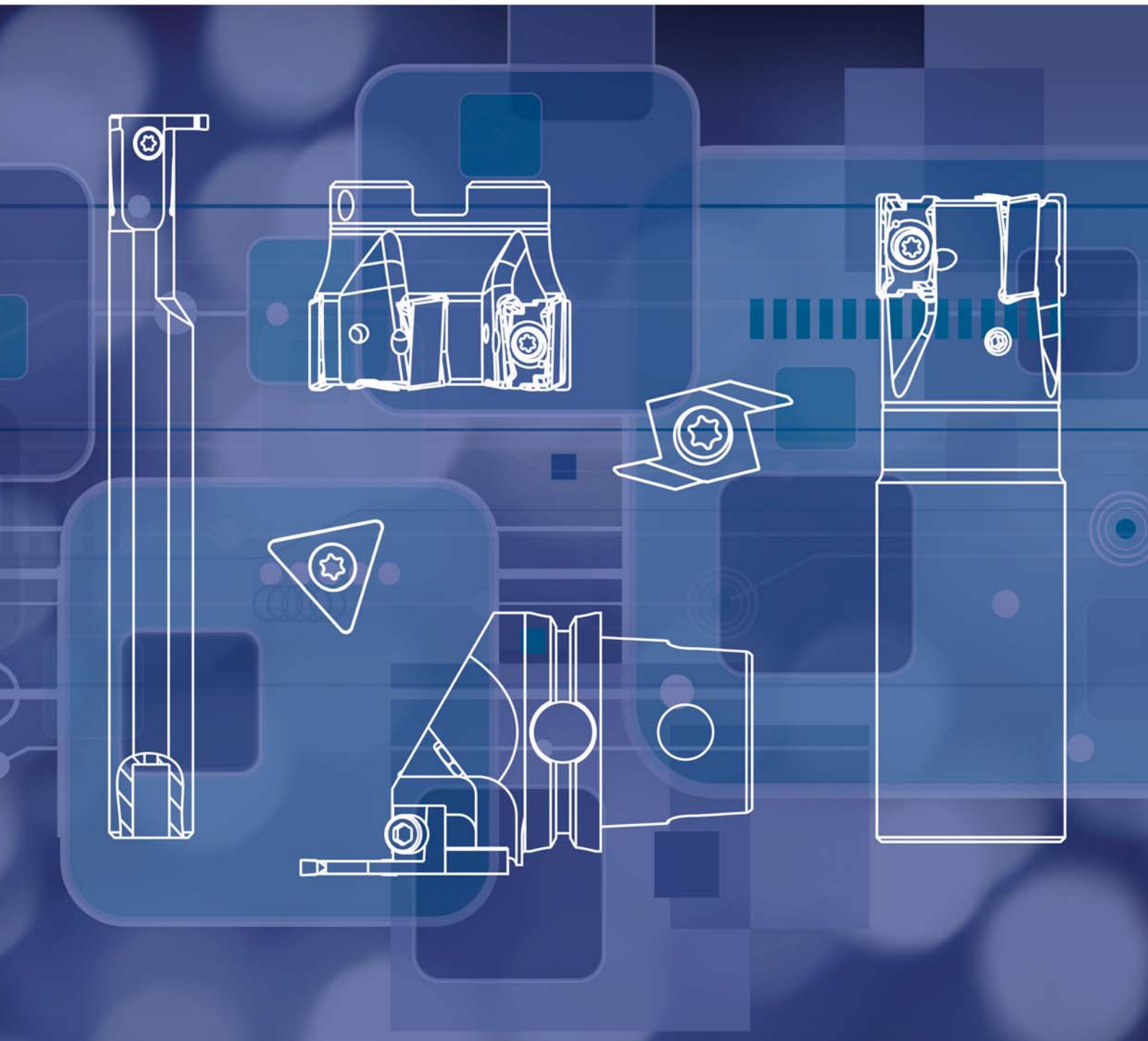

01

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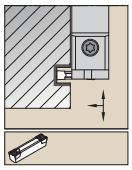
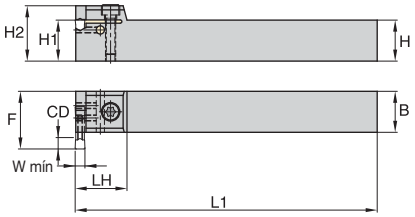
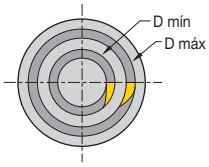
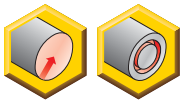




corte à direita (R)





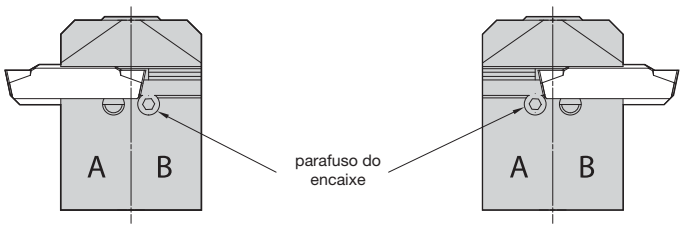
Canal de face integral • Montagem de topo • Sentido de rotação duplo • Sistema métrico




número para pedido	código do produto	tamanho do inserto	CD	W mín	D mín	H1	B	H2	L1	F	LH	parafuso do grampo	Torx	parafuso de assentamento sextavado	sextavado (mm)
2414136	**A4ENN2020K0305**	3	5	3,00	70	20	20	27	125,0	25,4	25	**MS2091**	T25	**MS2090**	1.5 mm
2414137	**A4ENN2525M0305**	3	5	3,00	70	25	25	32	150,0	30,4	25	**MS2091**	T25	**MS2090**	1.5 mm
1949651	**A4ENN2020K0407**	4	7	4,00	90	20	20	27	125,0	27,9	25	**MS2091**	T25	**MS2090**	1.5 mm
1949652	**A4ENN2525M0407**	4	7	4,00	90	25	25	32	150,0	33,1	25	**MS2091**	T25	**MS2090**	1.5 mm
1949654	**A4ENN2525M0509**	5	9	5,00	120	25	25	33	150,0	35,1	34	**MS1970**	T30	**193.297**	1.5 mm
2503543	**A4ENN2020K0611**	6	11	6,00	120	20	20	28	125,0	35,4	34	**MS1595**	T30	**193.297**	2 mm
2503544	**A4ENN2525M0611**	6	11	6,00	120	25	25	33	150,0	38,9	34	**MS1970**	T30	**193.297**	2 mm
2503545	**A4ENN3232P0611**	6	11	6,00	120	32	32	40	170,0	43,4	34	**MS1970**	T30	**193.297**	2 mm

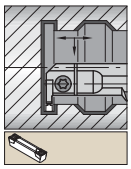
NOTA: D mín. para aplicações de canal de face.
Os porta-ferramentas estilo A4EN são projetados sem apoio de aço estendido, para o recurso de abertura de canal de face. As recomendações de avanço de corte devem ser reduzidas de 25 a 30%.
Torque do parafuso de fixação recomendado: 50–70 pol. lbs. (6–8 Nm).
A largura mínima de corte é fornecida somente como referência. Consulte a lista de insertos para verificar a largura real. O tamanho do alojamento do inserto deve corresponder ao tamanho do alojamento do porta-ferramentas escolhido.

Montagem dos insertos nos porta-ferramentas A4EN

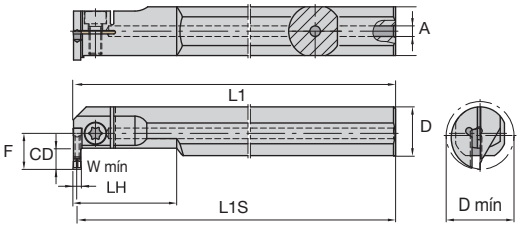


corte esquerdo — corte direito

Os porta-ferramentas A4EN podem ser usados para aplicações tanto com sentido de rotação à direita quanto à esquerda. O parafuso de fixação deve ser usado na posição B para corte à esquerda e na posição A para corte à direita.



Haste de aço com refrigeração interna.



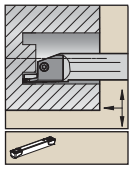
corte à direita (R)

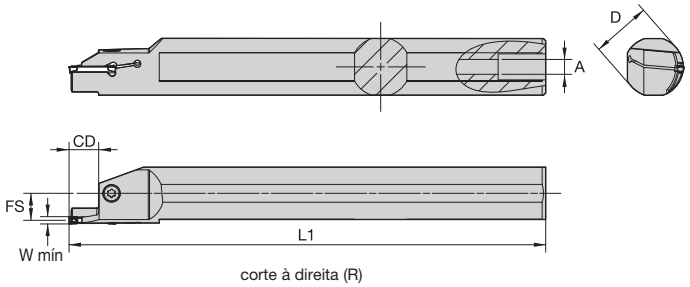


Barra de mandrilar em aço • Métrico

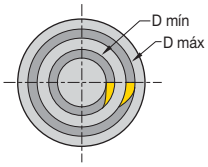


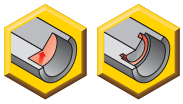
número para pedido	código do produto	tamanho do inserto	CD	W mín	D	D mín	L1	F	L1S	A	parafuso do grampo	tamanho da chave do parafuso de fixação
corte à direita (R)												
2979223	**A20RA4EMR0207M**	2	7,00	2,00	20	25	200	13	199,0	4,00	**MS2089**	25 IP
2979225	**A25RA4EMR0210M**	2	10,00	2,00	25	32	200	17	199,0	5,00	**MS2089**	25 IP
1949655	**A20RA4EMR0307M**	3	7,00	3,00	20	25	200	13	198,5	4,00	**MS2089**	25 IP
1949657	**A25RA4EMR0310M**	3	10,00	3,00	25	32	200	17	198,5	5,00	**MS1595**	T30
1949659	**A32SA4EMR0312M**	3	12,00	3,00	32	40	250	22	248,5	6,00	**MS1595**	T30
1949661	**A20RA4EMR0407M**	4	7,00	4,00	20	25	200	13	198,0	4,00	**MS2089**	25 IP
1949663	**A25RA4EMR0410M**	4	10,00	4,00	25	32	200	17	198,0	5,00	**MS1595**	T30
1949665	**A32SA4EMR0412M**	4	12,00	4,00	32	40	250	22	248,0	6,00	**MS1595**	T30
1949667	**A40TA4EMR0416M**	4	16,00	4,00	40	52	300	30	298,0	6,00	**MS1970**	T30
1949669	**A32SA4EMR0516M**	5	16,00	5,00	32	44	250	26	247,5	6,00	**MS1595**	T30
1949671	**A40TA4EMR0516M**	5	16,00	5,00	40	52	300	30	297,5	6,00	**MS1970**	T30
2263197	**A40TA4EMR0616M**	6	16,00	6,00	40	52	300	30	297,0	6,00	**MS1970**	T30
corte à esquerda (L)												
2979192	**A20RA4EML0207M**	2	7,00	2,00	20	25	200	13	199,0	4,00	**MS2089**	25 IP
2979224	**A25RA4EML0210M**	2	10,00	2,00	25	32	200	17	199,0	5,00	**MS2089**	25 IP
1949656	**A20RA4EML0307M**	3	7,00	3,00	20	25	200	13	198,5	4,00	**MS2089**	25 IP
1949658	**A25RA4EML0310M**	3	10,00	3,00	25	32	200	17	198,5	5,00	**MS1595**	T30
1949660	**A32SA4EML0312M**	3	12,00	3,00	32	40	250	22	248,5	6,00	**MS1595**	T30
1949662	**A20RA4EML0407M**	4	7,00	4,00	20	25	200	13	198,0	4,00	**MS2089**	25 IP
1949664	**A25RA4EML0410M**	4	10,00	4,00	25	32	200	17	198,0	5,00	**MS1595**	T30
1949666	**A32SA4EML0412M**	4	12,00	4,00	32	40	250	22	248,0	6,00	**MS1595**	T30
1949668	**A40TA4EML0416M**	4	16,00	4,00	40	52	300	30	298,0	6,00	**MS1970**	T30
1949670	**A32SA4EML0516M**	5	16,00	5,00	32	44	250	26	247,5	6,00	**MS1595**	T30
1949672	**A40TA4EML0516M**	5	16,00	5,00	40	52	300	30	297,5	6,00	**MS1970**	T30
2263198	**A40TA4EML0616M**	6	16,00	6,00	40	52	300	30	297,0	6,00	**MS1970**	T30





corte à direita (R)





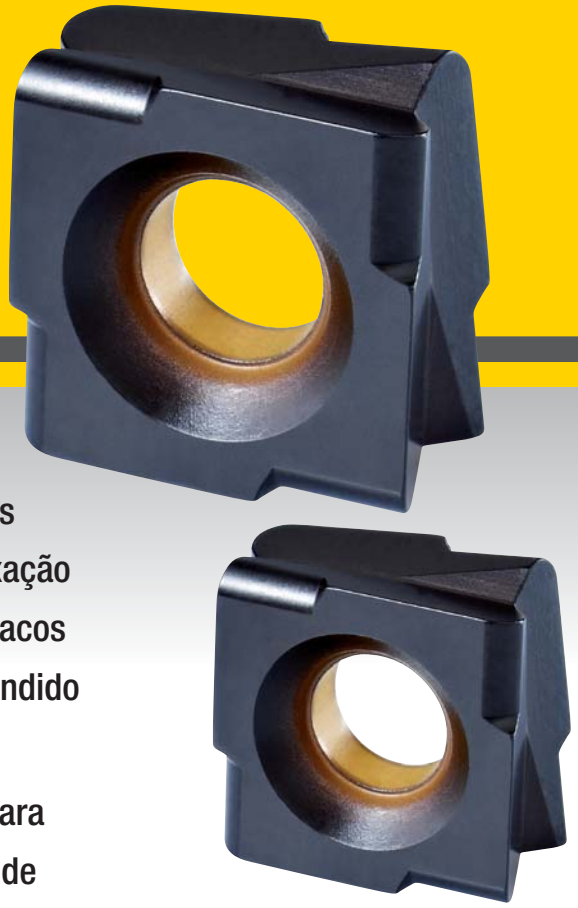
Barra de mandrilar em aço de abertura de canal de face • Métrico



número para pedido	código do produto	tamanho do inserto	CD	D mín	D máx	W mín	D	L1	FS	A	parafuso do grampo	tamanho da chave do parafuso de fixação
corte à direita (R)												
3871038	**A16RA4SAR2S12M017021**	2S	12,00	17	21	2,00	16	201	7	4,00	**MS1160**	T20
3871039	**A20RA4SAR2S12M021026**	2S	12,00	21	23	2,00	20	201	9	4,00	**MS1160**	T20
3871040	**A25RA4SAR2S12M026036**	2S	12,00	26	36	2,00	25	201	12	6,35	**MS1160**	T20
3871041	**A20RA4SAR3S14M021026**	3S	14,00	21	26	3,00	20	201	9	4,00	**MS1160**	T20
3871042	**A25RA4SAR3S14M026036**	3S	14,00	26	36	3,00	25	201	11	6,35	**MS1160**	T20
corte à esquerda (L)												
3871033	**A16RA4SAL2S12M017021**	2S	12,00	17	21	2,00	16	201	7	4,00	**MS1160**	T20
3871034	**A20RA4SAL2S12M021026**	2S	12,00	21	26	2,00	20	201	9	4,00	**MS1160**	T20
3871035	**A25RA4SAL2S12M026036**	2S	12,00	26	36	2,00	25	201	12	6,35	**MS1160**	T20
3871037	**A25RA4SAL3S14M026036**	3S	14,00	26	36	3,00	25	201	11	6,35	**MS1160**	T20

O programa de inserto retificado de precisão Fix-Perfect™ com Beyond™ vai além!

Fix-Perfect™



As características de desempenho inovadoras desses insertos retificados de precisão permitem uma indexação absolutamente precisa e com excelente fluxo de cavacos na usinagem de materiais das peças de aço, ferro fundido e aço inoxidável.

Os insertos Fix-Perfect Beyond são a solução ideal para operações de usinagem em uma grande quantidade de indústrias, incluindo as de energia hidráulica, energia, automotiva, equipamentos pesados e aplicações de engenharia geral.

Experimente as vantagens no seu distribuidor autorizado da Kennametal ou no site **kennametal.com**.

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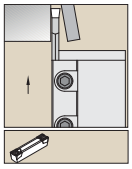
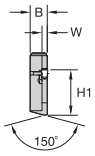
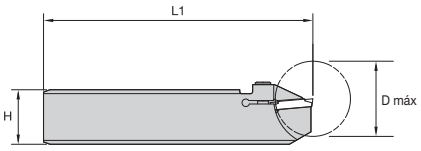
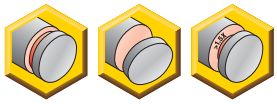






corte à direita (R)

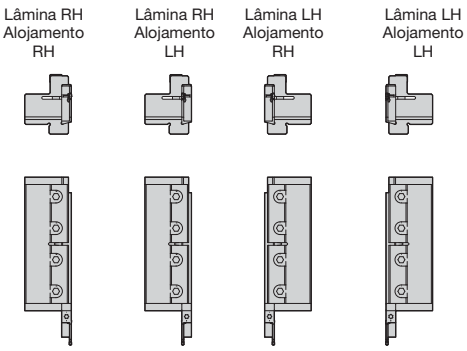


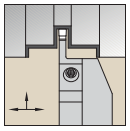
Lâmina de corte de ponta simples • Sistema métrico



número para pedido	código do produto	tamanho do inserto	H	W	H1	L1	B	D máx	parafuso do grampo	Torx
corte à direita (R)										
3967127	**A4BHCL26K0317R**	3	26	3,0	21,4	125	7,95	35	**MS1571**	T20
3967124	**A4BHCL32K0317R**	3	32	3,0	25,0	125	7,95	35	**MS1571**	T20
3967117	**A4BHCR32K0217R**	2	32	2,0	25,0	125	7,95	35	**MS1571**	T20
corte à esquerda (L)										
3967136	**A4BHCL32K0217L**	2	32	2,0	25,0	125	7,95	35	**MS1571**	T20
3967137	**A4BHCL32K0317L**	3	32	3,0	25,0	125	7,95	35	**MS1571**	T20
3967134	**A4BHCR26K0317L**	3	26	3,0	21,4	125	7,95	35	**MS1571**	T20

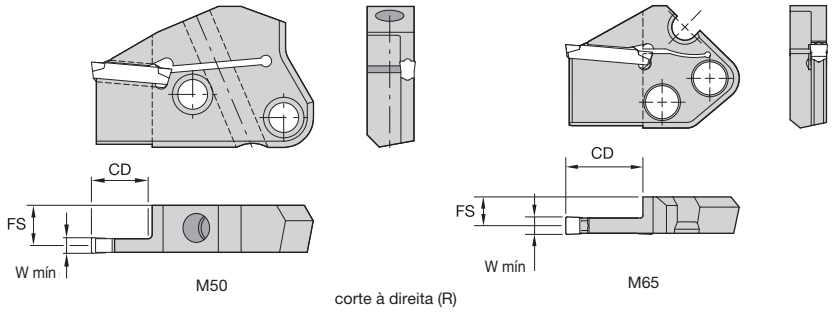
NOTA: Somente para lâminas com tamanho do alojamento 1.
As chaves para montagem 170.137 e 170.130 devem ser pedidas separadamente.





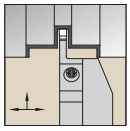
Corte à direita mostrado.





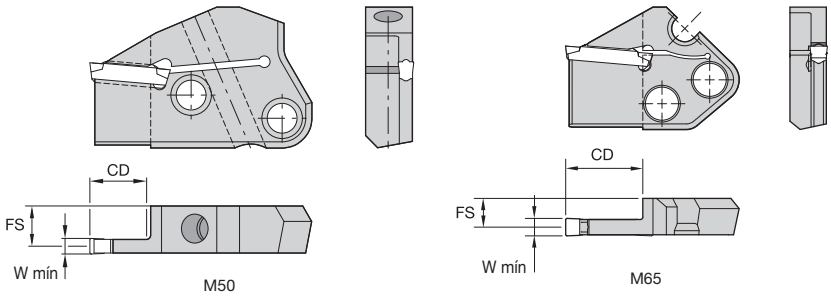
Lâmina Modular Reta com Refrigeração

número para pedido	código do produto	tamanho do inserto	CD	FS	tamanho da lâmina
corte à direita (R)					
6401815	**A4M50R0314MC**	3	14,0	10,42	50
6401817	**A4M50R0414MC**	4	14,0	9,92	50
6401819	**A4M50R0519MC**	5	19,0	9,42	50
6401834	**A4M65R0620MC**	6	20,0	9,88	65
6401838	**A4M65R0820MC**	8	20,0	9,00	65
6401852	**A4M65R1020MC**	10	20,0	8,35	65
6401831	**A4M65R0522MC**	5	22,0	10,28	65
6401835	**A4M65R0626MC**	6	26,0	9,88	65
6401839	**A4M65R0826MC**	8	26,0	9,00	65
6401853	**A4M65R1026MC**	10	26,0	8,35	65
corte à esquerda (L)					
6401814	**A4M50L0314MC**	3	14,0	10,42	50
6401816	**A4M50L0414MC**	4	14,0	9,92	50
6401818	**A4M50L0519MC**	5	19,0	9,43	50
6401832	**A4M65L0620MC**	6	20,0	9,88	65
6401836	**A4M65L0820MC**	8	20,0	9,00	65
6401840	**A4M65L1020MC**	10	20,0	8,35	65
6401820	**A4M65L0522MC**	5	22,0	10,28	65
6401833	**A4M65L0626MC**	6	26,0	9,88	65
6401837	**A4M65L0826MC**	8	26,0	9,00	65
6401851	**A4M65L1026MC**	10	26,0	8,35	65



Corte à direita mostrado.



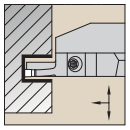


corte à direita (R)

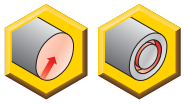
Lâmina reta modular

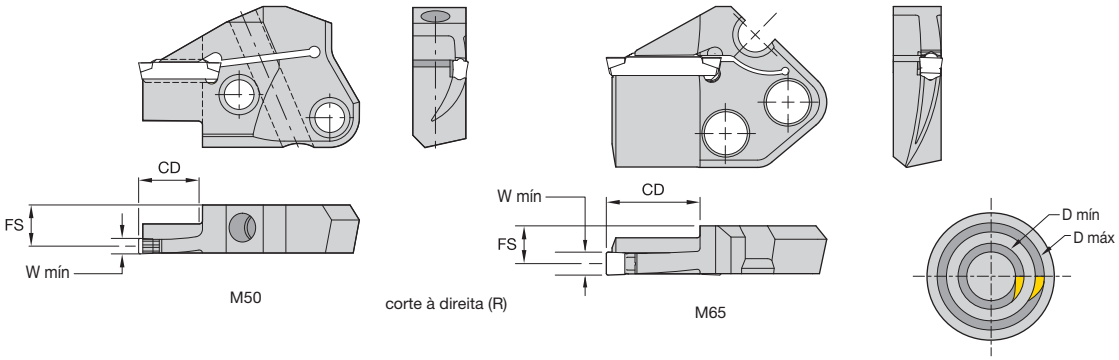
número para pedido	código do produto	tamanho do inserto	W mín	CD	FS	tamanho da lâmina
corte à direita (R)						
3051624	**A4M50R0214M**	2	2,00	14,0	10,87	50
1989348	**A4M50R0314M**	3	3,00	14,0	10,43	50
1989350	**A4M50R0414M**	4	4,00	14,0	9,93	50
1989352	**A4M50R0519M**	5	5,00	19,0	9,43	50
3557114	**A4M65R0620M**	6	6,00	20,0	9,88	65
3557116	**A4M65R0626M**	6	6,00	26,0	9,88	65
3557120	**A4M65R0826M**	8	8,00	26,0	9,00	65
3557124	**A4M65R1026M**	10	10,00	26,0	8,35	65
corte à esquerda (L)						
3022625	**A4M50L0214M**	2	2,00	14,0	10,87	50
1989347	**A4M50L0314M**	3	3,00	14,0	10,43	50
1989349	**A4M50L0414M**	4	4,00	14,0	9,93	50
3051623	**A4M50L2B14M**	2B	2,50	14,0	10,70	50
1989351	**A4M50L0519M**	5	5,00	19,0	9,43	50
3557115	**A4M65L0620M**	6	6,00	20,0	9,88	65
3557119	**A4M65L0820M**	8	8,00	20,0	9,00	65
3557123	**A4M65L1020M**	10	10,00	20,0	8,35	65
3557117	**A4M65L0626M**	6	6,00	26,0	9,88	65
3557121	**A4M65L0826M**	8	8,00	26,0	9,00	65
3557125	**A4M65L1026M**	10	10,00	26,0	8,35	65

NOTA: O alojamento com tamanho 2B só aceita insertos de tamanho 2B. O alojamento com tamanho 2 aceita insertos de tamanho 2 ou 2B.



Corte à direita mostrado.





Lâmina de canal de face modular • Interna

número para pedido	código do produto	tamanho do inserto	D mín	D máx	tamanho da cápsula
corte à direita (R)					
3051670	**A4M50R0212A036046**	2	36	46	50
3051671	**A4M50R0212A042054**	2	42	54	50
3051672	**A4M50R0212A050064**	2	50	64	50
3051673	**A4M50R0212A060084**	2	60	84	50
3051674	**A4M50R0212A080124**	2	80	124	50
3051675	**A4M50R0212A120254**	2	120	254	50
3051676	**A4M50R0212A250999**	2	250	–	50
2542517	**A4M50R0314A036048**	3	36	48	50
2542518	**A4M50R0314A042058**	3	42	58	50
2542519	**A4M50R0314A052074**	3	52	74	50
2542520	**A4M50R0314A068100**	3	68	100	50
2542521	**A4M50R0314A090160**	3	90	160	50
2542522	**A4M50R0314A130300**	3	130	300	50
2542523	**A4M50R0314A290999**	3	290	–	50
2542531	**A4M50R0414A048072**	4	48	72	50
2542532	**A4M50R0414A064100**	4	64	100	50
2542533	**A4M50R0414A092150**	4	92	150	50
2542534	**A4M50R0414A132300**	4	132	300	50
2542535	**A4M50R0414A290999**	4	290	–	50
2542541	**A4M50R0519A058094**	5	58	94	50
2542542	**A4M50R0519A080136**	5	80	136	50
2542543	**A4M50R0519A120300**	5	120	300	50
2542544	**A4M50R0519A250999**	5	250	–	50
3557131	**A4M65R0624A070-112**	6	70	112	65
3557163	**A4M65R0624A100-212**	6	100	212	65
3557165	**A4M65R0624A200-999**	6	200	999	65
3557167	**A4M65R0824A090-200**	8	90	200	65
3557169	**A4M65R0824A184-999**	8	184	999	65
3557173	**A4M65R1024A200-999**	10	200	999	65

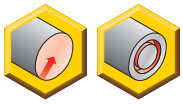
(continuação)

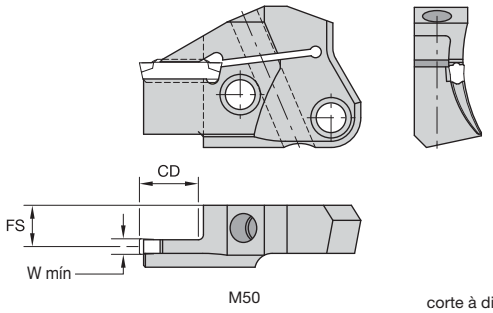
(Lâmina de canal de face modular • Interna — continuação)

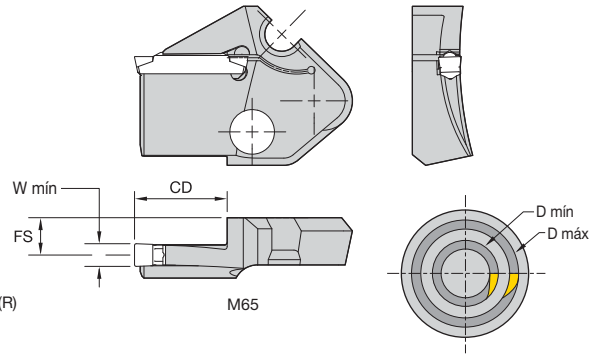
número para pedido	código do produto	tamanho do inserto	D mín	D máx	tamanho da cápsula
corte à esquerda (L)					
3051629	**A4M50L0212A060084**	2	60	84	50
3051631	**A4M50L0212A120254**	2	120	254	50
3051632	**A4M50L0212A250999**	2	250	—	50
2542524	**A4M50L0314A036048**	3	36	48	50
2542527	**A4M50L0314A068100**	3	68	100	50
2542528	**A4M50L0314A090160**	3	90	160	50
2542529	**A4M50L0314A130300**	3	130	300	50
2542530	**A4M50L0314A290999**	3	290	—	50
2542537	**A4M50L0414A064100**	4	64	100	50
2542538	**A4M50L0414A092150**	4	92	150	50
2542539	**A4M50L0414A132300**	4	132	300	50
2542540	**A4M50L0414A290999**	4	290	—	50
2542545	**A4M50L0519A058094**	5	58	94	50
2542546	**A4M50L0519A080136**	5	80	136	50
2542547	**A4M50L0519A120300**	5	120	300	50
2542548	**A4M50L0519A250999**	5	250	—	50
3557132	**A4M65L0624A070-112**	6	70	112	65
3557164	**A4M65L0624A100-212**	6	100	212	65
3557166	**A4M65L0624A200-999**	6	200	999	65
3557174	**A4M65L1024A200-999**	10	200	999	65



Corte à direita mostrado.







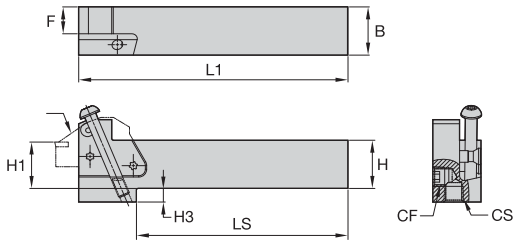
Lâmina de canal de face modular • Externa

número para pedido	código do produto	tamanho do inserto	D mín	D máx	CD	FS	tamanho da cápsula
corte à direita (R)							
3051677	**A4M50R0212B036046**	2	36	46	12,00	10,900	50
3051678	**A4M50R0212B042054**	2	42	54	12,00	10,900	50
3051679	**A4M50R0212B050064**	2	50	64	12,00	10,900	50
3051680	**A4M50R0212B060084**	2	60	84	12,00	10,900	50
3051681	**A4M50R0212B080124**	2	80	124	12,00	10,900	50
3051682	**A4M50R0212B120254**	2	120	254	12,00	10,900	50
3051683	**A4M50R0212B250999**	2	250	–	12,00	10,900	50
3867457	**A4M50R2S12B016020**	2S	16	20	12,00	10,900	50
3867458	**A4M50R2S12B020025**	2S	20	25	12,00	10,900	50
3867459	**A4M50R2S12B025036**	2S	25	36	12,00	10,900	50
2398751	**A4M50R0314B036048**	3	36	48	14,00	10,500	50
2398752	**A4M50R0314B042058**	3	42	58	14,00	10,500	50
2398763	**A4M50R0314B052074**	3	52	74	14,00	10,500	50
2398764	**A4M50R0314B068100**	3	68	100	14,00	10,500	50
2398765	**A4M50R0314B090160**	3	90	160	14,00	10,500	50
2398766	**A4M50R0314B130300**	3	130	300	14,00	10,500	50
2398767	**A4M50R0314B290999**	3	290	–	14,00	10,500	50
2398775	**A4M50R0414B048072**	4	48	72	14,00	10,000	50
2398776	**A4M50R0414B064100**	4	64	100	14,00	10,000	50
2398777	**A4M50R0414B092150**	4	92	150	14,00	10,000	50
2398778	**A4M50R0414B132300**	4	132	300	14,00	10,000	50
2398779	**A4M50R0414B290999**	4	290	–	14,00	10,000	50
3867460	**A4M50R3S14B020025**	3S	20	25	14,00	10,490	50
3867461	**A4M50R3S14B025036**	3S	25	36	14,00	10,490	50
3867462	**A4M50R4S14B025035**	4S	25	35	14,00	10,000	50
3867464	**A4M50R5S17B028038**	5S	28	38	17,00	9,500	50
2398785	**A4M50R0519B058094**	5	58	94	19,00	9,500	50
2398786	**A4M50R0519B080136**	5	80	136	19,00	9,500	50
2398787	**A4M50R0519B120300**	5	120	300	19,00	9,500	50
2398788	**A4M50R0519B250999**	5	250	–	19,00	9,500	50
3557175	**A4M65R0624B070-112**	6	70	112	24,00	9,870	65
3557177	**A4M65R0624B100-212**	6	100	212	24,00	9,870	65
3557179	**A4M65R0624B200-999**	6	200	999	24,00	9,870	65
3557181	**A4M65R0824B090-200**	8	90	200	24,00	9,000	65
3557193	**A4M65R0824B184-999**	8	184	999	24,00	9,000	65
3557195	**A4M65R1024B100-220**	10	100	220	24,00	8,350	65
3557197	**A4M65R1024B200-999**	10	200	999	24,00	8,350	65

(continuação)

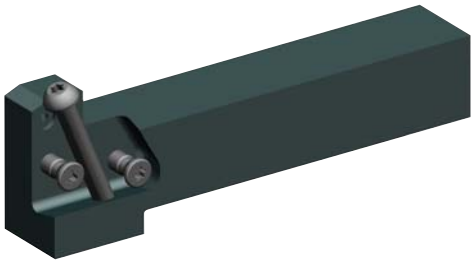
(Lâmina de canal de face modular • Externa — continuação)

número para pedido	código do produto	tamanho do inserto	D mín	D máx	CD	FS	tamanho da cápsula
corte à esquerda (L)							
3051663	**A4M50L0212B036046**	2	36	46	12,00	10,900	50
3051664	**A4M50L0212B042054**	2	42	54	12,00	10,900	50
3051665	**A4M50L0212B050064**	2	50	64	12,00	10,900	50
3051666	**A4M50L0212B060084**	2	60	84	12,00	10,900	50
3051667	**A4M50L0212B080124**	2	80	124	12,00	10,900	50
3051668	**A4M50L0212B120254**	2	120	254	12,00	10,900	50
3867466	**A4M50L2S12B016020**	2S	16	20	12,00	10,900	50
3867467	**A4M50L2S12B020025**	2S	20	25	12,00	10,900	50
3867468	**A4M50L2S12B025036**	2S	25	36	12,00	10,900	50
2398768	**A4M50L0314B036048**	3	36	48	14,00	10,500	50
2398769	**A4M50L0314B042058**	3	42	58	14,00	10,500	50
2398770	**A4M50L0314B052074**	3	52	74	14,00	10,500	50
2398771	**A4M50L0314B068100**	3	68	100	14,00	10,500	50
2398772	**A4M50L0314B090160**	3	90	160	14,00	10,500	50
2398773	**A4M50L0314B130300**	3	130	300	14,00	10,500	50
2398774	**A4M50L0314B290999**	3	290	—	14,00	10,500	50
2398780	**A4M50L0414B048072**	4	48	72	14,00	10,000	50
2398781	**A4M50L0414B064100**	4	64	100	14,00	10,000	50
2398782	**A4M50L0414B092150**	4	92	150	14,00	10,000	50
2398783	**A4M50L0414B132300**	4	132	300	14,00	10,000	50
2398784	**A4M50L0414B290999**	4	290	—	14,00	10,000	50
3867469	**A4M50L3S14B020025**	3S	20	25	14,00	10,490	50
3867470	**A4M50L3S14B025036**	3S	25	36	14,00	10,490	50
3867472	**A4M50L4S14B035048**	4S	35	48	14,00	10,000	50
3867484	**A4M50L5S17B028038**	5S	28	38	17,00	9,500	50
2398789	**A4M50L0519B058094**	5	58	94	19,00	9,500	50
2398790	**A4M50L0519B080136**	5	80	136	19,00	9,500	50
2398791	**A4M50L0519B120300**	5	120	300	19,00	9,500	50
2398792	**A4M50L0519B250999**	5	250	—	19,00	9,500	50
3557176	**A4M65L0624B070-112**	6	70	112	24,00	9,870	65
3557178	**A4M65L0624B100-212**	6	100	212	24,00	9,870	65
3557180	**A4M65L0624B200-999**	6	200	999	24,00	9,870	65
3557182	**A4M65L0824B090-200**	8	90	200	24,00	9,000	65
3557194	**A4M65L0824B184-999**	8	184	999	24,00	9,000	65
3557198	**A4M65L1024B200-999**	10	200	999	24,00	8,350	65



Necessários 2 parafusos para lâmina.

corte à direita (R)



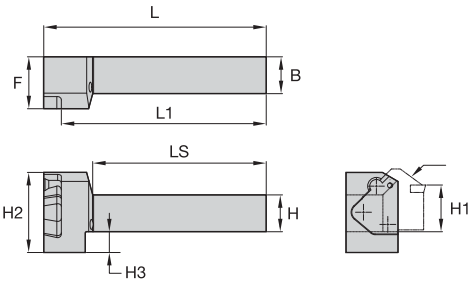
Porta-ferramenta modular reto com refrigeração • Métrico

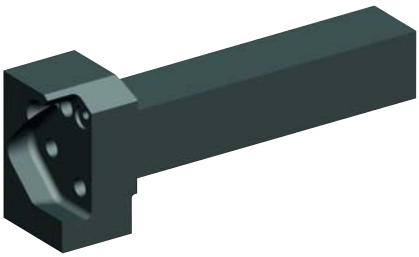
NOTA: Para porta ferramenta modular reto com refrigeração, veja página C58.




número para pedido	código do produto	B	H	L1	F	LS	H3	parafuso da lâmina	Torx	parafuso do grampo	Torx
corte à direita (R)											
1600249	**KGMSR2525M50**	25	25	138,75	13,84	109,00	7,00	**MS1162**	T25	**MS2002**	T25
3553429	**KGMSR2525M65**	25	25	150,00	13,00	120,00	14,00	**MS1163**	T30	**–**	–
1621083	**KGMSR3232P50**	32	32	158,75	20,81	–	–	**MS1162**	T25	**MS2002**	T25
3553431	**KGMSR3232P65**	32	32	170,00	20,79	158,00	7,00	**MS1163**	T30	**–**	–
corte à esquerda (L)											
1600250	**KGMSL2525M50**	25	25	138,75	13,84	109,00	7,00	**MS1162**	T25	**MS2002**	T25
3553430	**KGMSL2525M65**	25	25	150,00	13,00	120,00	14,00	**MS1163**	T30	**–**	–
1621084	**KGMSL3232P50**	32	32	158,75	20,81	–	–	**MS1162**	T25	**MS2002**	T25
3553432	**KGMSL3232P65**	32	32	170,00	20,79	158,00	7,00	**MS1163**	T30	**–**	–

NOTA: KGMS..: Suportes com sentido de rotação à direita usam lâminas com sentido de rotação à direita.
KGME..: Suportes com sentido de rotação à direita usam lâminas com sentido de rotação à esquerda.
O torque dos parafusos de fixação e da lâmina M50 deve estar entre 8–10 Nm (71–88 lb-pol).
O torque dos parafusos de fixação e da lâmina deve estar entre 8–10 Nm (71–88 lb-pol).





M65
Necessários 2 parafusos para lâmina.

corte à direita (R)

Porta-ferramentas de montagem de topo reto • Sistema métrico

NOTA: Para porta ferramenta modular lateral com refrigeração, veja página C59.

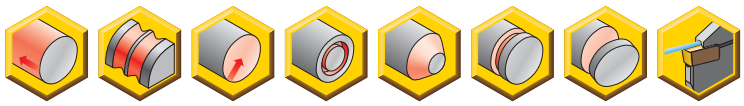


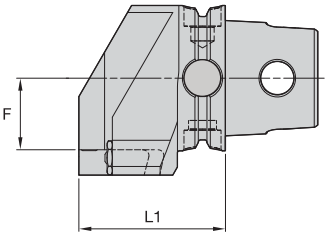


número para pedido	código do produto	B	H	L1	F	LS	H3	L	parafuso da lâmina (2 necessários)	Torx	parafuso do grampo	Torx
corte à direita (R)												
1600270	**KGMER2525M50**	25	25	139,25	42,75	125,25	6,84	150,25	**MS1162**	T25	**MS2002**	T25
3553453	**KGMER2525M65**	25	25	138,15	35,00	129,00	14,00	150,00	**MS1163**	T30	**–**	–
1621085	**KGMER3232P50**	32	32	159,25	42,75	145,25	–	170,25	**MS1162**	T25	**MS2002**	T25
3553455	**KGMER3232P65**	32	32	158,15	35,00	153,00	7,00	170,00	**MS1163**	T30	**–**	–
corte à esquerda (L)												
1600271	**KGMEL2525M50**	25	25	139,25	42,75	125,25	6,84	150,25	**MS1162**	T25	**MS2002**	T25
3553454	**KGMEL2525M65**	25	25	138,15	35,00	129,00	14,00	150,00	**MS1163**	T30	**–**	–
1621086	**KGMEL3232P50**	32	32	159,25	42,75	145,25	–	170,25	**MS1162**	T25	**MS2002**	T25
3553456	**KGMEL3232P65**	32	32	158,15	35,00	153,00	7,00	170,00	**MS1163**	T30	**–**	–

NOTA: KGMS..: Suportes com sentido de rotação à direita usam lâminas com sentido de rotação à direita.
KGME..: Suportes com sentido de rotação à direita usam lâminas com sentido de rotação à esquerda.
O torque dos parafusos de fixação e da lâmina M50 deve estar entre 8–10 Nm (71–88 lb-pol).
O torque dos parafusos de fixação e da lâmina deve estar entre 8–10 Nm (71–88 lb-pol).

- Melhor plataforma KM de troca rápida.
- Com refrigeração através do encaixe.
- Lâminas intercambiáveis para versatilidade e profundidade de corte.







corte à direita (R)

KM™ QUICK CHANGE

Sistema KM modular direto com refrigeração

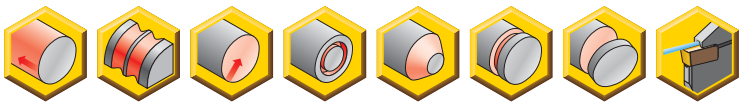


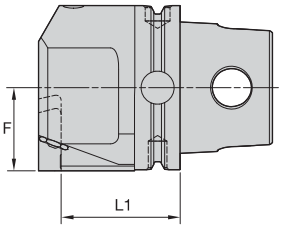


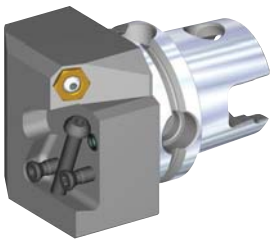
número para pedido	código do produto	Tamanho do sistema CSMS	L1	F	tamanho da lâmina	parafuso da lâmina	Torx	parafuso do grampo	Torx
corte à direita (R)									
5999790	**KM40TSKGMSR50C**	KM40TS	53,5	15,0	50	**MS1162**	T25	**MS2002**	T25
6000422	**KM50TSKGMSR65C**	KM50TS	53,5	22,0	65	**MS1163**	T30	**–**	–
5999864	**KM50TSKGMSR50C**	KM50TS	58,5	23,0	50	**MS1162**	T25	**MS2002**	T25
6000431	**KM63TSKGMSR65C**	KM63TS	58,5	30,0	65	**MS1163**	T30	**–**	–
5999948	**KM63TSKGMSR50C**	KM63TS	63,5	31,0	50	**MS1162**	T25	**MS2002**	T25
5999972	**KM63XMZKGMSR50CY**	KM63XMZ	63,5	31,0	50	**MS1162**	T25	**MS2002**	T25
6017695	**KM80TSKGMSR65C**	KM80TS	63,5	40,0	65	**MS1163**	T30	**–**	–
6000018	**KM80ATCKGMSR50C**	KM80ATC	66,5	41,0	50	**MS1162**	T25	**MS2002**	T25
6000014	**KM80TSKGMSR50C**	KM80TS	66,5	41,0	50	**MS1162**	T25	**MS2002**	T25
corte à esquerda (L)									
5999861	**KM40TSKGMSL50C**	KM40TS	53,5	15,0	50	**MS1162**	T25	**MS2002**	T25
6000424	**KM50TSKGMSL65C**	KM50TS	53,5	22,0	65	**MS1163**	T30	**–**	–
5999865	**KM50TSKGMSL50C**	KM50TS	58,5	23,0	50	**MS1162**	T25	**MS2002**	T25
6000433	**KM63TSKGMSL65C**	KM63TS	58,5	30,0	65	**MS1163**	T30	**–**	–
5999949	**KM63TSKGMSL50C**	KM63TS	63,5	31,0	50	**MS1162**	T25	**MS2002**	T25
5999973	**KM63XMZKGMSLF50CY**	KM63XMZ	63,5	31,0	50	**MS1162**	T25	**MS2002**	T25
6017696	**KM80TSKGMSL65C**	KM80TS	63,5	40,0	65	**MS1163**	T30	**–**	–
6000019	**KM80ATCKGMSL50C**	KM80ATC	66,5	41,0	50	**MS1162**	T25	**MS2002**	T25
6000015	**KM80TSKGMSL50C**	KM80TS	66,5	41,0	50	**MS1162**	T25	**MS2002**	T25

NOTA: KGMS..: Suportes com sentido à direita usam lâminas com sentido à direita.
KGME..: Suportes com sentido à direita usam lâminas com sentido à esquerda.
O torque do parafuso de fixação e da lâmina M50 deve estar entre 8–10 Nm (71–88 pol. lbs.).
O torque do parafuso de fixação e da lâmina M65 deve estar entre 18–20 Nm (159–177 pol. lbs.).

- Melhor plataforma KM de troca rápida.
- Com refrigeração através do encaixe.
- Lâminas intercambiáveis para versatilidade e profundidade de corte.






corte à direita

KM QUICK CHANGE

Sistema KM de montagem de topo modular com refrigeração • Métrico

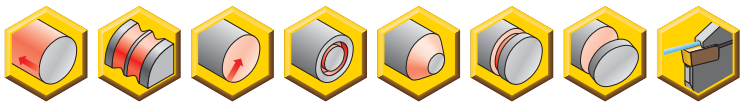


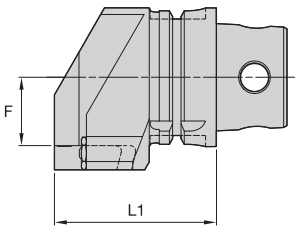


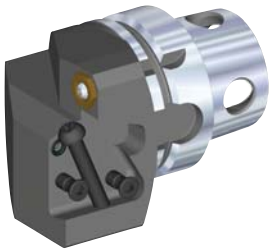
número para pedido	código do produto	Tamanho do sistema CSMS	L1	F	tamanho da lâmina	parafuso da lâmina	Torx	parafuso do grampo	Torx
corte à direita (R)									
5999788	**KM40TSKGMER50C**	KM40TS	28,0	20,50	50	**MS1162**	T25	**MS2002**	T25
5999862	**KM50TSKGMER50C**	KM50TS	38,0	25,50	50	**MS1162**	T25	**MS2002**	T25
6000410	**KM50TSKGMER65C**	KM50TS	47,0	25,50	65	**MS1163**	T30	**–**	–
6000425	**KM63TSKGMER65C**	KM63TS	47,0	32,52	65	**MS1163**	T30	**–**	–
5999946	**KM63TSKGMER50C**	KM63TS	48,0	32,50	50	**MS1162**	T25	**MS2002**	T25
6000434	**KM63XMZKGMER65CY**	KM63XMZ	47,0	32,50	65	**MS1163**	T30	**–**	–
5999950	**KM63XMZKGMER50CY**	KM63XMZ	48,0	32,50	50	**MS1162**	T25	**MS2002**	T25
6017697	**KM80ATCKGMER65C**	KM80ATC	57,0	40,50	65	**MS1163**	T30	**–**	–
6000016	**KM80ATCKGMER50C**	KM80ATC	58,0	40,50	50	**MS1162**	T25	**MS2002**	T25
6017693	**KM80TSKGMER65C**	KM80TS	57,0	40,50	65	**MS1163**	T30	**–**	–
6000012	**KM80TSKGMER50C**	KM80TS	58,0	40,50	50	**MS1162**	T25	**MS2002**	T25
corte à esquerda (L)									
5999789	**KM40TSKGMEL50C**	KM40TS	28,0	20,50	50	**MS1162**	T25	**MS2002**	T25
5999863	**KM50TSKGMEL50C**	KM50TS	38,0	25,50	50	**MS1162**	T25	**MS2002**	T25
6000421	**KM50TSKGMEL65C**	KM50TS	47,0	25,50	65	**MS1163**	T30	**–**	–
6000430	**KM63TSKGMEL65C**	KM63TS	47,0	32,52	65	**MS1163**	T30	**–**	–
5999947	**KM63TSKGMEL50C**	KM63TS	48,0	32,50	50	**MS1162**	T25	**MS2002**	T25
6000436	**KM63XMZKGMELF65CY**	KM63XMZ	47,0	32,50	65	**MS1163**	T30	**–**	–
5999971	**KM63XMZKGMELF50CY**	KM63XMZ	48,0	32,50	50	**MS1162**	T25	**MS2002**	T25
6017698	**KM80ATCKGMEL65C**	KM80ATC	57,0	40,50	65	**MS1163**	T30	**–**	–
6000017	**KM80ATCKGMEL50C**	KM80ATC	58,0	40,50	50	**MS1162**	T25	**MS2002**	T25
6017694	**KM80TSKGMEL65C**	KM80TS	57,0	40,50	65	**MS1163**	T30	**–**	–
6000013	**KM80TSKGMEL50C**	KM80TS	58,0	40,50	50	**MS1162**	T25	**MS2002**	T25

NOTA: KGMS..: Suportes com sentido à direita usam lâminas com sentido à direita.
KGME..: Suportes com sentido à direita usam lâminas com sentido à esquerda.
O torque do parafuso de fixação e da lâmina M50 deve estar entre 8–10 Nm (71–88 pol. lbs.).
O torque do parafuso de fixação e da lâmina M65 deve estar entre 18–20 Nm (159–177 pol. lbs.).

- Com refrigeração através do encaixe.
- Lâminas intercambiáveis para versatilidade e profundidade de corte.







corte à direita

Sistema KM4X™ modular direto com refrigeração

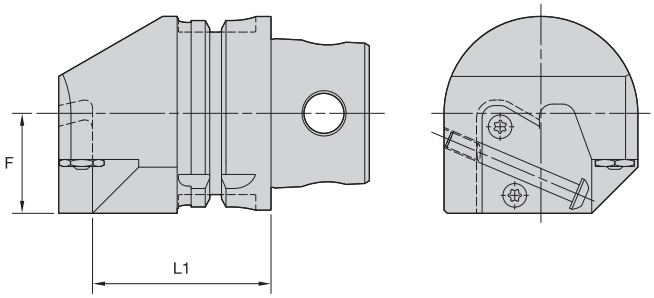


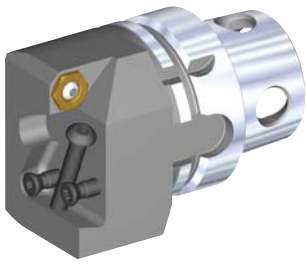


número para pedido	código do produto	Tamanho do sistema CSMS	L1	F	tamanho da lâmina	parafuso da lâmina	Torx	parafuso do grampo	Torx
corte à direita (R)									
5543560	**KM4X63KGMSR65C**	KM4X63	68,5	30,0	65	**MS1163**	T30	**–**	–
6000407	**KM4X63KGMSR50C**	KM4X63	73,5	31,0	50	**MS1162**	T25	**MS2002**	T25
corte à esquerda (L)									
5543558	**KM4X63KGMSL65C**	KM4X63	68,5	30,0	65	**MS1163**	T30	**–**	–
6000408	**KM4X63KGMSL50C**	KM4X63	73,5	31,0	50	**MS1162**	T25	**MS2002**	T25

NOTA: KGMS..: Suportes com sentido à direita usam lâminas com sentido à direita.
KGME..: Suportes com sentido à direita usam lâminas com sentido à esquerda.
O torque do parafuso de fixação e da lâmina M50 deve estar entre 8–10 Nm (71–88 pol. lbs.).
O torque do parafuso de fixação e da lâmina M65 deve estar entre 18–20 Nm (159–177 pol. lbs.).







corte à direita

Sistema KM4X™ de montagem de topo modular com refrigeração

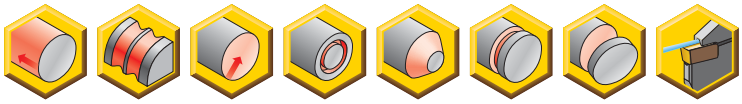


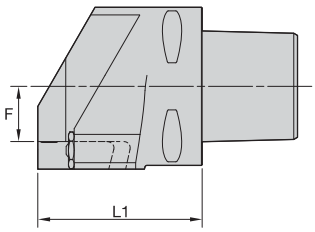


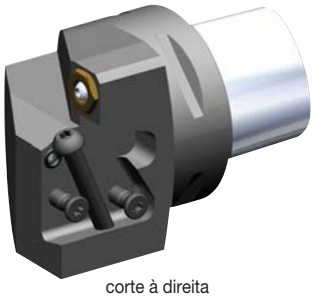


número para pedido	código do produto	Tamanho do sistema CSMS	L1	F	tamanho da cápsula	parafuso da lâmina	bocal	parafuso do grampo	kgs	lbs
corte à direita (R)										
5543555	**KM4X63KGMER65C**	KM4X63	57,0	32,5	65	**MS1163**	**PMT04525**	**–**	1,87	4.13
6000404	**KM4X63KGMER50C**	KM4X63	58,0	32,5	50	**MS1162**	**PMT04525**	**MS2002**	1,85	4.08
6000407	**KM4X63KGMSR50C**	KM4X63	73,5	31,0	50	**MS1162**	**PMT04525**	**MS2002**	1,86	4.11
corte à esquerda (L)										
5543553	**KM4X63KGMEL65C**	KM4X63	57,0	32,5	65	**MS1163**	**PMT04525**	**–**	1,87	4.13
6000405	**KM4X63KGMEL50C**	KM4X63	58,0	32,5	50	**MS1162**	**PMT04525**	**MS2002**	1,85	4.08
6000408	**KM4X63KGMSL50C**	KM4X63	73,5	31,0	50	**MS1162**	**PMT04525**	**MS2002**	1,86	4.11

- Plataforma de troca rápida padrão PSC.
- Com refrigeração através do encaixe.
- Lâminas intercambiáveis para versatilidade e profundidade de corte.







corte à direita

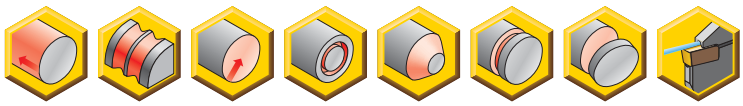
Sistema PSC modular direto com refrigeração

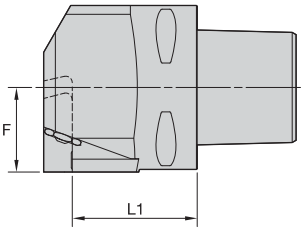


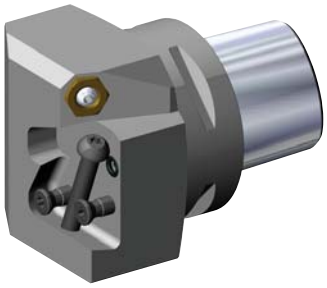


número para pedido	código do produto	Tamanho do sistema CSMS	L1	F	tamanho da lâmina	parafuso da lâmina	Torx	parafuso do grampo	Torx
corte à direita (R)									
6000028	**PSC40KGMSR50C**	PSC40	63,5	10,0	50	**MS1162**	T25	**MS2002**	T25
5405654	**PSC50KGMSR65C**	PSC50	49,0	25,5	65	**MS1163**	T30	**–**	–
6000152	**PSC50KGMSR50C**	PSC50	63,5	15,0	50	**MS1162**	T25	**MS2002**	T25
6000464	**PSC63KGMSR65C**	PSC63	60,5	21,0	65	**MS1163**	T30	**–**	–
6000211	**PSC63KGMSR50C**	PSC63	65,5	22,0	50	**MS1162**	T25	**MS2002**	T25
6000468	**PSC80KGMSR65C**	PSC80	68,5	29,0	65	**MS1163**	T30	**–**	–
6000216	**PSC80KGMSR50C**	PSC80	73,5	30,0	50	**MS1162**	T25	**MS2002**	T25
corte à esquerda (L)									
6000029	**PSC40KGMSL50C**	PSC40	63,5	10,0	50	**MS1162**	T25	**MS2002**	T25
5405655	**PSC50KGMSL65C**	PSC50	49,0	25,5	65	**MS1163**	T30	**–**	–
6000153	**PSC50KGMSL50C**	PSC50	63,5	15,0	50	**MS1162**	T25	**MS2002**	T25
6000465	**PSC63KGMSL65C**	PSC63	60,5	21,0	65	**MS1163**	T30	**–**	–
6000213	**PSC63KGMSL50C**	PSC63	65,5	22,0	50	**MS1162**	T25	**MS2002**	T25
6000469	**PSC80KGMSL65C**	PSC80	68,5	29,0	65	**MS1163**	T30	**–**	–
6000217	**PSC80KGMSL50C**	PSC80	73,5	30,0	50	**MS1162**	T25	**MS2002**	T25

- Plataforma de troca rápida padrão PSC.
- Com refrigeração através do encaixe.
- Lâminas intercambiáveis para versatilidade e profundidade de corte.







corte à direita

Sistema PSC de montagem de topo modular com refrigeração





número para pedido	código do produto	Tamanho do sistema CSMS	L1	F	tamanho da lâmina	parafuso da lâmina	Torx	parafuso do grampo	Torx
corte à direita (R)									
6000026	**PSC40KGMER50C**	PSC40	33,0	20,5	50	**MS1162**	T25	**MS2002**	T25
6000030	**PSC50KGMER50C**	PSC50	43,0	25,5	50	**MS1162**	T25	**MS2002**	T25
5405652	**PSC50KGMER65C**	PSC50	55,5	22,0	65	**MS1163**	T30	**–**	–
6000159	**PSC63KGMER50C**	PSC63	48,0	32,5	50	**MS1162**	T25	**MS2002**	T25
6000462	**PSC63KGMER65C**	PSC63	49,0	32,5	65	**MS1163**	T30	**–**	–
6000466	**PSC80KGMER65C**	PSC80	57,0	40,5	65	**MS1163**	T30	**–**	–
6000214	**PSC80KGMER50C**	PSC80	58,0	40,5	50	**MS1162**	T25	**MS2002**	T25
corte à esquerda (L)									
6000027	**PSC40KGMEL50C**	PSC40	33,0	20,5	50	**MS1162**	T25	**MS2002**	T25
6000151	**PSC50KGMEL50C**	PSC50	43,0	25,5	50	**MS1162**	T25	**MS2002**	T25
5405653	**PSC50KGMEL65C**	PSC50	55,5	22,0	65	**MS1163**	T30	**–**	–
6000160	**PSC63KGMEL50C**	PSC63	48,0	32,5	50	**MS1162**	T25	**MS2002**	T25
6000463	**PSC63KGMEL65C**	PSC63	49,0	32,5	65	**MS1163**	T30	**–**	–
6000467	**PSC80KGMEL65C**	PSC80	57,0	40,5	65	**MS1163**	T30	**–**	–
6000215	**PSC80KGMEL50C**	PSC80	58,0	40,5	50	**MS1162**	T25	**MS2002**	T25

Top Notch™

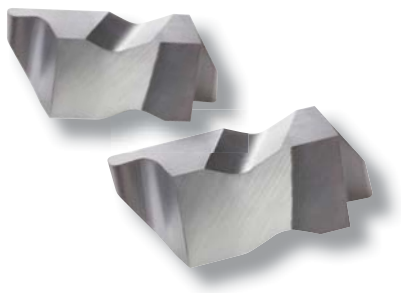
Ferramenta de canais e insertos Beyond™ para as suas operações de canal raso e torneamento

Aplicação principal

A abertura de canal Top Notch é a solução comprovada para alta produtividade. O sistema Top Notch fornece uma performance constante da ferramenta, indexação precisa e fixação excepcional, proporcionando um excelente acabamento superficial e maior vida útil da ferramenta.

Características e benefícios

- As classes Beyond com revestimento PVD foram projetadas para cortar uma variedade de materiais das peças.
- Fixação rígida trava firmemente o inserto no lugar através dos mais duros cortes.
- Um design versátil permite que um único sistema faça operações de abertura de canal no diâmetro interno ou externo e de face, de torneamento reverso, de rebaixamento e até de rosqueamento.
- Os insertos com controle do cavaco proporcionam excelente evacuação de cavacos na abertura de canal e oferecem melhor controle de cavaco no torneamento multidirecional.







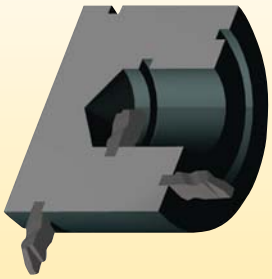
O nosso projeto rígido de fixação evita o movimento do inserto durante as aplicações com altas taxas de avanço. Essa vantagem garante excelente acabamento superficial, produtividade melhorada e maior vida útil da ferramenta, oferecendo uma concentricidade perfeita. A fixação reforçada do grampo gera forças de fixação em três direções proporcionando uma resistência superior ao esforço axial e à força tangencial.

Etapa 1 • Escolha o sistema com base na profundidade necessária do canal

O que você precisa saber

- Profundidade, largura e perfil do canal.
- Material a ser usinado.
- Aplicação a ser executada (abertura de canal de face, no diâmetro externo ou no diâmetro interno).
- Requisitos do porta-ferramenta (por exemplo, KM™, haste quadrada, sentido de rotação à direita/esquerda).

Top Notch™

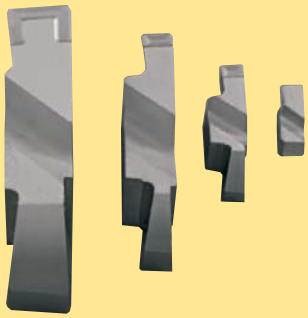


Canal

Para a profundidade do canal ≤1,5x a largura do canal, veja a tabela de capacidades do sistema e proceda com a etapa 2.

Abertura de canal Top Notch para aplicações de abertura de canal no diâmetro interno, no diâmetro externo e de face

capacidades do sistema		mínimo pol. (mm)	máximo pol. (mm)
Abertura de canal no diâmetro externo/interno	largura	0.31 (0,79)	.375 (9,53)
	profundidade	.050 (1,27)	.375 (9,53)
canal da face	largura	.125 (3,18)	.375 (9,53)
	profundidade	.150 (3,81)	.250 (6,35)
abertura de canal interno	diâmetro	.440 (11,2)	—
diâmetro do canal de face	padrão	.940 (23,9)	—
	profundo	1.875 (47,6)	—
abertura de canal profundo no diâmetro externo/interno	largura	.062 (1,57)	.250 (6,35)
	profundidade	.125 (3,18)	.500 (12,70)
abertura de canal profundo de face	largura	.125 (3,18)	.250 (6,35)
	profundidade	.250 (6,35)	.500 (12,70)

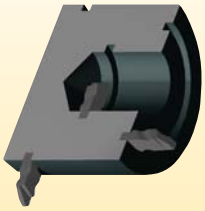


Etapa 2 • Escolha o porta-ferramenta com base na aplicação

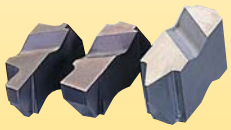
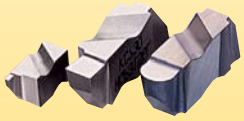
NOTA: Os porta-ferramentas estão disponíveis como versões de haste quadrada convencional bem como versões de troca rápida. O tamanho do inserto deve corresponder ao inserto padrão do porta-ferramentas escolhido.

Etapa 3 • Escolha o estilo de quebra-cavacos e a taxa de avanço

Quebra-cavacos e taxas de avanço • pol./rot (mm/rot)



materiais das peças e aplicação	P	M	K	N	S	H
primeira opção	**NG-K** .003–.011 (0,08–0,28)	**NG-K** .0025–.008 (0,07–0,20)	**NG** .004–.012 (0,01–0,30)	**NGP** .004–.012 (0,01–0,30)	**NG-K** .0025–.008 (0,07–0,20)	**NG-ST** CBN com ponta .002–.004 (0,05–0,10)
opção alternativa	**NG** .004–.012 (0,10–0,30)	**NGP** .004–.009 (0,10–0,23)	**NG-K** .003–.011 (0,08–0,28)	**NG-K** .003–.012 (0,08–0,30)	**NGP** .004–.008 (0,10–0,20)	–

Insertos com quebra-cavacos _K	insertos de topo plano	insertos de saída positiva
		

Etapa 4 • Escolha a classe e a velocidade

Recomendações por classe

Tabela de velocidade inicial exibida no “Guia de Aplicação”

	materiais das peças					
condição de usinagem	P	M	K	N	S	H
alta performance para condições ideais (cortes limpos, ótimas condições de usinagem capacidade de velocidade de corte superior)	**KCP10B** 120–450	**KCU10** 120–260	**KCK20B** 150–550	**KD1425** 150–1500	**KCU10** 15–170	**KB5625** 45–230
uso geral (primeira opção para usinagem geral)	**KCP25B** 110–365	**KCU25** 120–245	**KCU10** 60–245	**KCU10** 120–975	**KCU10** 15–135	**KB5625** 80–150
condições desfavoráveis (desbaste, más condições de usinagem, cortes interrompidos, velocidade baixa, abertura de canal de diâmetro interno)	**KCU25** 85–270	**KCU25** 90–210	**KCU25** 50–195	**K313** 40–610	**KCU25** 8–110	**KB1630** 45–120

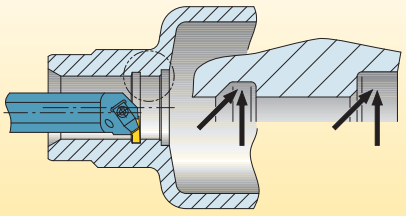
Etapa 5 • Escolha o inserto e o suporte na página do catálogo

NOTA: O tamanho do inserto deve corresponder ao tamanho do inserto padrão do porta-ferramenta escolhido.

Exemplo para Top Notch • Abertura de canal
Material ..... aço de baixa liga
Profundidade do canal ..... 2mm (.079")
Largura do canal..... 3mm (.118")
Operação..... Corte no diâmetro interno, capacidade de velocidade limitada, canal em mergulho e chanfro

Recomendação
Inserto NG2M300RK
Tamanho da classe KC5025
Largura do inserto ..... 3mm (.118")
Tamanho do inserto 2

Porta-ferramenta ..... A20QNNTOL2 (métrico)
A12NEL2 (polegada)
Inserto padrão N.2R



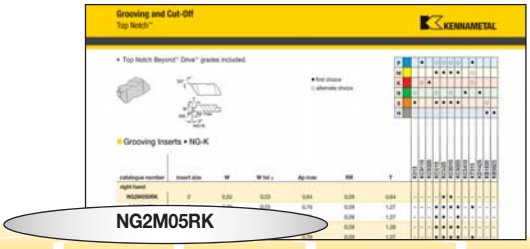
Velocidade: 400 SFM (120 m/min.)
Avanço: .006 pol./rot (0,15 mm/rot)

Parabéns!

Você maximizou a sua produtividade com sucesso, selecionando as melhores geometria do inserto Top Notch, classe e especificações de corte para a sua aplicação!

Como funcionam os números de catálogo?

Cada caractere no nosso número de catálogo significa uma característica específica daquele produto. Use as colunas-chave a seguir e as imagens correspondentes para fazer uma identificação fácil do atributo a ser aplicado.

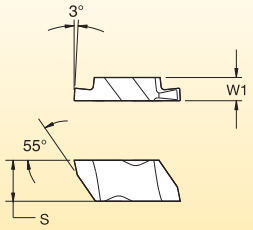


N	G		2	M	05	R		K	
Tipo do inserto	Estilo do inserto	Informação complementar	Tamanho do inserto	Identificação do tamanho	Tamanho do canal**	Sentido de rotação do inserto	Profundidade de corte	Design do quebra-cavacos	Definição dos insertos
N = Top Notch 	**B** = Em branco (para formas especiais) **F** = Abertura de canal de face **G** = Abertura de canal **P** = Retornar **R** = Raio completo **U** = Rebaixamento (ou folga) **V** = Poli-V	**D** = Canal profundo **P** = Positivo **C** = Canal de chanfro		**M** = Largura do inserto de canal em metros **C** = Largura do inserto de canal de anel é o tamanho do anel elástico nominal □ = Em branco indica largura do inserto em polegadas	A posição pertence à largura do canal para os insertos com estilo F-, G-, e U; os raios, aos insertos para abertura de canais com estilo R; e tamanho do anel, aos insertos para canal e chanfro. Dimensões em 0,01mm. **Exemplo métrico:** Largura de canal ou raio de 3,25mm corresponde à posição de número "325" no catálogo. **Tolerância da largura:** ±0,025mm salvo se especificado diferente.	**L** = sentido de rotação à esquerda **R** = sentido de rotação à direita	Indicado para insertos para abertura de canais e chanfro em incrementos de 0,01mm.	**E** = Apenas arredondamento da aresta (Hone) **K** = Controle do cavaco padrão **S** = Área T e arredondamento da aresta (Hone) **ST** = Ponta STD (PcBN)	O tamanho do canal "J" ou "L" para insertos Poli-V "I" indica abertura de canal de face interno

número do inserto	W1 mm
1	2,54
2	3,81
3	4,95
4	6,98
5	9,65
6	9,73

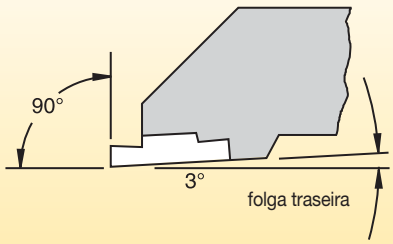
* Sistema de identificação exclusivo da Kennametal.
** Posição omitida para blanks com estilo Top Notch NB.

Dimensões dos insertos para rosqueamento e abertura de canal Top Notch



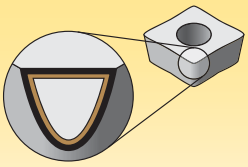
tamanho do inserto	S mm	W1 mm
1	2,54	2,54
2	5,56	3,81
3	8,74	4,95
4	11,51	6,48
5	17,48	9,65
6	11,51	9,73
8	7,93	11,13

Projeto das ferramentas Top Notch



NOTA: Os suportes são projetados para posicionar o inserto inclinado a 3°, para proporcionar uma folga traseira em direção ao lado aberto.

A Kennametal e a tecnologia de ferramentas Top Notch se unem para fornecer a você o melhor de todos os sistemas de rosqueamento e abertura de canal disponíveis no mundo neste momento.

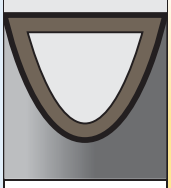
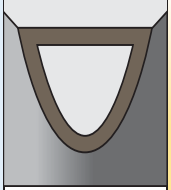
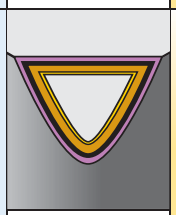
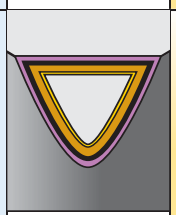
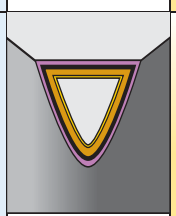


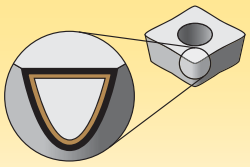
Os revestimentos proporcionam capacidade de alta velocidade e são projetados para acabamento e desbaste leve.

P	Aço
M	Aço inoxidável
K	Ferro fundido
N	Materiais não ferrosos
S	Ligas resistentes a altas temperaturas
H	Materiais endurecidos

resistência ao desgaste ⟷ tenacidade

Classes

Revestimento		Descrição da classe		05	10	15	20	25	30	35	40	45
KCU10		**Composição:** Revestimento avançado PVD multicamadas sobre um substrato de metal duro sem liga e muito resistente à deformação. O revestimento novo e melhorado aumenta a estabilidade da aresta, com capacidade para uma ampla faixa de velocidades e avanços. **Aplicação:** A classe KCU10 é ideal para usinagem de acabamento até usinagem em geral da maioria dos materiais das peças em uma ampla faixa de capacidades de velocidades e avanços. Excelente para usinar a maior parte dos aços, aços inoxidáveis, ferros fundidos, materiais não ferrosos e ligas resistentes a altas temperaturas, com dureza da aresta melhorada, resistência de entalhamento e com capacidade para maiores velocidades de corte e avanços.	P		■	■	■					
			M		■	■	■					
			K	■	■	■	■					
			N		■	■	■					
			S		■	■	■					
			H		■							
	–											
												beyond
KCU25		**Composição:** Uma classe PVD avançada com revestimento AlTiN duro e substrato sem liga de grãos finos. O revestimento novo e melhorado aumenta a estabilidade da aresta, com capacidade para uma ampla faixa de velocidades e avanços. **Aplicação:** A classe KCU25™ é ideal para a usinagem em geral da maior parte dos aços, aços inoxidáveis, ligas resistentes a altas temperaturas, titânio, ferros fundidos e materiais não ferrosos em uma ampla faixa de velocidades e avanços, com dureza da aresta melhorada para cortes interrompidos e altas faixas de avanço.	P				■	■	■			
			M				■	■	■			
			K				■	■	■			
			N				■	■	■			
			S				■	■	■			
	–											
												beyond
KCP10B		**Composição:** Uma classe de metal duro enriquecido com cobalto e especialmente usinado com revestimento espesso de CVD de MT-TiCN-Al_2O_3-TiOCN para máxima resistência a desgaste. **Aplicação:** Excelente classe para usinagem desde acabamento a usinagem média, para diversos materiais das peças, inclusive a maior parte dos aços, aços inoxidáveis ferríticos, martensíticos e PH, além de ferros fundidos. O substrato enriquecido com cobalto oferece uma combinação equilibrada de resistência à deformação e dureza, enquanto as camadas espessas de revestimento oferecem extraordinária resistência à abrasão e resistência a desgaste por craterização na usinagem em altas velocidades. O revestimento uniforme fornece resistência à formação de aresta postiça e à ocorrência de microlascamentos, além de produzir excelentes acabamentos superficiais.	P		■	■	■					
			K					■	■	■		
	–											
												beyond DRIVE
KCP25B		**Composição:** Classe tenaz de metal duro enriquecido com cobalto, com revestimento CVD multicamadas de MT-TiCN-Al_2O_3-TiOCN com excelente adesão entre as camadas. **Aplicação:** Melhor classe para uso geral em torneamento da maioria dos aços e de aços inoxidáveis ferríticos e martensíticos. O projeto do substrato garante uma adequada resistência à deformação com excelente comprimento da aresta do inserto. As camadas do revestimento oferecem boa resistência a desgaste em uma ampla gama de condições de usinagem, e o tratamento pós-revestimento minimiza a ocorrência de microlascamentos e melhora a aresta postiça do revestimento ao substrato, levando a uma maior vida útil da ferramenta e a melhores acabamentos da peça.	P				■	■	■			
			K						■	■	■	
	–											
												beyond DRIVE
KCK20B		**Composição:** Um revestimento CVD de MT-TICN-Al_2O_3-TiOCN com dureza especial sobre um substrato resistente ao desgaste. **Aplicação:** Especificamente desenvolvida para maximizar a adesão do revestimento e a resistência da aresta, tornando essa classe ideal para cortes interrompidos com refrigeração de ferros fundidos dúctil e cinzento. Ela pode ser usada em uma ampla gama de aplicações, de acabamento a desbaste, para maximizar a produtividade onde quer que resistência e confiabilidade sejam necessárias.	P		■	■						
			K			■	■	■	■			
	–											
												beyond DRIVE



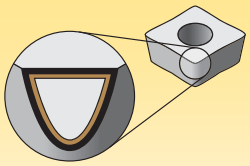
Os revestimentos proporcionam capacidade de alta velocidade e são projetados para acabamento e desbaste leve.

P	Aço
M	Aço inoxidável
K	Ferro fundido
N	Materiais não ferrosos
S	Ligas resistentes a altas temperaturas
H	Materiais endurecidos

resistência ao desgaste ⟷ **tenacidade**

Classes

Revestimento	Descrição da classe		05	10	15	20	25	30	35	40	45
K313	**Composição:** Classe dura, com baixo teor de aglutinante e sem liga, com grãos finos de WC/Co. **Aplicação:** Excepcional resistência a desgaste da aresta combinada com altíssima resistência para a usinagem de titânio, ferros fundidos, aços inoxidáveis austenísticos, metais não ferrosos, não metais e a maioria das ligas resistentes a altas temperaturas. Excelente resistência à deformação térmica e ao desgaste por entalhe no flanco. A estrutura do grão é bem controlada, proporcionando furos e facetas mínimas, o que contribui para um serviço durável e confiável.	M									
		K									
		N									
		S									
KC5010	**Composição:** Revestimento avançado PVD de AlTiN sobre um substrato de metal duro sem liga e muito resistente à deformação. **Aplicação:** A classe KC5010 é ideal para acabamento de usinagem geral da maioria de materiais das peças em velocidades mais altas. Excelente para usinar a maior parte dos aços, aços inoxidáveis, ferros fundidos, materiais não ferrosos e ligas resistentes a altas temperaturas sob condições estáveis. Também desempenha bem na usinagem de materiais endurecidos e de cavacos curtos.	P									
		M									
		K									
		N									
		S									
		H									
KC5025	**Composição:** Classe com revestimento avançado PVD de AlTiN sobre um substrato tenaz, sem liga e de grão ultrafino. **Aplicação:** Para usinagem em geral da maior parte dos aços, aços inoxidáveis, ligas resistentes a altas temperaturas, titânio, ferros fundidos e materiais não ferrosos. As velocidades podem variar de baixa até média e admitem cortes interrompidos e altas taxas de avanço.	P									
		M									
		K									
		N									
		S									



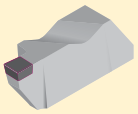
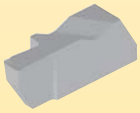
Os revestimentos proporcionam capacidade de alta velocidade e são projetados para acabamento e desbaste leve.

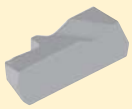
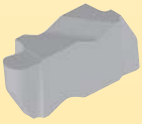
P	Aço
M	Aço inoxidável
K	Ferro fundido
N	Materiais não ferrosos
S	Ligas resistentes a altas temperaturas
H	Materiais endurecidos

resistência ao desgaste ⟷ **tenacidade**

Classes

Revestimento	Descrição da classe	05	10	15	20	25	30	35	40	45
KT315 –	**Composição:** Classe com revestimento de PVD multicamadas de TiN/TiCN/TiN sobre um substrato de cermet, para torneamento. **Aplicação:** Ideal para acabamento de alta velocidade para usinagem média da maioria dos aços carbono, aços-liga e aços inoxidáveis. Funciona muito bem também em aplicações para ferros fundidos cinzentos e dúcteis. Possibilita uma longa e uniforme vida útil da ferramenta e produzirá excelentes acabamentos nas peças.	P	P							
		K	K							
KB1630 –	**Composição:** Uma classe de alto conteúdo de PcBN não revestido. Ponta de PcBN soldada em um inserto de metal duro. **Aplicação:** Projetada para ser usada do desbaste ao acabamento em cortes interrompidos em aços endurecidos (>45 HRC). Também pode ser aplicada em ferros fundidos cinzentos, ferros fundidos coquilhados, liças de aço com alto teor de cromo, ligas de alta temperatura e metais sinterizados. Os insertos com pontas de PcBN estão disponíveis em uma variedade de estilos, incluindo as geometrias Top Notch™ e Screw-On.	K	K	K						
		S		S						
		H				H	H	H		
KB5625 –	**Composição:** Classe com alto teor médio de PcBN com um revestimento PVD-TiN/AlTiN, proporcionando mais resistência a desgaste. **Aplicação:** Desenvolvido para uso de desbaste a acabamento de aços endurecidos (>45 HRC). Use em aços para rolamento, aços para ferramenta com usinagem a quente e frio, aços de alta velocidade, aços forjados, aços endurecidos, ferros nitretados e carburados e alguns revestimentos duros.	H			H	H	H			
KD1425 –	**Composição:** Inserto com ponta soldada de diamante policristalino (PCD) multimodal com variedade de tamanhos de grãos. **Aplicação:** Desenvolvido para extrema resistência à abrasão combinada com boa resistência da aresta em aplicações difíceis. A opção ideal para ligas de alumínio com alto teor de silício, materiais bimetálicos (AL/GCI), MMC, plásticos reforçados com fibra de carbono (CFRP) e outros materiais abrasivos não metálicos.	N		N	N	N				

estilo do inserto	aplicação	ângulo de inclinação	página(s)
NG 	• Abertura de canal para uso geral. • Abertura de canal para O-Rings. • Abertura de canal para anéis elásticos.	Neutro	C154
NG-K 	• Geometria de controle de cavacos. • Abertura de canal para uso geral. • Abertura de canal para O-Rings. • Abertura de canal para anéis elásticos. • Torneamento leve.	10° positivo	C146
NG-ST 	• Torneamento duro.	Neutro	C163
NGC-K 	• Canal de aresta combinado com canal e chanframento em um mergulho positivo com controle de cavaco. • Projetada para canais para anéis elásticos padrão DIN 471/472.	10° positivo	C152
NGD 	• Abertura de canal profundo.	Neutro	C157
NGD-K 	• Geometria de controle de cavacos. • Abertura de canal profundo. • Torneamento leve.	10° positivo	C149
NGP 	• Abertura de canal para uso geral. • Abertura de canal para O-Rings. • Abertura de canal para anéis elásticos.	5° positivo	C152
NF 	• Abertura de canal de face. • Folga lateral adicional.	Neutro	C161
NF-K 	• Abertura de canal de face com controle do cavaco. • Folga lateral adicional.	10° positivo	C159
NFD-K 	• Abertura de canais de face profunda com controle do cavaco. • Folga lateral adicional.	10° positivo	C160

estilo do inserto	aplicação	ângulo de inclinação	página(s)
NFD-KI 	• Abertura de canal profundo de face interno com controle do cavaco. • Usado em barras para mandrilamento para abertura de canal de face interno.	10° positivo	C160
NP-K NPD-K 	• Torneamento. • Torneamento reverso positivo. • Usinagem de perfil com controle de cavacos.	10° positivo	C151
NR 	• Abertura de canal de raio completo. • Torneamento e perfilagem.	Neutro	C158
NR-K 	• Geometria de controle de cavacos. • Abertura de canal, torneamento e perfilagem de raio completo.	10° positivo	C150
NRD 	• Abertura de canal profundo. • Forma final com raio completo.	Neutro	C159
NRP 	• Abertura de canal de raio completo. • Perfilagem de usinagem leve.	5° positivo	C153
NU 	• Rebaixamento.	Neutro	C161
NV 	• Abertura de canal Poli-V.	Neutro	C162
NB/NBD 	• Blanks. • Blanks para abertura de canal profundo. • Disponíveis somente em classes sem revestimento.	–	C162–C163

A Kennametal na internet

kennametal.com

ENCONTRE AS ÚLTIMAS INFORMAÇÕES SOBRE OS PRODUTOS

Se a sua atividade é torneamento, fresamento ou holemaking, as marcas da Kennametal são as ferramentas de alta performance que você precisa. Oferecemos soluções padrão e customizadas para uma ampla gama de aplicações.

Encontre informações sobre as nossas mais recentes campanhas e catálogos.

Registre-se no Konnect para obter as funcionalidades completas do site de pedidos on-line da Kennametal.



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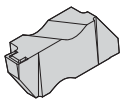
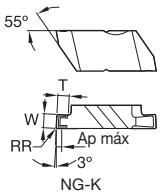
ENCONTRE UM DISTRIBUIDOR AUTORIZADO LOCAL EM SUA ÁREA

A Kennametal oferece produtos e serviços de classe mundial em todo o mundo. Nossos distribuidores nos conhecem e, mais importante, eles conhecem você. Eles sabem melhor que qualquer pessoa no setor como fazer a potência global da Kennametal trabalhar para você — na sua indústria, na sua região e para seus negócios.

- Classes Top Notch Beyond™ Drive™ incluídas.





● primeira opção
○ opção alternativa

		KCU10	KCU25	KCP10B	KCP25B	KCK20B	K313	KC5010	KC5025	KT315	KB1630	KB5625	KD1425
P		●	●	●	●	○		○	○	●			
M		●	●				○	●	○				
K		○	○	○	○	●	○	○	○	○	○		
N		●	○				○	●	○				●
S		●	●				●	○	○		○		
H		○						○			●	●	

Canal e torneamento • Controle do cavaco

código do produto	tamanho do inserto	W	W tol ±	Ap máx	RR	T	KCU10	KCU25	KCP10B	KCP25B	KCK20B	K313	KC5010	KC5025	KT315	KB1630	KB5625	KD1425
corte à direita (R)																		
NG2M050RK	2	0,50	0,03	0,64	0,09	0,64	●	●	–	●	–	–	●	–	–	–	–	–
NG2031RK	2	0,79	0,03	0,76	0,09	1,27	●	●	●	●	–	–	●	●	●	–	–	–
NG2M080RK	2	0,80	0,03	0,76	0,09	1,27	●	●	●	●	–	–	–	●	–	–	–	–
NG2M100RK	2	1,00	0,03	0,76	0,09	1,28	●	●	●	●	–	–	●	●	–	–	–	–
NG2047RK	2	1,19	0,03	0,76	0,09	1,27	●	●	●	●	–	–	●	●	●	–	–	–
NG2M120RK	2	1,20	0,03	0,76	0,09	1,27	●	●	●	●	–	–	●	●	–	–	–	–
NG2M140RK	2	1,40	0,03	0,76	0,09	1,28	●	●	●	●	–	–	●	●	–	–	–	–
NG2M150RK	2	1,50	0,03	1,09	0,19	2,79	–	●	–	●	–	–	–	●	–	–	–	–
NG2062RK	2	1,56	0,03	1,09	0,19	2,79	●	●	●	●	–	–	●	●	●	–	–	–
NG2M170RK	2	1,70	0,03	1,09	0,19	2,79	●	●	●	●	–	–	●	●	–	–	–	–
NG2M175RK	2	1,75	0,03	1,09	0,19	2,81	–	●	–	●	–	–	–	–	–	–	–	–
NG2M195RK	2	1,95	0,03	1,09	0,19	2,79	●	●	●	●	–	–	●	●	–	–	–	–
NG2M200RK	2	2,00	0,03	1,09	0,19	2,79	●	●	●	●	–	–	●	●	●	–	–	–
NG2M220RK	2	2,20	0,03	1,09	0,19	2,79	–	●	–	●	–	–	–	●	–	–	–	–
NG2M225RK	2	2,25	0,03	1,09	0,19	2,81	●	●	●	●	–	–	–	●	–	–	–	–
NG2094RK	2	2,39	0,03	1,09	0,19	2,79	●	●	●	●	–	–	●	●	●	–	–	–
NG2M250RK	2	2,50	0,03	1,09	0,19	2,79	–	●	–	●	–	–	–	●	–	–	–	–
NG2M275RK	2	2,75	0,03	1,09	0,19	2,79	●	●	●	●	–	–	–	●	–	–	–	–
NG2M300RK	2	3,00	0,03	1,09	0,19	2,79	●	●	●	●	–	–	●	●	–	–	–	–
NG2125RK	2	3,18	0,03	1,09	0,19	2,79	●	●	●	●	–	–	●	●	●	–	–	–
NG2M320RK	2	3,20	0,03	1,09	0,19	2,79	–	–	–	●	–	–	–	–	–	–	–	–
NG2M325RK	2	3,25	0,03	1,09	0,19	2,79	–	●	–	●	–	–	–	●	–	–	–	–
NG3M100RK	3	1,00	0,03	0,76	0,20	1,91	–	●	–	●	–	–	–	●	–	–	–	–
NG3047RK	3	1,19	0,03	0,76	0,19	1,91	●	●	●	●	–	–	●	●	–	–	–	–
NG3M120RK	3	1,20	0,03	0,76	0,19	1,91	●	●	●	●	–	–	–	●	–	–	–	–
NG3M150RK	3	1,50	0,03	1,02	0,19	2,39	–	●	–	●	–	–	–	●	–	–	–	–
NG3062RK	3	1,58	0,03	1,02	0,19	2,39	●	●	●	●	–	–	●	●	●	–	–	–
NG3M175RK	3	1,75	0,03	1,02	0,19	2,39	–	●	–	●	–	–	–	●	–	–	–	–
NG3072RK	3	1,83	0,03	1,02	0,19	2,39	●	●	●	●	–	–	●	●	–	–	–	–
NG3078RK	3	1,98	0,03	1,02	0,19	2,39	●	●	●	●	–	–	●	●	–	–	–	–
NG3M200RK	3	2,00	0,03	1,02	0,19	2,39	–	●	–	●	–	–	–	●	●	–	–	–
NG3M220RK	3	2,20	0,03	1,02	0,19	2,39	–	●	–	●	–	–	–	●	–	–	–	–
NG3M225RK	3	2,24	0,03	1,02	0,19	2,39	●	●	●	●	–	–	●	●	–	–	–	–
NG3094RK	3	2,39	0,03	1,02	0,19	3,81	●	●	●	–	–	–	●	●	●	–	–	–
NG3M250RK	3	2,50	0,03	1,02	0,19	3,81	–	●	–	●	–	–	–	●	–	–	–	–

(continuação)

(Canal e torneamento • Controle do cavaco — continuação)

● primeira opção
○ opção alternativa

		KCU10	KCU25	KCP10B	KCP25B	KCK20B	K313	KC5010	KC5025	KT315	KB1630	KB5625	KD1425
P		●	●	●	●	○		○	○	●			
M		●	●				○	●	○				
K		○	○	○	○	●	○	○	○	○	○		
N		●	○				○	●	○				●
S		●	●				●	○	○		○		
H		○						○			●	●	

código do produto	tamanho do inserto	W	W tol ±	Ap máx	RR	T	KCU10	KCU25	KCP10B	KCP25B	KCK20B	K313	KC5010	KC5025	KT315	KB1630	KB5625	KD1425
NG3M275RK	3	2,75	0,03	1,02	0,19	3,81	●	●	●	●	–	–	●	●	–	–	–	–
NG3M300RK	3	3,00	0,03	1,02	0,19	3,81	●	●	●	●	–	–	●	●	–	–	–	–
NG3125RK	3	3,18	0,03	1,02	0,19	3,81	●	●	●	●	–	–	●	●	●	–	–	–
NG3M320RK	3	3,20	0,03	1,02	0,19	3,81	–	●	–	●	–	–	–	●	–	–	–	–
NG3M325RK	3	3,25	0,03	1,02	0,19	3,81	–	●	–	●	–	–	–	●	–	–	–	–
NG3M350RK	3	3,50	0,03	2,92	0,32	3,81	–	●	–	●	–	–	–	●	–	–	–	–
NG3156RK	3	3,96	0,03	2,92	0,19	3,81	●	●	●	●	–	–	●	●	–	–	–	–
NG3M400RK	3	4,00	0,03	2,92	0,32	3,81	●	●	●	●	–	–	●	●	–	–	–	–
NG3M425RK	3	4,25	0,03	2,92	0,32	3,81	●	●	●	●	–	–	–	●	–	–	–	–
NG3M450RK	3	4,50	0,03	2,92	0,32	3,81	–	●	–	●	–	–	–	–	–	–	–	–
NG3189RK	3	4,80	0,03	2,92	0,57	3,81	●	●	●	●	–	–	●	●	–	–	–	–
NG4M300RK	4	3,00	0,03	1,02	0,19	3,81	–	●	–	●	–	–	–	–	–	–	–	–
NG4125RK	4	3,18	0,03	1,06	0,19	3,81	●	●	●	●	–	–	●	–	–	–	–	–
NG4M350RK	4	3,50	0,03	2,92	0,57	6,35	–	●	–	●	–	–	–	–	–	–	–	–
NG4M400RK	4	4,00	0,03	2,92	0,57	6,35	–	●	●	●	–	–	●	●	–	–	–	–
NG4M450RK	4	4,50	0,03	2,92	0,57	6,35	–	●	–	●	–	–	–	–	–	–	–	–
NG4189RK	4	4,80	0,03	2,92	0,57	6,35	●	●	●	●	–	–	●	●	–	–	–	–
NG4M500RK	4	5,00	0,03	2,92	0,32	6,35	●	●	●	●	–	–	–	–	–	–	–	–
NG4M550RK	4	5,50	0,03	3,81	0,57	6,35	–	–	–	●	–	–	–	–	–	–	–	–
NG4M600RK	4	6,00	0,03	3,81	0,57	6,35	–	●	–	●	–	–	–	–	–	–	–	–
NG4250RK	4	6,35	0,03	3,81	0,57	6,35	–	●	●	●	–	–	●	●	–	–	–	–
corte à esquerda (L)																		
NG2M050LK	2	0,50	0,03	0,64	0,09	0,64	●	●	–	●	–	–	●	–	–	–	–	–
NG2031LK	2	0,79	0,03	0,76	0,09	1,27	●	●	●	●	–	–	●	●	–	–	–	–
NG2M080LK	2	0,80	0,03	0,76	0,09	1,27	●	●	●	●	–	–	–	●	–	–	–	–
NG2M100LK	2	1,00	0,03	0,76	0,08	1,27	●	●	●	●	–	–	●	●	–	–	–	–
NG2047LK	2	1,19	0,03	0,76	0,09	1,27	●	●	●	●	–	–	●	●	–	–	–	–
NG2M120LK	2	1,20	0,03	0,76	0,09	1,27	●	●	●	●	–	–	●	●	–	–	–	–
NG2M140LK	2	1,40	0,03	0,76	0,09	1,27	●	●	●	●	–	–	–	●	–	–	–	–
NG2M150LK	2	1,50	0,03	1,09	0,19	2,79	–	●	–	●	–	–	–	●	–	–	–	–
NG2062LK	2	1,58	0,03	1,09	0,19	2,79	●	●	●	●	–	–	●	●	–	–	–	–
NG2M170LK	2	1,70	0,03	1,09	0,19	2,79	–	●	●	●	–	–	●	●	–	–	–	–
NG2M175LK	2	1,75	0,03	1,09	0,19	2,79	–	●	–	●	–	–	–	●	–	–	–	–
NG2M195LK	2	1,95	0,03	1,09	0,19	2,79	–	●	●	●	–	–	●	–	–	–	–	–
NG2M200LK	2	2,00	0,03	1,09	0,19	2,79	●	●	●	●	–	–	●	●	–	–	–	–
NG2M220LK	2	2,20	0,03	1,09	0,19	2,79	–	●	–	●	–	–	–	–	–	–	–	–
NG2M225LK	2	2,25	0,03	1,09	0,19	2,79	●	●	●	●	–	–	–	●	–	–	–	–
NG2094LK	2	2,39	0,03	1,09	0,19	2,79	●	●	●	●	–	–	●	●	–	–	–	–
NG2M250LK	2	2,50	0,03	1,09	0,19	2,79	–	●	–	●	–	–	–	●	–	–	–	–
NG2M275LK	2	2,75	0,03	1,09	0,19	2,79	●	●	–	●	–	–	●	–	–	–	–	–

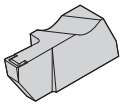
(continuação)

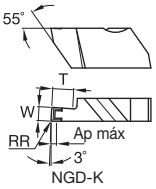
(Canal e torneamento • Controle do cavaco — continuação)

● primeira opção
○ opção alternativa

		KCU10	KCU25	KCP10B	KCP25B	KCK20B	K313	KC5010	KC5025	KT315	KB1630	KB5625	KD1425
P		●	●	●	●	○		○	○	●			
M		●	●				○	●	○				
K		○	○	○	○	●	○	○	○	○	○		
N		●	○				○	●	○				●
S		●	●				●	○	○		○		
H		○						○			●	●	

código do produto	tamanho do inserto	W	W tol ±	Ap máx	RR	T	KCU10	KCU25	KCP10B	KCP25B	KCK20B	K313	KC5010	KC5025	KT315	KB1630	KB5625	KD1425
NG2M300LK	2	3,00	0,03	1,09	0,19	2,79	●	●	●	●	–	–	●	●	–	–	–	–
NG2125LK	2	3,18	0,03	1,09	0,19	2,79	●	●	●	●	–	–	●	●	–	–	–	–
NG2M325LK	2	3,25	0,03	1,09	0,19	2,79	–	●	–	●	–	–	–	–	–	–	–	–
NG3M100LK	3	1,00	0,03	0,76	0,20	1,91	–	●	–	●	–	–	–	●	–	–	–	–
NG3047LK	3	1,19	0,03	0,76	0,19	1,90	●	●	●	●	–	–	●	●	–	–	–	–
NG3M120LK	3	1,20	0,03	0,76	0,19	1,91	●	●	●	●	–	–	–	●	–	–	–	–
NG3M150LK	3	1,50	0,03	1,02	0,19	2,39	–	●	–	●	–	–	–	●	–	–	–	–
NG3062LK	3	1,58	0,03	1,02	0,19	2,39	●	●	–	–	–	–	●	●	–	–	–	–
NG3M175LK	3	1,75	0,03	1,02	0,19	2,39	–	●	–	●	–	–	–	●	–	–	–	–
NG3072LK	3	1,83	0,03	1,02	0,19	2,39	●	●	●	●	–	–	●	●	–	–	–	–
NG3078LK	3	1,98	0,03	1,02	0,19	2,39	●	●	●	●	–	–	●	●	–	–	–	–
NG3M200LK	3	2,00	0,03	1,02	0,19	2,39	–	●	–	●	–	–	–	●	–	–	–	–
NG3M220LK	3	2,20	0,03	1,02	0,19	2,39	–	●	–	●	–	–	–	●	–	–	–	–
NG3M225LK	3	2,25	0,03	1,02	0,19	2,39	●	●	●	●	–	–	–	–	–	–	–	–
NG3094LK	3	2,39	0,03	1,02	0,19	3,81	●	●	●	●	–	–	●	●	●	–	–	–
NG3M250LK	3	2,50	0,03	1,02	0,19	3,81	–	●	–	●	–	–	–	●	–	–	–	–
NG3M275LK	3	2,75	0,03	1,02	0,19	3,81	●	●	●	●	–	–	–	●	–	–	–	–
NG3M300LK	3	3,00	0,03	1,02	0,19	3,81	●	●	●	●	–	–	●	●	–	–	–	–
NG3125LK	3	3,18	0,03	1,02	0,19	3,81	●	●	●	●	–	–	●	●	–	–	–	–
NG3M320LK	3	3,20	0,03	1,02	0,19	3,81	–	●	–	●	–	–	–	●	–	–	–	–
NG3M325LK	3	3,25	0,03	1,02	0,19	3,81	–	●	–	●	–	–	–	●	–	–	–	–
NG3M350LK	3	3,50	0,03	2,92	0,32	3,81	–	●	–	●	–	–	–	●	–	–	–	–
NG3156LK	3	3,96	0,03	2,92	0,19	3,81	●	●	●	●	–	–	●	●	–	–	–	–
NG3M400LK	3	4,00	0,03	2,92	0,32	3,81	●	●	●	●	–	–	–	●	–	–	–	–
NG3M425LK	3	4,25	0,03	2,92	0,32	3,81	●	●	●	●	–	–	–	–	–	–	–	–
NG3M450LK	3	4,50	0,03	2,92	0,32	3,81	–	●	–	●	–	–	–	–	–	–	–	–
NG3189LK	3	4,80	0,03	2,92	0,57	3,81	●	●	●	●	–	–	●	●	–	–	–	–
NG4M300LK	4	3,00	0,03	1,02	0,19	3,81	–	●	–	●	–	–	–	–	–	–	–	–
NG4125LK	4	3,18	0,03	1,06	0,19	3,81	●	●	●	●	–	–	–	–	–	–	–	–
NG4M320LK	4	3,20	0,03	1,02	0,19	3,81	–	–	–	●	–	–	–	–	–	–	–	–
NG4M350LK	4	3,50	0,03	2,92	0,57	6,35	–	●	–	●	–	–	–	–	–	–	–	–
NG4M400LK	4	4,00	0,03	2,92	0,57	6,35	●	●	●	●	–	–	–	–	–	–	–	–
NG4M450LK	4	4,50	0,03	2,92	0,57	6,35	–	●	–	●	–	–	–	●	–	–	–	–
NG4189LK	4	4,80	0,03	2,92	0,57	6,35	●	●	●	●	–	–	●	●	–	–	–	–
NG4M500LK	4	5,00	0,03	2,92	0,32	6,35	●	●	●	●	–	–	●	–	–	–	–	–
NG4M550LK	4	5,50	0,03	3,81	0,57	6,35	–	–	–	●	–	–	–	–	–	–	–	–
NG4M600LK	4	6,00	0,03	3,81	0,57	6,35	–	●	–	●	–	–	–	–	–	–	–	–
NG4250LK	4	6,35	0,03	3,81	0,57	6,35	●	●	●	●	–	–	●	●	–	–	–	–





● primeira opção
○ opção alternativa

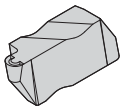
		KCU10	KCU25	KCP10B	KCP25B	KCK20B	K313	KC5010	KC5025	KT315	KB1630	KB5625	KD1425
P		●	●	●	●	○		○	○	●			
M		●	●				○	●	○				
K		○	○	○	○	●	○	○	○	○	○		
N		●	○				○	●	○				●
S		●	●				●	○	○		○		
H		○						○			●	●	

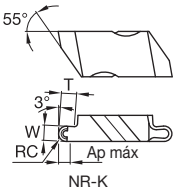
Canal e torneamento • Canal profundo • Controle do cavaco

código do produto	tamanho do inserto	W	W tol ±	Ap máx	RR	T	KCU10	KCU25	KCP10B	KCP25B	KCK20B	K313	KC5010	KC5025	KT315	KB1630	KB5625	KD1425
corte à direita (R)																		
NGD2M150RK	2	1,50	0,03	1,09	0,19	4,06	●	●	–	–	–	–	●	●	–	–	–	–
NGD2M200RK	2	2,00	0,03	1,09	0,19	5,08	●	●	–	–	–	–	●	●	–	–	–	–
NGD2M250RK	2	2,50	0,03	1,09	0,19	5,08	●	●	–	–	–	–	–	●	–	–	–	–
NGD3062RK	3	1,58	0,03	1,02	0,19	3,18	●	●	–	–	–	●	●	●	–	–	–	–
NGD3M200RK	3	2,00	0,03	1,02	0,19	4,06	●	●	–	–	–	–	●	●	–	–	–	–
NGD3094RK	3	2,39	0,03	1,02	0,19	6,35	●	●	–	–	–	●	●	●	–	–	–	–
NGD3M250RK	3	2,50	0,03	1,02	0,19	6,35	–	●	–	–	–	–	●	●	–	–	–	–
NGD3M300RK	3	3,00	0,03	1,02	0,19	6,35	●	●	–	–	–	–	●	●	–	–	–	–
NGD3125RK	3	3,18	0,03	1,02	0,19	6,35	●	●	–	–	–	●	●	●	–	–	–	–
NGD3M400RK	3	4,00	0,03	2,92	0,32	6,35	●	●	–	–	–	–	●	●	–	–	–	–
NGD3189RK	3	4,80	0,03	2,92	0,58	6,35	●	●	–	–	–	–	●	●	–	–	–	–
NGD4125RK	4	3,18	0,03	1,02	0,19	6,35	●	●	–	–	–	–	●	●	–	–	–	–
NGD4189RK	4	4,80	0,03	2,92	0,57	9,53	●	●	–	–	–	–	●	●	–	–	–	–
NGD4M550RK	4	5,50	0,03	3,81	0,57	12,70	–	●	–	–	–	–	–	–	–	–	–	–
NGD4250RK	4	6,35	0,03	3,81	0,57	12,70	●	●	–	–	–	–	●	●	–	–	–	–
corte à esquerda (L)																		
NGD2M150LK	2	1,50	0,03	1,09	0,19	4,06	●	●	–	–	–	–	–	●	–	–	–	–
NGD2M200LK	2	2,00	0,03	1,09	0,19	5,08	●	●	–	–	–	–	●	●	–	–	–	–
NGD2M250LK	2	2,50	0,03	1,09	0,19	5,08	●	●	–	–	–	–	●	●	–	–	–	–
NGD3062LK	3	1,57	0,03	1,02	0,19	3,18	●	●	–	–	–	–	●	●	–	–	–	–
NGD3M200LK	3	2,00	0,03	1,02	0,19	4,06	–	●	–	–	–	–	–	●	–	–	–	–
NGD3094LK	3	2,39	0,03	1,02	0,19	6,34	●	●	–	–	–	●	●	●	–	–	–	–
NGD3M250LK	3	2,50	0,03	1,02	0,19	6,35	–	●	–	–	–	–	–	●	–	–	–	–
NGD3M300LK	3	3,00	0,03	1,02	0,19	6,35	●	●	–	–	–	–	●	●	–	–	–	–
NGD3125LK	3	3,18	0,03	1,02	0,19	6,35	●	●	–	–	–	●	●	●	–	–	–	–
NGD3M350LK	3	3,50	0,03	2,92	0,32	6,35	–	●	–	–	–	–	–	●	–	–	–	–
NGD3M400LK	3	4,00	0,03	2,92	0,32	6,35	●	●	–	–	–	–	–	●	–	–	–	–
NGD3189LK	3	4,80	0,03	2,92	0,57	6,35	●	●	–	–	–	–	●	●	–	–	–	–
NGD4125LK	4	3,18	0,03	1,02	0,19	6,35	●	●	–	–	–	–	●	●	–	–	–	–
NGD4M400LK	4	4,00	0,03	2,92	0,57	9,53	–	●	–	–	–	–	–	–	–	–	–	–
NGD4189LK	4	4,80	0,03	2,92	0,57	9,53	●	●	–	–	–	–	●	●	–	–	–	–
NGD4M500LK	4	5,00	0,03	2,92	0,57	12,70	–	●	–	–	–	–	–	–	–	–	–	–
NGD4250LK	4	6,35	0,03	3,80	0,57	12,70	●	●	–	–	–	–	–	●	–	–	–	–

NOTA: Esses insertos têm uma aresta de corte. O inserto mostrado tem o sentido de rotação para a direita; o inserto com sentido de rotação para a esquerda é a imagem invertida.
Os seguintes insertos têm ponta dupla: NGD3062RK, NGD4125RK, NGD3062LK e NGD4125LK.

- Inserto com raio total e controle do cavaco





NR-K

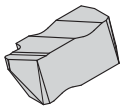
● primeira opção
○ opção alternativa

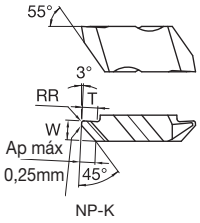
		KCU10	KCU25	KCP10B	KCP25B	KCK20B	K313	KC5010	KC5025	KT315	KB1630	KB5625	KD1425
P		●	●	●	●	○		○	○	●			
M		●	●				○	●	○				
K		○	○	○	○	●	○	○	○	○	○		
N		●	○				○	●	○				●
S		●	●				●	○	○		○		
H		○						○			●	●	

Canal e torneamento • Raio total • Controle do cavaco

código do produto	tamanho do inserto	W	Ap máx	RC	T	KCU10	KCU25	KCP10B	KCP25B	KCK20B	K313	KC5010	KC5025	KT315	KB1630	KB5625	KD1425
corte à direita (R)																	
NR3031RK	3	1,57	1,97	0,79	2,39	●	●	–	–	–	–	●	●	–	–	–	–
NR3047RK	3	2,39	1,91	1,19	3,81	●	●	–	–	–	–	●	●	–	–	–	–
NR3062RK	3	3,18	2,92	1,59	3,81	●	●	–	–	–	–	●	●	–	–	–	–
NR3078RK	3	3,97	2,54	1,98	3,81	●	●	–	–	–	–	●	–	–	–	–	–
NR4062RK	4	3,18	2,92	1,59	3,81	●	●	–	–	–	–	●	–	–	–	–	–
NR4094RK	4	4,79	3,81	2,39	6,35	●	●	–	–	–	–	●	–	–	–	–	–
NR4125RK	4	6,35	3,81	3,18	6,35	●	●	–	–	–	–	●	●	–	–	–	–
corte à esquerda (L)																	
NR3031LK	3	1,58	1,98	0,79	2,39	●	●	–	–	–	–	●	●	–	–	–	–
NR3047LK	3	2,39	1,91	1,19	3,81	●	●	–	–	–	–	●	●	–	–	–	–
NR3062LK	3	3,18	2,92	1,59	3,81	●	●	–	–	–	–	●	●	–	–	–	–
NR3078LK	3	3,96	2,54	1,98	3,81	–	●	–	–	–	–	●	●	–	–	–	–
NR4062LK	4	3,18	2,92	1,59	3,81	●	●	–	–	–	–	●	–	–	–	–	–
NR4094LK	4	4,79	3,81	2,39	6,35	●	●	–	–	–	–	●	●	–	–	–	–
NR4125LK	4	6,36	3,81	3,18	6,35	●	●	–	–	–	–	●	–	–	–	–	–

NOTA: O inserto mostrado tem o sentido de rotação para a direita; o inserto com sentido de rotação para a esquerda é a imagem invertida.





NP-K

● primeira opção
○ opção alternativa

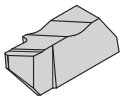
		KCU10	KCU25	KCP10B	KCP25B	KCK20B	K313	KC5010	KC5025	KT315	KB1630	KB5625	KD1425
P		●	●	●	●	○		○	○	●			
M		●	●				○	●	○				
K		○	○	○	○	●	○	○	○	○	○		
N		●	○				○	●	○				●
S		●	●				●	○	○		○		
H		○						○			●	●	

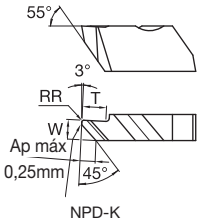
Canal e perfil • Controle do cavaco

código do produto	tamanho do inserto	W	W tol ±	Ap máx	RR	T	KCU10	KCU25	KCP10B	KCP25B	KCK20B	K313	KC5010	KC5025	KT315	KB1630	KB5625	KD1425
corte à direita (R)																		
NP2002RK	2	3,82	0,03	—	0,25	2,81	●	●	–	–	–	–	●	●	–	–	–	–
NP2012RK	2	3,82	0,03	—	0,25	2,81	–	●	–	–	–	–	–	–	–	–	–	–
NP3002RK	3	4,95	0,03	—	0,25	5,08	●	●	–	–	–	–	●	–	–	–	–	–
NP3012RK	3	4,95	0,03	—	0,25	5,08	–	●	–	–	–	–	–	●	–	–	–	–

NOTA: O inserto mostrado tem o sentido de rotação para a direita; o inserto com sentido de rotação para a esquerda é a imagem invertida.
Tolerância de W ± 0,13mm (± 0,005").

- Insertos positivos para perfilagem profunda.



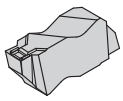


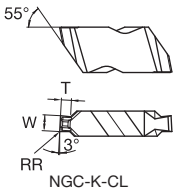
NPD-K

Canal e perfil • Canal profundo • Controle do cavaco

código do produto	tamanho do inserto	W	W tol ±	Ap máx	RR	T	KCU10	KCU25	KCP10B	KCP25B	KCK20B	K313	KC5010	KC5025	KT315	KB1630	KB5625	KD1425
corte à direita (R)																		
NPD2002RK	2	3,68	0,13	—	0,09	5,08	–	●	–	–	–	–	●	–	–	–	–	–
NPD3002RK	3	4,83	0,13	—	0,09	6,35	–	●	–	–	–	–	–	–	–	–	–	–
NPD3012RK	3	4,95	0,03	—	0,25	6,35	●	●	–	–	–	–	●	–	–	–	–	–

NOTA: O inserto mostrado tem o sentido de rotação para a direita; o inserto com sentido de rotação para a esquerda é a imagem invertida.
Tolerância de W ± 0,13mm (± 0,005").





NGC-K-CL

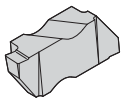
● primeira opção
○ opção alternativa

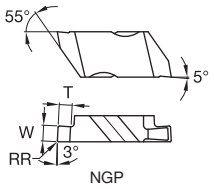
		KCU10	KCU25	KCP10B	KCP25B	KCK20B	K313	KC5010	KC5025	KT315	KB1630	KB5625	KD1425
P		●	●	●	●	○		○	○	●			
M		●	●				○	●	○				
K		○	○	○	○	●	○	○	○	○	○		
N		●	○				○	●	○				●
S		●	●				●	○	○		○		
H		○						○			●	●	

Canal e chanfro • Controle do cavaco

código do produto	tamanho do inserto	tamanho do anel elástico	W	RR	T	KCU10	KCU25	KCP10B	KCP25B	KCK20B	K313	KC5010	KC5025	KT315	KB1630	KB5625	KD1425
corte à direita (R)																	
NGC2C130R055K	2	1,30	1,39	0,08	0,6	–	●	–	–	–	–	–	–	–	–	–	–
NGC2C215R150K	2	2,15	2,24	0,08	1,5	–	●	–	–	–	–	–	–	–	–	–	–
corte à esquerda (L)																	
NGC2C130L055K	2	1,30	1,39	0,08	0,6	–	●	–	–	–	–	–	–	–	–	–	–
NGC2C185L125K	2	1,85	1,94	0,08	1,3	–	●	–	–	–	–	–	–	–	–	–	–
NGC2C215L150K	2	2,15	2,24	0,08	1,5	–	●	–	–	–	–	–	–	–	–	–	–

NOTA: Canal e insertos do chanfro para canais de anéis elásticos para especificações DIN 471/472.
O inserto mostrado tem o sentido de rotação para a direita; o inserto com sentido de rotação para a esquerda é a imagem invertida.





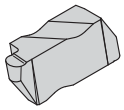
NGP

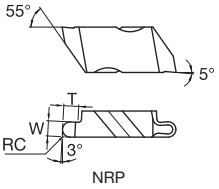
Canal e torneamento • Positivo

código do produto	tamanho do inserto	W	W tol ±	Ap máx	RR	T	KCU10	KCU25	KCP10B	KCP25B	KCK20B	K313	KC5010	KC5025	KT315	KB1630	KB5625	KD1425
corte à direita (R)																		
NGP2031R	2	0,79	0,03	—	0,09	1,27	●	–	–	–	–	–	●	–	–	–	–	–
NGP2062R	2	1,58	0,03	—	0,19	2,79	●	–	–	–	–	–	●	–	–	–	–	–
NGP2125R	2	3,18	0,03	—	0,19	2,79	●	–	–	–	–	–	–	–	–	–	–	–
NGP3088R	3	2,24	0,03	—	0,19	2,39	●	–	–	–	–	–	–	–	–	–	–	●
NGP3125R	3	3,18	0,03	—	0,19	3,81	●	–	–	–	–	–	●	–	–	–	–	●
NGP3156R	3	3,96	0,03	—	0,19	3,81	●	–	–	–	–	–	–	–	–	–	–	–
NGP4189R	4	4,80	0,03	—	0,57	6,35	●	–	–	–	–	–	–	–	–	–	–	–
NGP4250R	4	6,35	0,03	—	0,57	6,35	–	–	–	–	–	–	●	–	–	–	–	–
corte à esquerda (L)																		
NGP2031L	2	0,79	0,03	—	0,09	1,27	●	–	–	–	–	–	–	–	–	–	–	–
NGP2062L	2	1,57	0,03	—	0,19	2,79	●	–	–	–	–	–	–	–	–	–	–	–
NGP2125L	2	3,18	0,03	—	0,19	2,79	●	–	–	–	–	–	–	–	–	–	–	–
NGP3088L	3	2,24	0,03	—	0,19	2,39	●	–	–	–	–	–	–	–	–	–	–	–
NGP3125L	3	3,18	0,03	—	0,19	3,81	–	–	–	–	–	–	●	–	–	–	–	–
NGP4250L	4	6,35	0,03	—	0,57	6,35	●	–	–	–	–	–	–	–	–	–	–	–

NOTA: Todas as classes KD e KB são de insertos de ponta simples.
O inserto mostrado tem o sentido de rotação para a direita; o inserto com sentido de rotação para a esquerda é a imagem invertida.

- Insertos com ângulo de saída positivo e raio total.





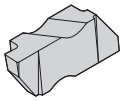
● primeira opção
○ opção alternativa

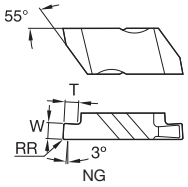
		KCU10	KCU25	KCP10B	KCP25B	KCK20B	K313	KC5010	KC5025	KT315	KB1630	KB5625	KD1425
P		●	●	●	●	○		○	○	●			
M		●	●				○	●	○				
K		○	○	○	○	●	○	○	○	○	○		
N		●	○				○	●	○				●
S		●	●				●	○	○		○		
H		○						○			●	●	

Canal e torneamento • Raio total • Positivo

código do produto	tamanho do inserto	W	Ap máx	RC	T	KCU10	KCU25	KCP10B	KCP25B	KCK20B	K313	KC5010	KC5025	KT315	KB1630	KB5625	KD1425
corte à direita (R)																	
NRP3031R	3	1,58	—	0,79	2,39	●	–	–	–	–	–	●	–	–	–	–	–
NRP3047R	3	2,39	—	1,19	3,81	●	–	–	–	–	●	●	–	–	–	–	–
NRP3062R	3	3,18	—	1,59	3,81	●	–	–	–	–	–	●	–	–	–	–	–
NRP3094R	3	4,78	—	2,39	3,81	●	–	–	–	–	–	●	–	–	–	–	–
corte à esquerda (L)																	
NRP3031L	3	1,58	—	0,79	2,39	●	–	–	–	–	–	●	–	–	–	–	–
NRP3047L	3	2,39	—	1,19	3,81	●	–	–	–	–	–	●	–	–	–	–	–
NRP3062L	3	3,18	—	1,59	3,81	–	–	–	–	–	–	●	–	–	–	–	–
NRP3094L	3	4,78	—	2,39	3,81	●	–	–	–	–	–	●	–	–	–	–	–

NOTA: O inserto mostrado tem o sentido de rotação para a direita; o inserto com sentido de rotação para a esquerda é a imagem invertida.





● primeira opção
○ opção alternativa

		KCU10	KCU25	KCP10B	KCP25B	KCK20B	K313	KC5010	KC5025	KT315	KB1630	KB5625	KD1425
P		●	●	●	●	○		○	○	●			
M		●	●				○	●	○				
K		○	○	○	○	●	○	○	○	○	○		
N		●	○				○	●	○				●
S		●	●				●	○	○		○		
H		○						○			●	●	

Canal e torneamento • Topo plano

código do produto	tamanho do inserto	W	W tol ±	Ap máx	RR	T	KCU10	KCU25	KCP10B	KCP25B	KCK20B	K313	KC5010	KC5025	KT315	KB1630	KB5625	KD1425
corte à direita (R)																		
NG2031R	2	0,79	0,03	—	0,09	1,27	●	●	–	–	●	●	●	●	–	–	–	–
NG2041R	2	1,04	0,03	—	0,09	1,27	●	●	–	–	●	●	●	●	–	–	–	–
NG2047R	2	1,19	0,03	—	0,09	1,27	●	●	–	–	●	–	●	–	–	–	–	–
NG2058R	2	1,47	0,03	—	0,19	1,27	–	●	–	–	–	–	–	●	–	–	–	–
NG2062R	2	1,58	0,03	—	0,19	2,79	●	●	–	–	●	●	●	●	–	–	–	–
NG2094R	2	2,39	0,03	—	0,19	2,79	●	●	–	–	●	●	●	–	–	–	–	–
NG2125R	2	3,18	0,03	—	0,19	2,79	●	●	–	–	–	–	●	–	–	–	–	–
NG3047R	3	1,19	0,03	—	0,19	1,91	●	●	–	–	●	●	●	●	–	–	–	–
NG3062R	3	1,58	0,03	—	0,19	2,39	●	●	–	–	●	●	●	●	–	–	–	–
NG3072R	3	1,83	0,03	—	0,19	2,39	●	–	–	–	●	–	●	–	–	–	–	–
NG3078R	3	1,98	0,03	—	0,19	2,39	●	–	–	–	●	–	●	–	–	–	–	–
NG3088R	3	2,24	0,03	—	0,19	2,39	●	●	–	–	●	–	●	–	–	–	–	–
NG3094R	3	2,39	0,03	—	0,19	3,81	●	●	–	–	●	●	●	●	–	–	–	–
NG3097R	3	2,46	0,03	—	0,32	3,81	●	●	–	–	●	–	●	–	–	–	–	–
NG3105R	3	2,67	0,03	—	0,19	3,81	●	●	–	–	●	–	●	●	–	–	–	–
NG3110R	3	2,79	0,03	—	0,32	3,81	–	●	–	–	–	–	–	●	–	–	–	–
NG3122R	3	3,10	0,03	—	0,19	3,81	–	●	–	–	–	–	–	–	–	–	–	–
NG3125R	3	3,18	0,03	—	0,19	3,81	●	●	–	–	●	●	●	●	–	–	–	–
NG3142R	3	3,61	0,03	—	0,32	3,81	–	●	–	–	–	–	●	–	–	–	–	–
NG3156R	3	3,96	0,03	—	0,19	3,81	●	●	–	–	●	–	●	●	–	–	–	–
NG3178R	3	4,52	0,03	—	0,19	3,81	–	–	–	–	–	–	–	●	–	–	–	–
NG3185R	3	4,70	0,03	—	0,57	3,81	–	●	–	–	–	–	–	–	–	–	–	–
NG3189R	3	4,80	0,03	—	0,57	3,81	●	●	–	–	●	●	●	●	–	–	–	–
NG4125R	4	3,18	0,03	—	0,19	3,81	●	●	–	–	●	●	–	–	–	–	–	–
NG4189R	4	4,80	0,03	—	0,57	6,35	●	●	–	–	●	●	●	–	–	–	–	–
NG4213R	4	5,41	0,03	—	0,19	6,35	–	●	–	–	–	–	–	–	–	–	–	–
NG4250R	4	6,35	0,03	—	0,57	6,35	●	●	–	–	●	–	●	●	–	–	–	–
NG5312R	5	7,93	0,03	—	0,83	9,52	–	●	–	–	–	–	–	–	–	–	–	–
NG6375R	6	9,53	0,03	—	0,83	6,35	–	●	–	–	–	–	–	–	–	–	–	–

(continuação)

(Canal e torneamento • Topo plano – continuação)

● primeira opção
○ opção alternativa

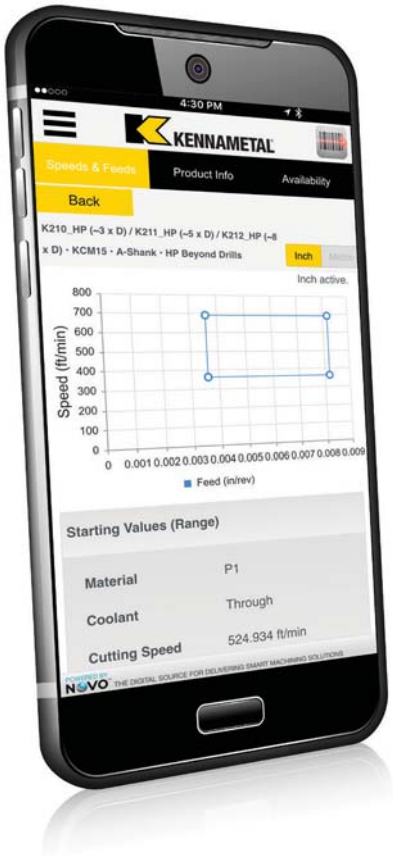
		KCU10	KCU25	KCP10B	KCP25B	KCK20B	K313	KC5010	KC5025	KT315	KB1630	KB5625	KD1425
P		●	●	●	●	○		○	○	●			
M		●	●				○	●	○				
K		○	○	○	○	●	○	○	○	○	○		
N		●	○				○	●	○				●
S		●	●				●	○	○		○		
H		○						○			●	●	

código do produto	tamanho do inserto	W	W tol ±	Ap máx	RR	T											
corte à esquerda (L)																	
NG1031L	1	0,79	0,08	—	0,19	1,27	–	●	–	–	–	–	–	–	–	–	–
NG1047L	1	1,19	0,08	—	0,19	1,91	–	●	–	–	–	–	●	–	–	–	–
NG1062L	1	1,58	0,08	—	0,19	1,91	–	●	–	–	–	–	●	–	–	–	–
NG1094L	1	2,39	0,08	—	0,19	1,91	–	●	–	–	–	–	●	–	–	–	–
NG2031L	2	0,79	0,03	—	0,09	1,27	●	●	–	–	●	●	●	–	–	–	–
NG2041L	2	1,04	0,03	—	0,09	1,27	–	●	–	–	●	–	●	●	–	–	–
NG2047L	2	1,19	0,03	—	0,09	1,27	●	●	–	–	–	–	●	–	–	–	–
NG2058L	2	1,47	0,03	—	0,19	1,27	–	●	–	–	–	–	–	–	–	–	–
NG2062L	2	1,58	0,03	—	0,19	2,79	●	●	–	–	●	●	●	●	–	–	–
NG2094L	2	2,39	0,03	—	0,19	2,79	●	●	–	–	●	●	●	–	–	–	–
NG2125L	2	3,18	0,03	—	0,19	2,79	●	●	–	–	●	–	●	–	–	–	–
NG3047L	3	1,19	0,03	—	0,19	1,91	●	●	–	–	●	●	●	–	–	–	–
NG3062L	3	1,57	0,03	—	0,19	2,38	●	●	–	–	●	●	●	●	–	–	–
NG3072L	3	1,83	0,03	—	0,19	2,39	●	–	–	–	–	–	●	–	–	–	–
NG3078L	3	1,98	0,03	—	0,19	2,39	●	–	–	–	–	–	–	–	–	–	–
NG3088L	3	2,24	0,03	—	0,19	2,39	●	●	–	–	–	–	●	–	–	–	–
NG3094L	3	2,39	0,03	—	0,19	3,81	●	●	–	–	●	●	●	●	–	–	–
NG3097L	3	2,46	0,03	—	0,32	3,81	●	●	–	–	–	–	–	–	–	–	–
NG3105L	3	2,67	0,03	—	0,19	3,81	●	●	–	–	–	–	●	–	–	–	–
NG3110L	3	2,79	0,03	—	0,32	3,81	–	●	–	–	–	–	●	–	–	–	–
NG3122L	3	3,10	0,03	—	0,19	3,81	–	●	–	–	–	–	–	–	–	–	–
NG3125L	3	3,18	0,03	—	0,19	3,81	●	●	–	–	●	●	●	●	–	–	–
NG3142L	3	3,61	0,03	—	0,32	3,81	●	●	–	–	–	–	–	–	–	–	–
NG3156L	3	3,96	0,03	—	0,19	3,81	–	●	–	–	–	–	●	–	–	–	–
NG3178L	3	4,52	—	—	0,19	3,81	–	●	–	–	–	–	–	–	–	–	–
NG3185L	3	4,70	0,03	—	0,57	3,81	–	–	–	–	–	–	●	–	–	–	–
NG3189L	3	4,80	0,03	—	0,57	3,81	●	●	–	–	●	–	●	●	–	–	–
NG4125L	4	3,18	0,03	—	0,19	3,81	●	●	–	–	–	●	–	–	–	–	–
NG4189L	4	4,80	0,03	—	0,57	6,35	●	●	–	–	●	–	●	–	–	–	–
NG4189LEST	4	4,80	0,03	—	0,57	6,35	–	–	–	–	–	–	–	–	●	–	–
NG4250L	4	6,35	0,03	—	0,57	6,35	●	●	–	–	●	–	●	●	–	–	–

NOTA: Todas as classes KD e KB são de insertos de ponta simples.
O inserto mostrado tem o sentido de rotação para a direita; o inserto com sentido de rotação para a esquerda é a imagem invertida.

Aplicativo móvel

O aplicativo móvel da Kennametal torna mais fácil acessar as informações sobre produtos, calculadoras e muito mais, a partir de dispositivos iPhone® e Android™.



CARACTERÍSTICAS

Faça o escaneamento do código de barras do pacote de ferramentas Kennametal ou pesquise pelo número de catálogo do produto para acessar as informações completas sobre os produtos.

As informações sobre produtos incluem imagens das ferramentas, dimensões, classes e destaques de produtos.

Verifique a disponibilidade de produtos em locais globais.

Obtenha informações sobre velocidade e avanço em valores no sistema métrico e em polegadas para todos os produtos de corte de metal.

Veja dicas técnicas para soluções úteis aos problemas comuns de usinagem.

Entre em contato com o atendimento a clientes diretamente a partir do aplicativo.

CALCULADORAS DE USINAGEM

Visualize dados para aplicações de fresamento e furação.

Valores calculados em polegadas ou no sistema métrico.

PEDIDOS

Faça seu login usando suas credenciais do Konnect para concluir uma compra.

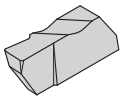
ONDE ENCONTRÁ-LO

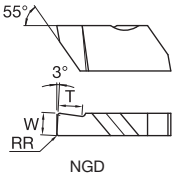
Baixe o aplicativo gratuito ainda hoje na loja do iTunes® ou Google Play™.

ANDROID APP ON Google play

Available on the App Store

● primeira opção
○ opção alternativa



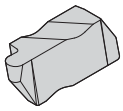


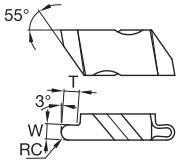
NGD

Canal e torneamento • Canal profundo • Topo plano

código do produto	tamanho do inserto	W	W tol ±	Ap máx	RR	T	KCU10	KCU25	KCP10B	KCP25B	KCK20B	K313	KC5010	KC5025	KT315	KB1630	KB5625	KD1425
corte à direita (R)																		
NGD3189R	3	4,80	0,03	—	0,57	6,35	●	–	–	–	–	●	–	–	–	–	–	–
NGD4250R	4	6,35	0,03	—	0,57	12,70	●	–	–	–	–	●	–	–	–	–	–	–
corte à esquerda (L)																		
NGD3189L	3	4,80	0,03	—	0,57	6,35	●	–	–	–	–	●	●	–	–	–	–	–
NGD4250L	4	6,35	0,03	—	0,57	12,70	●	–	–	–	–	●	●	–	–	–	–	–

NOTA: Esses insertos têm uma aresta de corte.
O inserto mostrado tem o sentido de rotação para a direita; o inserto com sentido de rotação para a esquerda é a imagem invertida.





NR

● primeira opção
○ opção alternativa

		KCU10	KCU25	KCP10B	KCP25B	KCK20B	K313	KC5010	KC5025	KT315	KB1630	KB5625	KD1425
P		●	●	●	●	○		○	○	●			
M		●	●				○	●	○				
K		○	○	○	○	●	○	○	○	○	○		
N		●	○				○	●	○				●
S		●	●				●	○	○		○		
H		○						○			●	●	

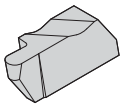
Canal e torneamento • Raio total • Topo plano

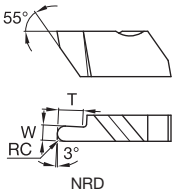
código do produto	tamanho do inserto	W	Ap máx	RC	T	KCU10	KCU25	KCP10B	KCP25B	KCK20B	K313	KC5010	KC5025	KT315	KB1630	KB5625	KD1425
corte à direita (R)																	
NR2M050R	2	1,00	—	0,50	1,27	●	●	–	–	–	–	●	●	–	–	–	–
NR2M075R	2	1,50	—	0,75	2,79	●	–	–	–	–	–	●	–	–	–	–	–
NR2031R	2	1,58	—	0,79	2,79	●	●	–	–	–	–	●	●	–	–	–	–
NR2M100R	2	2,00	—	1,00	2,79	●	–	–	–	–	–	●	●	–	–	–	–
NR2047R	2	2,39	—	1,19	2,79	–	●	–	–	–	–	–	–	–	–	–	–
NR2M125R	2	2,50	—	1,25	2,79	–	–	–	–	–	–	–	●	–	–	–	–
NR2M150R	2	3,00	—	1,50	2,79	–	–	–	–	–	–	–	●	–	–	–	–
NR2062R	2	3,18	—	1,59	2,79	●	●	–	–	–	–	●	–	–	–	–	–
NR2M175R	2	3,50	—	1,75	2,79	–	–	–	–	–	–	–	●	–	–	–	–
NR3031R	3	1,58	—	0,79	2,39	●	●	–	–	–	●	●	●	–	–	–	–
NR3M100R	3	2,00	—	1,00	2,39	–	–	–	–	–	–	–	●	–	–	–	–
NR3047R	3	2,39	—	1,19	3,81	●	●	–	–	–	●	●	–	–	–	–	–
NR3M150R	3	3,00	—	1,50	3,81	–	–	–	–	–	–	–	●	–	–	–	–
NR3062R	3	3,18	—	1,59	3,81	●	●	–	–	–	●	●	●	–	–	–	–
NR3078R	3	3,96	—	1,98	3,81	–	–	–	–	–	●	–	–	–	–	–	–
NR3M200R	3	4,00	—	2,00	3,81	–	–	–	–	–	–	–	●	–	–	–	–
NR3094R	3	4,78	—	2,39	3,81	●	●	–	–	–	–	●	●	–	–	–	–
NR4094R	4	4,78	—	2,39	6,35	–	–	–	–	–	●	–	–	–	–	–	–
NR4125R	4	6,35	—	3,18	6,35	●	●	–	–	–	–	●	–	–	–	–	–
corte à esquerda (L)																	
NR2M050L	2	1,00	—	0,50	1,27	●	●	–	–	–	–	●	–	–	–	–	–
NR2031L	2	1,58	—	0,79	2,79	●	●	–	–	–	–	●	●	–	–	–	–
NR2M100L	2	2,00	—	1,00	2,79	–	–	–	–	–	–	–	●	–	–	–	–
NR2047L	2	2,39	—	1,19	2,79	–	●	–	–	–	–	–	–	–	–	–	–
NR2M150L	2	3,00	—	1,50	2,79	–	–	–	–	–	–	–	●	–	–	–	–
NR2062L	2	3,18	—	1,59	2,79	●	●	–	–	–	–	●	–	–	–	–	–
NR3031L	3	1,58	—	0,79	2,39	●	●	–	–	–	●	●	●	–	–	–	–
NR3M100L	3	2,00	—	1,00	2,39	–	–	–	–	–	–	–	●	–	–	–	–
NR3047L	3	2,39	—	1,19	3,81	●	●	–	–	–	●	●	–	–	–	–	–
NR3M150L	3	3,00	—	1,50	3,81	●	–	–	–	–	–	●	●	–	–	–	–
NR3062L	3	3,18	—	1,59	3,81	●	●	–	–	–	●	●	●	–	–	–	–
NR3M200L	3	4,00	—	2,00	3,81	–	–	–	–	–	–	–	●	–	–	–	–
NR3094L	3	4,78	—	2,39	3,81	–	●	–	–	–	●	●	●	–	–	–	–
NR4125L	4	6,35	—	3,18	6,35	–	●	–	–	–	–	●	–	–	–	–	–

NOTA: O inserto mostrado tem o sentido de rotação para a direita; o inserto com sentido de rotação para a esquerda é a imagem invertida.

P		●	●	●	●	○		○	○	●			
M		●	●				○	●	○				
K		○	○	○	○	●	○	○	○	○	○		
N		●	○				○	●	○				●
S		●	●				●	○	○		○		
H		○						○			●	●	

● primeira opção
○ opção alternativa

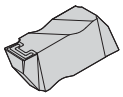


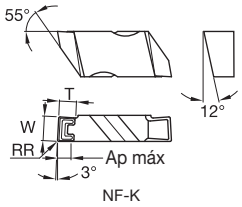


Canal e torneamento • Canal profundo • Raio total • Topo plano

código do produto	tamanho do inserto	W	Ap máx	RC	T	KCU10	KCU25	KCP10B	KCP25B	KCK20B	K313	KC5010	KC5025	KT315	KB1630	KB5625	KD1425
corte à direita (R)																	
NRD3031R	3	1,58	—	0,79	3,18	●	●	–	–	–	–	●	●	–	–	–	–
NRD3062R	3	3,17	—	1,59	6,35	●	●	–	–	–	–	●	●	–	–	–	–
NRD4062R	4	3,18	—	1,59	6,35	●	●	–	–	–	–	●	–	–	–	–	–
NRD4094R	4	4,78	—	2,39	12,70	●	–	–	–	–	–	●	–	–	–	–	–
NRD4125R	4	6,35	—	3,18	12,70	–	●	–	–	–	–	●	–	–	–	–	–
corte à esquerda (L)																	
NRD3031L	3	1,58	—	0,79	3,18	●	●	–	–	–	–	●	●	–	–	–	–
NRD3062L	3	3,17	—	1,59	6,35	●	●	–	–	–	–	●	●	–	–	–	–
NRD4062L	4	3,18	—	1,59	6,35	●	●	–	–	–	–	●	●	–	–	–	–
NRD4094L	4	4,78	—	2,39	12,70	●	●	–	–	–	–	●	–	–	–	–	–
NRD4125L	4	6,35	—	3,18	12,70	●	●	–	–	–	–	●	●	–	–	–	–

NOTA: Esses insertos têm uma aresta de corte.
O inserto mostrado tem o sentido de rotação para a direita; o inserto com sentido de rotação para a esquerda é a imagem invertida.

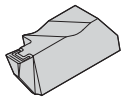


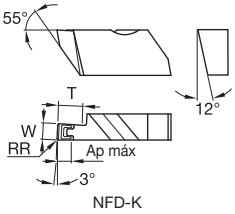


Canal de face • Controle do cavaco

código do produto	tamanho do inserto	W	W tol ±	Ap máx	RR	T	KCU10	KCU25	KCP10B	KCP25B	KCK20B	K313	KC5010	KC5025	KT315	KB1630	KB5625	KD1425
corte à direita (R)																		
NF3M200RK	3	2,00	0,03	1,02	0,19	1,78	–	–	–	–	–	–	–	●	–	–	–	–
NF3M300RK	3	3,00	0,03	1,02	0,19	3,81	–	–	–	–	–	–	–	●	–	–	–	–
NF3125RK	3	3,18	0,03	1,02	0,19	3,81	–	●	–	–	–	–	–	●	–	–	–	–
NF3156RK	3	3,96	0,03	2,92	0,19	3,81	–	●	–	–	–	–	–	–	–	–	–	–
corte à esquerda (L)																		
NF3M200LK	3	2,00	0,03	1,02	0,19	1,78	–	–	–	–	–	–	–	●	–	–	–	–
NF3M300LK	3	3,00	0,03	1,02	0,19	3,81	–	–	–	–	–	–	–	●	–	–	–	–
NF3125LK	3	3,18	0,03	1,02	0,19	3,81	–	●	–	–	–	–	–	●	–	–	–	–
NF3156LK	3	3,96	0,03	2,92	0,19	3,81	–	●	–	–	–	–	–	–	–	–	–	–

NOTA: O inserto mostrado tem o sentido de rotação para a direita; o inserto com sentido de rotação para a esquerda é a imagem invertida.





NFD-K

		KCU10	KCU25	KCP10B	KCP25B	KCK20B	K313	KC5010	KC5025	KT315	KB1630	KB5625	KD1425
P		●	●	●	●	○		○	○	●			
M		●	●				○	●	○				
K		○	○	○	○	●	○	○	○	○	○		
N		●	○				○	●	○				●
S		●	●				●	○	○		○		
H		○						○			●	●	

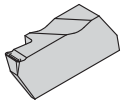
● primeira opção
○ opção alternativa

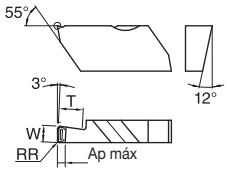
Canal de face • Canal profundo • Controle do cavaco

código do produto	tamanho do inserto	W	W tol ±	Ap máx	RR	T	KCU10	KCU25	KCP10B	KCP25B	KCK20B	K313	KC5010	KC5025	KT315	KB1630	KB5625	KD1425
corte à direita (R)																		
NFD3M300RK	3	3,00	0,03	1,02	0,19	6,35	–	–	–	–	–	–	–	●	–	–	–	–
NFD3125RK	3	3,18	0,03	1,02	0,19	6,35	–	●	–	–	–	–	–	●	–	–	–	–
NFD4189RK	4	4,80	0,03	2,92	0,57	9,53	–	●	–	–	–	–	–	–	–	–	–	–
NFD4250RK	4	6,35	0,03	3,81	0,57	12,70	–	●	–	–	–	–	–	–	–	–	–	–
corte à esquerda (L)																		
NFD3M300LK	3	3,00	0,03	1,02	0,19	6,35	–	–	–	–	–	–	–	●	–	–	–	–
NFD3125LK	3	3,18	0,03	1,02	0,19	6,35	–	●	–	–	–	–	–	●	–	–	–	–
NFD4189LK	4	4,80	0,03	2,92	0,57	9,53	–	●	–	–	–	–	–	●	–	–	–	–
NFD4250LK	4	6,35	0,03	3,81	0,57	12,70	–	●	–	–	–	–	–	–	–	–	–	–

NOTA: Esses insertos têm uma aresta de corte.
O inserto mostrado tem o sentido de rotação para a direita; o inserto com sentido de rotação para a esquerda é a imagem invertida.

- Insertos para abertura de canais de face profundos.



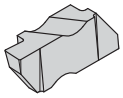


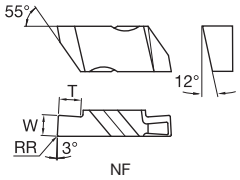
NFD-KI

Canal de face • Canal profundo interno • Controle do cavaco

código do produto	tamanho do inserto	W	W tol ±	Ap máx	RR	T	KCU10	KCU25	KCP10B	KCP25B	KCK20B	K313	KC5010	KC5025	KT315	KB1630	KB5625	KD1425
corte à direita (R)																		
NFD3125RKI	3	3,18	0,03	1,02	0,19	6,35	–	●	–	–	–	–	–	●	–	–	–	–
NFD3189RKI	3	4,80	0,03	2,92	0,57	6,35	–	●	–	–	–	–	–	–	–	–	–	–
corte à esquerda (L)																		
NFD3125LKI	3	3,18	0,03	1,02	0,19	6,35	–	●	–	–	–	–	–	–	–	–	–	–
NFD3189LKI	3	4,80	0,03	2,92	0,57	6,35	–	●	–	–	–	–	–	–	–	–	–	–

NOTA: Esses insertos têm uma aresta de corte.
Insertos NFD-KI são compatíveis somente com barras de mandrilar de estilo NS.
O inserto mostrado tem o sentido de rotação para a direita; o inserto com sentido de rotação para a esquerda é a imagem invertida.





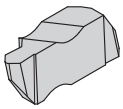
● primeira opção
○ opção alternativa

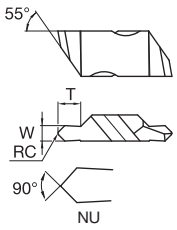
		KCU10	KCU25	KCP10B	KCP25B	KCK20B	K313	KC5010	KC5025	KT315	KB1630	KB5625	KD1425
P		●	●	●	●	○		○	○	●			
M		●	●				○	●	○				
K		○	○	○	○	●	○	○	○	○	○		
N		●	○				○	●	○				●
S		●	●				●	○	○		○		
H		○						○			●	●	

Canal de face • Topo plano

código do produto	tamanho do inserto	W	W tol ±	Ap máx	RR	T	KCU10	KCU25	KCP10B	KCP25B	KCK20B	K313	KC5010	KC5025	KT315	KB1630	KB5625	KD1425
corte à direita (R)																		
NF3125R	3	3,18	0,03	—	0,19	3,81	–	–	–	–	–	●	–	–	–	–	–	–
NF3188R	3	4,78	0,03	—	0,57	3,81	–	●	–	–	–	–	–	–	–	–	–	–
corte à esquerda (L)																		
NF3125L	3	3,18	0,03	—	0,19	3,81	–	–	–	–	–	●	–	–	–	–	–	–
NF3188L	3	4,78	0,03	—	0,57	3,81	–	●	–	–	–	–	–	–	–	–	–	–

NOTA: O inserto mostrado tem o sentido de rotação para a direita; o inserto com sentido de rotação para a esquerda é a imagem invertida.





Canal e torneamento • Topo plano • 90°

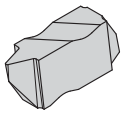
código do produto	tamanho do inserto	W	Ap máx	RC	T	KCU10	KCU25	KCP10B	KCP25B	KCK20B	K313	KC5010	KC5025	KT315	KB1630	KB5625	KD1425
corte à direita (R)																	
NU3094R	3	2,39	—	0,51	3,18	–	–	–	–	–	–	–	●	–	–	–	–
NU3125R	3	3,18	—	1,19	4,78	–	●	–	–	–	–	–	–	–	–	–	–
corte à esquerda (L)																	
NU3094L	3	2,39	—	0,51	3,18	–	●	–	–	–	–	–	●	–	–	–	–
NU3125L	3	3,18	—	1,19	4,78	–	–	–	–	–	–	–	●	–	–	–	–
NU3156L	3	3,96	—	1,19	4,78	–	–	–	–	–	–	–	●	–	–	–	–

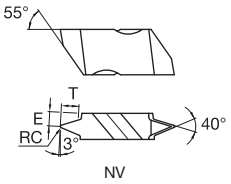
NOTA: Tolerância de W ± 0,13mm (± 0,005").
O inserto mostrado tem o sentido de rotação para a direita; o inserto com sentido de rotação para a esquerda é a imagem invertida.
Insertos NU compatíveis com insertos de estilo NR.

- Insertos para abertura de canal Poli-V.

● primeira opção
○ opção alternativa

		KCU10	KCU25	KCP10B	KCP25B	KCK20B	K313	KC5010	KC5025	KT315	KB1630	KB5625	KD1425
P		●	●	●	●	○		○	○	●			
M		●	●				○	●	○				
K		○	○	○	○	●	○	○	○	○	○		
N		●	○				○	●	○				●
S		●	●				●	○	○		○		
H		○						○			●	●	



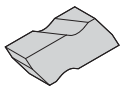


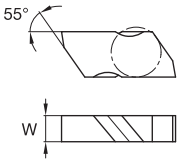
NV

Canal e torneamento • Topo plano • Poli-V

código do produto	tamanho do inserto	E	RC	T	KCU10	KCU25	KCP10B	KCP25B	KCK20B	K313	KC5010	KC5025	KT315	KB1630	KB5625	KD1425
corte à direita (R)																
NV3RJ	3	3,18	0,32	2,21	–	●	–	–	–	–	–	–	–	–	–	–
NV4RL	4	3,00	0,32	5,11	–	●	–	–	–	–	–	–	–	–	–	–
corte à esquerda (L)																
NV4LL	4	3,00	0,32	5,11	–	●	–	–	–	–	–	–	–	–	–	–

NOTA: O inserto mostrado tem o sentido de rotação para a direita; o inserto com sentido de rotação para a esquerda é a imagem invertida.





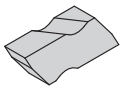
NB

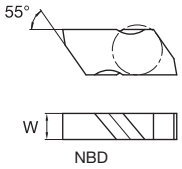
Canal e torneamento • Blank

código do produto	tamanho do inserto	W	W tol ±	Ap máx	RR	T	KCU10	KCU25	KCP10B	KCP25B	KCK20B	K313	KC5010	KC5025	KT315	KB1630	KB5625	KD1425
corte à direita (R)																		
NB2R	2	3,84	–	–	–	–	–	–	–	–	–	●	–	–	–	–	–	–
NB3R	3	4,95	–	–	–	–	–	–	–	–	–	●	–	–	–	–	–	–
NB4R	4	6,48	–	–	–	–	–	–	–	–	–	●	–	–	–	–	–	–
corte à esquerda (L)																		
NB2L	2	3,84	–	–	–	–	–	–	–	–	–	●	–	–	–	–	–	–
NB3L	3	4,95	–	–	–	–	–	–	–	–	–	●	–	–	–	–	–	–
NB4L	4	6,48	–	–	–	–	–	–	–	–	–	●	–	–	–	–	–	–

NOTA: Os blanks NB e NBD foram projetados para permitir a modificação da dimensão da largura W e da forma da ponta.
A dimensão da largura W é fornecida para indicar a máxima largura possível. Disponíveis somente em classes sem revestimento.
O inserto mostrado tem o sentido de rotação para a direita; o inserto com sentido de rotação para a esquerda é a imagem invertida.

● primeira opção
○ opção alternativa



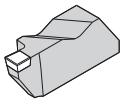


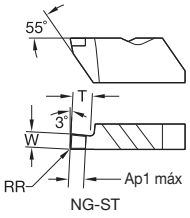
		KCU10	KCU25	KCP10B	KCP25B	KCK20B	K313	KC5010	KC5025	KT315	KB1630	KB5625	KD1425
P		●	●	●	●	○		○	○	●			
M		●	●				○	●	○				
K		○	○	○	○	●	○	○	○	○	○		
N		●	○				○	●	○				●
S		●	●				●	○	○		○		
H		○						○			●	●	

Canal e torneamento • Canal profundo • Blank

código do produto	tamanho do inserto	W	W tol ±	Ap max	RR	T	KCU10	KCU25	KCP10B	KCP25B	KCK20B	K313	KC5010	KC5025	KT315	KB1630	KB5625	KD1425
corte à direita (R)																		
NBD2R	2	3,81	–	–	–	–	–	–	–	–	–	●	–	–	–	–	–	–
NBD3R	3	4,95	–	–	–	–	–	–	–	–	–	●	–	–	–	–	–	–
corte à esquerda (L)																		
NBD3L	3	4,95	–	–	–	–	–	–	–	–	–	●	–	–	–	–	–	–

NOTA: Os blanks NB e NBD foram projetados para permitir a modificação da dimensão da largura W e da forma da ponta.
A dimensão da largura W é fornecida para indicar a máxima largura possível. Disponíveis somente em classes sem revestimento.
O inserto mostrado tem o sentido de rotação para a direita; o inserto com sentido de rotação para a esquerda é a imagem invertida.





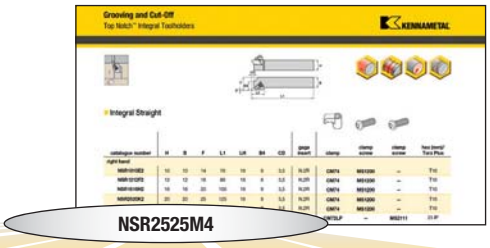
Canal e torneamento • Topo plano • PcBN

código do produto	tamanho do inserto	W	Ap máx	RR	T	KCU10	KCU25	KCP10B	KCP25B	KCK20B	K313	KC5010	KC5025	KT315	KB1630	KB5625	KD1425
corte à direita (R)																	
NG3062REST	3	1,58	–	0,19	2,39	–	–	–	–	–	–	–	–	–	●	–	●
NG3M200RS02020ST	3	2,00	2,00	0,20	2,39	–	–	–	–	–	–	–	–	–	●	●	–
NG3094REST	3	2,39	–	0,19	3,81	–	–	–	–	–	–	–	–	–	●	–	●
NG3M300RS02020ST	3	3,00	3,00	0,20	3,81	–	–	–	–	–	–	–	–	–	●	●	–
NG3125REST	3	3,18	–	0,19	3,81	–	–	–	–	–	–	–	–	–	●	–	●
NG3125RS0820ST	3	3,18	3,00	0,25	3,81	–	–	–	–	–	–	–	–	–	●	●	–
NG3M400RS02020ST	3	4,00	3,00	0,20	3,81	–	–	–	–	–	–	–	–	–	–	●	–
NG3189REST	3	4,80	–	0,57	3,81	–	–	–	–	–	–	–	–	–	–	–	●
NG4189REST	4	4,80	–	0,57	6,35	–	–	–	–	–	–	–	–	–	●	–	–
corte à esquerda (L)																	
NG3062LEST	3	1,58	–	0,19	2,39	–	–	–	–	–	–	–	–	–	●	–	●
NG3M200LS02020ST	3	2,00	2,00	0,20	2,39	–	–	–	–	–	–	–	–	–	–	●	–
NG3094LEST	3	2,39	–	0,19	3,81	–	–	–	–	–	–	–	–	–	●	–	●
NG3125LEST	3	3,18	–	0,19	3,81	–	–	–	–	–	–	–	–	–	●	–	–
NG3125LS0820ST	3	3,18	3,00	0,25	3,81	–	–	–	–	–	–	–	–	–	●	–	–
NG4189LEST	4	4,80	–	0,57	6,35	–	–	–	–	–	–	–	–	–	●	–	–

NOTA: Todas as classes KB são de insertos de ponta simples.
O inserto mostrado tem o sentido de rotação para a direita; o inserto com sentido de rotação para a esquerda é a imagem invertida.

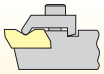
Como funcionam os números de catálogo?

Cada caractere no nosso número de catálogo significa uma característica específica daquele produto. Use as colunas-chave a seguir e as imagens correspondentes para fazer uma identificação fácil do atributo a ser aplicado.

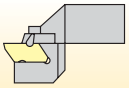


NSR2525M4

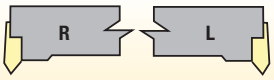
N	S	R		2525	M	4	
Método de suporte do inserto	Posição de montagem do inserto	Sentido de rotação da ferramenta	Cabeça deslocada	Tamanho da haste	Comprimento da ferramenta	Tamanho do inserto	Qualificado superfície e comprimento



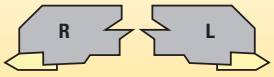
N =
Top Notch*



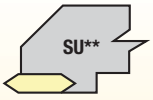
DH =
Cabeça deslocada



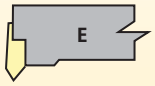
Montagem de topo



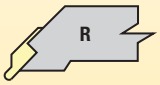
Montagem lateral



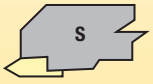
SU = Inserto utilitário com montagem lateral



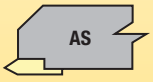
E = Fim



R = Rebaixo



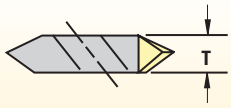
S = Montagem lateral, com deslocamento



AS = Montagem lateral, sem deslocamento

sistema métrico:
altura e largura da haste em milímetros e comprimento do suporte conforme o padrão ISO.

L1	ISO
32	A
40	B
50	C
60	D
70	E
80	F
90	G
100	H
110	J
125	K
140	L
150	M
160	N
170	P
180	Q
200	R
250	S
300	T
350	U
400	V
450	W
500	Y
Comprimento especial	X



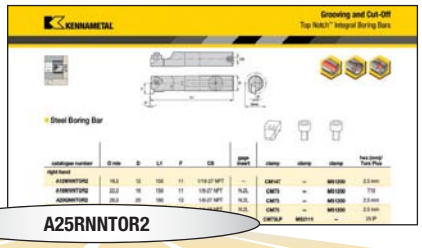
tamanho do inserto	T mm
2	3,81
3	4,95
4	6,98
5	9,65
6	9,73
8	11,13

Q =
Suporte métrico qualificado

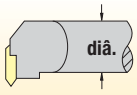
* Padrão exclusivo Kennametal.
** O suporte utilitário com montagem lateral só pode ser usado com insertos NTU.

Como funcionam os números de catálogo?

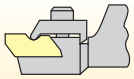
Cada caractere no nosso número de catálogo significa uma característica específica daquele produto. Use as colunas-chave a seguir e as imagens correspondentes para fazer uma identificação fácil do atributo a ser aplicado.



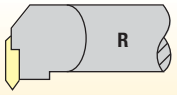
A	25	R	N	N	T	0	R	2
Tipo de barra	Diâmetro da barra	Comprimento da barra	Método de suporte do inserto	Formato do inserto	Localização do inserto	Ângulo de inclinação	Sentido de rotação da barra	Tamanho do inserto



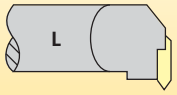
Diâmetro da barra em milímetros



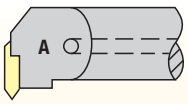
N* = Top Notch



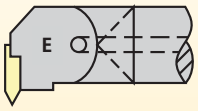
R = Sentido de rotação à direita



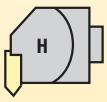
L = Sentido de rotação à esquerda



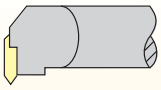
A = Aços com refrigeração



E = Metal duro com refrigeração

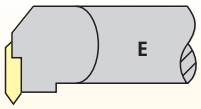


H = Cabeça intercambiável

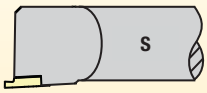


barras métricas:

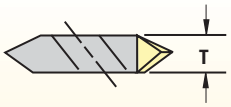
K	=	125mm
M	=	150mm
Q	=	180mm
R	=	200mm
S	=	250mm
T	=	300mm
U	=	350mm



E = Montagem de topo

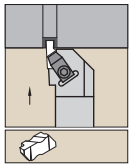


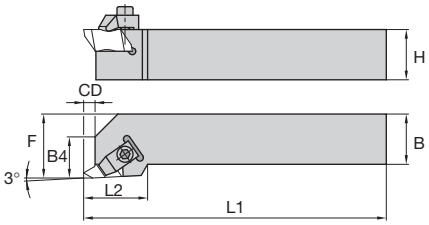
S = Montagem reta



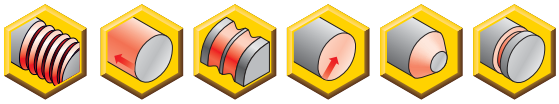
tamanho do inserto	T mm
1	3,54
2	3,81
3	5,35
4	6,40
5	9,65
6	9,73
8	11,13

* Somente padrão Kennametal.





corte à direita



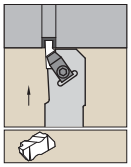
Fixação integral direta

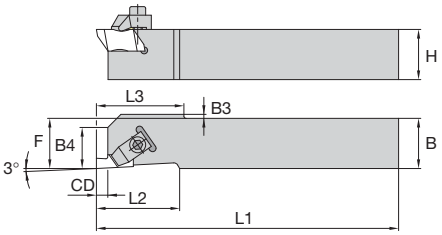




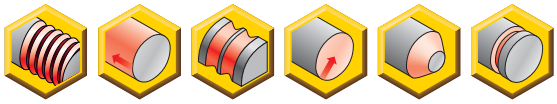
número para pedido	código do produto	H	B	F	L1	LH	B4	CD	inserto padrão	grampo	parafuso do grampo	parafuso do grampo	sextavado (mam)/ Torx Plus
corte à direita (R)													
1098790	**NSR1010E2**	10	10	14	70	19	9	3,5	N.2R	**CM74**	**MS1200**	**–**	T10
1098791	**NSR1212F2**	12	12	16	80	19	9	3,5	N.2R	**CM74**	**MS1200**	**–**	T10
1098792	**NSR1616H2**	16	16	20	100	19	9	3,5	N.2R	**CM74**	**MS1200**	**–**	T10
1098793	**NSR2020K2**	20	20	25	125	19	9	3,5	N.2R	**CM74**	**MS1200**	**–**	T10
1098794	**NSR2525M2**	25	25	32	150	19	9	3,5	N.2R	**CM74**	**MS1200**	**–**	T10
1098795	**NSR2020K3**	20	20	25	125	32	13	5,3	N.3R	**CM72LP**	**–**	**MS2111**	25 IP
1098796	**NSR2525M3**	25	25	32	150	32	13	5,3	N.3R	**CM72LP**	**–**	**MS2111**	25 IP
1098797	**NSR3225P3**	32	25	32	170	32	13	5,3	N.3R	**CM72LP**	**–**	**MS2111**	25 IP
1098798	**NSR3232P3**	32	32	40	170	32	13	5,3	N.3R	**CM72LP**	**–**	**MS2111**	25 IP
1098799	**NSR2525M4**	25	25	32	150	35	14	7,5	N.4R	**CM72LP**	**–**	**MS2111**	25 IP
1098800	**NSR3225P4**	32	25	32	170	35	14	7,5	N.4R	**CM72LP**	**–**	**MS2111**	25 IP
1098801	**NSR3232P4**	32	32	40	170	35	14	7,5	N.4R	**CM72LP**	**–**	**MS2111**	25 IP
corte à esquerda (L)													
1098861	**NSL1010E2**	10	10	14	70	19	9	3,5	N.2L	**CM75**	**MS1200**	**–**	T10
1098862	**NSL1212F2**	12	12	16	80	19	9	3,5	N.2L	**CM75**	**MS1200**	**–**	T10
1098863	**NSL1616H2**	16	16	20	100	19	9	3,5	N.2L	**CM75**	**MS1200**	**–**	T10
1098864	**NSL2020K2**	20	20	25	125	19	9	3,5	N.2L	**CM75**	**MS1200**	**–**	T10
1098865	**NSL2525M2**	25	25	32	150	19	9	3,5	N.2L	**CM75**	**MS1200**	**–**	T10
1098866	**NSL2020K3**	20	20	25	125	32	13	5,3	N.3L	**CM73LP**	**–**	**MS2111**	25 IP
1098867	**NSL2525M3**	25	25	32	150	32	13	5,3	N.3L	**CM73LP**	**–**	**MS2111**	25 IP
1098868	**NSL3225P3**	32	25	32	170	32	13	5,3	N.3L	**CM73LP**	**–**	**MS2111**	25 IP
1098869	**NSL3232P3**	32	32	40	170	32	13	5,3	N.3L	**CM73LP**	**–**	**MS2111**	25 IP
1098870	**NSL2525M4**	25	25	32	150	35	14	7,5	N.4L	**CM73LP**	**–**	**MS2111**	25 IP
1098871	**NSL3225P4**	32	25	32	170	35	14	7,5	N.4L	**CM73LP**	**–**	**MS2111**	25 IP
1098872	**NSL3232P4**	32	32	40	170	35	14	7,5	N.4L	**CM73LP**	**–**	**MS2111**	25 IP

NOTA: Dimensão F medida na ponta afiada do inserto de rosqueamento em estilo N.

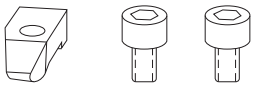




corte à direita



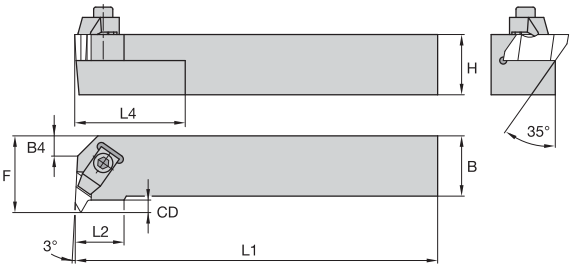
Fixação integral direta • Sem deslocamento



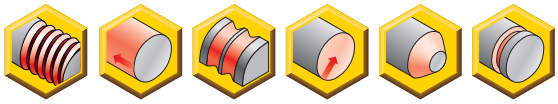
número para pedido	código do produto	H	B	F	L1	LH	B4	CD	B3	L3	inserto padrão	grampo	parafuso do grampo	parafuso do grampo	sextavado (mam)/Torx Plus
corte à direita (R)															
1098788	**NASR1010M2Q**	10	10	10	150	19	9	3,5	2,03	19	N.2R	**CM182**	**MS1200**	**–**	T10
1098789	**NASR1212M2Q**	12	12	12	150	19	9	3,5	–	–	N.2R	**CM182**	**MS1200**	**–**	T10
1098786	**NASR1616K3Q**	16	16	16	125	32	13	5,3	–	–	N.3R	**CM184LP**	**–**	**MS2111**	25 IP
corte à esquerda (L)															
1098859	**NASL1010M2Q**	10	10	10	150	19	9	3,5	2,03	19	N.2L	**CM183**	**MS1200**	**–**	T10
1098860	**NASL1212M2Q**	12	12	12	150	19	9	6,9	–	–	N.2L	**CM183**	**MS1200**	**–**	T10
1098857	**NASL1616K3Q**	16	16	16	125	32	13	5,3	–	–	N.3L	**CM185LP**	**–**	**MS2111**	25 IP

NOTA: Dimensão F medida na ponta afiada do inserto de rosqueamento em estilo N.

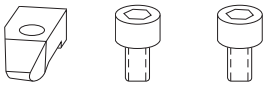




corte à direita

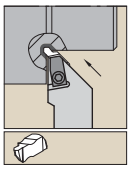


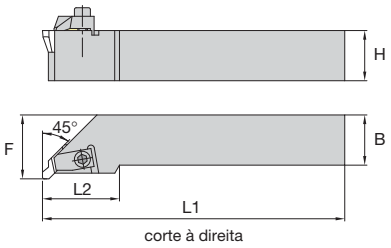
Montagem de topo integral



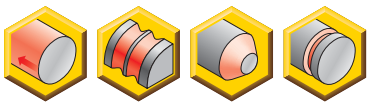
número para pedido	código do produto	H	B	F	L1	LH	CD	inserto padrão	grampo	parafuso do grampo	parafuso do grampo	Torx/ Torx Plus
corte à direita (R)												
1098803	**NER1616H2**	16	16	20	100	15	3,5	N.2L	**CM75**	**MS1200**	–	T10
1098804	**NER2020K2**	20	20	25	125	15	3,5	N.2L	**CM75**	**MS1200**	–	T10
1098805	**NER2525M2**	25	25	32	150	15	3,5	N.2L	**CM75**	**MS1200**	–	T10
1098806	**NER2525M3**	25	25	32	150	22	5,3	N.3L	**CM73LP**	–	**MS2111**	25 IP
1098807	**NER3225P3**	32	25	32	170	22	3,8	N.3L	**CM73LP**	–	**MS2111**	25 IP
1098808	**NER2525M4**	25	25	35	150	24	6,4	N.4L	**CM73LP**	–	**MS2111**	25 IP
1098809	**NER3225P4**	32	25	35	170	24	6,4	N.4L	**CM73LP**	–	**MS2111**	25 IP
1098810	**NER3232P4**	32	32	40	170	24	6,4	N.4L	**CM73LP**	–	**MS2111**	25 IP
corte à esquerda (L)												
1098874	**NEL1616H2**	16	16	20	100	15	3,5	N.2R	**CM74**	**MS1200**	–	T10
1098875	**NEL2020K2**	20	20	25	125	15	3,5	N.2R	**CM74**	**MS1200**	–	T10
1098876	**NEL2525M2**	25	25	32	150	15	3,5	N.2R	**CM74**	**MS1200**	–	T10
1098877	**NEL2525M3**	25	25	32	150	22	5,3	N.3R	**CM72LP**	–	**MS2111**	25 IP
1098878	**NEL3225P3**	32	25	32	170	22	3,8	N.3R	**CM72LP**	–	**MS2111**	25 IP
1098879	**NEL2525M4**	25	25	35	150	24	6,4	N.4R	**CM72LP**	–	**MS2111**	25 IP
1098880	**NEL3225P4**	32	25	35	170	24	6,4	N.4R	**CM72LP**	–	**MS2111**	25 IP
1098881	**NEL3232P4**	32	32	40	170	24	6,4	N.4R	**CM72LP**	–	**MS2111**	25 IP

NOTA: Dimensão F medida na ponta afiada do inserto de rosqueamento em estilo N.

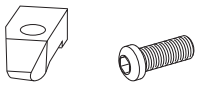




corte à direita

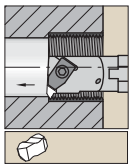


Rebaixamento integral de 45° • Métrico

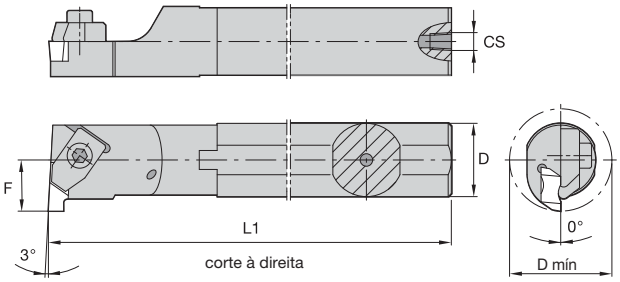


número para pedido	código do produto	H	B	F	L1	LH	inserto padrão	grampo	parafuso do grampo	sextavado (mm)/Torx Plus
corte à esquerda (L)										
1098883	**NRL2020K3**	20	20	25	125	32	NU3125R	**CM72LP**	**MS2111**	25 IP
1098884	**NRL2525M3**	25	25	32	150	32	NU3125R	**CM72LP**	**MS2111**	25 IP
1098885	**NRL3225P3**	32	25	32	170	32	NU3125R	**CM72LP**	**MS2111**	25 IP
corte à direita (R)										
1098812	**NRR2020K3**	20	20	25	125	32	NU3125L	**CM73LP**	**MS2111**	25 IP
1098813	**NRR2525M3**	25	25	32	150	32	NU3125L	**CM73LP**	**MS2111**	25 IP
1098814	**NRR3225P3**	32	25	32	170	32	NU3125L	**CM73LP**	**MS2111**	25 IP

NOTA: Os porta-ferramentas NR são compatíveis somente com os insertos estilo “NU”.



Haste de aço com refrigeração interna.



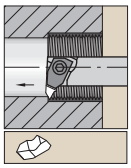


Barra de mandrilar de aço • Métrico

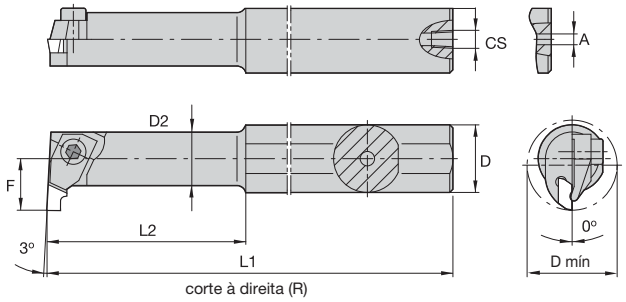


número para pedido	código do produto	D mín	D	L1	F	CS	inserto padrão	grampo	parafuso do grampo	parafuso do grampo	sextavado (mm)/ Torx Plus
corte à direita (R)											
1098945	**A12MNNTOR2**	18,5	12	150	11	1/16-27 NPT	–	**CM147**	–	**MS1200**	2.5 mm
1098947	**A16MNNTOR2**	22,0	16	150	11	1/8-27 NPT	N.2L	**CM75**	–	**MS1200**	T10
1098949	**A20QNNTOR2**	26,0	20	180	13	1/8-27 NPT	N.2L	**CM75**	–	**MS1200**	2.5 mm
1098951	**A25RNNTOR2**	34,0	25	200	17	1/4-18 NPT	N.2L	**CM75**	–	**MS1200**	2.5 mm
1098953	**A25RNNTOR3**	34,0	25	200	17	1/8 - 27 NPT	N.3L	**CM73LP**	**MS2111**	–	25 IP
1098955	**A32SNNTOR3**	44,0	32	250	22	1/4-18 NPT	N.3L	**CM73LP**	**MS2111**	–	25 IP
1098957	**A40TNNTOR3**	54,0	40	300	27	1/4-18 NPT	N.3L	**CM73LP**	**MS2111**	–	25 IP
1099001	**A40TNNTOR4**	54,0	40	300	27	1/4-18 NPT	N.4L	**CM73LP**	**MS2111**	–	25 IP
1099003	**A50UNNTOR4**	70,0	50	350	35	1/4-18 NPT	N.4L	**CM73LP**	**MS2111**	–	25 IP
corte à esquerda (L)											
1098946	**A12MNNTOL2**	18,5	12	150	11	1/16-27 NPT	NG2R	**CM146**	–	**MS1200**	2.5 mm
1098948	**A16MNNTOL2**	22,0	16	150	11	1/8-27 NPT	N.2R	**CM74**	–	**MS1200**	T10
1098950	**A20QNNTOL2**	26,0	20	180	13	1/8-27 NPT	NG2R	**CM74**	–	**MS1200**	2.5 mm
1098952	**A25RNNTOL2**	34,0	25	200	17	1/4-18 NPT	N.2R	**CM74**	–	**MS1200**	2.5 mm
1098954	**A25RNNTOL3**	34,0	25	200	17	1/4-18 NPT	N.3R	**CM72LP**	**MS2111**	–	25 IP
1098956	**A32SNNTOL3**	44,0	32	250	22	1/4-18 NPT	N.3R	**CM72LP**	**MS2111**	–	25 IP
1098958	**A40TNNTOL3**	54,0	40	300	27	1/4-18 NPT	N.3R	**CM72LP**	**MS2111**	–	25 IP
1099002	**A40TNNTOL4**	54,0	40	300	27	1/4-18 NPT	N.4R	**CM72LP**	**MS2111**	–	25 IP

NOTA: O diâmetro mínimo do furo varia de acordo com a profundidade do canal. Para detalhes, veja a página C172.

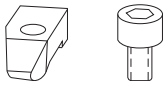


Haste de aço com refrigeração interna.



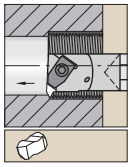


Barra de mandrilar de aço • ID mínimo • Métrico

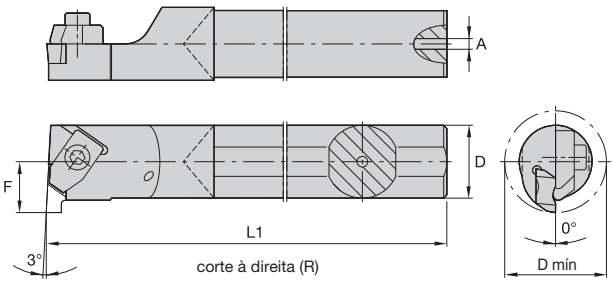


número para pedido	código do produto	D mín	D	D2	L1	L2	F	A	CS	inserto padrão	grampo	parafuso do grampo	sextavado (mm)
corte à direita (R)													
1098944	**A12MNNTOR1**	11,5	12	10,0	150	31,30	7	4,0	1/16-27 NPT	N.1L	**CM109**	**MS1034**	1.5 mm
1098943	**A10KNNTOR1**	11,5	10	10,0	125	—	7	3,2	—	NG1L	**CM109**	**MS1034**	1.5 mm

NOTA: O diâmetro mínimo do furo varia de acordo com a profundidade do canal. Para detalhes, veja a página C172.

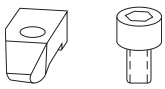


Haste de metal duro com refrigeração interna.



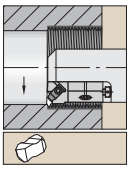


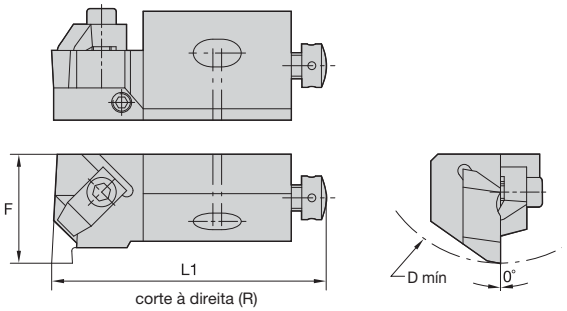
Barras de mandrilar de metal duro



número para pedido	código do produto	D mín	D	L1	F	A	inserto padrão	grampo	parafuso do grampo	Torx/ Torx Plus
corte à direita (R)										
1152834	**E16RNNTOR2**	22,0	16	200	11	5,537	N.2L	**CM75**	**MS1200**	T10
1152836	**E20SNNTOR2**	26,0	20	250	13	7,137	N.2L	**CM75**	**MS1200**	T10
corte à esquerda (L)										
1152835	**E16RNNTOL2**	22,0	16	200	11	5,537	N.2R	**CM74**	**MS1200**	T10

NOTA: O diâmetro mínimo do furo varia de acordo com a profundidade do canal. Para detalhes, veja a página C172.







Cápsula de aço para mandrilamento



número para pedido	código do produto	D mín	F	L1	inserto padrão	grampo	parafuso do grampo	sextavado (mm)	parafuso de ajuste radial	sextavado (mm)	parafuso axial	sextavado (mm)	arruela
corte à direita (R)													
1098380	**NER12CA2**	50	20	55,7	N.2L	**CM75**	**MS1025**	2.5 mm	**KUAM23**	2.5 mm	**KUAM31**	2.5 mm	**CSWM 060 050**
corte à esquerda (L)													
1098624	**NEL12CA2**	50	20	55,0	N.2R	**CM74**	**MS1025**	2.5 mm	**KUAM23**	2.5 mm	**KUAM31**	2.5 mm	**CSWM 060 050**
1098626	**NEL25CA3**	100	32	100,0	N.3R	**CM72LP**	**MS412**	4 mm	**KUAM26**	4 mm	**KUAM33**	4 mm	**CSWM 100 080**

NOTA: O diâmetro mínimo de furo (Dmín.) varia de acordo com o tipo e o passo da rosca. Para detalhes, veja a página C172.
Dimensão F medida na ponta afiada do inserto para rosqueamento estilo Top Notch.

Diretrizes de usinagem para controle do cavaco • Abertura de canal

Quando o diâmetro de corte adequado não estiver disponível, o posicionamento do cortador correto dará os resultados positivos.

- A altura central do inserto deverá estar posicionada no centro da peça ou até 0,13mm (0,005") acima.
- O tempo de parada no fundo do canal (mais de três rotações) não é recomendado.
- O controle do cavaco está relacionado com a taxa de avanço e deverá ser ajustado para se adequar à situação específica. A faixa de avanços recomendada é de 0,08 a 0,3 mm/rot (de 0,003 a 0,012 IPR).

Diretrizes de usinagem para controle de cavacos • Torneamento/Perfilagem

A profundidade máxima de corte para o corte lateral (torneamento/perfilagem) depende do material a ser cortado e da largura da ferramenta.

- Insertos com largura de 0,79mm a 1,6mm (0,031 a 0,062") podem cortar até uma profundidade de 0,6mm a (0,025").
- Insertos com largura de 1,7mm a 3,3mm (0,067 a 0,128") podem cortar até uma profundidade de 1mm (0,040").
- Insertos com largura de 3,5mm a 4,8mm (0,138 a 1,89") podem cortar até uma profundidade de 2mm (0,080").
- Insertos com largura de 5,0mm a 6,35mm (0,197 a 0,250") podem cortar até uma profundidade de 3mm (0,120").

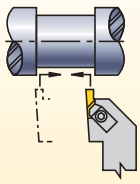
Limites do canal (profundidade máxima do canal interno em comparação com o diâmetro mínimo de furo)

número de catálogo do inserto	profundidade máxima do canal interno mm	diâmetro mínimo de furo mm
NG-1094L	1,91	20,32
—	1,02	11,18
NG-2031R/L	1,27	18,54
NG-2041R/L	—	—
NG-2047R/L	—	—
NG-2058R/L	—	—
—	2,79	63,50
NG-2062R/L	2,59	44,45
NG-2094R/L	2,49	38,10
NG-2125R/L	2,03	25,40
—	1,40	18,54
NG-3047R/L	—	—
NG-3062R/L	2,39	44,45
NG-3072R/L	2,29	41,28
NG-3078R/L	1,91	34,93
NG-3088R/L	—	—
NG-3094R/L	—	—
NG-3097R/L	3,81	60,33
NG-3105R/L	—	—
NG-3110R/L	3,68	53,98
NG-3122R/L	—	—
NG-3125R/L	3,51	47,63
NG-3142R/L	—	—
NG-3156R/L	3,18	41,28
NG-3178R/L	—	—
NG-3185R/L	2,79	34,93
NG-3189R/L	—	—
NG-4125R/L	3,81	69,85
—	6,35	146,05
NG-4189R/L	6,22	127,00
NG-4213R/L	6,10	114,30
NG-4219R/L	5,54	82,55
NG-4250R/L	5,08	63,50

NOTA: Os mesmos valores da profundidade máxima do canal e do diâmetro mínimo de furo também se aplicam aos insertos métricos NG-K (controle do cavaco) e NR (raio completo) de tamanho similar.

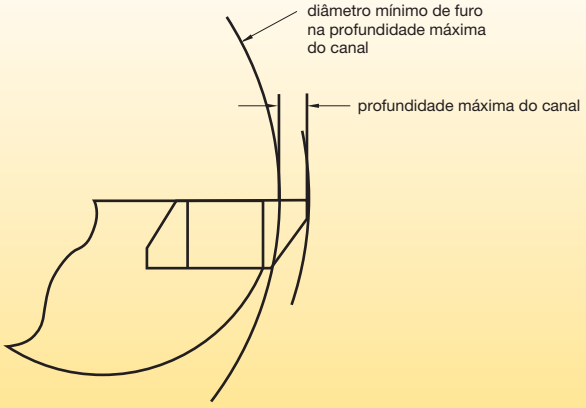
Torneamento de acabamento do canal

1. Mergulhe nos dois lados da largura do canal.
2. Mergulhe na área central para remover o núcleo do material restante.
3. Para evitar cavacos no inserto e obter a perpendicularidade da parede do canal, siga o trajeto da ferramenta indicado aqui.
4. Use a menor profundidade de corte possível que ainda permita uma boa quebra de cavacos, vida útil da ferramenta e acabamento superficial.



número de catálogo do inserto	profundidade máxima do canal interno mm	diâmetro mínimo de furo mm
—	9,53	731,82
NG-5250R/L	9,17	401,62
NG-5281R/L	8,74	274,62
NG-5312R/L	8,31	185,72
NG-5344R/L	7,47	122,22
NG-5375R/L	6,53	90,47
—	5,46	71,42
NG-6250R/L	6,35	146,05
NG-6281R/L	6,22	127,00
NG-6312R/L	6,10	114,30
NG-6344R/L	5,54	82,55
NG-6375R/L	5,08	63,50

Profundidade do canal interno em comparação com a interferência da barra



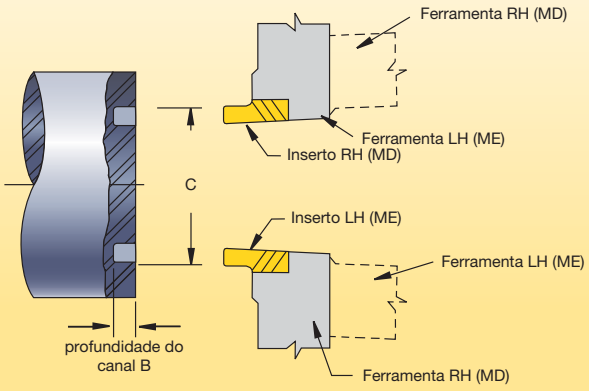
NOTA: Os limites de profundidade interna do canal são uma função da folga da barra em comparação com o diâmetro do furo.

Diretrizes de usinagem para operações de abertura de canal de face • Externo

Insertos NF/NDF padrão

família de insertos	profundidade máxima do canal "B" mm	diâmetro mínimo do canal "C" mm
NF-3	1,52	23,90
NF-3	2,39	30,50
NF-3	3,18	36,10
NF-3	3,81	41,30
NFD-3	6,35	47,60
NF-4/6	1,52	23,90
NF-4/6	2,39	30,50
NF-4/6	3,18	36,10
NF-4/6	3,81	41,30
NF-4/6	4,78	47,60
NF-4/6	6,35	57,20
NFD-4	9,53	57,20
NFD-4	12,70	57,20

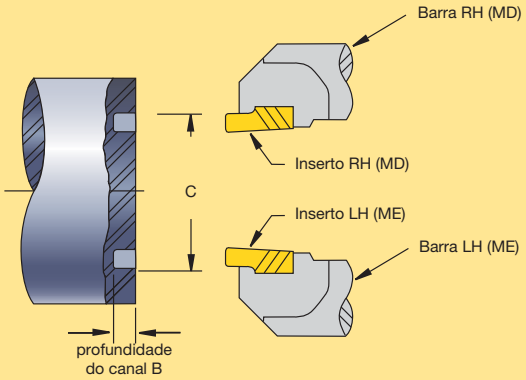
Porta-ferramentas



Insertos NG/NGD padrão

família de insertos	profundidade máxima do canal "B" mm	diâmetro mínimo do canal "C" mm
NG-2	1,27	54,0
NG-2	2,79	88,9
NG-3	2,39	101,6
NG-3	3,18	127,0
NG-3	3,81	139,7
NGD-3	6,35	174,6
NG-4	3,81	152,4
NG-4	6,35	209,6
NGD-4	9,53	222,3
NGD-4	12,70	222,3
NG-5	9,53	333,0

Barras de mandrilar

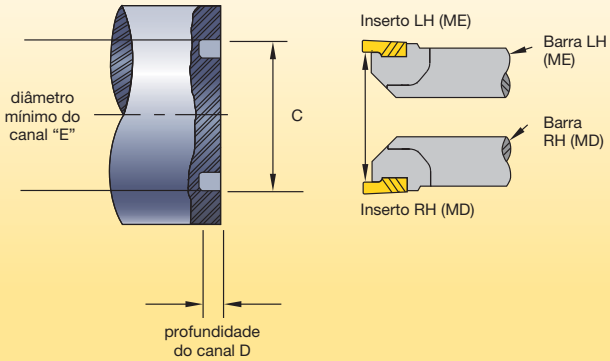


Diretrizes de usinagem para operações de abertura de canal de face • Interno

família de insertos	profundidade máxima do canal "D" mm	diâmetro mínimo do canal "E" mm
NFD-3-KI	6,35	57,2

NOTA: Para aplicações internas, use somente com insertos NFD-KI.

Barras de mandrilar

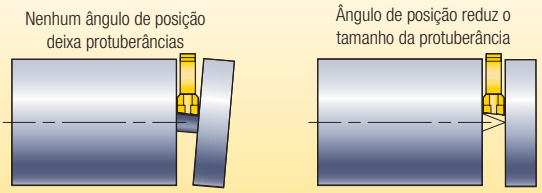


Diretrizes de aplicação de ferramenta

- Use sempre as boas práticas de usinagem em geral.
- Faça da preparação da máquina e da peça a mais rígida possível.
- Porta-ferramenta com haste integral proporcionam a melhor rigidez. Quando possível, eles deverão ser a sua primeira escolha em porta-ferramenta.
- Use o porta-ferramenta com a profundidade de corte menor possível para a aplicação (dimensão “CD”).
- Ao trocar insertos, certifique-se de que o novo inserto esteja posicionado com firmeza contra o batente positivo do porta-ferramenta.
- Nunca aperte o parafuso de fixação sem que o inserto esteja no alojamento.
- A projeção do porta-ferramenta para fora do bloco da ferramenta deverá ser a mais curta possível.
- Os insertos deverão cortar o mais próximo possível do centro.
- O tempo de parada no fundo do canal deverá ser menor que três rotações.
- As velocidades de corte e avanços recomendados são um ponto de partida. Ajuste de acordo com a necessidade para obter maior vida útil da ferramenta e excelente controle do cavaco.

Definições e diretrizes

1. Largura de corte (W) = largura do inserto.
2. Ângulo de posição = 0° (neutro); 6° (direita (RH) ou esquerda (LH).

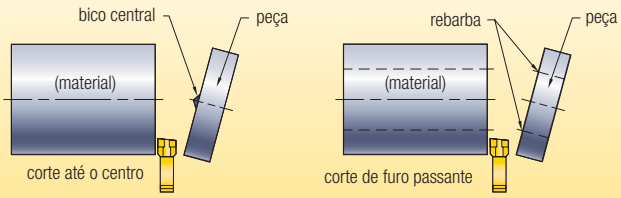


Reduzir as rebarbas das faces de corte:

- Use insertos do tipo com ângulo de posição (figuras 1 e 2). O ângulo de posição em insertos para corte reduz as rebarbas que permanecem na peça, mas diminui a vida útil da ferramenta aumentando a deflexão lateral da peça e possivelmente o tempo de ciclo.
- Se for obrigatório que o ângulo de posição seja de 0°, use o inserto para corte e a lâmina mais estreitos possíveis. Isto minimizará o bico central ou o comprimento da rebarba de corte.

Figura 1

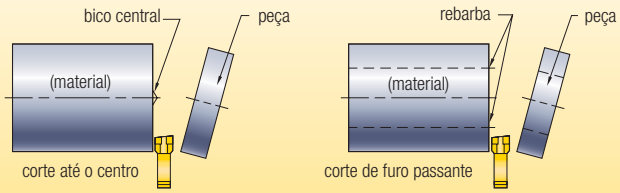
Escolha do inserto com ângulo de posição esquerdo



Os insertos com ângulo de posição com sentido de rotação à esquerda deixam um bico central ou rebarbas na peça e produzem uma superfície do material limpa.

Figura 2

Escolha do inserto com ângulo de posição direito



Reduz protuberâncias, mas diminui a produtividade e vida útil da ferramenta

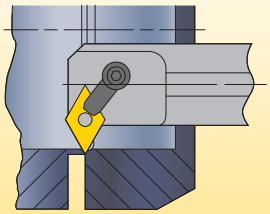
Os insertos com ângulo de posição com sentido de rotação à direita deixam um bico central ou rebarba na peça e produzem uma superfície do material limpa.

- Verifique a altura total e mantenha centralizado com o diâmetro da peça.
- A altura da aresta de corte deve estar dentro de ±0,1mm (.004") para o centro; a posição de corte recomendada é de 0,05mm (.002") acima do centro.

Tubulação

- Em peças tubulares que requerem um chanfro no diâmetro interno, alinhe a ferramenta de chanfro de diâmetro interno com a superfície de corte. Isso permitirá que a operação de chanfro realmente separe a peça da barra (veja a figura 3). Note que a peça poderá cair em cima da barra para chanframento, a qual, neste caso, funcionará como um coletor de peças.

Figura 3

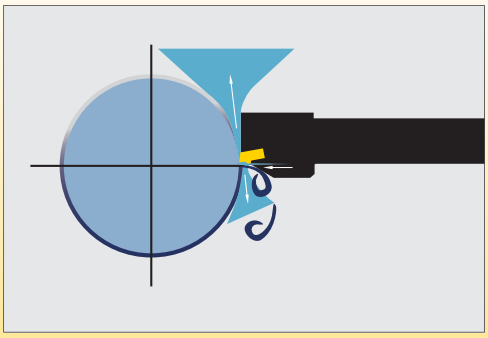


Alinhamento do chanfro interno

Melhorar o acabamento superficial das faces de corte:

- Use o inserto com ângulo de posição de 0°.
- Aumente o fluxo de fluido refrigerante ou melhore a técnica de aplicação, como mostrado na figura 4.
- Reduza as taxas de avanço próximo do ponto de rompimento do corte.
- Verifique se a ferramenta de abertura de canal está configurada no ângulo correto.
- Use lâminas com a altura de face maior possível e a largura de corte menor possível.
- Aumente a velocidade de corte.

Figura 4

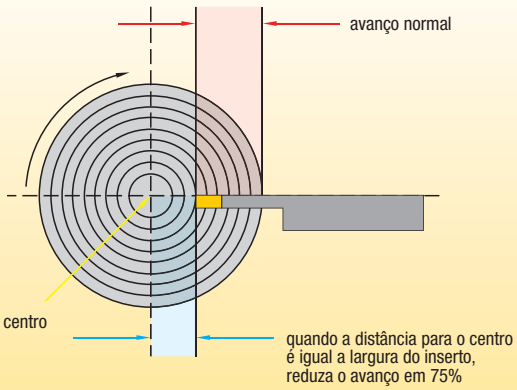


Este é o método preferido para a aplicação de fluido refrigerante

- Monte a ferramenta de corte de cabeça para baixo. Isso permite que a gravidade remova os cavacos e evita que eles sejam cortados duas vezes. Outra vantagem em montar a ferramenta de cabeça para baixo é a de evitar que os cavacos formem cunhas entre o inserto e as paredes laterais do canal, riscando as superfícies.

Diretrizes da programação

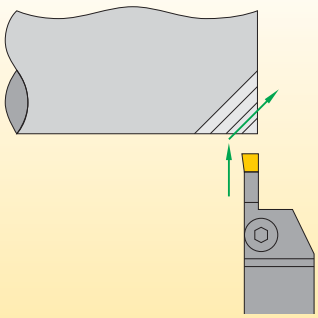
Redução do avanço no corte



Redução do avanço ao abordar o centro = maior vida útil da ferramenta

Chanfrar

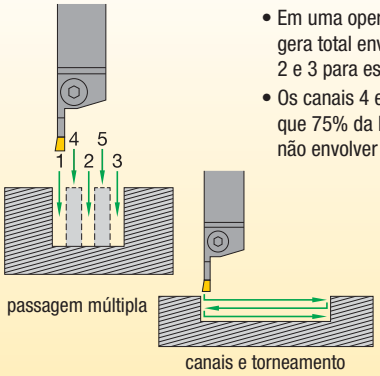
Chanfrar com uma ferramenta de canais reduziu o tempo de índice da máquina e as estações da ferramenta.



(continuação)

Diretrizes da programação *(continuação)*

Fresamento de cavidade



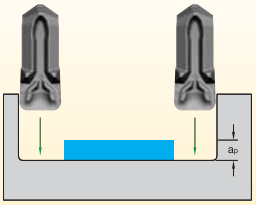
- Em uma operação de passagem múltipla, gera total envolvimento dos canais em 1, 2 e 3 para estabilidade máxima.
- Os canais 4 e 5 não devem ter mais do que 75% da largura do inserto, para não envolver os raios.

Se o encaixe for mais fundo do que largo = passagem múltipla

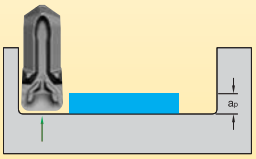
Se o encaixe for mais largo do que fundo = canal e torneamento

Encaixe quadrado

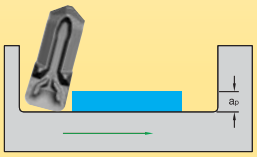
Etapas 1 e 2
Fresar em mergulho o raio e a parede em cada lado para abrir dois canais.



Etapa 3
Retirar a ferramenta 0,1mm; isto é necessário para criar um fundo plano.

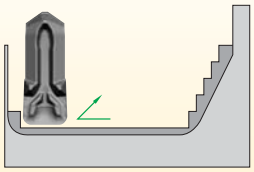


Etapa 4
Virar de lado. Esta ferramenta foi projetada para deflexão, criando o alívio frontal necessário.

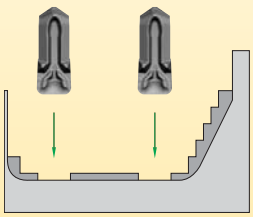


Encaixe de perfil

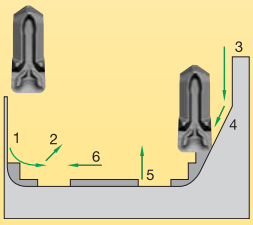
Etapa 1
Desbaste para ter praticamente a mesma quantidade de estoque restante em todas as superfícies para acabamento.



Etapa 2
Abrir dois canais para fora da parede e do raio.

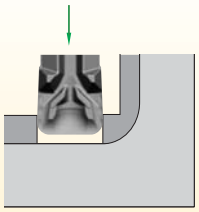


Etapa 3
(1 e 2) Acabamento da parede e do raio.
(3 e 4) Acabamento da parede, ângulo e raio no lado oposto do encaixe.
(5) Retirar a ferramenta 0,1mm (.004").
(6) Virar de lado para o acabamento do piso do encaixe.

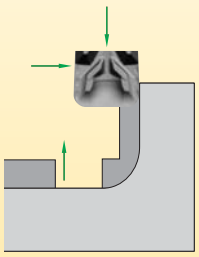


Gerando um raio

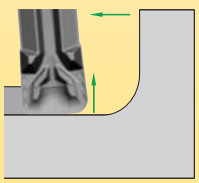
Etapa 1
Abra um canal para fora do raio.



Etapa 2
Retire e mova o material na parede e gere o raio. Ao gerar o canal na etapa anterior, apenas uma superfície é envolvida de cada vez, reduzindo o risco de vibrações.

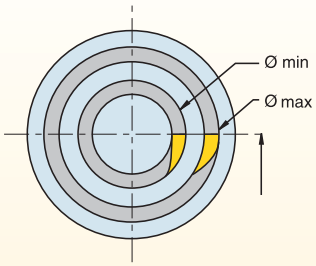


Etapa 3
Retire a ferramenta 0,1mm (.004") e vire de lado.



Guia de falhas e soluções para ferramentas de abertura de canal

Diretrizes de aplicação de abertura de canal de face



Seleção da ferramenta

- Ao selecionar o porta-ferramentas, sempre inicie no maior diâmetro possível e trabalhe em direção ao menor diâmetro. Isso permitirá o uso da ferramenta mais robusta.

Cortando a primeira ranhura

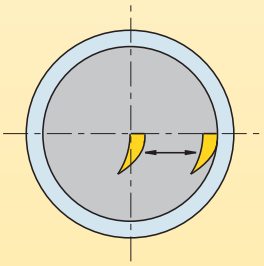
- O diâmetro externo do primeiro canal deve estar entre a capacidade de diâmetro mínimo e o de diâmetro máximo da ferramenta para abertura de canal de face (veja a ilustração acima). Isso cria uma folga para o porta-ferramenta.

Controle do cavaco

- Ajuste a velocidade e o avanço de modo a obter excelente controle e evacuação de cavacos da ranhura. A compressão de cavacos pode causar acabamento superficial de baixa qualidade, quebra da ferramenta e vida útil da ferramenta reduzida.

Preparação (setup) da ferramenta

- A ferramenta deve ser preparada (setup) o mais próximo possível da altura de centro para evitar uma grande formação de rebarbas.
- Alinhe a aresta de corte perpendicular com a peça.



Alargando um canal de face

- Depois de o primeiro canal ter sido cortado, a largura do canal pode ser alargada em ambas as direções e usando a mesma ferramenta. A melhor prática é trabalhar do diâmetro externo para o diâmetro interno.

Soluções práticas para problemas de abertura de canal

problema	solução
rebarba	1. Verificar a altura de centro da ferramenta. 2. Usar ferramentas afiadas (indexar com mais frequência). 3. Usar inclinação positiva para a pastilha do revestimento PVD. 4. Usar a classe correta para o material da peça. 5. Usar a geometria correta (por exemplo, inclinação positiva para materiais que recalcam no corte). 6. Mudar o trajeto da ferramenta.
acabamento superficial de baixa qualidade	1. Aumente a velocidade. 2. Usar ferramentas afiadas (indexar com mais frequência). 3. Tempo de permanência nas últimas voltas de 1–3 (máx.). 4. Usar a geometria de controle de cavacos apropriada. 5. Aumentar o fluxo de fluído refrigerante. 6. Verificar a preparação (setup) adequada (projeção e tamanho da haste). 7. Usar a geometria correta (por exemplo, ângulo de saída positivo para materiais que recalcam no corte).
fundo da ranhura não plano	1. Usar ferramentas afiadas (trocar com mais frequência). 2. Manter a ferramenta no fundo por 1–3 rotações (máx.). 3. Reduzir o balanço da ferramenta (aumentar a rigidez). 4. Reduzir a taxa de avanço no fundo do canal. 5. Usar um inserto mais largo. 6. Verificar a altura do centro da ferramenta.
baixo controle do cavaco	1. Usar ferramentas afiadas (indexar com mais frequência). 2. Aumentar a concentração de fluído refrigerante. 3. Ajustar a taxa de avanço (a regra é aumentar primeiro).
vibração	1. Reduzir o balanço da ferramenta e a projeção da peça. 2. Ajustar a velocidade (a regra é aumentar primeiro). 3. Ajustar o avanço (a regra é aumentar primeiro). 4. Verificar a altura de centro da ferramenta.
cavacos da pastilha	1. Usar a classe correta para o material da peça. 2. Aumentar a velocidade. 3. Reduzir o avanço. 4. Usar uma classe mais robusta. 5. Aumentar a rigidez da ferramenta e da preparação (setup).
aresta postiça	1. Usar inclinação positiva para a pastilha de revestimento PVD. 2. Aumentar a velocidade. 3. Reduzir o avanço. 4. Aumentar o fluxo/concentração de fluído refrigerante. 5. Usar cermets.
as paredes laterais não estão retas	1. Verificar se o alinhamento da ferramenta está correto. 2. Reduzir o balanço da ferramenta e da peça. 3. Usar pastilhas afiadas (indexar com mais frequência).

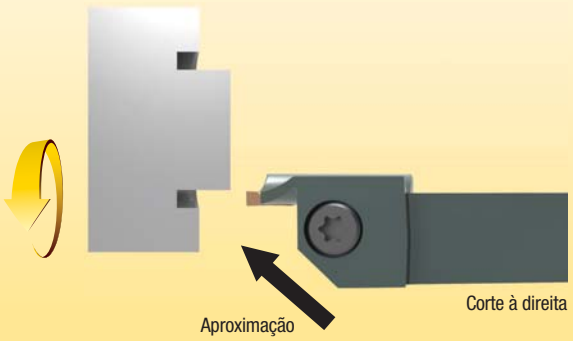
Etapas para seleção adequada da ferramenta de canais de face

- Etapa 1: Selecione a sua rotação de eixo
- Etapa 2: Selecione o seu ângulo de aproximação e a orientação do porta-ferramenta

Ferramental integral

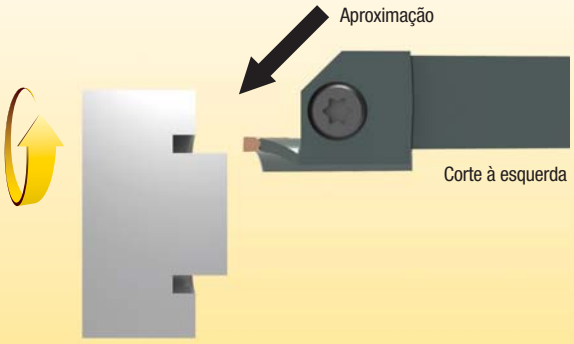
Rotação no sentido anti-horário

Haste quadrada

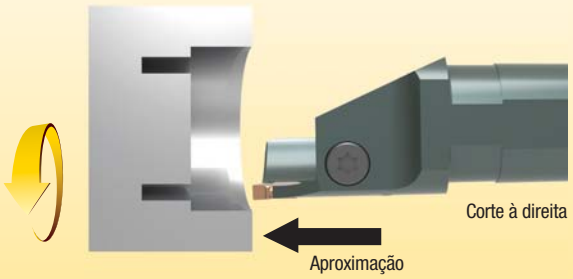


Rotação no sentido horário

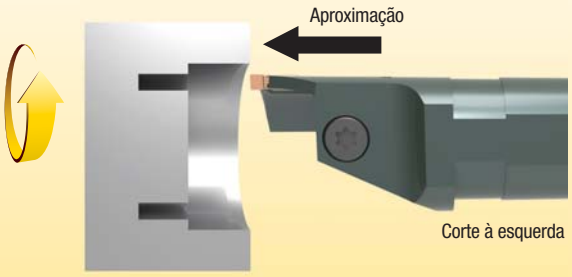
Haste quadrada



Barra de mandrilar



Barra de mandrilar



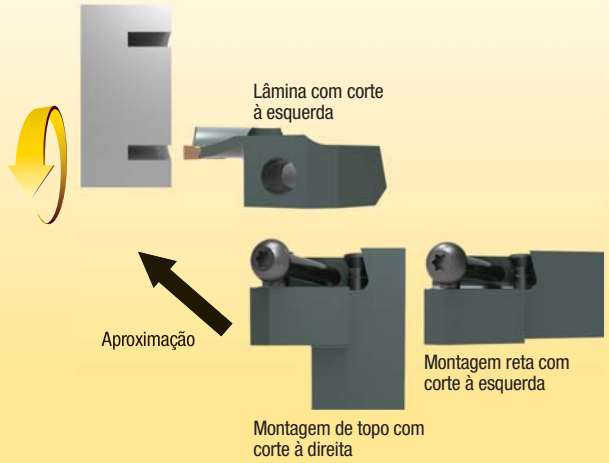
Etapas para seleção adequada da ferramenta de canais de face modulares

- Etapa 1: Selecione a sua rotação de eixo
- Etapa 2: Selecione o seu ângulo de aproximação e a orientação do porta-ferramenta
- Etapa 3: Identifique a combinação de ferramenta de lâmina e haste

Ferramenta modular

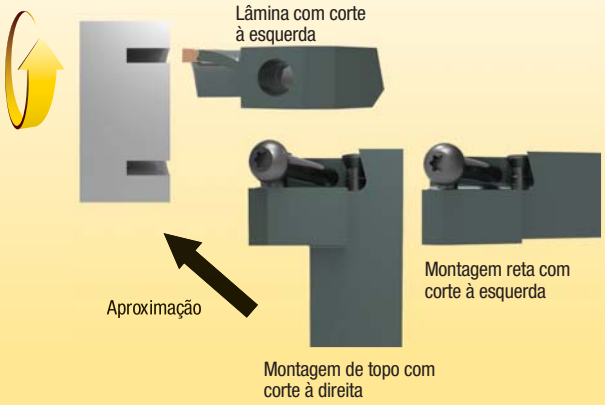
AntiContador com rotação no sentido horário

Curvatura para fora com corte à esquerda

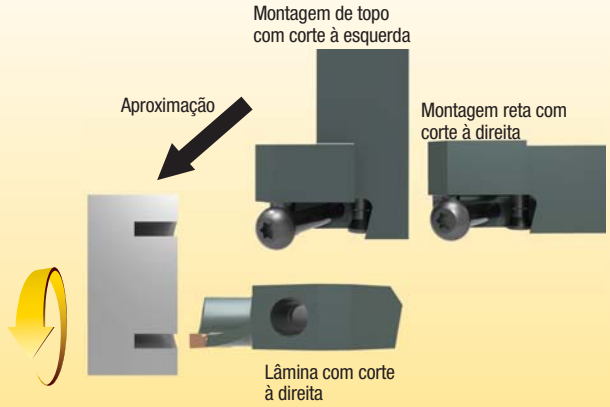


Rotação no sentido horário

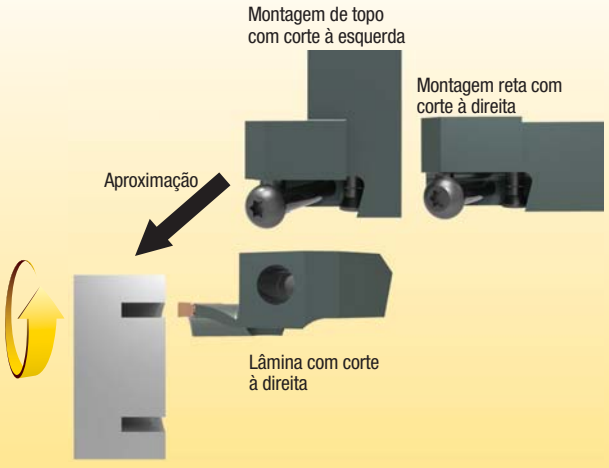
Curvatura para dentro com corte à esquerda

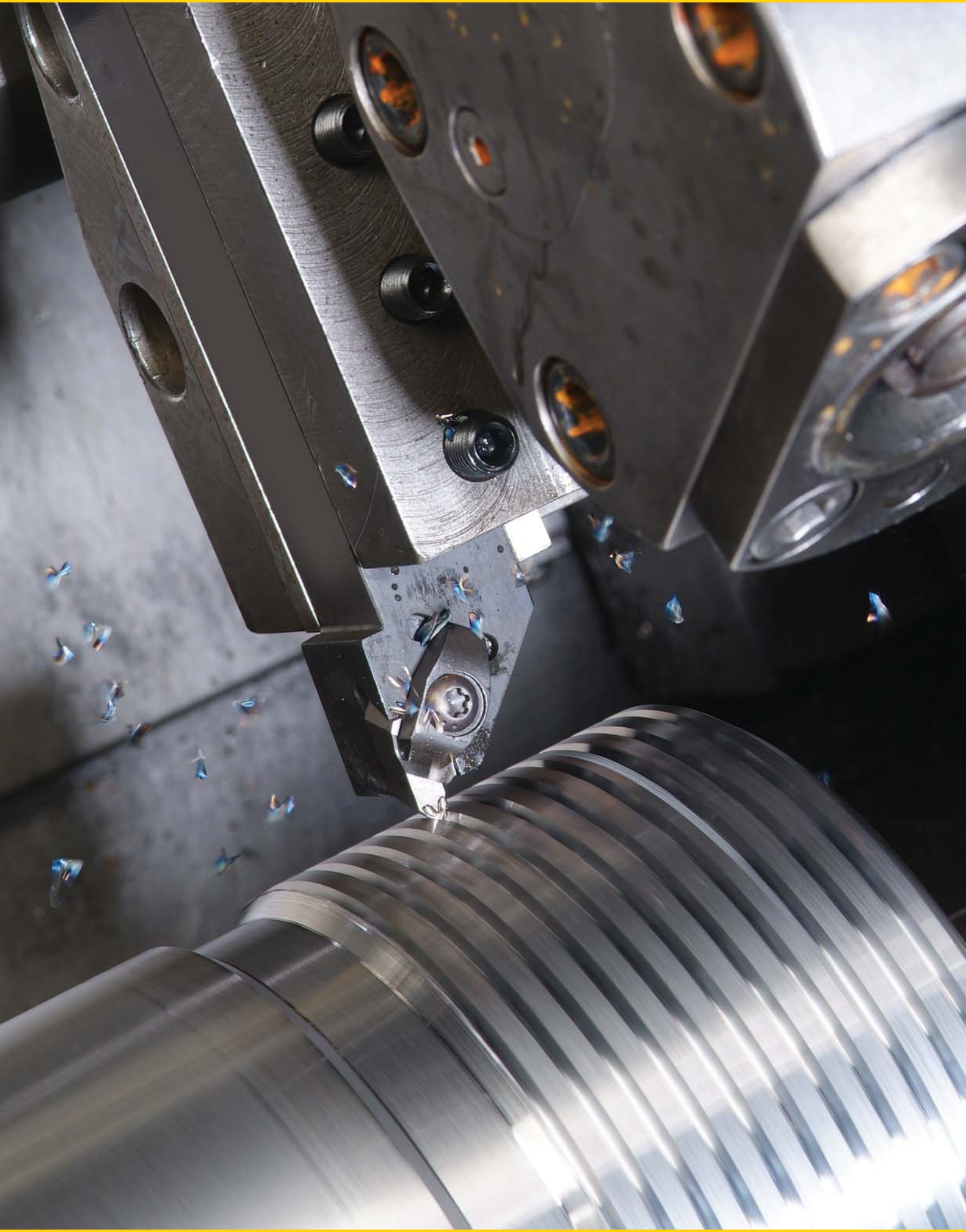


Curvatura para dentro com corte à direita



Curvatura para fora com corte à direita





Rosqueamento

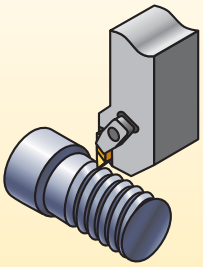
Guia de aplicações de rosqueamento D2–D3

Rosqueamento Top Notch D4–D43

Rosqueamento Laydown LT D44–D87

Informações técnicas sobre rosqueamento D88–D110

Rosqueamento externo Top Notch

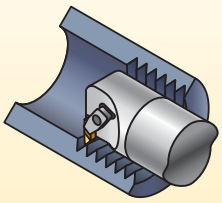


Tamanhos do porta-ferramenta de haste quadrada:
- Sistema métrico — 10–32mm

Crista (perfil completo):
UN TPI de 32–7
ISO 1,5–3,0mm de passo

Perfil parcial de 60° — Topo plano (NTF e NTK):
UN 44–4,5 TPI
ISO 0,6–5,5mm de passo

Rosqueamento interno Top Notch

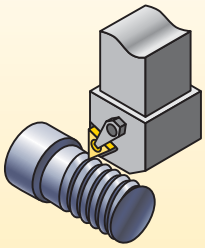


Diâmetros da barra de mandrilar:
- Sistema métrico —10–50mm
- Furo mínimo —11,5mm
- Aço

Crista (perfil completo):
UN 16–8 TPI
ISO 1,5–3,0mm de passo

Perfil parcial de 60° — Topo plano (NTF-1L, NTF e NTK):
UN 24–4,5 TPI
ISO 1,0–5,5mm de passo

Rosqueamento externo de assentamento LT

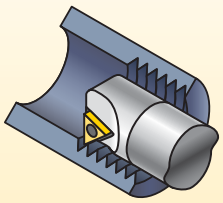


Tamanhos do porta-ferramenta de haste quadrada:
- Sistema métrico — 8–40mm

Crista (perfil completo):
UN 48–8 TPI
ISO 0,5–5,0mm de passo

Perfil parcial de 60°:
UN 48–4 TPI
ISO 0,5–6,0mm de passo

Rosqueamento interno de assentamento LT



Diâmetros da barra de mandrilar:
- Sistema métrico —12–50mm
- Furo mínimo — 13mm
- Aço e metal duro

Crista (perfil completo): e perfil parcial:
UN 48–8 TPI
ISO 0,5–5,0mm de passo

Perfil parcial de 60°:
UN 48–4 TPI
ISO 0,5–6,0mm de passo

Perfil parcial de 55°:
UN 48–5 TPI
ISO 0,5–5,0mm de passo

Ferramental para rosqueamento Top Notch™

A solução comprovada de rosqueamento de alta produtividade

O rosqueamento Top Notch com a tecnologia de insertos Beyond™ e com grampo superior rosqueado fornece uma performance da ferramenta uniforme para quase todas as operações. Com a maior variedade de classes e geometrias do setor, o sistema de rosqueamento Top Notch é uma solução comprovada.

Características e benefícios

Escolhendo o sistema de rosqueamento Top Notch

- Uma excelente opção para aplicações pesadas, como a usinagem de roscas Acme, Buttress e API. O Top Notch também é o melhor sistema para aplicações de passo largo e rosqueamento com múltiplos dentes.
- A maior variedade de geometrias de insertos e classes do setor.
- O design de fixação rígida de pastilha muito rígido garante a maior vida útil da ferramenta, o melhor acabamento superficial e excelente qualidade da peça a ser usinada.
- A simplicidade do design Top Notch não requer seleção de calço para ângulos de hélice da rosca. Isso ajuda a evitar erros no chão de fábrica.
- Reduz a quantidade de itens no estoque usando os mesmos porta-ferramentas e barras de mandrilar Top Notch com insertos de rosqueamento ou de abertura de canal.
- Os insertos com quebra-cavacos Top Notch eliminam as longas e incômodas serpentinas.
- Uma excelente escolha para formas de rosca especiais e projetos de porta-ferramentas.

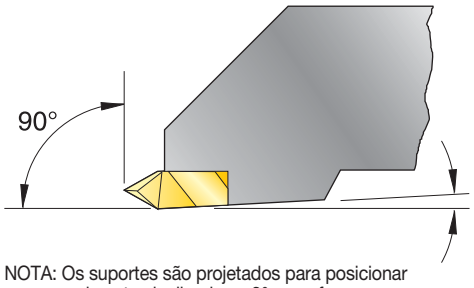
Os insertos Top Notch™ estão disponíveis nas classes KCU10™ e KCU25™ para suportar as severas exigências às quais as arestas de corte do inserto de rosqueamento são submetidas.

A versatilidade do aço Top Notch permite que você use tanto insertos de rosqueamento quanto de abertura de canais no mesmo porta-ferramentas.



Forma de rosca com retífica de precisão

- Minimiza a formação de aresta postiça.
- Executa cortes precisos na maioria dos materiais comuns.
- Reduz as forças de corte.
- Garante roscas precisas de alta qualidade.



NOTA: Os suportes são projetados para posicionar os insertos inclinados a 3°, para fornecer uma folga traseira em direção ao lado aberto.

Excelente controle do cavaco.

- Elimina as serpentinas longas e problemáticas.
- Excelente para operações de rosqueamento interno.
- Disponível em insertos de perfil parcial para rosca de 60°.

Etapa 1 • Escolha o método de rosqueamento e o sentido da ferramenta

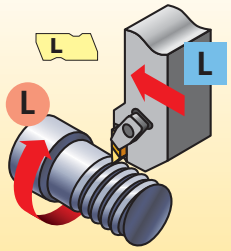
Informação necessária:

- Operação externa/interna.
- Rotação do fuso/sentido de rotação da rosca.
- Direção de avanço.

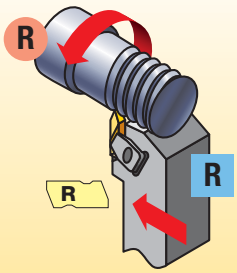


sentido de rotação da rosca | sentido de rotação do porta-ferramenta | sentido de rotação do inserto

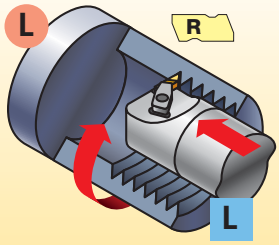
Avanço na direção do mandril • RECOMENDADO



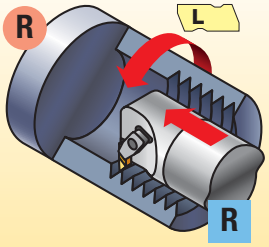
rosca esquerda externa



rosca direita externa

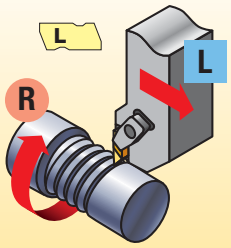


rosca esquerda interna

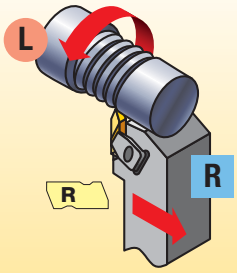


rosca direita interna

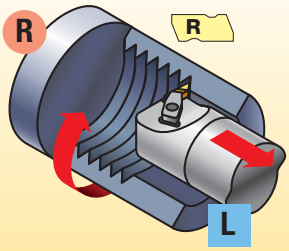
Direção do avanço na direção contrária à do mandril



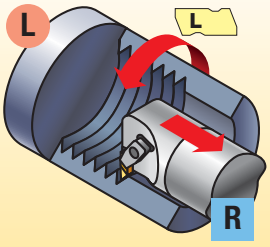
rosca direita externa



rosca esquerda externa



rosca direita interna



rosca esquerda interna

Etapa 2 • Escolha o suporte na página do catálogo

O tamanho do inserto deve corresponder ao tamanho do inserto padrão da seleção de porta-ferramenta:

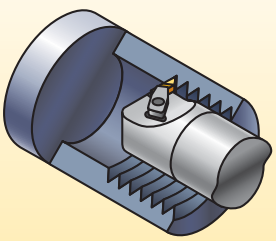
Informação necessária:

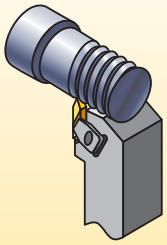
- Operação externa/interna.
- Diâmetro mínimo de furo (para operações internas).
- Sentido de rotação da ferramenta.
- Tamanho do inserto (inserto padrão).

número de catálogo	inserto padrão
NSR-163D	N.3R
NSR-164D	N.4R

NOTA: Os porta-ferramentas e as barras de mandrilar Top Notch estão relacionadas com um inserto padrão para indicar o tamanho e o sentido de rotação necessários. Eles são compatíveis tanto com os insertos de abertura de canal quanto com os de rosqueamento do mesmo tamanho.

Escolha a ferramenta adequada para o tamanho e o sentido do inserto:



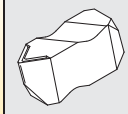


NOTA: Otimize a sua operação de rosqueamento por meio do método de penetração adequado e dos valores de penetração recomendados.

Veja a seção técnica nas páginas D88–D110 deste catálogo.
Para rosqueamento interno, o furo mínimo varia, dependendo do tipo de rosca.
Para detalhes, veja a página D102.

Etapa 3 • Escolha o inserto para a aplicação

- Veja a visão geral de insertos para rosqueamento na página D11.
- Escolha os insertos com crista para obter uma forma de rosca completamente controlada, incluindo o controle do diâmetro. Os insertos com crista eliminam a necessidade de rebarbação.
- Os insertos com perfil parcial sem crista podem cortar uma variedade de passos de rosca.
- Considere o tamanho do inserto para a escolha do porta-ferramentas.



tamanho do inserto	número de catálogo	KCU25/ KC5025	KCU10/ KC5010
2	**NT-2RK**	●	●
3	**NT-3RK**	●	●
4	**NT-4RK**	●	●

Etapa 4 • Escolha a classe e a velocidade

Recomendações para a escolha da classe e da velocidade — m/min.

materiais das peças	aço	aço inoxidável	ferro fundido	metais não ferrosos	ligas resistentes a altas temperaturas
estilo de inserto	controle do cavaco ou neutro 	controle do cavaco ou positivo 	Neutro 	positivo 	positivo 
ótimas condições de corte	**KCU10/KC5010** 70–260	**KCU10/KC5010** 90–245	**KCU10/KC5010** 60–245	**KC5410** 90–550	**KCU10/KC5010** 30–150
primeira opção	**KCU25/KC5025** 50–230	**KCU25/KC5025** 75–230	**KCU25/KC5025** 50–180	**KCU25/KC5025** 60–455	**KCU25/KC5025** 20–120

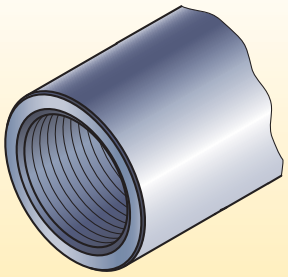
Exemplos:

Controle do cavaco: NT-K ou NT-CK (somente perfil parcial)
Neutro: NT, NT-C, NTF, NTC, NJ, NJF, NDC-V, NA, NDC, NTB-A/B
Positivo: NTP, NTK, NJP, NJK

Exemplos de rosqueamento Top Notch:

aplicação: Material da rosca direita interna 8 TPI
Acme: aço de liga
diâmetro da peça: 114,3 ótimas condições de corte avançam na direção do mandril

Recomendação:
inserto: NA3L8
classe: KCU10
tamanho do inserto: 3
barra de mandrilar: A40NER3
inserto padrão: N.3L
velocidade: 150 m/min.
passadas de avanço*: 12 passadas



* Recomendações de avanço fornecidas na seção de dados técnicos nas páginas D97–D101.

Velocidades iniciais recomendadas [m/min.]

Grupo de material		K68			KCU10/KC5010			KCU25/KC5025			KC5410		
P	0–1	–	**–**	–	135	**200**	260	105	**165**	230	–	**–**	–
	2	–	**–**	–	130	**190**	245	100	**150**	200	–	**–**	–
	3	–	**–**	–	105	**155**	200	75	**125**	170	–	**–**	–
	4	–	**–**	–	70	**120**	160	60	**95**	130	–	**–**	–
	5	–	**–**	–	105	**155**	200	75	**130**	170	–	**–**	–
	6	–	**–**	–	70	**120**	160	50	**90**	130	–	**–**	–
M	1	45	**75**	105	120	**180**	245	90	**170**	230	–	**–**	–
	2	35	**65**	100	90	**165**	210	75	**140**	200	–	**–**	–
	3	35	**65**	100	90	**165**	210	75	**135**	200	–	**–**	–
K	1	30	**75**	120	120	**180**	245	90	**135**	180	–	**–**	–
	2	25	**60**	100	90	**150**	210	70	**120**	170	–	**–**	–
	3	20	**55**	90	60	**105**	150	50	**85**	120	–	**–**	–
N	1–2	90	**245**	365	150	**365**	550	120	**305**	455	245	**425**	610
	3	45	**75**	105	90	**135**	180	60	**105**	150	90	**150**	210
	4	60	**120**	180	120	**305**	455	100	**200**	305	120	**305**	455
	5	45	**90**	150	90	**165**	245	70	**135**	195	120	**210**	305
	6	35	**75**	120	120	**210**	305	100	**170**	245	120	**245**	365
S	1	8	**25**	45	30	**70**	105	20	**40**	60	–	**–**	–
	2	8	**24**	40	30	**65**	100	20	**35**	45	–	**–**	–
	3	8	**24**	40	30	**65**	100	20	**35**	45	–	**–**	–
	4	9	**60**	105	55	**105**	150	45	**85**	120	–	**–**	–
H	1	–	**–**	–	30	**45**	60	–	**–**	–	–	**–**	–
	2	–	**–**	–	15	**30**	45	–	**–**	–	–	**–**	–
	3	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–
	4	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–

NOTA: A PRIMEIRA opção de velocidade inicial está em **negrito**.

O NOVO SABE CAD/CAM

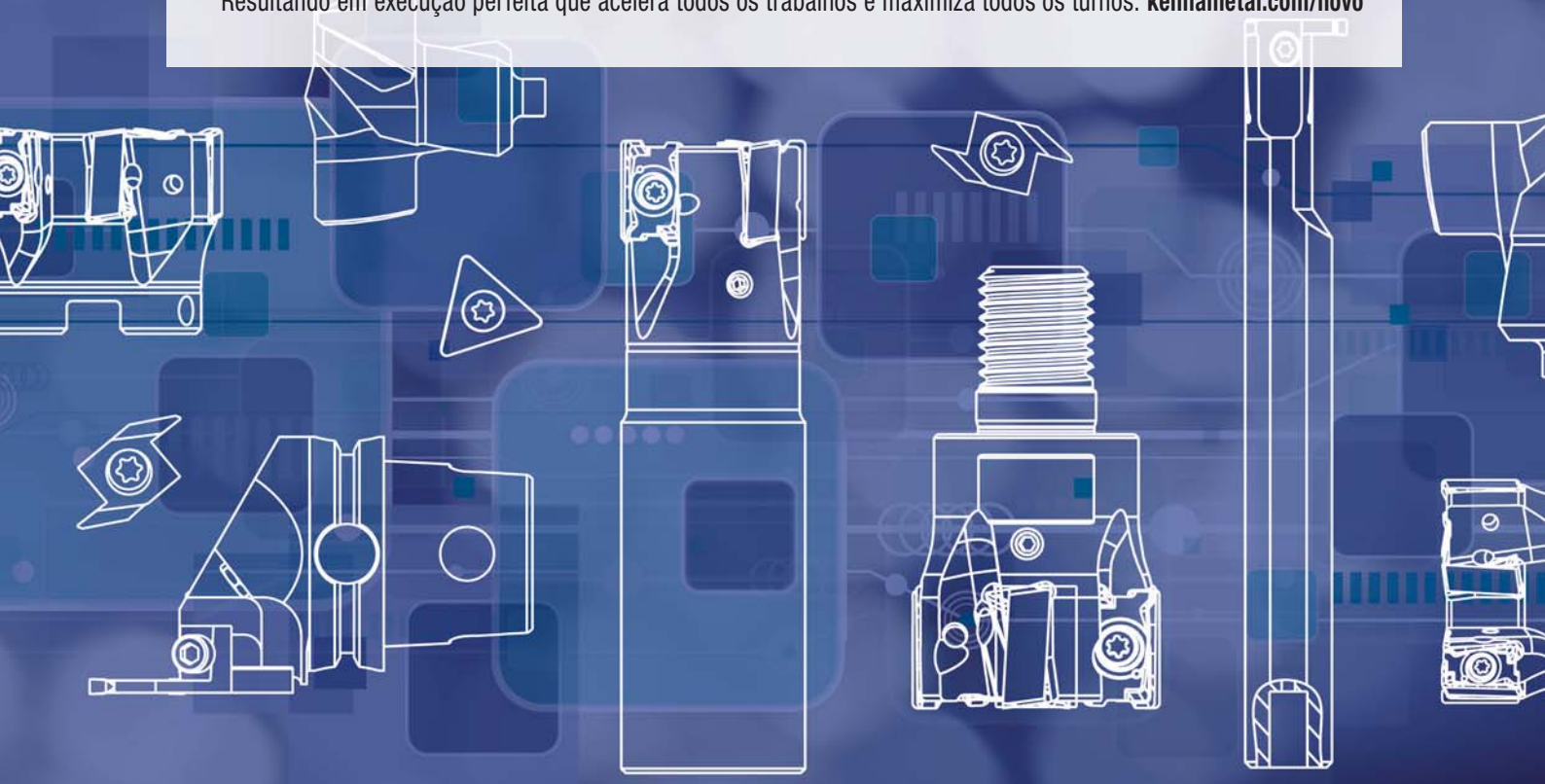
Com a inclusão do NOVO™ à sua equipe, as suas capacidades de CAD/CAM se tornam muito mais precisas, simples e produtivas.

Antes do NOVO: O programador usaria o seu software de CAD/CAM para programar separadamente. Usando o método ultrapassado de encontrar uma ferramenta em um catálogo e, em seguida, passar a informação do ferramental do catálogo para o software de CAD/CAM.

A preocupação é o fato de suposições serem feitas e apenas parte das informações do ferramental serem inseridas.

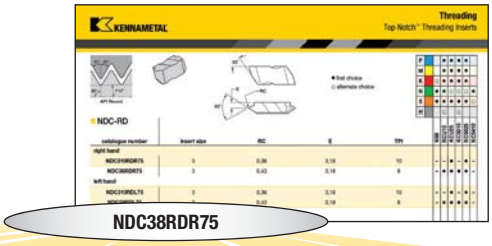
Com o NOVO: A poderosa inteligência digital do NOVO não só ajuda o programador a encontrar a ferramenta certa para a usinagem de metal, mas também integra automaticamente todos os dados do ferramental em uma solução de CAD/CAM completa. A integração de todos os dados do ferramental aumenta a viabilidade da peça a ser programada e é entregue rapidamente — economizando o seu tempo.

O NOVO pode garantir que você tenha as ferramentas certas no seu maquinário, na sequência certa. Resultando em execução perfeita que acelera todos os trabalhos e maximiza todos os turnos. **kennametal.com/novo**



Como funcionam os números de catálogo?

Cada caractere no nosso número de catálogo significa uma característica específica daquele produto. Use as colunas-chave a seguir e as imagens correspondentes para fazer uma identificação fácil do atributo a ser aplicado.



N	D	C	3	8RD	R	75	
Tipo do inserto	Inserto	Informações adicionais	Tamanho do inserto	Identificação da rosca	Sentido de rotação do inserto	Definição do inserto	Informações adicionais

N — Top Notch*



A — Acme

D — API ou NPT

J — Rosca UNJ

T — Rosca de 60° V

W — Whitworth de 55° V

B — Buttress

F — Passo fino

S — Stub Acme

C — Com crista

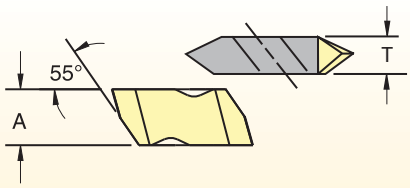
P — Ângulo de saída positivo

K — Passo fino, positivo

Indica o API ou a designação na indústria da perfuração (p. ex., 10RD, 8RD, 0,038) ou os insertos de rosqueamento de raio de raiz controlado indicam o raio de raiz em incrementos de 0,001" (NJ, NJF, NJP, NJK) ou M indica a rosca ISO no sistema métrico

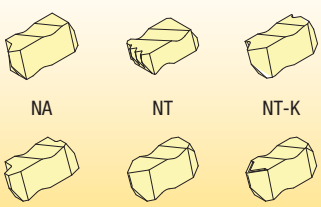
R — Sentido de rotação à direita

L — Sentido de rotação à esquerda



Dimensões do inserto Top Notch

tamanho do inserto	A mm	T mm
1	2,54	2,54
2	5,56	3,81
3	8,74	4,95
4	11,51	6,48
5	17,48	9,65
6	11,51	9,73
8	7,93	11,13



- Roscas por polegada ou passo (para sistema métrico)
- Inserto Buttress tipo “A” ou “B”.
- Conicidade por pé — Roscas API

I — Rosca interna

E — Rosca externa (usada somente se as roscas interna e externa forem diferentes)

M — Dentes múltiplos

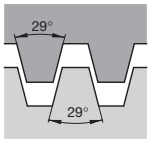
K — Controle do cavaco padrão

C — Passo largo

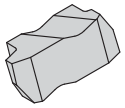
D — Selo a seco

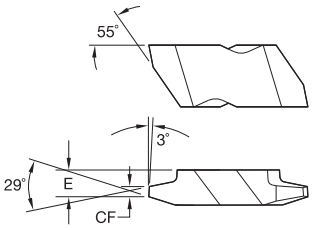
* Somente para o padrão exclusivo Kennametal.

estilo			perfil da rosca	padrão	classe de tolerância	Com crista	aplicação	página(s)
controle do cavaco — K	Neutro	positivo						
NT-K 	NT 	NTP 	Perfil parcial de 60°	–	–	N	Rosca de 60° para uso geral, tais como ISO e UN, onde os insertos sem crista são necessários para cortar uma variedade de passos.	D19, D24
NT-CK 			Perfil parcial de 60° — passo largo	–	–	N	Rosca de 60° com passo largo, tais como ISO e UN, onde os insertos sem crista são necessários para cortar uma variedade de passos.	D21
	NTF 	NTK 	Perfil parcial de 60° — passo fino	–	–	N	Rosca de 60° com passo fino, tais como ISO e UN, onde os insertos sem crista são necessários para cortar uma variedade de passos — permite rosquear próximo dos cantos.	D23
	NTU 		Perfil parcial de 60° — passo fino	–	–	N	Inserto de quatro arestas para rosqueamento de perfil parcial de 60° — requer porta-ferramentas estilo NSU para inserto tamanho 4U.	D24
	NTC-M 		Métrica ISO	ISO R262, DIN 13	6g/6H	Y	Rosca em V de 60° métrico amplamente usado para todas as indústrias.	D21
	NTC 		UN Americana	ANSI B1.1:74	2A/2B	Y	Rosca em V de 60° em polegadas amplamente usado para todas as indústrias.	D20
	NJ 	NJP 	UNJ	MIL-S-8879C	3A/3B	N	Raio de raiz controlado em roscas externas para as indústrias militar e aeroespacial.	D17–D18
	NJF 	NJK 	UNJ — passo fino	MIL-S-8879C	3A/3B	N	Raio de raiz controlado em roscas externas para as indústrias militar e aeroespacial — permite rosquear próximo dos cantos.	D17–D18
	NDC-V 		NPT	ANSI/ACME B1.201: 1983	Padrão NPT	Y	Padrão de roscas de tubos para conexões e tubos.	D16
	NDC-V-M 		NPT — dente múltiplo	ANSI/ACME B1.201: 1983	Padrão NPT	Y	Insertos para rosqueamento com múltiplos dentes para alta produtividade para roscas NPT.	D16
	NWC-E 		Whitworth, BSW e BSP	BS 84:1956, ISO 228/1:1982, DIN 259	Classe média A	Y	Rosca de 55° amplamente usada para conexões de gás e água.	D25
	ND 		Conexões de flanges rotativos API perfil parcial	API SPEC. 7:1990	Padrão API	N	Forma em V de 60° usada para conexões de flanges rotativos para a indústria petrolífera e de gás, incluindo as formas V-0,038R, V-0,040 e V-0,050	D14
	NDC 		Conexões de flanges rotativos API perfil completo (com crista)	API SPEC. 7:1990	Padrão API	Y	Forma em V de 60° usada para conexões de flanges rotativos para a indústria petrolífera e de gás, incluindo as formas 0,038R, V-0,040 e V-0,050 — forma de perfil completo (com crista), incluindo cônica	D14
	NDC-RD 		Redonda API	API PADRÃO 5B:1979	Padrão API RD	Y	Rosca em V de 60° com raio grande para revestimentos, tubulações e tubos para a indústria petrolífera e de gás, incluindo as formas redondas 8 e 10.	D15
	NDC-RD-M 		API redonda — dente múltiplo	API PADRÃO 5B:1979	Padrão API RD	Y	Insertos para rosqueamento com múltiplos dentes de alta produtividade para roscas API redondas	D15
	NA 		Acme	ANSI B1.5:1988	3G	N	Rosca truncada de 29° para aplicações em mecanismos em uma ampla variedade de indústrias.	D12
	NAS 		Stub Acme	ANSI B1.8:1988	2G	N	Rosca truncada de 29° de profundidade superficial para aplicações em mecanismos em uma ampla variedade de indústrias.	D13
	NTB-A 		Buttress americana — flanco de ataque com folga de 7° (por empuxo)	ANSI B1.9:1973	Classe 2	N	Forma de dente de serra para aplicações em mancais de carga axial em uma variedade de indústrias — use o estilo “A” quando o flanco de folga de 7° for o flanco de ataque.	D19
	NTB-B 		Buttress americana — flanco de ataque com folga de 45° (por tração)	ANSI B1.9:1973	Classe 2	N	Forma de dente de serra para aplicações em mancais de carga axial em uma variedade de indústrias — use o estilo “B” quando o flanco de folga de 45° for o flanco de ataque.	D20



Acme



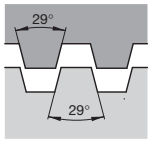


● primeira opção
○ opção alternativa

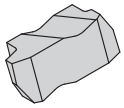
P			●	●	●	●	
M			●	●	●	●	
K		○	●	●	●	●	
N		●	●	○	○	○	●
S		●	●	●	●	●	○
H			○		○		

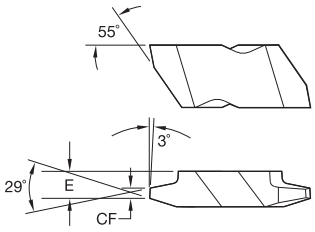
NA

código do produto	tamanho do inserto	RC	E	CF	FPP (fios por polegada)	K68	KCU10	KCU25	KC5010	KC5025	KC5410
corte à direita (R)											
NA3R10	3	–	3,79	0,810	10	–	●	●	●	●	–
NA3R12	3	–	3,79	0,719	12	–	●	–	–	●	–
NA3R16	3	–	3,79	0,523	16	–	●	–	–	–	–
NA3R4	3	–	3,38	2,222	4	–	–	●	●	●	–
NA3R5	3	–	3,79	1,750	5	–	●	●	●	●	–
NA3R6	3	–	3,79	1,438	6	–	●	●	●	●	–
NA3R8	3	–	3,79	1,044	8	–	●	●	●	●	–
NA4R4	4	–	5,13	2,223	4	–	–	●	●	●	–
NA4R5	4	–	5,13	1,750	5	–	–	–	–	●	–
NA4R6	4	–	5,13	1,438	6	–	–	–	–	●	–
NA6R25	6	–	7,19	3,635	2.5	–	–	–	–	●	–
NA6R2	6	–	7,19	4,577	2	–	●	●	●	●	–
NA6R3	6	–	7,19	3,007	3	–	–	●	–	●	–
corte à esquerda (L)											
NA3L8	3	–	3,79	1,044	8	–	●	●	●	●	–
NA3L10	3	–	3,79	0,810	10	–	–	●	–	●	–
NA3L12	3	–	3,79	0,719	12	–	–	–	●	●	–
NA3L4	3	–	3,38	2,222	4	●	●	●	●	●	–
NA3L5	3	–	3,79	1,750	5	–	–	●	●	●	–
NA3L6	3	–	3,79	1,438	6	–	–	●	●	●	–
NA4L5	4	–	5,13	1,750	5	–	–	–	–	●	–
NA4L6	4	–	5,13	1,438	6	–	–	–	–	●	–
NA4L8	4	–	5,13	1,044	8	–	–	●	–	–	–
NA4L4	4	–	5,13	2,223	4	–	●	–	–	●	–
NA6L3	6	–	7,19	3,007	3	–	–	●	–	●	–
NA6L25	6	–	7,19	3,635	2.5	–	–	●	–	–	–
NA6L2	6	–	7,19	4,577	2	–	–	●	●	●	–
NA3L16	3	–	3,79	0,523	16	–	●	–	–	–	–



Stub Acme



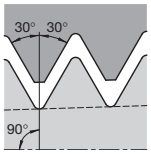


● primeira opção
○ opção alternativa

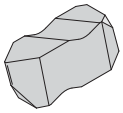
P			●	●	●	●	
M			●	●	●	●	
K		○	●	●	●	●	
N		●	●	○	○	○	●
S		●	●	●	●	●	○
H			○		○		

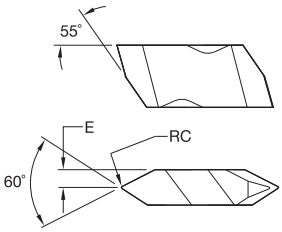
NAS

código do produto	tamanho do inserto	RC	E	CF	FPP (fios por polegada)	K68	KCU10	KCU25	KC5010	KC5025	KC5410
corte à direita (R)											
NAS3R10	3	–	3,79	0,940	10	–	●	–	●	●	–
NAS3R12	3	–	3,79	0,828	12	–	–	●	–	●	–
NAS3R16	3	–	3,79	0,605	16	–	–	–	–	●	–
NAS3R4	3	–	3,79	2,550	4	–	–	●	–	●	–
NAS3R5	3	–	3,79	2,014	5	–	●	–	–	●	–
NAS3R6	3	–	3,79	1,656	6	–	●	–	●	●	–
NAS3R8	3	–	3,79	1,209	8	–	●	●	●	●	–
corte à esquerda (L)											
NAS3L10	3	–	3,79	0,940	10	–	●	–	–	●	–
NAS3L12	3	–	3,79	0,828	12	–	–	–	–	●	–
NAS3L4	3	–	3,79	2,550	4	–	–	●	–	●	–
NAS3L5	3	–	3,79	2,014	5	–	●	–	–	●	–
NAS3L6	3	–	3,79	1,656	6	–	●	●	●	●	–
NAS3L8	3	–	3,79	1,209	8	–	●	●	●	●	–



Conexões de flanges rotativos API-Interno



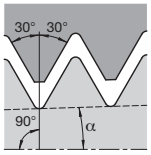


● primeira opção
○ opção alternativa

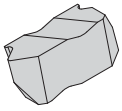
		K68	KCU10	KCU25	KC5010	KC5025	KC5410
P			●	●	●	●	
M			●	●	●	●	
K		○	●	●	●	●	
N		●	●	○	○	○	●
S		●	●	●	●	●	○
H			○		○		

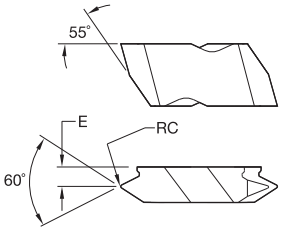
ND • Perfil parcial

código do produto	tamanho do inserto	RC	E	FPP (fios por polegada)	K68	KCU10	KCU25	KC5010	KC5025	KC5410
corte à direita (R)										
ND3040R	3	0,45	2,08	5	–	–	–	–	●	–
ND3038R	3	0,90	2,08	4	–	–	–	–	●	–
ND4050R	4	0,57	3,25	4	–	–	●	–	–	–
corte à esquerda (L)										
ND3038L	3	0,90	2,08	4	–	–	–	–	●	–
ND3040L	3	0,45	2,08	5	–	–	●	–	–	–



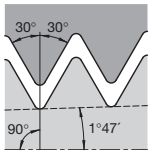
α =1/2arctg (tpf/12)
Conexões de flanges rotativos API-Interno



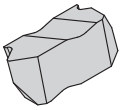


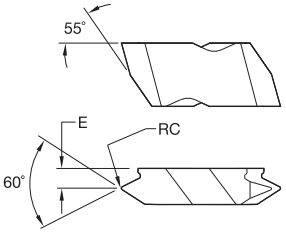
NDC • Crista

código do produto	tamanho do inserto	RC	E	FPP (fios por polegada)	K68	KCU10	KCU25	KC5010	KC5025	KC5410
corte à direita (R)										
NDC3040R3	3	0,45	3,73	5	–	–	–	–	●	–
NDC4040R3	4	0,45	3,73	5	–	–	–	–	●	–
NDC4050R2	4	0,57	4,65	4	–	–	–	–	●	–
NDC4050R3	4	0,57	4,65	4	–	–	–	–	●	–
NDC4038R2	4	0,90	4,65	4	–	–	–	–	●	–
corte à esquerda (L)										
NDC3040L3	3	0,45	3,73	5	–	–	–	●	–	–
NDC4050L2	4	0,57	4,65	4	–	–	–	–	●	–
NDC4038L2	4	0,90	4,65	4	–	–	–	–	●	–



Redonda API



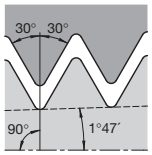


● primeira opção
○ opção alternativa

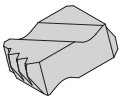
		K68	KCU10	KCU25	KC5010	KC5025	KC5410
P			●	●	●	●	
M			●	●	●	●	
K		○	●	●	●	●	
N		●	●	○	○	○	●
S		●	●	●	●	●	○
H			○		○		

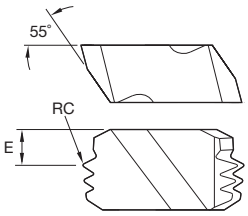
NDC-RD

código do produto	tamanho do inserto	RC	E	FPP (fios por polegada)	K68	KCU10	KCU25	KC5010	KC5025	KC5410
corte à direita (R)										
NDC310RDR75	3	0,36	3,18	10	–	–	–	–	●	–
NDC38RDR75	3	0,43	3,18	8	–	–	●	●	●	–
corte à esquerda (L)										
NDC310RDL75	3	0,36	3,18	10	–	–	–	–	●	–
NDC38RDL75	3	0,43	3,18	8	–	–	●	●	●	–



Redonda API



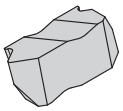


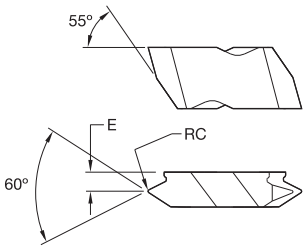
NDC-RD-M • Multidentes

código do produto	tamanho do inserto	RC	E	FPP (fios por polegada)	K68	KCU10	KCU25	KC5010	KC5025	KC5410
corte à direita (R)										
NDC68RDR75M	6	0,41	2,62	8	–	●	–	–	–	–

● primeira opção
○ opção alternativa

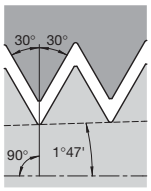
		K68	KCU10	KCU25	KC5010	KC5025	KC5410
P			●	●	●	●	
M			●	●	●	●	
K		○	●	●	●	●	
N		●	●	○	○	○	●
S		●	●	●	●	●	○
H			○		○		



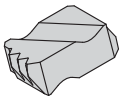


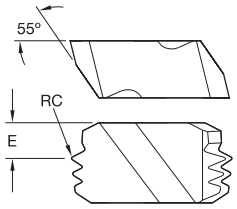
NDC-V

código do produto	tamanho do inserto	RC	E	FPP (fios por polegada)	K68	KCU10	KCU25	KC5010	KC5025	KC5410
corte à direita (R)										
NDC327VR75	3	0,05	3,66	27	–	●	–	–	–	–
NDC314VR75	3	0,08	3,66	14	–	●	–	–	–	–
NDC3115VR75	3	0,10	3,66	11.5	–	●	–	●	–	–
NDC38VR75	3	0,13	2,54	8	–	–	–	●	–	–
corte à esquerda (L)										
NDC3115VL75	3	0,10	3,66	11.5	–	●	–	●	–	–
NDC38VL75	3	0,13	2,54	8	–	–	–	●	–	–



NPT



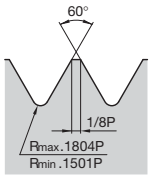


NDC-V-M • Multidentes

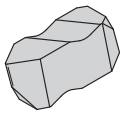
código do produto	tamanho do inserto	RC	E	FPP (fios por polegada)	K68	KCU10	KCU25	KC5010	KC5025	KC5410
corte à direita (R)										
NDC8115VR75M	8	0,10	2,59	11.5	–	●	–	–	–	–
NDC88VR75M	8	0,13	2,41	8	–	●	–	●	–	–
corte à esquerda (L)										
NDC88VL75M	8	0,13	2,41	8	–	–	–	●	–	–

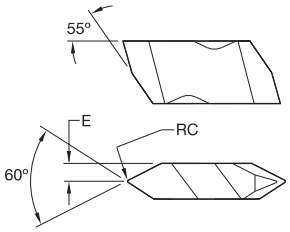
P			●	●	●	●	
M			●	●	●	●	
K		○	●	●	●	●	
N		●	●	○	○	○	●
S		●	●	●	●	●	○
H			○		○		

● primeira opção
○ opção alternativa



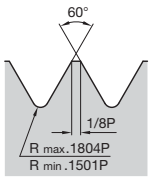
UNJ-Externo



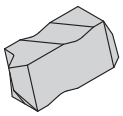


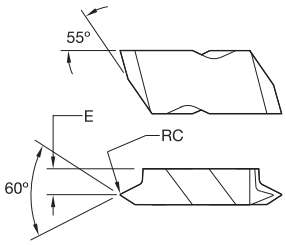
NJ

código do produto	tamanho do inserto	RC	E	passo da rosca externa mm	passo da rosca interna mm	TPI externo	FPP interno	K68	KCU10	KCU25	KC5010	KC5025	KC5410
corte à direita (R)													
NJ3010R16	3	0,25	2,49	–	–	16	–	●	–	●	–	●	–
NJ3014R12	3	0,33	2,49	–	–	12	–	–	●	●	●	●	–
NJ3020R8	3	0,49	2,49	–	–	8	–	–	–	–	●	●	–
corte à esquerda (L)													
NJ3010L16	3	0,25	2,49	–	–	16	–	–	–	–	–	●	–
NJ3014L12	3	0,33	2,49	–	–	12	–	–	–	–	●	●	–
NJ3020L8	3	0,49	2,49	–	–	8	–	–	–	–	–	●	–



UNJ-Externo



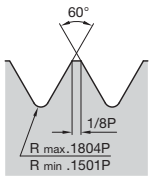


NJF

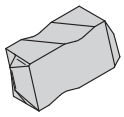
código do produto	tamanho do inserto	RC	E	passo da rosca externa mm	passo da rosca interna mm	TPI externo	FPP interno	K68	KCU10	KCU25	KC5010	KC5025	KC5410
corte à direita (R)													
NJF3005R32	3	0,13	3,58	–	–	32	–	–	●	–	●	–	–
NJF3006R28	3	0,15	3,58	–	–	28	–	–	–	–	●	●	–
NJF3007R24	3	0,17	3,58	–	–	24	–	–	–	–	●	●	–
NJF3008R20	3	0,20	3,58	–	–	20	–	–	–	–	●	●	–
NJF3009R18	3	0,22	3,58	–	–	18	–	●	–	●	●	●	–
NJF3010R16	3	0,25	3,58	–	–	16	–	–	–	–	●	●	–
NJF3012R14	3	0,28	3,58	–	–	14	–	–	–	●	●	●	–
corte à esquerda (L)													
NJF3007L24	3	0,17	3,58	–	–	24	–	–	–	–	●	–	–
NJF3008L20	3	0,20	3,58	–	–	20	–	–	–	–	●	–	–
NJF3010L16	3	0,25	3,58	–	–	16	–	–	–	–	●	–	–

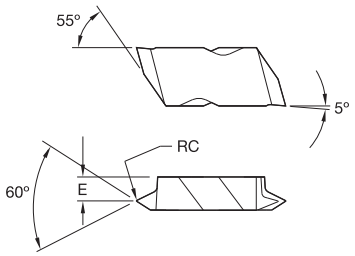
P			●	●	●	●	
M			●	●	●	●	
K		○	●	●	●	●	
N		●	●	○	○	○	●
S		●	●	●	●	●	○
H			○		○		

● primeira opção
○ opção alternativa



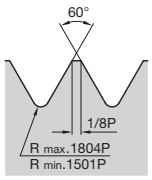
UNJ-Externo



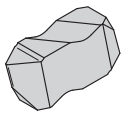


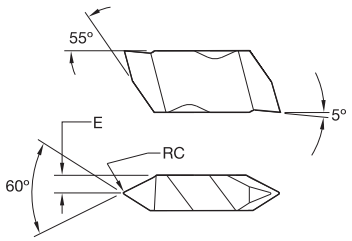
NJK

código do produto	tamanho do inserto	RC	E	passo da rosca externa mm	passo da rosca interna mm	TPI externo	FPP interno	K68	KCU10	KCU25	KC5010	KC5025	KC5410
corte à direita (R)													
NJK3005R32	3	0,13	3,58	–	–	32	–	–	–	–	●	●	–
NJK3006R28	3	0,15	3,58	–	–	28	–	–	–	●	●	–	–
NJK3007R24	3	0,17	3,58	–	–	24	–	–	–	●	●	●	–
NJK3008R20	3	0,20	3,58	–	–	20	–	–	●	●	●	●	–
NJK3009R18	3	0,22	3,58	–	–	18	–	–	–	–	●	●	–
NJK3010R16	3	0,25	3,58	–	–	16	–	–	–	●	●	●	–
NJK3012R14	3	0,28	3,58	–	–	14	–	–	–	–	●	●	–
corte à esquerda (L)													
NJK3005L32	3	0,13	3,58	–	–	32	–	–	–	–	–	●	–
NJK3006L28	3	0,15	3,58	–	–	28	–	–	–	–	–	●	–



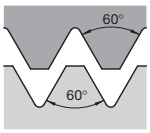
UNJ-Externo



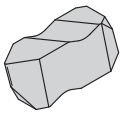


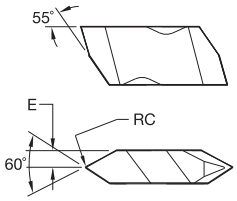
NJP

código do produto	tamanho do inserto	RC	E	passo da rosca externa mm	passo da rosca interna mm	TPI externo	FPP interno	K68	KCU10	KCU25	KC5010	KC5025	KC5410
corte à direita (R)													
NJP3010R16	3	0,25	2,49	–	–	16	–	–	●	–	●	●	–
NJP3014R12	3	0,33	2,49	–	–	12	–	●	●	●	●	●	–
NJP3020R8	3	0,49	2,49	–	–	8	–	–	–	●	●	●	–
corte à esquerda (L)													
NJP3010L16	3	0,25	2,49	–	–	16	–	–	–	–	–	●	–
NJP3014L12	3	0,33	2,49	–	–	12	–	–	–	–	●	–	–
NJP3020L8	3	0,49	2,49	–	–	8	–	–	–	–	–	●	–



Perfil parcial de 60°



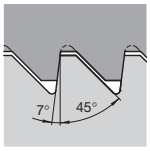


● primeira opção
○ opção alternativa

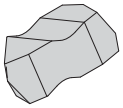
P			●	●	●	●	
M			●	●	●	●	
K		○	●	●	●	●	
N		●	●	○	○	○	●
S		●	●	●	●	●	○
H			○		○		

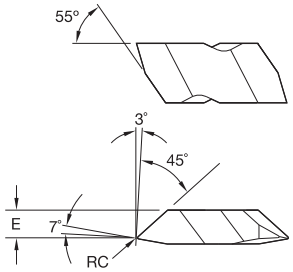
NT

código do produto	tamanho do inserto	RC	E	passo da rosca externa mm	passo da rosca interna mm	TPI externo	FPP interno	K68	KCU10	KCU25	KC5010	KC5025	KC5410
corte à direita (R)													
NT2R	2	0,10	1,90	0,70-3,0	1,25-3,5	8-36	7-20	●	●	●	●	●	–
NT3R	3	0,17	2,49	1,25-4,0	2,0-5,0	6-20	5-12	●	●	●	●	●	–
NT4R	4	0,17	3,25	1,25-6,25	2,0-6,25	4-20	4-12	●	●	●	●	●	–
corte à esquerda (L)													
NT2L	2	0,10	1,90	0,70-3,0	1,25-3,5	8-36	7-20	●	●	●	●	●	–
NT3L	3	0,17	2,49	1,25-4,0	2,0-5,0	6-20	5-12	●	●	●	●	●	–
NT4L	4	0,17	3,25	1,25-6,25	2,0-6,25	4-20	4-12	●	●	●	●	●	–



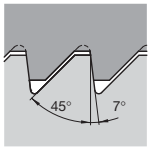
Buttress americana-por empuxo



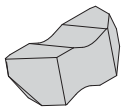


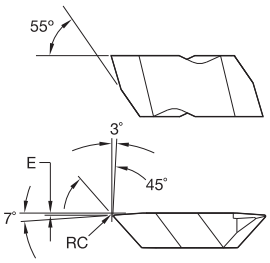
NTB-A

código do produto	tamanho do inserto	RC	E	FPP (fios por polegada)	K68	KCU10	KCU25	KC5010	KC5025	KC5410
corte à direita (R)										
NTB2RA	2	0,08	3,20	16-20	●	–	–	–	–	–
NTB3RA	3	0,17	4,17	8-16	–	●	–	–	●	–
NTB4RA	4	0,25	5,23	4-6	–	●	–	–	–	–
corte à esquerda (L)										
NTB3LA	3	0,17	4,17	8-16	●	–	–	●	●	–



American Buttress-
por tração



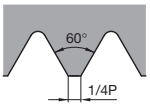


● primeira opção
○ opção alternativa

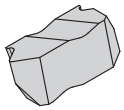
P			●	●	●	●	
M			●	●	●	●	
K		○	●	●	●	●	
N		●	●	○	○	○	●
S		●	●	●	●	●	○
H			○		○		

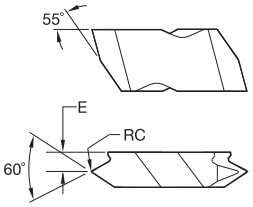
NTB-B

código do produto	tamanho do inserto	RC	E	FPP (fios por polegada)	K68	KCU10	KCU25	KC5010	KC5025	KC5410
corte à direita (R)										
NTB2RB	2	0,08	0,25	16-20	–	–	–	●	–	–
NTB3R12B	3	0,16	2,49	12	–	–	–	●	–	–
NTB3RB	3	0,17	0,31	8-16	●	●	●	●	●	–
NTB4RB	4	0,25	0,41	4-6	–	●	–	●	●	–
corte à esquerda (L)										
NTB2LB	2	0,08	0,25	16-20	–	●	–	●	–	–
NTB3L12B	3	0,16	2,49	12	–	–	–	●	–	–
NTB3LB	3	0,17	0,31	8-16	●	●	–	●	●	–
NTB4LB	4	0,25	0,41	4-6	–	–	–	●	●	–



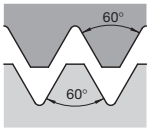
UN americana-
interna



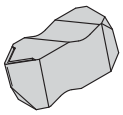


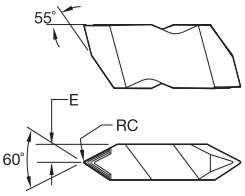
NTC-I

código do produto	tamanho do inserto	RC	E	passo da rosca externa mm	passo da rosca interna mm	TPI externo	FPP interno	K68	KCU10	KCU25	KC5010	KC5025	KC5410
corte à direita (R)													
NTC3R12I	3	0,10	3,76	–	–	–	12	–	–	–	–	●	–
corte à esquerda (L)													
NTC3L12I	3	0,10	3,76	–	–	–	12	–	–	–	–	●	–
NTC3L14I	3	0,09	3,76	–	–	–	14	–	–	–	–	●	–
NTC3L16I	3	0,08	3,76	–	–	–	16	–	–	–	–	●	–
NTC3L8I	3	0,18	2,72	–	–	–	8	–	–	–	–	●	–
NTC3L10I	3	0,13	2,72	–	–	–	10	–	–	–	–	●	–



Perfil parcial de 60°



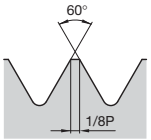


● primeira opção
○ opção alternativa

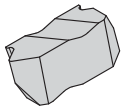
P			●	●	●	●	
M			●	●	●	●	
K		○	●	●	●	●	
N		●	●	○	○	○	●
S		●	●	●	●	●	○
H			○		○		

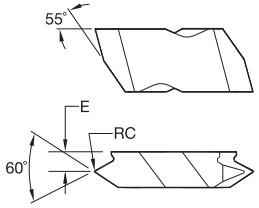
NT-CK

código do produto	tamanho do inserto	RC	E	passo da rosca externa mm	passo da rosca interna mm	TPI externo	FPP interno	K68	KCU10	KCU25	KC5010	KC5025	KC5410
corte à direita (R)													
NT3RCK	3	0,34	2,46	2,5-4,0	4,0	6-11	6	–	●	●	●	●	–
NT4RCK	4	0,34	3,23	2,5-5,5	4,0-5,5	4,5-11	4.5-6	–	–	●	●	●	–
corte à esquerda (L)													
NT3LCK	3	0,34	2,46	2,5-4,0	4,0	6-11	6	–	●	●	●	●	–
NT4LCK	4	0,34	3,23	2,5-5,5	4,0-5,5	4,5-11	4.5-6	–	–	●	–	●	–



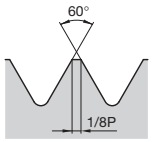
Métrico interno de ISO



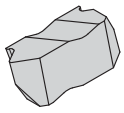


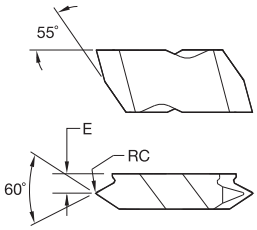
NTC-M-E

código do produto	tamanho do inserto	RC	E	passo da rosca externa mm	passo da rosca interna mm	TPI externo	FPP interno	K68	KCU10	KCU25	KC5010	KC5025	KC5410
corte à direita (R)													
NTC3MR150E	3	0,20	3,68	1,50	–	–	–	–	●	–	●	●	–
NTC3MR200E	3	0,27	3,68	2,00	–	–	–	–	–	–	●	–	–



UN americana-externa



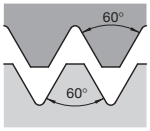


● primeira opção
○ opção alternativa

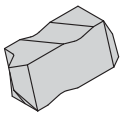
P			●	●	●	●	
M			●	●	●	●	
K		○	●	●	●	●	
N		●	●	○	○	○	●
S		●	●	●	●	●	○
H			○		○		

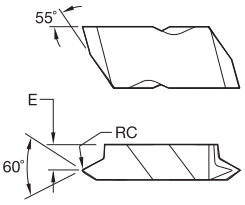
NTC-E

código do produto	tamanho do inserto	RC	E	passo da rosca externa mm	passo da rosca interna mm	TPI externo	FPP interno	K68	KCU10	KCU25	KC5010	KC5025	KC5410
corte à direita (R)													
NTC3R32E	3	0,10	3,76	–	–	32	–	–	●	–	–	●	–
NTC3R28E	3	0,12	3,76	–	–	28	–	–	–	–	–	●	–
NTC3R24E	3	0,13	3,76	–	–	24	–	–	–	–	●	●	–
NTC3R20E	3	0,16	3,76	–	–	20	–	–	●	–	●	●	–
NTC3R18E	3	0,18	3,76	–	–	18	–	–	–	●	●	●	–
NTC3R16E	3	0,19	3,76	–	–	16	–	–	–	–	●	●	–
NTC3R14E	3	0,22	3,76	–	–	14	–	–	–	–	●	●	–
NTC3R13E	3	0,24	3,76	–	–	13	–	–	–	–	●	●	–
NTC3R12E	3	0,25	3,76	–	–	12	–	–	–	●	●	●	–
NTC3R11E	3	0,28	2,72	–	–	11	–	–	●	–	–	●	–
NTC3R10E	3	0,32	2,72	–	–	10	–	–	–	–	●	●	–
NTC3R9E	3	0,36	2,72	–	–	9	–	–	●	–	–	–	–
NTC3R8E	3	0,41	2,72	–	–	8	–	–	●	–	●	●	–
NTC3R7E	3	0,47	2,72	–	–	7	–	–	–	–	–	●	–
corte à esquerda (L)													
NTC3L16E	3	0,19	3,76	–	–	16	–	–	●	–	–	–	–
NTC3L12E	3	0,25	3,76	–	–	12	–	–	●	–	–	–	–
NTC3L10E	3	0,32	2,72	–	–	10	–	–	●	–	–	–	–
NTC3L8E	3	0,41	2,72	–	–	8	–	–	–	–	●	–	–



Perfil parcial de 60°



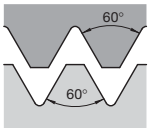


● primeira opção
○ opção alternativa

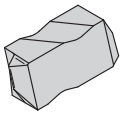
P			●	●	●	●	
M			●	●	●	●	
K		○	●	●	●	●	
N		●	●	○	○	○	●
S		●	●	●	●	●	○
H			○		○		

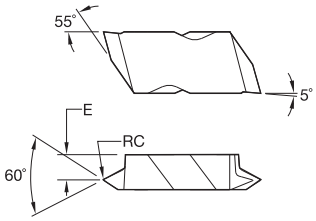
NTF

código do produto	tamanho do inserto	RC	E	passo da rosca externa mm	passo da rosca interna mm	TPI externo	FPP interno	K68	KCU10	KCU25	KC5010	KC5025	KC5410
corte à direita (R)													
NTF2R	2	0,08	2,79	0,60-1,75	1,0-2,0	14-44	12-24	●	●	●	●	●	–
NTF3R	3	0,08	3,58	0,60-2,5	1,0-2,5	10-44	9-24	●	●	●	●	●	–
NTF4R	4	0,08	5,11	0,60-2,5	1,0-2,5	10-44	9-24	–	–	–	–	●	–
corte à esquerda (L)													
NTF2L	2	0,08	2,79	0,60-1,75	1,0-2,0	14-44	12-24	●	●	●	●	●	–
NTF3L	3	0,08	3,58	0,60-2,5	1,0-2,5	10-44	9-24	●	●	●	●	●	–



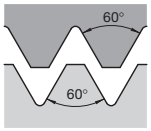
Perfil parcial de 60°



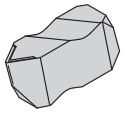


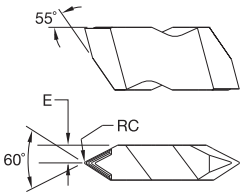
NTK

código do produto	tamanho do inserto	RC	E	passo da rosca externa mm	passo da rosca interna mm	TPI externo	FPP interno	K68	KCU10	KCU25	KC5010	KC5025	KC5410
corte à direita (R)													
NTK2R	2	0,08	2,79	0,60-1,75	1,0-2,0	14-44	12-24	●	●	●	●	●	–
NTK3R	3	0,08	3,58	0,60-2,50	1,0-2,5	10-44	9-24	●	●	●	●	●	–
corte à esquerda (L)													
NTK2L	2	0,08	2,79	0,60-1,75	1,0-2,0	14-44	12-24	●	●	●	●	●	–
NTK3L	3	0,08	3,58	0,60-2,50	1,0-2,5	10-44	9-24	●	●	●	●	●	–



Perfil parcial de 60°



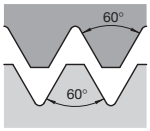


● primeira opção
○ opção alternativa

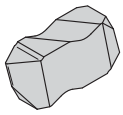
P		●	●	●	●		
M		●	●	●	●		
K	○	●	●	●	●		
N	●	●	○	○	○	●	
S	●	●	●	●	●	○	
H		○		○			

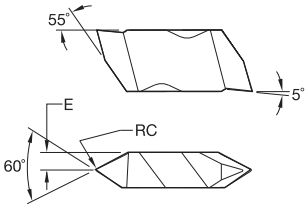
NT-K

código do produto	tamanho do inserto	RC	E	passo da rosca externa mm	passo da rosca interna mm	TPI externo	FPP interno	K68	KCU10	KCU25	KC5010	KC5025	KC5410
corte à direita (R)													
NT2RK	2	0,10	1,90	0,70-3,0	1,25-3,5	8-36	7-20	–	●	●	●	●	–
NT3RK	3	0,17	2,49	1,25-4,0	2,0-5,0	6-20	5-12	–	●	●	●	●	–
NT4RK	4	0,16	3,24	1,25-6,25	2,0-6,25	4-20	4-12	–	●	●	●	●	–
corte à esquerda (L)													
NT2LK	2	0,10	1,90	0,70-3,0	1,25-3,5	8-36	7-20	–	●	●	●	●	–
NT3LK	3	0,17	2,49	1,25-4,0	2,0-5,0	6-20	5-12	–	●	●	●	●	–
NT4LK	4	0,16	3,24	1,25-6,25	2,0-6,25	4-20	4-12	–	●	●	●	●	–



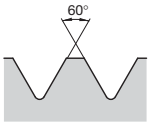
Perfil parcial de 60°



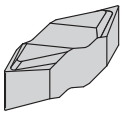


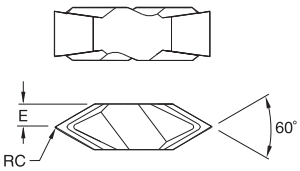
NTP

código do produto	tamanho do inserto	RC	E	passo da rosca externa mm	passo da rosca interna mm	TPI externo	FPP interno	K68	KCU10	KCU25	KC5010	KC5025	KC5410
corte à direita (R)													
NTP2R	2	0,10	1,91	0,70-3,0	1,25-3,5	8-36	7-20	●	●	●	●	●	–
NTP3R	3	0,17	2,49	1,25-4,0	2,0-5,0	6-20	5-12	●	●	●	●	●	●
NTP4R	4	0,17	3,25	1,25-6,25	2,0-6,25	4-20	4-12	–	●	●	●	●	–
corte à esquerda (L)													
NTP2L	2	0,10	1,91	0,70-3,0	1,25-3,5	8-36	7-20	●	●	●	●	●	–
NTP3L	3	0,17	2,49	1,25-4,0	2,0-5,0	6-20	5-12	●	●	●	●	●	–
NTP4L	4	0,17	3,25	1,25-6,25	2,0-6,25	4-20	4-12	–	–	–	●	●	–



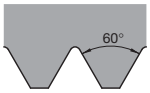
Partial Profile
60° External



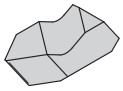


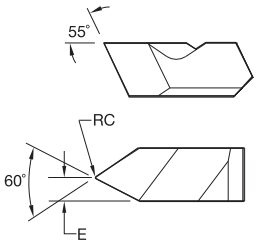
NTU

código do produto	tamanho do inserto	RC	E	passo da rosca externa mm	passo da rosca interna mm	TPI externo	FPP interno	K68	KCU10	KCU25	KC5010	KC5025	KC5410
corte à direita (R)													
NTU4R	4U	0,11	3,18	1,25-6,25	–	4-20	–	–	–	●	–	●	–



Perfil parcial interno de 60°



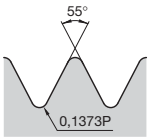


● primeira opção
○ opção alternativa

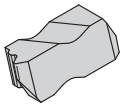
		K68	KCU10	KCU25	KC5010	KC5025	KC5410
P			●	●	●	●	
M			●	●	●	●	
K		○	●	●	●	●	
N		●	●	○	○	○	●
S		●	●	●	●	●	○
H			○		○		

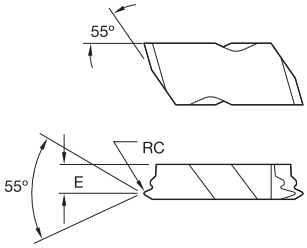
NT-1L

código do produto	tamanho do inserto	RC	E	passo da rosca externa mm	passo da rosca interna mm	TPI externo	FPP interno	K68	KCU10	KCU25	KC5010	KC5025	KC5410
corte à esquerda (L)													
NT1L	1	0,08	1,09	–	1,0-2,0	–	12-24	●	●	●	●	●	–



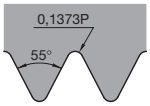
Whitworth BSW, BSF, BSP-Externo



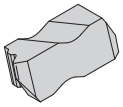


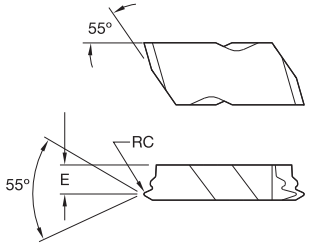
NWC-E

código do produto	tamanho do inserto	RC	E	FPP (fios por polegada)	K68	KCU10	KCU25	KC5010	KC5025	KC5410
corte à direita (R)										
NWC3R14E	3	0,24	3,43	14	–	–	●	●	–	–
NWC3R11E	3	0,30	3,43	11	–	–	–	●	●	–



Whitworth BSW, BSF, BSP-Interno



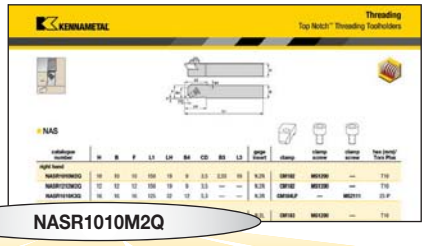


NWC-I

código do produto	tamanho do inserto	RC	E	FPP (fios por polegada)	K68	KCU10	KCU25	KC5010	KC5025	KC5410
corte à esquerda (L)										
NWC3L11I	3	0,30	3,43	11	–	–	–	–	●	–

Como funcionam os números de catálogo?

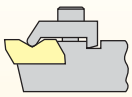
Cada caractere no nosso número de catálogo significa uma característica específica daquele produto. Use as colunas-chave a seguir e as imagens correspondentes para fazer uma identificação fácil do atributo a ser aplicado.



NASR1010M2Q

N — Método de retenção do inserto

N — Top Notch™

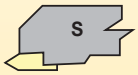


AS — Local de montagem do inserto

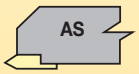
Montagem de topo



Montagem lateral com deslocamento

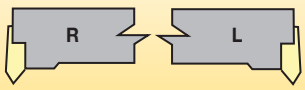


Montagem lateral sem deslocamento

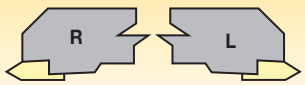


R — Sentido de rotação da ferramenta

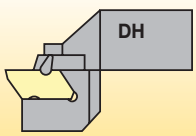
Montagem de topo



Montagem lateral



Cabeça deslocada



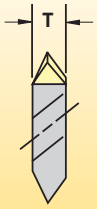
1010 — Tamanho da haste

Altura e largura da haste em mm e do suporte

M — Comprimento da ferramenta

L1	ISO
32	A
40	B
50	C
60	D
70	E
80	F
90	G
100	H
110	J
125	K
140	L
150	M
160	N
170	P
180	Q
200	R
250	S
300	T
350	U
400	V
450	W
500	Y
comprimento especial	X

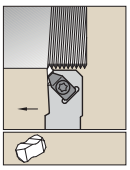
2 — Tamanho do inserto

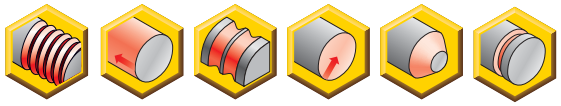


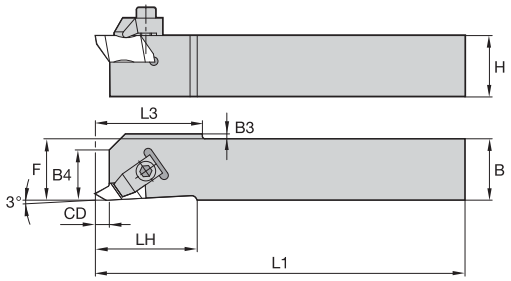
tamanho do inserto	T
2	3,81
3	4,95
4	6,98
5	9,65
6	9,73
8	11,13

Q — Suporte qualificado

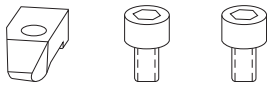
Q — Suporte qualificado





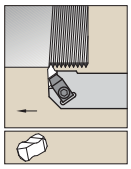


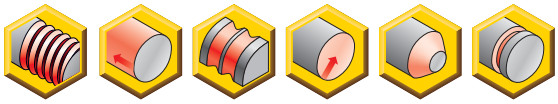
NAS

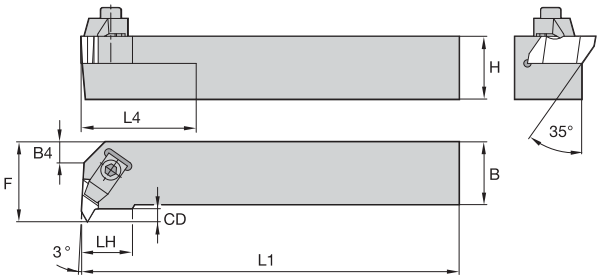


número para pedido	código do produto	H	B	F	L1	LH	B4	CD	B3	L3	inserto padrão	grampo	parafuso do grampo	parafuso do grampo	sextavado (mm)/ Torx Plus
corte à direita (R)															
1098788	**NASR1010M2Q**	10	10	10	150	19	9	3,5	2,03	19	N.2R	**CM182**	**MS1200**	**–**	T10
1098789	**NASR1212M2Q**	12	12	12	150	19	9	3,5	–	–	N.2R	**CM182**	**MS1200**	**–**	T10
1098786	**NASR1616K3Q**	16	16	16	125	32	13	5,3	–	–	N.3R	**CM184LP**	**–**	**MS2111**	25 IP
corte à esquerda (L)															
1098859	**NASL1010M2Q**	10	10	10	150	19	9	3,5	2,03	19	N.2L	**CM183**	**MS1200**	**–**	T10
1098860	**NASL1212M2Q**	12	12	12	150	19	9	6,9	–	–	N.2L	**CM183**	**MS1200**	**–**	T10
1098857	**NASL1616K3Q**	16	16	16	125	32	13	5,3	–	–	N.3L	**CM185LP**	**–**	**MS2111**	25 IP

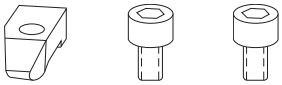
NOTA: Dimensão F medida na ponta afiada do inserto de rosqueamento em estilo N.





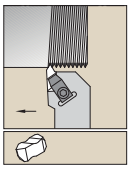


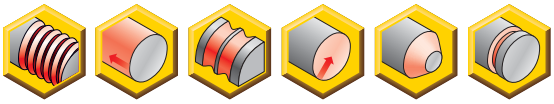
NE

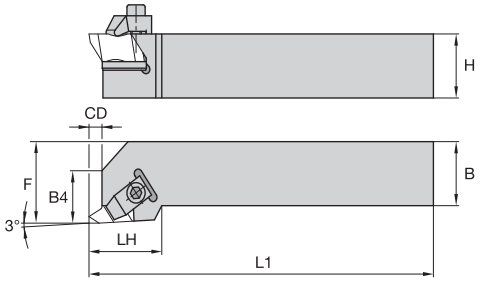


número para pedido	código do produto	H	B	F	L1	LH	CD	L4	inserto padrão	grampo	parafuso do grampo	parafuso do grampo	sextavado (mm)/ Torx Plus
corte à direita (R)													
1098803	**NER1616H2**	16	16	20	100	15	3,5	–	N.2L	**CM75**	**MS1200**	**–**	T10
1098804	**NER2020K2**	20	20	25	125	15	3,5	–	N.2L	**CM75**	**MS1200**	**–**	T10
1098805	**NER2525M2**	25	25	32	150	15	3,5	25,4	N.2L	**CM75**	**MS1200**	**–**	T10
1098806	**NER2525M3**	25	25	32	150	22	5,3	50,8	N.3L	**CM73LP**	**–**	**MS2111**	25 IP
1098808	**NER2525M4**	25	25	35	150	24	6,4	50,8	N.4L	**CM73LP**	**–**	**MS2111**	25 IP
1098807	**NER3225P3**	32	25	32	170	22	3,8	50,8	N.3L	**CM73LP**	**–**	**MS2111**	25 IP
1098809	**NER3225P4**	32	25	35	170	24	6,4	50,8	N.4L	**CM73LP**	**–**	**MS2111**	25 IP
1098810	**NER3232P4**	32	32	40	170	24	6,4	50,8	N.4L	**CM73LP**	**–**	**MS2111**	25 IP
corte à esquerda (L)													
1098874	**NEL1616H2**	16	16	20	100	15	3,5	–	N.2R	**CM74**	**MS1200**	**–**	T10
1098875	**NEL2020K2**	20	20	25	125	15	3,5	–	N.2R	**CM74**	**MS1200**	**–**	T10
1098876	**NEL2525M2**	25	25	32	150	15	3,5	25,4	N.2R	**CM74**	**MS1200**	**–**	T10
1098877	**NEL2525M3**	25	25	32	150	22	5,3	50,8	N.3R	**CM72LP**	**–**	**MS2111**	25 IP
1098879	**NEL2525M4**	25	25	35	150	24	6,4	50,8	N.4R	**CM72LP**	**–**	**MS2111**	25 IP
1098878	**NEL3225P3**	32	25	32	170	22	3,8	50,8	N.3R	**CM72LP**	**–**	**MS2111**	25 IP
1098880	**NEL3225P4**	32	25	35	170	24	6,4	50,8	N.4R	**CM72LP**	**–**	**MS2111**	25 IP
1098881	**NEL3232P4**	32	32	40	170	24	6,4	50,8	N.4R	**CM72LP**	**–**	**MS2111**	25 IP

NOTA: Dimensão F medida na ponta afiada do inserto para rosqueamento estilo Top Notch.





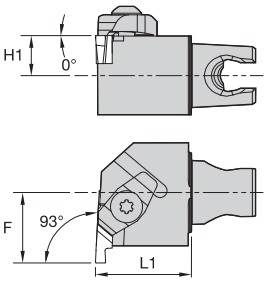


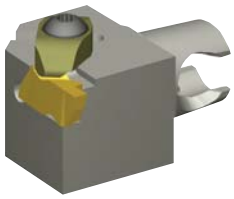
NS



número para pedido	código do produto	H	B	F	L1	LH	B4	CD	inserto padrão	grampo	parafuso do grampo	parafuso do grampo	sextavado (mm)/ Torx Plus
corte à direita (R)													
1098790	**NSR1010E2**	10	10	14	70	19	9	3,5	N.2R	**CM74**	**MS1200**	**–**	T10
1098791	**NSR1212F2**	12	12	16	80	19	9	3,5	N.2R	**CM74**	**MS1200**	**–**	T10
1098792	**NSR1616H2**	16	16	20	100	19	9	3,5	N.2R	**CM74**	**MS1200**	**–**	T10
1098793	**NSR2020K2**	20	20	25	125	19	9	3,5	N.2R	**CM74**	**MS1200**	**–**	T10
1098795	**NSR2020K3**	20	20	25	125	32	13	5,3	N.3R	**CM72LP**	**–**	**MS2111**	25 IP
1098794	**NSR2525M2**	25	25	32	150	19	9	3,5	N.2R	**CM74**	**MS1200**	**–**	T10
1098796	**NSR2525M3**	25	25	32	150	32	13	5,3	N.3R	**CM72LP**	**–**	**MS2111**	25 IP
1098799	**NSR2525M4**	25	25	32	150	35	14	7,5	N.4R	**CM72LP**	**–**	**MS2111**	25 IP
1098797	**NSR3225P3**	32	25	32	170	32	13	5,3	N.3R	**CM72LP**	**–**	**MS2111**	25 IP
1098800	**NSR3225P4**	32	25	32	170	35	14	7,5	N.4R	**CM72LP**	**–**	**MS2111**	25 IP
1098798	**NSR3232P3**	32	32	40	170	32	13	5,3	N.3R	**CM72LP**	**–**	**MS2111**	25 IP
1098801	**NSR3232P4**	32	32	40	170	35	14	7,5	N.4R	**CM72LP**	**–**	**MS2111**	25 IP
corte à esquerda (L)													
1098861	**NSL1010E2**	10	10	14	70	19	9	3,5	N.2L	**CM75**	**MS1200**	**–**	T10
1098862	**NSL1212F2**	12	12	16	80	19	9	3,5	N.2L	**CM75**	**MS1200**	**–**	T10
1098863	**NSL1616H2**	16	16	20	100	19	9	3,5	N.2L	**CM75**	**MS1200**	**–**	T10
1098864	**NSL2020K2**	20	20	25	125	19	9	3,5	N.2L	**CM75**	**MS1200**	**–**	T10
1098866	**NSL2020K3**	20	20	25	125	32	13	5,3	N.3L	**CM73LP**	**–**	**MS2111**	25 IP
1098865	**NSL2525M2**	25	25	32	150	19	9	3,5	N.2L	**CM75**	**MS1200**	**–**	T10
1098867	**NSL2525M3**	25	25	32	150	32	13	5,3	N.3L	**CM73LP**	**–**	**MS2111**	25 IP
1098870	**NSL2525M4**	25	25	32	150	35	14	7,5	N.4L	**CM73LP**	**–**	**MS2111**	25 IP
1098868	**NSL3225P3**	32	25	32	170	32	13	5,3	N.3L	**CM73LP**	**–**	**MS2111**	25 IP
1098871	**NSL3225P4**	32	25	32	170	35	14	7,5	N.4L	**CM73LP**	**–**	**MS2111**	25 IP
1098869	**NSL3232P3**	32	32	40	170	32	13	5,3	N.3L	**CM73LP**	**–**	**MS2111**	25 IP
1098872	**NSL3232P4**	32	32	40	170	35	14	7,5	N.4L	**CM73LP**	**–**	**MS2111**	25 IP

NOTA: Dimensão F medida na ponta do inserto para rosqueamento no estilo Top Notch e abertura de canal.





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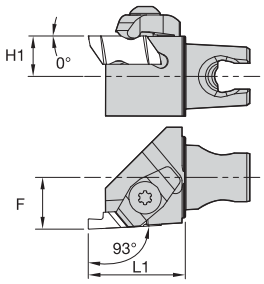
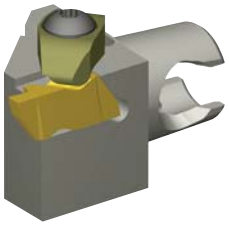
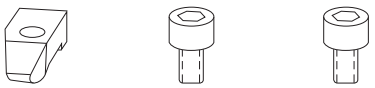
número para pedido	código do produto	L1	F	H1	inserto padrão	grampo	parafuso do grampo	parafuso do grampo
corte à direita (R)								
2399462	**KM25NER230**	30	22	12,5	NG2L	**CM75**	**–**	**MS1200**
2399494	**KM25NER330**	30	22	12,5	NG3L	**CM73LP**	**MS2111**	**–**
2399496	**KM25NER430**	30	24	12,5	NG4L	**CM73LP**	**MS2111**	**–**
corte à esquerda (L)								
2399495	**KM25NEL330**	30	22	12,5	NG3R	**CM72LP**	**MS2111**	**–**
2399497	**KM25NEL430**	30	24	12,5	NG4R	**CM72LP**	**MS2111**	**–**



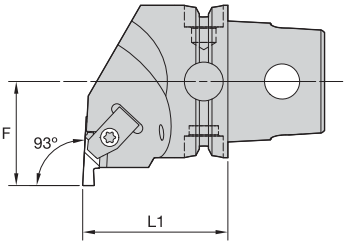


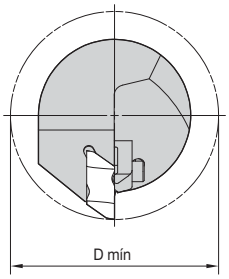
NS 93°

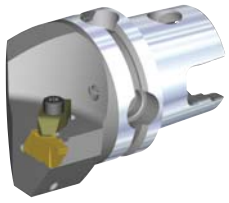


número para pedido	código do produto	L1	F	H1	inserto padrão	grampo	parafuso do grampo	parafuso do grampo
corte à direita (R)								
2399498	**KM25NSR230**	30	16	12,5	NG2R	**CM74**	**–**	**MS1200**
2399500	**KM25NSR330**	30	16	12,5	NG3R	**CM72LP**	**MS2111**	**–**
corte à esquerda (L)								
2399499	**KM25NSL230**	30	16	12,5	NG2L	**CM75**	**–**	**MS1200**
2399501	**KM25NSL330**	30	16	12,5	NG3L	**CM73LP**	**MS2111**	**–**
2399503	**KM25NSL430**	30	16	12,5	NG4L	**CM213LP**	**MS2111**	**–**



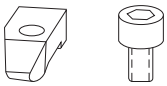






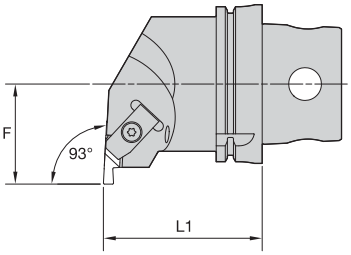
KM QUICK CHANGE

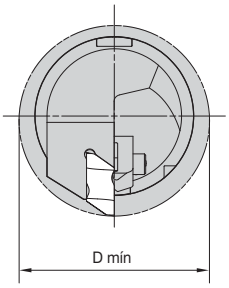
NE 93°

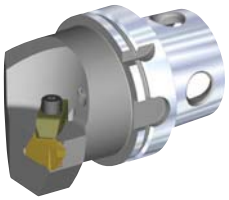


número para pedido	código do produto	L1 mm	L1 pol	F mm	F pol	D mín mm	D mín pol	inserto padrão	grampo	parafuso do grampo	kgs	lbs
corte à direita (R)												
3902285	**KM40TSNER2**	40	1.575	27	1.063	54	2.126	NG2L	**CM75**	**MS1488**	0,30	.66
3902286	**KM40TSNER3**	40	1.575	27	1.063	54	2.126	NG3L	**CM73**	**MS1489**	0,30	.67
3902287	**KM40TSNER4**	40	1.575	27	1.063	54	2.126	NG4L	**CM73**	**MS1489**	0,30	.65
corte à esquerda (L)												
3902132	**KM40TSNEL2**	40	1.575	27	1.063	54	2.126	NG2R	**CM74**	**MS1488**	0,30	.66
3902283	**KM40TSNEL3**	40	1.575	27	1.063	54	2.126	NG3R	**CM-72**	**MS1489**	0,30	.67
3902284	**KM40TSNEL4**	40	1.575	27	1.063	54	2.126	NG4R	**CM-72**	**MS1489**	0,30	.65

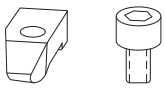






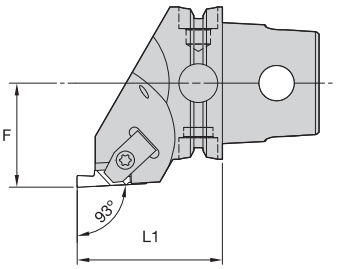


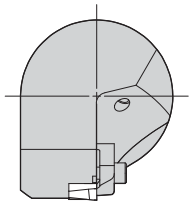
NE

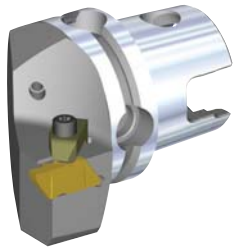


número para pedido	código do produto	L1		F		D mín		inserto padrão	grampo	parafuso do grampo	kgs	lbs
		mm	pol	mm	pol	mm	pol					
corte à direita (R)												
5337758	**KM4X100NER3**	100	3.937	63	2.480	120	4.724	NG3L	**CM73**	**MS1489**	4,45	9.80
5337759	**KM4X100NER4**	100	3.937	63	2.480	120	4.724	NG4L	**CM73**	**MS1489**	4,51	9.93
5337770	**KM4X100NER5**	100	3.937	63	2.480	120	4.724	NG5L	**CM81**	**MS1490**	4,65	10.25
5337771	**KM4X100NER6**	100	3.937	63	2.480	120	4.724	NG6L	**CM121**	**MS1489**	4,48	9.88
corte à esquerda (L)												
5337754	**KM4X100NEL3**	100	3.937	63	2.480	120	4.724	NG3R	**CM-72**	**MS1489**	4,45	9.80
5337755	**KM4X100NEL4**	100	3.937	63	2.480	120	4.724	NG4R	**CM-72**	**MS1489**	4,51	9.93
5337756	**KM4X100NEL5**	100	3.937	63	2.480	120	4.724	NG5R	**CM80**	**MS1490**	4,65	10.25
5337757	**KM4X100NEL6**	100	3.937	63	2.480	120	4.724	NG6R	**CM120**	**MS1489**	4,48	9.88



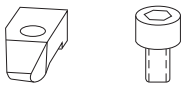






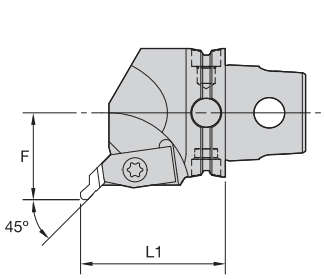
KM QUICK CHANGE

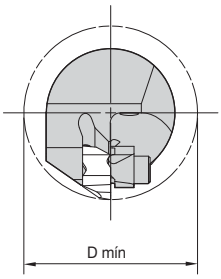
NS 93°

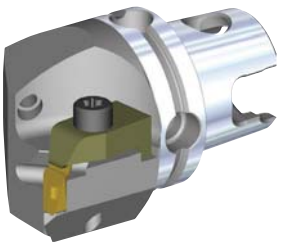


número para pedido	código do produto	L1 mm	L1 pol	F mm	F pol	inserto padrão	grampo	parafuso do grampo	kgs	lbs
corte à direita (R)										
3902293	**KM40TSNSR2**	40	1.575	27	1.063	NG2R	**CM74**	**MS1488**	0,32	.70
3902294	**KM40TSNSR3**	47	1.850	27	1.063	NG3R	**CM-72**	**MS1489**	0,32	.71
3902295	**KM40TSNSR4**	47	1.850	27	1.063	NG4R	**CM-72**	**MS1489**	0,30	.66
corte à esquerda (L)										
3902290	**KM40TSNSL2**	40	1.575	27	1.063	NG2L	**CM75**	**MS1488**	0,32	.70
3902291	**KM40TSNSL3**	47	1.850	27	1.063	NG3L	**CM73**	**MS1489**	0,33	.72
3902292	**KM40TSNSL4**	47	1.850	27	1.063	NG4L	**CM73**	**MS1489**	0,30	.66



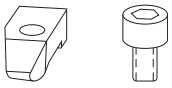






KM QUICK CHANGE

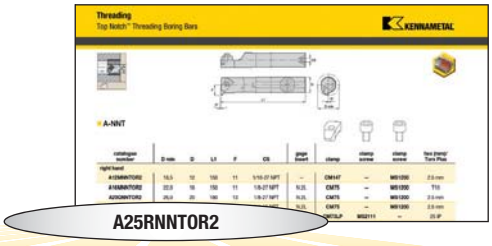
NR 45°



número para pedido	código do produto	L1 mm	L1 pol	F mm	F pol	D mín mm	D mín pol	inserto padrão	grampo	parafuso do grampo	kgs	lbs
corte à direita (R)												
3902289	**KM40TSNRR3045M**	45	1.772	27	1.063	54	2.126	NU3L	**CM73**	**MS1489**	0,34	.75
corte à esquerda (L)												
3902288	**KM40TSNRL3045M**	45	1.772	27	1.063	54	2.126	NU3R	**CM-72**	**MS1489**	0,33	.74

Como funcionam os números de catálogo?

Cada caractere no nosso número de catálogo significa uma característica específica daquele produto. Use as colunas-chave a seguir e as imagens correspondentes para fazer uma identificação fácil do atributo a ser aplicado.



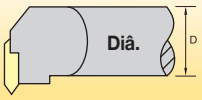
A25RNNTOR2

A	25	R	N	N	T	0	R	2
Tipo de barra	Diâmetro da barra	Comprimento da barra	Método de retenção do inserto	Formato do inserto	Local do inserto	Ângulo de inclinação 0 = 0°	Sentido de rotação da ferramenta	Inserto Tamanho

A — Aços com refrigeração

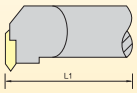


25 — Barra em milímetros

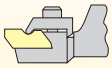


R — Barras

K	=	125,0mm
M	=	150,0mm
Q	=	180,0mm
R	=	200,0mm
S	=	250,0mm
T	=	300,0mm
U	=	350,0mm

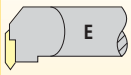


N — Top Notch*

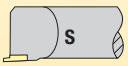


* Somente para o padrão exclusivo.

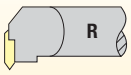
Montagem de topo



Montagem lateral

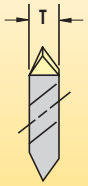


Sentido de rotação à direita



Sentido de rotação à esquerda





tamanho do inserto	T
2	3,81
3	4,95
4	6,98
5	9,65
6	9,73
8	11,13

Perfilagem Beyond™ Top Notch™



Top Notch é a solução comprovada para alta produtividade. O sistema Top Notch fornece uma performance constante da ferramenta, indexação precisa e fixação excepcional, proporcionando um excelente acabamento superficial e maior vida útil da ferramenta.

CARACTERÍSTICAS E BENEFÍCIOS

Produtividade e lucratividade superiores

- Forças de corte inferior aumentam a velocidade e reduzem o tempo de ciclo.
- Vida útil da ferramenta estendida.

Confiabilidade

- Desgaste uniforme/vida útil previsível.
- Resiste a danos de fluxo do cavaco.
- Acabamento superficial uniforme.

Versatilidade

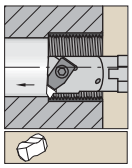
- Os produtos podem ser usados em uma ampla gama de aplicações.
- Uso em aplicações de baixa a alta velocidade.
- Portfólio completo de produtos.
- Para acabamento em torneamento de rebaste de aço, ferro fundido, aço inoxidável e ligas resistentes a altas temperaturas.



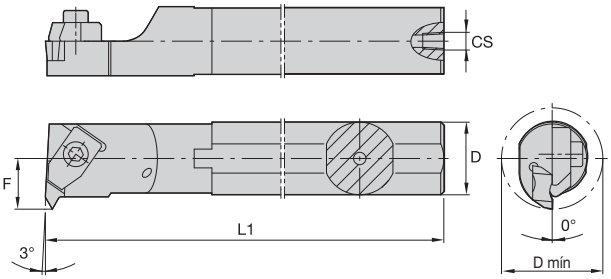
Experimente as vantagens no seu distribuidor autorizado da Kennametal ou no site **kennametal.com**.

KENNAMETAL®

kennametal.com

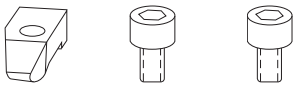


Haste de aço com refrigeração interna



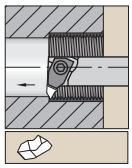


A-NNT

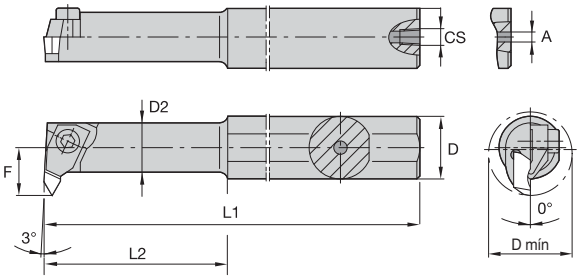


número para pedido	código do produto	D mín	D	L1	F	CS	inserto padrão	grampo	parafuso do grampo	parafuso do grampo	sextavado (mm)/ Torx Plus
corte à direita (R)											
1098945	**A12MNNTOR2**	18,5	12	150	11	1/16-27 NPT	–	**CM147**	–	**MS1200**	2.5 mm
1098947	**A16MNNTOR2**	22,0	16	150	11	1/8-27 NPT	N.2L	**CM75**	–	**MS1200**	T10
1098949	**A20QNNTOR2**	26,0	20	180	13	1/8-27 NPT	N.2L	**CM75**	–	**MS1200**	2.5 mm
1098951	**A25RNNTOR2**	34,0	25	200	17	1/4-18 NPT	N.2L	**CM75**	–	**MS1200**	2.5 mm
1098953	**A25RNNTOR3**	34,0	25	200	17	1/8 - 27 NPT	N.3L	**CM73LP**	**MS2111**	–	25 IP
1098955	**A32SNNTOR3**	44,0	32	250	22	1/4-18 NPT	N.3L	**CM73LP**	**MS2111**	–	25 IP
1098957	**A40TNNTOR3**	54,0	40	300	27	1/4-18 NPT	N.3L	**CM73LP**	**MS2111**	–	25 IP
1099001	**A40TNNTOR4**	54,0	40	300	27	1/4-18 NPT	N.4L	**CM73LP**	**MS2111**	–	25 IP
1099003	**A50UNNTOR4**	70,0	50	350	35	1/4-18 NPT	N.4L	**CM73LP**	**MS2111**	–	25 IP
corte à esquerda (L)											
1098946	**A12MNNTOL2**	18,5	12	150	11	1/16-27 NPT	NG2R	**CM146**	–	**MS1200**	2.5 mm
1098948	**A16MNNTOL2**	22,0	16	150	11	1/8-27 NPT	N.2R	**CM74**	–	**MS1200**	T10
1098950	**A20QNNTOL2**	26,0	20	180	13	1/8-27 NPT	NG2R	**CM74**	–	**MS1200**	2.5 mm
1098952	**A25RNNTOL2**	34,0	25	200	17	1/4-18 NPT	N.2R	**CM74**	–	**MS1200**	2.5 mm
1098954	**A25RNNTOL3**	34,0	25	200	17	1/4-18 NPT	N.3R	**CM72LP**	**MS2111**	–	25 IP
1098956	**A32SNNTOL3**	44,0	32	250	22	1/4-18 NPT	N.3R	**CM72LP**	**MS2111**	–	25 IP
1098958	**A40TNNTOL3**	54,0	40	300	27	1/4-18 NPT	N.3R	**CM72LP**	**MS2111**	–	25 IP
1099002	**A40TNNTOL4**	54,0	40	300	27	1/4-18 NPT	N.4R	**CM72LP**	**MS2111**	–	25 IP

NOTA: O diâmetro mínimo de furo (Dmín.) varia de acordo com o tipo e o passo da rosca. Para detalhes, veja a página D102.
Dimensão F medida na ponta afiada do inserto para abertura de canal estilo NG.

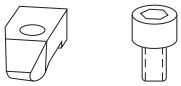


Haste de aço com refrigeração interna



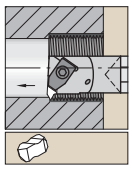


A-NNT-1

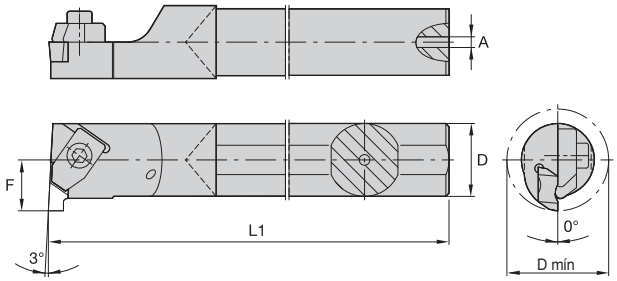


número para pedido	código do produto	D mín	D	HDD	L1	L2	F	A	CS	inserto padrão	grampo	parafuso do grampo	sextavado (mm)
corte à direita (R)													
1098943	**A10KNNTOR1**	11,5	10	10,0	125	—	7	3,2	—	NG1L	**CM109**	**MS1034**	1.5 mm
1098944	**A12MNNTOR1**	11,5	12	10,0	150	31,30	7	4,0	1/16-27 NPT	N.1L	**CM109**	**MS1034**	1.5 mm

NOTA: Dimensão F medida na ponta afiada do inserto para rosqueamento estilo Top Notch.

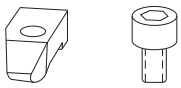


Haste de metal duro com refrigeração interna





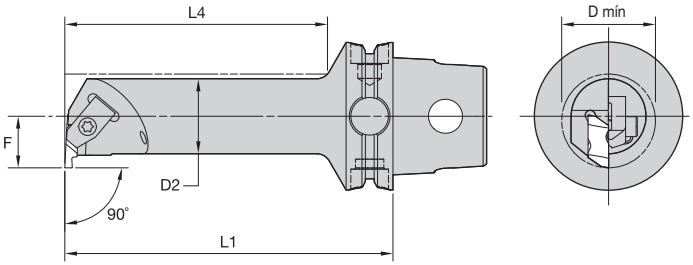
E-NNT

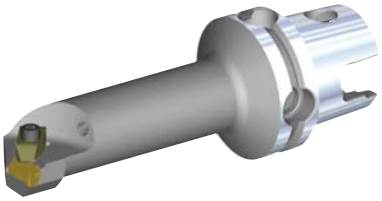


número para pedido	código do produto	D mín	D	L1	F	A	inserto padrão	grampo	parafuso do grampo	Torx/ Torx Plus
corte à direita (R)										
1152834	**E16RNNTOR2**	22	16	200	11	5,5	N.2L	**CM75**	**MS1200**	T10
1152836	**E20SNNTOR2**	26	20	250	13	7,1	N.2L	**CM75**	**MS1200**	T10
corte à esquerda (L)										
1152835	**E16RNNTOL2**	22	16	200	11	5,5	N.2R	**CM74**	**MS1200**	T10

NOTA: O diâmetro mínimo de furo (Dmín.) varia de acordo com o tipo e o passo da rosca. Para detalhes, veja a página D102.
Dimensão F medida na ponta afiada do inserto para rosqueamento estilo Top Notch.







KM QUICK CHANGE

NE 90° • Aço

número para pedido	código do produto	D2 mm	D2 pol	D mín mm	D mín pol	F mm	F pol	L4 mm	L4 pol	L1 mm	L1 pol	inserto padrão	kgs	lbs
corte à direita (R)														
3955481	**KM40TSS12ENER2**	12	.472	19	.73	11	.433	42	1.655	70	2.756	NG2L	0,27	.58
3955483	**KM40TSS16FNER2**	16	.630	20	.79	11	.433	56	2.209	80	3.150	NG2L	0,28	.62
3955485	**KM40TSS20GNER2**	20	.787	25	.98	13	.512	70	2.757	90	3.543	NG2L	0,35	.76
3955487	**KM40TSS25ENER2**	25	.984	32	1.26	17	.669	55	2.169	70	2.756	NG2L	0,34	.75
3955491	**KM40TSS25ENER3**	25	.984	34	1.34	17	.669	55	2.169	70	2.756	NG3L	0,35	.77
3955489	**KM40TSS25HNER2**	25	.984	32	1.26	17	.669	75	2.954	100	3.937	NG2L	0,49	1.08
3955493	**KM40TSS25HNER3**	25	.984	34	1.34	17	.669	75	2.954	100	3.937	NG3L	0,49	1.09
3955497	**KM40TSS32GNER3**	32	1.260	40	1.57	22	.866	76	2.993	90	3.543	NG3L	0,55	1.21
3955495	**KM40TSS32JNER3**	32	1.260	40	1.57	22	.866	96	3.780	110	4.331	NG3L	0,67	1.48
corte à esquerda (L)														
3955480	**KM40TSS12ENEL2**	12	.472	19	.73	11	.433	42	1.655	70	2.756	NG2R	0,27	.59
3955482	**KM40TSS16FNEL2**	16	.630	20	.79	11	.433	56	2.209	80	3.150	NG2R	0,28	.62
3955484	**KM40TSS20GNEL2**	20	.787	25	.98	13	.512	70	2.757	90	3.543	NG2R	0,35	.76
3955486	**KM40TSS25ENEL2**	25	.984	32	1.26	17	.669	55	2.169	70	2.756	NG2R	0,34	.75
3955490	**KM40TSS25ENEL3**	25	.984	34	1.34	17	.669	55	2.169	70	2.756	NG3R	0,35	.77
3955492	**KM40TSS25HNEL3**	25	.984	34	1.34	17	.669	75	2.954	100	3.937	NG3R	0,49	1.09
3955496	**KM40TSS32GNEL3**	32	1.260	40	1.57	22	.866	76	2.993	90	3.543	NG3R	0,55	1.21

(continuação)

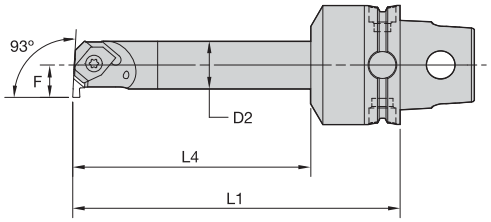
(NE 90° • Aço — continuação)

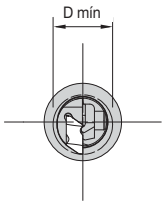
Peças de reposição

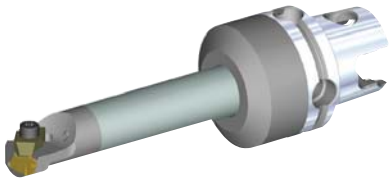



código do produto	grampo	parafuso do grampo
corte à direita (R)		
KM40TSS12ENER2	CM147	MS1488
KM40TSS16FNER2	CM147	MS1488
KM40TSS20GNER2	CM75	MS1488
KM40TSS25ENER2	CM75	MS1488
KM40TSS25ENER3	CM73	MS1489
KM40TSS25HNER2	CM75	MS1488
KM40TSS25HNER3	CM73	MS1489
KM40TSS32GNER3	CM73	MS1489
KM40TSS32JNER3	CM73	MS1489
corte à esquerda (L)		
KM40TSS12ENEL2	CM146	MS1488
KM40TSS16FNEL2	CM146	MS1488
KM40TSS20GNEL2	CM74	MS1488
KM40TSS25ENEL2	CM74	MS1488
KM40TSS25ENEL3	CM-72	MS1489
KM40TSS25HNEL3	CM-72	MS1489
KM40TSS32GNEL3	CM-72	MS1489









KM™ QUICK CHANGE

NE 90° • Metal duro

número para pedido	código do produto	D2 mm	D2 pol	D mín mm	D mín pol	F mm	F pol	L4 mm	L4 pol	L1 mm	L1 pol	inserto padrão	kgs	lbs
corte à direita (R)														
3951836	**KM40TSE16JNER2**	16	.630	20	.79	11	.433	80	3.15	110	4.331	NG2L	0,41	.90
corte à esquerda (L)														
3951835	**KM40TSE16JNEL2**	16	.630	20	.79	11	.433	80	3.15	110	4.331	NG2R	0,41	.90

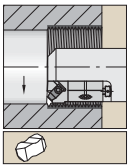
Peças de reposição

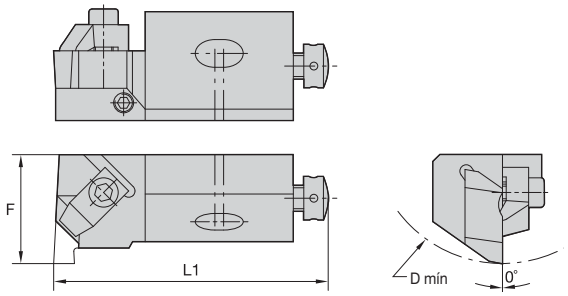




código do produto	grampo	parafuso do grampo
corte à direita (R)		
KM40TSE16JNER2	**CM146**	**MS1488**
corte à esquerda (L)		
KM40TSE16JNEL2	**CM147**	**MS1488**





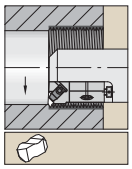


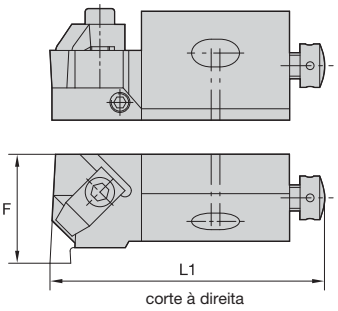
Cápsula de aço para mandrilamento



número para pedido	código do produto	D mín	F	L1	inserto padrão	grampo	parafuso do grampo	sextavado (mm)	parafuso de ajuste radial	sextavado (mm)	parafuso axial	sextavado (mm)	arruela
corte à direita (R)													
1098380	**NER12CA2**	50	20	55,7	N.2L	**CM75**	**MS1025**	2.5 mm	**KUAM23**	2.5 mm	**KUAM31**	2.5 mm	**CSWM 060 050**
corte à esquerda (L)													
1098624	**NEL12CA2**	50	20	55,0	N.2R	**CM74**	**MS1025**	2.5 mm	**KUAM23**	2.5 mm	**KUAM31**	2.5 mm	**CSWM 060 050**
1098626	**NEL25CA3**	100	32	100,0	N.3R	**CM72LP**	**MS412**	4 mm	**KUAM26**	4 mm	**KUAM33**	4 mm	**CSWM 100 080**

NOTA: O diâmetro mínimo de furo (Dmín.) varia de acordo com o tipo e o passo da rosca. Para detalhes, veja a página D102.
Dimensão F medida na ponta afiada do inserto para rosqueamento estilo Top Notch.







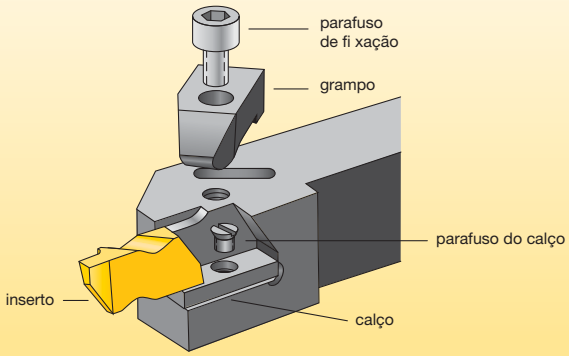
Cápsula de aço para mandrilamento



número para pedido	código do produto	D mín	F	L1	inserto padrão	grampo	parafuso do grampo	sextavado (mm)	parafuso de ajuste radial	sextavado (mm)	parafuso axial	sextavado (mm)	arruela
corte à direita (R)													
1098380	**NER12CA2**	50	20	55,7	N.2L	**CM75**	**MS1025**	2.5 mm	**KUAM23**	2.5 mm	**KUAM31**	2.5 mm	**CSWM 060 050**
corte à esquerda (L)													
1098624	**NEL12CA2**	50	20	55,0	N.2R	**CM74**	**MS1025**	2.5 mm	**KUAM23**	2.5 mm	**KUAM31**	2.5 mm	**CSWM 060 050**
1098626	**NEL25CA3**	100	32	100,0	N.3R	**CM72LP**	**MS412**	4 mm	**KUAM26**	4 mm	**KUAM33**	4 mm	**CSWM 100 080**

NOTA: O diâmetro mínimo de furo (Dmín.) varia de acordo com o tipo e o passo da rosca. Para detalhes, veja a página D102.
Dimensão F medida na ponta afiada do inserto para rosqueamento estilo Top Notch.

Porta-ferramentas e barras de mandrilar



tamanho e estilo do inserto	grampo	parafuso de fixação	calço	parafuso do calço
NG-1L	CM-109	S-304	–	–
NG-2R	CM-182	S-310	–	–
NG-2L	CM-183	S-310	–	–
NG-2R	CM-74	S-310	–	–
NG-2L	CM-75	S-310	–	–
NG-3R	CM-184	S-412	–	–
NG-3L	CM-185	S-412	–	–
NG-3R	CM-72	S-412	–	–
NG-3L	CM-73	S-412	–	–
NG-3R*	CM-78	S-412	–	–
NG-3L*	CM-70	S-412	–	–
NG-4R	CM-72	S-412	SM-420	SL-344
NG-4L	CM-73	S-412	SM-420	SL-344
NG-5R	CM-80	S-352	–	–
NG-5L	CM-81	S-352	–	–
NG-6R	CM-120	S-412	SM-416	S-111
NG-6L	CM-121	S-412	SM-416	S-111
NG-8R	CM-144	S-422	SM-419	S-112
NG-8L	CM-145	S-422	SM-419	S-112
NG-8R**	CM-144	S-422	SM-427	S-111
NG-8L**	CM-145	S-422	SM-427	S-111
Canal de alívio Top Notch				
NU-3125R	CM-72	S-412	–	–
NU-3125L	CM-73	S-412	–	–
NU-3125R**	CM-72	S-618	–	–
NU-3125L**	CM-73	S-618	–	–

* Cabeçote de mandrilar do diâmetro de 25mm.

** Cabeçote de mandrilar.

LT • Rosqueamento de assentamento triangular

Aplicação principal

O rosqueamento de assentamento triangular (LT) é o sistema ideal para roscas de passo fino, ângulo de hélice alto em roscas com várias entradas, rosqueamento de ponta única em furos de pequenos diâmetros. Com uma ampla seleção de insertos com controle de cavacos estilo CB, você receberá um controle do cavaco superior, proporcionando um excelente acabamento superficial com a mínima interferência por parte do operador. O projeto de baixo perfil permite o fluxo do cavaco sem obstruções—ideal para roscas de diâmetro interno. Ângulos de calços variáveis proporcionam geometrias de corte adequadas para rosqueamento com ângulos de hélice altos e hélice reversa, aumentando a vida útil da ferramenta e melhorando a qualidade da rosca.

Características e benefícios

Rosca com retífica de precisão em LT e LT-CB

- Minimiza a formação de aresta postiça.
- Corta com precisão a maioria dos materiais comuns.
- Reduz as forças de corte.
- Garante roscas precisas e de alta qualidade.

Classes premium de PVD com revestimento de TiAlN KC5010™ e KC5025™

- Aumenta a vida útil da ferramenta em condições de usinagem pré-existentes.
- Aumenta a produtividade superando as classes PVD convencionais com uma vantagem de até 30% em velocidades de corte.

Excelente controle do cavaco.

- Elimina as longas e incômodas serpentinas.
- Excelente para operações de rosqueamento interno.
- Disponível em insertos de perfil parcial e de perfil completo para todas as formas de roscas comuns.

Insertos Kenna Universal™

- O inserto de rosca moldada de precisão LT-K fornece utilidade e valor extraordinários.
- O excelente controle do cavaco combinado com a classe KU25T™ permite um rosqueamento sem problemas em uma variedade de materiais das peças.


KENNAMETAL S20SLSER16 NX4

Etapa 1 • Escolha o método de rosqueamento e o sentido da ferramenta

Informações necessárias:

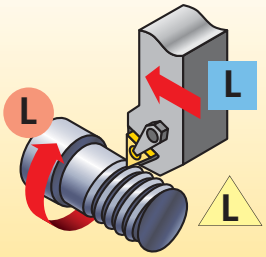
- Operação externa/interna.
- Rotação do fuso/sentido de rotação da rosca.
- Direção de avanço.

L R — sentido de rotação da rosca

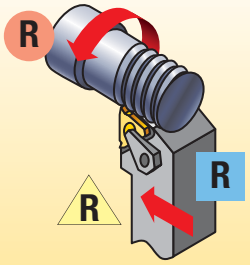
L R — sentido de rotação do porta-ferramenta

L R — sentido de rotação do inserto

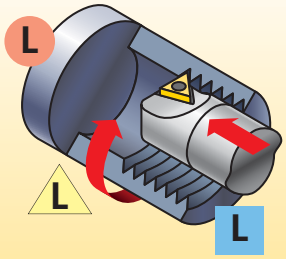
Avanço na direção do mandril • hélice padrão • RECOMENDADO



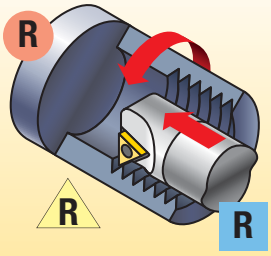
rosca esquerda externa



rosca direita externa

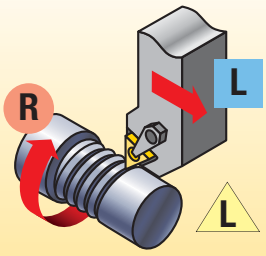


rosca esquerda interna

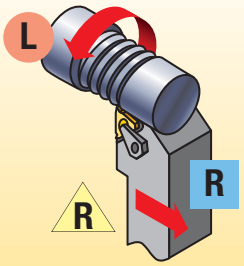


rosca direita interna

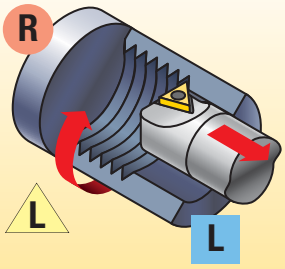
Avanço na direção contrária à do mandril • hélice reversa*



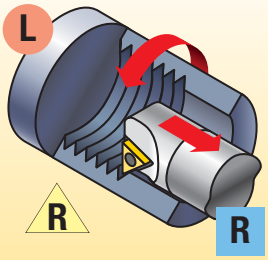
rosca direita externa



rosca esquerda externa



rosca direita interna



rosca esquerda interna

** Calço negativo necessário*

Etapa 2 • Escolha o suporte na página do catálogo

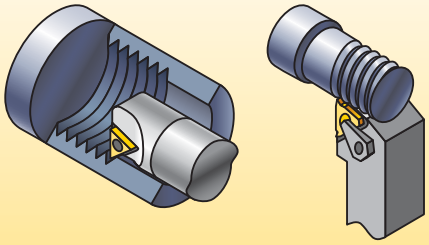
Informação necessária:

- Operação externa/interna.
- Diâmetro mínimo de furo (para operações internas).
- Sentido de rotação da ferramenta.
- Tamanho do inserto (inserto padrão).

O tamanho do inserto deve corresponder ao tamanho do inserto padrão da seleção de porta-ferramenta:

número de catálogo	inserto padrão	diâmetro mínimo de furo	calço
S0812LSER2	2IRA60	16,5mm	SM-YI3
S2020LSER3	3IR...	36,8mm	SM-YI3

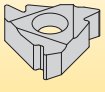
Escolha a ferramenta adequada para o tamanho e o sentido do inserto:



Etapa 3 • Escolha o inserto para a aplicação

- Escolha os insertos com crista para obter uma rosca completamente controlada, incluindo o diâmetro.
- Os insertos de crista eliminam a necessidade de rebarbação e os insertos são otimizados, fornecendo maior vida útil da ferramenta no passo específico.
- Os insertos com perfil parcial sem crista oferecem a flexibilidade de cortar uma variedade de passos de rosca com apenas um inserto.
- Considere o tamanho do inserto para a escolha do porta-ferramentas.

NOTA: Veja a visão geral de insertos para rosqueamento na página D50.



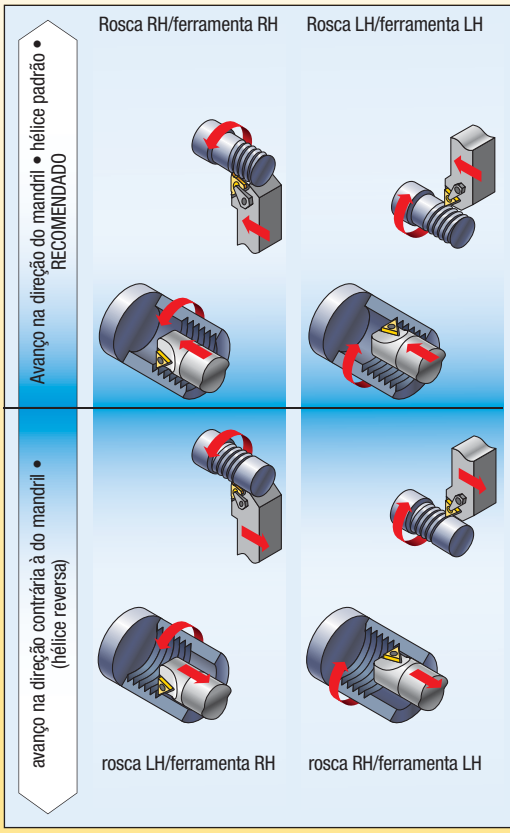
tamanho do inserto	número de catálogo	KCU25/KC5025
11	**2IRA60**	•
16	**3IRAG60**	•

Etapa 4 • Escolha o calço apropriado

Informação necessária:

- Forma da rosca (TPI ou de passo).
- Diâmetro de passo.
- Método da hélice (sentido de rotação da ferramenta, direção do avanço e sentido de rotação da rosca).
- Número de entradas.

Escolha o calço adequado: SMYE... para externa RH ou interna LH
SMYI... para interna RH ou externa LH



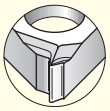
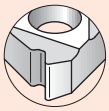
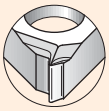
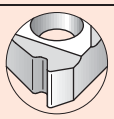
insert size	toolholder external	toolholder internal	shim ordering code (inch) SM–YE3–3P	SM–YE3–2P	SM–YE3–1P	SM–YE3 standard	SM–YE3–1N	SM–YE3–1.5N	SM–YE3–2N	SM–YE3–3N
3 (3/8")	RH	LH								
3 (3/8")	LH	RH	SM–YI3–3P	SM–YI3–2P	SM–YI3–1P	SM–YI3	SM–YI3–1N	SM–YI3–1.5N	SM–YI3–2N	SM–YI3–3N
4 (1/2")	RH	LH	SM–YE4–3P	SM–YE4–2P	SM–YE4–1P	SM–YE4	SM–YE4–1N	SM–YE4–1.5N	SM–YE4–2N	SM–YE4–3N
4 (1/2")	LH	RH	SM–YI4–3P	SM–YI4–2P	SM–YI4–1P	SM–YI4	SM–YI4–1N	SM–YI4–1.5N	SM–YI4–2N	SM–YI4–3N
TPI		pitch (mm)	pitch diameter (inch)							
72		–	–	–	–	0.12–0.31	0.32–0.84	>0.84	0.84–0.32	0.31–0.12
–		0,35	–	–	–	0.12–0.3	0.31–0.84	>0.84	0.84–0.31	0.3–0.12
64		–	–	–	–	0.14–0.35	0.36–0.95	>0.95	0.95–0.36	0.35–0.14
–		0,40	–	–	–	0.14–0.35	0.36–0.96	>0.96	0.96–0.36	0.35–0.14
56		0,45	–	–	–	0.16–0.4	0.41–1.09	>1.09	1.09–0.41	0.4–0.16
–		0,50	–	–	0.11–0.16	0.17–0.44	0.45–1.2	>1.20	1.2–0.45	0.44–0.17
48		–	–	–	0.12–0.17	0.18–0.46	0.47–1.27	>1.27	1.27–0.47	0.46–0.18
44		–	–	–	0.13–0.19	0.2–0.51	0.52–1.38	>1.38	1.38–0.52	0.51–0.2
–		0,60	–	0.1–0.12	0.13–0.2	0.21–0.53	0.54–1.44	>1.44	1.44–0.54	0.53–0.21
40		–	–	0.11–0.13	0.14–0.21	0.22–0.56	0.57–1.52	>1.52	1.52–0.57	0.56–0.22
–		0,70	–	0.12–0.15	0.16–0.23	0.24–0.62	0.63–1.68	>1.68	1.68–0.63	0.62–0.24
36		–	–	0.12–0.15	0.16–0.23	0.24–0.62	0.63–1.69	>1.69	1.69–0.63	0.62–0.24
–		0,75	0.11–0.12	0.13–0.16	0.17–0.25	0.26–0.66	0.67–1.8	>1.80	1.8–0.67	0.66–0.26
32		–	0.12–0.13	0.14–0.17	0.18–0.26	0.27–0.7	0.71–1.9	>1.90	1.9–0.71	0.7–0.27
–		0,80	0.12–0.13	0.14–0.17	0.18–0.26	0.27–0.71	0.72–1.91	>1.91	1.91–0.72	0.71–0.27
28		–	0.14–0.14	0.15–0.19	0.2–0.3	0.31–0.8	0.81–2.17	>2.17	2.17–0.81	0.8–0.31
27		–	0.14–0.15	0.16–0.2	0.21–0.31	0.32–0.83	0.84–2.25	>2.25	2.25–0.84	0.83–0.32
–		1,00	0.15–0.16	0.17–0.21	0.22–0.33	0.34–0.89	0.9–2.39	>2.39	2.39–0.9	0.89–0.34
24		–	0.16–0.17	0.18–0.23	0.24–0.35	0.36–0.94	0.95–2.53	>2.53	2.53–0.95	0.94–0.36
–		1,25	0.19–0.2	0.21–0.27	0.28–0.42	0.43–1.11	1.12–2.99	>2.99	2.99–1.12	1.11–0.43
20		–	0.19–0.21	0.22–0.27	0.28–0.42	0.43–1.13	1.14–3.04	>3.04	3.04–1.14	1.13–0.43
18		–	0.21–0.23	0.24–0.31	0.32–0.47	0.48–1.26	1.277–3.38	>3.38	3.38–1.27	1.26–0.48
–		1,50	0.22–0.25	0.26–0.33	0.34–0.5	0.51–1.34	1.35–3.59	>3.59	3.59–1.35	1.34–0.51
16		–	0.24–0.26	0.27–0.35	0.36–0.53	0.54–1.41	1.42–3.8	>3.80	3.8–1.42	1.41–0.54
–		1,75	0.26–0.29	0.3–0.38	0.39–0.59	0.6–1.56	1.57–4.19	>4.19	4.19–1.57	1.56–0.6
14		–	0.27–0.3	0.31–0.4	0.41–0.61	0.62–1.62	1.63–4.34	>4.34	4.34–1.63	1.62–0.62
13		–	0.29–0.32	0.33–0.43	0.44–0.66	0.67–1.74	1.75–4.68	>4.68	4.68–1.75	1.74–0.67
–		2,00	0.3–0.33	0.34–0.44	0.45–0.67	0.68–1.78	1.79–4.79	>4.79	4.79–1.79	1.78–0.68
12		–	0.32–0.35	0.36–0.46	0.47–0.71	0.72–1.89	1.9–5.07	>5.07	5.07–1.9	1.89–0.72
11.5		–	0.33–0.37	0.38–0.49	0.5–0.74	0.75–1.97	1.98–5.29	>5.29	5.29–1.98	1.97–0.75
11		–	0.34–0.38	0.39–0.51	0.52–0.78	0.79–2.06	2.07–5.53	>5.53	5.53–2.07	2.06–0.79
–		2,50	0.37–0.42	0.43–0.55	0.56–0.84	0.85–2.23	2.24–5.98	>5.98	5.98–2.24	2.23–0.85
10		–	0.38–0.42	0.43–0.56	0.57–0.86	0.87–2.27	2.28–6.08	>6.08	6.08–2.28	2.27–0.87
9		–	0.42–0.47	0.48–0.62	0.63–0.95	0.96–2.52	2.53–6.75	>6.75	6.75–2.53	2.52–0.96
–		3,00	0.45–0.5	0.51–0.66	0.67–1.02	1.03–2.68	2.69–7.18	>7.18	7.18–2.69	2.68–1.03
8		–	0.47–0.53	0.54–0.7	0.71–1.08	1.09–2.84	2.85–7.6	>7.60	7.6–2.85	2.84–1.09
–		3,50	0.52–0.59	0.6–0.77	0.78–1.19	1.2–3.13	3.14–8.38	>8.38	8.38–3.14	3.13–1.2
7		–	0.524–0.61	0.62–0.8	0.81–1.23	1.24–3.25	3.26–8.68	>8.68	8.68–3.26	3.25–1.24
–		4,00	0.6–0.67	0.68–0.89	0.9–1.36	1.37–3.58	3.59–9.57	>9.57	9.57–3.59	3.58–1.37
6		–	0.63–0.71	0.72–0.94	0.95–1.44	1.45–3.79	3.8–10.13	>10.13	10.13–3.8	3.79–1.45
–		5,00	0.75–0.84	0.85–1.11	1.12–1.7	1.71–4.48	4.49–11.97	>11.97	11.97–4.49	4.48–1.71
5		–	0.76–0.86	0.87–1.13	1.14–1.73	1.74–4.55	4.56–12.16	>12.16	12.16–4.56	4.55–1.74
4.5		–	0.84–0.95	0.96–1.26	1.27–1.92	1.93–5.06	5.07–13.51	>13.51	13.51–5.07	5.06–1.93
–		6,00	0.9–1.01	1.02–1.33	1.34–2.04	2.05–5.37	5.38–14.36	>14.36	14.36–5.38	5.37–2.05
4		–	0.95–1.07	1.08–1.41	1.42–2.16	2.17–5.69	5.7–15.2	>15.20	15.2–5.7	5.69–2.17
inclination angle			4.5	3.5	2.5	1.5	0.5	0.0	-0.5	-1.5
			standard helix (feed toward the chuck)						reverse helix (feed away from the chuck)	

Se o calço recomendado for diferente do calço fornecido com o porta-ferramenta, peça o calço separadamente.

NOTA: Otimize a sua operação de rosqueamento através do ângulo de penetração adequado e dos valores de penetração recomendados.
Veja a seção técnica nas páginas D88–D110.
Veja também informações sobre a seleção detalhada de calços nas páginas D109–D110.

Etapa 5 • Escolha a classe e a velocidade

Recomendações para a escolha da classe e da velocidade — m/min.

	materiais das peças	P	M	K	N	S
Kenna Perfect™	estilo do inserto	CB quebra-cavacos			CB quebra-cavacos	
	ótimas condições de corte	**KC5010** 70–260	**KC5010** 90–245	**KC5010** 60–245	**KC5010** 90–550	**KC5010** 30–150
	primeira opção	**KC5025** 50–230	**KC5025** 75–230	**KC5025** 50–180	**KC5025** 60–455	**KC5025** 20–120
Kenna Universal™	estilo do inserto	-K quebra-cavacos				
	seleção	**KU25T** 45–210	**KU25T** 70–205	**KU25T** 45–160	**KU25T** 55–410	**KU25T** 20–110

NOTA: Veja a visão geral de insertos para rosqueamento na página D50.

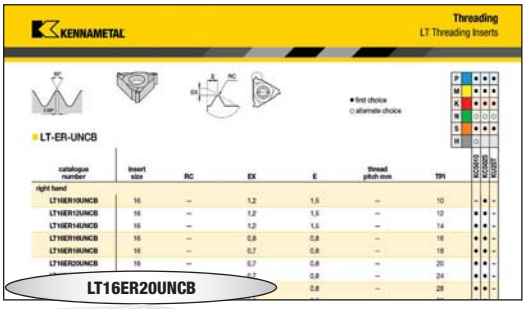
Velocidades iniciais recomendadas [m/min.]

Grupo de material		KC5010			KC5025			KU25T		
P	0–1	135	**200**	260	105	**165**	230	95	**150**	210
	2	130	**190**	245	100	**150**	200	90	**135**	180
	3	105	**155**	200	75	**125**	170	70	**115**	155
	4	70	**120**	160	60	**95**	130	55	**85**	115
	5	105	**155**	200	75	**130**	170	70	**115**	155
	6	70	**120**	160	50	**90**	130	45	**80**	115
M	1	120	**180**	245	90	**170**	230	80	**155**	205
	2	90	**165**	210	75	**140**	200	70	**125**	180
	3	90	**165**	210	75	**135**	200	70	**120**	180
K	1	120	**180**	245	90	**135**	180	80	**120**	160
	2	90	**150**	210	70	**120**	170	65	**110**	155
	3	60	**105**	150	50	**85**	120	45	**75**	110
N	1–2	150	**365**	550	120	**305**	455	110	**275**	410
	3	90	**135**	180	60	**105**	150	55	**95**	135
	4	120	**305**	455	100	**200**	305	90	**180**	275
	5	90	**165**	245	70	**135**	195	65	**120**	175
	6	120	**210**	305	100	**170**	245	90	**155**	220
S	1	30	**70**	105	20	**40**	60	20	**35**	55
	2	30	**65**	100	20	**35**	45	20	**30**	40
	3	30	**65**	100	20	**35**	45	20	**30**	40
	4	55	**105**	150	45	**85**	120	40	**75**	110
H	1	30	**45**	60	–	**–**	–	–	**–**	–
	2	15	**30**	45	–	**–**	–	–	**–**	–
	3	–	**–**	–	–	**–**	–	–	**–**	–
	4	–	**–**	–	–	**–**	–	–	**–**	–

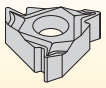
NOTA: A PRIMEIRA opção de velocidade inicial está em **negrito**.

Como funcionam os números de catálogo?

Cada caractere no nosso número de catálogo significa uma característica específica daquele produto. Use as colunas-chave a seguir e as imagens correspondentes para fazer uma identificação fácil do atributo a ser aplicado.



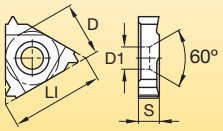
LT
Tipo do inserto



LT = Rosqueamento de assentamento triangular

16
Comprimento da aresta de corte (tamanho)

tamanho do inserto	LI (mm)	D (mm)	S (mm)	D1 (mm)
11	11,0	6,35	3,20	3,25
16	16,5	9,52	3,63	3,94
22	22,0	12,70	4,78	4,88



ER
Sentido de rotação do inserto

ER = Sentido de rotação direita externa
EL = Sentido de rotação esquerda externa
NR = Sentido de rotação direita interna
NL = Sentido de rotação esquerda interna

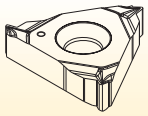
20
Passo da rosca

perfil parcial		
designação	**passo da rosca (mm)**	**FPP**
A	0,50–1,5	48–16
AG	0,50–3,0	48–8
G	1,75–3,0	14–8
N	3,50–5,0	7–5
perfil completo		
está indicado o FPP (fios por polegada) ou o passo real em mm	0,5–4,0	48–8

UN
Perfil da rosca

ISO = Sistema métrico de 60° ISO
UN = Sistema americano UN 60°
60 = Perfil parcial sem crista 60°
55 = Perfil parcial sem crista 55°
W = Whitworth de 55°
BSPT = Rosca para tubo padrão britânico de 55°
NPT = Rosca para tubo nacional americano de 60°
ACME = Acme americana
STACME = Stub Acme americana
TR = Trapezoidal DIN 103
RD = Redonda DIN 405
UNJ = Raio de raiz controlado de 60°
NPTF = Selo a seco 60°
API = Roscas do Instituto Americano de Petróleo
BUT = Alojamento Buttress API
APIRD = Redonda API

CB
Controle do cavaco



☐ = Topo plano
CB = Quebra-cavacos
K = Quebra-cavacos Kenna Universal™



A vantagem da LT da Kennametal

Todas as caixas com 10 insertos incluem gratuitamente uma chave Torx e um parafuso de trava de reposição, exceto os insertos LT-K.

estilo			perfil da rosca	padrão	classe de tolerância	Com crista	aplicação	página(s)
CB	K	topo plano						
 LT-60CB	 LT-60K	 LT-60	Perfil parcial de 60°	—	—	N	Rosca de 60° para uso geral, tais como ISO e UN, onde os insertos sem crista são necessários para cortar uma variedade de passos.	D53–D54, D66–D67
 LT-ISOCB	 LT-ISOK	 LT-ISO	Métrica ISO	ISO R262, DIN 13	6g/6H	Y	Rosca em V de 60° métrico amplamente usado para todas as indústrias.	D57–D58, D70–D71
 LT-UNCB	 LT-UNK	 LT-UN	UN Americana	ANSI B1.1:74	2A/2B	Y	Rosca em V de 60° em polegadas amplamente usado para todas as indústrias.	D62–D63, D74–D75
		 LT-UNJ	UNJ	MIL-S-8879C	3A/3B	Y	Raio de raiz controlado em roscas externas para as indústrias militar e aeroespacial, rosca de 60°.	D63, D75
 LT-NPTCB		 LT-NPT	NPT	USAS B2.1:1968	Padrão NPT	Y	Padrão de roscas de tubos de 60° para conexões e tubos.	D59, D72
 LT-NPTFCB		 LT-NPTF	NPTF	ANSI B1.20.3-1976	Classe 2	Y	Padrão de roscas tipo Dryseal de 60° para conexões e tubos.	D60, D72
	 LT-55K	 LT-55	Perfil parcial de 55°	—	—	N	Rosca de 55° para uso geral, tais como Whitworth, BSW e BSP, onde os insertos sem crista são necessários para cortar uma variedade de passos.	D52, D65–D66
		 LT-BSPT	BSPT	BS 21:1985	Padrão BSPT	Y	Rosca de 55° para conexões e tubos.	D56, D69
 LT-WCB	 LT-WK	 LT-W	Whitworth, BSW, BSF, BSP	BS 84:1956, ISO 228/1:1985, DIN 259	Classe média A	Y	Rosca de 55° amplamente usada para conexões de gás e água.	D64–D65, D76
		 LT-API	Conexões de canto rotativas API	API SPEC. 7:1990	Padrão API	Y	Rosca em V de 60° usada para conexões de flanges rotativos para a indústria petrolífera e de gás, incluindo as formas 0,038R, V-0,040 e V-0,050.	D55, D68
		 LT-APIRD	Redonda API	API PADRÃO 5B:1979	Padrão API RD	Y	Rosca em V de 60° com raio grande para revestimentos, tubulações e tubos para a indústria petrolífera e de gás, incluindo as formas redondas 8 e 10.	D55, D69
		 LT-BUT	Alojamento Buttress API	API SPEC. 7:1990	Padrão API	Y	Rosca Buttress de 45° usada para conexões e tubos para a indústria petrolífera e de gás.	D56, D69
		 LT-ACME	Acme	ANSI B1.5:1988	3G	N	Rosca truncada de 29° para aplicações em mecanismos em uma ampla variedade de indústrias.	D54, D68
		 LT-STACME	Stub Acme	ANSI B1.8:1988	2G	N	Rosca truncada de 29° de profundidade superficial para aplicações em mecanismos em uma ampla variedade de indústrias.	D61, D73
		 LT-RD	Redondo	DIN 405	7h/7H	Y	Rosca redonda para conexões nas indústrias química e de alimentos.	D60, D73
		 LT-TR	Trapez	DIN 103	7e/7H	N	Rosca métrica truncada de 30° para aplicações em mecanismos de movimento.	D61, D73

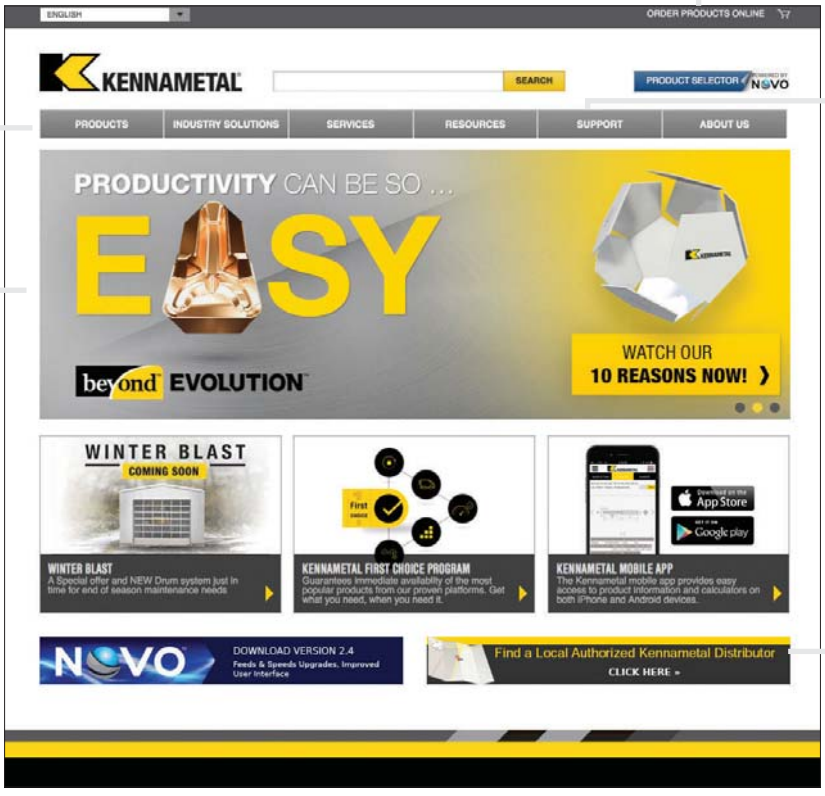
A Kennametal na internet

kennametal.com

ENCONTRE AS ÚLTIMAS INFORMAÇÕES SOBRE OS PRODUTOS

Se a sua atividade é torneamento, fresamento ou holemaking, as marcas da Kennametal são as ferramentas de alta performance que você precisa. Oferecemos soluções padrão e customizadas para uma ampla gama de aplicações.

Encontre informações sobre as nossas mais recentes campanhas e catálogos.



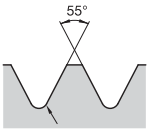
Registre-se no Konnect para obter as funcionalidades completas do site de pedidos on-line da Kennametal.

ENTRE EM CONTATO CONOSCO

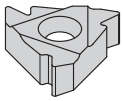
Nossos clientes são importantes para nós. Nós queremos proporcionar a você o melhor atendimento ao cliente do setor. Se você tiver um comentário ou uma pergunta, envie para nós. Faremos o possível para responder a todas as consultas dentro de 24 horas.

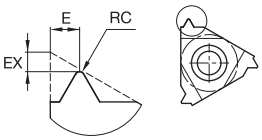
ENCONTRE UM DISTRIBUIDOR AUTORIZADO LOCAL EM SUA ÁREA

A Kennametal oferece produtos e serviços de classe mundial em todo o mundo. Nossos distribuidores nos conhecem e, mais importante, eles conhecem você. Eles sabem melhor que qualquer pessoa no setor como fazer a potência global da Kennametal trabalhar para você — na sua indústria, na sua região e para seus negócios.



Perfil parcial de 55°



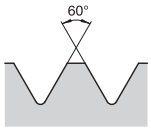


● primeira opção
○ opção alternativa

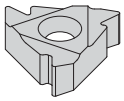
P		●	●	●
M		●	●	●
K		●	●	●
N		○	○	○
S		●	●	●
H		○		

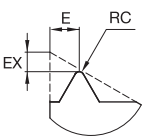
LT-ER/L-55

código do produto	tamanho do inserto	RC	EX	E	Passo da rosca em mm	FPP (fios por polegada)	KC5010	KC5025	KU25T
corte à direita (R)									
LT16ERA55	16	0,05	0,8	0,89	0,50-1,50	16-48	–	●	–
LT16ERAG55	16	0,08	1,2	1,70	0,50-3,00	8-48	●	●	–
16ERG55	16	0,20	1,2	1,70	1,75-3,00	8-14	–	●	–
LT22ERN55	22	0,43	1,7	2,49	3,50-5,00	5-7	–	●	–
corte à esquerda (L)									
LT16ELAG55	16	0,08	1,2	1,70	0,50-3,00	8-48	–	●	–



Perfil parcial de 60°





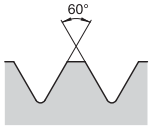


● primeira opção
○ opção alternativa

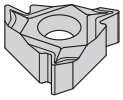
		KC5010	KC5025	KU25T
P		●	●	●
M		●	●	●
K		●	●	●
N		○	○	○
S		●	●	●
H		○		

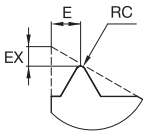
LT-ER/L-60

código do produto	tamanho do inserto	RC	EX	E	Passo da rosca em mm	FPP (fios por polegada)	KC5010	KC5025	KU25T
corte à direita (R)									
LT16ERA60	16	0,05	0,8	0,9	0,50-1,50	16-48	●	●	–
16ERAG60	16	0,08	1,2	1,7	0,50-3,0	8-48	–	●	–
LT16ERAG60	16	0,08	1,2	1,7	0,50-3,0	8-48	●	–	–
LT16ERG60	16	0,28	1,2	1,7	1,75-3,0	8-14	●	●	–
LT22ERN60	22	0,53	1,7	2,5	3,5-5,0	5-7	–	●	–
corte à esquerda (L)									
LT16ELA60	16	0,05	0,8	0,9	0,50-1,50	16-48	–	●	–
LT16ELAG60	16	0,08	1,2	1,7	0,50-3,0	8-48	–	●	–
LT16ELG60	16	0,28	1,2	1,7	1,75-3,0	8-14	–	●	–
LT22ELN60	22	0,53	1,7	2,5	3,5-5,0	5-7	–	●	–



Perfil parcial de 60°

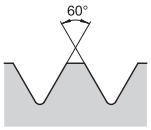




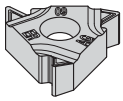


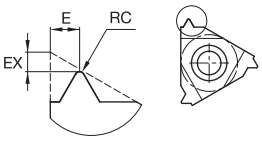
LT-ER-60CB

código do produto	tamanho do inserto	RC	EX	E	Passo da rosca em mm	FPP (fios por polegada)	KC5010	KC5025	KU25T
corte à direita (R)									
LT16ERAG60CB	16	0,08	0,9	1,5	0,50-3,0	8-48	●	●	–



Perfil parcial de 60°



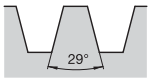


P	●	●	●
M	●	●	●
K	●	●	●
N	○	○	○
S	●	●	●
H	○		

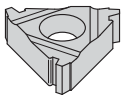
● primeira opção
○ opção alternativa

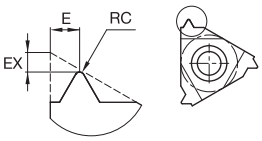
LT-ER-60K

código do produto	tamanho do inserto	RC	EX	E	Passo da rosca em mm	FPP (fios por polegada)	KC5010	KC5025	KU25T
corte à direita (R)									
LT16ERAG60K	16	0,08	1,2	1,7	0,50-3,0	8-48	–	–	●



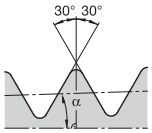
Acme Externo



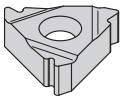


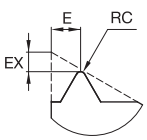
LT-ER/L-ACME

código do produto	tamanho do inserto	RC	EX	E	Passo da rosca em mm	FPP (fios por polegada)	KC5010	KC5025	KU25T
corte à direita (R)									
LT16ER10ACME	16	–	1,3	1,40	–	10	–	●	–
LT16ER12ACME	16	–	1,1	1,19	–	12	–	●	–
LT16ER16ACME	16	–	1,0	1,09	–	16	–	●	–
LT16ER8ACME	16	–	1,4	1,50	–	8	–	●	–
LT22ER5ACME	22	–	2,0	2,29	–	5	–	●	–
LT22ER6ACME	22	–	1,8	2,11	–	6	–	●	–



Conexões de flanges rotativos API-Externo
α = 1/2 arctan (TPF/12)





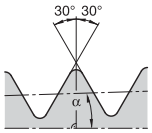


● primeira opção
○ opção alternativa

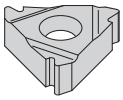
P		●	●	●
M		●	●	●
K		●	●	●
N		○	○	○
S		●	●	●
H		○		

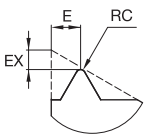
LT-ER/L-API

código do produto	tamanho do inserto	RC	EX	E	Passo da rosca em mm	FPP (fios por polegada)	KC5010	KC5025	KU25T
corte à direita (R)									
LT22ER4API382	22	–	2,1	2,79	–	4	–	●	–
LT22ER4API502	22	–	2,0	2,90	–	4	●	●	–
LT22ER4API503	22	–	2,0	2,90	–	4	●	–	–
LT22ER5API403	22	–	1,8	2,60	–	5	●	–	–
LT27ER4API502	28	0,64	2,0	2,79	–	4	–	●	–
LT27ER4API382	28	0,97	2,0	2,79	–	4	–	●	–



API Redondo-Externo

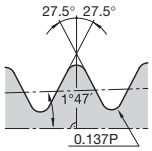




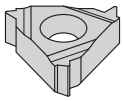


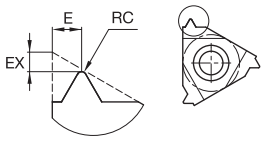
LT-ER/L-APIRD

código do produto	tamanho do inserto	RC	EX	E	Passo da rosca em mm	FPP (fios por polegada)	KC5010	KC5025	KU25T
corte à direita (R)									
LT16ER10APIRD	16	–	1,2	1,40	–	10	–	●	–
LT16ER8APIRD	16	–	1,3	1,50	–	8	–	●	–
corte à esquerda (L)									
LT16EL8APIRD	16	–	1,3	1,50	–	8	–	●	–



BSPT-Externo



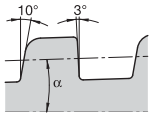


● primeira opção
○ opção alternativa

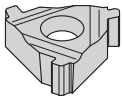
P		●	●	●
M		●	●	●
K		●	●	●
N		○	○	○
S		●	●	●
H		○		

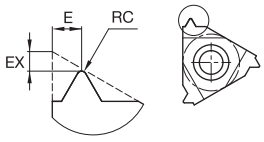
LT-ER/L-BSPT

código do produto	tamanho do inserto	RC	EX	E	Passo da rosca em mm	FPP (fios por polegada)	KC5010	KC5025	KU25T
corte à direita (R)									
LT16ER11BSPT	16	–	1,1	1,50	–	11	–	●	–
LT16ER14BSPT	16	–	1,0	1,19	–	14	–	●	–



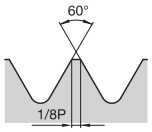
Rosca Buttress americana API-Externo
α = 1/2 arctan (TPF/12)



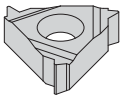


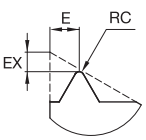
LT-ER/L-BUT

código do produto	tamanho do inserto	RC	EX	E	Passo da rosca em mm	FPP (fios por polegada)	KC5010	KC5025	KU25T
corte à direita (R)									
LT22ER5BUT75	22	–	3,1	1,91	–	5	–	●	–



Métrico externa de ISO





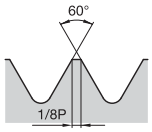


● primeira opção
○ opção alternativa

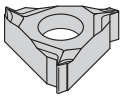
P	●	●	●	
M	●	●	●	
K	●	●	●	
N	○	○	○	
S	●	●	●	
H	○			

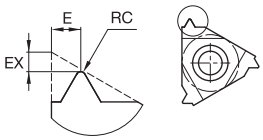
LT-ER/L-ISO

código do produto	tamanho do inserto	RC	EX	E	thread pitch mm	TPI	KC5010	KC5025	KU25T
corte à direita (R)									
LT16ER05ISO	16	–	0,6	0,4	0,50	–	–	●	–
LT16ER075ISO	16	–	0,6	0,6	0,75	–	–	●	–
LT16ER10ISO	16	–	0,7	0,7	1,0	–	●	●	–
LT16ER125ISO	16	–	0,8	0,9	1,25	–	●	●	–
LT16ER15ISO	16	–	0,8	1,0	1,5	–	●	●	–
LT16ER175ISO	16	–	0,9	1,2	1,75	–	●	●	–
LT16ER20ISO	16	–	1,0	1,3	2,0	–	●	●	–
LT16ER25ISO	16	–	1,1	1,5	2,5	–	●	●	–
LT16ER30ISO	16	–	1,2	1,6	3,0	–	●	●	–
LT22ER35ISO	22	–	1,6	2,3	3,5	–	–	●	–
LT22ER40ISO	22	–	1,6	2,3	4,0	–	–	●	–
LT22ER45ISO	22	–	1,7	2,4	4,5	–	–	●	–
LT22ER50ISO	22	–	1,7	2,5	5,0	–	–	●	–
corte à esquerda (L)									
LT16EL15ISO	16	–	0,8	1,0	1,5	–	●	●	–
LT16EL175ISO	16	–	0,9	1,2	1,75	–	–	●	–
LT16EL20ISO	16	–	1,0	1,3	2,0	–	–	●	–
LT16EL25ISO	16	–	1,1	1,5	2,5	–	–	●	–
LT16EL30ISO	16	–	1,2	1,6	3,0	–	–	●	–
LT16EL05ISO	16	–	0,6	0,4	0,50	–	–	●	–
LT16EL075ISO	16	–	0,6	0,6	0,75	–	–	●	–
LT16EL10ISO	16	–	0,7	0,7	1,0	–	–	●	–
LT16EL125ISO	16	–	0,8	0,9	1,25	–	–	●	–
LT22EL35ISO	22	–	1,6	2,3	3,5	–	–	●	–



Métrico externo de ISO



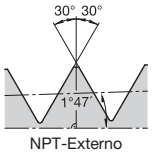


● primeira opção
○ opção alternativa

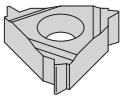
P		●	●	●
M		●	●	●
K		●	●	●
N		○	○	○
S		●	●	●
H		○		

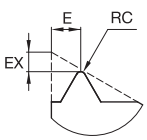
LT-ER-ISOCB

código do produto	tamanho do inserto	RC	EX	E	Passo da rosca em mm	FPP (fios por polegada)	KC5010	KC5025	KU25T
corte à direita (R)									
LT16ER05ISOCB	16	–	1,2	0,5	0,50	–	●	●	–
LT16ER075ISOCB	16	–	1,2	0,6	0,75	–	●	●	–
LT16ER10ISOCB	16	–	0,7	0,8	1,0	–	●	●	–
LT16ER125ISOCB	16	–	0,7	0,8	1,25	–	●	●	–
LT16ER15ISOCB	16	–	0,7	0,8	1,5	–	●	●	–
LT16ER175ISOCB	16	–	1,2	1,5	1,75	–	●	●	–
LT16ER20ISOCB	16	–	1,2	1,5	2,0	–	●	●	–
LT16ER25ISOCB	16	–	1,2	1,5	2,5	–	–	●	–
LT16ER30ISOCB	16	–	1,3	1,5	3,0	–	●	●	–



NPT-Externo





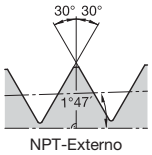


● primeira opção
○ opção alternativa

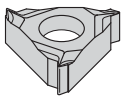
P		●	●	●
M		●	●	●
K		●	●	●
N		○	○	○
S		●	●	●
H		○		

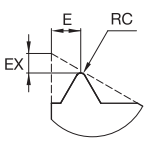
LT-ER/L-NPT

código do produto	tamanho do inserto	RC	EX	E	Passo da rosca em mm	FPP (fios por polegada)	KC5010	KC5025	KU25T
corte à direita (R)									
LT16ER115NPT	16	–	1,1	1,5	–	11.5	●	●	–
LT16ER14NPT	16	–	0,9	1,2	–	14	●	●	–
LT16ER18NPT	16	–	0,8	1,0	–	18	●	●	–
LT16ER27NPT	16	–	0,7	0,8	–	27	–	●	–
LT16ER8NPT	16	–	1,3	1,8	–	8	–	●	–



NPT-Externo

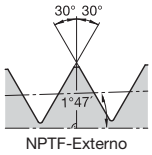




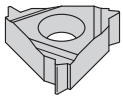


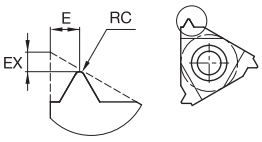
LT-ER-NPTCB

código do produto	tamanho do inserto	RC	EX	E	Passo da rosca em mm	FPP (fios por polegada)	KC5010	KC5025	KU25T
corte à direita (R)									
LT16ER14NPTCB	16	–	1,1	1,5	–	14	●	●	–



NPTF-Externo



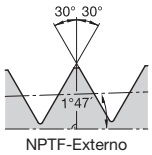


● primeira opção
○ opção alternativa

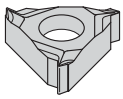
P	●	●	●	
M	●	●	●	
K	●	●	●	
N	○	○	○	
S	●	●	●	
H	○			

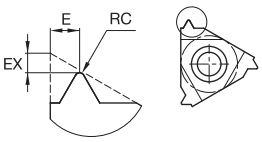
LT-ER/L-NPTF

código do produto	tamanho do inserto	RC	EX	E	Passo da rosca em mm	FPP (fios por polegada)	KC5010	KC5025	KU25T
corte à direita (R)									
LT16ER115NPTF	16	–	1,1	1,5	–	11.5	–	●	–
LT16ER14NPTF	16	–	0,9	1,2	–	14	–	●	–



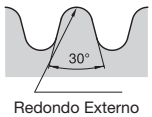
NPTF-Externo



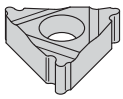


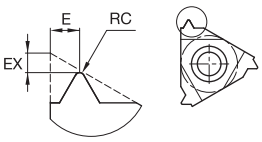
LT-ER-NPTFCB

código do produto	tamanho do inserto	RC	EX	E	Passo da rosca em mm	FPP (fios por polegada)	KC5010	KC5025	KU25T
corte à direita (R)									
LT16ER115NPTFCB	16	–	1,1	1,5	–	11.5	–	●	–



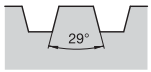
Redondo Externo



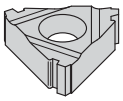


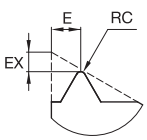
LT-ER/L-RD

código do produto	tamanho do inserto	RC	EX	E	Passo da rosca em mm	FPP (fios por polegada)	KC5010	KC5025	KU25T
corte à direita (R)									
LT16ER8RD	16	0,76	1,4	1,30	–	8	–	●	–
LT22ER6RD	22	1,01	1,5	1,70	–	6	–	●	–



Stub Acme
(truncado)-Externo





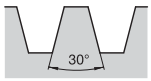


● primeira opção
○ opção alternativa

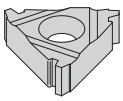
P		●	●	●
M		●	●	●
K		●	●	●
N		○	○	○
S		●	●	●
H		○		

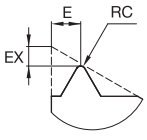
LT-ER/L-STACME

código do produto	tamanho do inserto	RC	EX	E	Passo da rosca em mm	FPP (fios por polegada)	KC5010	KC5025	KU25T
corte à direita (R)									
LT16ER10STACME	16	–	1,2	1,30	–	10	–	●	–
LT16ER12STACME	16	–	1,2	1,19	–	12	–	●	–
LT16ER16STACME	16	–	1,0	0,99	–	16	–	●	–
LT16ER6STACME	16	–	1,7	1,80	–	6	–	●	–
LT16ER8STACME	16	–	1,4	1,50	–	8	–	●	–
LT22ER5STACME	22	–	2,1	2,29	–	5	–	●	–



Trapezoidal-Externo

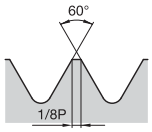




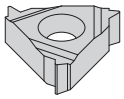


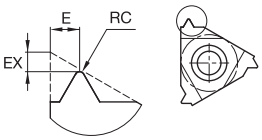
LT-ER/L-TR

código do produto	tamanho do inserto	RC	EX	E	Passo da rosca em mm	FPP (fios por polegada)	KC5010	KC5025	KU25T
corte à direita (R)									
LT16ER2TR	16	–	1,1	1,30	2,0	–	–	●	–
LT16ER3TR	16	–	1,3	1,50	3,0	–	–	●	–
LT22ER4TR	22	–	1,7	1,91	4,0	–	–	●	–
LT22ER5TR	22	–	2,1	2,50	5,0	–	–	●	–



UN americana-externa



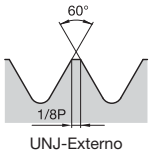


● primeira opção
○ opção alternativa

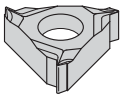
P		●	●	●
M		●	●	●
K		●	●	●
N		○	○	○
S		●	●	●
H		○		

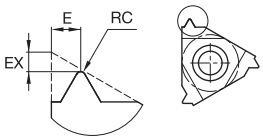
LT-ER/L-UN

código do produto	tamanho do inserto	RC	EX	E	Passo da rosca em mm	FPP (fios por polegada)	KC5010	KC5025	KU25T
corte à direita (R)									
LT16ER10UN	16	–	1,1	1,5	–	10	–	●	–
LT16ER12UN	16	–	1,1	1,4	–	12	●	●	–
LT16ER14UN	16	–	1,0	1,2	–	14	●	●	–
LT16ER16UN	16	–	0,9	1,1	–	16	●	●	–
LT16ER18UN	16	–	0,8	1,0	–	18	●	●	–
LT16ER20UN	16	–	0,8	0,9	–	20	●	●	–
LT16ER24UN	16	–	0,7	0,8	–	24	●	●	–
LT16ER28UN	16	–	0,6	0,7	–	28	●	●	–
LT16ER32UN	16	–	0,6	0,6	–	32	●	●	–
LT16ER36UN	16	–	0,6	0,6	–	36	–	●	–
LT16ER40UN	16	–	0,6	0,6	–	40	–	●	–
LT16ER48UN	16	–	0,6	0,6	–	48	–	●	–
LT16ER8UN	16	–	1,2	1,6	–	8	–	●	–
corte à esquerda (L)									
LT16EL24UN	16	–	0,7	0,8	–	24	–	●	–
LT16EL28UN	16	–	0,6	0,7	–	28	–	●	–
LT16EL8UN	16	–	1,2	1,6	–	8	–	●	–
LT16EL12UN	16	–	1,1	1,4	–	12	–	●	–
LT16EL14UN	16	–	1,0	1,2	–	14	–	●	–
LT16EL16UN	16	–	0,9	1,1	–	16	–	●	–
LT16EL18UN	16	–	0,8	1,0	–	18	–	●	–
LT16EL20UN	16	–	0,8	0,9	–	20	–	●	–



UNJ-Externo



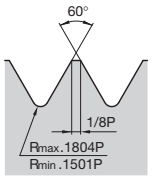


● primeira opção
○ opção alternativa

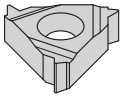
P		●	●	●
M		●	●	●
K		●	●	●
N		○	○	○
S		●	●	●
H		○		

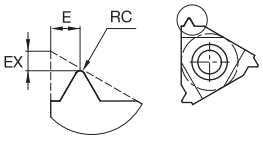
LT-ER-UNCB

código do produto	tamanho do inserto	RC	EX	E	Passo da rosca em mm	FPP (fios por polegada)	KC5010	KC5025	KU25T
corte à direita (R)									
LT16ER10UNCB	16	–	1,2	1,5	–	10	–	●	–
LT16ER12UNCB	16	–	1,2	1,5	–	12	●	●	–
LT16ER14UNCB	16	–	1,2	1,5	–	14	●	●	–
LT16ER16UNCB	16	–	0,8	0,8	–	16	●	●	–
LT16ER18UNCB	16	–	0,7	0,8	–	18	●	●	–
LT16ER20UNCB	16	–	0,7	0,8	–	20	●	●	–
LT16ER24UNCB	16	–	0,7	0,8	–	24	●	●	–
LT16ER28UNCB	16	–	0,7	0,8	–	28	●	●	–
LT16ER32UNCB	16	–	1,2	0,5	–	32	●	●	–
LT16ER8UNCB	16	–	1,3	1,5	–	8	●	●	–



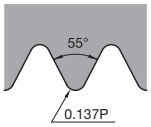
UNJ-Externo



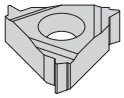


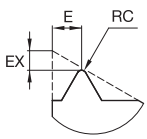
LT-ER/L-UNJ

código do produto	tamanho do inserto	RC	EX	E	Passo da rosca em mm	FPP (fios por polegada)	KC5010	KC5025	KU25T
corte à direita (R)									
LT16ER12UNJ	16	–	1,1	1,3	–	12	●	●	–
LT16ER14UNJ	16	–	1,0	1,2	–	14	●	●	–
LT16ER16UNJ	16	–	0,9	1,1	–	16	●	●	–
LT16ER18UNJ	16	–	0,8	1,0	–	18	●	●	–
LT16ER20UNJ	16	–	0,8	0,9	–	20	●	●	–
LT16ER24UNJ	16	–	0,7	0,8	–	24	–	●	–
LT16ER28UNJ	16	–	0,7	0,7	–	28	–	●	–
LT16ER32UNJ	16	–	0,6	0,7	–	32	–	●	–
corte à esquerda (L)									
LT16EL16UNJ	16	–	0,9	1,1	–	16	–	●	–



Whitworth BSW,
BSF, BSP-Interno





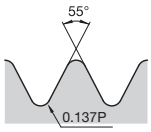


● primeira opção
○ opção alternativa

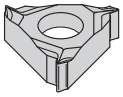
P	●	●	●
M	●	●	●
K	●	●	●
N	○	○	○
S	●	●	●
H	○		

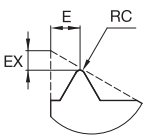
LT-ER/L-W

código do produto	tamanho do inserto	RC	EX	E	Passo da rosca em mm	FPP (fios por polegada)	KC5010	KC5025	KU25T
corte à direita (R)									
LT16ER10W	16	–	1,1	1,50	–	10	–	●	–
LT16ER11W	16	–	1,1	1,50	–	11	●	●	–
LT16ER12W	16	–	1,1	1,40	–	12	–	●	–
LT16ER14W	16	–	1,0	1,19	–	14	●	●	–
LT16ER16W	16	–	0,9	1,09	–	16	–	●	–
LT16ER18W	16	–	0,8	0,99	–	18	–	●	–
LT16ER19W	16	–	0,8	0,99	–	19	●	●	–
LT16ER20W	16	–	0,8	0,89	–	20	–	●	–
LT16ER24W	16	–	0,7	0,79	–	24	–	●	–
LT16ER28W	16	–	0,6	0,69	–	28	–	●	–
LT16ER8W	16	–	1,2	1,50	–	8	–	●	–
LT16ER9W	16	–	1,2	1,70	–	9	–	●	–
LT22ER6W	22	–	1,6	2,29	–	6	–	●	–
LT22ER7W	22	–	1,6	2,29	–	7	–	●	–
corte à esquerda (L)									
LT16EL11W	16	–	1,1	1,50	–	11	–	●	–
LT16EL14W	16	–	1,0	1,19	–	14	–	●	–



Whitworth BSW,
BSF, BSP-Externo





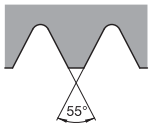


● primeira opção
○ opção alternativa

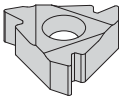
P		●	●	●
M		●	●	●
K		●	●	●
N		○	○	○
S		●	●	●
H		○		

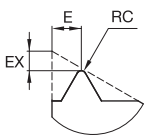
LT-ER-WCB

código do produto	tamanho do inserto	RC	EX	E	Passo da rosca em mm	FPP (fios por polegada)	KC5010	KC5025	KU25T
corte à direita (R)									
LT16ER11WCB	16	–	1,3	1,50	–	11	–	●	–
LT16ER14WCB	16	–	1,3	1,50	–	14	●	●	–



Perfil parcial interno
de 55°

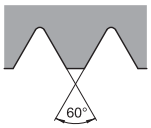




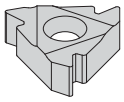


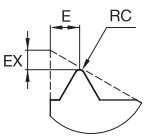
LT-NR/L-55

código do produto	tamanho do inserto	RC	EX	E	Passo da rosca em mm	FPP (fios por polegada)	KC5010	KC5025	KU25T
corte à direita (R)									
LT11NRA55	11	0,05	0,8	0,89	0,50-1,50	16-48	–	●	–
LT16NRA55	16	0,05	0,8	0,89	0,50-1,50	16-48	–	●	–
LT16NRAG55	16	0,07	1,2	1,70	0,50-3,0	8-48	–	●	–
LT16NRG55	16	0,21	1,2	1,70	1,75-3,0	8-14	–	●	–
LT22NRN55	22	0,43	1,7	2,49	3,5-5,0	5-7	–	●	–



Perfil parcial interno de 60°





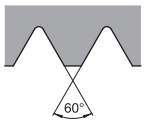


● primeira opção
○ opção alternativa

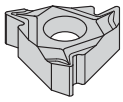
P		●	●	●
M		●	●	●
K		●	●	●
N		○	○	○
S		●	●	●
H		○		

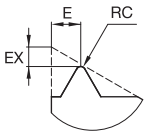
LT-NR/L-60

código do produto	insert size	RC	EX	E	Passo da rosca em mm	FPP (fios por polegada)	KC5010	KC5025	KU25T
corte à direita (R)									
LT11NRA60	11	0,05	0,8	0,9	0,50-1,5	48-16	●	●	–
LT16NRA60	16	0,05	0,8	0,9	0,50-1,5	48-16	●	●	–
LT16NRAG60	16	0,05	1,2	1,7	0,50-3,0	48-8	●	●	–
LT16NRG60	16	0,15	1,2	1,7	1,75-3,0	14-8	●	●	–
LT22NRN60	22	0,31	1,7	2,5	3,5-5,0	7-5	–	●	–
corte à esquerda (L)									
LT11NLA60	11	0,05	0,8	0,9	0,50-1,5	48-16	–	●	–
LT16NLA60	16	0,05	0,8	0,9	0,50-1,5	48-16	–	●	–
LT16NLAG60	16	0,05	1,2	1,7	0,50-3,0	48-8	–	●	–
LT16NLG60	16	0,15	1,2	1,7	1,75-3,0	14-8	–	●	–
LT22NLN60	22	0,31	1,7	2,5	3,5-5,0	7-5	–	●	–



Perfil parcial interno de 60°





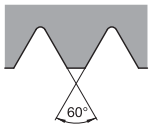


● primeira opção
○ opção alternativa

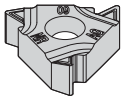
P		●	●	●
M		●	●	●
K		●	●	●
N		○	○	○
S		●	●	●
H		○		

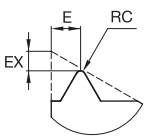
LT-NR-60CB

código do produto	tamanho do inserto	RC	EX	E	Passo da rosca em mm	FPP (fios por polegada)	KC5010	KC5025	KU25T
corte à direita (R)									
LT11NRA60CB	11	0,05	0,6	0,8	0,50-1,50	48-16	–	●	–
LT16NRAG60CB	16	0,05	0,9	1,5	0,50-3,0	48-8	–	●	–
LT16NRG60CB	16	0,16	1,0	1,5	1,75-3,0	14-8	–	●	–



Perfil parcial interno de 60°

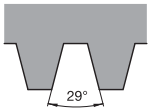




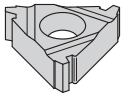


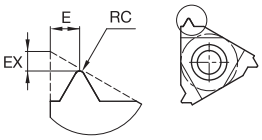
LT-NR-60K

código do produto	tamanho do inserto	RC	EX	E	Passo da rosca em mm	FPP (fios por polegada)	KC5010	KC5025	KU25T
corte à direita (R)									
LT16NRAG60K	16	0,04	1,2	1,7	0,50-3,0	48-8	–	–	●



Acme Interno



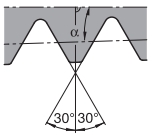


● primeira opção
○ opção alternativa

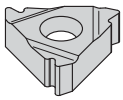
		KC5010	KC5025	KU25T
P		●	●	●
M		●	●	●
K		●	●	●
N		○	○	○
S		●	●	●
H		○		

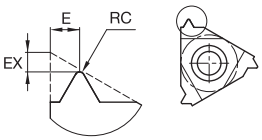
LT-NR/L-ACME

código do produto	tamanho do inserto	RC	EX	E	Passo da rosca em mm	FPP (fios por polegada)	KC5010	KC5025	KU25T
corte à direita (R)									
LT16NR10ACME	16	–	1,2	1,30	–	10	–	●	–
LT16NR12ACME	16	–	1,2	1,30	–	12	–	●	–
LT16NR8ACME	16	–	1,4	1,50	–	8	–	●	–
LT22NR5ACME	22	–	2,0	2,29	–	5	–	●	–
LT22NR6ACME	22	–	1,8	2,11	–	6	–	●	–



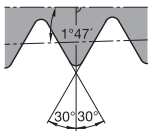
Conexões de flanges rotativos API-Interno
α = 1/2 arctan (TPF/12)



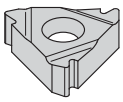


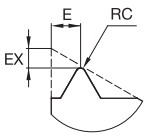
LT-NR/L-API

código do produto	tamanho do inserto	RC	EX	E	Passo da rosca em mm	FPP (fios por polegada)	KC5010	KC5025	KU25T
corte à direita (R)									
LT22NR4API382	22	–	2,1	2,79	–	4	–	●	–
LT22NR4API502	22	–	2,1	3,10	–	4	–	●	–
LT22NR5API403	22	–	1,8	2,60	–	5	–	●	–
LT27NR4API502	28	0,65	2,0	3,79	–	4	–	●	–
LT27NR4API382	28	0,99	2,0	2,79	–	4	–	●	–



API Redondo-Interno





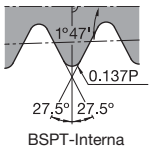


● primeira opção
○ opção alternativa

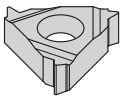
P		●	●	●
M		●	●	●
K		●	●	●
N		○	○	○
S		●	●	●
H		○		

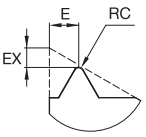
LT-NR/L-APIRD

código do produto	tamanho do inserto	RC	EX	E	Passo da rosca em mm	FPP (fios por polegada)	KC5010	KC5025	KU25T
corte à direita (R)									
LT16NR10APIRD	16	–	1,2	1,40	–	10	–	●	–
LT16NR8APIRD	16	–	1,3	1,50	–	8	–	●	–



BSPT-Interna

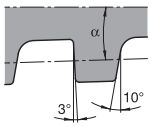




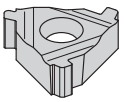


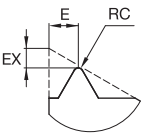
LT-NR/L-BSPT

código do produto	tamanho do inserto	RC	EX	E	Passo da rosca em mm	FPP (fios por polegada)	KC5010	KC5025	KU25T
corte à direita (R)									
LT11NR14BSPT	11	–	0,9	0,99	–	14	–	●	–
LT16NR11BSPT	16	–	1,1	1,50	–	11	–	●	–
LT16NR14BSPT	16	–	1,0	1,19	–	14	–	●	–



Rosca Buttress americana API-Interno
α = 1/2 arctan (TPF/12)

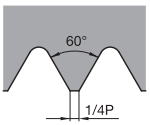




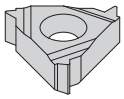


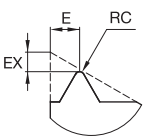
LT-NR/L-BUT

código do produto	tamanho do inserto	RC	EX	E	Passo da rosca em mm	FPP (fios por polegada)	KC5010	KC5025	KU25T
corte à direita (R)									
LT22NR5BUT1	22	–	2,8	1,91	–	5	–	●	–
LT22NR5BUT75	22	–	2,8	1,91	–	5	–	●	–



ISO Metric-Internal





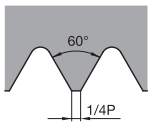


● primeira opção
○ opção alternativa

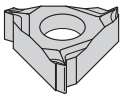
P		●	●	●
M		●	●	●
K		●	●	●
N		○	○	○
S		●	●	●
H		○		

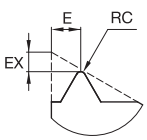
LT-NR/L-ISO

código do produto	tamanho do inserto	RC	EX	E	Passo da rosca em mm	FPP (fios por polegada)	KC5010	KC5025	KU25T
corte à direita (R)									
LT11NR05ISO	11	–	0,6	0,4	0,50	–	–	●	–
LT11NR075ISO	11	–	0,6	0,6	0,75	–	–	●	–
LT11NR10ISO	11	–	0,6	0,7	1,0	–	–	●	–
LT11NR125ISO	11	–	0,8	0,9	1,25	–	–	●	–
LT11NR15ISO	11	–	0,8	1,0	1,5	–	●	●	–
LT11NR175ISO	11	–	0,9	1,1	1,75	–	–	●	–
LT11NR20ISO	11	–	0,9	1,1	2,0	–	–	●	–
LT16NR05ISO	16	–	0,6	0,4	0,50	–	–	●	–
LT16NR075ISO	16	–	0,6	0,6	0,75	–	–	●	–
LT16NR10ISO	16	–	0,6	0,7	1,0	–	●	●	–
LT16NR125ISO	16	–	0,8	0,9	1,25	–	–	●	–
LT16NR15ISO	16	–	0,8	1,0	1,5	–	●	●	–
LT16NR175ISO	16	–	0,9	1,2	1,75	–	–	●	–
LT16NR20ISO	16	–	1,0	1,3	2,0	–	●	●	–
LT16NR25ISO	16	–	1,1	1,5	2,5	–	–	●	–
LT16NR30ISO	16	–	1,1	1,5	3,0	–	●	●	–
LT22NR35ISO	22	–	1,6	2,3	3,5	–	–	●	–
LT22NR40ISO	22	–	1,6	2,3	4,0	–	–	●	–
LT22NR45ISO	22	–	1,6	2,4	4,5	–	–	●	–
LT22NR50ISO	22	–	1,6	2,3	5,0	–	–	●	–
corte à esquerda (L)									
LT11NL15ISO	11	–	0,8	1,0	1,5	–	–	●	–
LT11NL10ISO	11	–	0,6	0,7	1,0	–	–	●	–
LT16NL30ISO	16	–	1,1	1,5	3,0	–	–	●	–
LT16NL10ISO	16	–	0,6	0,7	1,0	–	–	●	–
LT16NL15ISO	16	–	0,8	1,0	1,5	–	–	●	–
LT16NL20ISO	16	–	1,0	1,3	2,0	–	–	●	–
LT16NL25ISO	16	–	1,1	1,5	2,5	–	–	●	–



Métrico interno de ISO







● primeira opção
○ opção alternativa

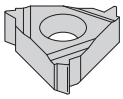
		KC5010	KC5025	KU25T
P		●	●	●
M		●	●	●
K		●	●	●
N		○	○	○
S		●	●	●
H		○		

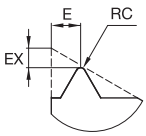
LT-NR-ISOCB

código do produto	tamanho do inserto	RC	EX	E	Passo da rosca em mm	FPP (fios por polegada)	KC5010	KC5025	KU25T
corte à direita (R)									
LT11NR075ISOCB	11	–	1,2	0,5	0,75	–	–	●	–
LT11NR10ISOCB	11	–	0,7	0,8	1,0	–	–	●	–
LT11NR125ISOCB	11	–	0,7	0,8	1,25	–	–	●	–
LT11NR15ISOCB	11	–	0,7	0,8	1,5	–	–	●	–
LT16NR10ISOCB	16	–	0,7	0,8	1,0	–	–	●	–
LT16NR15ISOCB	16	–	0,7	0,8	1,5	–	–	●	–
LT16NR20ISOCB	16	–	1,1	1,5	2,0	–	–	●	–
LT16NR25ISOCB	16	–	1,1	1,5	2,5	–	–	●	–

P		●	●	●
M		●	●	●
K		●	●	●
N		○	○	○
S		●	●	●
H		○		

● primeira opção
○ opção alternativa

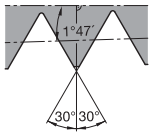




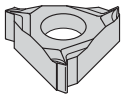


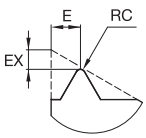
LT-NR/L-NPT

código do produto	tamanho do inserto	RC	EX	E	Passo da rosca em mm	FPP (fios por polegada)	KC5010	KC5025	KU25T
corte à direita (R)									
LT11NR14NPT	11	–	0,8	1,0	–	14	●	●	–
LT11NR18NPT	11	–	0,8	1,0	–	18	–	●	–
LT16NR115NPT	16	–	1,1	1,5	–	11.5	●	●	–
LT16NR14NPT	16	–	0,9	1,2	–	14	–	●	–
LT16NR8NPT	16	–	1,3	1,8	–	8	–	●	–



NPT-Interno

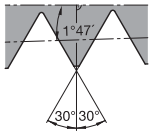




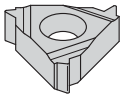


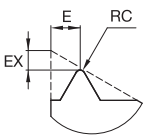
LT-NR-NPTCB

código do produto	tamanho do inserto	RC	EX	E	Passo da rosca em mm	FPP (fios por polegada)	KC5010	KC5025	KU25T
corte à direita (R)									
LT16NR115NPTCB	16	–	1,1	1,5	–	11.5	–	●	–
LT16NR14NPTCB	16	–	1,4	1,2	–	14	–	●	–



NPTF-Interno





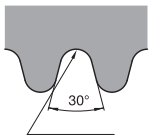


LT-NR/L-NPTF

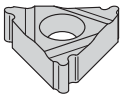
código do produto	tamanho do inserto	RC	EX	E	Passo da rosca em mm	FPP (fios por polegada)	KC5010	KC5025	KU25T
corte à direita (R)									
LT11NR14NPTF	11	–	0,8	0,99	–	14	–	●	–
LT16NR14NPTF	16	–	0,9	1,19	–	14	–	●	–

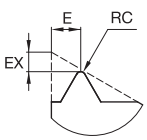
● primeira opção
○ opção alternativa

P	●	●	●
M	●	●	●
K	●	●	●
N	○	○	○
S	●	●	●
H	○		



Redondo-Interno

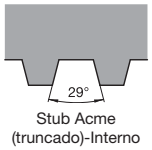




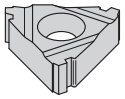


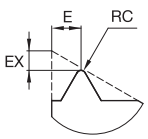
LT-NR/L-RD

código do produto	tamanho do inserto	RC	EX	E	Passo da rosca em mm	FPP (fios por polegada)	KC5010	KC5025	KU25T
corte à direita (R)									
LT16NR8RD	16	0,70	1,4	1,40	–	8	–	●	–
LT22NR6RD	22	0,93	1,5	1,70	–	6	–	●	–



Stub Acme
(truncado)-Interno

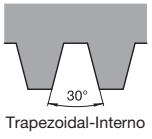




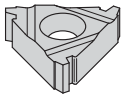


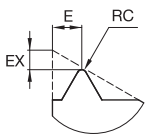
LT-NR/L-STACME

código do produto	tamanho do inserto	RC	EX	E	Passo da rosca em mm	FPP (fios por polegada)	KC5010	KC5025	KU25T
corte à direita (R)									
LT16NR10STACME	16	–	1,2	1,30	–	10	–	●	–
LT16NR12STACME	16	–	1,1	1,19	–	12	–	●	–
LT16NR14STACME	16	–	1,1	1,09	–	14	–	●	–
LT16NR16STACME	16	–	1,0	0,99	–	16	–	●	–
LT16NR6STACME	16	–	1,7	1,80	–	6	–	●	–
LT16NR8STACME	16	–	1,4	1,50	–	8	–	●	–



Trapezoidal-Interno

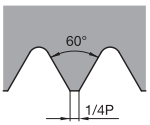




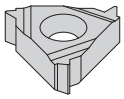


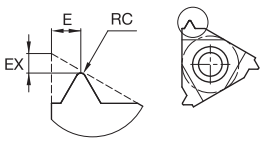
LT-NR/L-TR

código do produto	tamanho do inserto	RC	EX	E	Passo da rosca em mm	FPP (fios por polegada)	KC5010	KC5025	KU25T
corte à direita (R)									
LT16NR2TR	16	–	1,1	1,30	2,0	–	–	●	–
LT16NR3TR	16	–	1,3	1,50	3,0	–	–	●	–
LT22NR4TR	22	–	1,7	1,91	4,0	–	–	●	–
LT22NR5TR	22	–	2,1	2,50	5,0	–	–	●	–



UN americana-interna



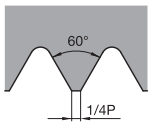


● primeira opção
○ opção alternativa

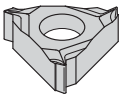
P		●	●	●
M		●	●	●
K		●	●	●
N		○	○	○
S		●	●	●
H		○		

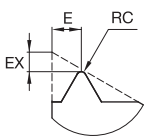
LT-NR/L-UN

código do produto	tamanho do inserto	RC	EX	E	Passo da rosca em mm	FPP (fios por polegada)	KC5010	KC5025	KU25T
corte à direita (R)									
LT11NR16UN	11	–	0,9	1,1	–	16	●	●	–
LT11NR18UN	11	–	0,8	1,0	–	18	–	●	–
LT11NR20UN	11	–	0,8	0,9	–	20	–	●	–
LT11NR24UN	11	–	0,7	0,8	–	24	–	●	–
LT11NR28UN	11	–	0,6	0,7	–	28	–	●	–
LT11NR32UN	11	–	0,6	0,6	–	32	–	●	–
LT11NR40UN	11	–	0,6	0,6	–	40	–	●	–
LT16NR10UN	16	–	1,1	1,5	–	10	–	●	–
LT16NR12UN	16	–	1,1	1,4	–	12	●	●	–
LT16NR14UN	16	–	0,9	1,2	–	14	–	●	–
LT16NR16UN	16	–	0,9	1,1	–	16	–	●	–
LT16NR18UN	16	–	0,8	1,0	–	18	–	●	–
LT16NR20UN	16	–	0,8	0,9	–	20	–	●	–
LT16NR24UN	16	–	0,7	0,8	–	24	–	●	–
LT16NR28UN	16	–	0,6	0,7	–	28	–	●	–
LT16NR32UN	16	–	0,6	0,6	–	32	–	●	–
LT16NR8UN	16	–	1,1	1,5	–	8	–	●	–
corte à esquerda (L)									
LT11NL32UN	11	–	0,6	0,6	–	32	–	●	–
LT16NL10UN	16	–	1,1	1,5	–	10	–	●	–
LT16NL12UN	16	–	1,1	1,4	–	12	–	●	–
LT16NL16UN	16	–	0,9	1,1	–	16	–	●	–



UN americana-interna





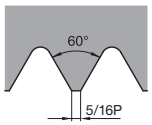


● primeira opção
○ opção alternativa

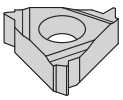
P		●	●	●
M		●	●	●
K		●	●	●
N		○	○	○
S		●	●	●
H		○		

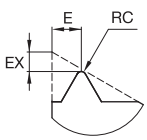
LT-NR-UNCB

código do produto	tamanho do inserto	RC	EX	E	Passo da rosca em mm	FPP (fios por polegada)	KC5010	KC5025	KU25T
corte à direita (R)									
LT11NR16UNCB	11	–	0,7	0,8	–	16	–	●	–
LT11NR18UNCB	11	–	0,6	0,8	–	18	–	●	–
LT11NR20UNCB	11	–	0,6	0,8	–	20	–	●	–
LT11NR24UNCB	11	–	0,7	0,8	–	24	–	●	–
LT11NR32UNCB	11	–	1,2	0,5	–	32	–	●	–
LT16NR10UNCB	16	–	1,1	1,5	–	10	–	●	–
LT16NR12UNCB	16	–	1,1	1,5	–	12	–	●	–
LT16NR14UNCB	16	–	1,1	1,5	–	14	–	●	–
LT16NR16UNCB	16	–	0,7	0,8	–	16	–	●	–
LT16NR18UNCB	16	–	0,6	0,8	–	18	–	●	–
LT16NR20UNCB	16	–	0,7	0,6	–	20	–	●	–
LT16NR8UNCB	16	–	1,1	1,5	–	8	–	●	–



UNJ-Interno

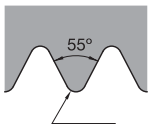




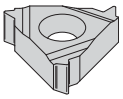


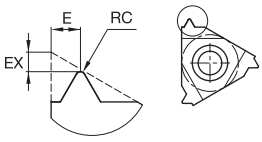
LT-NR/L-UNJ

código do produto	tamanho do inserto	RC	EX	E	Passo da rosca em mm	FPP (fios por polegada)	KC5010	KC5025	KU25T
corte à direita (R)									
LT11NR14UNJ	11	–	1,0	1,2	–	14	–	●	–
LT11NR16UNJ	11	–	0,9	1,1	–	16	–	●	–
LT11NR18UNJ	11	–	0,8	1,0	–	18	–	●	–
LT16NR12UNJ	16	–	1,1	1,3	–	12	–	●	–
LT16NR16UNJ	16	–	0,9	1,1	–	16	–	●	–



Whitworth BSW,
BSF, BSP-Interno



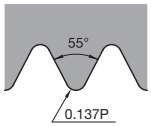


P		●	●	●
M		●	●	●
K		●	●	●
N		○	○	○
S		●	●	●
H		○		

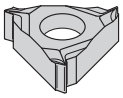
● primeira opção
○ opção alternativa

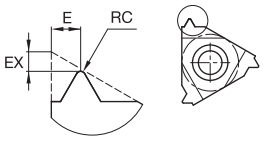
LT-NR/L-W

código do produto	tamanho do inserto	RC	EX	E	Passo da rosca em mm	FPP (fios por polegada)	KC5010	KC5025	KU25T
corte à direita (R)									
LT11NR14W	11	–	0,9	1,09	–	14	–	●	–
LT11NR19W	11	–	0,8	0,99	–	19	–	●	–
LT16NR10W	16	–	1,1	1,50	–	10	–	●	–
LT16NR11W	16	–	1,1	1,50	–	11	●	●	–
LT16NR12W	16	–	1,1	1,40	–	12	–	●	–
LT16NR14W	16	–	1,0	1,19	–	14	–	●	–
LT16NR16W	16	–	0,9	1,09	–	16	–	●	–
LT16NR19W	16	–	0,8	0,99	–	19	–	●	–
LT16NR20W	16	–	0,8	0,89	–	20	–	●	–
LT16NR8W	16	–	1,2	1,50	–	8	–	●	–
LT22NR7W	22	–	1,6	2,29	–	7	–	●	–
corte à esquerda (L)									
LT16NL11W	16	–	1,1	1,50	–	11	–	●	–



Whitworth BSW,
BSF, BSP-Interno





LT-NR-WCB

código do produto	tamanho do inserto	RC	EX	E	Passo da rosca em mm	FPP (fios por polegada)	KC5010	KC5025	KU25T
corte à direita (R)									
LT16NR11WCB	16	–	1,3	1,50	–	11	–	●	–
LT16NR14WCB	16	–	1,3	1,50	–	14	–	●	–

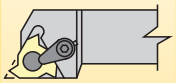
Como funcionam os números de catálogo?

Cada caractere no nosso número de catálogo significa uma característica específica daquele produto. Use as colunas-chave a seguir e as imagens correspondentes para fazer uma identificação fácil do atributo a ser aplicado.

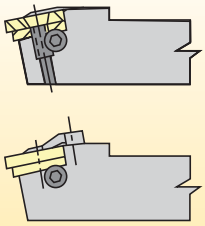


L	S	AS	R		2525M	16	
Estilo do inserto	Método de retenção do inserto	Estilo da ferramenta	Sentido de rotação da ferramenta	Cabeça deslocada	Tamanho da haste	Tamanho do inserto	Superfície e comprimento qualificados

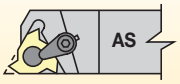
L — Assentamento triangular



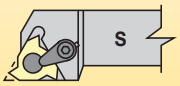
S — Somente com parafuso do inserto ou com grampo de fixação



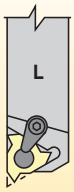
Canal reto



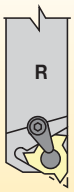
Haste com deslocamento

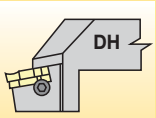


Sentido de rotação à esquerda



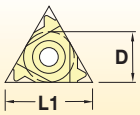
Sentido de rotação à direita





Sistema métrico:
Altura e largura da haste em mm e comprimento do suporte conforme o padrão ISO.

O tamanho é igual ao número de incrementos de 1/8" de polegada no círculo inscrito.



tamanho do inserto em polegadas	tamanho do inserto no sistema métrico	D mm	L1 mm
2	11	6,4	11,0
3	16	9,5	16,5
4	22	12,7	22,0

C — encosto e comprimento qualificados, 6" de comprimento

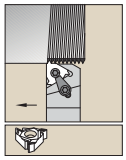
D — encosto e comprimento qualificados, 6" de comprimento

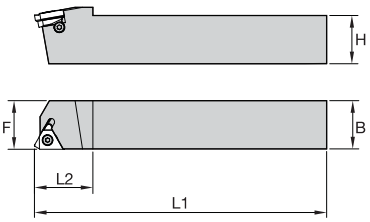
E — encosto e comprimento qualificados, 6" de comprimento

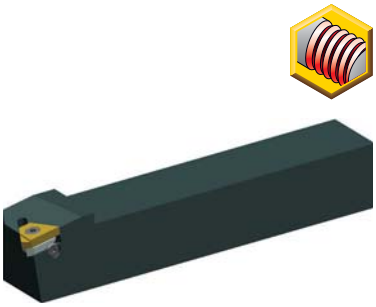
T — encosto e comprimento qualificados, 3,25" de comprimento

Q — suporte métrico qualificado

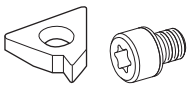
NOTA: Porta-ferramentas com haste principal com medidas maiores que 12mm ou 1/2" são fornecidos com o grampo de fixação e o parafuso do inserto.
Fixe o inserto com o grampo ou com o parafuso do inserto. **Não usar ambos.**
Para o sistema de codificação de produto de calço de rosqueamento, veja a página D80.





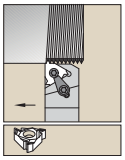


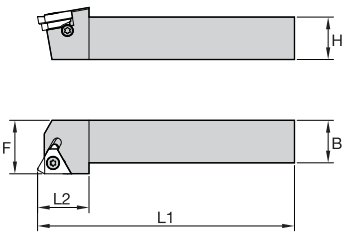
LSA

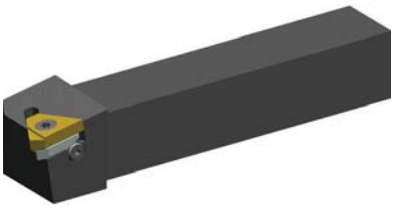




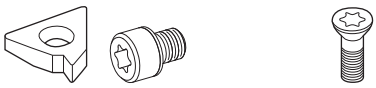
número para pedido	código do produto	H	B	F	L1	inserto padrão	calço	parafuso do calço	Torx	Torx	parafuso do inserto	Torx
corte à direita (R)												
1136965	**LSASR1212N16**	12	12	16	85	LT16ER	–	–	–	–	**SSA3T**	T10
1136984	**LSASR1616H16**	16	16	16	100	LT16ER	**SMYE3**	**SSY3T**	T10	T15	**SSA3T**	T10
1136992	**LSASR2020K16**	20	20	20	125	LT16ER	**SMYE3**	**SSY3T**	T10	T15	**SSA3T**	T10
1137000	**LSASR2525M16**	25	25	25	150	LT16ER	**SMYE3**	**SSY3T**	T10	T15	**SSA3T**	T10
1137007	**LSASR2525M22**	25	25	25	150	LT22ER	**SMYE4**	**SSY4T**	T20	T20	**SSA4T**	T20
1125454	**LSASR3232P16**	32	32	32	170	LT16ER	**SMYE3**	**SSY3T**	T10	T15	**SSA3T**	T10
1611931	**LSASR3232P22**	32	32	32	170	LT22ER	**SMYE4**	**SSY4T**	T20	T20	**SSA4T**	T20
corte à esquerda (L)												
1136926	**LSASL1212N16**	12	12	16	85	LT16EL	–	–	–	–	**SSA3T**	T10
1136935	**LSASL1616H16**	16	16	16	100	LT16EL	**SMYI3**	**SSY3T**	T10	T15	**SSA3T**	T10
1136943	**LSASL2020K16**	20	20	20	125	LT16EL	**SMYI3**	**SSY3T**	T10	T15	**SSA3T**	T10
1136951	**LSASL2525M16**	25	25	25	150	LT16EL	**SMYI3**	**SSY3T**	T10	T15	**SSA3T**	T10
1136959	**LSASL2525M22**	25	25	25	150	LT22EL	**SMYI4**	**SSY4T**	T20	T20	**SSA4T**	T20



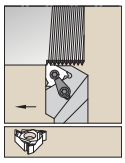


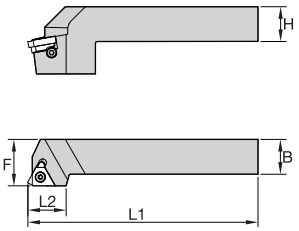


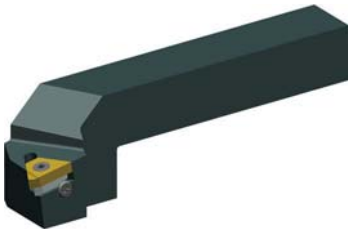
LSS



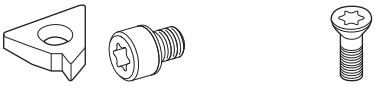
número para pedido	código do produto	H	B	F	L1	LH	inserto padrão	calço	parafuso do calço	Torx	parafuso do inserto	Torx
corte à direita (R)												
1137054	**LSSR2020K16Q**	20	20	25	125	25	LT16ER	**SMYE3**	**SSY3T**	T10	**SSA3T**	T10
1137063	**LSSR2525M16Q**	25	25	32	150	25	LT16ER	**SMYE3**	**SSY3T**	T10	**SSA3T**	T10
1137069	**LSSR2525M22Q**	25	25	32	150	30	LT22ER	**SMYE4**	**SSY4T**	T20	**SSA4T**	T20
1611933	**LSSR3232P16Q**	32	32	40	170	32	LT16ER	**SMYE3**	**SSY3T**	T10	**SSA3T**	T10
1611935	**LSSR3232P22Q**	32	32	40	170	30	LT22ER	**SMYE4**	**SSY4T**	T20	**SSA4T**	T20
corte à esquerda (L)												
1192325	**LSSL2020K16Q**	20	20	25	125	25	LT16EL	**SMYI3**	**SSY3T**	T10	**SSA3T**	T10
1137022	**LSSL2525M16Q**	25	25	32	150	25	LT16EL	**SMYI3**	**SSY3T**	T10	**SSA3T**	T10
1137029	**LSSL2525M22Q**	25	25	32	150	30	LT22EL	**SMYI4**	**SSY4T**	T20	**SSA4T**	T20
1611934	**LSSL3232P16Q**	32	32	40	170	32	LT16EL	**SMYI3**	**SSY3T**	T10	**SSA3T**	T10







LSS-DH



número para pedido	código do produto	H	B	F	L1	LH	inserto padrão	calço	parafuso do calço	Torx	parafuso do inserto	Torx
corte à direita (R)												
1174502	**LSSRDH2020K16Q**	20	20	25	125	38	LT16ER	**SMYE3**	**SSY3T**	T10	**SSA3T**	T10
1611938	**LSSRDH2525M16**	25	25	32	150	38	LT16ER	**SMYE3**	**SSY3T**	T10	**SSA3T**	T10
1137036	**LSSRDH2525M22Q**	25	25	32	150	38	LT22ER	**SMYE4**	**SSY4T**	T20	**SSA4T**	T20
corte à esquerda (L)												
1611939	**LSSLDH2525M16**	25	25	32	150	38	LT16EL	**SMYI3**	**SSY3T**	T10	**SSA3T**	T10

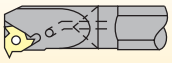
Como funcionam os números de catálogo?

Cada caractere no nosso número de catálogo significa uma característica específica daquele produto. Use as colunas-chave a seguir e as imagens correspondentes para fazer uma identificação fácil do atributo a ser aplicado.

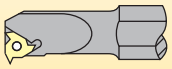


E	16		L	S	E	R	16
Tipo de barra	Diâmetro da barra de haste com gargalo primária	Diâmetro da barra (de montagem) secundária	Estilo do inserto	Método de retenção do inserto	Estilo da barra	Sentido de rotação da ferramenta	Tamanho do inserto

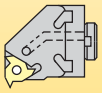
E — Metal duro com refrigeração



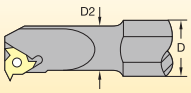
S — Haste de aço sem refrigeração



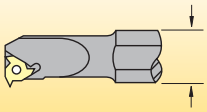
H — Cabeça intercambiável com refrigeração



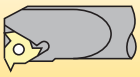
Diâmetro métrico em mm.



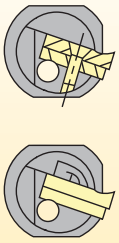
Diâmetro métrico em mm.



L — Assentamento triangular



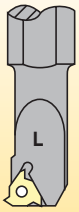
S — Somente com parafuso do inserto ou com grampo de fixação



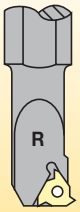
Montagem posterior da aresta de corte



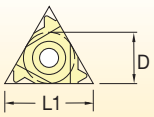
Sentido de rotação à esquerda



Sentido de rotação à direita



O tamanho é igual ao número de incrementos de 1/8" de polegada no círculo inscrito.



tamanho do inserto em polegadas	tamanho do inserto no sistema métrico	D mm	L1 mm
2	11	6,4	11,0
3	16	9,5	16,5
4	22	12,7	22,0

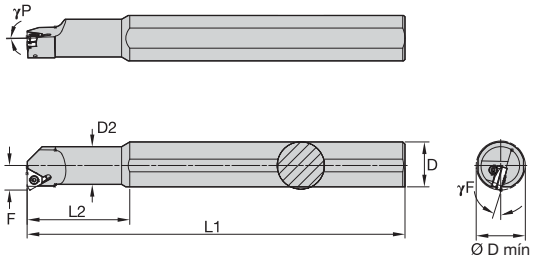
Sistema de codificação de produto para calço para rosqueamento LT

SM	Y	E	3	2P
Calço	Calço para insertos padrão LT	Rosqueamento do inserto	Tamanho do inserto	Ângulo do calço
		E = Externo **I** = Interno	Valor D em 1/8"	**2P** = 2° positivo **1P** = 1° positivo **—** = 0° neutro **1N** = 1° negativo **2N** = 2° negativo **3N** = 3° negativo

Para calços e kits de calços veja as páginas D109–D110.

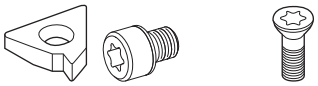


Haste de aço com refrigeração interna.

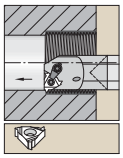




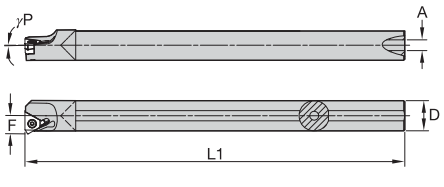
A-LSE



número para pedido	código do produto	D	D mín	D2	F	L1	L2	γF°	γP°	inserto padrão	calço	parafuso do calço	Torx	parafuso do inserto	Torx
corte à direita (R)															
1131468	**A1020LSER11**	20	13	–	7,3	180	25	-15.0	-1.5	LT11NR	–	–	–	**SSN2T**	T8
1131481	**A1320LSER11**	20	16	–	8,9	180	32	-15.0	-1.5	LT11NR	–	–	–	**SSN2T**	T8
1612581	**A1320LSER16**	20	17	–	10,3	180	32	-15.0	-1.5	LT16NR	–	–	–	**SSA3T**	T10
1798921	**A1616LSER16**	16	20	16,0	11,3	150	32	-15.0	-1.5	LT16NR	–	–	–	**SSA3T**	T10
1131509	**A1620LSER16**	20	20	–	11,7	180	36	-15.0	-1.5	LT16NR	–	–	–	**SSA3T**	T10
1131524	**A2020LSER16**	20	24	20,0	13,4	180	40	-15.0	-1.5	LT16NR	**SMYI3**	**SSY3T**	T10	**SSA3T**	T10
1131547	**A2525LSER16**	25	29	–	16,1	200	45	-15.0	-1.5	LT16NR	**SMYI3**	**SSY3T**	T10	**SSA3T**	T10
1131566	**A2525LSER22**	25	32	–	17,2	200	45	-15.0	-1.5	LT22NR	**SMYI4**	**SSY4T**	T20	**SSA4T**	T20
1612584	**A2020LSER22**	20	27	20,0	15,6	180	50	-15.0	-1.5	LT22NR	–	–	–	**SSA4T**	T20
1131574	**A2532LSER16**	32	29	–	16,3	250	60	-15.0	-1.5	LT16NR	**SMYI3**	**SSY3T**	T10	**SSA3T**	T10
1131582	**A2532LSER22**	32	32	–	17,4	250	60	-15.0	-1.5	LT22NR	**SMYI4**	**SSY4T**	T20	**SSA4T**	T20
1612587	**A3232LSER22**	32	39	32,0	21,5	250	60	-15.0	-1.5	LT22NR	**SMYI4**	**SSY4T**	T20	**SSA4T**	T20
1798922	**A4040LSER22**	40	47	40,0	25,8	300	60	-15.0	-1.5	LT22NR	**SMYI4**	**SSY4T**	T20	**SSA4T**	T20
1798920	**A1010LSER11**	10	13	10,0	7,3	100	100	-15.0	-1.5	LT11NR	–	–	–	**SSN2T**	T8
corte à esquerda (L)															
1612586	**A2532LSEL16**	32	29	–	16,3	250	–	-15.0	-1.5	LT16NL	**SMYE3**	**SSY3T**	T10	**SSA3T**	T10
1131458	**A1020LSEL11**	20	13	–	7,3	180	25	-15.0	-1.5	LT11NL	–	–	–	**SSN2T**	T8
1131476	**A1320LSEL11**	20	16	–	8,9	180	32	-15.0	-1.5	LT11NL	–	–	–	**SSN2T**	T8
1798980	**A1616LSEL16**	16	20	16,0	11,3	150	32	-15.0	-1.5	LT16NL	–	–	–	**SSA3T**	T10
1131499	**A1620LSEL16**	20	20	–	11,5	180	40	-15.0	-1.5	LT16NL	–	–	–	**SSA3T**	T10
1131516	**A2020LSEL16**	20	24	20,0	13,4	180	40	-15.0	-1.5	LT16NL	**SMYE3**	**SSY3T**	T10	**SSA3T**	T10
1131532	**A2525LSEL16**	25	29	–	16,1	200	45	-15.0	-1.5	LT16NL	**SMYE3**	**SSY3T**	T10	**SSA3T**	T10
1131540	**A2525LSEL22**	25	32	–	17,2	200	45	-15.0	-1.5	LT22NL	**SMYE4**	**SSY4T**	T20	**SSA4T**	T20
1612585	**A2020LSEL22**	20	27	20,0	15,6	180	50	-15.0	-1.5	LT22NL	–	–	–	**SSA4T**	T20
1612588	**A3232LSEL22**	32	39	32,0	21,5	250	60	-15.0	-1.5	LT22NL	**SMYE4**	**SSY4T**	T20	**SSA4T**	T20
1799093	**A4040LSEL22**	40	47	40,0	25,8	300	60	-15.0	-1.5	LT22NL	**SMYE4**	**SSY4T**	T20	**SSA4T**	T20
1798979	**A1010LSEL11**	10	13	10,0	7,3	100	100	-15.0	-1.5	LT11NL	–	–	–	**SSN2T**	T8



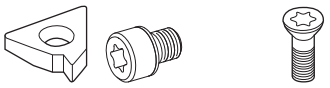
Haste de metal duro com refrigeração interna.





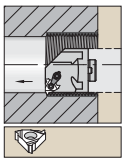


E-LSE

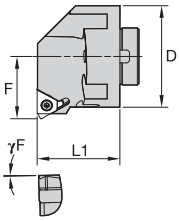


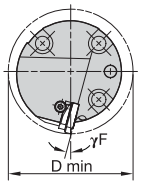
número para pedido	código do produto	D	D mín	F	L1	A	γF°	γP°	inserto padrão	calço	parafuso do calço	Torx	parafuso do inserto	Torx
corte à direita (R)														
1152844	**E16RLSER16**	16	20	11,5	200,0	6	-15	-1.5	LT16NR	**—**	**—**	—	**SN3TPKG**	T10
1152846	**E20SLSER16**	20	24	13,4	250,0	7	-15	-1.5	LT16NR	**SMYI3**	**SSY3T**	T10	**SSA3T**	T10
1152848	**E25TLSER16**	25	29	15,8	300,0	8	-15	-1.5	LT16NR	**SMYI3**	**SSY3T**	T10	**SSA3T**	T10

NOTA: Itens listados sem um calço são projetados para um ângulo de inclinação de 1.5°.



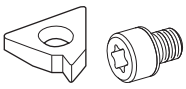
With through coolant.







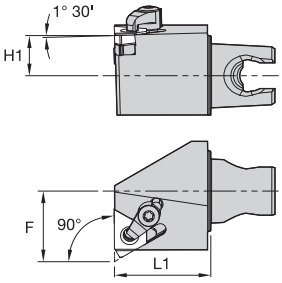
H-LSE

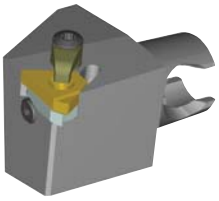


número para pedido	código do produto	D	D mín	L1	F	γF°	γP°	inserto padrão	calço	parafuso do calço	Torx	parafuso do inserto	Torx
corte à direita (R)													
1095216	**H16LSER3**	25	30,5	41,3	16,4	-15.0	-1.5	LT16NR	**SMYI3**	**SSY3T**	T10	**SSA3T**	T10
1095218	**H20LSER3**	32	36,8	41,3	19,3	-15.0	-1.5	LT16NR	**SMYI3**	**SSY3T**	T10	**SSA3T**	T10
1095220	**H24LSER3**	38	44,7	41,3	22,5	-15.0	-1.5	LT16NR	**SMYI3**	**SSY3T**	T10	**SSA3T**	T10
1095224	**H24LSER4**	38	45,3	41,3	24,7	-15.0	-1.5	LT22NR	**SMYI4**	**SSY4T**	T20	**SSA4T**	T20
1803997	**H40LSER22**	40	47,0	41,3	25,9	-15.0	-1.5	LT22NR	**SMYI4**	**SSY4T**	T20	**SSA4T**	T20
1803995	**H50LSER16**	50	54,0	41,3	28,6	-15.0	-1.5	LT16NR	**SMYI3**	**SSY3T**	T10	**SSA3T**	T10
1803999	**H50LSER22**	50	56,0	41,3	30,5	-15.0	-1.5	LT22NR	**SMYI4**	**SSY4T**	T20	**SSA4T**	T20
3842905	**H50LSER27**	50	58,0	41,3	31,4	-15.0	-1.5	LT27NR	**SMYI5**	**SSY5T**	T25	**SSA5T**	T25
1095222	**H32LSER3**	51	61,0	41,3	32,4	-15.0	-1.5	LT16NR	**SMYI3**	**SSY3T**	T10	**SSA3T**	T10
1095226	**H32LSER4**	51	61,0	41,3	32,4	-15.0	-1.5	LT22NR	**SMYI4**	**SSY4T**	T20	**SSA4T**	T20
3842895	**H32LSER5**	51	61,0	41,3	32,5	-15.0	-1.5	LT27NR	**SMYI5**	**SSY5T**	T25	**SSA5T**	T25
3842897	**H40LSER5**	64	77,0	41,3	38,9	-15.0	-1.5	LT27NR	**SMYI5**	**SSY5T**	T25	**SSA5T**	T25

NOTA: Para barras adaptadoras, veja as páginas de B386.

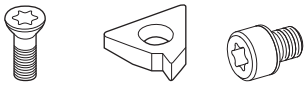






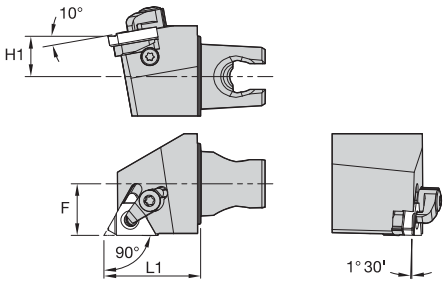
O grampo exibido nas imagens não está mais disponível.

LSE • Montagem frontal



número para pedido	código do produto	L1	F	H1	inserto padrão	parafuso do inserto	calço	parafuso do calço
corte à direita (R)								
2399506	**KM25LSER1630**	30	22	12,5	LT16EL	**SSA3T**	**SMYI3**	**SSY3T**
corte à esquerda (L)								
2399507	**KM25LSEL1630**	30	22	12,5	LT16ER	**SSA3T**	**SMYE3**	**SSY3T**

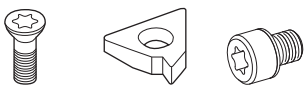






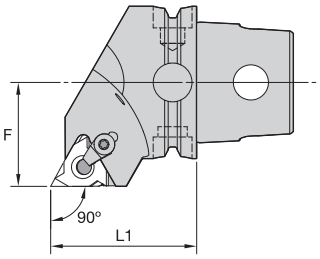
O grampo exibido nas imagens não está mais disponível.

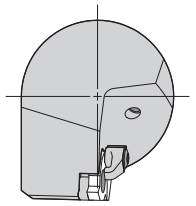
LSS • Montagem lateral

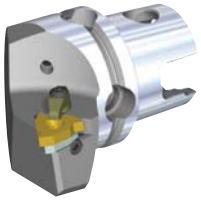


número para pedido	código do produto	L1	F	H1	inserto padrão	parafuso do inserto	calço	parafuso do calço
corte à direita (R)								
2399504	**KM25LSSR1630**	30	16	12,5	LT16ER	**SSA3T**	**SMYE3**	**SSY3T**
3176219	**KM25LSSR2230**	30	16	12,5	LT22ER	**SSA4T**	**SMYE4**	**SSY4T**
corte à esquerda (L)								
2399505	**KM25LSSL1630**	30	16	12,5	LT16EL	**SSA3T**	**SMYI3**	**SSY3T**
3176220	**KM25LSSL2230**	30	16	12,5	LT22EL	**SSA4T**	**SMYI4**	**SSY4T**





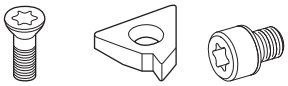




O grampo exibido nas imagens não está mais disponível.

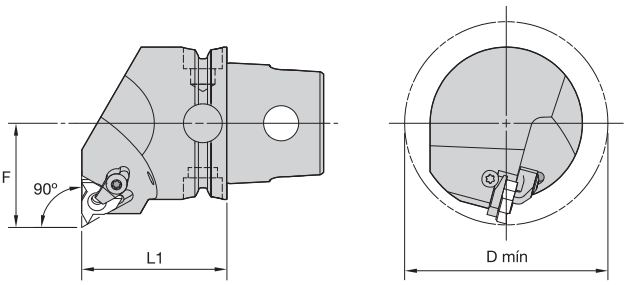
KM QUICK CHANGE

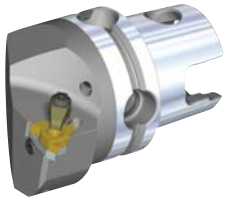
LSS 90°



número para pedido	código do produto	L1 mm	L1 pol	F mm	F pol	inserto padrão	parafuso do inserto	calço	parafuso do calço	kgs	lbs
corte à direita (R)											
3950857	**KM40TSLSSR16**	40	1.575	27	1.063	LT16ER	**SSA3T**	**SMYE3**	**SSY3T**	0,31	.68
3950858	**KM40TSLSSR22**	40	1.575	27	1.063	LT22ER	**SSA4T**	**SMYE4**	**SSY4T**	0,30	.66
3959401	**KM40TSLSSR27**	45	1.772	27	1.063	LT27ER	**SSA5T**	**SMYE5**	**SSY5T**	0,37	.82
corte à esquerda (L)											
3950855	**KM40TSLSSL16**	40	1.575	27	1.063	LT16EL	**SSA3T**	**SMYI3**	**SSY3T**	0,32	.70
3950856	**KM40TSLSSL22**	40	1.575	27	1.063	LT22EL	**SSA4T**	**SMYI4**	**SSY4T**	0,31	.68
3959400	**KM40TSLSSL27**	45	1.772	27	1.063	LT27EL	**SSA5T**	**SMYI5**	**SSY5T**	0,37	.82



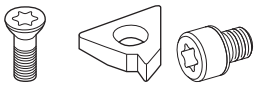




KM QUICK CHANGE

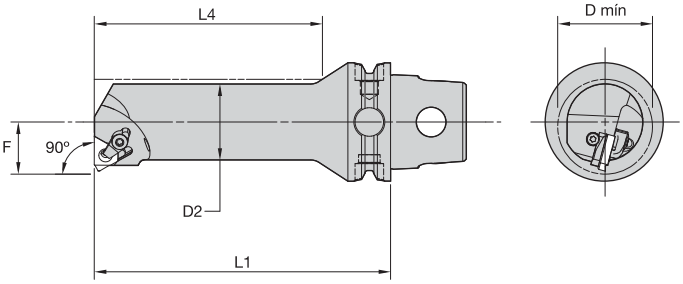
O grampo exibido nas imagens não está mais disponível.

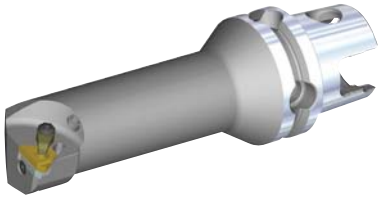
LSE-N 90° • Somente interno



número para pedido	código do produto	L1 mm	L1 pol	F mm	F pol	D mín mm	D mín pol	inserto padrão	parafuso do inserto	calço	parafuso do calço	kgs	lbs
corte à direita (R)													
3950832	**KM40TSLSER16N**	40	1.575	27	1.063	54	2.126	LT16NR	**SSA3T**	**SMYI3**	**SSY3T**	0,35	.77
3950854	**KM40TSLSER22N**	40	1.575	27	1.063	54	2.126	LT22NR	**SSA4T**	**SMYI4**	**SSY4T**	0,35	.77
3959399	**KM40TSLSER27N**	45	1.772	27	1.063	54	2.126	LT27NR	**SSA5T**	**SMYI5**	**SSY5T**	0,39	.86
corte à esquerda (L)													
3950831	**KM40TSLSEL16N**	40	1.575	27	1.063	54	2.126	LT16NL	**SSA3T**	**SMYE3**	**SSY3T**	0,35	.77







KM QUICK CHANGE

O grampo exibido nas imagens não está mais disponível.

LSE 90°

número para pedido	código do produto	D2 mm	D2 pol	D mín mm	D mín pol	F mm	F pol	L4 mm	L4 pol	L1 mm	L1 pol	inserto padrão	kgs	lbs
corte à direita (R)														
3955464	**KM40TSS10DLSER11**	10	.39	13	.51	7	.276	35	1.38	60	2.362	LT11NR	0,22	.49
3955466	**KM40TSS12ELSER11**	12	.47	16	.63	9	.354	42	1.66	70	2.756	LT11NR	0,25	.56
3955468	**KM40TSS16FLSER16**	16	.63	20	.79	11	.433	56	2.21	80	3.150	LT16NR	0,28	.61
3955470	**KM40TSS20GLSER16**	20	.79	25	.98	13	.512	70	2.76	90	3.543	LT16NR	0,34	.75
3955472	**KM40TSS25HLSER16**	25	.98	32	1.26	17	.669	75	2.95	100	3.937	LT16NR	0,50	1.11
3955474	**KM40TSS32JLSER16**	32	1.26	40	1.57	22	.866	96	3.78	110	4.331	LT16NR	0,72	1.58
3955476	**KM40TSS32JLSER22**	32	1.26	40	1.57	22	.866	96	3.78	110	4.331	LT22NR	0,71	1.56
corte à esquerda (L)														
3955463	**KM40TSS10DLSEL11**	10	.39	13	.51	7	.276	35	1.38	60	2.362	LT11NL	0,22	.49
3955465	**KM40TSS12ELSEL11**	12	.47	16	.63	9	.354	42	1.65	70	2.756	LT11NL	0,25	.55
3955469	**KM40TSS20GLSEL16**	20	.79	25	.98	13	.512	70	2.76	90	3.543	LT16NL	0,34	.75
3955471	**KM40TSS25HLSEL16**	25	.98	32	1.26	17	.669	75	2.95	100	3.937	LT16NL	0,50	1.11
3955473	**KM40TSS32JLSEL16**	32	1.26	40	1.57	22	.866	96	3.78	110	4.331	LT16NL	0,72	1.58
3955475	**KM40TSS32JLSEL22**	32	1.26	40	1.57	22	.866	96	3.78	110	4.331	LT22NL	0,71	1.56

NOTA: Itens listados sem um calço são projetados para um ângulo de inclinação de 1.5°.

Peças de reposição



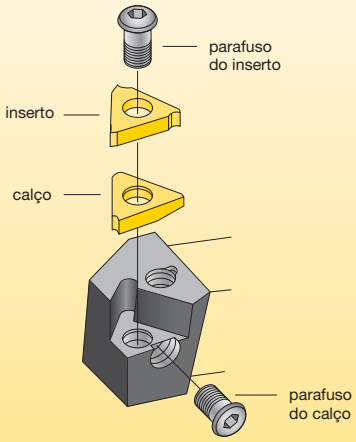


código do produto	parafuso do inserto	calço	parafuso do calço
corte à direita (R)			
KM40TSS10DLSER11	**SSN2T**	**–**	**–**
KM40TSS12ELSER11	**SSN2T**	**–**	**–**
KM40TSS16FLSER16	**SN3TPKG**	**–**	**–**
KM40TSS20GLSER16	**SSA3T**	**SMYI3**	**SSY3T**
KM40TSS25HLSER16	**SSA3T**	**SMYI3**	**SSY3T**
KM40TSS32JLSER16	**SSA3T**	**SMYI3**	**SSY3T**
KM40TSS32JLSER22	**SSA4T**	**SMYI4**	**SSY4T**
corte à esquerda (L)			
KM40TSS10DLSEL11	**SSN2T**	**–**	**–**
KM40TSS12ELSEL11	**SSN2T**	**–**	**–**
KM40TSS20GLSEL16	**SSA3T**	**SMYE3**	**SSY3T**
KM40TSS25HLSEL16	**SSA3T**	**SMYE3**	**SSY3T**
KM40TSS32JLSEL16	**SSA3T**	**SMYE3**	**SSY3T**
KM40TSS32JLSEL22	**SSA4T**	**SMYE4**	**SSY4T**

Porta-ferramentas para rosqueamento

Em todos os casos, é importante a escolha do calço adequado.

Os porta-ferramentas da Kennametal são fornecidos com um calço para um ângulo de posição de 1,5°. Troque o calço se a sua rosca tiver mais de 1° de diferença. Para mais detalhes sobre a escolha correta dos calços, veja as páginas D109–D110.



tamanho do inserto e do parafuso	parafuso do inserto	calço	parafuso e arruela do calço
3ER	SS-A3T	SM-YIE3	SS-Y3T
3EL	SS-A3T	SM-YI3	SS-Y3T
4ER	SS-A4T	SM-YIE4	SS-Y4T
4EL	SS-A4T	SM-YI4	SS-Y4T
Barras de mandrilar de rosqueamento de assentamento			
2IR	SS-N2T	–	–
2IL	SS-N2T	–	–
3IR	SS-A3T	SM-YI3	SS-Y3T
3IL	SS-A3T	SM-YIE3	SS-Y3T
4IR	SS-A4T	SM-YI4	SS-Y4T
4IL	SS-A4T	SM-YIE4	SS-Y4T

SM	—	Y	E	3	—	2N
Calço		Calço Y para insertos padrão de assentamento	E – Externo I – Interno	IC – 16mm		Ângulo do calço

2P	2° positivo
1P	1° positivo
–	0º
1N	1º negativo
2N	2º negativo
3N	3º negativo

ângulo resultante		3.5º	2.5º	1.5º	0.5º	-0.5º	-1.5º
tamanho do inserto (iC)	porta-ferramenta	código para pedido do calço					
16mm	Por exemplo, RH/pol. LH ex. LH/pol. RH (MD)	SM-YE3-2P SM-YI3-2P	SM-YE3-1P SM-YI3-1P	SM-YE3 SM-YI3	SM-YE3-1N SM-YI3-1N	SM-YE3-2N SM-YI3-2N	SM-YE3-3N SM-YI3-3N
16m	Por exemplo, RH/pol. LH ex. LH/pol. RH (MD)	SM-YE4-2P SM-YI4-2P	SM-YE4-1P SM-YI4-1P	SM-YE4 SM-YI4	SM-YE4-1N SM-YI4-1N	SM-YE4-2N SM-YI4-2N	SM-YE4-3N SM-YI4-3N

Kit de calço inclinado

Como talvez sejam necessários calços diferentes daqueles fornecidos com nossos suportes de ferramenta padrão, recomendamos que os kits de calço estejam prontamente disponíveis em todas as lojas de ferramenta.

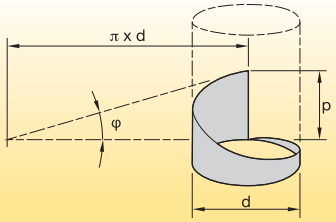
tamanho do inserto	tamanho do calço (D)	código do pedido	contém calços em ângulo
3x	16mm	ABY3SET	SM-YE3-2P, 1P, 1N, 2N, 3N SM-YI3-2P, 1P, 1N, 2N, 3N
4x	16mm	ABY4	SM-YE4-2P, 1P, 1N, 2N, 3N SM-YI4-2P, 1P, 1N, 2N, 3N

Ângulo de hélice

Exemplo:
d = 48,06mm (1,892")
p = 3,175mm (0,125")

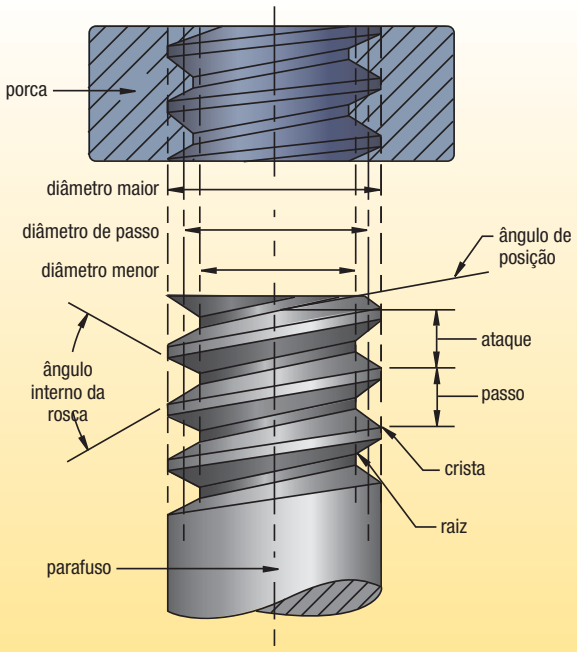
ϕ = Ângulo da hélice
p = passo
d = diâmetro do passo

$$\phi = \arctan\left(\frac{p * \text{entradas}}{\pi * \varnothing}\right) = 1.13°$$



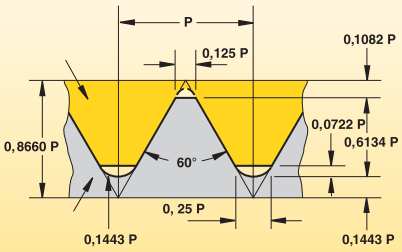
Definições da rosca do parafuso

1. **Diâmetro maior** — O maior diâmetro de uma rosca do parafuso reta. Isso se aplica tanto a roscas internas quanto externas.
2. **Diâmetro do passo** — Em uma rosca reta, é o diâmetro que passa através do perfil da rosca em tais pontos, o que faz com que a largura do canal da rosca seja igual à metade do passo básico. Em uma "rosca perfeita", isso ocorre no ponto onde as larguras da rosca e do canal são iguais.
3. **Ângulo da rosca (interno**) — O ângulo interno entre os flancos individuais da forma da rosca.
4. **Diâmetro menor** — O menor diâmetro de uma rosca do parafuso reta. Isso se aplica tanto a roscas internas quanto externas.
5. **Ângulo de posição**— Em uma rosca reta, o ângulo de posição é o angulo criado pela hélice da rosca no diâmetro primitivo com um plano perpendicular ao eixo.
6. **Ataque** — A distância que uma rosca do parafuso avança axialmente em uma volta. Em roscas de uma só entrada, o passo e o passo de hélice são idênticos. O ataque é igual ao passo multiplicado pelo número de entradas.
7. **Passo** — É a distância de um ponto em uma rosca do parafuso ao ponto correspondente na próxima rosca medida paralelamente ao eixo da rosca.
8. **Crista** — A superfície mais externa da forma da rosca que se une aos flancos.
9. **Raiz** — A superfície mais interna da forma da rosca que se une aos flancos.



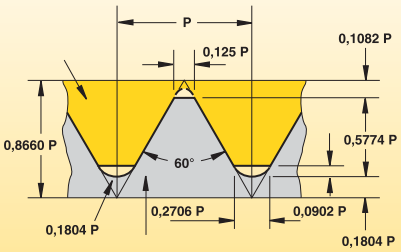
NOTA: As roscas por polegada (TPI) não são mostradas:
O número de fios por polegada é medido axialmente.
Os termos passo e FPP são frequentemente usados de modo alternado. FPP = 1/passo

ISO M (Métrica) e UN (Unificada Nacional)



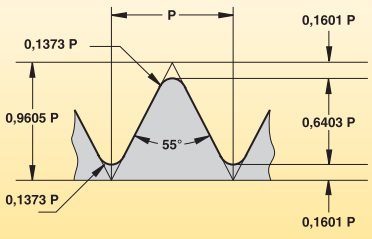
Uso: Todos os ramos da indústria mecânica.

UNJ (raio de raiz controlado)



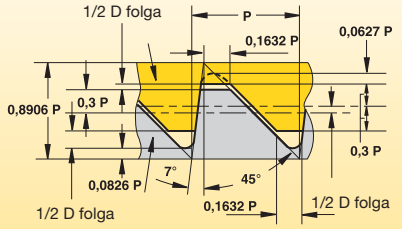
Uso: Indústrias aeroespacial e espacial.

Whitworth (BSW)



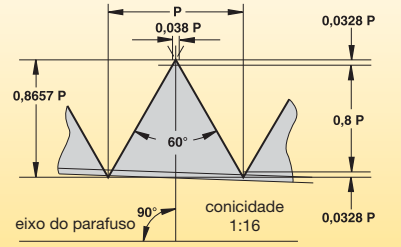
Uso: Conexões e acessórios para tubulações de redes de gás, água e esgoto (substituídas pela ISO).

Buttress americana



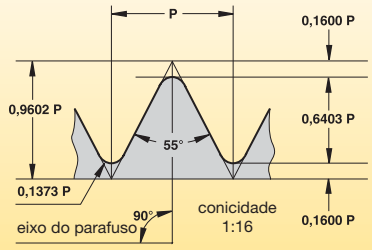
Uso: Conexões e acessórios para tubulações.

NPT (Rosca para tubo padrão nacional americano)



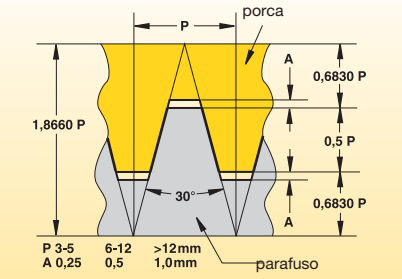
Uso: Conexões e acessórios para tubulações.

BSPT (Rosca para tubo padrão britânico)



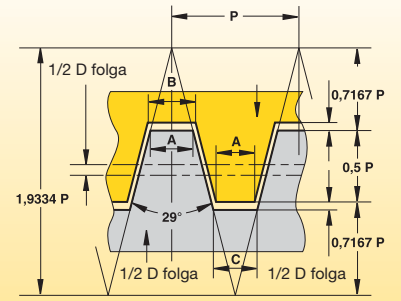
Uso: Rosca para tubulações de redes de vapor, gás e água.

TR DIN 103



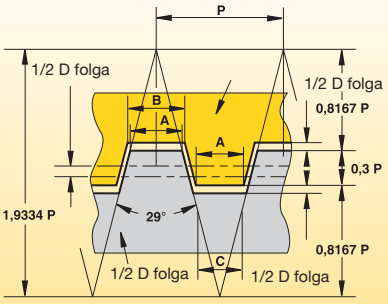
Uso: Indústria mecânica de fusos de transmissão de movimento.

Acme



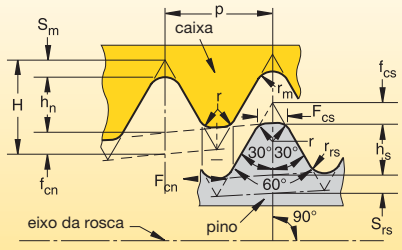
A = 0,0307 P
B = 0,3707 P—x D folga
C = 0,3707 P—(D1 folga—D2 folga)
Uso: Acme - geralmente é usada na indústria mecânica de fusos de transmissão de movimento.

Acme, truncada (Stub)



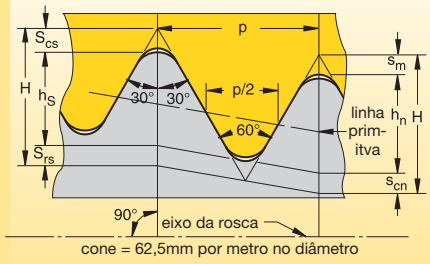
A = 0,4224 P
B = 0,4224 P—x D folga
C = 0,4224 P—(D1 folga—D2 folga)
Uso: Onde a Acme normal é muito profunda.

Conexão de flanges rotativos API



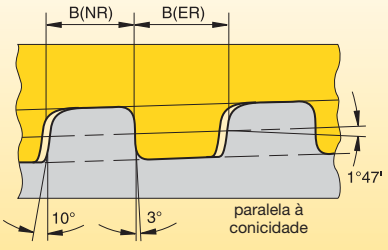
NOTA: Cone mostrado com exagero.

Forma de rosca de revestimento e tubular redondo API



NOTA: Cone mostrado com exagero.

Buttress API

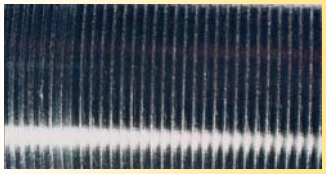


Classes e velocidades sugeridas para rosqueamento de vários materiais das peças

grupo de materiais das peças	materiais das peças	velocidade de corte (vc) recomendada— SFM				
		sem revestimento	com revestimento PVD			
		K68	KC5010	KC5025	KC5410	KU25T
aço carbono de usinagem livre	10L18, 10L45, 1213, 12L13, 12L14, 1140, 1141, 11L44, 1151, 10L50	—	91–198	45–198	—	91–137
aço carbono básico	10063, 1008, 1010, 1015, 1018, 1020, 1025, 1026, 1108, 1117	—	76–198	45–175	—	76–122
aços-liga/aços-ferramenta de 150 a 325 HB (até 35 HRC)	1042, 1045, 1070, 1080, 1085, 1090, 1095, 1541, 1561, 1572, 5140, 8620, W1, O1, S1, P20, H13, D2, A6, H13, L6	—	76–198	38–167	—	73–122
aços-liga/aços-ferramenta de 330 a 450 HB (de 36 a 47 HRC)		—	61–160	—	—	61–106
endurecimento martensítico/ ferrítico aço inoxidável/por precipitação	416, 420F, 440F, 405, 409, 429, 430, 434, 436, 442, PH	—	45–160	30–122	—	24–61
aços inoxidáveis austeníticos	201, 202, 301, 302, 303, 304, 304, 305, 321, 347, 348, 310, 314, 316, 316L, 330	61–106	61–198	46–137	—	24–106
ferros fundidos cinzentos de 135 a 270 HB	classe 20, 30, 35, 45	61–91	61–237	46–122	—	30–110
ferros fundidos cinzentos de 275 a 450 HB	classe 50, 55, 60	45–76	45–175	15–76	—	30–110
ferro fundido de liga/nodular	A536, J434C, 60-40-18, 80-55-06, 100-70-03	45–76	45–198	30–160	—	30–110
ligas de alumínio de usinagem livre	2024-T4, 2014-T6, 6061-T6 2011-T3, 3003-H18, A2, Alcan, Alcoa 510, Duralumin	122–244	122–365	—	152–457	30–305
ligas de alumínio com alto teor de silício	A380, A390, A380-1, A390-1, A380-2	—	—	—	—	—
cobre/zinco/latão/bronze		76–183	76–304	46–236	—	30–244
não metálicos	Grafite, náilon, plásticos, borrachas, fenóis e carbono	122–457	122–396	46–305	—	30–244
ligas resistentes à alta temperatura de 125 a 269 HB (até 27 HRC)	Nickel 200, Monel, R405, Monel K500, INCONEL 600, INCONEL® 625/901x750/718, Waspaloy, Hastelloy C	24–37	24–122	13–76	—	11–85
ligas resistentes à alta temperatura de 260 a 450 HB (de 26 a 47 HRC)	Rene 95, Waspaloy A286, Incoloy 800, Haynes 188, Stellite F, Haynes 25	24–30	30–76	6–61	—	11–61
ligas de titânio	Ti-6Al-4V, TI-5Al-2.5Sn	34–55	34–99	—	—	11–76

NOTA: Quando os níveis de dureza da peça estiverem no topo da faixa, a velocidade inicial em m/min. deverá estar no mínimo. Verifique regularmente se nos grampos dos insertos há superfícies desgastadas

Preparação de aresta:
Sem revestimento — afiada
Revestimento PVD — leve arredondamento da aresta, exceto inclinação superior positiva, inclinação superior afiada

problema	causa	solução possível
rosca com acabamento áspero 	• Fresas pequenas. • Acabamento áspero. • Etapas. • Calço inadequado. • Penetração inadequada.	• Use uma penetração de flanco modificada. • Use insertos de perfil total. • Aumente a concentração de fluído refrigerante. • Aumenta a m/mm. • Verificar o eixo de deslocamento Z da máquina. • Verificar a forma do inserto. • Verificar o calço correto no sistema LT. • Calcular a folga do flanco.
vibração 	• Pouca rigidez. • Movimentação do inserto. • Penetração inadequada. • Fora da linha de centro.	• Use uma penetração de flanco modificada. • Minimizar o balanço da ferramenta. • Verificar a deflexão da peça. • Verificar o inserto e a fixação. • Verificar se a posição de corte da ferramenta está na linha de centro da peça. • Ajustar o número de passadas. Passadas menores reduzem a vibração por ressonância.
aresta postiça 	• Velocidade muito baixa. • Refrigeração insuficiente. • Carga de cavacos.	• Aumento da m/mm. • Aumentar a concentração de fluído refrigerante e/ou o fluxo. • Ajustar o ângulo de penetração. • Aumentar a profundidade de corte por passada.
deformação 	• Classe errada. • Velocidade muito alta. • Ângulo de penetração inadequado. • Refrigeração insuficiente.	• Use uma penetração de flanco modificada. • Use uma classe mais resistente ao desgaste (por exemplo, KC5010™). • Redução da m/mm. • Aumentar o fluxo de fluído refrigerante.
cavacos  	• Penetração inadequada. • Carga de cavacos • Classe errada. • Velocidade incorreta. • Pouca rigidez.	• Use uma penetração de flanco modificada. • Aumentar ou diminuir o número de passadas. • Eliminar as passadas de efeito mola. • Use uma classe mais tenaz (por exemplo, KC5025™). • Aumentar a velocidade de corte se houver lascamento na aresta traseira. • Diminuir a velocidade de corte se houver lascamento na aresta dianteira. • Minimizar o balanço da ferramenta. • Verificar a movimentação e a fixação do inserto. Faça o torque do parafuso ou do grampo para o valor correto. • Verificar uma possível deflexão da peça. • Calcular a folga do flanco. • Proporcione um calço correto.
ponta quebrada 	• Carga excessiva de cavacos. • Raio de ponta pequeno. • Classe errada. • Penetração inadequada.	• Use uma penetração de flanco modificada. • Diminuir a carga de cavacos. • Use um raio de ponta maior, se possível. • Use uma classe mais tenaz (por exemplo, KC5025).
desgaste de flanco 	• Calço inadequado. • Classe errada. • Refrigeração insuficiente. • Fora da linha de centro. • Folga de flanco insuficiente. • Ângulo de penetração inadequado.	• Proporcione um calço correto. • Use uma classe mais resistente a desgaste (por exemplo, KC5025). • Aumentar o fluxo de fluído refrigerante. • Verificar a altura da linha de centro da ferramenta. (Quanto menor o diâmetro, mais crítica a necessidade da precisão da linha de centro.) • Calcule a folga do flanco e mude o calço para aumentar a folga no flanco gasto. • Se o desgaste for no flanco posterior, aumente a folga do ângulo de penetração.

(continuação)

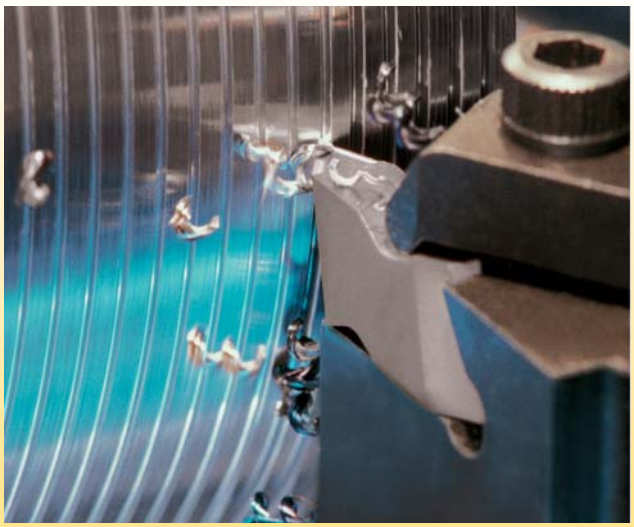
(Informações técnicas • Guia de falhas e soluções — continuação)

problema	solução possível																	
	Aumentar a m/mm	Reduzir a m/mm	aumentar a carga de cavacos	diminuir a carga de cavacos onde a falhas ocorrem	usar uma classe mais tenaz de de classe de metal duro	usar uma classe mais dura de classe de metal duro	aplicar líquido refrigerante	usar metal duro com revestimento	usar inserto com perfil completo	mudar o ângulo de penetração	verificar se há movimentação do inserto e reassentar	reduzir o balanço da ferramenta	selecionar novamente o calço	aplicar o estilo de quebra-cavacos	reduzir a DOC	ajustar a altura do centro	começar o ponto de início das roscas 12mm antes da peça	mudar o método de penetração
vibração	•			•							•	•				•		•
rebarba na crista	•								•									•
vida útil da ferramenta curta		•	•	•		•		•										•
aresta dianteira lascada			•	•	•													
aresta traseira lascada					•					•								
ponta quebrada (primeiro passe)	•														•	•		
ponta quebrada (depois do primeiro passe)				•	•					•			•					•
aresta postiça na aresta de corte	•		•				•	•										•
perfil completo prematuro													•					
filetes divididos																	•	
baixa evacuação de cavacos														•				•

A tecnologia de insertos da Kennametal traz o controle do cavaco para as suas operações de rosqueamento com a plataforma Top Notch™. O canal rebaixado para cavacos exclusivo da Kennametal, quando usado de acordo com as nossas recomendações, controla o cavaco na maioria das aplicações. Nosso projeto de ângulo de saída positivo diminui as pressões de corte, as quais por sua vez, reduzem a geração de calor danosa resultando, dessa forma, em maior vida útil da ferramenta. Os cavacos longos como fios não mais danificarão o acabamento superficial da peça. O perigo para os operadores ao remover os cavacos longos da peça e da placa é eliminado. Todos esses benefícios unidos para melhorar a produtividade das suas operações de rosqueamento.

O último passe

Alguns controles CNC requerem que o último passe esteja no ângulo de penetração 0°, porque senão o cavaco não quebrará no último passe. Na maior parte dos carbonos e aços de liga, o último passe pode continuar na profundidade de corte de 0,127mm e produzir um acabamento satisfatório. Para alguns materiais, deve ser usado um passe de 0,025 a 0,076mm (efeito mola) para aumentar o acabamento superficial, porém, a ação de quebra do cavaco poderá ficar comprometida.

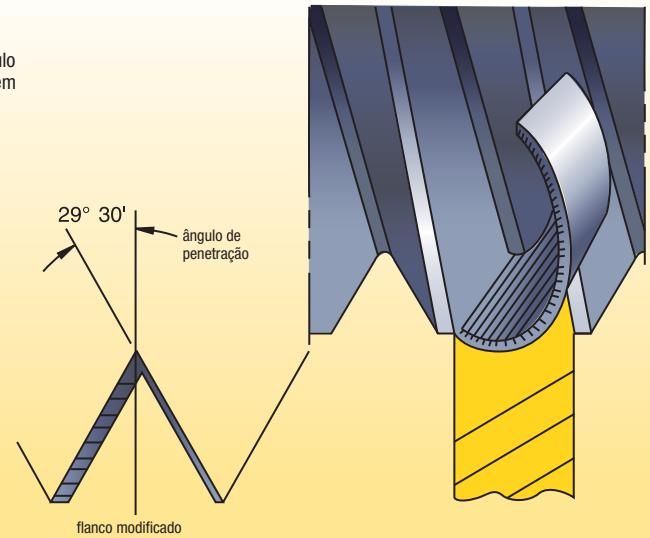


Programação da máquina

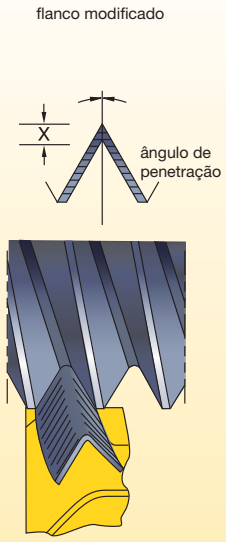
Os controles CNC modernos permitem ao programador ajustar facilmente o ângulo de penetração, o número de passes e a profundidade de corte de cada passe. O inserto para rosqueamento com controle de cavacos trabalha melhor com um ângulo de penetração de 29° 30', embora seja aceitável entre 15° e 30°. É importante também manter um mínimo de profundidade de corte de 0,127mm em cada passe. Em muitas aplicações, o uso de ciclos fechados em CNC produz somente resultados medianos. Os programas personalizados são melhores e mais recomendados.

Ângulo de penetração

Para quebrar os cavacos de modo efetivo e constante, é importante usar um ângulo de penetração entre 28° e 29° 30'. Não aplicar insertos com controle do cavaco em ângulos de penetração menores que 15°.



Radial



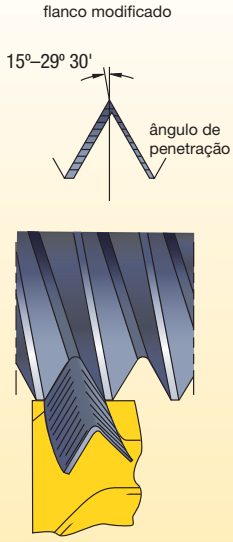
Vantagem —

- O corte em ambos os lados da rosca posiciona toda a aresta de corte no corte, protegendo-a de cavacos.
- Desgaste regular do inserto.

Desvantagem —

- A ferramenta desenvolve um cavaco tipo canal que pode ser difícil de manusear.
- Ocorrem cavacos na ponta quando materiais de alta tensão são cortados.
- Aumenta a formação de rebarbas.
- A aresta de corte inteira é aglutinada no acabamento da rosca, causando maior tendência à vibração.

Flanco modificado



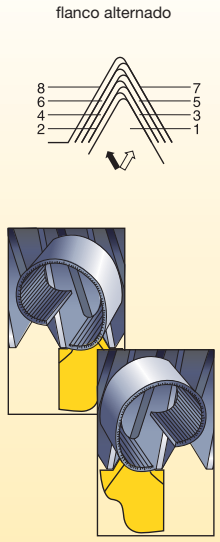
Vantagem —

- A ferramenta corta ambos os lados da rosca, assim, fica protegida contra cavacos, similar a um ângulo de penetração de 0˚. O cavaco tipo canal é formado, mas a espessura irregular do cavaco ajuda a remover o cavaco, similar a penetração no flanco.
- Este é o método preferido, especialmente quando usado com um inserto com controle do cavaco.
- Penetrações radiais e/ou no flanco alternado combinadas.
- Resulta em excelente vida útil da ferramenta, com o desgaste distribuído uniformemente nos dois flancos.

Desvantagem —

- Desvantagens similares às do ângulo de penetração de 0˚, embora bastante reduzidas já que as forças de corte são mais bem equilibradas e o fluxo do cavaco, não são um problema acentuado.

Flanco alternado



Vantagem —

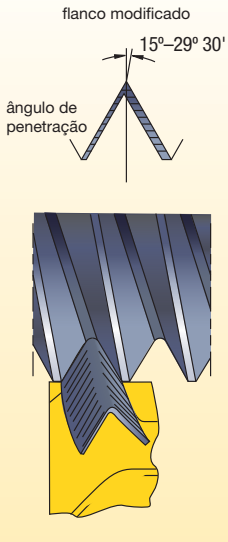
- Maior vida útil da ferramenta porque ambas as arestas são usadas igualmente.

NOTA: Algumas máquinas ferramentas podem exigir técnicas de programação especiais para alcançar este método de penetração.

Desvantagem —

- Difícil de cortar em máquinas convencionais.

Flanco modificado revertido



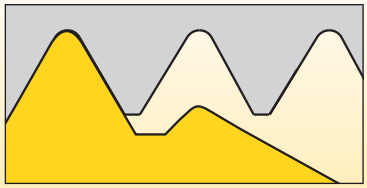
Vantagem —

- A ferramenta corta ambos os lados da rosca, assim, fica protegida contra cavacos, similar a um ângulo de penetração de 0˚. O cavaco tipo canal é formado, mas a espessura irregular do cavaco ajuda a remover o cavaco, similar a penetração no flanco.
- Este é o método preferido, especialmente quando usado com um inserto com controle do cavaco.
- Penetrações radiais e/ou no flanco alternado combinadas.
- Resulta em excelente vida útil da ferramenta, com o desgaste distribuído uniformemente nos dois flancos.
- Como o fluxo do cavaco é a direção de penetração revertida, esta é uma excelente escolha para o rosqueamento interno.

Desvantagem —

- A programação precisa ser feita linha a linha.

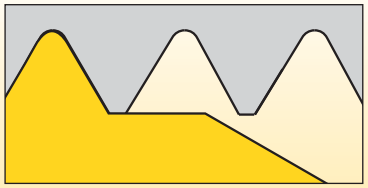
Perfil parcial



Perfil do dente parcial universal:

- Estoque reduzido.
- Para vários passos em uma faixa limitada.
- Os diâmetros maiores/menores devem ser pré-torneados com precisão.

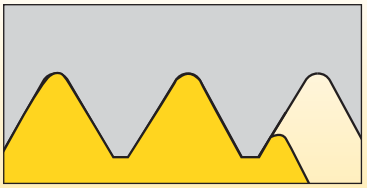
Perfil completo



Perfil do dente completo incluindo a altura do dente:

- Para operações sem rebarbas e roscas precisas no passo especificado.
- Aplicação geral.
- Margem de usinagem para um diâmetro externo/do centro em torno de 0,004– a 0,006".

Perfil de multifacas



Perfil de multidentes geralmente com 2 a 3 dentes:

- Rosqueamento altamente produtivo com menos passes e maior vida útil da ferramenta.
- Requer uma configuração rígida e batimento longo da rosca.

Fórmulas

Fórmula métrica		
para encontrar	**dada**	**fórmula**
m/mín	D (mm) RPM	$m/mín = \frac{\pi \times D}{1.000} \times RPM$
RPM	D (mm) m/mín	$RPM = \frac{m/mín \times 1000}{D \times \pi}$

Legenda

m/mín	=	metros por minuto
RPM	=	revoluções por minuto
D	=	diâmetro da peça
π	=	3,1416

Velocidades máximas de corte

A velocidade máxima de corte em máquinas mais antigas é frequentemente limitada pela velocidade de deslocamento máximo (IPM ou mm/min.) da ferramenta permitida pela máquina. Verifique a velocidade máxima com as seguintes fórmulas:

fórmula métrica: velocidade máxima de corte (m/mín) = diâmetro da peça (mm) x 3,14 x (1/passo) x $\frac{mm/mín\ máx.}{1000mm}$

Folga do flanco

γ = arctan (sin (β/2) * tan(α))
γ = folga lateral (flanco)
β = ângulo incluído da rosca
α = ângulo de inclinação radial

Rosca	Ângulo	Externo	Interno
UN & ISO	60	5.3	8
BSW	55	4.8	7.3
TR	30	2.6	4
ACME	29	2.6	3.9
AMBUT	7	.6	.9
AMBUT	45	4	6

Recomendações para passes de penetração de rosqueamento

FPP	48–32	28–24	20–16	14–12	11.5–9	8–6	5–4	3–2
passo métrico (mm)	0,50–0,75	0,80–1	1,25–1,5	1,75–2	2,5–3	3,5–4	4,5–6	8,0
Tipo de rosca	**número recomendado de passes**							
Formas de roscas V comuns ISO, UN, UNJ, NPT, Whitworth, BSPT e de flanges rotativos API	4–5	5–6	6–8	8–10	9–12	12–15	14–16	15–25
Acme, Trapez, redonda, redonda API	—	—	5–6	7–8	10–11	12–13	13–15	18–20
Stub Acme e Buttress API	—	—	5	5–6	7–8	8–10	10–12	14–16
Buttress americana	—	—	7–8	9–10	11–12	13–15	17–19	22–24

NOTA: Manter uma penetração mínima de 0,05mm nos últimos passes para evitar endurecimento de trabalho e abrasão excessiva da ferramenta de rosqueamento.

Valores de penetração de volume constante para operações de rosqueamento

Em muitas aplicações, o uso de ciclos fechados em CNC produz somente resultados medianos. Por exemplo, uma rosca externa de 8 passos tem uma profundidade de 2mm (0,0789").

$$\Delta ap_x = \frac{ap}{\sqrt{nap-1}} * \sqrt{\phi}$$

Fórmula para a penetração constante da carga de cavacos

Δap = penetração radial
x = passe atual (de 1 ao nap)
nap = número de passes
ϕ = primeiro passe, 0,3
segundo passe, 1
terceiro passe e além, x-1

Usando a penetração radial

Tensão por flexão na aresta de corte causada pelos cavacos em forma de V em materiais de peças de aço com formação de cavacos longos.

Altas forças de corte com espessuras de corte pequenas requerem arestas afiadas com alta resistência.

Usando a penetração no flanco

Menor tensão por flexão e arestas de corte estáveis produzem formas de cavacos mais favoráveis e maiores espessuras de corte.

Metais duros com alta dureza, boa resistência a desgaste e estabilidade de temperatura são vantajosos.

Diretrizes para a penetração —
Como determinar o número e o tamanho dos passes

O número de passes "s" por rosca é decisivo para um rosqueamento e um torneamento de perfil completo bem-sucedidos. As tabelas seguintes fornecem valores padrão para as condições de aplicação para a usinagem de aço.
O número adequado de passes deve ser determinado empiricamente.

Se ocorrerem quebras de insertos, o número de passes deve ser aumentado. Se aumentar o desgaste, o número de passes deve ser diminuído. A espessura do cavaco não deverá ser menor que 0,05mm. O sobremetal para o diâmetro não deverá exceder 0,2mm.

Corte de rosca externa, métrica ISO

passo da rosca P (mm)	0,50	0,75	1,00	1,25	1,50	1,75	2,00	2,50	3,00	3,50	4,00	4,50	5,00
T Ap (mm)	0,305	0,457	0,610	0,762	0,914	1,067	1,219	1,524	1,829	2,159	2,464	2,769	3,073
N Ap	4	4	5	6	6	8	8	10	12	14	15	15	16
	valores de penetração no flanco (X/Z)												
ordem dos passes	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z
1	0,096	0,145	0,167	0,187	0,224	0,221	0,252	0,278	0,302	0,328	0,361	0,405	0,435
2	0,080	0,119	0,138	0,154	0,185	0,182	0,208	0,230	0,249	0,271	0,298	0,335	0,359
3	0,073	0,109	0,126	0,141	0,169	0,167	0,191	0,210	0,228	0,248	0,273	0,306	0,329
4	0,056	0,084	0,097	0,108	0,130	0,128	0,146	0,161	0,175	0,190	0,209	0,235	0,252
5			0,082	0,091	0,110	0,108	0,123	0,136	0,148	0,160	0,176	0,198	0,213
6				0,080	0,097	0,095	0,109	0,120	0,130	0,141	0,155	0,175	0,187
7						0,086	0,098	0,108	0,118	0,128	0,141	0,158	0,169
8						0,079	0,090	0,100	0,108	0,118	0,129	0,145	0,156
9								0,093	0,101	0,109	0,120	0,135	0,145
10								0,087	0,095	0,103	0,113	0,127	0,136
11									0,089	0,097	0,107	0,120	0,129
12									0,085	0,092	0,102	0,114	0,122
13										0,088	0,097	0,109	0,117
14										0,085	0,093	0,105	0,112
15											0,090	0,101	0,108
16													0,104
T Ap (mm)	0,305	0,457	0,610	0,762	0,914	1,067	1,219	1,524	1,829	2,159	2,464	2,769	3,073

NOTA: Sempre reserve 0,08–0,13mm de estoque extra para insertos de perfil completo.

Corte de rosca interna, métrica ISO

passo da rosca P (mm)	0,50	0,75	1,00	1,25	1,50	1,75	2,00	2,50	3,00	3,50	4,00	4,50	5,00
T Ap (mm)	0,279	0,406	0,533	0,686	0,813	0,940	1,092	1,346	1,626	1,905	2,159	2,438	2,718
N Ap	4	4	5	6	6	8	8	10	11	12	14	15	16
	valores de penetração no flanco (X/Z)												
ordem dos passes	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z
1	0,088	0,129	0,146	0,168	0,199	0,195	0,226	0,246	0,282	0,315	0,328	0,357	0,384
2	0,073	0,106	0,121	0,139	0,164	0,161	0,187	0,203	0,232	0,260	0,271	0,295	0,317
3	0,067	0,097	0,110	0,127	0,151	0,147	0,171	0,186	0,213	0,238	0,248	0,270	0,291
4	0,051	0,075	0,085	0,097	0,116	0,113	0,131	0,143	0,163	0,183	0,190	0,207	0,223
5			0,071	0,082	0,097	0,095	0,111	0,120	0,138	0,154	0,160	0,175	0,188
6				0,072	0,086	0,084	0,097	0,106	0,121	0,136	0,141	0,154	0,166
7						0,076	0,088	0,096	0,110	0,123	0,128	0,139	0,150
8						0,070	0,081	0,088	0,101	0,113	0,118	0,128	0,138
9								0,082	0,094	0,105	0,109	0,119	0,128
10								0,077	0,088	0,099	0,103	0,112	0,120
11									0,083	0,093	0,097	0,106	0,114
12									0,000	0,089	0,092	0,101	0,108
13										0,000	0,088	0,096	0,103
14										0,000	0,085	0,092	0,099
15											0,000	0,089	0,096
16													0,092
T Ap (mm)	0,279	0,406	0,533	0,686	0,813	0,940	1,092	1,346	1,626	1,905	2,159	2,438	2,718

NOTA: Sempre reserve 0,08–0,13mm de estoque extra para insertos de perfil completo.

Corte de rosca externa, rosca UN

FPP	24	20	18	16	14	12	11	10	9	8	7	6	5
T Ap (mm)	0,660	0,787	0,864	0,965	0,914	1,067	1,219	1,524	1,829	2,159	2,464	2,769	3,073
N Ap	5	6	6	7	9	9	10	11	12	13	14	15	16
	valores de penetração no flanco (X/Z)												
ordem dos passes	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z
1	0,181	0,193	0,212	0,216	0,177	0,207	0,223	0,264	0,302	0,341	0,374	0,405	0,435
2	0,149	0,159	0,175	0,178	0,146	0,171	0,184	0,218	0,249	0,282	0,309	0,335	0,359
3	0,137	0,146	0,160	0,163	0,134	0,156	0,168	0,200	0,228	0,258	0,283	0,306	0,329
4	0,105	0,112	0,123	0,125	0,103	0,120	0,129	0,153	0,175	0,198	0,217	0,235	0,252
5	0,088	0,094	0,103	0,106	0,087	0,101	0,109	0,129	0,148	0,167	0,183	0,198	0,213
6		0,083	0,091	0,093	0,076	0,089	0,096	0,114	0,130	0,147	0,161	0,175	0,187
7				0,084	0,069	0,080	0,087	0,103	0,118	0,133	0,146	0,158	0,169
8					0,063	0,074	0,080	0,095	0,108	0,122	0,134	0,145	0,156
9					0,059	0,069	0,074	0,088	0,101	0,114	0,125	0,135	0,145
10							0,070	0,083	0,095	0,107	0,117	0,127	0,136
11								0,078	0,089	0,101	0,111	0,120	0,129
12									0,085	0,096	0,105	0,114	0,122
13										0,092	0,101	0,109	0,117
14											0,097	0,105	0,112
15												0,101	0,108
16													0,104
T Ap (mm)	0,660	0,787	0,864	0,965	0,914	1,067	1,219	1,524	1,829	2,159	2,464	2,769	3,073

NOTA: Sempre reserve 0,08–0,13mm de estoque extra para insertos de perfil completo.

Corte de rosca interna, rosca UN

FPP	24	20	18	16	14	12	11	10	9	8	7	6	5
T Ap (mm)	0,584	0,686	0,762	0,864	0,991	1,143	1,245	1,372	1,524	1,727	1,956	2,286	2,743
N Ap	5	6	6	7	8	9	9	10	11	12	13	14	15
	valores de penetração no flanco (X/Z)												
ordem dos passes	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z
1	0,160	0,168	0,187	0,193	0,205	0,221	0,241	0,250	0,264	0,285	0,309	0,347	0,402
2	0,132	0,139	0,154	0,159	0,169	0,183	0,199	0,207	0,218	0,236	0,255	0,287	0,332
3	0,121	0,127	0,141	0,146	0,155	0,167	0,182	0,189	0,200	0,216	0,234	0,263	0,304
4	0,093	0,097	0,108	0,112	0,119	0,128	0,140	0,145	0,153	0,166	0,179	0,202	0,233
5	0,078	0,082	0,091	0,094	0,100	0,108	0,118	0,123	0,129	0,140	0,151	0,170	0,196
6		0,072	0,080	0,083	0,088	0,095	0,104	0,108	0,114	0,123	0,133	0,150	0,173
7				0,075	0,080	0,086	0,094	0,098	0,103	0,111	0,120	0,135	0,156
8					0,073	0,079	0,086	0,090	0,095	0,102	0,111	0,124	0,144
9						0,074	0,080	0,084	0,088	0,095	0,103	0,116	0,134
10								0,078	0,083	0,089	0,097	0,109	0,126
11									0,078	0,085	0,092	0,103	0,119
12										0,080	0,087	0,098	0,113
13											0,083	0,094	0,108
14											0,080	0,090	0,104
15													0,100
16													
T Ap (mm)	0,584	0,686	0,762	0,864	0,991	1,143	1,245	1,372	1,524	1,727	2,036	2,286	2,743

NOTA: Sempre reserve 0,08–0,13mm de estoque extra para insertos de perfil completo.

Usinagem de rosca externa e interna, rosca NPT

FPP	27	18	14	11.5	8
T Ap (mm)	0,762	1,118	1,422	1,727	2,489
N Ap	6	8	10	12	14
	valores de penetração no flanco (X/Z)				
ordem dos passes	X/Z	X/Z	X/Z	X/Z	X/Z
1	0,187	0,231	0,260	0,285	0,378
2	0,154	0,191	0,214	0,236	0,312
3	0,141	0,175	0,196	0,216	0,286
4	0,108	0,134	0,151	0,166	0,219
5	0,091	0,113	0,127	0,140	0,185
6	0,080	0,100	0,112	0,123	0,163
7		0,090	0,101	0,111	0,147
8		0,083	0,093	0,102	0,135
9			0,087	0,095	0,126
10			0,081	0,089	0,118
11				0,085	0,112
12				0,080	0,107
13					0,102
14					0,098
15					
16					
T Ap (mm)	0,762	1,118	1,422	1,727	2,489

NOTA: Sempre reserve 0,08–0,13mm de estoque extra para insertos de perfil completo.

Usinagem de rosca externa e interna, rosca BSPT

FPP	28	19	14	11
T Ap (mm)	0,584	0,864	1,168	1,448
N Ap	5	8	10	12
	valores de penetração no flanco (X/Z)			
ordem dos passes	X/Z	X/Z	X/Z	X/Z
1	0,160	0,179	0,213	0,239
2	0,132	0,148	0,176	0,197
3	0,121	0,135	0,161	0,181
4	0,093	0,104	0,124	0,139
5	0,078	0,087	0,104	0,117
6		0,077	0,092	0,103
7		0,070	0,083	0,093
8		0,064	0,076	0,086
9			0,071	0,080
10			0,067	0,075
11				0,071
12				0,067
13				
14				
15				
16				
T Ap (mm)	0,584	0,864	1,168	1,448

Usinagem de rosca externa e interna, rosca trapezoidal conforme a norma DIN 103

passo	1,5	2	3	4	5
T Ap (mm)	1,016	1,245	1,753	2,261	2,743
N Ap	6	8	10	12	14
	valores de penetração no flanco (X/Z)				
ordem dos passes	X/Z	X/Z	X/Z	X/Z	X/Z
1	0,249	0,258	0,320	0,373	0,417
2	0,206	0,213	0,264	0,308	0,344
3	0,188	0,195	0,242	0,282	0,315
4	0,144	0,150	0,186	0,217	0,242
5	0,122	0,126	0,157	0,183	0,204
6	0,107	0,111	0,138	0,161	0,180
7		0,100	0,125	0,145	0,162
8		0,092	0,115	0,134	0,149
9			0,107	0,125	0,139
10			0,100	0,117	0,131
11				0,111	0,123
12				0,105	0,117
13					0,112
14					0,108
15					
16					
T Ap (mm)	1,016	1,245	1,753	2,261	2,743

NOTA: Sempre reserve 0,08–0,13mm de estoque extra para insertos de perfil completo.

Usinagem de rosca externa e interna, rosca redonda conforme a norma DIN 405

passo	10	8	6
T Ap (mm)	1,321	1,626	2,159
N Ap	8	10	12
	valores de penetração no flanco (X/Z)		
ordem dos passes	X/Z	X/Z	X/Z
1	0,273	0,297	0,357
2	0,226	0,245	0,294
3	0,207	0,224	0,270
4	0,159	0,172	0,207
5	0,134	0,145	0,174
6	0,118	0,128	0,154
7	0,107	0,116	0,139
8	0,098	0,106	0,128
9		0,099	0,119
10		0,093	0,112
11			0,106
12			0,100
13			
14			
15			
16			
T Ap (mm)	1,321	1,626	2,159

Corte de rosca externa e interna, rosca Whitworth

FPP	28	20	19	16	14	12	11	10	9	8	7	6	5
T Ap (mm)	0,584	0,813	0,813	0,864	1,016	1,346	1,473	1,626	1,803	2,032	2,311	2,718	3,251
N Ap	5	6	6	8	8	9	9	10	11	12	14	15	16
	valores de penetração no flanco (X/Z)												
ordem dos passes	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z
1	0,160	0,199	0,199	0,179	0,210	0,261	0,285	0,297	0,312	0,336	0,351	0,398	0,460
2	0,132	0,164	0,164	0,148	0,174	0,215	0,236	0,245	0,258	0,277	0,290	0,329	0,380
3	0,121	0,151	0,151	0,135	0,159	0,197	0,216	0,224	0,236	0,254	0,266	0,301	0,348
4	0,093	0,116	0,116	0,104	0,122	0,151	0,166	0,172	0,181	0,195	0,204	0,231	0,267
5	0,078	0,097	0,097	0,087	0,103	0,128	0,140	0,145	0,153	0,164	0,172	0,195	0,225
6		0,086	0,086	0,077	0,091	0,112	0,123	0,128	0,135	0,145	0,151	0,171	0,198
7				0,070	0,082	0,102	0,111	0,116	0,122	0,131	0,137	0,155	0,179
8				0,064	0,075	0,093	0,102	0,106	0,112	0,120	0,126	0,143	0,165
9						0,087	0,095	0,099	0,104	0,112	0,117	0,133	0,153
10								0,093	0,098	0,105	0,110	0,125	0,144
11									0,093	0,099	0,104	0,118	0,136
12										0,095	0,099	0,112	0,130
13											0,095	0,107	0,124
14											0,091	0,103	0,119
15												0,099	0,114
16													0,110
T Ap (mm)	0,584	0,813	0,813	0,864	1,016	1,346	1,473	1,626	1,803	2,032	2,311	2,718	3,251

NOTA: Sempre reserve 0,08–0,13mm de estoque extra para insertos de perfil completo.

Roscas multidentes, internas

	Métrica ISO						ISO UN					Whitworth	NPT		
tipo	3M	2M	3M	2M	3M	2M	2M	3M	2M	3M	2M	2M	2M	3M	2M
passo (mm)	1,0	1,5	1,5	2,0	2,0	3,0	—	—	—	—	—	—	—	—	—
FPP	—	—	—	—	—	—	16	16	12	12	8	11	11,5	11,5	8
profundidade total	0,609	0,838	0,838	1,168	1,168	1,778	0,939	0,939	1,245	1,245	1,880	1,575	1,753	1,753	2,540
1	0,330	0,381	0,508	0,508	0,711	0,558	0,431	0,558	0,558	0,762	0,584	0,736	0,584	0,812	0,889
2	0,279	0,254	0,330	0,381	0,457	0,482	0,304	0,381	0,406	0,482	0,508	0,482	0,508	0,558	0,635
3	—	0,203	—	0,279	—	0,431	0,203	—	0,279	—	0,431	0,355	0,355	0,3815	0,558
4	—	—	—	—	—	0,304	—	—	—	—	0,355	—	0,304	—	0,457

Recomendações para peças de aço (<300 BHN)

			profundidade total — no raio		
número de catálogo	tamanho do inserto	Perfil TPI	primeiro passe	segundo passe	terceiro passe
NTC-8R/L8EM	8	8 UN	1,21	1,63	2,00
NTC-8R/L8IM	8	8 UN	1,19	1,55	1,88
NTC-8R/L10EM	8	10 UN	0,92	1,27	1,60
NTC-8R/L10IM	8	10 UN	0,90	1,22	1,52
NTC-8R/L12EM	8	12 UN	0,76	1,04	1,32
NTC-8R/L12IM	8	12 UN	0,76	0,93	1,20
NTC-8R/L14EM	8	14 UN	0,68	0,95	1,12
NTC-8R/L14IM	8	14 UN	0,60	0,78	1,04
NTC-8R/L16EM 8	8	16 UN	0,58	0,81	0,96
NTC-8R/L16IM	8	16 UN	0,50	0,68	0,93
NTC-8R/L18EM	8	18 UN	0,48	0,66	0,86
NTC-8R/L18IM	8	18 UN	0,48	0,60	0,83
NDC-68RDR/L-75M	8	8 redondo	1,47	1,65	1,85
NDC-61RDR/L-75M	8	10 redondo	1,11	1,29	1,45
NDC-88RDRD/L-75M	8	8 redondo	1,29	1,75	1,85
NDC-88VR/L-75M	8	8 NPT	1,01	1,72	2,45
NDC-8115VR/L-75M	8	11.5 NPT	0,96	1,37	1,70
NDN-814VR/L-75M	8	14 NPT	0,96	1,22	1,36

NOTA: Sempre reserve 0,08–0,13mm de estoque extra para insertos de perfil completo.

ACME, externo

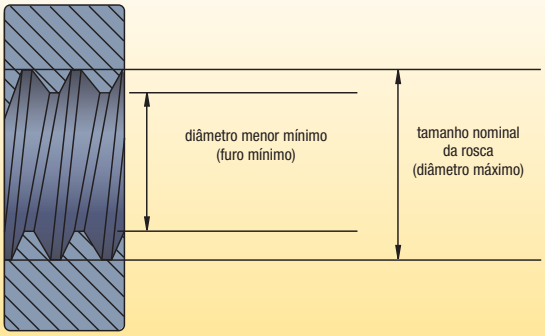
passo, FPP	28	20	19	16	14	12	11	10	9	8	7	6	5
profundidade	.028	.032	.032	.034	.040	.053	.058	.064	.071	.080	.091	.107	0.128
número de passes	5	6	6	8	8	9	9	10	11	12	14	15	16
	valores de penetração no flanco (X/Z)												
ordem dos passes	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z
1	.039	.041	.050	.063	.074	.095	.112	.138	.180	.256	.008/-	.008/-	.008/-
2	.009	.008	.009	.010	.010	.011	.012	.013	.019	.028	.013/.007	.014/.007	.017/.009
3	.009	.008	.009	.009	.010	.011	.011	.012	.018	.026	.01/.005	.011/.006	.013/.007
4	.007	.007	.007	.009	.009	.010	.010	.011	.016	.023	.008/.004	.009/.005	.011/.006
5	.006	.006	.007	.007	.007	.009	.010	.011	.015	.022	.007/.004	.008/.004	.009/.005
6	.005	.005	.005	.006	.006	.008	.009	.010	.013	.019	.007/.003	.007/.004	.009/.004
7	.003	.004	.005	.005	.005	.007	.008	.010	.011	.017	.006/.003	.007/.004	.008/.004
8		.003	.004	.005	.005	.006	.007	.009	.011	.015	.006/.003	.006/.003	.007/.004
9			.004	.004	.005	.006	.007	.008	.009	.013	.005/.003	.006/.003	.007/.004
10				.004	.005	.006	.007	.008	.009	.013	.005/.003	.005/.003	.006/.003
11				.004	.004	.006	.006	.007	.009	.011	.005/.002	.005/.003	.006/.003
12					.004	.006	.006	.007	.008	.011	.004/.002	.005/.003	.006/.003
13					.004	.005	.006	.006	.007	.010	.004/.002	.005/.003	.006/.003
14						.004	.005	.006	.007	.009	.004/.002	.005/.002	.005/.003
15							.004	.006	.007	.009		.005/.002	.005/.003
16							.004	.006	.006	.008			.005/.003
17								.004	.005	.007	.004/.002	.005/.003	.006/.003
18								.004	.005	.007	.004/.002	.005/.002	.005/.003
19									.005	.006		.005/.002	.005/.003
20										.006			.005/.003

NOTA: Sempre reserve 0,08–0,13mm de estoque extra para insertos de perfil completo.

ACME, interno

passo, FPP	28	20	19	16	14	12	11	10	9	8	7	6	5
profundidade	.028	.032	.032	.034	.040	.053	.058	.064	.071	.080	.091	.107	0.128
número de passes	5	6	6	8	8	9	9	10	11	12	14	15	16
	valores de penetração no flanco (X/Z)												
ordem dos passes	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z
1	.039	.041	.050	.063	.074	.095	.112	.138	.180	.256	.008/-	.008/-	.008/-
2	.009	.008	.009	.010	.010	.011	.012	.013	.019	.028	.013/.007	.014/.007	.017/.009
3	.009	.008	.009	.009	.010	.011	.011	.012	.018	.026	.01/.005	.011/.006	.013/.007
4	.007	.007	.007	.009	.009	.010	.010	.011	.016	.023	.008/.004	.009/.005	.011/.006
5	.006	.006	.007	.007	.007	.009	.010	.011	.015	.022	.007/.004	.008/.004	.009/.005
6	.005	.005	.005	.006	.006	.008	.009	.010	.013	.019	.007/.003	.007/.004	.009/.004
7	.003	.004	.005	.005	.005	.007	.008	.010	.011	.017	.006/.003	.007/.004	.008/.004
8		.003	.004	.005	.005	.006	.007	.009	.011	.015	.006/.003	.006/.003	.007/.004
9			.004	.004	.005	.006	.007	.008	.009	.013	.005/.003	.006/.003	.007/.004
10				.004	.005	.006	.007	.008	.009	.013	.005/.003	.005/.003	.006/.003
11				.004	.004	.006	.006	.007	.009	.011	.005/.002	.005/.003	.006/.003
12					.004	.006	.006	.007	.008	.011	.004/.002	.005/.003	.006/.003
13					.004	.005	.006	.006	.007	.010	.004/.002	.005/.003	.006/.003
14						.004	.005	.006	.007	.009	.004/.002	.005/.002	.005/.003
15							.004	.006	.007	.009		.005/.002	.005/.003
16							.004	.006	.006	.008			.005/.003
17								.004	.005	.007	.004/.002	.005/.003	.006/.003
18								.004	.005	.007	.004/.002	.005/.002	.005/.003
19									.005	.006		.005/.002	.005/.003
20										.006			.005/.003

As tabelas a seguir listam o maior passo de rosca que pode ser aplicado em aplicações internas usando os insertos de rosqueamento Top Notch™ para rosqueamento em V de 60° e Acme.



Limites de rosqueamento em V de 60°, no sistema métrico
limites de rosqueamento interno para insertos de rosqueamento em V com NT-1 e NT-2 de 60º

FPP	tamanho nominal da rosca		diâmetro mínimo da rosca (mm)	
	NT-1	NT-2	NT-1	NT-2
4,00	M48 x 4.00	–	43,67	–
3,00	M42 x 3.00	–	38,75	–
2,50	M39 x 2.50	M24 x 2,50	36,29	21,29
2,00	M33 x 2.00	M15 x 2,00	30,84	12,84
1,75	M32 x 1.75	M15 x 1,75	30,11	13,11
1,50	M32 x 1.50	M15 x 1,50	30,38	13,38
1,25	M29 x 1.29	M14 x 1,25	27,65	12,65
1,00*	M27 x 1,00	M14 x 1,00	25,92	12,92
0,75	M22 x 0,75	M12 x 0,75	21,19	11,19

* É possível cortar o passo da rosca de 1mm ou menos com um inserto NT-2 desde que o diâmetro menor da rosca seja de 25mm ou maior (11mm ou maior com NT-1).

limites de rosqueamento interno para insertos de rosqueamento em V com NT-3 e NT-4 de 60º

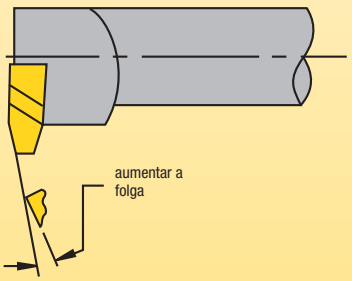
FPP	tamanho nominal da rosca	diâmetro mínimo da rosca (mm)
6,00**	M76 x 6.00	69,50
5,50**	M73 x 5.50	67,05
5,00	M70 x 5.00	64,59
4,00	M64 x 4.00	59,67
3,00	M52 x 3.00	48,75
2,50	M48 x 2.50	45,29
2,00	M42 x 2.00	39,84
1,75	M40 x 1.75	38,11
1,50*	M38 x 1.50	36,38

* É possível cortar uma rosca com passo de 1,5mm ou menos desde que o diâmetro menor da rosca seja de 35mm ou maior.
** Somente para inserto NT-4.

Limites para o rosqueamento Acme
limitações de rosqueamento interno NA e NAS-2, -3, -4 e -6 Acme.

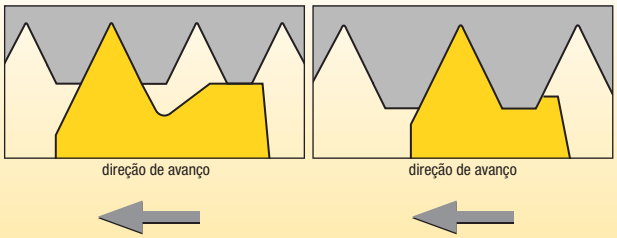
FPP	tamanho nominal da rosca	diâmetro mínimo da rosca (mm)	
	NT-1	NT-1	NT-2
2**	5	4.500	114.3
2-1/2**	4-1/2	4.100	104.1
3**	4	3.665	93.1
4	3-1/2	3.250	82.6
5	3	2.800	71.1
6	2-1/2	2.333	59.3
8	2-1/4	2.125	54.0
10	2	1.900	48.3
12	1-3/4	1.667	42.4
14	1-5/8	1.554	39.5
16*	1-1/2	1.438	36.5

* É possível cortar 16 roscas por polegada ou mais finas desde que o diâmetro menor seja de 36,5mm (1,438 ") ou maior.
** Somente para inserto NT-6.



Uma folga adicional secundária pode ser retificada na aresta dianteira do inserto fornecendo uma folga helicoidal suficiente para usinagem de roscas grossas e com várias entradas. Podem ser fornecidos insertos padrão modificados para a usinagem de roscas fora dos limites mostrados.

Dados de aplicação para torneamento de perfil completo de rosca V de 60°



Insertos para torneamento de crista NTC para (P ≤ 2mm) e mais finas.

Insertos para torneamento de crista NTC para (P ≤ 3mm) e mais grossas.

NOTA: Os insertos NTC controlam automaticamente desde a raiz até as dimensões da crista. Porém, ao configurar operações de rosqueamento com insertos NTC, verifique as dimensões corretas dos diâmetros interno e externo na crista da rosca.

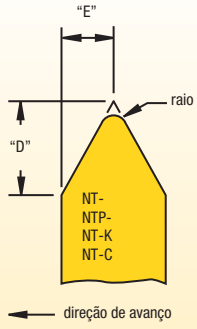
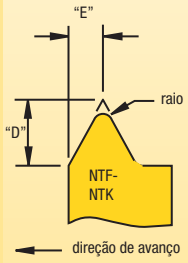
Dados de aplicação para torneamento de perfil completo de rosca V de 60°

número de catálogo do inserto	raio de ponta no inserto (mm)	raio da rosca para a norma MIL-S-8879A (mm)
NJ-3014R/L12	0,317/0,342	0,317/0,381
NJK-3008R/L20	0,190/0,215	0,190/0,0228

Nota sobre a rosca J para o catálogo

A forma do raio de raiz controlado da rosca (SAE8879C) é definida somente para a rosca externa. Para usinar a rosca interna correspondente, escolha um inserto que cortará uma rosca 2B de classe unificada, e em seguida faça um furo com diâmetro menor em relação ao tamanho. Para os valores de diâmetro menores e corretos da rosca J, consulte as normas SAE8879C, MIL-S-8879C e SAEAS8879D.

Dados de aplicação da rosca V de 60°

descrição do inserto	inserto	D (mm)	E (mm)	FPP recomendado*		Passo recomendado*	
				externo	interno	externo	interno
	NT-1	1,90	1,11	–	24–12	–	1,00–2,00
	NT-2	28,70	1,90	36–8	20–7	0,70–3,00	1,25–3,50
	NT-2-K	28,70	1,90	36–8	20–7	0,70–3,00	1,25–3,50
	NTF-2	15,75	1,01	44–14	24–12	0,60–1,75	1,00–2,00
	NTK-2	15,75	1,01	44–14	24–12	0,60–1,75	1,00–2,00
	NTP-2	28,70	1,90	36–8	20–7	0,70–3,0	1,25–3,50
	NT-3	37,59	2,46	20–6	12–5	1,25–4,00	2,00–5,00
	NT-3-K	37,59	2,46	20–6	12–5	1,25–4,00	2,00–5,00
	NT-3-C	37,59	2,46	11–6	6 (somente)	2,50–4,00	4 (somente)
	NT-3-CK	37,59	2,46	11–6	6 (somente)	2,50–4,00	4 (somente)
	NTF-3	21,08	1,37	44–10	24–9	0,60–2,50	1,00–2,50
	NTK-3	21,08	1,37	44–10	24–9	0,60–2,50	1,00–2,50
	NTP-3	37,59	2,46	20–6	12–5	1,25–4,00	2,00–5,00
	NT-4	49,78	3,22	20–4	12–4	1,25–6,25	2,00–6,25
	NT-4-K	49,78	3,22	20–4	12–4	1,25–6,25	2,00–6,25
	NT-4-C	49,78	3,22	11–4 1/2	6–4 1/2	2,50–5,50	4,00–5,50
	NT-4-CK	49,78	3,22	11–4 1/2	6–4 1/2	2,50–5,50	4,00–5,50
	NTF-4	21,08	1,37	44–10	24–9	0,60–2,50	1,00–2,50
	NTK-4	21,08	1,37	44–10	24–9	0,60–2,50	1,00–2,50
	NTP-4	49,78	3,22	20–4	12–4	1,25–6,25	2,00–6,25

* Com base no tamanho do raio do inserto máximo e nas especificações de rosca 2A e 2B.

Formas de rosca API • Tabela de aplicações de insertos para conexões de flanges rotativos API

forma da rosca	Inserto Kennametal™		aplicação na junção da ferramenta	tamanho mínimo da caixa*
	Com crista	sem crista		
V-.038R 2" TPF 4 TPI	NDC-4038R/L2 4-E/IR4API382	ND-3038R/L	2-3/8 nivelamento interno API 2-7/8 nivelamento interno API 3-1/2 nivelamento interno API 4 nivelamento interno API 4-1/2 nivelamento interno API 5-1/2 nivelamento interno API 6-5/8 nivelamento interno API 4 furos completos API API #23, API #26, API #31, API #35, API #38, API #40, API #44, API #46, API #50	API #31 2-7/8 IF
V-.038R 3" TPF 4 TPI	NDC-4038R/L3 4-E/IR4API383	ND-3038R/L	API #56 API #61 API #70 API #77	API #56
V-.050 2" TPF 4 TPI	NDC-4050R/L2 4-E/IRAPI502	ND-4050R/L	5-1/2 furo total API 6-5/8 API regular 6-5/8 furo total API	5-1/2 furo total API
V-.050 3" TPF 4 TPI	NDC-4050R/L3 4-E/IR4API503	ND-4050R/L	5-1/2 API regular 7-5/8 API regular 8-5/8 API regular	5-1/2 API regular
V-.040 3" TPF 5 TPI	NDC-3040R/L3 NDC-4040R/L3 4-E/IR5API403	ND-3040R/L ND-4040R/L	2-3/8 API regular 2-7/8 API regular 3-1/2 API regular 4-1/2 API regular	3-1/2 API regular

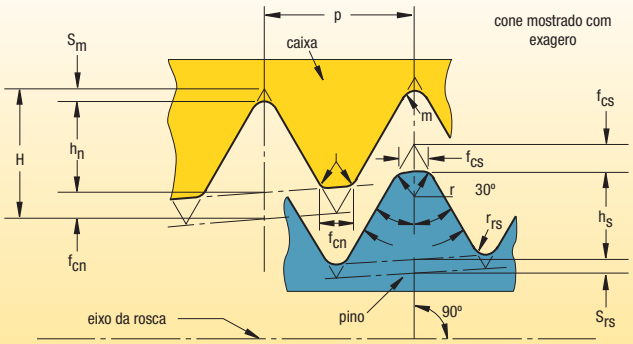
* É o tamanho mínimo da caixa que pode ser rosqueado com um inserto padrão Top Notch devido ao furo mínimo do equipamento.

Formas de rosca API
Dimensões da rosca do produto • Conexões de flanges rotativos (polegada)

forma da rosca	cone de polegadas por pé	altura da rosca, não truncada H	altura da rosca, truncada $h_n=h_s$	truncamento da raiz $S_m=S_{rs}$ $f_m=f_{rs}$	truncamento da crista $f_{cn}=f_{cs}$	largura do plano		raio da raiz $r_m=r_{rs}$	raio nos cantos da rosca r	passo p
						crista $f_{cn}=f_{cs}$	crista $f_m=f_{rs}$			
V-.038R	2	.216005	.121844	.038000	.056161	.065	—	.038	.015	.250
V-.038R	3	.215379	.121381	.038000	.055998	.065	—	.038	.015	
V-.040	3	.172303	.117842	.020000	.034461	.040	—	.020	.015	.250
V-.050	3	.215379	.147303	.025000	.043076	.050	—	.025	.015	
V-.050	2	.216005	.147804	.025000	.043201	.050	—	.025	.015	.250

NOTA: Todas as dimensões estão em polegadas.

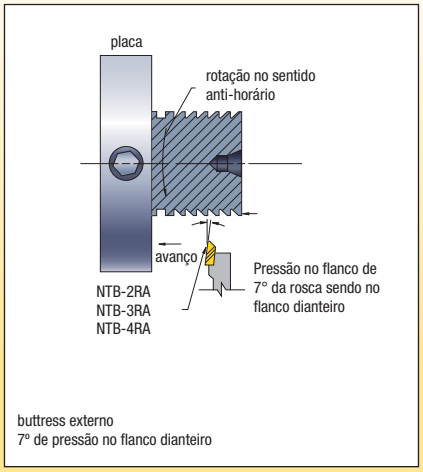
Forma da rosca produzida V-0,040 e V-0,050



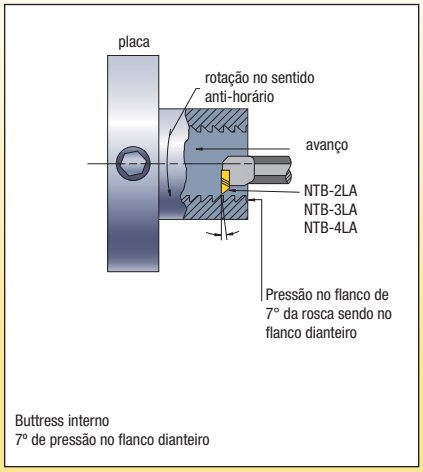
Rosca para revestimento e tubular redondo (dimensões de altura)

elemento da rosca		10 TPI p = .1000	8 TPI p = .1250
H	= .866p	.08660	.10825
$H_s = h_n$	= .626p - .007	.05560	.07125
$S_{rs} = S_m$	= .120p + .002	.01400	.01700
$S_{cs} = S_{cn}$	= .120p + .005	.01700	.02000

Buttress americana (7° de pressão no flanco dianteiro): insertos NTB-A • Por empuxo

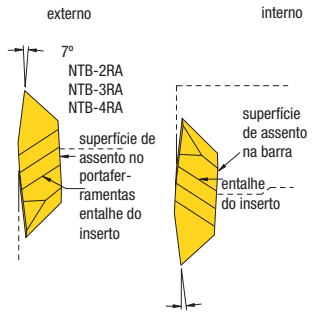


buttress externo
7° de pressão no flanco dianteiro

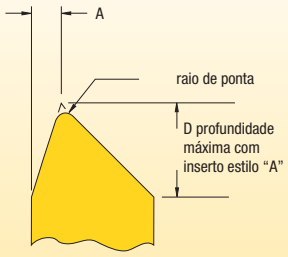


Buttress interno
7° de pressão no flanco dianteiro

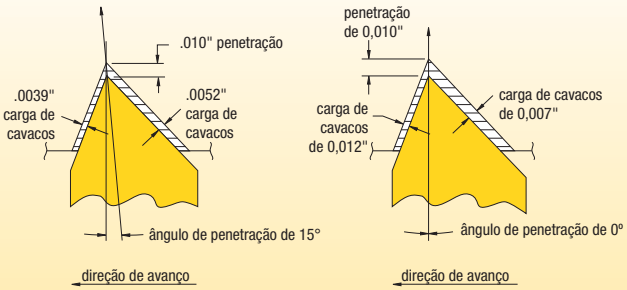
Inserto versus orientação do porta-ferramenta



Dimensões de referência



Ângulo de penetração versus carga de cavacos: 7° de pressão no flanco dianteiro



Inserto NTB-A

inserto	D (polegada)	"A" ref. (polegada)	raio de ponta (polegada)	passo baseado no raio máximo
NTB-2A	.133	.024	.002–.004	16–20 TPI
NTB-3A	.171	.031	.005–.008	8–16 TPI
NTB-4A	.218	.049	.008–.012	4–6 TPI

NOTA: Para uma carga de cavacos balanceada, sugerimos um ângulo de penetração de 15°.

Limitações de rosqueamento interno

limites de rosqueamento interno para insertos de rosqueamento com NTB-2A

FPP	tamanho nominal da rosca	diâmetro menor mínimo (polegada)
8	1-3/4	1.600
10	1-5/8	1.505
12	1-1/2	1.400
16	1-1/4	1.175
20	1-1/16	1.002

limites de rosqueamento interno para insertos de rosqueamento com NTB-3 e NTB-4A

FPP	tamanho nominal da rosca	diâmetro menor mínimo (polegada)
4*	2-1/2	2.200
5	2-1/4	2.010
6	2	1.800
8	1-3/4	1.600
10	1-5/8	1.505
12**	1-1/2	1.400

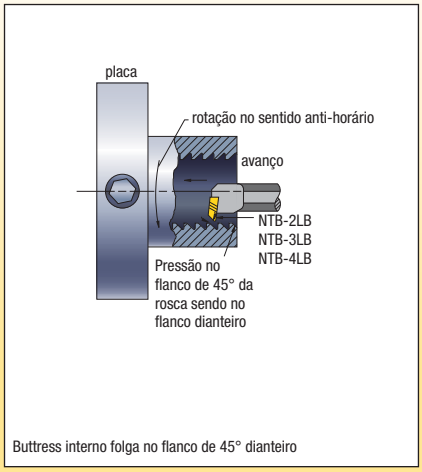
* Somente para inserto NTB-4A
** É possível cortar 16 ou 20 roscas por polegada desde que o diâmetro menor seja de 1,375" ou maior.

Roscas por polegada versus tabela de raio de raiz máximo da rosca (polegada)

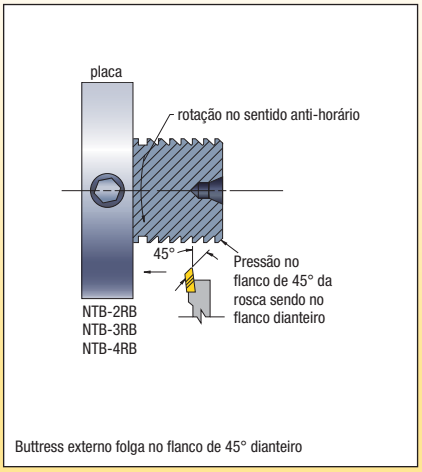
FPP	20	16	12	10	8	6	5	4	3	2-1/2	2	1-1/2	1-1/4	1
raio de raiz máximo da rosca	.0036	.0045	.0059	.0071	.0089	.0119	.0143	.0179	.0238	.0268	.0375	.0476	.0572	.0714

NOTA: Formas buttress especiais estão disponíveis mediante solicitação.

Buttress americana (45° de folga no flanco dianteiro): Insertos NTB-B • Por tração

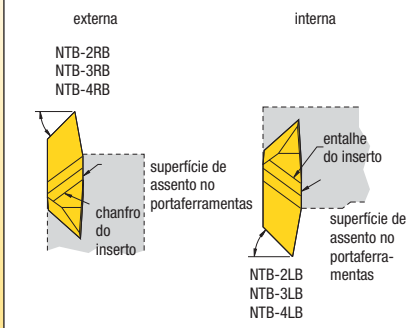


Buttress interno folga no flanco de 45° dianteiro



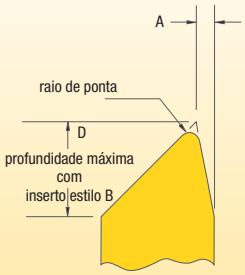
Buttress externo folga no flanco de 45° dianteiro

Inserto versus orientação da ferramenta

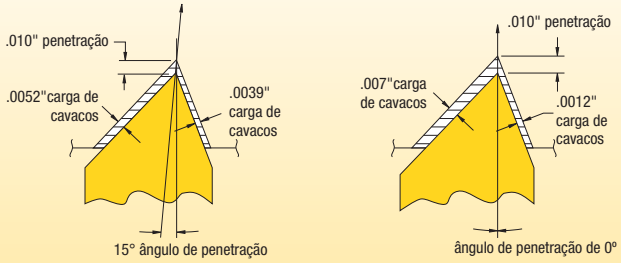


45° de folga no flanco dianteiro

Dimensões de referência



Ângulo de penetração versus carga de cavacos: 45° de folga no flanco dianteiro



Inserto NTB-B

inserto	D (polegada)	referência "A" (polegada)	raio de ponta (polegada)	passo baseado no raio máximo
NTB-3B	.171	.031	.005–.004	8–16 TPI

NOTA: Para uma carga de cavacos balanceada, sugerimos um ângulo de penetração reverso de 15°.

Limitações de rosqueamento interno

limites de rosqueamento interno para insertos de rosqueamento com NTB-2B

FPP	tamanho nominal da rosca	diâmetro menor mínimo (polegada)
8	1-3/4	1.600
10	1-5/8	1.505
12	1-1/2	1.400
16	1-1/4	1.175
20	1-1/16	1.002

limites de rosqueamento interno para insertos de rosqueamento com NTB-3 e NTB-4B

FPP	tamanho nominal da rosca	diâmetro menor mínimo (polegada)
4*	2-7/8	2.575
5	2-3/4	2.510
6	2-3/8	2.175
8	2-1/8	1.975
10	1-7/8	1.755
12	1-5/8	1.525
16	1-1/2	1.407
20	1-7/16	1.378

* Somente para inserto NTB-4B.

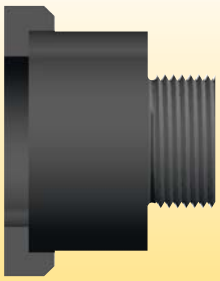
Informações necessárias

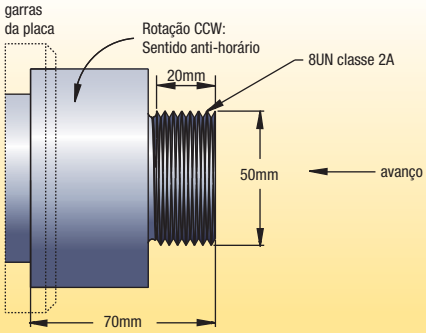
Com base no trefilamento da peça:

material: 316SS, 200 HB
forma da rosca: 8UN
tolerância: classe 2A
operação: rosqueamento externo
diâmetro do passo: 50mm x 25mm de profundidade

Com base nos dados de configuração da máquina:

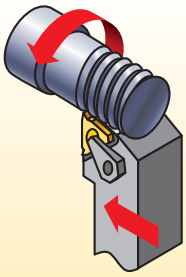
ferramental: 20mm x 20mm
rotação do fuso: sentido anti-horário
avanço: na direção do mandril





Etapas para uma operação de rosqueamento bem-sucedida

Etapa 1 •
Determine o método de rosqueamento



Você precisa saber:

- Operação (externa).
- Rotação do fuso (sentido anti-horário). Rotação no sentido anti-horário.
- Direção do avanço (na direção do mandril).
- Porta-ferramentas com sentido à direita.
- Inserto com sentido à direita (ER).
- Método da hélice padrão.

Etapa 2 •
Escolha o inserto



Você precisa saber:

- Forma da rosca (passo ISO R262 1mm).
- Sentido de rotação do inserto (à direita — ER).

Escolha a solução de alto desempenho

código do produto	tamanho do inserto	KCU25/ KC5025
3ER10ISO	3	•

Seleção de alto desempenho

NOTA: Use o inserto com o maior tamanho disponível.
inserto: 3ER10ISO
classe: KCU25/KC5025
velocidade: 150 m/min

Etapa 3 •
Escolha a classe e a velocidade

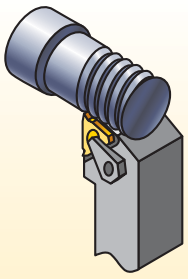
Você precisa saber:

- Material das peças (316SS-200HB).
- Operação (externa).

Opções: Diretrizes de seleção da classe e da velocidade

operação do rosqueamento	aço inoxidável
externo	uso geral e alto desempenho
	KC5025
	50–360 m/min

Etapa 4 •
Escolha o porta-ferramentas



Você precisa saber:

- Operação externa ou interna (externa).
- Diâmetro do passo para determinar o diâmetro mínimo de furo (N/A).
- Tipo de ferramenta — porta-ferramentas, barra de mandrilar (porta-ferramentas).
- Sentido da ferramenta (sentido à direita).
- Tamanho do inserto (16).

Opções:

código do produto	tamanho do inserto	calço
AL203R	3	SM-YE3

Primeira opção: Suporte LSASR-123

Etapa 5 •
Escolha o calço

Você precisa saber:

- Forma da rosca — TPI ou passo (8 TPI).
- Diâmetro de passo (50mm).
- Método da hélice (padrão). Veja a tabela de seleção do calço de rosqueamento de assentamento (LT).

Escolha o calço SM-YE3

NOTA: O calço SM-YE3 é fornecido com o porta-ferramentas selecionado.

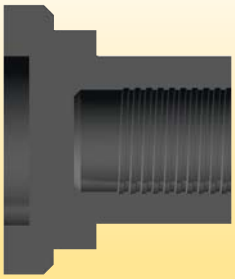
Informações necessárias

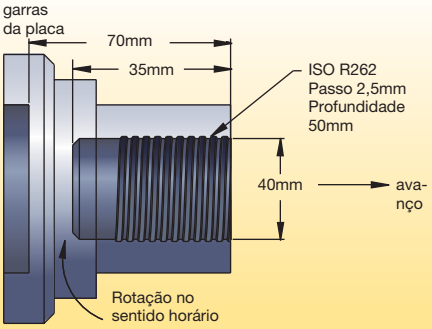
Com base no trefilamento da peça:

material:	aço 4.140
forma da rosca:	(passo ISO R262 2,5mm)
tolerância:	classe métrica ISO 6G/6H
operação:	rosqueamento interno
diâmetro do passo:	40mm x 35mm de profundidade

Com base nos dados de configuração da máquina:

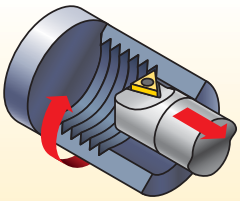
ferramental:	barra de mandrilar de 20mm
rotação do fuso:	sentido horário
avanço:	na direção contrária à do mandril





Etapas para uma operação de rosqueamento bem-sucedida

Etapa 1 •
Determine o método de rosqueamento



Você precisa saber:

- Operação (interna).
- Rotação do fuso (sentido horário). Rotação no sentido horário.
- Direção do avanço (na direção contrária à do mandril).
- Porta-ferramentas com sentido de rotação à esquerda.
- Inserto com sentido de rotação à esquerda (NL).
- Método da hélice reversa.

Etapa 2 •
Escolha o inserto



Você precisa saber:

- Forma de rosca (ISO Metric Class 6G/6H).
- Sentido de direção do inserto (à esquerda — NL).

Escolha a solução de alto desempenho

código do produto	tamanho do inserto	KCU25/ KC5025
3IL25ISO	3	•

Seleção de alto desempenho

NOTA: Use o inserto com o maior tamanho disponível para entrar no furo.

inserto:	3IL25ISO
classe:	KCU25/KC5025
velocidade:	130 m/min

Etapa 3 •
Escolha a classe e a velocidade

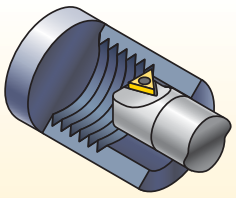
Você precisa saber:

- Material das peças (aço 4010).
- Operação (interna).

Opções: Diretrizes de seleção da classe e da velocidade

operação do rosqueamento	aço
interno	uso geral e alto desempenho
	KC5025
	40–200 m/min

Etapa 4 •
Escolha o porta-ferramentas



Você precisa saber:

- Operação externa ou interna (interna).
- Diâmetro do passo para determinar o diâmetro mínimo de furo para operações internas (40mm).
- Tipo de ferramenta — porta-ferramentas, barra de mandrilar (barra de mandrilar).
- Sentido de rotação da ferramenta (sentido de rotação à esquerda).
- Tamanho do inserto (16).

Opções:

código do produto	tamanho do inserto	calço
AVR32D3R	3	SM-YE3

Primeira opção: Suporte LSASR-123

Etapa 5 •
Escolha o calço

Você precisa saber:

- Forma da rosca — TPI ou passo (8 TPI).
- Diâmetro de passo (50mm).
- Método da hélice (padrão). Veja a tabela de seleção do calço de rosqueamento de assentamento (LT).

Escolha o calço SM-YE3

NOTA: Para esta aplicação, o calço padrão fornecido deve ser substituído pelo calço recomendado, SM-YE3.

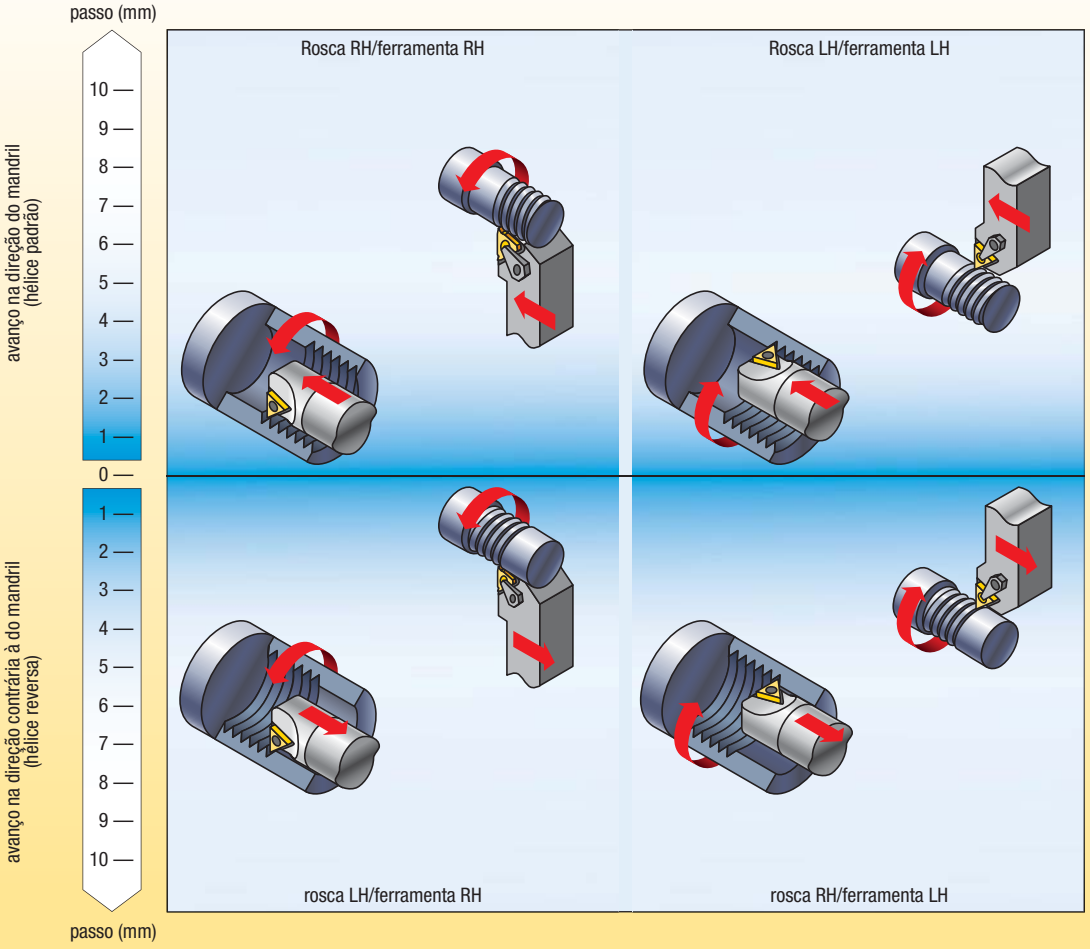
Diretrizes para a seleção do calço para rosqueamento de assentamento

É essencial selecionar o calço correto para garantir a qualidade da rosca e a máxima vida útil da ferramenta.
Os seguintes parâmetros são necessários:

- Passo
- Diâmetro de passo
- Número de entradas
- Direção de avanço

NOTA: Ao considerar o método de corte de roscas a ser usado, a forma e a estabilidade da peça e o fluxo de cavacos são fatores determinantes para a sua decisão.

Tabela de seleção de assentamento



NOTA: Em roscas com várias entradas, use o valor do passo em vez do passo.

Diagrama de ângulo de ataque de rosca

Para calcular o ângulo de hélice de uma dada rosca, usar a fórmula:

$$ß = \text{Arctan} \frac{P \bullet S}{\pi D_e}$$

ß = ângulo de ataque de rosca
D_e = diâmetro efetivo do passo de desgaste da rosca
P = 1/TPI
= roscas por polegada
S = número de entradas
entrada única, ataque = passo
várias entradas, ataque = passo (x) número de entradas

Todas os porta-ferramentas são projetados com um ângulo de inclinação = 1,5°. Ao tornear roscas padrão com um ângulo de posição de 1 a 2°, isso garante uma folga adequada entre os flancos do dente da rosca e do inserto. O ângulo de ataque de rosca e o ângulo de inclinação necessário do inserto são dados por ß.

A altura da aresta de corte é constante em cada combinação entre calço e inserto. Todos os porta-ferramentas são fornecidos com um ângulo de inclinação de 1 a 1/2°.

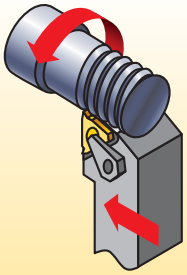
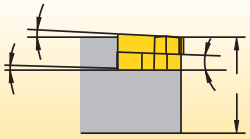


Tabela de seleção do calço de rosqueamento de assentamento • Métrico

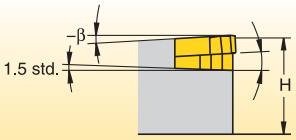
tamanho do inserto	ferramenta		código para pedido do calço (mm)							
	externa	interna				standard				
3 (9,52)	RH (MD)	LH (ME)	SM–YE3–3P	SM–YE3–2P	SM–YE3–1P	SM–YE3	SM–YE3–1N	SM–YE3–1.5N	SM–YE3–2N	SM–YE3–3N
3 (9,52)	LH (ME)	RH (MD)	SM–YI3–3P	SM–YI3–2P	SM–YI3–1P	SM–YI3	SM–YI3–1N	SM–YI3–1.5N	SM–YI3–2N	SM–YI3–3N
4 (12,7)	RH (MD)	LH (ME)	SM–YE4–3P	SM–YE4–2P	SM–YE4–1P	SM–YE4	SM–YE4–1N	SM–YE4–1.5N	SM–YE4–2N	SM–YE4–3N
4 (12,7)	LH (ME)	RH (MD)	SM–YI4–3P	SM–YI4–2P	SM–YI4–1P	SM–YI4	SM–YI4–1N	SM–YI4–1.5N	SM–YI4–2N	SM–YI4–3N
FPP (fios por polegada)		passo (mm)	diâmetro primitivo (mm)							
72		—	—	—	—	3,1–8	8–21,4	>21,4	21,4–8	8–3,1
—		0,35	—	—	—	3,0–8	8–21,3	>21,3	21,3–8	3–8
64		—	—	—	—	3,4–9	9–24,1	>24,1	24,1–9	9–3,4
—		0,40	—	—	—	3,5–9,1	9,1–24,3	>24,3	24,3–9,1	9,1–3,5
56		0,45	—	—	—	3,9–10,3	10,3–27,6	>27,6	27,6–10,3	10,3–3,9
—		0,50	—	—	2,8–4,3	4,3–11,4	11,4–30,4	>30,4	30,4–11,4	11,4–4,3
48		—	—	—	3–4,6	4,6–12,1	12,1–32,2	>32,2	32,2–12,1	12,1–4,6
44		—	—	—	3,3–5	5–13,2	13,2–35,1	>35,1	35,1–13,2	13,2–5
—		0,60	—	2,6–3,4	3,4–5,2	5,2–13,7	13,7–36,5	>36,5	36,5–13,7	13,7–5,2
40		—	—	2,8–3,6	3,6–5,5	5,5–14,5	14,5–38,6	>38,6	38,6–14,5	14,5–5,5
—		0,70	—	3,0–4	4–6,1	6,1–16	16–42,6	>42,6	42,6–16	16–6,1
36		—	—	3,1–4	4–6,1	6,1–16,1	16,1–42,9	>42,9	42,9–16,1	16,1–6,1
—		0,75	2,8–3,2	3,3–4,3	4,3–6,5	6,5–17,1	17,1–45,6	>45,6	45,6–17,1	17,1–6,5
32		—	3–3,4	3,4–4,5	4,5–6,9	6,9–18,1	18,1–48,3	>48,3	48,3–18,1	18,1–6,9
—		0,80	3–3,5	3,5–4,6	4,6–6,9	6,9–18,2	18,2–48,6	>48,6	48,6–18,2	18,2–6,9
28		—	3,4–3,9	3,9–5,2	5,2–7,9	7,9–20,7	20,7–55,1	>55,1	55,1–20,7	20,7–7,9
27		—	3,6–4,1	4,1–5,4	5,4–8,2	8,2–21,4	21,4–57,2	>57,2	57,2–21,4	21,4–8,2
—		1,00	3,8–4,3	4,3–5,7	5,7–8,7	8,7–22,8	22,8–60,8	>60,8	60,8–22,8	22,8–8,7
24		—	4–4,6	4,6–6	6–9,2	9,2–24,1	24,1–64,3	>64,3	64,3–24,1	24,1–9,2
—		1,25	4,7–5,4	5,4–7,1	7,1–10,8	10,9–28,5	28,5–76	>76,0	76–28,5	28,5–10,8
20		—	4,8–5,5	5,5–7,2	7,2–11	11–28,9	29–77,2	>77,2	77,2–28,9	29–11
18		—	5,3–6,1	6,1–8	8–12,2	12,2–32,2	32,2–85,8	>85,8	85,8–32,2	32,2–12,2
—		1,50	5,7–6,5	6,5–8,5	8,5–13	13–34,2	34,2–91,2	>91,2	91,2–34,2	34,2–13
16		—	6–6,9	6,9–9	9–13,8	13,8–36,2	36,2–96,5	>96,5	96,5–36,2	36,2–13,8
—		1,75	6,6–7,96	7,6–10	10–15,2	15,2–39,9	39,9–106,4	>106,4	106,4–39,9	39,9–15,2
14		—	6,9–7,9	7,9–10,3	10,3–15,7	15,7–41,4	41,4–110,3	>110,3	110,3–41,4	41,4–15,7
13		—	7,4–8,5	8,5–11,1	11,1–17	17–44,5	44,5–118,8	>118,8	118,8–44,5	44,5–17
—		2,00	7,6–8,7	8,7–11,4	11,4–17,4	17,4–45,6	45,6–121,6	>121,6	121,6–45,6	45,6–17,4
12		—	8–9,2	9,2–12	12,1–18,4	18,4–48,2	48,3–128,7	>128,7	128,7–48,2	48,2–18,4
11.5		—	8,4–9,6	9,6–12,6	12,6–19,2	19,2–50,3	50,3–134,3	>134,3	134,3–50,3	50,3–19,2
11		—	8,8–10	10–13,1	13,1–20	20–52,6	52,6–140,4	>140,4	140,4–52,6	52,6–20
—		2,50	9,5–10,8	10,8–14,2	14,2–21,7	21,7–57	57–152	>152,0	152–57	57–21,7
10		—	9,6–11	11–14,5	14,5–22	22–57,9	57,9–154,4	>154,4	154,4–57,9	57,9–22
9		—	10,7–12,2	12,2–16,1	16,1–24,5	24,5–64,3	64,3–171,6	>171,6	171,6–64,3	64,3–24,5
—		3,00	11,4–13	13–17,1	17,1–26	26–68,4	68,4–182,4	>182,4	182,4–68,4	68,4–26
8		—	12–13,8	13,8–18,1	18,1–27,6	27,6–72,4	72,4–193	>193,0	193–72,4	72,4–27,6
—		3,50	13,3–15,2	15,2–19,9	19,9–30,4	30,4–79,8	79,8–212,8	>212,8	212,8–79,8	79,8–30,4
7		—	13,8–15,7	15,7–20,7	20,7–31,5	31,5–82,7	82,7–220,6	>220,6	220,6–82,7	82,7–31,5
—		4,00	15,2–17,3	17,3–22,8	22,8–34,7	34,7–91,2	91,2–243,2	>243,2	243,2–91,2	91,2–34,7
6		—	16–18,3	18,3–24,1	24,1–36,7	36,7–96,5	96,5–257,4	>257,4	257,4–96,5	96,5–36,7
—		5,00	19–21,7	21,7–28,5	28,5–43,4	43,4–114	114–304	>304,0	304–114	114–43,4
5		—	19,3–22	22–28,9	28,9–44,1	44,1–115,8	115,8–308,8	>308,8	308,8–115,8	115,8–44,1
4,5		—	21,4–24,5	24,5–32,1	32,1–49	49–128,7	128,7–343,1	>343,1	343,1–128,7	128,7–49
—		6,00	22,7–26	26–34,2	34,2–52,1	52,1–136,8	136,8–364,8	>364,8	364,8–136,8	136,8–52,1
4		—	24,1–27,5	27,5–36,2	36,2–55,1	55,1–144,8	144,8–386	>386	386–144,8	144,8–55,1
ângulo de inclinação			4.5	3.5	2.5	1.5	0.5	0.0	-0.5	-1.5
			hélice standard (avanço na direção da placa)						hélice reversa (avanço na direção contrária à da placa)	

1. Escolha FPP ou passo (mm) nas colunas à esquerda.
2. Siga a linha para o diâmetro primitivo especificado e a direção de avanço correta.
3. Siga a coluna no alto para o calço necessário baseado no tipo e sentido de rotação do porta-ferramenta e no tamanho do inserto.

método da hélice padrão:
Usado quando uma rosca RH é cortada com uma ferramenta RH ou uma rosca LH com uma ferramenta LH.



método da hélice reversa:
Usado quando uma rosca RH é cortada com uma ferramenta LH ou uma rosca LH com uma ferramenta RH.



O NOVO SABE PROCURAR

A procura por uma ferramenta foi melhorada através de funções de Aconselhamento e seleção do NOVO™, economizando tempo e dinheiro.

SUGERIR

Utiliza uma abordagem baseada em regras para fornecer recomendações de ferramenta de corte:

- Definir recurso de usinagem (fresamento de face, canais, furo cego etc.)
- Aplicar requisitos de limitação (geometria, material, tolerância etc.)
- Definir sequência de usinagem (operações de etapa única ou múltiplas, desbaste e acabamento etc.)
- Receber os resultados em ranking

SELECIONAR

Um método de selecionar ferramenta de corte de uma estrutura em árvore por meio de uma busca hierárquica ou paramétrica:

- Se você sabe qual é produto que está procurando, uma busca rápida pode ser feita somente com o número de catálogo ou descrição do produto.
- Filtros inteligentes reduzem significativamente a quantidade de potenciais soluções de ferramental.
- Após a ferramenta ter sido selecionada, o NOVO também fornece opções de itens de corte e adaptação que combinam com a sua solução.

O NOVO pode garantir que você tenha as ferramentas certas no seu maquinário, na sequência certa. Resultando em execução perfeita que acelera todos os trabalhos e maximiza todos os turnos. **kennametal.com/novo**



Aplicação específica

Fix-Perfect **E2–E18**

Perfilagem Top Notch **E20–E43**

Usinagem ferroviária **E44–E61**

Insertos K-Lock **E62–E65**

Fix-Perfect™

O programa de inserto retificado de precisão Fix-Perfect™ com Beyond vai além!

As características de desempenho inovadoras desses insertos retificados de precisão permitem uma indexação absolutamente precisa e com excelente fluxo de cavacos na usinagem de materiais das peças de aço, ferro fundido e aço inoxidável.

Os insertos Fix-Perfect Beyond são a solução ideal para operações de usinagem em uma grande quantidade de indústrias, incluindo as de energia hidráulica, energia, automotiva, equipamentos pesados e aplicações de engenharia geral.

Características, funções e vantagens

Características

- Projeto tangencial.
- Sistema de fixação rígido.
- Até oito arestas de corte (protegidas pelo alojamento do encaixe).
- Geometria positiva.
- Insertos retificados de precisão.

Funções

- Sistema estável.
- Sistema de fixação muito estável e troca da aresta de corte fácil e rápida.
- Use até oito arestas por inserto.
- Forças de corte muito baixas e excelente controle do cavaco.
- Melhor precisão de indexação.

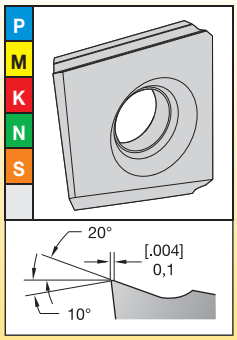


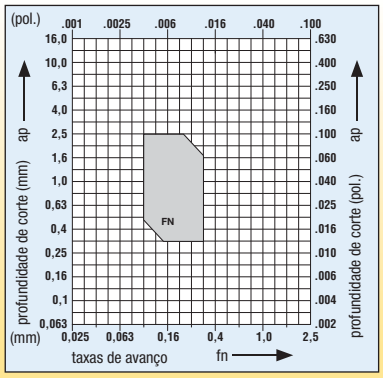
Benefícios

- Confiabilidade do processo e alta produtividade.
- Tempo de parada de máquina reduzido.
- Produtividade superior.
- Menos vibrações, corte suave e silencioso, sem deformação da peça e alta qualidade superficial.
- Confiabilidade do processo.

Acabamento

D2FIX-FN

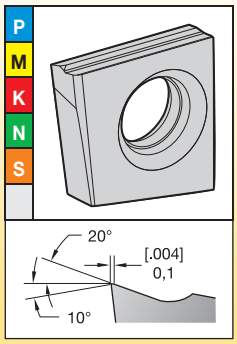


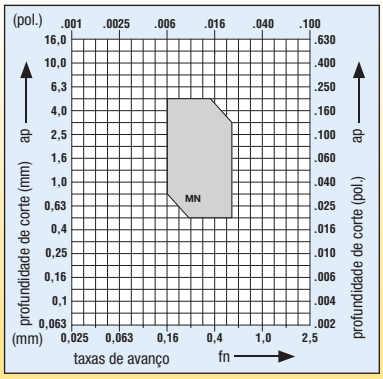


P	Aço
M	Aço inoxidável
K	Ferro fundido
N	Materiais não ferrosos
S	Ligas resistentes a altas temperaturas
H	Materiais endurecidos

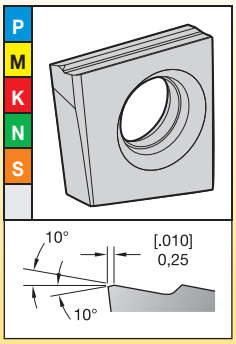
Usinagem média

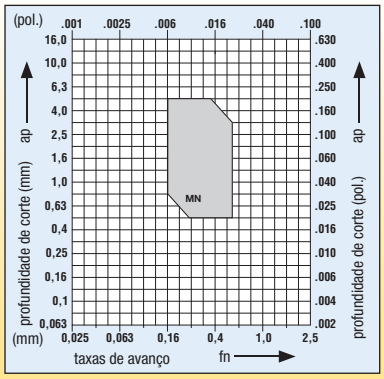
C2FIX-MN



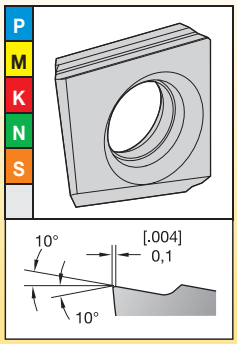


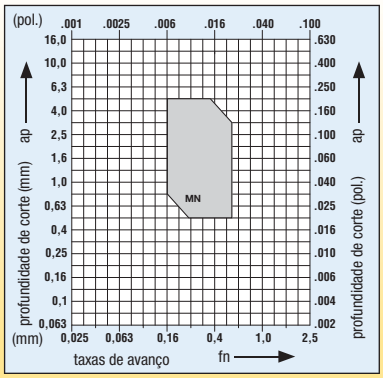
C2FIX18-MN



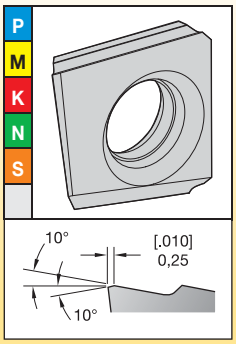


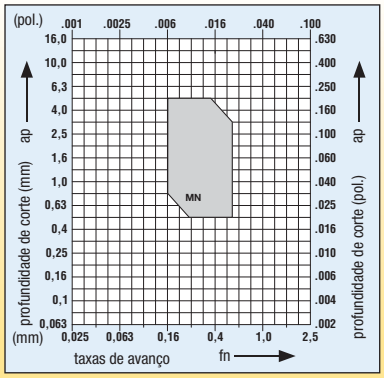
D2FIX15-MN



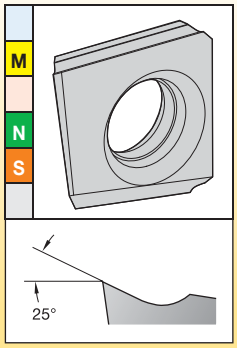


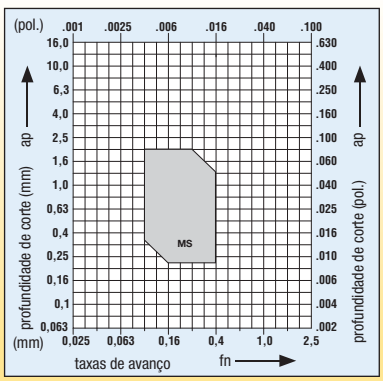
K2FIX-MN



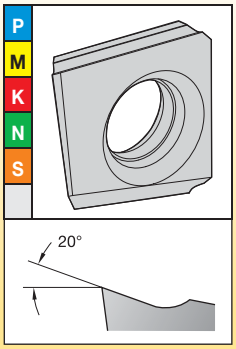


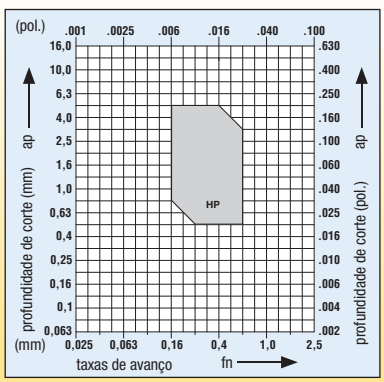
D2FIX-MS





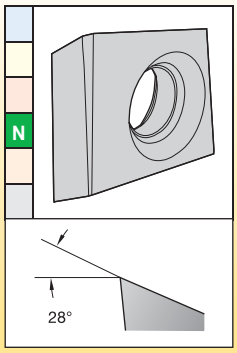
D2FIX-HP

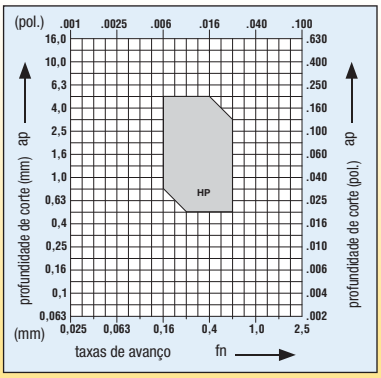




Usinagem média

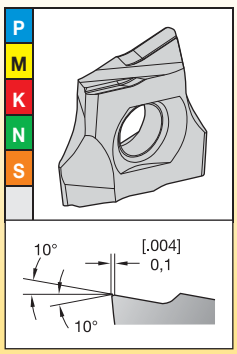
E2FIX-HP

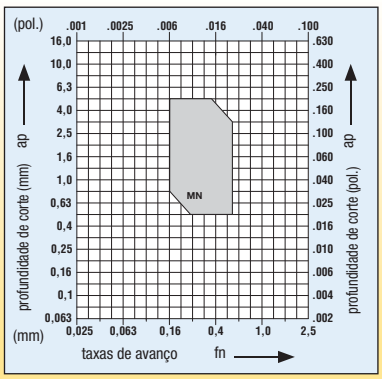




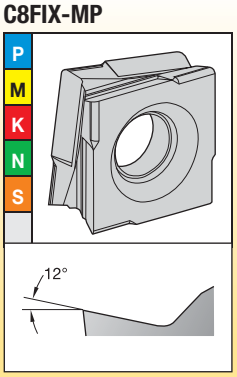
P	Aço
M	Aço inoxidável
K	Ferro fundido
N	Materiais não ferrosos
S	Ligas resistentes a altas temperaturas
H	Materiais endurecidos

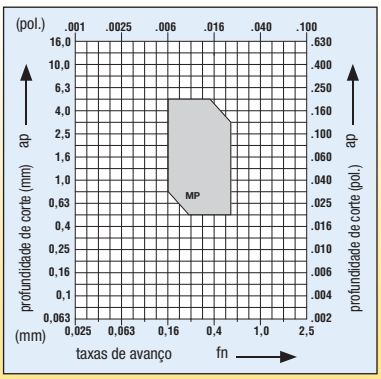
D4FIX-MN





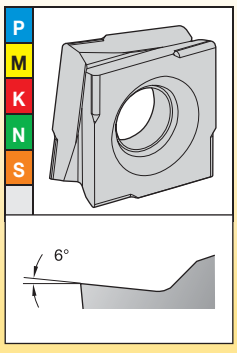
C8FIX-MP

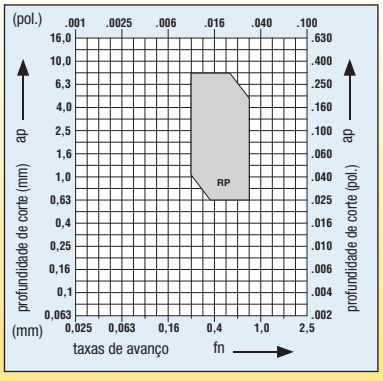




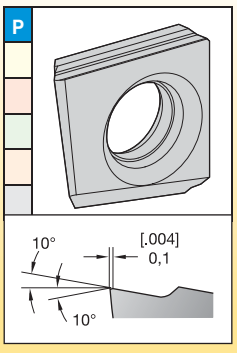
Desbaste

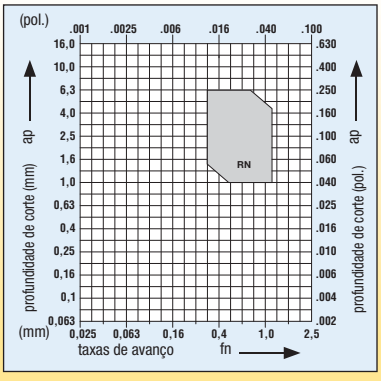
C8FIX-RP



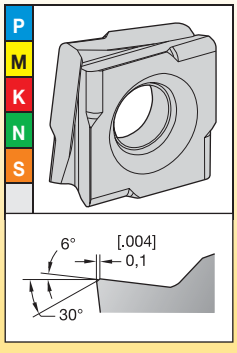


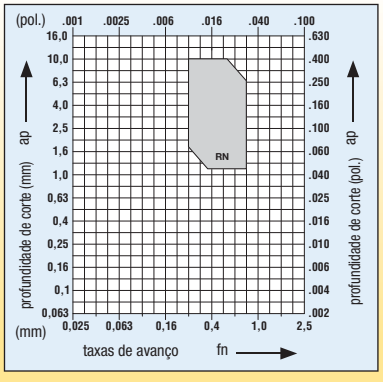
D2FIX-RN



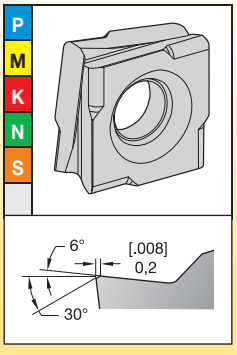


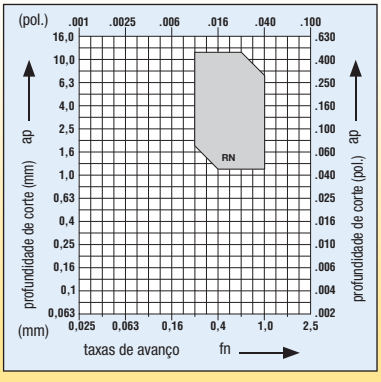
C8FIX15-RN





C8FIX18-RN





Escolha a geometria do inserto

Insertos com 8 arestas

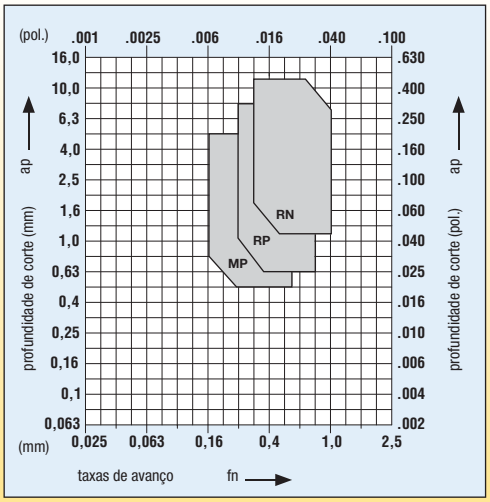
Desbaste
Corte interrompido e/ou escala pesada
USE: -RP OU -RN


-RP


-RN

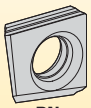
Torneamento médio
Corte ligeiramente interrompido e/ou escala leve
USE: -MP


-MP

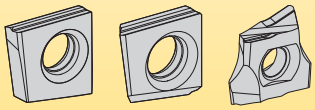


Insertos com 2 e 4 arestas

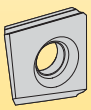
Desbaste
Corte interrompido e/ou escala pesada
USE: -RN

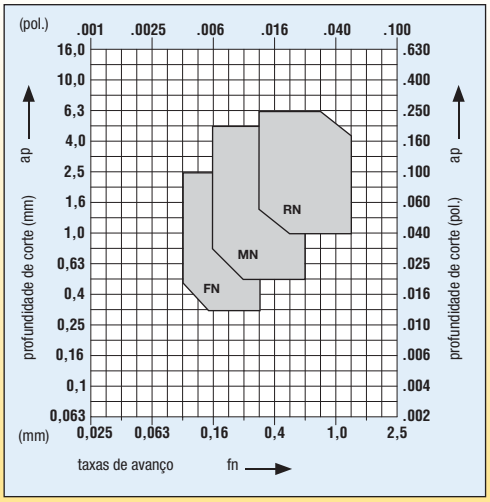

-RN

Torneamento médio
Corte ligeiramente interrompido e/ou escala leve
USE: -MN


-MN

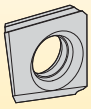
Acabamento
Corte não interrompido, sem escala
USE: FN

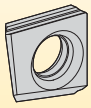

-FN

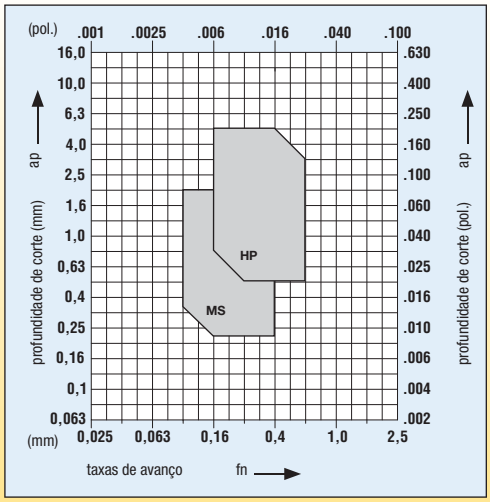


Insertos com 2 arestas, altamente positivo

Torneamento médio
Corte ligeiramente interrompido e/ou escala leve
USE: -HP OU -MS


-HP


-MS



Selecione a classe

	P	M	K	N	S	H
fortemente interrompido	KCP40/KCU25	KCU25/KCP40	KCP25/KCU25	KCU25	KCU25	–
ligeiramente interrompido	KCP25/KCU25	KCU25/KCP40	KCP25/KCU25	KCU25	KCU25	–
profundidades de corte variáveis	KCP10/KCU10	KCU10/KCM15	KCP10/KCU10	KCU10	KCU10	KCU10
suave	KCP10/KCU10	KCU10/KCM15	KCP10/KCU10	KCU10	KCU10	KCU10

Selecione a velocidade de corte

Aço — velocidade — m/min. (SFM) — condições iniciais

grupo de materiais	classe	60 (200)	90 (300)	120 (400)	105 (500)	185 (617)	215 (717)	245 (800)	275 (900)	300 (1000)	m/min.	SFM
P	KCP40				◁▷						150	500
	KCU10						◁▷				200	650
	KCP25						◁▷				200	650
	KCP10							◁▷			250	180

Aço inoxidável — velocidade — m/min. (SFM) — condições iniciais

grupo de materiais	classe	45 (150)	70 (233)	90 (300)	115 (383)	140 (467)	165 (550)	185 (617)	210 (700)	230 (767)	m/min.	SFM
M	KCP40					◁▷					140	450
	KCM15						◁▷				165	550
	KCU25						◁▷				165	550
	KCU10							◁▷			185	600

Ferro fundido — velocidade — m/min. (SFM) — condições iniciais

grupo de materiais	classe	90 (300)	135 (450)	180 (600)	225 (750)	275 (900)	320 (1050)	360 (1200)	410 (1350)	460 (1500)	m/min.	SFM
K	KCU25			◁▷							140	450
	KCU10				◁▷						165	550
	KCP25					◁▷					165	550
	KCP10						◁▷				185	600

Não ferrosos — velocidade — m/min. (SFM) — condições iniciais

grupo de materiais	classe	150 (500)	225 (750)	300 (1000)	380 (1267)	460 (1533)	535 (1783)	610 (2033)	685 (2283)	760 (2533)	m/min.	SFM
N	KCU10					◁▷					460	1500

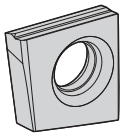
Ligas resistentes a altas temperaturas — velocidade — m/min. (SFM) — condições iniciais

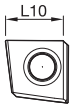
grupo de materiais	classe	35 (117)	45 (150)	55 (183)	65 (217)	75 (250)	85 (283)	95 (317)	120 (400)	140 (467)	m/min.	SFM
S	KCU25		◁▷								45	150
	KCU10				◁▷						60	200

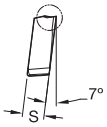
Aço endurecido — velocidade — m/min. (SFM) — condições iniciais

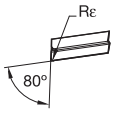
grupo de materiais	classe	5 (17)	15 (50)	25 (83)	35 (117)	45 (150)	55 (183)	65 (217)	75 (250)	85 (283)	m/min.	SFM
H	KCU10				◁▷						30	100

beyond









● primeira opção
○ opção alternativa

		KCP10	KCP25	KCP40	KCM15	KCU10	KCU25
P		●	●	●	●	●	●
M		○	○	●	●	●	●
K		●	●	●	●	●	●
N						●	●
S				○	○	●	●
H							

Aplicação específica

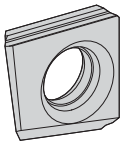
C2FIX-MN

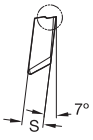
código do produto	L10	S	Rε	KCP10	KCP25	KCP40	KCM15	KCU10	KCU25
corte à direita (R)									
C2FIX110404RMN	10,70	4,00	0,40	–	–	–	–	●	–
C2FIX110405RMN	10,70	4,00	0,50	–	●	●	–	–	–
C2FIX150510RMN	14,50	5,00	1,00	–	●	–	–	–	–
C2FIX150512RMN	14,50	5,00	1,20	–	–	–	–	–	●
C2FIX150505RMN	14,70	5,00	0,50	–	●	–	–	–	–
corte à esquerda (L)									
C2FIX110404LMN	10,70	4,00	0,40	–	–	–	–	–	●
C2FIX110405LMN	10,70	4,00	0,50	–	●	●	–	●	–
C2FIX110408LMN	10,70	4,00	0,80	–	●	–	–	–	–
C2FIX150510LMN	14,50	5,00	1,00	–	●	●	–	–	–
C2FIX150508LMN	14,60	5,00	0,80	–	●	–	–	●	●
C2FIX150504LMN	14,70	5,00	0,40	–	–	●	–	–	●
C2FIX150505LMN	14,70	5,00	0,50	–	●	●	–	●	–
C2FIX180610LMN	17,50	6,00	1,00	–	●	●	–	●	–

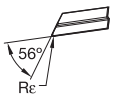
beyond

		KCP10	KCP25	KCP40	KCM15	KCU10	KCU25
P		●	●	●	●	●	●
M		○	○	●	●	●	●
K		●	●	●	●	●	●
N						●	●
S				○	○	●	●
H							

● primeira opção
○ opção alternativa

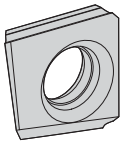


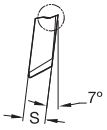



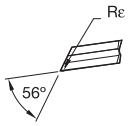


D2FIX-MN

código do produto	L10	S	Rε	KCP10	KCP25	KCP40	KCM15	KCU10	KCU25
corte à direita (R)									
D2FIX110405RMN	10,50	4,00	0,50	–	●	●	–	–	–
D2FIX150508RMN	14,20	5,00	0,80	–	●	–	–	–	–
D2FIX150505RMN	14,50	5,00	0,50	●	●	●	–	–	–
D2FIX150504RMN	14,60	5,00	0,40	–	●	–	–	–	–
D2FIX150503RMN	14,70	5,00	0,30	–	●	–	–	–	–
corte à esquerda (L)									
D2FIX110405LMN	10,50	4,00	0,50	–	●	●	–	–	–
D2FIX150508LMN	14,20	5,00	0,80	–	●	–	–	–	–
D2FIX150505LMN	14,50	5,00	0,50	–	●	–	–	–	–





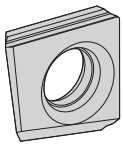
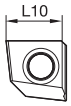
D2FIX-HP

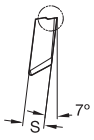
código do produto	L10	S	Rε	KCP10	KCP25	KCP40	KCM15	KCU10	KCU25
corte à direita (R)									
D2FIX110404RHP	10,00	4,00	0,40	–	–	–	–	–	●
D2FIX110403RHP	10,10	4,00	0,30	–	●	–	–	●	–
D2FIX150508RHP	13,60	5,00	0,80	–	–	–	–	●	●
D2FIX150504RHP	14,00	5,00	0,40	–	–	–	–	●	●
D2FIX150503RHP	14,10	5,00	0,30	–	●	–	–	●	–
corte à esquerda (L)									
D2FIX110403LHP	10,10	4,00	0,30	–	–	–	–	●	–
D2FIX150508LHP	13,60	5,00	0,80	–	–	–	–	●	–
D2FIX150503LHP	14,10	5,00	0,30	–	–	–	–	●	–

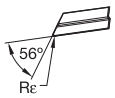
beyond

P	●	●	●	●	●	●
M	○	○	●	●	●	●
K	●	●	●	●	●	●
N					●	●
S			○	○	●	●
H						

● primeira opção
○ opção alternativa

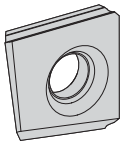
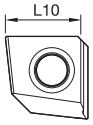



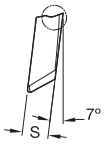


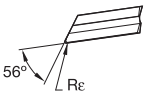


D2FIX-MS

código do produto	L10	S	Rε	KCP10	KCP25	KCP40	KCM15	KCU10	KCU25
corte à direita (R)									
D2FIX150505RMS	13,90	5,00	0,50	–	–	–	–	●	–
D2FIX150503RMS	14,10	5,00	0,30	–	–	–	–	●	–
corte à esquerda (L)									
D2FIX150505LMS	13,90	5,00	0,50	–	–	–	–	●	–
D2FIX150503LMS	14,10	5,00	0,30	–	–	–	–	●	–

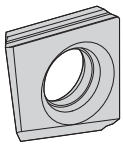



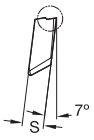


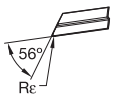


D2FIX-FN

código do produto	L10	S	Rε	KCP10	KCP25	KCP40	KCM15	KCU10	KCU25
corte à direita (R)									
D2FIX150505RFN	13,90	5,00	0,50	–	●	–	–	●	–

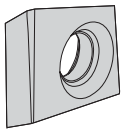
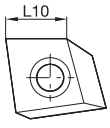


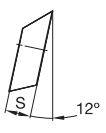



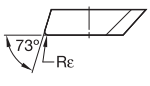


D2FIX-RN

código do produto	L10	S	Rε	KCP10	KCP25	KCP40	KCM15	KCU10	KCU25
corte à direita (R)									
D2FIX150505RRN	14,50	5,00	0,50	●	–	●	–	–	–
corte à esquerda (L)									
D2FIX150505LRN	14,50	5,00	0,50	–	●	–	–	–	–

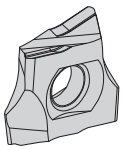


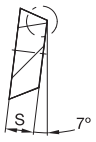


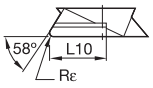
E2FIX-HP

código do produto	L10	S	Rε	KCP10	KCP25	KCP40	KCM15	KCU10	KCU25
corte à direita (R)									
E2FIX100505RHP	10,50	5,00	0,50	–	–	–	–	●	–
corte à esquerda (L)									
E2FIX100505LHP	10,50	5,00	0,50	–	–	–	–	●	–

beyond





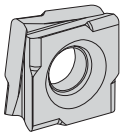
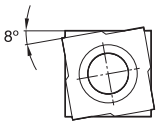


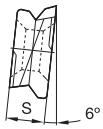
● primeira opção
○ opção alternativa

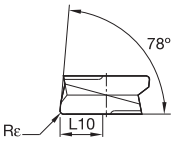
P		●	●	●	●	●	●
M		○	○	●	●	●	●
K		●	●	●	●	●	●
N						●	●
S				○	○	●	●
H							

D4FIX-MN

código do produto	L10	S	Rε	KCP10	KCP25	KCP40	KCM15	KCU10	KCU25
corte à direita (R)									
D4FIX140608RMN	6,70	5,90	0,80	●	●	–	–	●	●
D4FIX140605RMN	7,00	5,90	0,50	●	●	–	–	–	–
D4FIX140604RMN	7,10	5,90	0,40	–	–	●	–	–	●
D4FIX140603RMN	7,20	5,90	0,30	●	●	–	–	–	–
corte à esquerda (L)									
D4FIX140608LMN	6,70	5,90	0,80	–	●	–	–	–	–

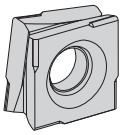



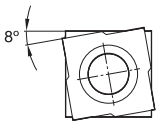


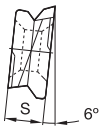


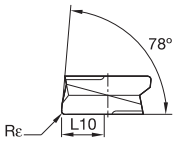
C8FIX-RN

código do produto	L10	S	Rε	KCP10	KCP25	KCP40	KCM15	KCU10	KCU25
corte à direita (R)									
C8FIX150612RRN	8,60	6,60	1,20	–	●	–	–	–	–
C8FIX150608RRN	8,90	6,60	0,80	●	●	●	–	–	●
C8FIX150605RRN	9,10	6,60	0,50	●	●	●	–	●	●
C8FIX180812RRN	10,60	7,90	1,20	–	●	●	–	–	●
C8FIX180808RRN	10,90	7,90	0,80	–	●	●	–	–	–
corte à esquerda (L)									
C8FIX150612LRN	8,60	6,60	1,20	–	●	–	–	–	–
C8FIX150608LRN	8,90	6,60	0,80	–	●	–	–	–	●
C8FIX150605LRN	9,10	6,60	0,50	–	●	●	–	–	●
C8FIX180812LRN	10,60	7,90	1,20	–	●	–	–	–	–







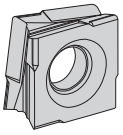


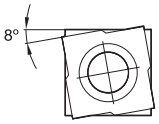
● primeira opção
○ opção alternativa

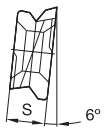
P		●	●	●	●	●	●
M		○	○	●	●	●	●
K		●	●	●	●	●	●
N						●	●
S				○	○	●	●
H							

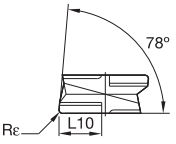
C8FIX-RP

código do produto	L10	S	Rε	KCP10	KCP25	KCP40	KCM15	KCU10	KCU25
corte à direita (R)									
C8FIX120508RRP	6,90	5,50	0,80	●	●	–	–	–	–
C8FIX120505RRP	7,10	5,50	0,50	–	●	–	–	–	●
C8FIX120504RRP	7,20	5,50	0,40	●	●	–	–	–	–
C8FIX120503RRP	7,30	5,50	0,30	–	●	●	–	–	–
corte à esquerda (L)									
C8FIX120508LRP	6,90	5,50	0,80	–	●	●	–	–	–
C8FIX150612LRP	7,80	6,60	1,20	–	●	–	–	–	–
C8FIX150608LRP	8,80	6,60	0,80	–	–	–	–	–	●









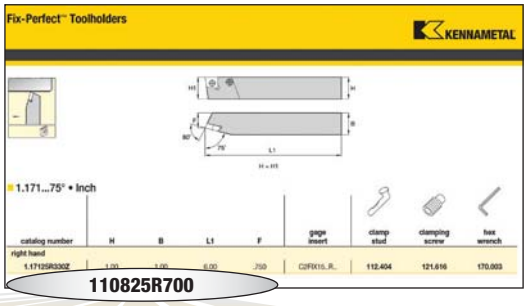
C8FIX-MP

código do produto	L10	S	Rε	KCP10	KCP25	KCP40	KCM15	KCU10	KCU25
corte à direita (R)									
C8FIX120503RMP	7,30	5,50	0,30	–	●	–	–	●	●
C8FIX150603RMP	9,30	6,60	0,30	●	●	●	–	●	●
C8FIX180805RMP	11,10	7,90	0,50	–	●	–	–	–	–
corte à esquerda (L)									
C8FIX120503LMP	7,30	5,50	0,30	●	●	–	–	●	–
C8FIX150603LMP	9,30	6,60	0,30	–	●	–	–	–	–

Aplicação específica

Como funcionam os números de catálogo?

Cada caractere no nosso número de catálogo significa uma característica específica daquele produto. Use as colunas-chave a seguir e as imagens correspondentes para fazer uma identificação fácil do atributo a ser aplicado.



1	1	08	25	R	7	0	0
Programa de torneamento	Número de arestas	Versão	Dimensões da haste	Sentido de corte	Suporte do parafuso de fixação	Formato do inserto	Suporte do parafuso de fixação

1 = Fix-Perfect

1 = Insertos com 2 arestas de corte

3 = Insertos com 4 arestas de corte

7 = Insertos com 8 arestas de corte

R = Direita

L = Esquerda

0 = Ativado a partir da aresta de corte principal

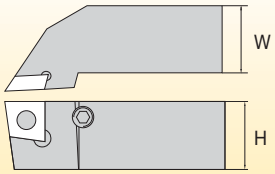
1 = Aresta de corte menor

2 = Acima de

5 = Aresta de corte principal com cápsula completa de aresta afiada

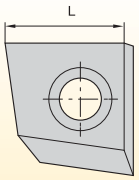
6 = Aresta de corte menor com cápsula completa de aresta afiada

08 = Configuração de 90° ou 93°, para a usinagem de alumínio
16 = 92° de ângulo de ajuste
20 = 92° de ângulo de ajuste
22 = 92° de ângulo de ajuste
30 = 75° de ângulo de ajuste
71 = 75° de ângulo de ajuste
72 = 45° de ângulo de ajuste
77 = 90° de ângulo de ajuste
80 = 90° de ângulo de ajuste

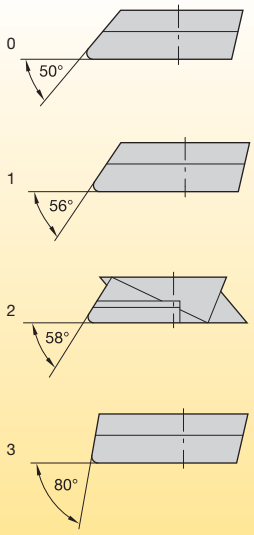


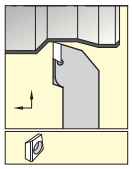
Porta-ferramentas

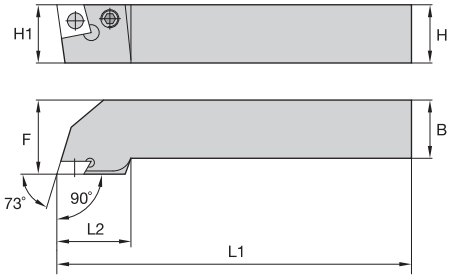
10 = 10 x 10mm
11 = 40 x 40mm
16 = 16 x 16mm
20 = 20 x 20mm
21 = 50 x 50mm
25 = 25 x 25mm
32 = 32 x 25mm
32 x 32mm
40 = 40 x 32mm



	L	arestas de corte
0	8mm 20mm 25mm	4 4 4
1	10,5mm 12mm	2 8
3	14,5mm 15mm	2 8
4	17,5mm 18mm	2 8
5	23,5mm 21mm	2 8
7	10,5mm	2 Alu



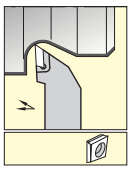


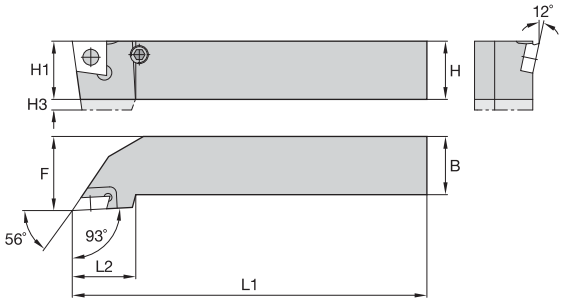


H = H1

1.108...90° • Métrico

código do produto	H	B	L1	F	inserto padrão	alavanca	parafuso de fixação	chave sextavada
corte à direita (R)								
1.10825R700	25	25	150,0	32,0	E2FIX10..R..	**410.081**	**121.616**	**170.003**

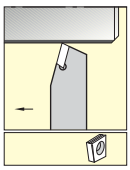


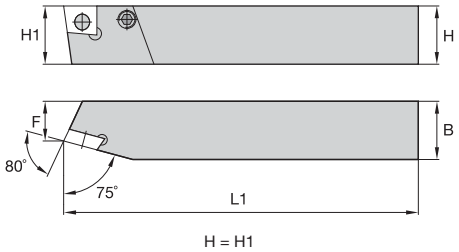


H = H1

1.108...93° • Métrico

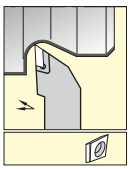
código do produto	H	H3	B	L1	F	inserto padrão	alavanca	parafuso de fixação	chave sextavada
corte à direita (R)									
1.10820R310	20	5	20	125,0	25,0	D2FIX15..RHP/FN/MS	**112.403**	**121.612**	**170.003**
1.10825R310	25	–	25	150,0	32,0	D2FIX15..RHP/FN/MS	**112.404**	**121.616**	**170.003**
corte à esquerda (L)									
1.10825L310	25	5	25	150,0	32,0	D2FIX15..LHP/FN/MS	**112.404**	**121.616**	**170.003**

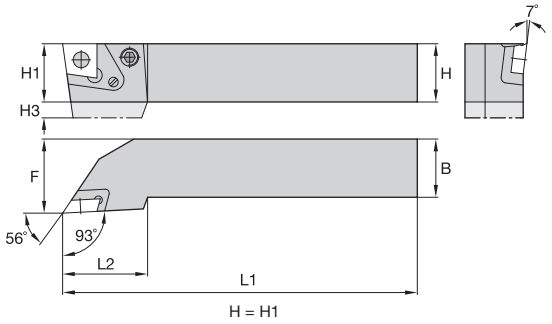




1.171...75° • Métrico

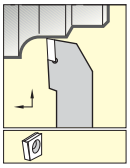
código do produto	H	B	L1	F	inserto padrão	alavanca	parafuso de fixação	chave sextavada
corte à esquerda (L)								
1.17125L330	25	25	150,0	17,0	C2FIX15..L..	**112.404**	**121.616**	**170.003**

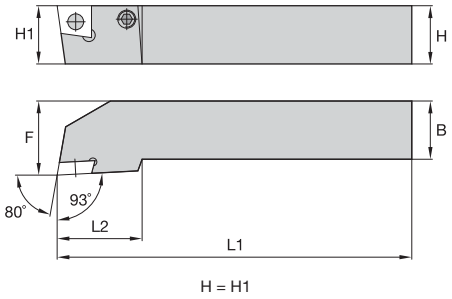




1.18 • Métrico

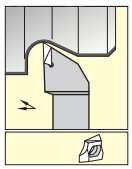
código do produto	H	H3	B	L1	F	inserto padrão	alavanca	parafuso de fixação	chave sextavada	conjunto do entalhe de aço
corte à direita (R)										
1.18016R110	16	4	16	100,0	24,0	D2FIX11..R..	**112.244**	**121.612**	**170.003**	–
1.18020R110	20	–	20	125,0	25,0	D2FIX11..R..	**112.244**	**121.612**	**170.003**	–
1.18020R310	20	5	20	125,0	26,0	D2FIX15..R..	**112.403**	**121.612**	**170.003**	–
1.18025R110	25	–	25	150,0	32,0	D2FIX11..R..	**112.244**	**121.612**	**170.003**	–
1.18025R310	25	–	25	150,0	32,0	D2FIX15..R..	**112.404**	**121.616**	**170.003**	–
1.18025R315	25	7	25	150,0	32,0	D2FIX15..R..	**112.505**	**121.616**	**170.003**	**132.151**
1.18032R315	32	–	25	170,0	32,0	D2FIX15..R..	**112.505**	**121.616**	**170.003**	**132.151**
corte à esquerda (L)										
1.18016L110	16	4	16	100,0	24,0	D2FIX11..L..	**112.244**	**121.612**	**170.003**	–
1.18020L110	20	–	20	125,0	25,0	D2FIX11..L..	**112.244**	**121.612**	**170.003**	–
1.18025L310	25	–	25	150,0	32,0	D2FIX15..L..	**112.404**	**121.616**	**170.003**	–
1.18025L315	25	7	25	150,0	32,0	D2FIX15..L..	**112.505**	**121.616**	**170.003**	**132.156**
1.18032L315	32	–	25	170,0	32,0	D2FIX15..L..	**112.505**	**121.616**	**170.003**	**132.156**

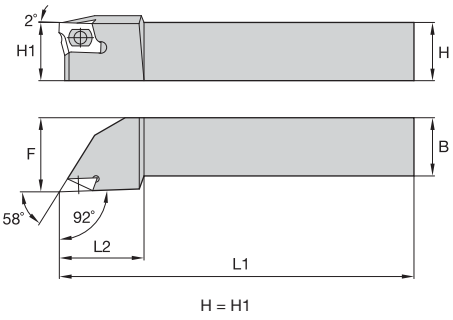




1.180...93° • Métrico

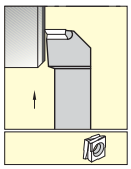
código do produto	H	B	L1	F	inserto padrão	alavanca	parafuso de fixação	chave sextavada
corte à esquerda (L)								
1.18025L330	25	25	150,0	32,0	C2FIX15..L..	**112.404**	**121.616**	**170.003**

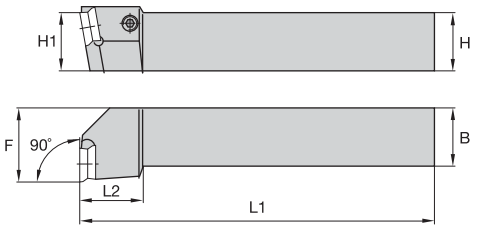




1.380...92° • Métrico

código do produto	H	B	L1	F	inserto padrão	alavanca	parafuso de fixação	chave sextavada
corte à direita (R)								
1.38020R021	20	20	125,0	25,0	D4FIX..R..	**114.111**	**121.812**	**170.004**
1.38025R021	25	25	150,0	32,0	D4FIX..R..	**114.114**	**121.816**	**170.004**
corte à esquerda (L)								
1.38025L021	25	25	150,0	32,0	D4FIX..L..	**114.114**	**121.816**	**170.004**



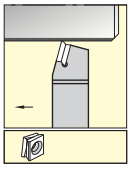


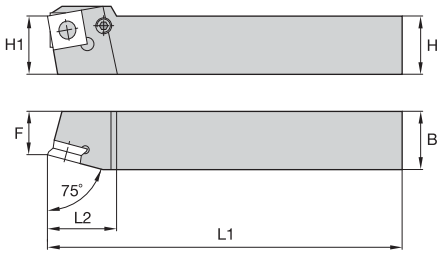
H = H1

1.777...90° • Métrico

código do produto	H	B	L1	F	inserto padrão	alavanca	parafuso de fixação	chave sextavada
corte à direita (R)								
1.77725R301	25	25	150,0	32,0	C8FIX15..L..	**118.314**	**121.816**	**170.004**

NOTA: As ferramentas com sentido de rotação para a direita usam insertos com sentido de rotação para a esquerda.

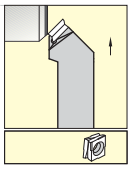


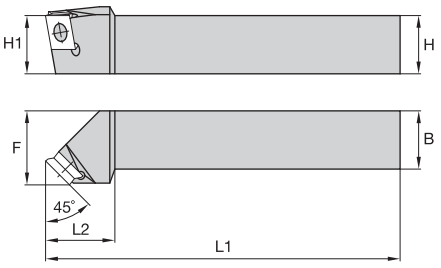


H = H1

1.771...75° • Métrico

código do produto	H	B	L1	F	inserto padrão	alavanca	parafuso de fixação	chave sextavada
corte à direita (R)								
1.77120R100	20	20	125,0	17,0	C8FIX12..R..	**118.204**	**121.612**	**170.003**
1.77125R300	25	25	150,0	21,0	C8FIX115..R..	**410.084**	**121.816**	**170.004**
1.77132R400	32	32	170,0	27,0	C8FIX18..R..	**410.091**	**–**	**–**
corte à esquerda (L)								
1.77120L100	20	20	125,0	17,0	C8FIX12..L..	**118.204**	**121.612**	**170.003**



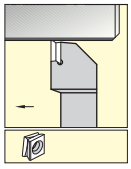


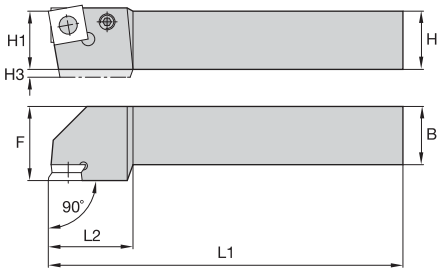
H = H1

1.772...45° • Métrico

código do produto	H	B	L1	F	inserto padrão	alavanca	parafuso de fixação	chave sextavada
corte à direita (R)								
1.77225R301	25	25	150,0	32,0	C8FIX15..L..	**118.314**	**121.816**	**170.004**

NOTA: O C8FIX15..L.. pode ser usado somente para rebaixamento.
Para rebaixamento e torneamento é necessário usar o C4FIX15..L...





H = H1

1.780...90° • Métrico

código do produto	H	H3	B	L1	F	inserto padrão	alavanca	parafuso de fixação	chave sextavada
corte à direita (R)									
1.78012R103	12	–	12	80,0	14,0	C8FIX12..R..	**–**	**–**	**170.003**
1.78016R100	16	4	16	100,0	25,0	C8FIX12..R..	**118.204**	**121.616**	**170.003**
1.78020R100	20	–	20	125,0	25,0	C8FIX12..R..	**118.204**	**121.616**	**170.003**
1.78025R100	25	–	25	150,0	32,0	1.81201R...	**118.204**	**121.616**	**170.003**
1.78025R300	25	–	25	150,0	32,0	C8FIX15..R..	**410.084**	**121.816**	**170.004**
1.78032R400	32	–	32	170,0	40,0	C8FIX18..R..	**410.091**	**121.825**	**170.004**
corte à esquerda (L)									
1.78025L100	25	–	25	150,0	32,0	1.81202L...	**118.204**	**121.616**	**170.003**
1.78025L300	25	–	25	150,0	32,0	C8FIX15..L..	**410.084**	**121.816**	**170.004**

Ferramenta de canais e insertos **Beyond**™ para as suas operações de canal raso e torneamento

Top Notch™



A abertura de canal Top Notch é a solução comprovada para alta produtividade. O sistema Top Notch fornece uma performance constante da ferramenta, indexação precisa e fixação excepcional, proporcionando um excelente acabamento superficial e maior vida útil da ferramenta.

CARACTERÍSTICAS E BENEFÍCIOS

- As classes Beyond com revestimento PVD foram projetadas para cortar uma variedade de materiais das peças.
- Fixação rígida trava firmemente o inserto no lugar através dos mais duros cortes.
- Um design versátil permite que um único sistema faça operações de abertura de canal no diâmetro interno ou externo e de face, de torneamento reverso, de rebaixamento e até de rosqueamento.
- Os insertos com controle do cavaco proporcionam excelente evacuação de cavacos na abertura de canal e oferecem melhor controle de cavaco no torneamento multidirecional.

Experimente as vantagens no seu distribuidor autorizado da Kennametal ou no site **kennametal.com**.

KENNAMETAL®

kennametal.com

Perfilagem Beyond™ Top Notch™

O sistema Top Notch é a solução comprovada para alta produtividade. O sistema Top Notch fornece uma performance constante da ferramenta, indexação precisa e fixação excepcional, proporcionando um excelente acabamento superficial e maior vida útil da ferramenta.



Características e benefícios

Classes Beyond™

Produtividade e lucratividade superiores

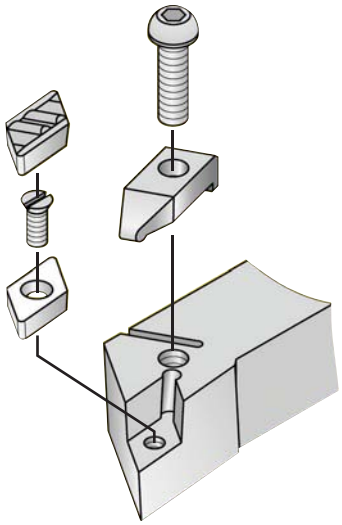
- Forças de corte inferior aumentam a velocidade e reduzem o tempo de ciclo.
- Vida útil da ferramenta estendida.

Confiabilidade

- Desgaste uniforme/vida útil previsível.
- Resiste a danos de fluxo do cavaco.
- Acabamento superficial uniforme.

Versatilidade

- Os produtos podem ser usados em uma ampla gama de aplicações.
- Uso em aplicações de baixa a alta velocidade.
- Portfólio completo de produtos.
- Para acabamento em torneamento de rebaste de aço, ferro fundido, aço inoxidável e ligas resistentes a altas temperaturas.



Geometria FP

- Taxa de remoção de metal superior.
- Versatilidade.
- Vida útil da ferramenta mais longa.
- Controle do cavaco ideal sobre a ampla faixa de condições de corte e materiais das peças.
- Melhor acabamento superficial.
- Melhor indexação.
- Menos ajustes durante a troca de inserto.



Geometria UF

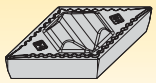
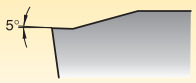
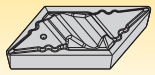
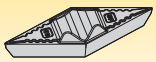
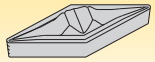
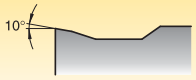
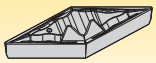
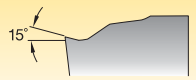
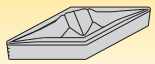
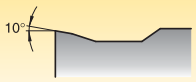
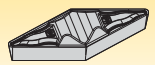
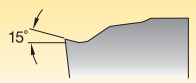
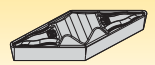
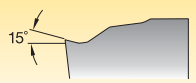
- Reduz as forças de corte.
- Vida útil da ferramenta mais longa.
- Controle do cavaco ideal sobre a ampla faixa de condições de corte.
- Controle do cavaco nas aplicações de acabamento.

Geometria HP

- Reduz as forças de corte.
- Vida útil da ferramenta mais longa.
- A interferência é evitada ao melhorar o acabamento superficial da peça.
- Melhor indexação.
- Bom controle sobre as dimensões do trabalho.
- Reduz a aderência do material das peças.

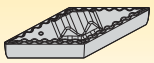
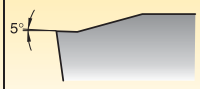
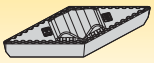
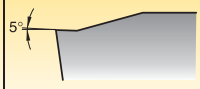
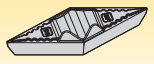
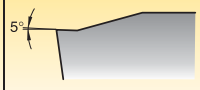
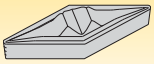
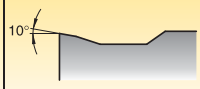
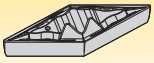
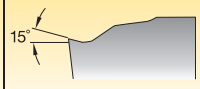
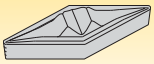
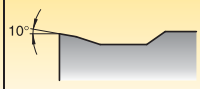
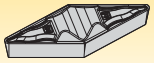
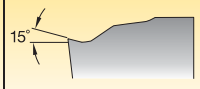
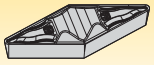
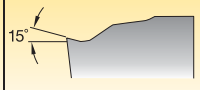
Selecione a geometria — com base nas taxas de avanço e na profundidade de corte

P	Aço
M	Aço inoxidável
K	Ferro fundido
N	Materiais não ferrosos
S	Ligas resistentes a altas temperaturas
H	Materiais endurecidos

operação	aplicação para o estilo do inserto	Geometria do Inserto	perfil	taxa de avanço – mm: 0,04 / 0,063 / 0,01 / 0,16 / 0,25 / 0,4 / 0,63 / 1,0 / 1,6 / 2,5 / 5,0 profundidade de corte — mm: 0,1 / 0,16 / 0,25 / 0,4 / 0,63 / 1,0 / 1,6 / 2,5 / 4,0 / 6,3 / 10,0
Acabamento Fino	DCGR-UF			0,1–0,3 0,1–1,3
	KCGR-UF			0,1–0,3 0,1–1,3
Acabamento	DCGR			0,1–0,3 0,1–1,3
	KCGR			0,1–0,4 0,3–2,0
	DCGR-FP			0,063–0,25 0,16–1,6
	DCGR-HP			0,1–0,4 0,3–2,0
	KCGR-FP			0,063–0,25 0,16–1,6
	KCGR-HP			0,063–0,25 0,16–1,6

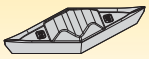
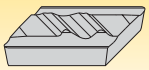
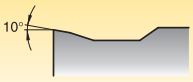
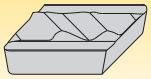
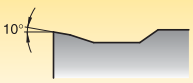
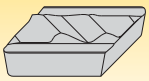
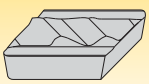
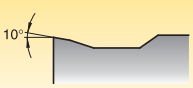
Selecione a geometria — com base nas taxas de avanço e na profundidade de corte

P	Aço
M	Aço inoxidável
K	Ferro fundido
N	Materiais não ferrosos
S	Ligas resistentes a altas temperaturas
H	Materiais endurecidos

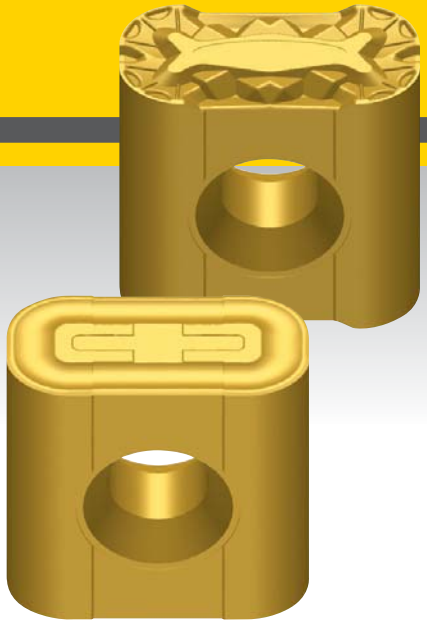
operação	aplicação para o estilo do inserto	Geometria do Inserto	perfil	taxa de avanço – mm: 0,04 / 0,063 / 0,01 / 0,16 / 0,25 / 0,4 / 0,63 / 1,0 / 1,6 / 2,5 / 5,0 profundidade de corte — mm: 0,1 / 0,16 / 0,25 / 0,4 / 0,63 / 1,0 / 1,6 / 2,5 / 4,0 / 6,3 / 10,0
Acabamento Fino	VBMR-UF			0,1–0,3 0,1–1,3
	VCMR-UF			0,1–0,3 0,1–1,3
	VPGR-UF			0,1–0,3 0,1–1,3
Acabamento	VBMR			0,1–0,4 0,3–2,0
	VBMR-FP			0,063–0,25 0,16–1,6
	VCGR			0,1–0,4 0,3–2,0
	VCMR-FP			0,063–0,25 0,16–1,6
	VPGR-FP			0,063–0,25 0,16–1,6

Selecione a geometria — com base nas taxas de avanço e na profundidade de corte

P	Aço
M	Aço inoxidável
K	Ferro fundido
N	Materiais não ferrosos
S	Ligas resistentes a altas temperaturas
H	Materiais endurecidos

operação	aplicação para o estilo do inserto	Geometria do Inserto	perfil	taxa de avanço – mm: 0,04 / 0,063 / 0,01 / 0,16 / 0,25 / 0,4 / 0,63 / 1,0 / 1,6 / 2,5 / 5,0 profundidade de corte — mm: 0,1 / 0,16 / 0,25 / 0,4 / 0,63 / 1,0 / 1,6 / 2,5 / 4,0 / 6,3 / 10,0
Acabamento	**VPGR-HP**			0,2–0,4 0,6–2,3
Acabamento	**KNGX-15**			0,2–0,4 0,8–2,8
Acabamento	**KNGX-20**			0,2–0,5 1,0–3,0
	KNGX-25			0,3–0,6 1,1–3,6
Acabamento	**KNGX-32**			0,3–0,7 1,5–5,1

Ferramentas da Kennametal para **estradas de ferro** e **usinagem de rodas**



A Kennametal oferece uma completa linha de ferramentas para a manutenção de rodas e eixos em oficinas ferroviárias. Todas as ferramentas incorporam a última tecnologia em ferramental para a máxima remoção de material e maior produtividade. Todas as ferramentas são testadas por profissionais em atividades reais por longos períodos de tempo em uma ampla gama de condições operacionais. Insertos padrão produzidos em série e poucos componentes reduzem o estoque e os custos operacionais. Incluídas nesta gama estão as ferramentas para recondicionamento dos jogos de rodas montadas, mandrilamento de rodas, alinhamento de rodas, torneamento de eixos e polimento de ponta de eixo.

Conheça as vantagens no seu distribuidor autorizado da Kennametal ou no site **kennametal.com**.

KENNAMETAL®

kennametal.com

Etapa 1 • Escolha a geometria do inserto

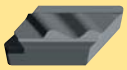
Insertos negativos



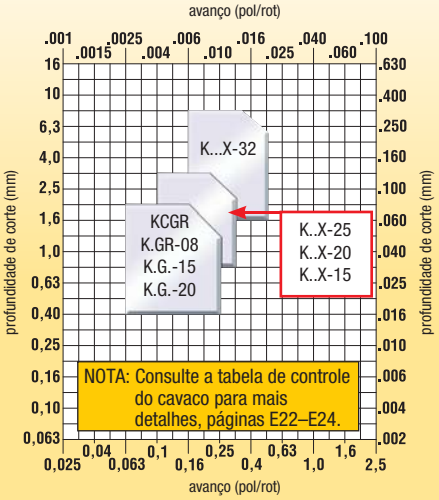
-K...X-32
Desbaste



-K...X-25–K...X-15,
Usinagem média



-K. GR-08, K.G.-15,
K.G.-20
Acabamento



Insertos positivos



-VCMR
Usinagem média



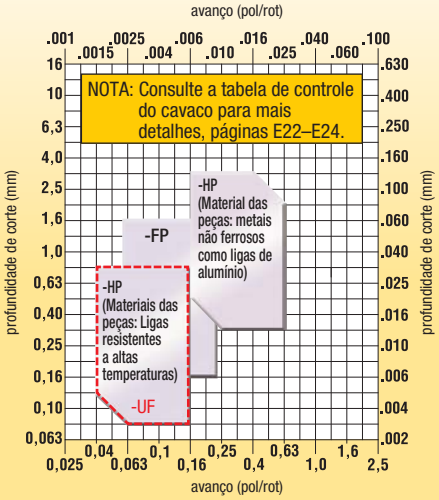
-.CGR, VBMR
Acabamento



-VCGN
Acabamento



-KCGR
Acabamento



Faixa de controle do cavaco
-UF: avanço de 0,08–0,3 mm/rev; DOC 0,1–1,3mm
-FP: avanço de 0,1–0,3 mm/rev; DOC 0,1–1,3mm
-HP: avanço de 028–0,4 mm/rev; DOC 0,6–2,3mm

Etapa 2 • Escolha a classe

		Aço			Aço inoxidável		
condições de corte		**Acabamento**	**Usinagem média**	**Desbaste**	**Acabamento**	**Usinagem média**	**Desbaste**
corte altamente interrompido		**KCP25**	**KCM25**	**KCM25**	**KCM25**	**KCM25**	**KCM25**
corte ligeiramente interrompido		**KCP10**	**KCP25**	**KCP25**	**KC5010/KCU10**	**KC5025/KCU25**	**KC5025/KCU25**
profundidade de corte variável, fundição ou superfície de forja		**KT315**	**KCP25**	**KCP25**	**KT315**	**KCM25**	**KCM25**
corte liso, superfície pré-torneada		**KT315**	**KCP05/KCP10**	**KCP10**	**KT315**	**KC5010/KCU10**	**KCM25**

		Ferro fundido			Não ferrosos		
condições de corte		**Acabamento**	**Usinagem média**	**Desbaste**	**Acabamento**	**Usinagem média**	**Desbaste**
corte altamente interrompido		**KCP10**	**KCP10**	**KCP10**	**KC5010/KCU10**	**KC5010/KCU10**	**KC5010/K313/ KCU10**
corte ligeiramente interrompido		**KCP05**	**KCP05**	**KCP05**	**KC5410/KD1425**	**KC5010/KCU10**	**KC5010**
profundidade de corte variável, fundição ou superfície de forja		**KCK05**	**KCK05**	**KCK05**	**KD1425**	**KC5410**	**KC5410**
corte liso, superfície pré-torneada		**KC5010/KCU10**	**KC5010/KCU10**	**KC5010/KCU10**	**KD1425**	**KC5410**	**KC5410**

Ligas resistentes a altas temperaturas

condições de corte		**Acabamento**	**Usinagem média**	**Desbaste**
corte altamente interrompido		**KC5025/KUC25**	**K68**	**K68**
corte ligeiramente interrompido		**KC5010**	**KC5010**	**KCM25**
profundidade de corte variável, fundição ou superfície de forja		**KC5010**	**KC5010**	**KC5010**
corte liso, superfície pré-torneada		**KC5010/KCU10/ K313**	**KC5010/KCU10**	**KC5010**

Selecione a velocidade de corte

Aço — velocidade — m/min. (SFM) — condições iniciais ◁▷

grupo de materiais	classe	50 (170)	100 (330)	150 (490)	200 (655)	250 (820)	300 (980)	350 (1150)	400 (1300)	m/min.	SFM
P	KT315					◁▷				260	850
	KCP05/KCP10				◁▷					340	800
	KCP25			◁▷						180	600
	KCM25			◁▷						165	550

Aço inoxidável — velocidade — m/min. (SFM) — condições iniciais ◁▷

grupo de materiais	classe	50 (170)	100 (330)	150 (490)	200 (655)	250 (820)	300 (980)	350 (1150)	400 (1300)	m/min.	SFM
M	KT315			◁▷						230	750
	KC5010/KCU10				◁▷					180	600
	KC5025/KCU25			◁▷						120	400
	KCM25			◁▷						150	500

Ferro fundido — velocidade — m/min. (SFM) — condições iniciais ◁▷

grupo de materiais	classe	150 (490)	200 (655)	250 (820)	300 (980)	350 (1150)	400 (1300)	500 (1600)	750 (2400)	m/min.	SFM
K	KB1345								◁▷	760	2520
	KT315				◁▷					275	900
	KC5010/KCU10			◁▷						245	800
	KCK20			◁▷						245	800
	KCP25			◁▷						230	750

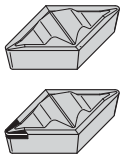
Não ferrosos — velocidade — m/min. (SFM) — condições iniciais ◁▷

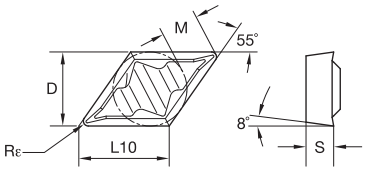
grupo de materiais	classe	250 (800)	500 (1600)	750 (2400)	1000 (3200)	1250 (4000)	1500 (4800)	1750 (5600)	2000 (6400)	m/min.	SFM
N	KO1425			◁▷						765	2500
	KC5410		◁▷							550	1800
	KC5010/KCU10		◁▷							460	1500
	K68/K313	◁▷								150	500

Ligas resistentes a altas temperaturas — velocidade — m/min. (SFM) — condições iniciais ◁▷

grupo de materiais	classe	15 (50)	40 (120)	55 (180)	80 (250)	100 (330)	170 (550)	200 (655)	120 (400)	m/min.	SFM
S	KC5010/KCU10				◁▷					60	200
	KC5025/KCU25			◁▷						50	170
	KCM25				◁▷					70	230
	K68/K31360		◁▷							30	100

◁▷ Representa as condições de corte recomendadas iniciais. Otimiza as suas aplicações específicas.



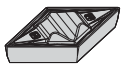


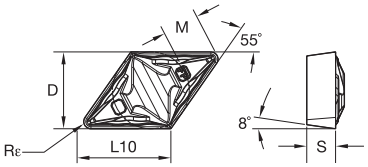
● primeira opção
○ opção alternativa

		K68	K313	KU10	KCP10	KCP25B	KCP25	KCK05	KCM15B	KCM25B	KCM25	KCU10	KCU25	KC5010	KC5025	KC5410	KT315	KD1425
P		●	●	●	●	●	●	○	○	○	○	●	●	●	●		●	
M		●	●	●					●	●	●	●	●	●	●		●	
K		●	●	●	○	○	○	●				●	●	●	●		●	
N		●	●	●								●	●	●	●	●		●
S		●	●	●					●	●	●	●	●	●	●			
H																		

DCGR • DPGR

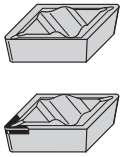
ISO código do produto	D	L10	S	M	Rε	K68	K313	KU10	KCP10	KCP25B	KCP25	KCK05	KCM15B	KCM25B	KCM25	KCU10	KCU25	KC5010	KC5025	KC5410	KT315	KD1425
DCGR150404	12,70	15,50	4,76	6,94	0,4	–	–	–	–	–	–	–	–	–	–	●	●	●	–	–	–	–
DCGR150408	12,70	15,50	4,76	6,48	0,8	●	–	–	–	–	–	–	–	–	–	●	●	●	–	–	–	●
DCGR150412	12,70	15,50	4,76	6,01	1,2	–	–	–	–	–	–	–	–	–	–	–	●	●	–	–	–	–

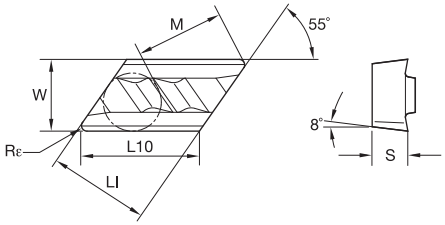




DCGR-FP • DPGR-FP

ISO código do produto	D	L10	S	M	Rε	K68	K313	KU10	KCP10	KCP25B	KCP25	KCK05	KCM15B	KCM25B	KCM25	KCU10	KCU25	KC5010	KC5025	KC5410	KT315	KD1425
DCGR150404FP	12,70	15,50	4,76	6,94	0,4	–	–	–	–	–	●	–	–	–	–	●	–	–	–	–	–	–
DCGR150408FP	12,70	15,50	4,76	6,48	0,8	–	–	–	●	–	–	–	–	–	●	–	–	–	–	–	–	–

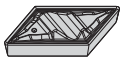


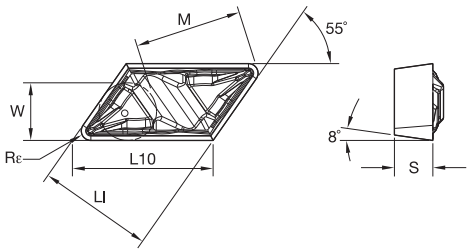


● primeira opção
○ opção alternativa

KCGR • NPGR

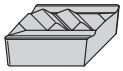
ISO código do produto	LI	L10	W	S	M	Rε	K68	K313	KU10	KCP10	KCP25B	KCP25	KCK05	KCM15B	KCM25B	KCM25	KCU10	KCU25	KC5010	KC5025	KC5410	KT315	KD1425
P							●	●	●	●	●	●	○	○	○	○	●	●	●	●		●	
M							●	●	●					●	●	●	●	●	●	●		●	
K							●	●	●	○	○	○	●				●	●	●	●		●	
N							●	●	●								●	●	●	●	●		●
S							●	●	●					●	●	●	●	●	●	●			
H																							
corte à direita (R)																							
KCGR110304R08	9,53	11,60	6,35	3,18	9,10	0,4	●	–	–	–	–	–	–	–	–	–	●	●	●	●	–	●	●
KCGR110308R08	9,53	11,60	6,35	3,18	8,66	0,8	–	–	–	–	–	–	–	–	–	–	●	●	–	–	–	●	–
corte à esquerda (L)																							
KCGR110308L08	9,53	11,60	6,35	3,18	8,66	0,8	–	–	–	–	–	–	–	●	–	–	●	●	–	●	–	–	●
KCGR110304L08	9,53	11,60	6,35	3,18	9,10	0,4	●	–	–	–	–	–	–	–	–	–	●	●	●	●	–	●	–

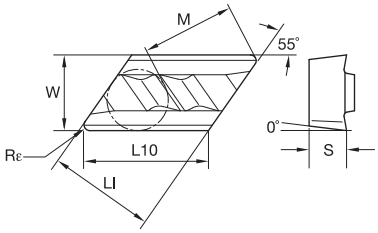




KCGR-FP • NPGR-FP

ISO código do produto	LI	L10	W	S	M	Rε	K68	K313	KU10	KCP10	KCP25B	KCP25	KCK05	KCM15B	KCM25B	KCM25	KCU10	KCU25	KC5010	KC5025	KC5410	KT315	KD1425
corte à direita (R)																							
KCGR110304R08FP	9,52	11,60	6,35	3,18	9,13	0,4	–	–	–	●	–	●	–	–	–	●	–	–	–	–	–	–	–
KCGR110308R08FP	9,52	11,63	6,35	3,18	8,73	0,8	–	–	–	●	–	–	–	–	–	–	●	–	–	–	–	–	–
corte à esquerda (L)																							
KCGR110308L08FP	9,52	11,63	6,35	3,18	8,73	0,8	–	–	–	●	–	●	–	–	–	–	–	–	–	–	–	–	–
KCGR110304L08FP	9,52	11,60	6,35	3,18	9,13	0,4	–	–	–	●	–	●	–	–	–	●	–	●	–	–	–	–	–



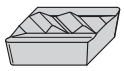


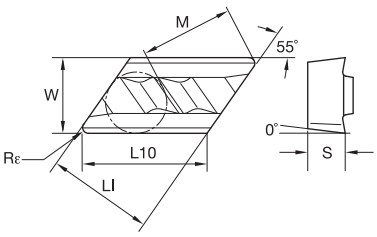
● primeira opção
○ opção alternativa

P		●	●	●	●	●	●	○	○	○	○	●	●	●	●		●	
M		●	●	●					●	●	●	●	●	●	●		●	
K		●	●	●	○	○	○	●				●	●	●	●		●	
N		●	●	●								●	●	●	●	●		●
S		●	●	●					●	●	●	●	●	●	●			
H																		

KNGX • NPR/L

ISO código do produto	LI	L10	W	S	M	Rε	K68	K313	KU10	KCP10	KCP25B	KCP25	KCK05	KCM15B	KCM25B	KCM25	KCU10	KCU25	KC5010	KC5025	KC5410	KT315	KD1425
corte à direita (R)																							
KNGX150404R20	12,68	15,44	9,47	4,76	13,46	0,4	–	–	–	–	–	–	–	–	–	–	–	●	●	–	–	–	–
KNGX150408R20	12,68	15,44	9,47	4,76	12,99	0,8	–	–	–	–	–	–	–	–	–	–	●	●	●	–	–	–	–
KNGX150401R15	12,70	15,44	9,53	4,76	13,76	0,1	●	–	–	–	–	–	–	–	–	–	●	–	–	–	–	–	–
KNGX150402R15	12,70	15,44	9,53	4,76	13,67	0,2	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–	–	–
KNGX220404R25	18,62	22,73	9,53	4,76	19,91	0,4	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–	–
KNGX220408R32	18,62	22,73	9,53	4,76	19,47	0,8	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–	–	–
corte à esquerda (L)																							
KNGX150408L20	12,68	15,44	9,47	4,76	12,99	0,8	●	–	–	–	–	–	–	–	–	–	–	●	●	–	–	–	–
KNGX150404L20	12,68	15,44	9,47	4,76	13,46	0,4	–	–	–	–	–	–	–	–	–	–	–	●	●	–	–	–	–
KNGX220408L20	18,62	22,73	9,53	4,76	19,47	0,8	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–	–	–



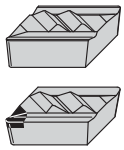


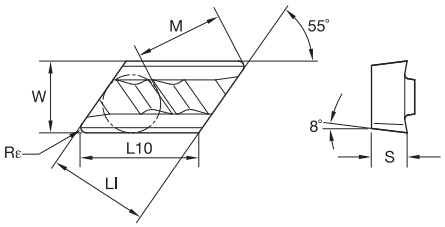
● primeira opção
○ opção alternativa

P		●	●	●	●	●	●	○	○	○	○	●	●	●	●		●			
M		●	●	●					●	●	●	●	●	●	●		●			
K		●	●	●	○	○	○	●				●	●	●	●		●			
N		●	●	●								●	●	●	●	●		●		
S		●	●	●					●	●	●	●	●	●	●					
H																				

KNUX • NPR/L

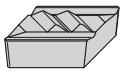
ISO código do produto	LI	L10	W	S	M	Rε	K68	K313	KU10	KCP10	KCP25B	KCP25	KCK05	KCM15B	KCM25B	KCM25	KCU10	KCU25	KC5010	KC5025	KC5410	KT315	KD1425
corte à direita (R)																							
KNUX150405R20	12,70	15,44	9,53	4,76	13,32	0,5	–	–	–	–	–	–	–	–	–	–	●	–	●	–	–	–	–
KNUX150405R25	12,70	15,44	9,53	4,76	13,32	0,5	●	–	–	–	●	–	–	–	–	–	–	–	–	–	–	–	–
KNUX150410R25	12,70	15,44	9,53	4,76	12,74	1,0	●	–	–	–	–	–	–	–	–	–	●	–	–	–	–	–	–
KNUX160405R1	16,15	17,51	9,52	4,76	–	0,5	–	–	–	–	–	–	–	●	●	–	–	●	–	–	–	–	–
KNUX160405R2	16,15	17,51	9,52	4,76	–	0,5	–	–	–	–	–	–	–	–	●	–	–	–	–	–	–	–	–
KNUX160410R1	16,15	17,51	9,52	4,76	–	1,0	–	–	–	–	–	–	–	–	●	–	–	–	–	–	–	–	–
KNUX160410R2	16,15	17,51	9,52	4,76	–	1,0	–	–	–	–	–	–	–	–	●	–	–	–	–	–	–	–	–
corte à esquerda (L)																							
KNUX150410L25	12,70	15,44	9,53	4,76	12,74	1,0	●	–	–	–	–	–	–	–	–	–	●	–	–	–	–	–	–
KNUX150405L25	12,70	15,44	9,53	4,76	13,32	0,5	●	–	–	–	–	–	–	–	–	–	●	–	–	–	–	–	–
KNUX160405L1	16,15	17,51	9,52	4,76	–	0,5	–	–	–	–	–	–	–	●	●	–	–	–	–	–	–	–	–
KNUX160405L2	16,15	17,51	9,52	4,76	–	0,5	–	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–

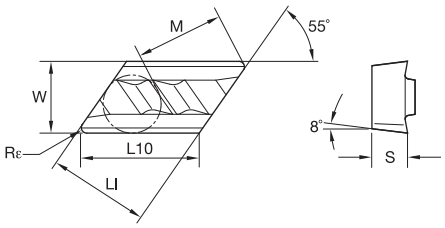




KCGX • NPR/L

ISO código do produto	LI	L10	W	S	M	Rε	K68	K313	KU10	KCP10	KCP25B	KCP25	KCK05	KCM15B	KCM25B	KCM25	KCU10	KCU25	KC5010	KC5025	KC5410	KT315	KD1425
corte à direita (R)																							
KCGX110301R15	9,53	11,60	6,35	3,18	9,43	0,1	●	●	–	–	–	–	–	–	–	–	●	–	●	●	–	–	●
KCGX110302R15	9,53	11,60	6,35	3,18	9,34	0,2	–	●	–	–	–	–	–	–	–	–	●	●	●	–	–	●	●
KCGX110304R15	9,53	11,60	6,35	3,18	9,11	0,4	●	●	–	–	–	–	–	–	–	–	●	●	●	●	●	●	●
KCGX110308R15	9,57	–	6,33	3,18	8,69	0,8	●	–	–	–	–	–	–	–	–	–	●	–	●	●	–	●	–
corte à esquerda (L)																							
KCGX110304L15	9,53	11,60	6,35	3,18	9,11	0,4	●	●	–	–	–	–	–	–	–	–	●	●	●	●	–	–	●
KCGX110302L15	9,53	11,60	6,35	3,18	9,34	0,2	–	●	–	–	–	–	–	–	–	–	●	●	–	–	–	–	●
KCGX110301L15	9,53	11,60	6,35	3,18	9,43	0,1	●	●	–	–	–	–	–	–	–	–	–	●	●	–	–	–	●
KCGX110308L15	9,57	–	6,33	3,18	8,69	0,8	●	●	–	–	–	–	–	–	–	–	–	●	●	–	–	–	–

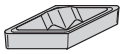


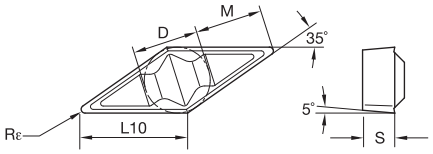


● primeira opção
○ opção alternativa

KCUX • NPR/L

ISO código do produto	LI	L10	W	S	M	Rε	K68	K313	KU10	KCP10	KCP25B	KCP25	KCK05	KCM15B	KCM25B	KCM25	KCU10	KCU25	KC5010	KC5025	KC5410	KT315	KD1425
P							●	●	●	●	●	●	○	○	○	○	●	●	●	●		●	
M							●	●	●					●	●	●	●	●	●	●		●	
K							●	●	●	○	○	○	●				●	●	●	●		●	
N							●	●	●								●	●	●	●	●		●
S							●	●	●								●	●	●	●			
H																							
corte à direita (R)																							
KCUX110302R15	9,50	11,60	6,33	3,18	9,40	0,2	●	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–
KCUX110305R15	9,53	11,60	6,35	3,18	9,06	0,5	●	–	–	–	●	–	–	–	–	–	●	–	●	–	–	–	–
KNUX150405R20	12,70	15,44	9,53	4,76	13,32	0,5	–	–	–	–	●	–	–	–	–	–	–	–	–	–	–	–	–
corte à esquerda (L)																							
KCUX110302L15	9,46	11,60	6,33	3,18	9,40	0,2	●	–	–	–	–	–	–	–	–	–	●	–	●	–	–	–	–
KCUX110305L15	9,53	11,60	6,35	3,18	9,06	0,5	●	–	–	–	–	–	–	–	–	–	●	–	●	–	–	–	–

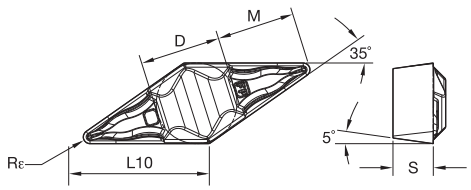




VBMR

ISO código do produto	D	L10	S	M	Rε	K68	K313	KU10	KCP10	KCP25B	KCP25	KCK05	KCM15B	KCM25B	KCM25	KCU10	KCU25	KC5010	KC5025	KC5410	KT315	KD1425
VBMR110304	6,35	11,07	3,18	6,46	0,4	–	–	–	–	–	–	–	–	–	–	–	–	●	●	–	●	–

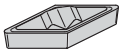


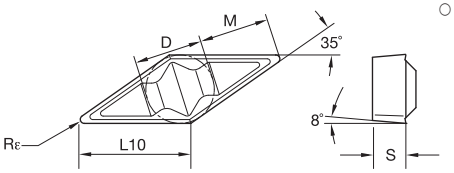


VBMR-FP

ISO código do produto	D	L10	S	M	Rε	K68	K313	KU10	KCP10	KCP25B	KCP25	KCK05	KCM15B	KCM25B	KCM25	KCU10	KCU25	KC5010	KC5025	KC5410	KT315	KD1425
VBMR110302FP	6,35	11,04	3,18	6,91	0,2	–	–	–	–	–	●	–	–	–	–	–	–	–	–	–	–	–
VBMR110304FP	6,35	11,07	3,18	6,46	0,4	–	–	–	●	–	●	–	–	–	–	–	●	–	–	–	–	–
VBMR110308FP	6,35	11,07	3,18	5,54	0,8	–	–	–	●	–	–	–	–	–	–	●	–	–	–	–	–	–

● primeira opção
○ opção alternativa

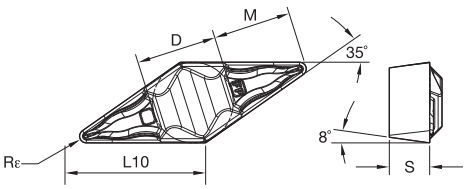




VCMR

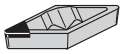
ISO código do produto	D	L10	S	M	Rε	K68	K313	KU10	KCP10	KCP25B	KCP25	KCK05	KCM15B	KCM25B	KCM25	KCU10	KCU25	KC5010	KC5025	KC5410	KT315	KD1425
VCMR160404	9,53	16,61	4,76	10,15	0,4	–	–	–	–	–	–	–	●	–	–	–	●	●	●	–	●	–
VCMR160408	9,53	16,61	4,76	9,23	0,8	–	–	–	–	–	–	–	●	–	–	●	●	●	●	–	●	–

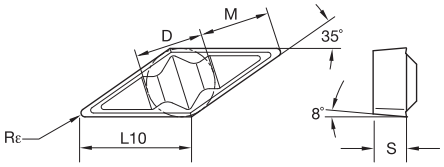




VCMR-FP

ISO código do produto	D	L10	S	M	Rε	K68	K313	KU10	KCP10	KCP25B	KCP25	KCK05	KCM15B	KCM25B	KCM25	KCU10	KCU25	KC5010	KC5025	KC5410	KT315	KD1425
VCMR160404FP	9,52	16,61	4,76	10,15	0,4	–	–	–	●	–	●	–	–	–	●	●	●	–	–	–	–	–
VCMR160408FP	9,52	16,61	4,76	9,23	0,8	–	–	–	●	–	●	●	–	–	●	–	–	–	–	–	–	–



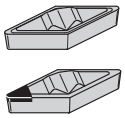


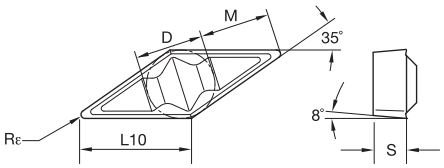
● primeira opção
○ opção alternativa

		K68	K313	KU10	KCP10	KCP25B	KCP25	KCK05	KCM15B	KCM25B	KCM25	KCU10	KCU25	KC5010	KC5025	KC5410	KT315	KD1425
P		●	●	●	●	●	●	○	○	○	○	●	●	●	●		●	
M		●	●	●					●	●	●	●	●	●	●		●	
K		●	●	●	○	○	○	●				●	●	●	●		●	
N		●	●	●								●	●	●	●	●		●
S		●	●	●					●	●	●	●	●	●	●			
H																		

VPGN

ISO código do produto	D	L10	S	M	Rε	K68	K313	KU10	KCP10	KCP25B	KCP25	KCK05	KCM15B	KCM25B	KCM25	KCU10	KCU25	KC5010	KC5025	KC5410	KT315	KD1425
VCGN160404	9,53	16,61	4,76	10,15	0,4	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●
VCGN160408	9,53	16,61	4,76	9,23	0,8	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●

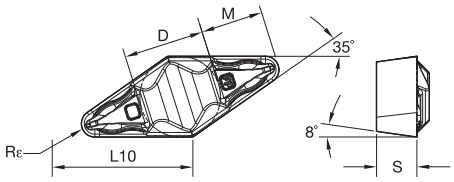




VCGR • VPGR

ISO código do produto	D	L10	S	M	Rε	K68	K313	KU10	KCP10	KCP25B	KCP25	KCK05	KCM15B	KCM25B	KCM25	KCU10	KCU25	KC5010	KC5025	KC5410	KT315	KD1425
VCGR160402	9,53	16,61	4,76	10,60	0,2	●	–	–	–	–	–	–	–	–	–	●	●	●	●	●	–	–
VCGR160404	9,53	16,61	4,76	10,15	0,4	●	●	–	–	–	●	–	–	–	–	●	●	●	●	●	●	●
VCGR160408	9,52	16,61	4,76	9,23	0,8	●	●	–	–	●	–	–	–	–	–	●	●	●	●	●	●	●
VCGR160412	9,53	16,61	4,76	8,31	1,2	●	–	–	–	–	–	–	–	–	–	●	●	●	–	–	–	●
VCGR160416	9,53	16,61	4,76	7,38	1,6	–	–	–	–	–	–	–	–	–	–	●	–	●	–	–	–	–



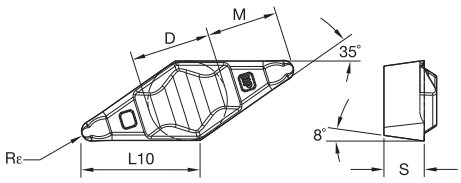


● primeira opção
○ opção alternativa

VCGR-FP • VPGR-FP

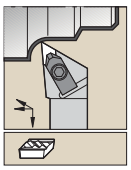
ISO código do produto	D	L10	S	M	Rε	K68	K313	KU10	KCP10	KCP25B	KCP25	KCK05	KCM15B	KCM25B	KCM25	KCU10	KCU25	KC5010	KC5025	KC5410	KT315	KD1425
VCGR160402FP	9,52	16,61	4,76	10,60	0,2	–	–	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–
VCGR160404FP	9,52	16,61	4,76	10,15	0,4	–	–	–	●	–	●	–	–	–	●	●	–	–	–	–	–	–
VCGR160408FP	9,52	16,61	4,76	9,23	0,8	–	–	–	●	–	●	●	–	–	●	–	–	–	–	–	–	–
VCGR160412FP	9,52	16,61	4,76	8,31	1,2	–	–	–	●	–	●	●	–	–	–	–	–	–	–	–	–	–
VCGR160416FP	9,52	16,61	4,76	7,38	1,6	–	–	–	–	–	●	–	–	–	–	–	–	–	–	–	–	–

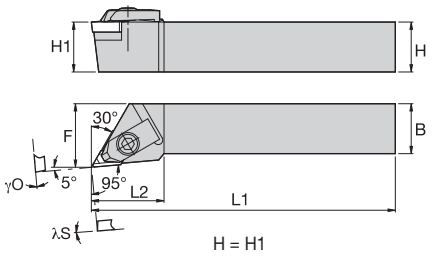




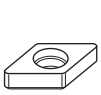
VCGR-HP • VPGR-HP

ISO código do produto	D	L10	S	M	Rε	K68	K313	KU10	KCP10	KCP25B	KCP25	KCK05	KCM15B	KCM25B	KCM25	KCU10	KCU25	KC5010	KC5025	KC5410	KT315	KD1425
VCGR160404HP	9,52	16,61	4,76	–	0,4	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–



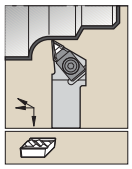


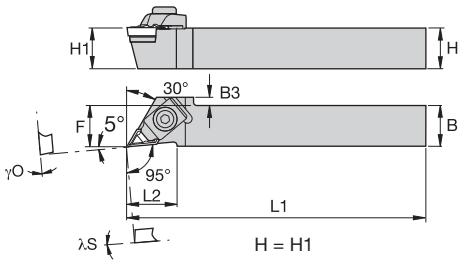
NKLC 95°



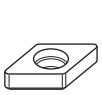



código do produto	H	B	F	L1	λS°	γO°	inserto padrão	calço	parafuso do calço	sexta-vado (mm)	grampo	parafuso do grampo	sexta-vado (mm)
corte à direita (R)													
NKLCR1616H11	16	16	20,0	100	0.0	0.0	KC..110305R	**SM885**	**MS959**	3 mm	**CM68**	**MS524**	3 mm
NKLCR2020K11	20	20	25,0	125	0.0	0.0	KC..110305R	**SM885**	**MS959**	3 mm	**CM68**	**MS524**	3 mm
NKLCR2525M11	25	25	32,0	150	0.0	0.0	KC..110305R	**SM885**	**MS959**	3 mm	**CM68**	**MS524**	3 mm
corte à esquerda (L)													
NKLCL2020K11	20	20	25,0	125	0.0	0.0	KC..110305L	**SM886**	**MS959**	3 mm	**CM68**	**MS524**	3 mm
NKLCL2525M11	25	25	32,0	150	0.0	0.0	KC..110305L	**SM886**	**MS959**	3 mm	**CM68**	**MS524**	3 mm



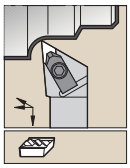


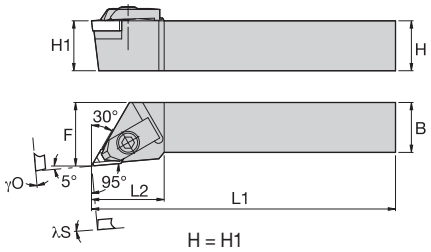
NKLC-F 95°



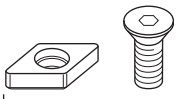
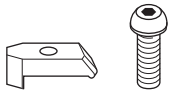



código do produto	H	B	F	L1	λS°	γO°	inserto padrão	calço	parafuso do calço	sexta-vado (mm)	grampo	parafuso do grampo	sexta-vado (mm)
corte à esquerda (L)													
NKLCRF1212M11Q	12	12	12,0	150	0.0	0.0	KC..110305R	**SM885**	**MS959**	3 mm	**CM180**	**MS524**	3 mm

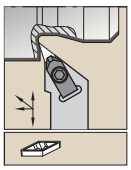


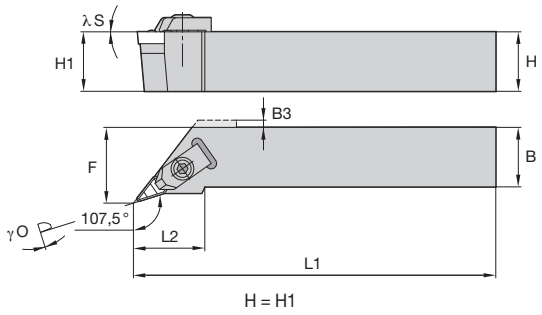


NKLN 95°

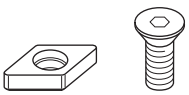
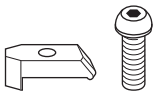



código do produto	H	B	F	L1	λS°	γO°	inserto padrão	calço	parafuso do calço	sexta-vado (mm)	grampo	parafuso do grampo	sexta-vado (mm)
corte à direita (R)													
NKLNR2020K15	20	20	25,0	125	-2.0	-5.0	KN..150410R	**SM872**	**MS111**	2 mm	**CM66**	**MS625**	4 mm
NKLNR2525M15	25	25	32,0	150	-2.0	-5.0	KN..150410R	**SM872**	**MS111**	2 mm	**CM66**	**MS625**	4 mm
corte à esquerda (L)													
NKLNL2020K15	20	20	25,0	125	-2.0	-5.0	KN..150410L	**SM871**	**MS111**	2 mm	**CM66**	**MS625**	4 mm
NKLNL2525M15	25	25	32,0	150	-2.0	-5.0	KN..150410L	**SM871**	**MS111**	2 mm	**CM66**	**MS625**	4 mm

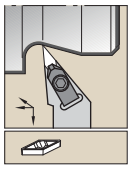


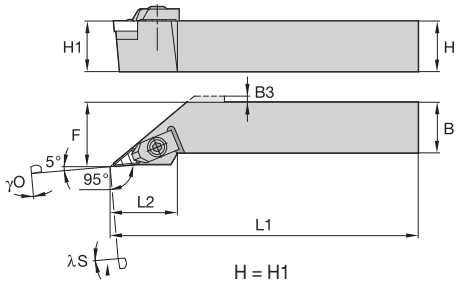


NVHB 107,5°

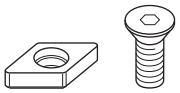
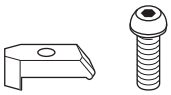



código do produto	H	B	F	L1	LH	λS°	γO°	inserto padrão	calço	parafuso do calço	sexta-vado (mm)	grampo	parafuso do grampo	sexta-vado (mm)
corte à direita (R)														
NVHBR2020K11	20	20	25,0	125	30,0	0.0	0.0	VB..110304	**SM813**	**MS959**	2.5 mm	**CM158**	**MS518**	2.5 mm
NVHBR2525M11	25	25	32,0	150	30,0	0.0	0.0	VB..110304	**SM813**	**MS959**	2.5 mm	**CM158**	**MS518**	2.5 mm
corte à esquerda (L)														
NVHBL2020K11	20	20	25,0	125	30,0	0.0	0.0	VB..110304	**SM813**	**MS959**	2.5 mm	**CM159**	**MS518**	2.5 mm
NVHBL2525M11	25	25	32,0	150	30,0	0.0	0.0	VB..110304	**SM813**	**MS959**	2.5 mm	**CM159**	**MS518**	2.5 mm

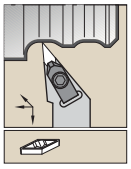


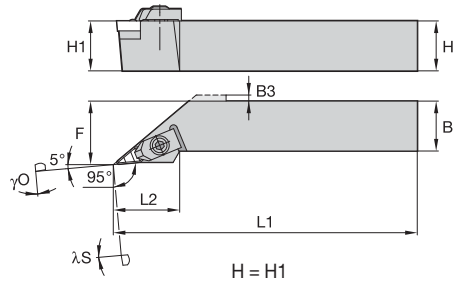


NVLB 95°

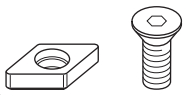
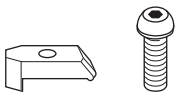



código do produto	H	B	F	L1	LH	λS°	γO°	inserto padrão	calço	parafuso do calço	sextavado (mm)	grampo	parafuso do grampo	sextavado (mm)
corte à direita (R)														
NVLBR2020K11	20	20	25,0	125	30,0	0.0	0.0	VB..110304	**SM813**	**MS959**	2.5 mm	**CM158**	**MS518**	2.5 mm
NVLBR2525M11	25	25	32,0	150	32,0	0.0	0.0	VB..110304	**SM813**	**MS959**	2.5 mm	**CM158**	**MS518**	2.5 mm
corte à esquerda (L)														
NVLBL2020K11	20	20	25,0	125	30,0	0.0	0.0	VB..110304	**SM813**	**MS959**	2.5 mm	**CM159**	**MS518**	2.5 mm
NVLBL2525M11	25	25	32,0	150	32,0	0.0	0.0	VB..110304	**SM813**	**MS959**	2.5 mm	**CM159**	**MS518**	2.5 mm

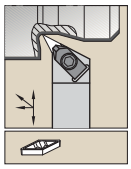


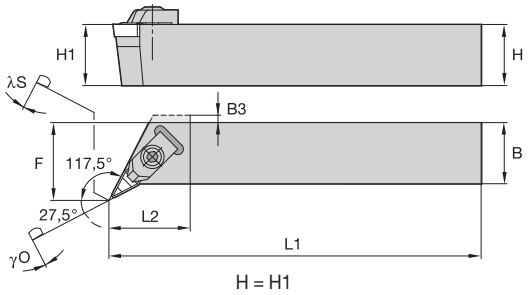


NVLC 95°

código do produto	H	B	F	L1	LH	B3	λS°	γO°	inserto padrão	calço	parafuso do calço	sextavado (mm)	grampo	parafuso do grampo	sextavado (mm)
corte à direita (R)															
NVLCR1616H16	16	16	20,0	100	37,0	5,0	0.0	0.0	VC..160408	**SM812**	**MS959**	4 mm	**CM113**	**MS412**	4 mm
NVLCR2020K16	20	20	25,0	125	37,0	—	0.0	0.0	VC..160408	**SM812**	**MS959**	4 mm	**CM113**	**MS412**	4 mm
NVLCR2525M16	25	25	32,0	150	37,0	—	0.0	0.0	VC..160408	**SM812**	**MS959**	4 mm	**CM113**	**MS412**	4 mm
NVLCR3225P16	32	25	32,0	170	37,0	—	0.0	0.0	VC..160408	**SM812**	**MS959**	4 mm	**CM113**	**MS412**	4 mm
corte à esquerda (L)															
NVLCL2020K16	20	20	25,0	125	37,0	—	0.0	0.0	VC..160408	**SM812**	**MS959**	4 mm	**CM114**	**MS412**	4 mm
NVLCL2525M16	25	25	32,0	150	37,0	—	0.0	0.0	VC..160408	**SM812**	**MS959**	4 mm	**CM114**	**MS412**	4 mm
NVLCL3225P16	32	25	32,0	170	37,0	—	0.0	0.0	VC..160408	**SM812**	**MS959**	4 mm	**CM114**	**MS412**	4 mm

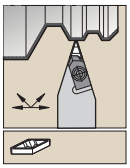


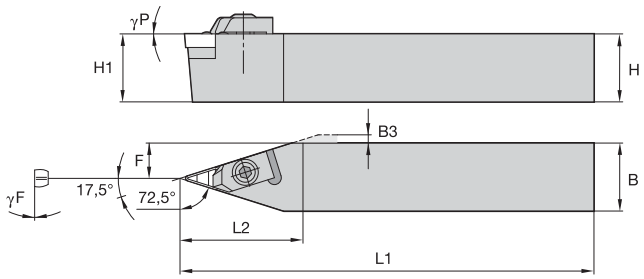


NVOC 117,5°

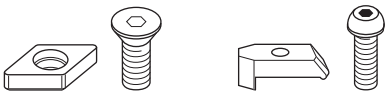


código do produto	H	B	F	L1	LH	B3	λS°	γO°	inserto padrão	calço	parafuso do calço	sextavado (mm)	grampo	parafuso do grampo	sextavado (mm)
corte à direita (R)															
NVOCR2020K16	20	20	32,0	125	29,0	3,0	0.0	0.0	VC..160408	**SM812**	**MS959**	4 mm	**CM113**	**MS412**	4 mm
NVOCR2525M16	25	25	32,0	150	29,0	3,0	0.0	0.0	VC..160408	**SM812**	**MS959**	4 mm	**CM113**	**MS412**	4 mm
corte à esquerda (L)															
NVOCL2020K16	20	20	32,0	125	29,0	3,0	0.0	0.0	VC..160408	**SM812**	**MS959**	4 mm	**CM114**	**MS412**	4 mm
NVOCL2525M16	25	25	32,0	150	29,0	3,0	0.0	0.0	VC..160408	**SM812**	**MS959**	4 mm	**CM114**	**MS412**	4 mm

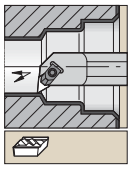




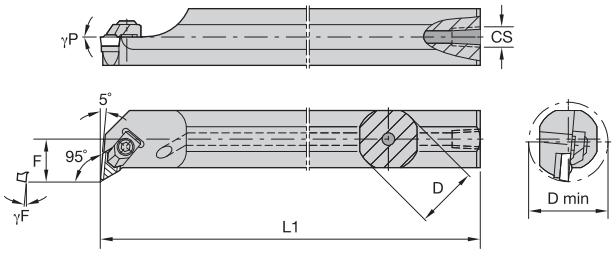
NVVC 72,5°



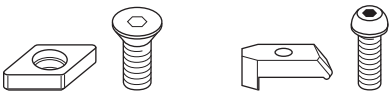
código do produto	H	B	F	L1	LH	B3	γF°	γP°	inserto padrão	calço	parafuso do calço	sexta-vada	grampo	parafuso do grampo	sexta-vada
NVVCN2020K16	20	20	10,0	125	42,0	2,0	0.0	0.0	VC..160408	**SM812**	**MS959**	4 mm	**CM113**	**MS412**	4 mm
NVVCN2525M16	25	25	12,5	150	42,0	—	0.0	0.0	VC..160408	**SM812**	**MS959**	4 mm	**CM113**	**MS412**	4 mm



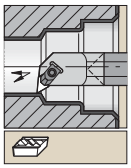
Haste de aço com refrigeração interna.



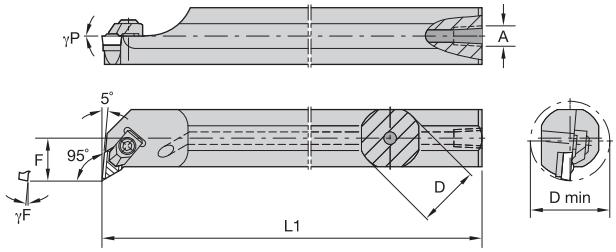
A-NKLC 95°



código do produto	D	D min	F	L1	CS	γF°	γP°	inserto padrão	calço	parafuso do calço	sexta-vada	grampo	parafuso do grampo	sexta-vada
corte à direita (R)														
A12MNKLCR11	12	16,0	9,0	150	1/16-27 NPT	-5.0°	0.0°	KC..110305R	—	—	2.5 mm	**CM106**	**MS518**	2.5 mm
A16MNKLCR11	16	20,0	11,0	150	1/8-27 NPT	-7.0°	0.0°	KC..110305L	**SM886**	**MS959**	2.5 mm	**CM106**	**MS518**	2.5 mm
A20QNKLCR11	20	25,0	13,0	180	1/8-27 NPT	-5.0°	0.0°	KC..110305L	**SM886**	**MS959**	3 mm	**CM68**	**MS524**	3 mm
A25RNKLCR11	25	32,0	16,0	200	1/4-18 NPT	-5.0°	0.0°	KC..110305L	**SM886**	**MS959**	3 mm	**CM68**	**MS524**	3 mm
A32SNKLCR11	32	40,0	22,0	250	1/4-18 NPT	-5.0°	0.0°	KC..110305L	**SM886**	**MS959**	3 mm	**CM68**	**MS524**	3 mm
corte à esquerda (L)														
A12MNKLCL11	16	20,0	11,0	150	1/8-27 NPT	-7.0°	0.0°	KC..110305L	—	—	2.5 mm	**CM106**	**MS518**	2.5 mm
A16MNKLCL11	16	20,0	11,0	150	1/8-27 NPT	-7.0°	0.0°	KC..110305R	**SM885**	**MS959**	2.5 mm	**CM105**	**MS518**	2.5 mm
A20QNKLCL11	20	25,0	13,0	180	1/8-27 NPT	-5.0°	0.0°	KC..110305R	**SM885**	**MS959**	3 mm	**CM68**	**MS524**	3 mm
A25RNKLCL11	25	32,0	16,0	200	1/4-18 NPT	-5.0°	0.0°	KC..110305R	**SM885**	**MS959**	3 mm	**CM68**	**MS524**	3 mm



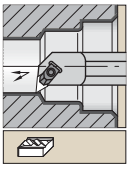
Haste de metal duro com refrigeração interna.



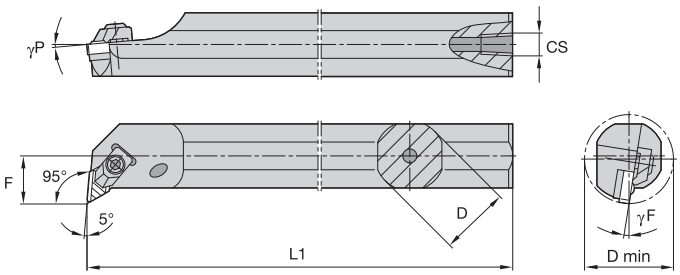
E-NKLC 95°



código do produto	D	D min	F	L1	A	γF°	γP°	inserto padrão	calço	parafuso do calço	sexta-vada	grampo	parafuso do grampo	sexta-vada
corte à direita (R)														
E12QNKLCR11	12	16,0	9,0	180	4,8	-5.0°	0.0°	KC..110308L	–	–	2.5 mm	**CM106**	**MS518**	2.5 mm
E16RNKLCR11	16	20,0	11,0	200	5,5	-5.0°	0.0°	KC..110308L	**SM886**	**MS959**	2.5 mm	**CM106**	**MS518**	2.5 mm
corte à esquerda (L)														
E12QNKLCL11	12	16,0	9,0	180	4,8	-5.0°	0.0°	KC..110308R	–	–	2.5 mm	**CM105**	**MS518**	2.5 mm



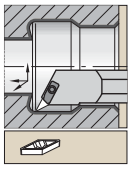
Haste de aço com refrigeração interna.



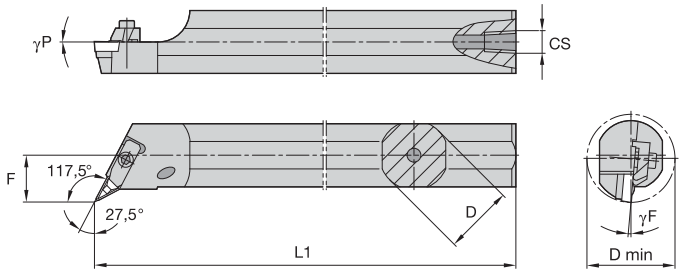
A-NKLN 95°



código do produto	D	D min	F	L1	CS	γF°	γP°	inserto padrão	calço	parafuso do calço	sexta-vada	grampo	parafuso do grampo	sexta-vada
corte à direita (R)														
A40TNKLNR15	40	50,0	27,0	300	1/4-18 NPT	-5.0°	-5.0°	KN..150410L	**SM871**	**MS111**	4 mm	**CM66**	**MS624**	4 mm



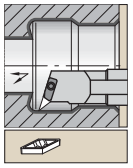
Haste de aço com refrigeração interna.



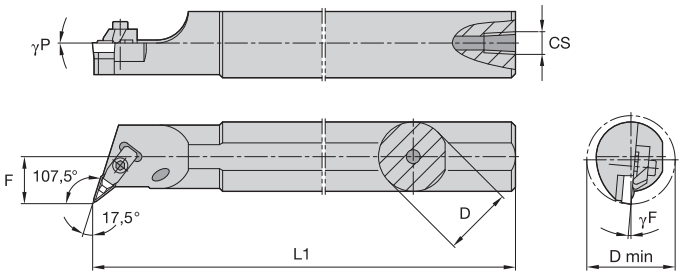
A-NVOC 117,5°



código do produto	D	D min	F	L1	CS	γF°	γP°	inserto padrão	calço	parafuso do calço	sexta-vada	grampo	parafuso do grampo	sexta-vada
corte à direita (R)														
A32SNVOCR16	32	40,0	22,0	250	1/4-18 NPT	-2.0°	0.0°	VC..160408	**SM812**	**MS959**	4 mm	**CM113**	**MS412**	4 mm
A50UNVOCR16	50	63,0	35,0	350	1/4-18 NPT	-2.0°	0.0°	VC..160408	**SM812**	**MS959**	4 mm	**CM113**	**MS412**	4 mm
corte à esquerda (L)														
A32SNVOCL16	32	40,0	22,0	250	1/4-18 NPT	-2.0°	0.0°	VC..160408	**SM812**	**MS959**	4 mm	**CM114**	**MS412**	4 mm
A40TNVOCL16	40	50,0	27,0	300	1/4-18 NPT	-2.0°	0.0°	VC..160408	**SM812**	**MS959**	4 mm	**CM114**	**MS412**	4 mm



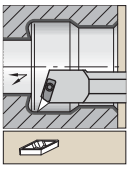
Haste de aço com refrigeração interna.



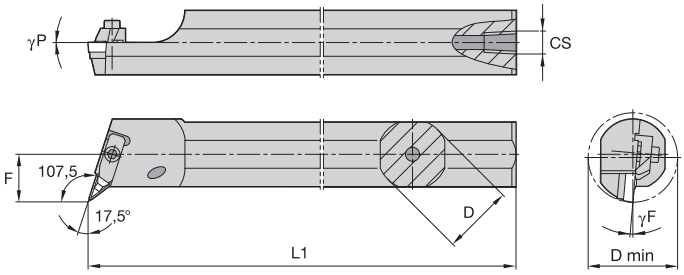
A-NVQB 107,5°



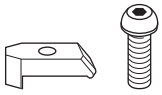
código do produto	D	D min	F	L1	CS	γF°	γP°	inserto padrão	calço	parafuso do calço	sexta-vada	grampo	parafuso do grampo	sexta-vada
corte à direita (R)														
A25TNVQBR11	25	32,0	17,0	300	1/4-18 NPT	-5.0°	0.0°	VB..110304	**SM813**	**MS959**	2.5 mm	**CM159**	**MS518**	2.5 mm



Haste de aço com refrigeração interna.



A-NVQC 107,5°

código do produto	D	D min	F	L1	CS	γF°	γP°	inserto padrão	calço	parafuso do calço	sexta-vada	grampo	parafuso do grampo	sexta-vada
corte à direita (R)														
A32SNVQCR16	32	40,0	22,0	250	1/4-18 NPT	-2.0°	0.0°	VC..160408	**SM812**	**MS959**	4 mm	**CM113**	**MS412**	4 mm

Via férrea

O conhecimento profundo que a Kennametal tem sobre a economia da cadeia de valor do setor ferroviário nos permite oferecer soluções customizadas sem precedentes, com foco em suas necessidades. Nós fornecemos um valor superior porque ouvimos você, nosso cliente, com toda a atenção, e inovamos com base no seu feedback. Nosso objetivo é ajudar você a ser mais competitivo — tanto em escala nacional quanto internacional.



Boas práticas em produtividade

Sendo uma parceira confiável para uma produção otimizada, a Kennametal oferece aos clientes o compromisso exclusivo de pesquisa e desenvolvimento de excelência, fornecendo continuamente formas altamente inovadoras para aumentar a produtividade. Certificação ISO 9001. As certificações QS 9000 TES e VDA 6.4 garantem os mais altos padrões de qualidade possíveis.

Melhor performance, menos impacto ambiental

Com tecnologia, podemos fazer as duas coisas. A Kennametal ajuda os clientes a manterem o foco nas causas de origem de comportamento não adequado em sistemas de fabricação altamente complexos, enquanto que, ao mesmo tempo, melhora a estrutura de custo, a qualidade e a performance. Além de oferecer o que é mais recente em tecnologia e ferramentas de corte de metal, nossa equipe de engenharia avançada analisará seus processos de produção existentes e ajudará a identificar novos métodos para melhorar a sua performance geral.

Ferramentas de tornos para rodas

As ferramentas Kennametal para ferrovias incorporam um projeto de unidade de fixação exclusivo desenvolvido ao longo de anos de testes em todos os tipos de tornos para rodas e usinando rodas com todos os tipos de superfícies de rodagem.

O projeto reforçado para serviço pesado provou a sua eficiência na redução de custos de usinagem em aplicações de torneamento de bandas de rodagem, a operação mais difícil encontrada nas oficinas de rodas e eixos.

Insertos robustos, com uma superfície maior do quebra-cavacos e arestas de corte com hone, oferecem um controle do cavaco mais efetivo e uma aresta de corte mais resistente. A combinação da geometria da ferramenta com a seleção de classes da Kennametal, resulta em maior produtividade em torneamento de rodas.



Conjunto de rodas

Vantagens das ferramentas Kennametal para tornos para rodas:

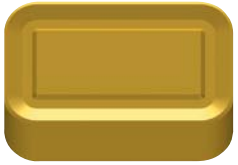
- Sem fixação superior que possa se desgastar ou interferir no fluxo do cavaco.
- O inserto trava contra duas paredes no porta-ferramenta para evitar o movimento dele sob cargas de corte pesadas.
- A unidade de bloqueio de aço endurecido fornece um assentamento positivo do inserto e proteção do porta-ferramentas.
- Indexação do inserto rápida e sem problemas – basta destravar um único parafuso para soltar o inserto.
- Remoção rápida da unidade de fixação de aço e do inserto para limpeza ou substituição.
- O design da unidade de fixação de aço para serviços pesados garante uma vida útil mais longa e ajuda a reduzir os custos operacionais.
- Menos peças no estoque.
- Os porta-ferramentas e as unidades de fixação de aço feitos em aço de liga termicamente tratado fornecem suporte para os cortes de desbaste severo em rodas durante o trabalho difícil.

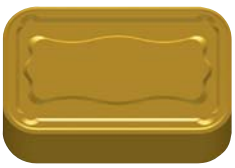

Raio completo LNUX-RRF


Raio completo LNUX-RRP


LNUX-RRH


LNUX-RRP

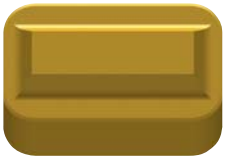

KRR6586-71


KRR6586-75


LNUX-RRSM


KRR6586-65


KRR6586-52

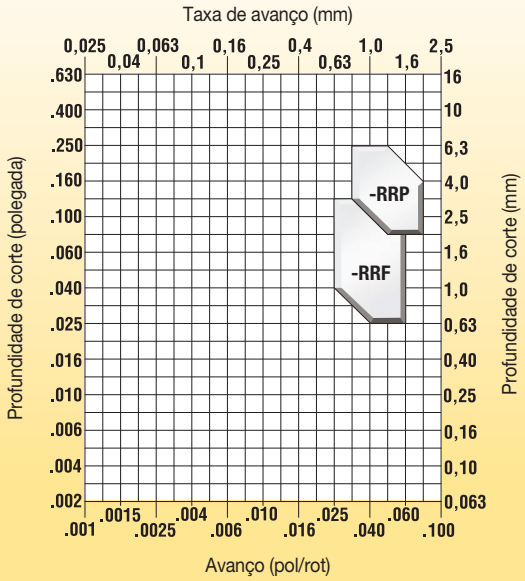

KRR6586-50

LNUX

Design de raio completo

Nossa geometria de quebra-cavacos de alta performance RRF e RRP

- Um inserto pode ser aplicado na perfilagem e faceamento.
- O controle do cavaco será melhorado até em profundidade de corte menor!




-RRP

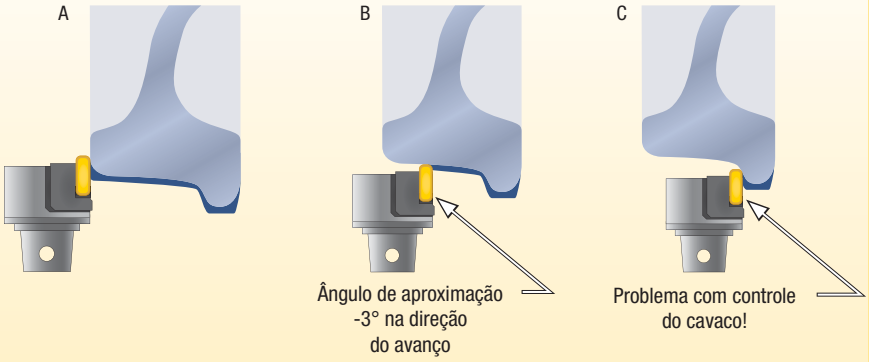

-RRF

Recomendações para aplicação

A: No começo do processo, a profundidade de corte é superior porque grande parte da rebarba maior precisa ser removida.

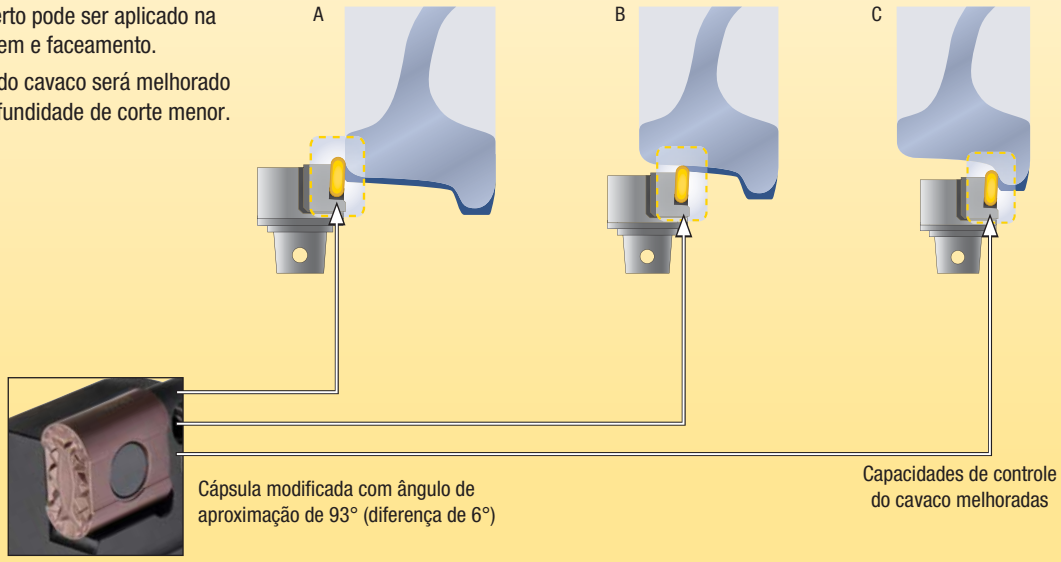
B: A profundidade de corte é menor, mas, às vezes, ela tem “pontos quentes” ou pontos de freio.

C: Área mais crítica em relação ao controle do cavaco, porque a espessura do cavaco é bem fina e muito difícil de administrar.



A, B, & C: Um inserto pode ser aplicado na perfilagem e faceamento.

A & C: O controle do cavaco será melhorado até em profundidade de corte menor.



Características e benefícios

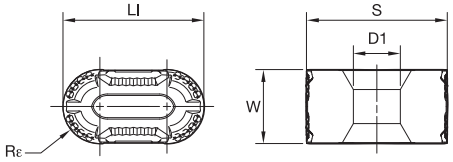


- A geometria de quebra-cavacos RRF e RRP bem executada com um design de raio completo oferece melhor controle do cavaco mesmo em menor profundidade de corte.

● primeira opção
○ opção alternativa

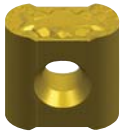
P		●	●
M			
K			
N			
S			
H			

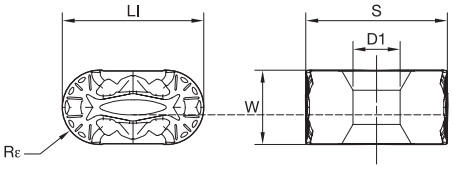




Raio completo LNUX-RRF

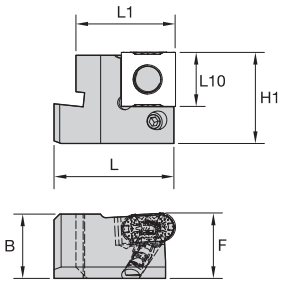
ISO código do produto	W	LI	S	Rε	D1	KCP10B	KCP25B
LNUX191950RRF	10,00	19,05	19,05	5,00	6,35	●	●

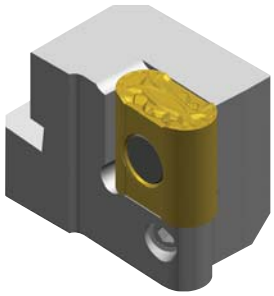




Raio completo LNUX-RRP

ISO código do produto	W	LI	S	Rε	D1	KCP10B	KCP25B
LNUX191950RRP	10,00	19,05	19,05	5,00	6,35	●	●
LNUX301960RRP	12,00	30,00	19,05	6,00	6,35	●	●



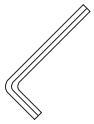


Cápsula WLJN

número para pedido	código do produto	H1	B	F	L10	L1	L	inserto padrão
6049016	**WLJNL32CA19S**	1.260	.890	.906	.750	1.38	1.681	LNUX191950RRP
6049018	**WLJNL32CA30S**	1.260	.890	.925	1.181	1.38	1.772	LNUX301960RRP
6049015	**WLJNR32CA19S**	1.260	.890	.906	.750	1.38	1.681	LNUX191950RRP
6049017	**WLJNR32CA30S**	1.260	.890	.925	1.181	1.38	1.772	LNUX301960RRP

Peças de reposição

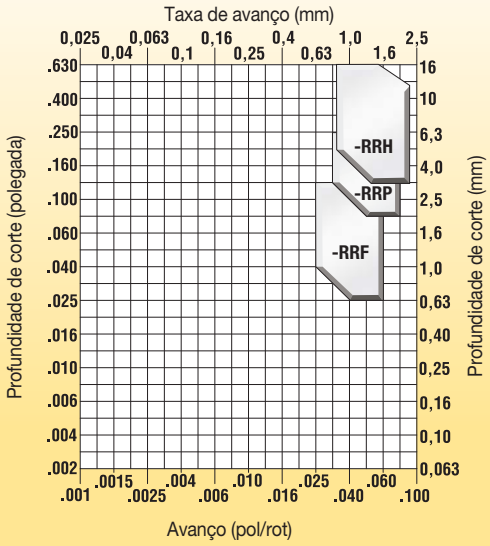




código do produto	alavanca	parafuso do grampo	chave sextavada
WLJNL32CA19S	**114.305**	**121.616**	**170.003**
WLJNL32CA30S	**114.305**	**121.616**	**170.003**
WLJNR32CA19S	**114.305**	**121.616**	**170.003**
WLJNR32CA30S	**114.305**	**121.616**	**170.003**

Nova geometria de quebra de cavacos

Para usinagem de rodas ferroviárias — RRF





-RRH

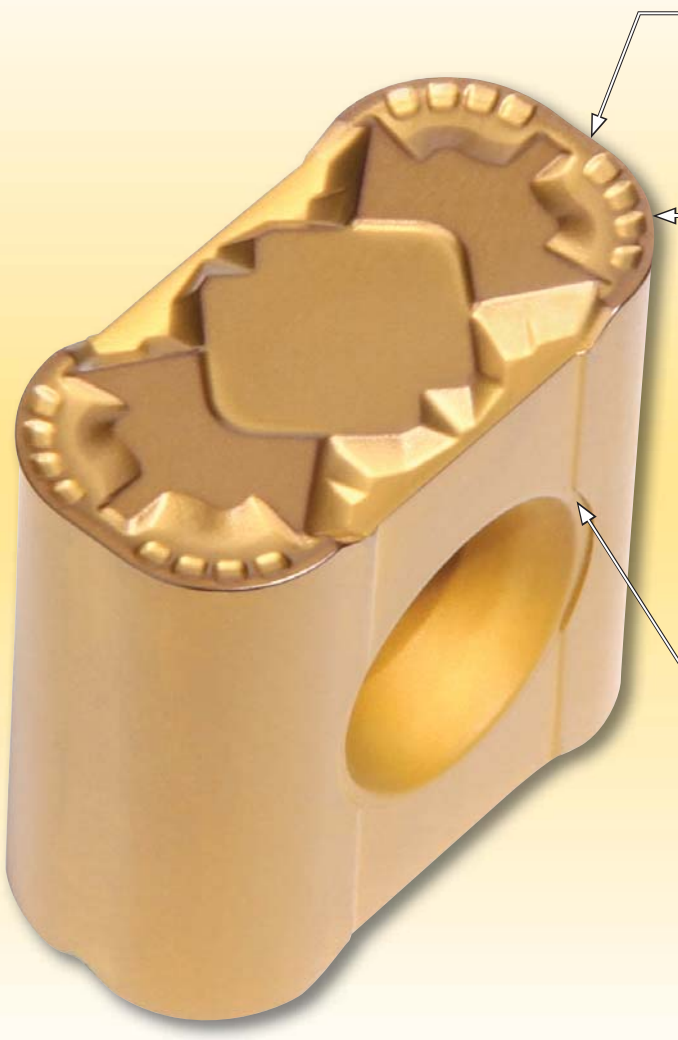


-RRP



-RRF

Reperfilamento de profundidade de corte menor

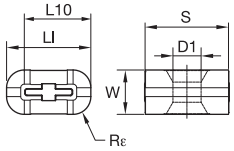


A Kennametal mantém em estoque uma completa linha de insertos padrão para a usinagem de rodas e eixos. Os insertos estão disponíveis em vários estilos, tamanhos e classes.

- **Mandrilamento de rodas** — insertos com quebra-cavacos moldados em forma redonda, quadrada, octogonal e insertos reafiáveis.
- **Torneamento de eixos** — insertos com forma triangular e romboidal com quebra-cavacos.
- **Torneamento de rodas** — estilos retangular e quadrado, com ou sem quebra-cavacos moldados.
- **Alinhamento de rodas** — botões redondos com furo central para travamento.

● primeira opção
○ opção alternativa





LNUX-RRF

ISO código do produto	W	LI	L10	S	Rε	D1	KCP10B	KCP10	KCP25B	KCP25
LNUX191940RRF	10,00	19,00	19,00	19,05	4,00	6,35	–	●	–	●
LNUX301940RRF	12,00	30,00	30,00	19,05	4,00	6,35	–	●	–	–

NOTA: Disponível também na classe KC9105™.

LNUX-RRH

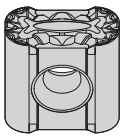
ISO código do produto	W	LI	L10	S	Rε	D1	KCP10B	KCP10	KCP25B	KCP25
LNUX191940RRH	10,00	19,00	19,00	19,05	4,00	6,35	–	●	–	●
LNUX301940RRH	12,00	30,00	30,00	19,05	4,00	6,35	●	–	–	●

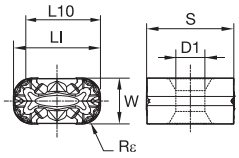
NOTA: Disponível também na classe KC9105.

A Kennametal mantém em estoque uma completa linha de insertos padrão para a usinagem de rodas e eixos. Os insertos estão disponíveis em vários estilos, tamanhos e classes.

- **Mandrilamento de rodas** — insertos com quebra-cavacos moldados em forma redonda, quadrada, octogonal e insertos reafiáveis.
- **Torneamento de eixos** — insertos com forma triangular e romboidal com quebra-cavacos.
- **Torneamento de rodas** — estilos retangular e quadrado, com ou sem quebra-cavacos moldados.
- **Alinhamento de rodas** — botões redondos com furo central para travamento.

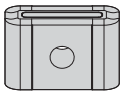
● primeira opção
○ opção alternativa

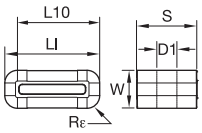




LNUX-RRP

ISO código do produto	W	LI	L10	S	Rε	D1	KCP10B	KCP10	KCP25B	KCP25
P							●	●	●	●
M										
K							○	○	○	○
N										
S										
H										
LNUX191940RRP	10,00	19,00	19,00	19,05	4,00	6,35	–	●	–	●
LNUX301940RRP	12,00	30,00	30,00	19,05	4,00	6,35	–	–	–	●





LNUX-RRSM

ISO código do produto	W	LI	L10	S	Rε	D1	KCP10B	KCP10	KCP25B	KCP25
LNUX191940RRSM	10,00	19,00	19,00	19,05	4,00	6,35	–	–	●	–
LNUX301940RRSM	12,00	30,00	30,00	19,05	4,00	6,35	●	–	–	–

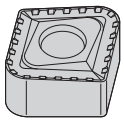
NOTA: Disponível também na classe KC9105™.

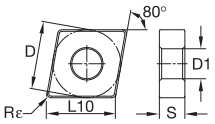
A Kennametal mantém em estoque uma completa linha de insertos padrão para a usinagem de rodas e eixos. Os insertos estão disponíveis em vários estilos, tamanhos e classes.

- **Mandrilamento de rodas** — insertos com quebra-cavacos moldados em forma redonda, quadrada, octogonal e insertos reafiáveis.
- **Torneamento de eixos** — insertos com forma triangular e romboidal com quebra-cavacos.
- **Torneamento de rodas** — estilos retangular e quadrado, com ou sem quebra-cavacos moldados.
- **Alinhamento de rodas** — botões redondos com furo central para travamento.

● primeira opção
○ opção alternativa

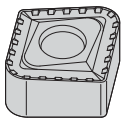
P		●	●	●	●
M					
K			●	●	●
N					
S					
H					

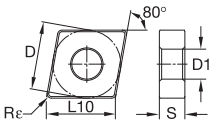




CNMM-RRP

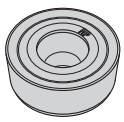
ISO código do produto	L10	S	Rε	D1	KCP10B	KCP10	KCP25B	KCP25
CNMM190740RRP	19,34	7,94	4,00	7,93	●	–	–	–

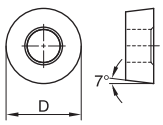




LNUX-WT5

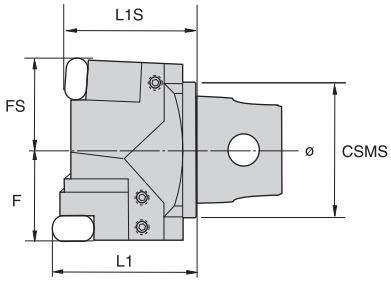
ISO código do produto	L10	S	Rε	D1	KCP10B	KCP10	KCP25B	KCP25
LNUX191940S-WT5	19,05	19,05	4,00	6,35	–	–	●	–
SNMX190640S-WT5	19,05	6,35	4,00	6,35	–	–	●	–





RCMX

ISO código do produto	L10	S	Rε	D1	KCP10B	KCP10	KCP25B	KCP25
RCMX2507M076	–	7,94	–	7,40	–	–	●	–



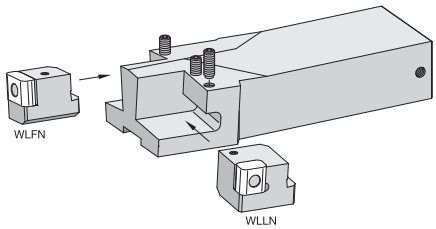


TK

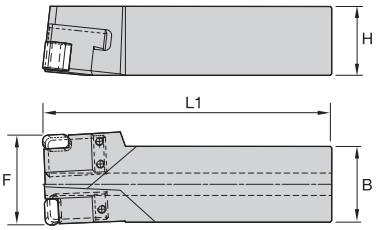
número para pedido	código do produto	Tamanho do sistema CSMS	F	FS	L1	L1S
1781755	**TK01338D**	KM63	42,50	42,50	66,00	60,00
1781756	**TK01339D**	KM63	42,50	42,50	66,00	60,00

Instruções de montagem

cone KM/básico	cápsula WLLN..	cápsula WLFN..
direita	**direita**	**esquerda**
esquerda	**esquerda**	**direita**

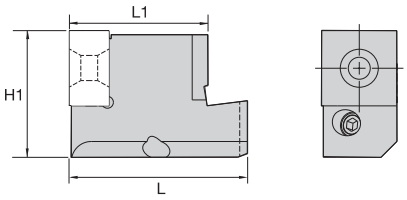


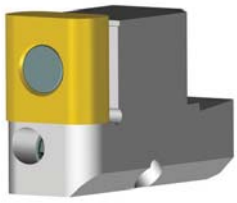
Montagem da ferramenta completa

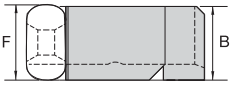


Haste básica WXXN

número para pedido	código do produto	H		B		F assembly		L1 assy		parafuso do grampo
		mm	pol	mm	pol	mm	pol	mm	pol	
1251261	**WXXNL4455X-FL**	50,00	1.969	55,00	2.165	65,00	2.559	210,00	8.268	**PT00163**
1251262	**WXXNR4455X-FL**	50,00	1.969	55,00	2.165	65,00	2.559	210,00	8.268	**PT00163**







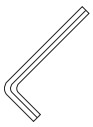
Cápsula WLFN

número para pedido	código do produto	H1	B	F	L1	L	Inserto 1
2435188	WLFNL32CA19S	32,00	18,60	19,00	35,00	42,70	LNUX191940...
2435187	WLFNR32CA19S	32,00	18,60	19,00	35,00	42,70	LNUX191940...

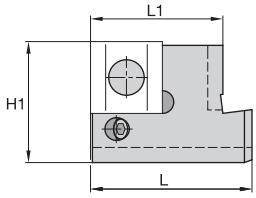
Peças de reposição

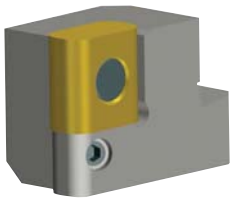


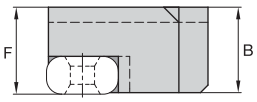




código do produto	alavanca	parafuso do grampo	chave sextavada
WLFNL32CA19S	114.305	121.616	170.003
WLFNR32CA19S	114.305	121.616	170.003







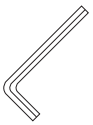
Cápsula WLLN

número para pedido	código do produto	H1	B	F	L1	L	Inserto 1
2435184	WLLNL32CA19S	32,00	22,60	23,00	35,00	42,70	LNUX191940...
2435186	WLLNL32CA30S	32,00	22,60	23,00	35,00	42,70	LNUX301940...
2435183	WLLNR32CA19S	32,00	22,60	23,00	35,00	42,70	LNUX191940...
2435185	WLLNR32CA30S	32,00	22,60	23,00	35,00	42,70	LNUX301940...

Peças de reposição







código do produto	alavanca	parafuso do grampo	chave sextavada
WLLNL32CA19S	114.305	121.616	170.003
WLLNL32CA30S	114.305	121.616	170.003
WLLNR32CA19S	114.305	121.616	170.003
WLLNR32CA30S	114.305	121.616	170.003

Torneamento de rodas e conjunto de rodas com as geometrias RU e UP Beyond™

A Kennametal oferece uma linha completa de ferramentas que incorpora a última tecnologia para oferecer a máxima remoção de material e maior produtividade. Insertos padrão produzidos em série e poucos componentes reduzem o estoque e os custos operacionais. Incluídas nesta gama estão as ferramentas para recondicionamento dos conjuntos de rodas montadas (rodeiros), mandrilamento de rodas, alinhamento de rodas, torneamento de eixos e polimento de ponta de eixo.



Características e benefícios

Vantagens das ferramentas Kennametal para tornos de rodas

- Unidade de fixação de aço de trabalho pesado.
- Sem fixação superior que possa se desgastar ou interferir no fluxo do cavaco.
- A unidade de fixação de aço endurecido previne o movimento do inserto.
- Remoção rápida da unidade de fixação de aço.
- Indexação do inserto rápida e sem problemas.
- Preparada para cortes de desbaste severo em rodas difíceis.

Obtenha tempos de produção reduzidos enquanto diminui os custos de produção e mantém os custos de manutenção mesmo sob estas condições severas:

- Áreas planas de derrapagem.
- Queimaduras acidentais por tochas.
- Superaquecimento dos eixos do rotor.
- Fungos e sobreposições excessivos que são endurecidos pela pressão irregular do retardador incomum.
- Rodas incompatíveis que causam o desgaste excessivo do lado da flange.





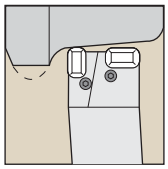
RU–Desbaste universal

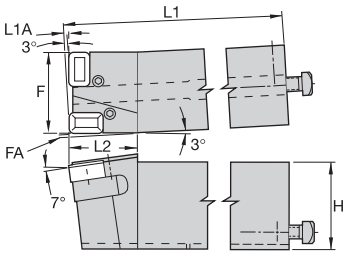




UP–Universal Positivo

- Torno de roda para trabalho pesado e totalmente automático, com dispositivo de medição integrado para determinar o desgaste do perfil do jogo de rodas.
- As máquinas tipo pórtico horizontal permitem operações completas.
- Adequadas para a usinagem de conjuntos de rodas (rodeiros) para locomotivas, vagonetes e vagões de passageiros e carga.



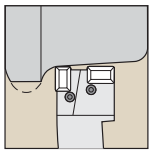


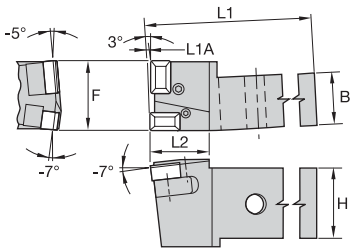
Centragem de perfil de banda de rodagem

número para pedido	código do produto	H	F	L1	L2	FA	L1A	inserto 1
1015754	**HUWTCL**	80,00	76,20	275,00	63,50	3,00	3,00	KRR6586__
1015723	**HUWTCR**	80,00	76,20	275,00	63,50	3,00	3,00	KRR6586__

NOTA: Requer 2 insertos.

- Proporciona a máxima produtividade pelo mínimo custo operacional.
- Indexação do inserto mais rápida com a ferramenta está montada no bloco da ferramenta.
- Unidades de bloqueio de aço individuais tornam fácil a indexação e o travamento de cada inserto separadamente.
- O posicionamento padrão na ferramenta, sobre o inserto, é mantido a +/- 0,08mm.
- Sem fixação superior que possa se desgastar ou interferir no fluxo do cavaco.
- A unidade de bloqueio de aço substituível protege o porta-ferramentas de danos.
- Estão disponíveis insertos aperfeiçoados com controle do cavaco.



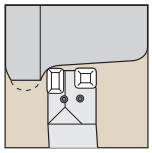


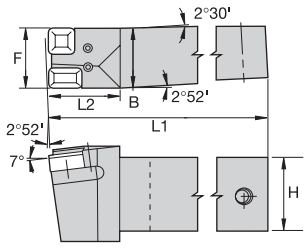
Usinagem de perfil da banda de rodagem

número para pedido	código do produto	H	B	F	L1	L2	L1A	inserto 1
1015688	**FUWTCL**	76,20	57,15	76,20	254,00	66,55	3,05	KRR6586__
1015687	**FUWTCR**	76,20	57,15	76,20	254,00	66,55	3,05	KRR6586__

NOTA: Requer 2 insertos.

- Proporciona a máxima produtividade pelo mínimo custo operacional.
- Ferramenta rápida de inserto intercambiável montada no bloco da ferramenta.
- Unidades de bloqueio de aço individuais tornam fácil a indexação e o travamento de cada inserto separadamente.
- O mínimo de peças para menor estoque.
- Sem fixação superior que possa se desgastar ou interferir no fluxo do cavaco.
- A unidade de bloqueio de aço substituível protege o porta-ferramentas de danos.
- Os insertos intercambiáveis com quebra-cavacos pré-formados proporcionam um controle do cavaco com ótimas velocidades e avanços.

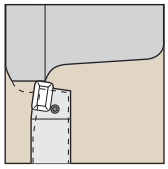


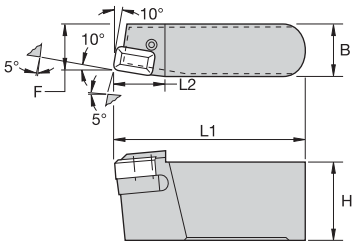


Usinagem de perfil da banda de rodagem

número para pedido	código do produto	H	B	F	L1	L2	inserto 1
1015659	**SUWTCL**	76,20	57,15	57,15	254,00	66,55	KRR6586__
1015658	**SUWTCR**	76,20	57,15	57,15	254,00	66,55	KRR6586__

NOTA: Requer 2 insertos.

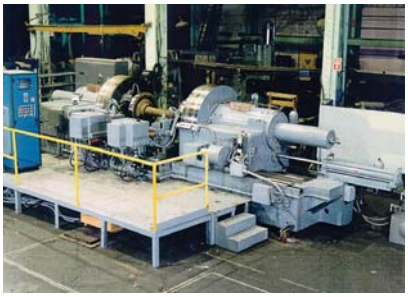


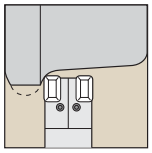


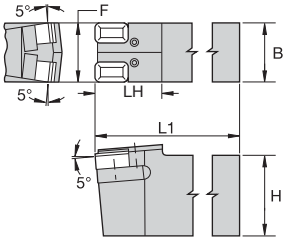
Usinagem do topo do friso

número para pedido	código do produto	H	B	F	L1	L2	inserto 1
1015690	**NUFRL**	63,50	41,28	36,53	152,40	39,62	KRR6586__
1015689	**NUFRR**	63,50	41,28	36,53	152,40	39,62	KRR6586__

- Proporciona a máxima produtividade pelo mínimo custo operacional.
- Ferramenta rápida de inserto intercambiável montada no bloco da ferramenta.
- Unidades de bloqueio de aço individuais tornam fácil a indexação e o travamento de cada inserto separadamente.
- O posicionamento padrão na ferramenta, sobre o inserto, é mantido a +/- 0,08mm.
- Sem fixação superior que possa se desgastar ou interferir no fluxo do cavaco.
- A unidade de bloqueio de aço substituível protege o porta-ferramentas de danos.
- Os insertos intercambiáveis com quebra-cavacos pré-formados proporcionam um controle do cavaco com ótimas velocidades e avanços.


Tornos Simmons-Niles para torneamento de rodas





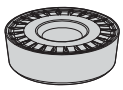
Usinagem de perfil da banda de rodagem

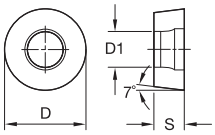
número para pedido	código do produto	H	B	F	L1	LH	inserto 1	unidade de travamento de aço	parafuso de fixação
1015684	**NUWTC**	76,20	57,15	57,15	412,75	95,25	KRR6586__	**SU3**	**S1006PKG**

NOTA: Requer 2 insertos.

● primeira opção
○ opção alternativa

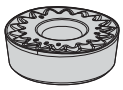
		KCK15B	KCK20	KCP10	KCP10B	KCP25	KCP25B	KCPK05	KCU10
P			○	●	●	●	●	●	○
M									●
K		●	●	○	○	○	○		○
N									○
S									●
H									○

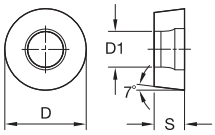




RCMH-UPG

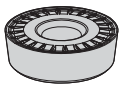
ISO código do produto	D	D1	S	KCK15B	KCK20	KCP10	KCP10B	KCP25	KCP25B	KCPK05	KCU10
RCMH2507M0TUPG	25	7,55	7,94	–	–	–	●	–	●	–	–
RCMH3209M0TUPG	32	10,35	9,52	–	–	–	●	–	●	–	–

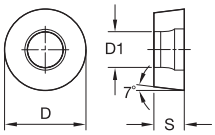




RCMH-RU

ISO código do produto	D	D1	S	KCK15B	KCK20	KCP10	KCP10B	KCP25	KCP25B	KCPK05	KCU10
RCMH2507M0RU	25	7,55	7,94	–	–	–	–	●	–	–	–
RCMH3209M0RU	32	10,35	9,53	–	–	–	–	●	–	–	–

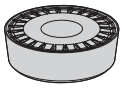


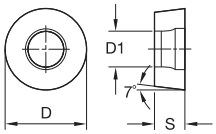


RCMT-UPG

ISO código do produto	D	D1	S	KCK15B	KCK20	KCP10	KCP10B	KCP25	KCP25B	KCPK05	KCU10
RCMT1606M0UPG	16	5,50	6,35	●	–	–	●	–	●	●	–
RCMT2006M0UPG	20	6,50	6,35	●	–	–	●	–	●	●	–

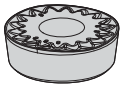
● primeira opção
○ opção alternativa

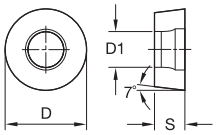




RCMX-UPG

ISO código do produto	D	D1	S	KCK15B	KCK20	KCP10	KCP10B	KCP25	KCP25B	KCPK05	KCU10
P					○	●	●	●	●	●	○
M											●
K				●	●	○	○	○	○		○
N											○
S											●
H											○
RCMX2507M0TUPG	25	7,19	7,94	–	–	–	●	–	●	–	–
RCMX3209M0TUPG	32	9,78	9,52	–	–	–	●	–	●	–	–





RCMX-RU

ISO código do produto	D	D1	S	KCK15B	KCK20	KCP10	KCP10B	KCP25	KCP25B	KCPK05	KCU10
RCMX2507M0RU	25	7,19	7,94	–	●	–	–	–	–	–	–
RCMX3209M0RU	32	9,78	9,53	–	●	●	–	–	–	–	–

Insertos K-Lock™

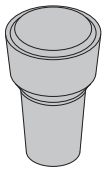


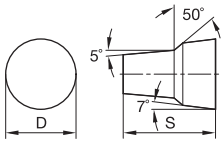
Características e benefícios

- Os insertos K-Lock são ideais para torneamento de canal profundo e perfilagem.
- Um sistema de fixação do inserto exclusivo, que permite um fluxo do cavaco livre.
- Disponível com periferias moldadas e retificadas.

● primeira opção
○ opção alternativa

		K68	KCU10	KCU25	KC5010	KC5025	KC5410
P			○	○	○	○	
M			●	●	●	●	
K		○					
N		●	○				●
S		●	●	●	●	●	
H							

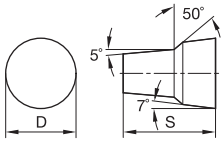




RCGK-FS

ISO código do produto	D	S	K68	KCU10	KCU25	KC5010	KC5025	KC5410
RCGK040300FS	4,76	6,38	–	●	–	–	–	–
RCGK060400FS	6,35	9,09	–	●	–	●	–	–
RCGK090700FS	9,53	13,23	–	●	–	●	●	–
RCGK120800FS	12,70	16,61	–	●	–	–	–	–

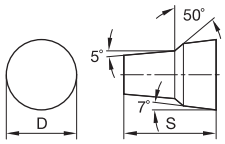




RCGK-HP

ISO código do produto	D	S	K68	KCU10	KCU25	KC5010	KC5025	KC5410
RCGK040300HP	4,76	6,38	–	●	–	●	–	–
RCGK060400HP	6,35	9,09	–	●	–	●	–	●
RCGK090700HP	9,53	13,23	–	●	–	–	–	●
RCGK120800HP	12,70	16,61	–	●	–	–	–	●





RCMK

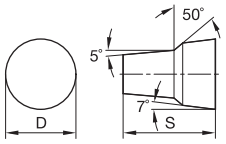
ISO código do produto	D	S	K68	KCU10	KCU25	KC5010	KC5025	KC5410
RCMK040300	4,76	6,38	–	–	–	●	–	–
RCMK060400	6,35	9,09	–	●	–	●	–	–
RCMK090700	9,53	13,23	–	–	–	●	–	–
RCMK120800	12,70	16,61	–	–	–	●	–	–

- Geometria média com face de inclinação positiva para controle do cavaco em materiais difíceis.

● primeira opção
○ opção alternativa

		K68	KCU10	KCU25	KC5010	KC5025	KC5410	KCS10
P								
M			●	●	●	●		
K								
N							●	
S		●	●	●	●	●		●
H								

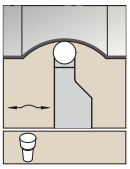


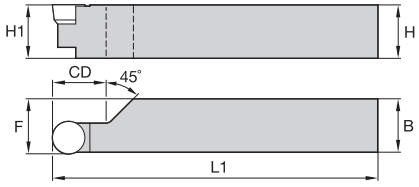


RCMK-MP

ISO código do produto	D	L10	Rε	K68	KCU10	KCU25	KC5010	KC5025	KC5410	KCS10
RCMK060400MP	6,35	–	–	–	–	–	–	–	–	●
RCMK090700MP	9,53	–	–	–	–	–	–	–	–	●
RCMK120800MP	12,70	–	–	–	–	–	–	–	–	●

Aplicação específica

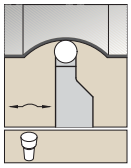


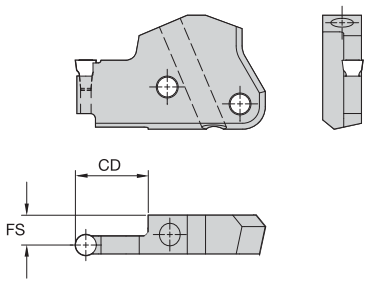


H = H1

TRAO

código do produto	H1	B	F	L1	CD	inserto padrão
corte à direita (R)						
TRAOR2525M04	25	25	25,4	150	20	RC..040300
TRAOR2525M06	25	25	25,5	150	20	RC..060400
TRAOR3225P06	32	25	25,5	170	20	RC..060400
corte à esquerda (L)						
TRAOL2525M06	25	25	25,5	150	20	RC..060400





TRM

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TRM50R0432M	32	9,62	50	RCMK152
TRM50R0620M	19	8,98	50	RCMK23
TRM50R0632M	32	8,98	50	RCMK-23
TRM50R0640M	38	8,98	50	RCGK23
TRM50R0720M	19	8,42	50	RCMK-2.55
TRM50R0920M	19	7,64	50	RC_K35
TRM50R0932M	32	7,65	50	RCMK-35
TRM50R0940M	38	7,64	50	RC_K35
TRM50R0950M	50	7,65	50	RCMK-35
corte à esquerda (L)				
TRM50L0432M	32	9,62	50	RCMK152
TRM50L0620M	19	8,98	50	RCMK23
TRM50L0632M	32	8,98	50	RCMK-23
TRM50L0640M	38	8,98	50	RCGK23
TRM50L0920M	19	7,64	50	RC_K35
TRM50L0932M	32	7,65	50	RCMK-35
TRM50L0950M	50	7,65	50	RCMK-35

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3758791	DNMG150604FP KCM15	B77
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B221A13300HP KCPK15	G49

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Ícones de torneamento

 Haste: KM-TS™ (ISO 26622)	 Haste: KM4X™	 Haste: VDI Shank	 Norma DIN 69880	 Refrigeração interna
 Refrigeração interna: 100 bar	 Refrigeração interna: 1500 psi	 Refrigeração interna: 80 bar	 Refrigeração interna: 1200 psi	 ISO: 26622
 ISO: 10889	 Torneamento	 Perfilagem	 Faceamento	 Canal da face
 Chanfrar	 Mandrilamento traseiro	 Rosqueamento	 Canal	 Cortar
 Torneamento de diâmetro interno	 Chamframento interno	 Faceamento interno	 Abertura de canais no diâmetro interno	 Abertura de canal de face no diâmetro interno
 Abertura de canal profundo	 Diâmetro interno Rosqueamento			

Ícones de holemaking

 Escareamento/ Percurso de chanfro	 Furação cônica	 Rebaixo	 Furação	 Furação: Entrada inclinada
 Furação: Saída inclinada	 Furação: Deslocamento de saída	 Furação: Fundo reto	 Furação: Placas empilhadas	 Furação: Convexo
 Furação: Furo cego	 Furação: Côncavo	 Furação: Corrente	Furação: Furo transversal	Furação: Meio cilindro
Furação: Furação de canto de 45°	Alargamento: Furo passante	Alargamento: Furo cego	Alargamento: Passagem transversal	Alargamento: Furos transversais e cegos
Alargamento: Corte interrompido	Profundidade de furação: 1 x D	Profundidade de furação: 3 x D	Profundidade de furação: 5 x D	Profundidade de furação: 8 x D
Profundidade de furação: 10 x D	Profundidade de furação: 12 x D	Profundidade de furação: 7 x D	Profundidade de furação: 4 x D	Profundidade de furação: 1,5 x D

(continuação)

(Ícones de holemaking — continuação)

 Estilo de canto: Chanfro de canto	 Estilo de canto: Topo reto	 Haste: Cilíndrica paralela	 Haste: Cilíndrica Paralela ≤h6	 Haste: Cilíndrica Weldon®
 Haste: Whistle Notch cilíndrico	 Haste: Whistle Notch cilíndrico ≤h6	 Haste: Whistle Notch 2° cilíndrico	 Haste: Cilíndrica com plano	 Haste cilíndrica com plano
 Haste SK: Rübig	 Haste: SK BT JIS B 6339	 Haste: SK CAT(CV) ANSI B5.50	 Haste: SK DV DIN 69871	 Haste: Whistle Notch cilíndrico com acionamento e flange
 Haste: Cilíndrica com plano e flange	 Haste KM™	 Haste: HSK DIN 69893	 Haste: HSK DIN 69893 Versão A	 Haste: KM-TS™ (ISO 26622)
 Haste: KM-XMZ	 Haste: ER	 Ângulo de hélice: 0°	 Ângulo de hélice: 15°	 Ângulo de hélice: 30°
 Ângulo da ponta: 118°	 Ângulo da ponta: 130°	 Balanceamento (G 6.3/25.000)	 Balanceamento (G 6.3/10.000)	 Balanceamento (G 6.3/6.000)
 Balanceamento (G 16/20.000)	 Norma DIN 6537	 Norma DIN 6535	 Norma DIN 69893	 Norma DIN 69090-3
 Furação: Sem refrigeração	 Refrigeração interna: Radial: Furação	 Refrigeração interna: Radial: Alargamento	 Refrigeração interna: Radial: Fresamento Intercambiável	 Refrigeração externa: Furação
Refrigeração interna: Mínima quantidade de lubrificante (MQL): Furação	Refrigeração interna: Axial: Furação	Refrigeração interna: Axial: Alargamento	Refrigeração interna: Entrada de refrigeração AD	Refrigeração interna: Entrada de refrigeração AD/B
Dimensões da ferramenta: 2 canais/2 guias/ Com refrigeração	Dimensões da ferramenta: 2 canais/2 guias/ Sem refrigeração	Dimensões da ferramenta: 2 canais/3 guias/ Com refrigeração	Dimensões da ferramenta: 2 canais/4 guias/ Com refrigeração	Dimensões da ferramenta: 2 canais/4 guias/ Sem refrigeração
Dimensões da ferramenta: 2 canais/4 guias/ Com ou sem refrigeração	Dimensões da ferramenta: 3 canais/3 guias/ Com refrigeração	Dimensões da ferramenta: 3 canais/3 guias/ Sem refrigeração	Dimensões da ferramenta: Configuração de estria: 2	Dimensões da ferramenta: Configuração de estria: 3
Dimensões da ferramenta: Configuração de estria: 4				

Ícones de rosqueamento

 Escareamento/ Percurso de chanfro	 Furação: Fundo reto	 Furação: Cego	 Rosqueamento: Furo passante	 Rosqueamento com macho: Furo cego
 Rosqueamento: Furo passante	 HSS-E: Aço rápido com liga de cobalto para materiais com dureza superior	 HSS-E-PM: Aço rápido com liga de cobalto para materiais com dureza superior (PM = Aço sinterizado)	 HM: (Carboneto)	 Profundidade de furação: 2 x D
 Chanfro forma B (3,5 a 5,5)	 Chanfro Forma C (2 a 3)	 Chanfro Forma D (3,5 a 5)	 Chanfro forma E (de 1,5 a 2)	 Chanfro forma B (3 a 5)
 Ângulo de hélice do macho: 0°	 Ângulo de hélice do macho: 10°	 Ângulo de hélice do macho: Esquerda 8°	 Ângulo de hélice do macho: 15°	 Ângulo de hélice do macho: Esquerda 15°
 Ângulo de hélice do macho: 25°	 Ângulo de hélice do macho: 30°	 Ângulo de hélice do macho: 42°	 Ângulo de hélice do macho: 45°	 Macho de abrir roscas multiuso: Ponto em espiral
 Tensão/ compressão	 Norma DIN: 371	 Norma DIN: 374	 DIN Número 376	 Norma DIN: 5156
 Norma DIN: 2174	 Refrigeração interna: Radial: Rosqueamento	 Refrigeração externa: Rosqueamento	 Refrigeração interna: Axial: Rosqueamento	 Especificações do fabricante: ISO 2
 Especificações do fabricante: ISO 3	 Especificações do fabricante: JIS	 Classe de ajuste: 2B	 Classe de ajuste: 3B	 Classe de ajuste: 6H
Classe de ajuste: 6HX	Classe de ajuste: 6G	Classe de ajuste: 2BX	Classe de ajuste: 3BX	Rosca fina unificada
Rosca grossa unificada	Rosca cônica para tubo padrão americano para roscas com material de selo a seco	Rosca cônica para tubo padrão americano para roscas sem material de selo a seco	Rosca para tubo Whitworth	Rosca grossa unificada: Perfil J
Rosca fina unificada: Perfil J	Rosca grossa métrica ISO	Rosca fina métrica ISO		

Ícones de fresamento de topo inteiriço

Fresamento de face	Fresamento helicoidal	Fresamento de mergulho	Fresamento de mergulho: Ponta esférica	Fresamento de rampa: Blank
Fresamento de rampa: Até 3°	Abertura de canal: Ponta esférica	Abertura de canal: Ponta esférica com dimensão AP	Abertura de canal: Topo reto	Abertura de canal: Topo reto com dimensão AP
Fresamento trocoidal	Fresamento trocoidal: Ponta esférica	Fresamento lateral/Fresamento de canto: Ponta esférica	Fresamento lateral/Fresamento de canto: Ponta esférica com dimensões AE/AP	Fresamento lateral/ fresamento de canto: Topo reto
Fresamento lateral/ fresamento de canto: Topo reto com dimensões AE/AP	Fresamento lateral/ fresamento de canto: Chanfro suavizado	Fresamento lateral/ fresamento de canto: Chanfro suavizado com dimensões AE/AP	Fresamento lateral/ fresamento de canto: Acabamento fino	Fresamento lateral/ fresamento de canto: Acabamento fino com dimensões AE/AP
Fresamento lateral/ fresamento de canto: Acabamento	Fresamento lateral/ fresamento de canto: Acabamento com dimensões AE/AP	Fresamento lateral/ fresamento de canto: Fresamento de topo sólido de parede fina	Fresamento lateral/ fresamento de canto: Raio	Fresamento lateral/ fresamento de canto: Raio com dimensões AE/AP
Fresamento de perfil 3D	Fresamento de perfil 3D com dimensões AE/AP	Fresamento de perfil 3D com fresamento de topo reto	Estilo de canto: Ponta esférica	Estilo de canto: Chanfro de canto
Estilo de canto: Raio de canto	Estilo de canto: Topo reto	Estilo de canto: Toroidal	Haste: Cilíndrica paralela	Haste: Cilíndrica Weldon®
Haste: SK BT JIS B 6339	Haste: SK CAT(CV) ANSI B5.50	Haste: HSK: CAT: Rosca da barra de tração: 5/8-11 UNC	Haste: HSK A/ DIN 69893	Haste: Safe-Lock™ ≤h6
Haste: Safe-Lock™	Haste: Haste PSC	Conexão Duo-Lock™	Ângulo de hélice: 0°	Ângulo de hélice: 15°
Ângulo da hélice: 20°	Ângulo da hélice: 25°	Ângulo de hélice: 30°	Ângulo da hélice: 35°	Ângulo da hélice: 38°
Ângulo da hélice: 40°	Ângulo da hélice: 45°	Ângulo da hélice: 50°	Ângulo da hélice: 60°	Ângulo da hélice: 43°
Ângulo da hélice: 36°	Ângulo da hélice: 35°/38°	Ângulo da hélice: 37°/39°	Balanceamento (G 2,5/25,000)	Norma DIN: 6527
Norma DIN: 6528	Furação: Refrigeração interna	Refrigeração interna	Refrigeração interna: Axial: Fresas de topo inteiriças	Dimensões da ferramenta: Configuração de canal: X (variável)

(continuação)

(Ícones de fresamento de topo inteiriço — continuação)

 Dimensões da ferramenta: Configuração de estria: 2	 Dimensões da ferramenta: Configuração de estria: 3	 Dimensões da ferramenta: Configuração de estria: 4	 Dimensões da ferramenta: Configuração de estria: 5	 Dimensões da ferramenta: Configuração de estria: 6
 Dimensões da ferramenta: Configuração de estria: 1	 Dimensões da ferramenta: Configuração de estria: 12	 ISO 26622		

Ícones de fresamento intercambiável

 Rebaixo	 Circular espiral	 Fresamento de face	 Fresamento helicoidal	 Fresamento de mergulho
 Fresamento de mergulho: Ponta esférica	 Fresamento de rampa: Blank	 Canais: Ponta esférica	 Canais: Lateral	 Canais: Lateral com dimensões AE/AP
 Abertura de canal: Fresamento lateral: Ponta esférica	 Canais: Topo reto	 Canais: T	 Canais: T com dimensão AP	 Fresamento lateral/ Fresamento de canto: Ponta esférica
 Fresamento lateral/ fresamento de canto: Canto inferior	 Fresamento lateral/ fresamento de canto: Topo reto	 Fresamento lateral/ fresamento de canto: Chanfro suavizado	 Abertura de canal: Perfilagem de canto	 Abertura de canal: Canto
 Fresamento de perfil 3D	 Fresamento de perfil 3D com fresamento de topo reto	 Ferramenta PCD	 Fresamento de cavidade	 Haste: Cilíndrica paralela
 Haste: Cilíndrica Weldon®	 Haste: Cilíndrica Weldon 2 planos	 Haste: Screw-On	 Haste: HSK DIN 69893	 Haste para fresa shell mill
 Fresamento: Refrigeração interna	 Refrigeração interna: Ar pressurizado Refrigeração: Fresamento radial: intercambiável			

P	Aço
M	Aço inoxidável
K	Ferro fundido
N	Materiais não ferrosos
S	Ligas resistentes a altas temperaturas
H	Materiais endurecidos
C	Materiais CFRP

material grupo	descrição	com-posição	tensão resistência RM (MPa)*	dureza (HB)	dureza (HRC)	material número
P0	Aços de baixo carbono e cavacos longos	C <0,25%	<530	<125	–	–
P1	Aços de baixo carbono, cavacos curtos e usinagem livre	C <0,25%	<530	<125	–	C15, Ck22, ST37-2, S235JR, 9SMnPb28, GS38
P2	Aços de médio e alto carbono	C >0,25%	>530	<220	<25	ST52, S355JR, C35, GS60, Cf53
P3	Aços-liga e aços-ferramenta	C >0,25%	600–850	<330	<35	16MnCr5, Ck45, 21CrMoV5-7, 38SMn28
P4	Aços-liga e aços-ferramenta	C >0,25%	850–1400	340–450	35–48	100Cr6, 30CrNiMo8, 42CrMo4, C70W2, S6525, X120Mn12
P5	Aços inoxidáveis PH, Ferríticos e Martensíticos	–	600–900	<330	<35	100Cr6, 30CrNiMo8, 42CrMo4, C70W2, S6525, X120Mn12
P6	Aços inoxidáveis PH, ferríticos e martensíticos de alta resistência	–	900–1350	350–450	35–48	X102CrMo17, G-X120Cr29
M1	Aço Inoxidável Austenístico	–	<600	130–200	–	X5CrNi 18 10, X2CrNiMo 17 13 2, G-X25CrNiSi18 9, X15CrNiSi 20 12
M2	Aços inoxidáveis austeníticos e inoxidáveis fundidos de alta resistência	–	600–800	150–230	<25	X2CrNiMo 13 4, X5NiCr 32 21, X5CrNiNb 18 10, G-X15CrNi 25-20
M3	Aço inoxidável duplex	–	<800	135–275	<30	X8CrNiMo27 5, X2CrNiMoN22 5 3, X20CrNiSi25 4, G-X40CrNiSi27 4
K1	Ferro fundido cinzento	–	125–500	120–290	<32	GG15, GG25, GG30, GG40, GTW40
K2	Ferros fundidos nodulares (dúcteis) de baixa e média resistência e ferros fundidos de grafita compactada (vermicular, CGI)	–	<600	130–260	<28	GGG40, GTS35
K3	Ferros fundidos nodulares de alta resistência e ferros fundidos nodulares austemperados (ADI)	–	>600	180–350	<43	GGG60, GTW55, GTS65
N1	Alumínio forjado	–	–	–	–	AlMg1, Al99.5, AlCuMg1, AlCuBiPb, AlMgSi1, ALMgSiPb
N2	Ligas de alumínio com baixo teor de silício e ligas de magnésio	Si <12,2%	–	–	–	GAlSiCu4, GDAlSi10Mg
N3	Ligas de alumínio com alto teor de silício e ligas de magnésio	Si >12,2%	–	–	–	G-ALSi12, G-AlSi17Cu4, G-AlSi21CuNiMg
N4	À base de cobre, latão e zinco em uma faixa de índice de usinabilidade de 70 a–100	–	–	–	–	CuZn40, Ms60, G-CuSn5ZnPb, CuZn37, CuSi3Mn
N5	Náilon, plásticos, borrachas, fenóis, resinas e fibra de vidro	–	–	–	–	Lexan®, Hostalen™, poliesterol, Makrolon®
N6	Carbono, compósitos de grafite e polímeros reforçados com fibras de carbono (CFRP)	–	–	–	–	CFK, GFK
N7	Compósitos de matriz metálica (MMC)	–	–	–	–	–
S1	Ligas à base de ferro, resistentes a altas temperaturas	–	500–1200	160–260	25–48	X1NiCrMoCu32 28 7, X12NiCrSi36 16, X5NiCrAlTi31 20, X40CoCrNi20 20
S2	Ligas à base de cobalto, resistentes a altas temperaturas	–	1.000–1450	250–450	25–48	Haynes® 188, Stellite® 6,21,31
S3	Ligas à base de níquel, resistentes a altas temperaturas	–	600–1700	160–450	<48	INCONEL® 690, INCONEL 625, Hastelloy®, NIMONIC® 75
S4	Titânio e ligas de titânio	–	900–1600	300–400	33–48	Ti1, TiAl5Sn2, TiAl6V4, TiAl4Mo4Sn2
H1	Materiais endurecidos	–	–	–	44–48	GX260NiCr42, GX330NiCr42, GX300CrNiSi952, GX300CrMo153, Hardox® 400
H2	Materiais endurecidos	–	–	–	48–55	–
H3	Materiais endurecidos	–	–	–	56–60	–
H4	Materiais endurecidos	–	–	–	>60	–
C1	CFRP, CFRP/CFRP	–	–	–	–	–
C2	CFRP/Não ferroso	–	–	–	–	–
C3	CFRP/Alta temperatura	–	–	–	–	–
C4	CFRP/Aço inoxidável	–	–	–	–	–
C5	CFRP/Não ferroso/Alta temperatura	–	–	–	–	–

P0 Lista dos materiais das peças • Aço • P0

Aços de Baixo Carbono, Cavacos Longos P0 Teor: C<.25% Resistência a Tensão RM (MPa): <530 Dureza (HB): <125*

AISI**	DIN	BTS	JIS	UNS	EN	AFNOR	UNI	SIS	SAE	ASTM	Número do Material	Referência do fabricante
1013	USt 34-1	–	–	G10130	–	–	–	1233	–	–	1.0055	–
1010	C 10	045 M 10	S 10 C	G10100	C 10	XC 10	C 10	–	–	–	1.0301	–
1008	DD 11 (StW 22)	HR 3	SPHD	–	DD 11	1 C	–	–	–	–	1.0332	–
1020	C 22	050 A 20	S 22 C	G10200	1 C 22	C 20	C 20	1450	–	–	1.0402	–
1025	C 25	070 M 26	S 22 C	G10250	1 C 25	C 25	C 25	–	–	–	1.0406	–
1012	B 500 H	–	S 12 C	G10120	B 500 B	XC 12	B 500 B	1332	–	–	1.0439	–
1018	C16.8	080 A 17	–	G10180	–	–	–	–	–	–	1.0453	–
1108	10 S 20	210 M 15	–	G 11080	10 S 20	10 F 1	CF 10 S 20	–	–	–	1.0721	–
1010	Ck 10	040 A 10	S 10 C	G10100	2 C 10	XC 10	C 10	1265	–	–	1.1121	–
1022	20 Mn 5	120 M 19	SMn 420	G 10220	20 Mn 5	20 M 5	G 22 Mn 3	–	–	–	1.1133	–
1015	Ck 15	080 M 15	S 15 C	G 10150	2 C 15	XC 15	C 15	1370	–	–	1.1141	–
1021	22 B 2	–	SWRCHB 220	G10210	C 22 BE 69	21 B 3	–	–	–	–	1.5508	–
–	PS 275 TM	S 275 M	–	–	S 275 M	S 275 M	S 275 M	–	–	–	1.8818	–
–	DI-MC 355 B	–	–	–	S 355 M	E 355	S 355 M	–	–	–	1.8823	–
–	DI-MC 420 B	S 420 M	–	–	S 420 M	E 420	S 420 M	–	–	–	1.8825	–
–	S 460 M	S 460 M	–	–	S 460 M	E460; S460M	S460M	–	–	–	1.8827	–
–	BTStE 355 TM	S 355 ML	–	–	S 355 ML	E 355	S 355 ML	–	–	–	1.8834	–
–	BTStE 420 TM	S 420 MI	–	–	S 420 ML	E 420	S 420 ML	–	–	–	1.8836	–
–	St E 320-3Z	–	–	–	S 320 GD + ZA	–	–	–	–	–	1.0250	–

P1 Lista dos materiais das peças • Aço • P1

Aços de baixo carbono, Cavacos Curtos e Usinagem Livre P1 Teor: C<.25% Resistência a Tensão RM (MPa): <530 Dureza (HB): <125*

AISI**	DIN	BTS	JIS	UNS	EN	AFNOR	UNI	SIS	SAE	ASTM	Número do Material	Referência do fabricante
–	R St 34-2/ S 205 G2T	34/20CR	–	K02502	–	–	–	–	–	–	1.0034	–
–	St 33	HR 15	SS 330	K01400	–	A 33	Fe 320	–	–	–	1.0035	–
A 570 Gr. 33	USt 37-2	4360-40 B	SS 34	K 02502	S 235 JR G1	E 24-2	Fe 360 BFU	1311	–	–	1.0036	–
–	St 37-2	HS 37/23	STKR 400	K02702	S 235 JR	E 28-2	Fe 430 C	1412	–	–	1.0037	–
A 570 Gr. 36	R St 37-2/S235 JRG2	4260-40 C	SS 34	K 02502	S235 JR G 2	E 24-2 NE	Fe 360 BFN	1312	–	–	1.0038	–
–	S 235 JRH	S 235 JRH	–	–	S235JRH	E 24-2	S 235 JRH	–	–	–	1.0039	–
–	R St 42-1	–	–	K02507	–	–	–	–	–	–	1.0077	–
–	S235J2G3/Fe 360 D1	S 235 J 2 G 3	–	K01501	S 235 J2 G3	E 24-4	S 235 J2G3	1313	–	–	1.0161	–
–	C 10 Pb	–	–	–	C 10 GPb	–	–	–	–	–	1.0302	–
–	QSt 32-3	–	SWRCH6R	–	CB 4 FF KD	–	CB 4 F U	–	–	–	1.0303	–
–	St 35.8	–	STPT 38	K01201	–	–	–	–	–	–	1.0305	–
–	St 37-2	360	STKM 12 A	K02504	S 235 JR	E 24-2	Fe 360	1412	–	–	1.0308	–
–	C10D	–	SWRM 10	–	C 10 D	FM 10	C 10 D	–	–	–	1.0310	–
–	C12D	–	SWRM 12	–	C 12 D	–	C 12 D	–	–	–	1.0311	–
–	R St 15	FeP05	–	–	Fe P05	FeP05	FeP05	–	–	–	1.0312	–
–	D 6-2	0 1 5 A 03	SWRM 6	G10050	C 4 D	–	3 CD 5	–	–	–	1.0314	–
–	St 37.8	–	STB 35	–	–	–	Fe 37	–	–	–	1.0315	–
–	St 13	CR 3	SPCD	–	–	–	–	–	–	–	1.0333	–
–	D D 13 (StW 24)	H S 3	SPHE	–	D D 13	3C	–	–	–	–	1.0335	–
–	USt 4/DC 04 G	–	–	–	D C 04 G 1	–	–	–	–	–	1.0336	–
–	Ro St 4/DC 04 GT	–	–	–	DC 04 GT	–	–	–	–	–	1.0337	–
–	St 4	DC 04/FeP04	SPCE	–	Fe P04	Fe 14	DC04/FeP04	–	–	–	1.0338	–
–	DC01Cu	–	–	–	DC 01 Cu	–	–	–	–	–	1.0344	–
–	RR St 3	CR 3	SPCD	–	Fe P03	F 13	DC 03/FeP 03	–	–	–	1.0347	–
–	U H I/P 195GH	–	SGV 480	–	P 195 Gh	–	–	–	–	–	1.0348	–
–	St 14 Cu 3	–	–	–	DC 04 Cu	–	–	–	–	–	1.0354	–
–	–	3 CR	–	–	D D 12	D D 12	–	–	–	–	1.0398	–
1015	C 15	080 M 15	S 15 C	G10170	C 15	C 12	C 15	1350	–	–	1.0401	–
–	LSt 45.8	–	–	–	C 16	–	C 16	–	–	–	1.0407	–
–	C15D	–	SWRM 15	–	C 15 D	FM 15	C 15 D	–	–	–	1.0413	–
–	C20D	–	SWRM 20	–	C 20 D	FM 20	C 20 D	–	–	–	1.0414	–
–	C26D	–	SWRH 27	–	C 26 D	FM 26	C 26 D	–	–	–	1.0415	–
–	C18D	–	SWRM 17	–	C 18 D	FM 18	C 18 D	–	–	–	1.0416	–
–	RSt 44-2	440	–	G10160	–	–	–	–	–	–	1.0419	–
–	P265 NB	–	SG 295	–	P 265 NB	BS 2	–	–	–	–	1.0423	–
–	P 265 GH	151-400	SG 30	K02801	P 265 GH	A42CP	P 265 GH	1430	–	–	1.0425	–
–	C 22.3	–	–	–	C 22 G 1	–	–	–	–	–	1.0427	–
–	BSt 420 S	–	–	–	Fe B 400	–	–	–	–	–	1.0428	–
–	C 21	–	SFVC 1	K03504	P 305 GH	–	–	–	–	–	1.0432	–
–	GS-45	A1	SC 450	J03001	GE 230	E23-45M	–	1305	–	–	1.0446	–
–	TStE 275 (S 275 NL)	40EE	–	–	S 275 NL	S 275 NL	S 275 NL	–	–	–	1.0491	–
–	St 42.8	–	STPT 42	–	–	–	Fe 42	–	–	–	1.0498	–
–	S 335 N (StE 355)	50 E	–	–	S 355 N	E 355	S 355 N	2134	–	–	1.0545	–
–	S 355 NL (TStE 355)	50 E E	–	–	S 355 NL	E 355	S 355 N L	2135	–	–	1.0546	–
–	R 7 S 6/C 7 RG 2	–	–	–	C 7 RG 2	–	–	–	–	–	1.0709	–
B1112	9 S 20	220 M 07	SUM 21	G 11120	–	–	CF 9 S 22	–	–	–	1.0711	–
1213	9 SMn 28/11 SMn 30	230 M 07	SUM 22	G 12130	11 SMn 28	S 250	CF 9 SMn 28	1912	–	–	1.0715	–
12L13	9 SMnPb 28	–	SUM 22 L	G 12134	11 SMnPb 28	S 250 Pb	CF 9 SMnPb 28	1914	–	–	1.0718	–
–	15 S 22/15 S 20	En32M	SUM 32	–	15 S 22	–	–	1922	–	–	1.0723	–
–	15 SMn 13	15 SMn 13	–	–	15 SMn 13	15 SMn 13	–	–	–	–	1.0725	–
1215	9 SMn 36/11 S Mn 37	240 M 07	SUM 25	G 12150	11 SMn 37	S 300	CF 9 SMn 36	–	–	–	1.0736	–
12L14	9 SMnPb 36/11 SMnPb 37	–	–	G 12144	11 SMnPb 37	S 300 Pb	CF 9 SMnPb 36	1926	–	–	1.0737	–
–	11 SMnPbTe 37	11 SMn 37	–	–	11 SMn 37	–	–	–	–	–	1.0738	–
–	15 SPb 20/15 SPb 22	–	–	–	15 SPb 22	–	–	–	–	–	1.0753	–
–	36 SMn 14	36SMn14	–	–	36SMn14	36SMn14	–	–	–	–	1.0764	–
–	C10D2	–	–	–	C 10 D 2	FM 10	C 10 D 2	–	–	–	1.1114	–
–	Cq 10 (C 10 C)	–	SWRCH 10 K	–	C 10 KD	–	–	–	–	–	1.1122	–
–	C15D2	–	–	–	C 15 D 2	FM 15	C 15 D 2	–	–	–	1.1126	–
–	C 18D2	–	–	–	C 18 D 2	FM 18	C 18 D 2	–	–	–	1.1129	–

(continuação)

P1 Lista dos materiais das peças • Aço • P1 *(continuação)*

Aços de baixo carbono, Cavacos Curtos e Usinagem Livre P1 Teor: C<.25% *Resistência a Tensão RM (MPa)*: <530* *Dureza (HB): <125*

AISI**	DIN	BTS	JIS	UNS	EN	AFNOR	UNI	SIS	SAE	ASTM	Número do Material	Referência do fabricante
–	GS-16 Mn 5	–	–	–	G 17 Mn 5	G 17 Mn 5	G17Mn5	–	–	–	1.1131	–
–	C20D2	–	–	–	C 20 D 2	FM 20	C20D 2	–	–	–	1.1137	–
–	C26D2	–	–	–	C 26 D 2	FM 26	C26D 2	–	–	–	1.1139	–
–	GC 16 E/GS-Ck 16	–	–	–	GC 16 E	–	–	–	–	–	1.1142	–
–	C 16 E	C 16 E	–	–	C 16 E	XC 18	–	–	–	–	1.1148	–
–	Cm 22	070 M 20	C 22 R (3 C 22)	–	3 C 22	XC 18 u	C 22 R	–	–	–	1.1149	–
–	Ck 22	050 A 20	S 22 C	G10230	2 C 22	XC 25	C 20	–	–	–	1.1151	–
–	Cq 22	–	SWRCH20K	–	C 21 KD	–	CB 20 FF	–	–	–	1.1152	–
–	Ck 25	070 M 26	S 25 C	G10250	2 C 25	XC 25	C 25	–	–	–	1.1158	–
–	C2D1	–	–	–	C 2 D 1	–	C 2 D 1	–	–	–	1.1185	–
–	19 MnVS 6	–	–	–	19 MnVS 6	–	–	–	–	–	1.1301	–
–	PS 275 TM	S 275 M	–	–	S 275 M	S 275 M	S 275 M	–	–	–	1.8818	–
–	DI-MC 355 B	–	–	–	S 355 M	E 355	S 355 M	–	–	–	1.8823	–
–	DI-MC 420 B	S 420 M	–	–	S 420 M	E 420	S 420 M	–	–	–	1.8825	–
–	S 460 M	S 460 M	–	–	S 460 M	E460;S460M	S460M	–	–	–	1.8827	–
–	BTStE 355 TM	S 355 ML	–	–	S 355 ML	E 355	S 355 ML	–	–	–	1.8834	–
–	BTStE 420 TM	S 420 MI	–	–	S 420 ML	E 420	S 420 ML	–	–	–	1.8836	–
–	S 235 J 0 W (Allwesta 360)	S 235 J 0 W	SMA 400 BW	–	S 235 JO W	S 235 J 0 W	–	–	–	–	1.8958	–
–	S 355 J 0 W (Allwesta 510)	WR 50 B	SMA 490 BW	–	S 235 JO W	E24W-3	S 235 J0 W	–	–	–	1.8959	–
–	WTSt 37-2/S235JRW	WR 50 B	SMA 41 A	K11538	S 235 JR W	E 24 W-2	–	–	–	–	1.8960	–
–	WTSt 37-3	WR 50 C	SMA 50 A	–	S 235 J2 W	S 235 J 2 W	Fe 360 D FF	–	–	–	1.8961	–
–	USt 42-2	–	SS 41	–	–	HS 18-0-2-10	–	–	–	–	1.0040	–
–	St 37-2	–	–	–	S 235 JRC	E 24-2	S 235 JRC	–	–	–	1.0120	–
–	S 235 JR G1F	–	–	–	S 235 JRG 1 F	–	–	–	–	–	1.0160	–
–	St 12	DC 01/Fe P01	SPCC	–	Fe P01	DC 01/fe P01	DC 01/FeP0 1	–	–	–	1.0330	–
–	GS-38	A1	–	–	GE 200	230-400M	–	1306	–	–	1.0420	–
–	GS-20 Mn 5	–	SMnC 420	H15220	–	–	–	–	–	–	1.1120	–
–	G 20 Mn 5	–	–	–	G 20 Mn 5	–	G 20 Mn 5	–	–	–	1.6220	–

P2 Lista dos materiais das peças • Aço • P2

Aços de Médio e Alto Carbono P2 *Teor: C>.25%* *Resistência a Tensão RM (MPa)*: >530* *Dureza (HB): <220 (HRC): <25*

AISI**	DIN	BTS	JIS	UNS	EN	AFNOR	UNI	SIS	SAE	ASTM	Número do Material	Referência do fabricante
–	S 355 JR	En 50 B	SM 490 YA	–	S 1207	E36-2	Fe 510 BFN	–	–	–	1.0045	–
1035	C 35	060 A 35	S 35 C	G 10350	1 C 35	CC 35	C 35	1550	–	–	1.0501	–
1045	GS-C 45	080 M 46	S 45 C	G10450	1 C 45	CC 45	C 45	1650	–	–	1.0503	–
1040	C 40	080 M 40	S 40 C	G 10 400	1 C 40	C 40	C 40	–	–	–	1.0511	–
1046	S 355 K 2 G 4 Cu	–	–	G10460	S 355 K2 G4 Cu	–	–	–	–	–	1.0519	–
1030	C30	080 M 30	SUP 7	G 10 300	1 C 30	C C 32	C 30	–	–	–	1.0528	–
1055	C 55	070 M 55	S 55 C	J05000	1 C 55	C 55	C 55	1655	–	–	1.0535	–
1551	C 50 Pb	–	–	G15510	C 50 G Pb	–	–	–	–	–	1.0542	–
–	GS-60	A3	–	–	GE 300	320-560M	C 45	1606	–	–	1.0558	–
1037	36 Mn4	170 H 36	–	G10370	–	–	–	–	–	–	1.0561	–
–	PSt 52-3 (S 355 J2 G3 F)	–	–	–	S 355 J2 G3 F	–	FE 510 C	–	–	–	1.0572	–
–	S 355 J2H (RoSt 52-3)	50D	–	–	S355J2H	–	S355J2H	–	–	–	1.0576	–
1060	C 60	080 A 62	S 60 C-CSP	G 10600	1 C 60	AF 70 C 55	C 60	–	–	–	1.0601	–
1070	C 67	CS 70	S 70 C -CSP	G10700	1 CS 67	C 68	C 67	–	–	–	1.0603	–
1074	C 75	CS 80	–	G10740	1 CS 75	C 75	C 75	–	–	–	1.0605	–
1059	C58D	–	S 58 C	G10590	C 58 D	FM 58	C 58 D	–	–	–	1.0609	–
1075	C76D	–	–	G10750	C 76 D	FM 76	C 76 D	–	–	–	1.0614	–
1080	C86D	CS 80	–	G10860	C 86 D	FM 86	C 86 D	–	–	–	1.0616	–
1095	C92D	95 CS	–	G10950	C 92 D	–	C 92 D	–	–	–	1.0618	–
1110	U 10 S 10	–	SUM 12	G11100	–	–	–	–	–	–	1.0702	–
11L08	10 SPb 20	–	–	G 11084	10 SPb 20	10 Pb F 2	CF 10 SPb 20	–	–	–	1.0722	–
1140	35 S 20	212 M 36	–	G 11400	35 S 20	35 MF 4	–	1957	–	–	1.0726	–
1146	45 S 20	212 M 44	–	G 11460	45 S 20	45 MF 4	–	1973	–	–	1.0727	–
1151	60 S 20	–	–	G11510	60 S 20	60 MF 4	–	–	–	–	1.0728	–
1141	36 Mn 6	212 M 36	S Mn 443	G 11410	–	–	–	–	–	–	1.1127	–
1039	40 Mn 4	150 M 36	–	G10390	–	35 M 5	–	–	–	–	1.1157	–
1536	34 Mn 5	En15B	SS 55	G15360	–	–	–	–	–	–	1.1166	–
1030	Cq 35	–	F.1133 (C 35 DF)	G 10300	C 35 KD	–	CB 35	–	–	–	1.1172	–
1034	Ck 34	080 M 34	S 34 C	G 10340	2 C 34	–	C 34	–	–	–	1.1173	–
1038 H	Ck 38	–	–	G 10380	–	XF 38	–	–	–	–	1.1176	–
1030	Ck 30	080 M 30	S 30 C	G 10300	2 C 30	XC 32	C 30	–	–	–	1.1178	–
1034	Ck 35	080 M 36	S 35 C	G 10340	2 C 35	XC 38 H1	C 35	1572	–	–	1.1181	–
1035	Cf 35	060 A 35	S 35 C	G 10350	C 35 G	XC 38 TS	C 35	1572	–	–	1.1183	–
1040	Ck 40	080 A 40	S 40 C	G 10400	2 C 40	XC 42 H1	C 40	–	–	–	1.1186	–
1045	Cf 45	060 A 47	S 45 C	G10450	C 45 G	XC 42 TS	C 43	1672	–	–	1.1193	–
1055	Ck 55	070 M 55	S 55 C	G10550	2 C 55	XC 55 H1	C 55	1655	–	–	1.1203	–
1050	Ck 50	080 M 50	S 50 C	G10500	2 C 50	XC 48 H1	C 50	1674	–	–	1.1206	–
1055	Cm 55	070 M 55	–	G 10550	3 C 55	XC 55 H1	C 55 R	–	–	–	1.1209	–
1053	Ck 53	En43C	S 53 C	G 10530	–	–	–	–	–	–	1.1210	–
1050	Cf 53	060 A 57	S 50 C	G 10500	C 53 G	XC 48 TS	C 48	1674	–	–	1.1213	–
1060	Ck 60	060 A 62	S 58 C	G 10640	2 C 60	XC 60	C 60	1678	–	–	1.1221	–
1552	52 Mn 5	–	–	G15520	–	–	–	–	–	–	1.1226	–
1065	FD (Federstahldraht)	095 A 65	–	G10650	C 68 D	–	–	–	–	–	1.1230	–
1070	Ck 67	060 A 67	S 70 C-CSP	G 10700	C 67 S	XC 68	C 70	1770	–	–	1.1231	–
1069	Ck 68	–	–	G10690	C 70 D	–	–	–	–	–	1.1234	–
1080	Ck 75	060 A 78	C 75	G 10800	C 75 S	XC 75	C 75	1774	–	–	1.1248	–
–	Cf 70	–	–	–	C 70 G	XC 70	–	–	–	–	1.1249	–
1090	Ck 85	–	SK 5 -CSP	G 10900	C 85 S	XC 90	C 90	–	–	–	1.1269	–
1085	90 Mn 4	080 A 83	SUP4	G 10850	–	–	–	–	–	–	1.1273	–
1095	Ck 101	060 A 96	SUP_4	G 10950	C 100 S	XC 100	C 100	1870	–	–	1.1274	–
1050	C 50	080 M 50	S 50 C	G 10 500	1 C 50	C 50	C 50	1674	–	–	1.0540	–
–	St 52-3 G	4360-50 B	SM 50 YB	–	S 355 J 2 G 3	E 36-3	Fe 510 B	2132	–	–	1.0570	–
1078	C78D	–	SWRH 77 B	G10780	C 78 D	FM 78	C 78 D	–	–	–	1.0620	–
1035	Cm 35	080 M 36	–	G 10350	3 C 35	38 H1 k	C 35 R	1572-03	–	–	1.1180	–
1566	66 Mn 4	–	–	G15660	–	–	–	–	–	–	1.1260	–
1084	C 85 W	–	SK 5	G10840	C 90 U	Y3 90	–	–	–	–	1.1830	–

NOTA: Para a legenda, veja a página Y217.

P3 Lista dos materiais das peças • Aço • P3

Aços-liga e aços ferramenta P3 *Teor: C>.25%* *Resistência a Tensão RM (MPa)*: 600–850* *Dureza (HB): <330 (HRC): <35*

AISI**	DIN	BTS	JIS	UNS	EN	AFNOR	UNI	SIS	SAE	ASTM	Número do Material	Referência do fabricante
1330	GS-30 Mn 5	120 M 36	SMn 433 H; SCMn 2	K13300	–	35 M 5	–	1330	–	–	1.1165	–
1330	28 Mn 6	150 M 28	SCMn 1	G 13300	28 Mn 6	35 M 5	C 28 Mn	–	–	–	1.1170	–
1335	36 Mn 5	150 M 36	SMn 438(H)	G13350	–	40 M 5	–	2120	–	–	1.1167	–
1345	StSch 90 C/GP 280 GH	–	–	G13450	GP 280 GH	GP 280 GH	GP 280 GH	–	–	–	1.0625	–
1513	P265	HR 40/30	–	G15130	–	12 M 5	–	–	–	–	1.0424	–
4142	43 CrMo 4	–	–	G41420	–	43 Cr Mo 4	–	–	–	–	1.3563	–
4147	48 CrMo 4	817 M 40	SNC 836	H41470	–	48 CrMo 4	–	–	–	–	1.3565	–
4419	GS-22 Mo 4	243-430	SCPH 11	G44190	G 20 Mo 5	G20Mo5	G 22 Mo 5	–	–	–	1.5419	–
4520	16 Mo 5	1503-245-420	SBC 690	K11522	–	–	16 Mo 5	–	–	–	1.5423	–
5015	15 Cr 3	523 M15	SCr 415 H	G50150	15 Cr 2	12 C 3	–	–	–	–	1.7015	–
5046	44 Cr 2	–	–	H50460	46 Cr 1 KD	44 Cr 2	–	–	–	–	1.3561	–
5115	16 MnCr 5	527 M 17	SCR 415	G 51150	16 MnCr 5 KD	16 MC 5	16 MnCr 5	2173	–	–	1.7131	–
5117	17 Cr 3	17 Cr 3	–	G51170	(15 Cr 2 KD)	18 C 3	–	–	–	–	1.7016	–
5130	28 Cr 4	530 A 30	–	G51300	28 Cr 4	30 CD 4	–	–	–	–	1.7030	–
5140	41 Cr 4	530 M 40	SCr 440 H	G51400	41 Cr 4	42 C 4	41 Cr 4	–	–	–	1.7035	–
5140	42 Cr 4	530 A 40	SCr 440	–	40 NiCrMo 3	42 C 4 TS	40 NiCrMo 3	2245	–	–	1.7045	–
9255	51 Si 7	250 A 53	–	G92550	–	51 S 7	48 Si 7	2090	–	–	1.0903	–
9255	55 Si 7	250 A 53	SKH 1; SKT 4	G92550	55 NiCrMoV 7	55 S 7	55 Si 8	2085	–	–	1.0904	–
9260	60 Si 7	251 A 60	–	G92600	60 Si 7	60 S 7	60 Si 7	–	–	–	1.5027	–
9262	60 SiCr 7	250 A 61	SUP 7	G92620	60 SiCr 8	60 SC 7	60 SiCr 8	–	–	–	1.0961	–
9262	60 SC 7	–	–	G92620	60 SiCr 8	61 SC 7	60 SiCr 8	–	–	–	1.5092	–
9262	60 SiCr 7	–	–	–	60 SiCr 8	–	–	–	–	–	1.7108	–
15B21 H	19 MnB 4	170 H 20	SWRCHB 420	H15211	19 MnB 4	20 MB 5	–	–	–	–	1.5523	–
15B21 H	20 MnB 5	–	SWRCHB 620	–	20 MnB 5	20 MnB 5	20 MnB 5	–	–	–	1.5530	–
50B40	37 CrB 1	120 M 36	SMnC 3 H	H50401	38 Cr 2	–	35 CB 1	–	–	–	1.7007	–
5130 H	34 Cr 4	530 A 32	SCr 430 H	G51300	34 Cr 4 KD	32 C 4	34 Cr 4 KB	–	–	–	1.7033	–
5132 H	37 Cr 4	530 A 36	SCr 435 H	G51320	37 Cr 4	38 C 4	36 CrMn 4	–	–	–	1.7034	–
A 204 Gr. A	15 Mo 3	1501-240	STFA 12	K11820	16 Mo 3	15 D3	16 Mo 3 KW	2912	–	–	1.5415	–
A 350-LF 5	10 Ni 14	503	SL 3 N 26	K31718	12 Ni 14	12Ni14	18 Ni 14 KT	–	–	–	1.5637	–
A 387 Gr. 12 Cl. 2	16 CrMo 4 4	–	–	K11564	–	–	A 18 CrMo 4 5 KW	–	–	–	1.7337	–
A 570 Gr. 36	St 37-3	4360-40 C	–	K01501	S 235 J2 G3	Fe 360 D1(2); E 24-3	Fe 360 D1(2)	1312	–	–	1.0116	–
A 570 Gr. 40	St 44-2	4360-43 B	SM 41 B	K 02502	S 275 JR	E 28-2	Fe 430 BFN	1412	–	–	1.0044	–
A 570 Gr. 50	St 50-2	4360-50 B	SS 50	–	E 295	A 50-2	Fe 490	2172	–	–	1.0050	–
A 573 Gr. 70	St 44-3	4360-43 C	SM 41 B	–	Fe 430 D1(2); S 275 J2 G3 (4)	Fe 430 D1(2);E 28-4	Fe 430 D FF	1414	–	–	1.0144	–
A 633 Gr. C	St E 355	P 355 N	SM 50 YB	K12000	P 355 N	E 355 R/FP	Fe E 355 KG	2132	–	–	1.0562	–
A 633 Gr. E	St E 420	S 420 N	SM 50 C	K02002	FeE 420 KGN	E 420-I	Fe E 420 KG	2143	–	–	1.8902	–
A 633 Gr. E	St E 460	P 460 N	SM 53 B	K02900	P 460 N	E 460-I	Fe E 460 KG	2143	–	–	1.8905	–
A-6	C 67 W	–	–	T30106	–	Y1 70	–	–	–	–	1.1744	–
E 52100	100 Cr 6	535 A 99	SUJ 2	G52986	100 Cr 6	100 C 6	100 Cr 6	2258	–	–	1.3505	–
O 2	90 MnCrV 8	BO 2	–	T31502	90 Mn V 8	90 MV 8	90 MnVCr 8 KU	–	–	–	1.2842	–
P21	90 Cr 3	–	–	T51621	–	–	–	–	–	–	1.2056	–
P3	10 NC 6	–	–	T51603	15 NiCr 6	10 NC 6	–	–	–	–	1.5713	–
P6	15 NiCr 14	–	SNC 22	T51606	–	10 NC 12	–	–	–	–	1.2735	–
T 8	C 80 W2	BW 1B	SKC 3	T12008	–	Y1 80	C 80 KU	–	–	–	1.1625	–
W 108	C 80 W1	–	–	T72301	C 80 U	Y1 90	C 80 KU	1880	–	–	1.1525	–
W 110	C 105 W1	B W 1 A	–	T72301	C 105 U	Y 105	C 100 KU	1880	–	–	1.1545	–
W 112	C 125 W	–	–	–	C 125 U	–	–	–	–	–	1.1563	–
W 112	C 125 W	–	SK 2	T72301	C 120 U	Y2 120	C 120 KU	–	–	–	1.1663	–
W 210	100 V 1	BW 2	SKS 43	T72302	100 V 2	Y1 105 V	102 V 2 KU	–	–	–	1.2833	–
–	St 50-1	–	–	–	–	–	–	–	–	–	1.0052	–
–	S 235 JO/ Fe 360 C	En 40C	–	–	S 235 JO	E24-3	Fe 360 CFN	–	–	–	1.0114	–
–	QSt 37-3	–	SWRCH 12R	–	–	–	–	–	–	–	1.0123	–
–	S 275 J0	En43C;S275J0	–	–	S 275 J0/ Fe 430 C	S 275 J0; E 28-3	S275J0;Fe430CFN	–	–	–	1.0143	–
–	S 275 J2 G4/ Fe 430 D 2	S 275 J2 G4	–	–	S 275 J2 G4	E28-4;S 275 J2 G4	S 275 J2 G4	1414	–	–	1.0145	–
–	Ro St 44-2	43C	–	–	S 275 J0 H	–	S 275 J0 H	–	–	–	1.0149	–
–	St 37.0	–	STPG 38	–	P 235 T1	–	–	–	–	–	1.0254	–
–	C9D	–	SWRM 8	–	C 9 D	FM 9	C 9 D	–	–	–	1.0304	–
–	C7D	C 7 D	SWRM 8	G10060	C 7 D	FM 8	C 7 D	–	–	–	1.0313	–
–	P235 GH	P 235 GH	SPV 50	K02503	P 235 GH	A 37 CP	Fe E 235	1330	–	–	1.0345	–
–	C 25 Pb	–	–	–	C 25 GPb	–	–	–	–	–	1.0411	–
–	L 245 MB	430	–	K03006	L 245 MB	L 245 MB	–	–	–	–	1.0418	–
–	P310 NB	224-410	SG 325	K02100	P280GH	BS 2	P 275 N	2103	–	–	1.0426	–
–	L 290 MB	–	–	–	L290MB	L 290 MB	–	–	–	–	1.0429	–
–	H III/P285NH	–	Sm 38	–	P 285 NH	–	–	–	–	–	1.0435	–
–	P310 NB	224-430	SG 325	K02100	P305GH	P 275 N	P 275 N	2103	–	–	1.0436	–
–	A St 41	P 275 N	STK 400	K02100	S 275 N	BS 3	P 275 N	2103	–	–	1.0437	–
–	B 500 A	–	SD 490	–	B 500 A	–	B 500 A	–	–	–	1.0438	–
–	H IV/P295NH	–	SG 37	K03102	–	–	Fe 460-2 KW	–	–	–	1.0445	–
–	StE 240.7	–	–	–	L 245 NB	L 245 NB	–	–	–	–	1.0457	–
–	TStE 255	–	–	K11535	–	–	–	–	–	–	1.0463	–
–	15 Mn 3 Al	–	–	–	C 14 GAl	–	–	–	–	–	1.0468	–
–	19 Mn 6/P 355 GH	P 355 GH	SGV 46	K03300	P355GH	A 52 CP	Fe E355-2	2101	–	–	1.0473	–
–	17 Mn 4/P 295 GH	224-460B	SG 37	K03501	P 295 GH	A 48 CP	Fe E 295	2102	–	–	1.0481	–
–	19 Mn 5	224-460	SG 37	K 03102	–	A 52 CP; AP; FP	Fe 460- 2 KW	–	–	–	1.0482	–
–	L 290 AG	–	–	–	L290GA	TS E 290	–	–	–	–	1.0483	–
–	L 290 NB	–	–	–	L290NB	L 290 NB	–	–	–	–	1.0484	–
–	21 Mn 6	–	–	K12320	–	–	–	–	–	–	1.0485	–
–	St E 285	P 275 N	SM 41 A	K 01802	P 275 N	P 275 N	Fe E 285 KG	–	–	–	1.0486	–
–	W St E 285	P 275 N	–	K 01802	P 275 NH	P 275 N	Fe E 285 KW	–	–	–	1.0487	–
–	T St E 285	P 275 NL 1	SLA 235 A	K 01803	P 275 NL 1	P 275 NL 1	Fe E 285 KT	–	–	–	1.0488	–
–	H 300/ZSt E 300	H280LA	–	–	H 280 LA	E 280 C	–	–	–	–	1.0489	–
–	S 275 NH	S 275 NH	–	–	S 275 NH	–	S 275 NH	–	–	–	1.0493	–
–	S 275 NLH	S275NLH	–	–	S 275 NLH	–	S275NLH	–	–	–	1.0497	–
–	C 35 Pb/C 35 GPb	–	–	–	C 35 Pb	–	–	–	–	–	1.0502	–
–	St E 315/P 315N	–	SM 50 A	K11506	P 315 N	–	Fe E 315 KG	–	–	–	1.0505	–
–	W St E 315	–	SNC 1	K02404	P 315 NH	–	Fe E 315 KW	2107	–	–	1.0506	–
–	St 55	–	STKM 16A	–	–	–	Fe 540	–	–	–	1.0507	–
–	T St E315	–	SLA 325 A	K02404	P 315 NL	–	–	2106	–	–	1.0508	–
–	C 40 Pb	–	–	–	C 40 G Pb	–	–	–	–	–	1.0512	–
–	C38D	–	SWRH 37	–	C 38 D	FM 38	C 38 D	–	–	–	1.0516	–
–	C48D	–	SWRH 48	–	C 48 D	FM 48	C 48 D	–	–	–	1.0517	–
–	C56D	–	–	–	C 56 D	FM 56	C 56 D	–	–	–	1.0518	–
–	S 355 NH	S 355 NH	–	–	S 355 NH	–	S 355 NH	–	–	–	1.0539	–
–	C42D	–	SWRH 42 B	–	C 42 D	FM 42	C 42 D	–	–	–	1.0541	–
–	S 355 JO H	50 C	–	–	S 355 JO H	–	S 355 JO H	–	–	–	1.0547	–
–	ZStE 340/ H 340	H 320 L A	–	–	H 320 LA	E 315 C	–	–	–	–	1.0548	–
–	S 335 NLH	50 EE	–	–	S 355 N LH	–	S 355 N L H	–	–	–	1.0549	–
–	S 355 JO	En 50 C; S 355 JO	SM 520 M	–	S 355 JO	S 355 JO; E 36-3	S 355 JO; Fe 510 C FN	–	–	–	1.0553	–
–	GS-70	50 C	–	–	S 355 JO C	E 36-3	Fe 510 C	–	–	–	1.0554	–

(continuação)

P3 Lista dos materiais das peças • Aço • P3 *(continuação)*

Aços-liga e aços ferramenta P3 *Teor: C>.25%* *Resistência a Tensão RM (MPa)*: 600–850* *Dureza (HB): <330 (HRC): <35*

AISI**	DIN	BTS	JIS	UNS	EN	AFNOR	UNI	SIS	SAE	ASTM	Número do Material	Referência do fabricante
–	ZStE 420/H 420	46/40HR,HS,CS	–	–	H 400 LA	H 400 LA	–	–	–	–	1.0556	–
–	P355 NB	–	SG 365	–	P 355 NB	BS 4	–	–	–	–	1.0557	–
–	W St E 355	P 355 NH	–	K01600	P 355 NH	P 355 NH	Fe E 355 KW	–	–	–	1.0565	–
–	T St E355	P 355 NL1	SLA 37	–	P 355 NL1	P 355 NL1	Fe E 355 KT	–	–	–	1.0566	–
–	P355 QH1	P 355 QH	–	–	P 355 QH	P 355 QH	–	–	–	–	1.0571	–
–	S 355 J 2 G 4	S 355 J 2 G 4	–	–	S 355 J 2 G 4	S 355 J 2 G 4	S 355 J 2 G 4	–	–	–	1.0577	–
–	L 360 MB	–	–	–	L 360 MB	L 360 MB	–	–	–	–	1.0578	–
–	St 52.4	–	STS 49	–	–	–	–	–	–	–	1.0581	–
–	L 360 NB/StE 360.7	–	–	–	L360NB	L 360 NB	–	–	–	–	1.0582	–
–	S 355 J 2 G 3 Cu/St 52-3 Cu3	–	–	–	S 355 J2 G3 Cu + CR	–	–	–	–	–	1.0585	–
–	C50D	–	–	–	C 50 D	FM 50	C 50 D	–	–	–	1.0586	–
–	QSt 52-3 Cu 3	–	–	–	S 355 J2 G3 Cu C	–	–	–	–	–	1.0587	–
–	D 53-2	–	SWRH 52 B	–	C 52 D	FM 52	C 52 D	–	–	–	1.0588	–
–	S 355 J 2 G 4 Cu	–	–	–	S 355 J2 G4 Cu	–	–	–	–	–	1.0592	–
–	S355k2G3/Fe 510 DD1 (MULTIST	S 355 K 2 G 3	SM 520 C	K02505	S 355 K 2 G 3	E36-4	S 355 K 2 G 3	–	–	–	1.0595	–
–	S355K2G4/Fe 510 DD 2 (MULTIS	S 355 K 2 G 4	–	–	S 355 K 2 G 4	S 355 K 2 G 4	S 355 K 2 G 4	–	–	–	1.0596	–
–	C62D	–	SWRH 62 B	–	C 62 D	FM 62	C 62 D	–	–	–	1.0611	–
–	C66D	–	–	–	C 66 D	FM 66	C 66 D	–	–	–	1.0612	–
–	C68D	–	SWRH 67 B	–	C 68 D	FM 68	C 68 D	–	–	–	1.0613	–
–	C70D	–	–	–	C 70 D	FM 70	C 70 D	–	–	–	1.0615	–
–	C72D	–	SWRH 72 B	–	C 72 D	FM 72	C 72 D	–	–	–	1.0617	–
–	GS-C 25	–	SCPH 1	–	GP 240 GH	GP 240 GH	GP 240 Gh	–	–	–	1.0619	–
–	C80D	–	–	–	C 80 D	FM 80	C 80 D	–	–	–	1.0622	–
–	C82D	–	SWRH 82 B	–	C 82 D	FM 82	C 82 D	–	–	–	1.0626	–
–	35 SPb 20	35 SPb 20	–	–	35 SPb 20	35 SPb 20	–	–	–	–	1.0756	–
–	45 SPb 20	–	–	–	46 SPb 20	–	–	–	–	–	1.0757	–
–	38 SMnPb 28	38 SMnPb 28	–	–	38 SMnPb 28	38 SMnPb 28	–	–	–	–	1.0761	–
–	44 SMn 28	44 SMn 28	–	–	44 SMn 28	44 SMn 28	–	–	–	–	1.0762	–
–	44 SMnPb 28	44 SMnPb 28	–	–	44 SMnPb 28	44 SMnPb 28	–	–	–	–	1.0763	–
–	36 SMnPb 14	36 SMnPb 14	–	–	36 SMnPb 14	36 SMnPb 14	–	–	–	–	1.0765	–
–	QSt E 690 TM (S 700 MC)	–	–	–	S 700 MC	S 690 MC	S 700 MC	–	–	–	1.0966	–
–	QSt E 260 N 7 S 260 NC	–	AE 275 NC	–	S 260 NC	–	S 260 NCX	–	–	–	1.0971	–
–	QSt E 300 TM/S 315 MC	43 F35 HR,HS,CS	–	–	S 315 MC	E 315 D	S 315 MC	–	–	–	1.0972	–
–	QSt E 300 N 7/ S 315 NC	–	AE 340 NC	–	S 315 NC	–	S 315 NC	–	–	–	1.0973	–
–	QSt E340 TM	HR 40/30	–	–	S 340 MC	E 335 D	–	–	–	–	1.0974	–
–	QSt E340 N	–	–	–	S 340 NC	–	Fe E 355 TD	–	–	–	1.0975	–
–	QSt E 360TM	–	–	–	S 355 MC	E 355 D	Fe E 355 TM	–	–	–	1.0976	–
–	QSt E360 N	–	–	–	S 355 NC	–	Fe E 355 TD	–	–	–	1.0977	–
–	QSt E380 TM	–	–	–	S 380 MC	E 390 D	–	–	–	–	1.0978	–
–	QSt E380 N	–	–	–	S 380 NC	–	Fe E 380 TD	–	–	–	1.0979	–
–	QSt E420 TM	HR 50 F 45	–	–	S 420 MC	E 430 D	Fe E 420 TM	–	–	–	1.0980	–
–	QSt E 420 N	–	–	–	S 420 NC	–	Fe E 420 TD	–	–	–	1.0981	–
–	QSt E 460 TM	50/45 HR	–	–	S 460 MC	E 445 D	–	–	–	–	1.0982	–
–	QSt E 460 N	–	–	–	S 460 NC	–	Fe E 460 TD	–	–	–	1.0983	–
–	QSt E500 TM	–	–	–	S 500 MC	E 490 D	Fe E 490 TM	2662	–	–	1.0984	–
–	QSt E500 N	–	–	–	S 500 NC	–	–	–	–	–	1.0985	–
–	QSt E550 TM	60/55 HS	–	–	S 550 MC	E 560 D	Fe E 560 TM	–	–	–	1.0986	–
–	QSt E550 N	–	–	–	S 550 NC	–	–	–	–	–	1.0987	–
–	EStE 285	P 275 NL 2	STK 400	–	P 275 NL 2	P 275 NL 2	P 275 NL 2	–	–	–	1.1104	–
–	EStE 315	–	–	–	S 315 NL 1	–	–	–	–	–	1.1105	–
–	EStE 355	P 355 NL 2	STK 500	–	P 355 NL 2	P 355 NL 2	P 355 NL 2	–	–	–	1.1106	–
–	C5D2	–	–	–	C 5 D 2	FM 6	C 5 D 2	–	–	–	1.1111	–
–	C8D2	–	–	–	C 8 D 2	FM 8	C 8 D 2	–	–	–	1.1113	–
–	C 10 E W/RSD 11	–	–	–	C 10 EW	–	–	–	–	–	1.1115	–
–	C32D2	–	–	–	C 32 D 2	FM 32	C 32 D 2	–	–	–	1.1143	–
–	C36D2	–	–	–	C 36 D 2	FM 36	C 36 D 2	–	–	–	1.1145	–
–	C40D2	–	–	–	C 40 D 2	FM 40	C 40 D 2	–	–	–	1.1153	–
–	C42D2	–	–	–	C 42 D 2	FM 42	C 42 D 2	–	–	–	1.1154	–
–	C46D2	–	–	–	C 46 D 2	FM 46	C46D 2	–	–	–	1.1162	–
–	C 25 R	C 25 R	–	–	C 25 R	C 25 R	C 25 R	–	–	–	1.1163	–
–	C48D2	–	–	–	C 48 D 2	FM 48	C48 D 2	–	–	–	1.1164	–
–	20 Mn 6	150 M 19	–	–	–	20 M 5	20 Mn 6	–	–	–	1.1169	–
–	C50D2	–	–	–	C 50 D 2	FM 50	C50D 2	–	–	–	1.1171	–
–	C 30 R	C 30 R	C 30 R (3 C 30)	–	C 30 R	C 30 R	C 30 R	–	–	–	1.1179	–
–	C3D1	–	–	–	C 3 D 1	–	C 3 D 1	–	–	–	1.1187	–
–	C40R/Cm 40	C 40 R	–	–	C 40 R	C 40 R	C 40	–	–	–	1.1189	–
–	Ck 45	080 M 46	S 45 C	–	2 C 45	XC 42	C 40	1672	–	–	1.1191	–
–	Cq 45	–	SWRCH45K	–	C 45 KD	–	–	–	–	–	1.1192	–
–	C 45 R	080 M 46	S 50 C	–	C 45 R	XC 48 H1u	C 45 R	1672	–	–	1.1201	–
–	C52D2	–	–	–	C 52 D 2	FM 52	C 52 D 2	–	–	–	1.1202	–
–	C 53 R/Cm 53	–	–	–	C 53 R	–	–	–	–	–	1.1205	–
–	C 10 R	C 10 R	–	–	C 10 R	C 10 R	–	–	–	–	1.1207	–
–	C 16 R	C 16 R	–	–	C 16 R	C 16 R	–	–	–	–	1.1208	–
–	C58D2	–	–	–	C 58 D 2	FM 58	C 58 D 2	–	–	–	1.1212	–
–	C62D2	–	–	–	C 62 D 2	FM 62	C 62 D 2	–	–	–	1.1222	–
–	Cm 60	C 60 R	–	–	3 C 60	C 60 R	C 60 R	–	–	–	1.1223	–
–	C60D2	–	–	–	C 60 D 2	FM 60	C 60 D 2	–	–	–	1.1228	–
–	C68D2	–	–	–	C 68 D 2	FM 68	C 68 D 2	–	–	–	1.1232	–
–	C66D2	–	–	–	C 66 D 2	FM 66	C 66 D 2	–	–	–	1.1236	–
–	C50R	C 50 R	–	–	C 50 R	FM 50	C 50 R	–	–	–	1.1241	–
–	C72D2	–	–	–	C 72 D 2	FM 72	C 72 D 2	–	–	–	1.1242	–
–	C70D2	–	–	–	C 70 D 2	FM 70	C 70 D 2	–	–	–	1.1251	–
–	C78D2	–	–	–	C 78 D 2	FM 78	C 78 D 2	–	–	–	1.1252	–
–	C76D2	–	–	–	C 76 D 2	FM 76	C 76 D 2	–	–	–	1.1253	–
–	C80D2	–	–	–	C 80 D 2	FM 80	C 80 D 2	–	–	–	1.1255	–

NOTA: Para a legenda, veja a página Y217.

(continuação)

P3 Lista dos materiais das peças • Aço • P3 *(continuação)*

Aços-liga e aços ferramenta P3 *Teor: C>.25%* *Resistência a Tensão RM (MPa)*: 600–850* *Dureza (HB): <330 (HRC): <35*

AISI**	DIN	BTS	JIS	UNS	EN	AFNOR	UNI	SIS	SAE	ASTM	Número do Material	Referência do fabricante
–	C82D2	–	–	–	C 82 D 2	FM 82	C 82 D 2	–	–	–	1.1262	–
–	C86D2	–	–	–	C 86 D 2	FM 86	C 86 D 2	–	–	–	1.1265	–
–	C88D2	–	–	–	C 88 D 2	–	C 88 D 2	–	–	–	1.1272	–
–	C92D2	–	–	–	C 92 D 2	–	C 92 D 2	–	–	–	1.1282	–
–	C98D2	–	–	–	C 98 D 2	–	C 98 D 2	–	–	–	1.1283	–
–	46 MnVS 6	–	–	–	46 MnVS 6	–	–	–	–	–	1.1304	–
–	C 90 U	–	–	–	C90U	–	–	–	–	–	1.1535	–
–	85 Cr 1	–	–	–	–	Y1 100 C 2	–	–	–	–	1.2004	–
–	140 Cr 3	–	SKS 8	–	140 Cr 2	Y2 140 C	–	–	–	–	1,2008	–
–	21 MnCr 5	–	SCR 420 H	–	21 MnCr 5	20 NC 5	–	–	–	–	1.2162	–
–	40 CrMnNiMo 8 6 4	–	–	–	40 CrMnNiMo 8-6-4	–	–	–	–	–	1.2738	–
–	16 CrNiMo 6	820A16	–	–	–	16 NCD 6	16NiCrMo6	–	–	–	1.3531	–
–	100 CrMn 7 3	–	–	–	100 CrMnMo 7	100 CD 7	–	–	–	–	1.3536	–
–	100 CrMo 7	–	SUS 4	K19965	100 CrMo 7	100 CD 7	100CrMo7	–	–	–	1.3537	–
–	100 CrMnMo 8	–	–	–	–	100 CrMnMo 8	–	–	–	–	1.3539	–
–	46 Si 7	–	–	–	45 Si	46 S 7	–	–	–	–	1.5024	–
–	55 Si 7	250 A 53	–	G92550	56 Si 7	55 S 7	55 Si 8	2085	–	–	1.5026	–
–	37 MnSi 5	–	–	–	–	38 MS 5	–	F.130.A	–	–	1.5122	–
–	15 MnMoV 4 5	–	–	–	15 MnMoV 4-5	15 MDV 4.05	–	–	–	–	1.5402	–
–	11 MnMo 4 5	–	–	K11123	11 MnMo 45 KE	–	–	–	–	–	1.5425	–
–	13 MnMo 6 5	–	–	K11424	11 MnMo 65 KE	–	–	–	–	–	1.5426	–
–	35 B 2	–	SWRCHB 237	–	C 35 B	35 B 3	–	–	–	–	1.5511	–
–	24 Ni 8	–	SCPL 21	J22501	G 9 Ni 10	22 N 8	G9Ni10	–	–	–	1.5633	–
–	10 NiCr 5 4	10NiCr5-4	–	–	10 NiCr 5-4	10 NiCr 5-4	–	–	–	–	1.5805	–
–	18 MnMoNi 5 5	–	–	–	18 MnMoNi 5-5	–	–	–	–	–	1.6308	–
–	20 MnMoNi 4 5	–	SQV 2 B	K12539	20 MnMoNi 4-5	–	–	–	–	–	1.6311	–
–	15 MnCrMoNiV 5 3	–	–	–	15 MnCrMoNiV 5-3	–	–	–	–	–	1.6920	–
–	17 CrS 3	17 CrS3	–	–	17 CrS 3	17 CrS 3	–	–	–	–	1.7014	–
–	28 CrS 4	–	–	–	28CrS4	28CrS4	–	–	–	–	1.7036	–
–	34 CrS 4	34 CrS 4	–	–	34 CrS 4	34 CrS 4	34 CrS 4	–	–	–	1.7037	–
–	41 CrS 4	41 CrS 4	–	–	41 CrS 4	41 CrS 4	41 CrS 4	2245	–	–	1.7039	–
–	38 Cr 4	–	–	–	38 Cr 4	–	38 Cr 4	–	–	–	1.7043	–
–	16 CrMo 4	18 CrMo4	SCM 418 H	–	18 CrMo 4	15 CD 3.5	18 CrMo 4	–	–	–	1.7242	–
–	12 CrMo 11 10	–	–	–	–	–	–	–	–	–	1.7305	–
–	22 CrMoS 3 5	–	–	–	22 CrMoS 3-5	22 CrMoS 3-5	–	–	–	–	1.7333	–
–	12 CrMo 19 5	3606-625	SCMV 6	K41545	X 12 CrMo 5	Z 10 CD 5.05	16 CrMo 20 5	–	–	–	1.7362	–
–	X 7 CrMo 6 1	B 5	–	S50281	CM 5-IG	–	–	–	–	–	1.7373	–
–	51 CrMoV 4	–	–	–	51 CrMoV 4	51 CDV 4	51 CrMoV 4	–	–	–	1.7701	–
–	21 CrMoV 5 7	–	–	K14073	21 CrMoV 5-7	20 CDV 5.07	–	–	–	–	1.7709	–
–	20 CrMoVTiB 4 10	–	–	–	20 CrMoVTiB 4-10	20 CrMoVTiB 4-10	–	–	–	–	1.7729	–
–	PS 275 TMK	S 275 ML	–	–	S 275 ML	S 275 ML	S 275 ML	–	–	–	1.8819	–
–	S 500 M	–	–	–	S 500 m	–	–	–	–	–	1.8829	–
–	BTStE 460 TM	S 460 ML	–	–	S 460 ML	E 460	S 460 ML	–	–	–	1.8838	–
–	S 500 ML	–	–	–	S 500 ML	–	–	–	–	–	1.8839	–
–	S 275 MH	–	–	–	S 275 MH	–	S 275 MH	–	–	–	1.8843	–
–	S 275 MLH	–	–	–	S 275 MLH	–	S 275 MLH	–	–	–	1.8844	–
–	S 355 MH	–	–	–	S 355 MH	–	S 355 MH	–	–	–	1.8845	–
–	S 355 MLH	–	–	–	S 355 MLH	–	S 355 MLH	–	–	–	1.8846	–
–	S 420 MH	–	–	–	S 420 MH	–	S 420 MH	–	–	–	1.8847	–
–	S 420 MLH	–	–	–	S 420 MLH	–	S 420 MLH	–	–	–	1.8848	–
–	S 460 MH	–	–	–	S 460 MH	–	S 460 MH	–	–	–	1.8849	–
–	StE 460	S 460 N	–	–	S 460 N	E 460	S 460N	–	–	–	1.8901	–
–	TStE 460	S 460 L	–	–	S 460 NL	E460	S 460 NL	–	–	–	1.8903	–
–	S 550 Q	–	–	–	S 550 Q	E 550	S 550 Q	–	–	–	1.8904	–
–	S 460 Q	55 F	–	–	S 460 Q	E 460	S 460 Q	–	–	–	1.8908	–
–	S 420 NL/TStE 420	S 420 NL	STK 540	K02002	S 420 NL	E 420 T-I	Fe E 420 KT	–	–	–	1.8912	–
–	S 620 Q	–	–	–	S 620 Q	E 620	S 620 Q	–	–	–	1.8914	–
–	T St E 460/P460NL1	P 460 NL 1	–	K02900	P 460 NL1	E 460 T-I	Fe E 460 KT	–	–	–	1.8915	–
–	S 460 QL1	55 F	–	–	S 460 QL 1	–	–	–	–	–	1.8916	–
–	T St E 500	–	–	K02001	–	E 500 T-I	–	–	–	–	1.8917	–
–	EStE 460/P460NI2	P 460 NL 2	–	–	P 460 NL 2	P 460 NL 2	P 460 NL 2	–	–	–	1.8918	–
–	EStE 500/S500NL1	–	–	–	S 500 NL 1	–	–	–	–	–	1.8919	–
–	TStE 690 VA/S690G1QL	–	–	–	S 690 G 1 QL	–	–	–	–	–	1.8920	–
–	TStE 690 VB/S690G2QL	–	–	K11646	S 690 G 2 QL	–	–	–	–	–	1.8921	–
–	S 690 G 4 QL/TStE 690 VC	–	–	–	S 690 G 4 QL	–	–	–	–	–	1.8922	–
–	S 590 QL/TStE 590 V	–	–	–	S 590 QL	–	–	–	–	–	1.8923	–
–	S 500 Q (StE 500 V)	–	–	–	S 500 Q	E 500	S 500 Q	2614	–	–	1.8924	–
–	S 890 QL 1 (EStE 90 V)	–	–	–	S 890 QL 1	–	–	–	–	–	1.8925	–
–	S 690 QL (TStE 690 V)	–	SHY 685 NS	–	S 690 QL	–	–	–	–	–	1.8928	–
–	S 690 Q/StE 690 V	–	SHY 685 N	–	S 690 Q	E 690	S 690 Q	–	–	–	1.8931	–
–	WSt E 420/P420NH	S 420 NL	STK 540	K02002	S 420 NL	S 420 NL	Fe E 420 KW	–	–	–	1.8932	–
–	S 960 QL/TStE 960 V	–	–	–	S 960 QL	–	–	–	–	–	1.8933	–
–	WSt E 460/P460NH	P 460 NH	–	K02900	P 460 NH	P 460 NH	Fe E 460 KW	–	–	–	1.8935	–
–	S 960 Q	–	–	–	S 960 Q	E 960 T-II	S 960 Q	–	–	–	1.8941	–
–	S 355 J 0 WP	WR 50 A	–	–	S 355 J0 WP	E 36 W-A3	S 355 J0 WP	–	–	–	1.8945	–
–	S 355 J 2 WP	S 355 J 2 WP	–	–	S 355 J2 WP	E36W-A4	S 355 J2 WP	–	–	–	1.8946	–
–	L 415 QB	–	–	–	L 415 QB	L 415 QB	–	–	–	–	1.8947	–
–	L 360 QB	–	–	–	L 360 QB	L 360 QB	–	–	–	–	1.8948	–
–	L 450 QB	–	–	–	L 450 QB	L 450 QB	–	–	–	–	1.8952	–
–	S 460 NH (FGS 47)	–	–	–	S 460 NH	–	S 460 NH	–	–	–	1.8953	–
–	L 485 QB	–	–	–	L 485 QB	L 485 QB	–	–	–	–	1.8955	–
–	S 460 NLH/FG S 47	–	–	–	S 460 NLH	–	S460NLH	–	–	–	1.8956	–
–	L 555 QB	–	–	–	L 555 QB	L 555 QB	–	–	–	–	1.8957	–
–	9 CrNiCuP 3 2 4	WR 50 A	SPA-H	K11430	–	–	–	–	–	–	1.8962	–
–	WTSt 52-3	WR 50 C	SMA 58 W	K11430	S 355 J 2 G 1 W	E 36 W-A2	–	–	–	–	1.8963	–
–	S 355 J 2 G 2 W	S 355 J 2 G 2 W	–	–	S 355 J 2 G 2 W	S 355 J 2 G 2 W	S 355 J 2 G 2 W	–	–	–	1.8965	–

(continuação)

P3 Lista dos materiais das peças • Aço • P3 *(continuação)*

Aços-liga e aços ferramenta P3 *Teor: C>.25%* *Resistência a Tensão RM (MPa)*: 600–850* *Dureza (HB): <330 (HRC): <35*

AISI**	DIN	BTS	JIS	UNS	EN	AFNOR	UNI	SIS	SAE	ASTM	Número do Material	Referência do fabricante
–	S 355 K 2 G 1 W	S 355 K 2 G 1 W	SMA 490 CW	–	S 355 K2 G1 W	S 355 K2 G1 W	S 355 K 2 G 1 W	–	–	–	1.8966	–
–	S 355 K 2 G 2 W	S 355 K 2 G 2 W	–	–	S 355 K2G2W	S 355 K 2 G 2 W	S 355 K 2 G 2 W	–	–	–	1.8967	–
–	QStE 600 TM/S 600 MC	–	–	–	S 600 MC	E 620 D	S 600 MC	–	–	–	1.8969	–
–	StE 415..7/L 415 NB	–	–	–	L 415 NB	L 415 NB	–	–	–	–	1.8972	–
–	StE 415.7 TM/L 415 MB	–	–	–	L 415 MB	L 415 MB	–	–	–	–	1.8973	–
–	S 700 MC (QStE 690 TM)	–	–	–	S 700 MC	E 690 D	S 700 MC	–	–	–	1.8974	–
–	L 450 MB/StE 445.7 TM	–	–	–	L 450 MB	L 450 MB	–	–	–	–	1.8975	–
–	S 650 MC (QStE 650 TM)	–	–	–	S 650 MC	E 620 D	S 650 MC	–	–	–	1.8976	–
–	L 485 MB/StE 480.7 TM	–	–	–	L 485 MB	L 485 MB	–	–	–	–	1.8977	–
–	StE 550.7 TM/L 555 MB	–	–	–	L 555 MB	L 555 MB	–	–	–	–	1.8978	–
–	St 60-2	4360-55 E	SM 58	–	E 335	A 60-2	Fe 60-2	1650	–	–	1.0060	–
–	St 70-2	E 360	–	–	E 360	A 70-2	Fe 70-2	1655	–	–	1.0070	–
–	C4D	–	–	–	C 4 D	FM 5	C 4 D	–	–	–	1.0300	–
–	C 22 8	–	–	–	P 250 GH	–	–	–	–	–	1.0460	–
–	H 260/ZSt E 260	H 240 LA	–	–	H 240 LA	E 240 C	–	–	–	–	1.0480	–
–	C32D	–	SWRH 32	K02701	C 32 D	FM 32	C 32 D	–	–	–	1.0530	–
–	ZStE 380/H 380	H 360 L A	–	–	H 360 LA	E 355 C	–	–	–	–	1.0550	–
–	C60D	–	–	–	C 60 D	FM 60	C 60 D	–	–	–	1.0610	–
–	38 SMn 28	38 SMn 28	–	–	38 SMn 28	38 SMn 28	–	–	–	–	1.0760	–
–	QSt E 260 TM/5260 MC	–	–	–	S 260 MC	41 S 7	Fe E 275 TM	–	–	–	1.0970	–
–	C3D2	–	–	–	C 3 D 2	FM 5	C 3 D 2	–	–	–	1.1110	–
–	C38D2	–	–	–	C 38 D 2	FM 38	C 38 D 2	–	–	–	1.1150	–
–	C 42 E Al/Ck 42 Al	–	–	–	S 355 G15	–	–	–	–	–	1.1190	–
–	C56D2/D 55-2	–	–	–	C 56 D 2	FM 56	C 56 D 2	–	–	–	1.1220	–
–	C 70 W1	–	–	–	CT 70	C 70 E 2 U	C 70 K U	–	–	–	1.1520	–
–	C 45 W	–	–	–	C 45 U	Y3 42	–	–	–	–	1.1730	–
–	C 60 W	–	SK 7	–	–	Y3 55	–	–	–	–	1.1740	–
–	100 CrMn 6	–	–	K19195	100 CrMn 6	100 CM 6	–	–	–	–	1.3520	–
–	28 B 2	–	SWRCHB 26	–	C 30 B	20 B 3	–	–	–	–	1.5510	–
–	St E 380	–	SM 50 B	–	S 380 N	–	Fe E 390 KG	–	–	–	1.8900	–
–	TStE 380/S380NL	–	–	–	S 380 NL	–	Fe E 390 KT	2117	–	–	1.8910	–
–	S 890 Q	–	–	–	S 890 Q	S 890 Q	S 890 Q	–	–	–	1.8940	–
–	46 Si 7	–	–	–	45 Si	46 S 7	–	–	–	–	1.5024	–
–	55 Si 7	250 A 53	–	G92550	56 Si 7	55 S 7	55 Si 8	2085	–	–	1.5026	–
–	37 MnSi 5	–	–	–	–	38 MS 5	–	F.130.A	–	–	1.5122	–
–	15 MnMoV 4 5	–	–	–	15 MnMoV 4-5	15 MDV 4.05	–	–	–	–	1.5402	–
–	11 MnMo 4 5	–	–	K11123	11 MnMo 45 KE	–	–	–	–	–	1.5425	–
–	13 MnMo 6 5	–	–	K11424	11 MnMo 65 KE	–	–	–	–	–	1.5426	–
–	35 B 2	–	SWRCHB 237	–	C 35 B	35 B 3	–	–	–	–	1.5511	–
–	24 Ni 8	–	SCPL 21	J22501	G 9 Ni 10	22 N 8	G9Ni10	–	–	–	1.5633	–
–	10 NiCr 5 4	10NiCr5-4	–	–	10 NiCr 5-4	10 NiCr 5-4	–	–	–	–	1.5805	–
–	18 MnMoNi 5 5	–	–	–	18 MnMoNi 5-5	–	–	–	–	–	1.6308	–
–	20 MnMoNi 4 5	–	SQV 2 B	K12539	20 MnMoNi 4-5	–	–	–	–	–	1.6311	–
–	15 MnCrMoNiV 5 3	–	–	–	15 MnCrMoNiV 5-3	–	–	–	–	–	1.6920	–
–	17 CrS 3	17 CrS3	–	–	17 CrS 3	17 CrS 3	–	–	–	–	1.7014	–
–	28 CrS 4	–	–	–	28CrS4	28CrS4	–	–	–	–	1.7036	–
–	34 CrS 4	34 CrS 4	–	–	34 CrS 4	34 CrS 4	34 CrS 4	–	–	–	1.7037	–
–	41 CrS 4	41 CrS 4	–	–	41 CrS 4	41 CrS 4	41 CrS 4	2245	–	–	1.7039	–
–	38 Cr 4	–	–	–	38 Cr 4	–	38 Cr 4	–	–	–	1.7043	–
–	16 CrMo 4	18 CrMo4	SCM 418 H	–	18 CrMo 4	15 CD 3.5	18 CrMo 4	–	–	–	1.7242	–
–	12 CrMo 11 10	–	–	–	–	–	–	–	–	–	1.7305	–
–	22 CrMoS 3 5	–	–	–	22 CrMoS 3-5	22 CrMoS 3-5	–	–	–	–	1.7333	–
–	12 CrMo 19 5	3606-625	SCMV 6	K41545	X 12 CrMo 5	Z 10 CD 5.05	16 CrMo 20 5	–	–	–	1.7362	–
–	X 7 CrMo 6 1	B 5	–	S50281	CM 5-IG	–	–	–	–	–	1.7373	–
–	51 CrMoV 4	–	–	–	51 CrMoV 4	51 CDV 4	51 CrMoV 4	–	–	–	1.7701	–
–	21 CrMoV 5 7	–	–	K14073	21 CrMoV 5-7	20 CDV 5.07	–	–	–	–	1.7709	–
–	20 CrMoVTiB 4 10	–	–	–	20 CrMoVTiB 4-10	20 CrMoVTiB 4-10	–	–	–	–	1.7729	–
–	PS 275 TMK	S 275 ML	–	–	S 275 ML	S 275 ML	S 275 ML	–	–	–	1.8819	–
–	S 500 M	–	–	–	S 500 m	–	–	–	–	–	1.8829	–
–	BTStE 460 TM	S 460 ML	–	–	S 460 ML	E 460	S 460 ML	–	–	–	1.8838	–
–	S 500 ML	–	–	–	S 500 ML	–	–	–	–	–	1.8839	–
–	S 275 MH	–	–	–	S 275 MH	–	S 275 MH	–	–	–	1.8843	–
–	S 275 MLH	–	–	–	S 275 MLH	–	S 275 MLH	–	–	–	1.8844	–
–	S 355 MH	–	–	–	S 355 MH	–	S 355 MH	–	–	–	1.8845	–
–	S 355 MLH	–	–	–	S 355 MLH	–	S 355 MLH	–	–	–	1.8846	–
–	S 420 MH	–	–	–	S 420 MH	–	S 420 MH	–	–	–	1.8847	–
–	S 420 MLH	–	–	–	S 420 MLH	–	S 420 MLH	–	–	–	1.8848	–
–	S 460 MH	–	–	–	S 460 MH	–	S 460 MH	–	–	–	1.8849	–
–	StE 460	S 460 N	–	–	S 460 N	E 460	S 460N	–	–	–	1.8901	–
–	TStE 460	S 460 L	–	–	S 460 NL	E460	S 460 NL	–	–	–	1.8903	–
–	S 550 Q	–	–	–	S 550 Q	E 550	S 550 Q	–	–	–	1.8904	–
–	S 460 Q	55 F	–	–	S 460 Q	E 460	S 460 Q	–	–	–	1.8908	–
–	S 420 NL/TStE 420	S 420 NL	STK 540	K02002	S 420 NL	E 420 T-I	Fe E 420 KT	–	–	–	1.8912	–
–	S 620 Q	–	–	–	S 620 Q	E 620	S 620 Q	–	–	–	1.8914	–
–	T St E 460/P460NL1	P 460 NL 1	–	K02900	P 460 NL1	E 460 T-I	Fe E 460 KT	–	–	–	1.8915	–
–	S 460 QL1	55 F	–	–	S 460 QL 1	–	–	–	–	–	1.8916	–
–	T St E 500	–	–	K02001	–	E 500 T-I	–	–	–	–	1.8917	–
–	EStE 460/P460NI2	P 460 NL 2	–	–	P 460 NL 2	P 460 NL 2	P 460 NL 2	–	–	–	1.8918	–
–	EStE 500/S500NL1	–	–	–	S 500 NL 1	–	–	–	–	–	1.8919	–
–	TStE 690 VA/S690G1QL	–	–	–	S 690 G 1 QL	–	–	–	–	–	1.8920	–
–	TStE 690 VB/S690G2QL	–	–	K11646	S 690 G 2 QL	–	–	–	–	–	1.8921	–
–	S 690 G 4 QL/TStE 690 VC	–	–	–	S 690 G 4 QL	–	–	–	–	–	1.8922	–
–	S 590 QL/TStE 590 V	–	–	–	S 590 QL	–	–	–	–	–	1.8923	–
–	S 500 Q (StE 500 V)	–	–	–	S 500 Q	E 500	S 500 Q	2614	–	–	1.8924	–
–	S 890 QL 1 (EStE 90 V)	–	–	–	S 890 QL 1	–	–	–	–	–	1.8925	–
–	S 690 QL (TStE 690 V)	–	SHY 685 NS	–	S 690 QL	–	–	–	–	–	1.8928	–
–	S 690 Q/StE 690 V	–	SHY 685 N	–	S 690 Q	E 690	S 690 Q	–	–	–	1.8931	–

NOTA: Para a legenda, veja a página Y217.

(continuação)

P3 Lista dos materiais das peças • Aço • P3 *(continuação)*

Aços-liga e aços ferramenta P3 *Teor: C>.25%* *Resistência a Tensão RM (MPa)*: 600–850* *Dureza (HB): <330 (HRC): <35*

AISI**	DIN	BTS	JIS	UNS	EN	AFNOR	UNI	SIS	SAE	ASTM	Número do Material	Referência do fabricante
–	WSt E 420/P420NH	S 420 NL	STK 540	K02002	S 420 NL	S 420 NL	Fe E 420 KW	–	–	–	1.8932	–
–	S 960 QL/TStE 960 V	–	–	–	S 960 QL	–	–	–	–	–	1.8933	–
–	WSt E 460/P460NH	P 460 NH	–	K02900	P 460 NH	P 460 NH	Fe E 460 KW	–	–	–	1.8935	–
–	S 960 Q	–	–	–	S 960 Q	E 960 T-II	S 960 Q	–	–	–	1.8941	–
–	S 355 J 0 WP	WR 50 A	–	–	S 355 J0 WP	E 36 W-A3	S 355 J0 WP	–	–	–	1.8945	–
–	S 355 J 2 WP	S 355 J 2 WP	–	–	S 355 J2 WP	E36W-A4	S 355 J2 WP	–	–	–	1.8946	–
–	L 415 QB	–	–	–	L 415 QB	L 415 QB	–	–	–	–	1.8947	–
–	L 360 QB	–	–	–	L 360 QB	L 360 QB	–	–	–	–	1.8948	–
–	L 450 QB	–	–	–	L 450 QB	L 450 QB	–	–	–	–	1.8952	–
–	S 460 NH (FGS 47)	–	–	–	S 460 NH	–	S 460 NH	–	–	–	1.8953	–
–	L 485 QB	–	–	–	L 485 QB	L 485 QB	–	–	–	–	1.8955	–
–	S 460 NLH/FG S 47	–	–	–	S 460 NLH	–	S460NLH	–	–	–	1.8956	–
–	L 555 QB	–	–	–	L 555 QB	L 555 QB	–	–	–	–	1.8957	–
–	9 CrNiCuP 3 2 4	WR 50 A	SPA-H	K11430	–	–	–	–	–	–	1.8962	–
–	WTSt 52-3	WR 50 C	SMA 58 W	K11430	S 355 J 2 G 1 W	E 36 W-A2	–	–	–	–	1.8963	–
–	S 355 J 2 G 2 W	S 355 J 2 G 2 W	–	–	S 355 J 2 G 2 W	S 355 J 2 G 2 W	S 355 J 2 G 2 W	–	–	–	1.8965	–
–	S 355 K 2 G 1 W	S 355 K 2 G 1 W	SMA 490 CW	–	S 355 K2 G1 W	S 355 K2 G1 W	S 355 K 2 G 1 W	–	–	–	1.8966	–
–	S 355 K 2 G 2 W	S 355 K 2 G 2 W	–	–	S 355 K2G2W	S 355 K 2 G 2 W	S 355 K 2 G 2 W	–	–	–	1.8967	–
–	QStE 600 TM/S 600 MC	–	–	–	S 600 MC	E 620 D	S 600 MC	–	–	–	1.8969	–
–	StE 415..7/L 415 NB	–	–	–	L 415 NB	L 415 NB	–	–	–	–	1.8972	–
–	StE 415.7 TM/L 415 MB	–	–	–	L 415 MB	L 415 MB	–	–	–	–	1.8973	–
–	S 700 MC (QStE 690 TM)	–	–	–	S 700 MC	E 690 D	S 700 MC	–	–	–	1.8974	–
–	L 450 MB/StE 445.7 TM	–	–	–	L 450 MB	L 450 MB	–	–	–	–	1.8975	–
–	S 650 MC (QStE 650 TM)	–	–	–	S 650 MC	E 620 D	S 650 MC	–	–	–	1.8976	–
–	L 485 MB/StE 480.7 TM	–	–	–	L 485 MB	L 485 MB	–	–	–	–	1.8977	–
–	StE 550.7 TM/L 555 MB	–	–	–	L 555 MB	L 555 MB	–	–	–	–	1.8978	–
–	St 60-2	4360-55 E	SM 58	–	E 335	A 60-2	Fe 60-2	1650	–	–	1.0060	–
–	St 70-2	E 360	–	–	E 360	A 70-2	Fe 70-2	1655	–	–	1.0070	–
–	C4D	–	–	–	C 4 D	FM 5	C 4 D	–	–	–	1.0300	–
–	C 22 8	–	–	–	P 250 GH	–	–	–	–	–	1.0460	–
–	H 260/ZSt E 260	H 240 LA	–	–	H 240 LA	E 240 C	–	–	–	–	1.0480	–
–	C32D	–	SWRH 32	K02701	C 32 D	FM 32	C 32 D	–	–	–	1.0530	–
–	ZStE 380/H 380	H 360 L A	–	–	H 360 LA	E 355 C	–	–	–	–	1.0550	–
–	C60D	–	–	–	C 60 D	FM 60	C 60 D	–	–	–	1.0610	–
–	38 SMn 28	38 SMn 28	–	–	38 SMn 28	38 SMn 28	–	–	–	–	1.0760	–
–	QSt E 260 TM/5260 MC	–	–	–	S 260 MC	41 S 7	Fe E 275 TM	–	–	–	1.0970	–
–	C3D2	–	–	–	C 3 D 2	FM 5	C 3 D 2	–	–	–	1.1110	–
–	C38D2	–	–	–	C 38 D 2	FM 38	C 38 D 2	–	–	–	1.1150	–
–	C 42 E Al/Ck 42 Al	–	–	–	S 355 G15	–	–	–	–	–	1.1190	–
–	C56D2/D 55-2	–	–	–	C 56 D 2	FM 56	C 56 D 2	–	–	–	1.1220	–
–	C 70 W1	–	–	–	CT 70	C 70 E 2 U	C 70 K U	–	–	–	1.1520	–
–	C 45 W	–	–	–	C 45 U	Y3 42	–	–	–	–	1.1730	–
–	C 60 W	–	SK 7	–	–	Y3 55	–	–	–	–	1.1740	–
–	100 CrMn 6	–	–	K19195	100 CrMn 6	100 CM 6	–	–	–	–	1.3520	–
–	28 B 2	–	SWRCHB 26	–	C 30 B	20 B 3	–	–	–	–	1.5510	–
–	St E 380	–	SM 50 B	–	S 380 N	–	Fe E 390 KG	–	–	–	1.8900	–
–	TStE 380/S380NL	–	–	–	S 380 NL	–	Fe E 390 KT	2117	–	–	1.8910	–
–	S 890 Q	–	–	–	S 890 Q	S 890 Q	S 890 Q	–	–	–	1.8940	–

P4 Lista dos materiais das peças • Aço • P4

Aços-liga e aços ferramenta P4 *Teor: C>.25%* *Resistência a Tensão RM (MPa)*: 850–1400* *Dureza (HB): 350–450 (HRC): 35–48*

AISI**	DIN	BTS	JIS	UNS	EN	AFNOR	UNI	SIS	SAE	ASTM	Número do Material	Referência do fabricante
A 570 Gr. 40	St 44-2	4360-43 B	SM 41 B	K 02502	S 275 JR	E 28-2	Fe 430 BFN	1412	–	–	1.0044	–
–	S 235 J0/Fe 360 C	En 40C	–	–	S 235 J0	E24-3	Fe 360 CFN	–	–	–	1.0114	–
A 570 Gr. 36	St 37-3	4360-40 C	–	K01501	S 235 J2 G3	Fe 360 D1(2); E 24-3	Fe 360 D1(2)	1312	–	–	1.0116	–
–	QSt 37-3	–	SWRCH 12R	–	–	–	–	–	–	–	1.0123	–
–	S 275 J0	En43C;S275J0	–	–	S 275 J0/Fe 430 C	S 275 J0; E 28-3	S275J0;Fe430CFN	–	–	–	1.0143	–
A 573 Gr. 70	St 44-3	4360-43 C	SM 41 B	–	Fe 430 D1(2); S 275 J2 G3 (4)	Fe 430 D1(2); E 28-4	Fe 430 D FF	1414	–	–	1.0144	–
–	S 275 J2 G4/Fe 430 D 2	S 275 J2 G4	–	–	S 275 J2 G4	E28-4;S 275 J2 G4	S 275 J2 G4	1414	–	–	1.0145	–
–	Ro St 44-2	43C	–	–	S 275 J0 H	–	S 275 J0 H	–	–	–	1.0149	–
–	St 37.0	–	STPG 38	–	P 235 T1	–	–	–	–	–	1.0254	–
–	C9D	–	SWRM 8	–	C 9 D	FM 9	C 9 D	–	–	–	1.0304	–
–	C7D	C 7 D	SWRM 8	G10060	C 7 D	FM 8	C 7 D	–	–	–	1.0313	–
–	L 210 GA	–	–	–	L 210 GA	TS E 220 classe 2	–	–	–	–	1.0319	–
–	USD 7/C 8 G1 W	–	–	–	C 8 G 1 W	–	–	–	–	–	1.0323	–
–	RSD 7/C8G2W	–	–	–	C 8 G 2 W	–	–	–	–	–	1.0324	–
–	RSD 10 Si/C10WSi	–	–	–	C 10 W Si	–	–	–	–	–	1.0339	–
–	P235 GH	P 235 GH	SPV 50	K02503	P 235 GH	A 37 CP	Fe E 235	1330	–	–	1.0345	–
–	RRSD 10/C10 W	–	–	–	C 10 W	–	–	–	–	–	1.0351	–
–	St 45.8	–	STB 410	K02727	–	–	–	–	–	–	1.0405	–
–	C 25 Pb	–	–	–	C 25 GPb	–	–	–	–	–	1.0411	–
–	L 245 MB	430	–	K03006	L 245 MB	L 245 MB	–	–	–	–	1.0418	–
1513	P265	HR 40/30	–	G15130	–	12 M 5	–	–	–	–	1.0424	–
–	P310 NB	224-410	SG 325	K02100	P280GH	BS 2	P 275 N	2103	–	–	1.0426	–
–	L 290 MB	–	–	–	L290MB	L 290 MB	–	–	–	–	1.0429	–
–	H II/P285NH	–	Sm 38	–	P 285 NH	–	–	–	–	–	1.0435	–
–	P310 NB	224-430	SG 325	K02100	P305GH	P 275 N	P 275 N	2103	–	–	1.0436	–
–	A St 41	P 275 N	STK 400	K02100	S 275 N	BS 3	P 275 N	2103	–	–	1.0437	–
–	B 500 A	–	SD 490	–	B 500 A	–	B 500 A	–	–	–	1.0438	–
–	GS-45	–	SC 450	–	–	–	–	–	–	–	1.0443	–
–	H IV/P295NH	–	SG 37	K03102	–	–	Fe 460-2 KW	–	–	–	1.0445	–

(continuação)

P4

Lista dos materiais das peças • Aço • P4 *(continuação)*

Aços-liga e aços ferramenta P4 *Teor: C>.25%* *Resistência a Tensão RM (MPa)*: 850–1400* *Dureza (HB): 350–450 (HRC): 35–48*

AISI**	DIN	BTS	JIS	UNS	EN	AFNOR	UNI	SIS	SAE	ASTM	Número do Material	Referência do fabricante
–	StE 240.7	–	–	–	L 245 NB	L 245 NB	–	–	–	–	1.0457	–
–	HIII/L 235 GA	–	–	–	L 235 GA	–	–	–	–	–	1.0458	–
–	L 245 GA/RRStE 240.7	–	–	–	L 245 GA	TS E 250	–	–	–	–	1.0459	–
–	St E255	–	–	K01800	–	–	–	–	–	–	1.0461	–
–	TStE 255	–	–	K11535	–	–	–	–	–	–	1.0463	–
–	15 Mn 3 Al	–	–	–	C 14 GAl	–	–	–	–	–	1.0468	–
–	21 Mn 4	–	–	–	–	–	20 Mn 4	–	–	–	1.0469	–
–	19 Mn 6/P 355 GH	P 355 GH	SGV 46	K03300	P355GH	A 52 CP	Fe E355-2	2101	–	–	1.0473	–
–	17 Mn 4/P 295 GH	224-460B	SG 37	K03501	P 295 GH	A 48 CP	Fe E 295	2102	–	–	1.0481	–
–	19 Mn 5	224-460	SG 37	K 03102	–	A 52 CP; AP; FP	Fe 460- 2 KW	–	–	–	1.0482	–
–	L 290 AG	–	–	–	L290GA	TS E 290	–	–	–	–	1.0483	–
–	L 290 NB	–	–	–	L290NB	L 290 NB	–	–	–	–	1.0484	–
–	21 Mn 6	–	–	K12320	–	–	–	–	–	–	1.0485	–
–	St E 285	P 275 N	SM 41 A	K 01802	P 275 N	P 275 N	Fe E 285 KG	–	–	–	1.0486	–
–	W St E 285	P 275 N	–	K 01802	P 275 NH	P 275 N	Fe E 285 KW	–	–	–	1.0487	–
–	T St E 285	P 275 NL 1	SLA 235 A	K 01803	P 275 NL 1	P 275 NL 1	Fe E 285 KT	–	–	–	1.0488	–
–	H 300/ZSt E 300	H280LA	–	–	H 280 LA	E 280 C	–	–	–	–	1.0489	–
–	S 275 NH	S 275 NH	–	–	S 275 NH	–	S 275 NH	–	–	–	1.0493	–
–	S 275 NLH	S275NLH	–	–	S 275 NLH	–	S275NLH	–	–	–	1.0497	–
–	L 360 GA	–	–	–	L 360 GA	–	–	–	–	–	1.0499	–
–	C 35 Pb/C 35 GPb	–	–	–	C 35 Pb	–	–	–	–	–	1.0502	–
–	St E 315/P 315N	–	SM 50 A	K11506	P 315 N	–	Fe E 315 KG	–	–	–	1.0505	–
–	W St E 315	–	SNC 1	K02404	P 315 NH	–	Fe E 315 KW	2107	–	–	1.0506	–
–	St 55	–	STKM 16A	–	–	–	Fe 540	–	–	–	1.0507	–
–	T St E315	–	SLA 325 A	K02404	P 315 NL	–	–	2106	–	–	1.0508	–
–	C 40 Pb	–	–	–	C 40 G Pb	–	–	–	–	–	1.0512	–
–	C38D	–	SWRH 37	–	C 38 D	FM 38	C 38 D	–	–	–	1.0516	–
–	C48D	–	SWRH 48	–	C 48 D	FM 48	C 48 D	–	–	–	1.0517	–
–	C56D	–	–	–	C 56 D	FM 56	C 56 D	–	–	–	1.0518	–
–	StSch 700 (R 0 700)	–	–	–	R 0700	–	–	–	–	–	1.0521	–
–	StSch800 (R 0 800)	–	–	–	R 0800	–	–	–	–	–	1.0524	–
–	Cf 45 Pb	–	–	–	–	–	C 46	–	–	–	1.0526	–
–	C32D	–	SWRH 32	K02701	C 32 D	FM 32	C 32 D	–	–	–	1.0530	–
–	GL-A 40 (S 390 G 1 S)	–	–	–	S 390 G 1 S	–	–	–	–	–	1.0532	–
–	S 355 NH	S 355 NH	–	–	S 355 NH	–	S 355 NH	–	–	–	1.0539	–
–	C42D	–	SWRH 42 B	–	C 42 D	FM 42	C 42 D	–	–	–	1.0541	–
–	Schienen 60 F(R 0600/ St Sch 60)	–	–	–	R 0600	–	–	–	–	–	1.0544	–
–	S 355 J0 H	50 C	–	–	S 355 J0 H	–	S 355 J0 H	–	–	–	1.0547	–
–	ZStE 340/H 340	H 320 L A	–	–	H 320 LA	E 315 C	–	–	–	–	1.0548	–
–	S 335 NLH	50 EE	–	–	S 355 N LH	–	S 355 N L H	–	–	–	1.0549	–
–	GS-52	A2	–	–	GE 260	–	–	–	–	–	1.0552	–
–	S 355 J0	En 50 C;S 355 J0	SM 520 M	–	S 355 J0	S 355 J0; E 36-3	S 355 J0; Fe 510 C FN	–	–	–	1.0553	–
–	GS-70	50 C	–	–	S 355 J0 C	E 36-3	Fe 510 C	–	–	–	1.0554	–
–	GS-62	–	–	–	S 355 GO 1	–	–	–	–	–	1.0555	–
–	ZStE 420/H 420	46/40HR,HS,CS	–	–	H 400 LA	H 400 LA	–	–	–	–	1.0556	–
–	P355 NB	–	SG 365	–	P 355 NB	BS 4	–	–	–	–	1.0557	–
–	GS-62.3	–	–	–	S 355 GO 2	–	–	–	–	–	1.0559	–
A 633 Gr. C	St E 355	P 355 N	SM 50 YB	K12000	P 355 N	E 355 R/FP	Fe E 355 KG	2132	–	–	1.0562	–
–	N 80	–	–	–	–	–	–	–	–	–	1.0564	–
–	W St E 355	P 355 NH	–	K01600	P 355 NH	P 355 NH	Fe E 355 KW	–	–	–	1.0565	–
–	T St E355	P 355 NL1	SLA 37	–	P 355 NL1	P 355 NL1	Fe E 355 KT	–	–	–	1.0566	–
–	32 Mn 3	–	–	–	–	–	–	–	–	–	1.0567	–
–	P355 QH1	P 355 QH	–	–	P 355 QH	P 355 QH	–	–	–	–	1.0571	–
–	ZStE 460/H 460	–	–	–	–	–	–	–	–	–	1.0574	–
–	S 355 J 2 G 4	S 355 J 2 G 4	–	–	S 355 J 2 G 4	S 355 J 2 G 4	S 355 J 2 G 4	–	–	–	1.0577	–
–	L 360 MB	–	–	–	L 360 MB	L 360 MB	–	–	–	–	1.0578	–
–	St 52.4	–	STS 49	–	–	–	–	–	–	–	1.0581	–
–	L 360 NB/StE 360.7	–	–	–	L360NB	L 360 NB	–	–	–	–	1.0582	–
–	S 355 J 2 G 3 Cu/St 52-3 Cu3	–	–	–	S 355 J2 G3 Cu + CR	–	–	–	–	–	1.0585	–
–	C50D	–	–	–	C 50 D	FM 50	C 50 D	–	–	–	1.0586	–
–	QSt 52-3 Cu 3	–	–	–	S 355 J2 G3 Cu C	–	–	–	–	–	1.0587	–
–	D 53-2	–	SWRH 52 B	–	C 52 D	FM 52	C 52 D	–	–	–	1.0588	–
–	FStE 355 OS 3/S355G03	–	–	K12000	S 355 G03	–	–	–	–	–	1.0591	–
–	S 355 J 2 G 4 Cu	–	–	–	S 355 J2 G4 Cu	–	–	–	–	–	1.0592	–
–	S355k2G3/Fe 510 DD1 (MULTIST)	S 355 K 2 G 3	SM 520 C	K02505	S 355 K 2 G 3	E36-4	S 355 K 2 G 3	–	–	–	1.0595	–
–	S355K2G4/Fe 510 DD 2 (MULTIST)	S 355 K 2 G 4	–	–	S 355 K 2 G 4	S 355 K 2 G 4	S 355 K 2 G 4	–	–	–	1.0596	–
–	C 30 Pb	–	–	–	C 3 0 GPb	–	–	–	–	–	1.0598	–
–	C 60 Pb	–	–	–	C 60 GPb	–	–	–	–	–	1.0602	–
–	C 67 GPb/C 67 Pb	–	–	–	C 67 GPb	–	–	–	–	–	1.0606	–
–	C 75 GPb/C 75 Pb	–	–	–	C 75 GPb	–	–	–	–	–	1.0607	–

NOTA: Para a legenda, veja a página Y217.

(continuação)

P4 Lista dos materiais das peças • Aço • P4 *(continuação)*

Aços-liga e aços ferramenta P4 *Teor: C>.25%* *Resistência a Tensão RM (MPa)*: 850–1400* *Dureza (HB): 350–450 (HRC): 35–48*

AISI**	DIN	BTS	JIS	UNS	EN	AFNOR	UNI	SIS	SAE	ASTM	Número do Material	Referência do fabricante
–	C62D	–	SWRH 62 B	–	C 62 D	FM 62	C 62 D	–	–	–	1.0611	–
–	C66D	–	–	–	C 66 D	FM 66	C 66 D	–	–	–	1.0612	–
–	C68D	–	SWRH 67 B	–	C 68 D	FM 68	C 68 D	–	–	–	1.0613	–
–	C70D	–	–	–	C 70 D	FM 70	C 70 D	–	–	–	1.0615	–
–	C72D	–	SWRH 72 B	–	C 72 D	FM 72	C 72 D	–	–	–	1.0617	–
–	GS-C 25	–	SCPH 1	–	GP 240 GH	GP 240 GH	GP 240 Gh	–	–	–	1.0619	–
–	GP 240 GR	–	–	–	GP 240 GR	GP 240 GR	GP 240 GR	–	–	–	1.0621	–
–	C80D	–	–	–	C 80 D	FM 80	C 80 D	–	–	–	1.0622	–
–	StSch 900 A (R 0900)	–	–	–	R 0900	–	–	–	–	–	1.0623	–
–	StSch 900 B (R 0900 Mn)	–	–	–	R 0900 Mn	–	–	–	–	–	1.0624	–
1345	StSch 90 C/GP 280 GH	–	–	G13450	GP 280 GH	GP 280 GH	GP 280 GH	–	–	–	1.0625	–
–	C82D	–	SWRH 82 B	–	C 82 D	FM 82	C 82 D	–	–	–	1.0626	–
–	C88D	–	–	–	C 88 D	–	C 88 D	–	–	–	1.0628	–
–	StSch 1200 (R 1200)	–	–	–	R 1200	–	–	–	–	–	1.0631	–
–	C 61/60 Mn 3	–	–	–	C 61	–	C 61	–	–	–	1.0642	–
–	C 85/85 Mn 3	–	–	–	C 85	–	C 85	–	–	–	1.0647	–
–	35 SPb 20	35 SPb 20	–	–	35 SPb 20	35 SPb 20	–	–	–	–	1.0756	–
–	45 SPb 20	–	–	–	46 SPb 20	–	–	–	–	–	1.0757	–
–	38 SMnPb 28	38 SMnPb 28	–	–	38 SMnPb 28	38 SMnPb 28	–	–	–	–	1.0761	–
–	44 SMn 28	44 SMn 28	–	–	44 SMn 28	44 SMn 28	–	–	–	–	1.0762	–
–	44 SMnPb 28	44 SMnPb 28	–	–	44 SMnPb 28	44 SMnPb 28	–	–	–	–	1.0763	–
–	36 SMnPb 14	36 SMnPb 14	–	–	36 SMnPb 14	36 SMnPb 14	–	–	–	–	1.0765	–
9255	51 Si 7	250 A 53	–	G92550	–	51 S 7	48 Si 7	2090	–	–	1.0903	–
9255	55 Si 7	250 A 53	SKH 1; SKT 4	G92550	55 NiCrMoV 7	55 S 7	55 Si 8	2085	–	–	1.0904	–
–	StSch 1100 (R 1100 Cr)	–	–	–	R 1100 Cr	–	–	–	–	–	1.0915	–
9262	60 SiCr 7	250 A 61	SUP 7	G92620	60 SiCr 8	60 SC 7	60 SiCr 8	–	–	–	1.0961	–
–	QSt E 690 TM (S 700 MC)	–	–	–	S 700 MC	S 690 MC	S 700 MC	–	–	–	1.0966	–
–	QSt E 260 N 7 S 260 NC	–	AE 275 NC	–	S 260 NC	–	S 260 NCX	–	–	–	1.0971	–
–	QSt E 300 TM/S 315 MC	43 F35 HR,HS,CS	–	–	S 315 MC	E 315 D	S 315 MC	–	–	–	1.0972	–
–	QSt E 300 N 7/S 315 NC	–	AE 340 NC	–	S 315 NC	–	S 315 NC	–	–	–	1.0973	–
–	QSt E340 TM	HR 40/30	–	–	S 340 MC	E 335 D	–	–	–	–	1.0974	–
–	QSt E340 N	–	–	–	S 340 NC	–	Fe E 355 TD	–	–	–	1.0975	–
–	QSt E 360TM	–	–	–	S 355 MC	E 355 D	Fe E 355 TM	–	–	–	1.0976	–
–	QSt E360 N	–	–	–	S 355 NC	–	Fe E 355 TD	–	–	–	1.0977	–
–	QSt E380 TM	–	–	–	S 380 MC	E 390 D	–	–	–	–	1.0978	–
–	QSt E380 N	–	–	–	S 380 NC	–	Fe E 380 TD	–	–	–	1.0979	–
–	QSt E420 TM	HR 50 F 45	–	–	S 420 MC	E 430 D	Fe E 420 TM	–	–	–	1.0980	–
–	QSt E 420 N	–	–	–	S 420 NC	–	Fe E 420 TD	–	–	–	1.0981	–
–	QSt E 460 TM	50/45 HR	–	–	S 460 MC	E 445 D	–	–	–	–	1.0982	–
–	QSt E 460 N	–	–	–	S 460 NC	–	Fe E 460 TD	–	–	–	1.0983	–
–	QSt E500 TM	–	–	–	S 500 MC	E 490 D	Fe E 490 TM	2662	–	–	1.0984	–
–	QSt E500 N	–	–	–	S 500 NC	–	–	–	–	–	1.0985	–
–	QSt E550 TM	60/55 HS	–	–	S 550 MC	E 560 D	Fe E 560 TM	–	–	–	1.0986	–
–	QSt E550 N	–	–	–	S 550 NC	–	–	–	–	–	1.0987	–
–	FStE 355 OS 3/S355G04	–	–	–	S 355 G04	–	–	–	–	–	1.1102	–
–	EStE 285	P 275 NL 2	STK 400	–	P 275 NL 2	P 275 NL 2	P 275 NL 2	–	–	–	1.1104	–
–	EStE 315	–	–	–	S 315 NL 1	–	–	–	–	–	1.1105	–
–	EStE 355	P 355 NL 2	STK 500	–	P 355 NL 2	P 355 NL 2	P 355 NL 2	–	–	–	1.1106	–
–	C5D2	–	–	–	C 5 D 2	FM 6	C 5 D 2	–	–	–	1.1111	–
–	USD 5/C 8 E1 W	–	–	–	C 8 E 1 W	–	–	–	–	–	1.1112	–
–	C8D2	–	–	–	C 8 D 2	FM 8	C 8 D 2	–	–	–	1.1113	–
–	C 10 E W/RSD 11	–	–	–	C 10 EW	–	–	–	–	–	1.1115	–
–	USD 6/C 8 E2 W	–	–	–	C 8 E 2 W	–	–	–	–	–	1.1116	–
–	G 24 Mn 4/GS 24 Mn 4	–	–	–	G 24 Mn 4	–	–	–	–	–	1.1136	–
–	C32D2	–	–	–	C 32 D 2	FM 32	C 32 D 2	–	–	–	1.1143	–
–	C36D2	–	–	–	C 36 D 2	FM 36	C 36 D 2	–	–	–	1.1145	–
–	C38D2	–	–	–	C 38 D 2	FM 38	C 38 D 2	–	–	–	1.1150	–
–	C 25 R	C 25 R	–	–	C 25 R	C 25 R	C 25 R	–	–	–	1.1163	–
–	C48D2	–	–	–	C 48 D 2	FM 48	C48 D 2	–	–	–	1.1164	–
1330	GS-30 Mn 5	120 M 36	SMn 433 H; SCMn 2	K13300	–	35 M 5	–	1330	–	–	1.1165	–
1335	36 Mn 5	150 M 36	SMn 438(H)	G13350	–	40 M 5	–	2120	–	–	1.1167	–
–	G 40 Mn 5/GS 40 Mn 5	–	–	–	G 40 Mn 5	–	–	–	–	–	1.1168	–
–	20 Mn 6	150 M 19	–	–	–	20 M 5	20 Mn 6	–	–	–	1.1169	–
–	C50D2	–	–	–	C 50 D 2	FM 50	C50D 2	–	–	–	1.1171	–
–	Ck 38 Pb	–	–	–	25 Mn 4	–	–	–	–	–	1.1177	–
–	C 30 R	C 30 R	C 30 R (3 C 30)	–	C 30 R	C 30 R	C 30 R	–	–	–	1.1179	–
–	Ck 35 Pb	–	–	–	S 355 G 13	–	–	–	–	–	1.1182	–
–	Ck 36	–	–	–	S 355 G 14	–	–	–	–	–	1.1184	–
–	C3D1	–	–	–	C 3 D 1	–	C 3 D 1	–	–	–	1.1187	–
–	C40R/Cm 40	C 40 R	–	–	C 40 R	C 40 R	C 40	–	–	–	1.1189	–
–	C52D2	–	–	–	C 52 D 2	FM 52	C 52 D 2	–	–	–	1.1202	–
–	C 53 R/Cm 53	–	–	–	C 53 R	–	–	–	–	–	1.1205	–
–	C 10 R	C 10 R	–	–	C 10 R	C 10 R	–	–	–	–	1.1207	–
–	C 16 R	C 16 R	–	–	C 16 R	C 16 R	–	–	–	–	1.1208	–
–	C58D2	–	–	–	C 58 D 2	FM 58	C 58 D 2	–	–	–	1.1212	–
–	Ck 53 Pb	–	–	–	C 90 S	–	–	–	–	–	1.1217	–
–	C62D2	–	–	–	C 62 D 2	FM 62	C 62 D 2	–	–	–	1.1222	–
–	Cm 60	C 60 R	–	–	3 C 60	C 60 R	C 60 R	–	–	–	1.1223	–
–	C60D2	–	–	–	C 60 D 2	FM 60	C 60 D 2	–	–	–	1.1228	–
–	C68D2	–	–	–	C 68 D 2	FM 68	C 68 D 2	–	–	–	1.1232	–
–	C66D2	–	–	–	C 66 D 2	FM 66	C 66 D 2	–	–	–	1.1236	–
–	C50R	C 50 R	–	–	C 50 R	FM 50	C 50 R	–	–	–	1.1241	–
–	C72D2	–	–	–	C 72 D 2	FM 72	C 72 D 2	–	–	–	1.1242	–
–	C70D2	–	–	–	C 70 D 2	FM 70	C 70 D 2	–	–	–	1.1251	–
–	C78D2	–	–	–	C 78 D 2	FM 78	C 78 D 2	–	–	–	1.1252	–
–	C76D2	–	–	–	C 76 D 2	FM 76	C 76 D 2	–	–	–	1.1253	–
–	C80D2	–	–	–	C 80 D 2	FM 80	C 80 D 2	–	–	–	1.1255	–
–	C82D2	–	–	–	C 82 D 2	FM 82	C 82 D 2	–	–	–	1.1262	–
–	C86D2	–	–	–	C 86 D 2	FM 86	C 86 D 2	–	–	–	1.1265	–
–	C88D2	–	–	–	C 88 D 2	–	C 88 D 2	–	–	–	1.1272	–
–	C92D2	–	–	–	C 92 D 2	–	C 92 D 2	–	–	–	1.1282	–
–	C98D2	–	–	–	C 98 D 2	–	C 98 D 2	–	–	–	1.1283	–
–	46 MnVS 6	–	–	–	46 MnVS 6	–	–	–	–	–	1.1304	–
–	C 90 U	–	–	–	C90U	–	–	–	–	–	1.1535	–
–	C 110 W	–	–	–	C 110 U	–	–	–	–	–	1.1554	–
–	C 120 U	–	–	–	C120U	–	–	–	–	–	1.1555	–
T 8	C 80 W2	BW 1B	SKC 3	T12008	–	Y1 80	C 80 KU	–	–	–	1.1625	–
–	C 105 W2	–	SK 3	–	–	–	–	–	–	–	1.1645	–
–	C 135 W	–	SK 1	–	–	Y2 140	C 140 KU	–	–	–	1.1673	–
A-6	C 67 W	–	–	T30106	–	Y1 70	–	–	–	–	1.1744	–

(continuação)

P4 Lista dos materiais das peças • Aço • P4 *(continuação)*

Aços-liga e aços ferramenta P4 *Teor: C>.25%* *Resistência a Tensão RM (MPa)*: 850–1400* *Dureza (HB): 350–450 (HRC): 35–48*

AISI**	DIN	BTS	JIS	UNS	EN	AFNOR	UNI	SIS	SAE	ASTM	Número do Material	Referência do fabricante
–	125 Cr 1	–	–	–	125 Cr 2	Y2 120 C	–	–	–	–	1.2002	–
–	85 Cr 1	–	–	–	–	Y1 100 C 2	–	–	–	–	1.2004	–
–	140 Cr 3	–	SKS 8	–	140 Cr 2	Y2 140 C	–	–	–	–	1,2008	–
–	105 Cr 4	–	SKC 11	–	–	–	–	–	–	–	1.2057	–
–	21 MnCr 5	–	SCR 420 H	–	21 MnCr 5	20 NC 5	–	–	–	–	1.2162	–
–	35 CrMo 7	–	–	–	35 CrMo 7	–	–	–	–	–	1.2302	–
–	48 CrMoV 67	–	–	–	–	45 CDV 6	–	–	–	–	1.2323	–
P6	15 NiCr 14	–	SNC 22	T51606	–	10 NC 12	–	–	–	–	1.2735	–
–	40 CrMnNiMo 8 6 4	–	–	–	40 CrMnNiMo 8-6-4	–	–	–	–	–	1.2738	–
–	57 NiCrMoV 7 7	–	–	–	55 NiCrMoV 7	–	–	–	–	–	1.2744	–
–	70 MnMoCr 8	–	–	–	70 MnMoCr 8	–	–	–	–	–	1.2824	–
–	95 MnWCr 5	–	–	–	95 MnWCr 5	–	–	–	–	–	1.2825	–
–	60 MnSi 4	–	–	–	–	60 MSC 4	–	–	–	–	1.2826	–
–	101 Cr 6	–	–	–	–	–	102 Cr 6 KU	–	–	–	1.3514	–
–	16 CrNiMo 6	820A16	–	–	–	16 NCD 6	16NiCrMo6	–	–	–	1.3531	–
–	100 CrMn 7 3	–	–	–	100 CrMnMo 7	100 CD 7	–	–	–	–	1.3536	–
–	100 CrMo 7	–	SUS 4	K19965	100 CrMo 7	100 CD 7	100CrMo7	–	–	–	1.3537	–
–	100 CrMnMo 8	–	–	–	–	100 CrMnMo 8	–	–	–	–	1.3539	–
5046	44 Cr 2	–	–	H50460	46 Cr 1 KD	44 Cr 2	–	–	–	–	1.3561	–
4142	43 CrMo 4	–	–	G41420	–	43 Cr Mo 4	–	–	–	–	1.3563	–
4147	48 CrMo 4	817 M 40	SNC 836	H41470	–	48 CrMo 4	–	–	–	–	1.3565	–
–	46 Si 7	–	–	–	45 Si	46 S 7	–	–	–	–	1.5024	–
9259H	51 Si 7	–	–	–	50 Si 7	–	48 Si 7	2090	–	–	1.5025	–
–	55 Si 7	250 A 53	–	G92550	56 Si 7	55 S 7	55 Si 8	2085	–	–	1.5026	–
9260	60 Si 7	251 A 60	–	G92600	60 Si 7	60 S 7	60 Si 7	–	–	–	1.5027	–
–	65 Si 7	–	SUP 7	–	–	–	–	–	–	–	1.5028	–
–	12 Mn 8	–	–	–	11 Mn 8 KE	–	–	–	–	–	1.5086	–
9262	60 SC 7	–	–	G92620	60 SiCr 8	61 SC 7	60 SiCr 8	–	–	–	1.5092	–
–	37 MnSi 5	–	–	–	–	38 MS 5	–	F.130.A	–	–	1.5122	–
–	50 MnSi 4	–	–	K04800	–	–	–	–	–	–	1.5131	–
–	15 MnMoV 4 5	–	–	–	15 MnMoV 4-5	15 MDV 4.05	–	–	–	–	1.5402	–
A 204 Gr. A	15 Mo 3	1501-240	STFA 12	K11820	16 Mo 3	15 D3	16 Mo 3 KW	2912	–	–	1.5415	–
4419	GS-22 Mo 4	243-430	SCPH 11	G44190	G 20 Mo 5	G20Mo5	G 22 Mo 5	–	–	–	1.5419	–
–	20 MnMo 3 5	–	–	K12121	–	–	–	–	–	–	1.5421	–
–	G 18 Mo 5	–	–	–	G18Mo5	–	G 18 Mo5	–	–	–	1.5422	–
4520	16 Mo 5	1503-245-420	SBC 690	K11522	–	–	16 Mo 5	–	–	–	1.5423	–
–	11 MnMo 4 5	–	–	K11123	11 MnMo 45 KE	–	–	–	–	–	1.5425	–
–	13 MnMo 6 5	–	–	K11424	11 MnMo 65 KE	–	–	–	–	–	1.5426	–
–	13 MnMo 8 5	–	–	K11423	11 MnMo 85 KE	–	–	–	–	–	1.5427	–
–	35 B 2	–	SWRCHB 237	–	C 35 B	35 B 3	–	–	–	–	1.5511	–
15B21 H	19 MnB 4	170 H 20	SWRCHB 420	H15211	19 MnB 4	20 MB 5	–	–	–	–	1.5523	–
15B21 H	20 MnB 5	–	SWRCHB 620	–	20 MnB 5	20 MnB 5	20 MnB 5	–	–	–	1.5530	–
–	24 Ni 8	–	SCPL 21	J22501	G 9 Ni 10	22 N 8	G9Ni10	–	–	–	1.5633	–
A 350-LF 5	10 Ni 14	503	SL 3 N 26	K31718	12 Ni 14	12Ni14	18 Ni 14 KT	–	–	–	1.5637	–
P3	10 NC 6	–	–	T51603	15 NiCr 6	10 NC 6	–	–	–	–	1.5713	–
–	10 NiCr 5 4	10NiCr5-4	–	–	10 NiCr 5-4	10 NiCr 5-4	–	–	–	–	1.5805	–
–	18 MnMoNi 5 5	–	–	–	18 MnMoNi 5-5	–	–	–	–	–	1.6308	–
–	20 MnMoNi 4 5	–	SQV 2 B	K12539	20 MnMoNi 4-5	–	–	–	–	–	1.6311	–
–	10 NiMnMo 6 5	–	–	K11160	–	–	–	–	–	–	1.6312	–
–	16 NiCrMO 12 6	–	–	–	–	16 NCD 13	–	–	–	–	1.6782	–
–	15 MnCrMoNiV 5 3	–	–	–	15 MnCrMoNiV 5-3	–	–	–	–	–	1.6920	–
50B40	37 CrB 1	120 M 36	SMnC 3 H	H50401	38 Cr 2	–	35 CB 1	–	–	–	1.7007	–
–	13 Cr 2	–	–	–	–	–	–	–	–	–	1.7012	–
–	17 CrS 3	17 CrS3	–	–	17 CrS 3	17 CrS 3	–	–	–	–	1.7014	–
5015	15 Cr 3	523 M15	SCr 415 H	G50150	15 Cr 2	12 C 3	–	–	–	–	1.7015	–
5117	17 Cr 3	17 Cr 3	–	G51170	(15 Cr 2 KD)	18 C 3	–	–	–	–	1.7016	–
5130 H	34 Cr 4	530 A 32	SCr 430 H	G51300	34 Cr 4 KD	32 C 4	34 Cr 4 KB	–	–	–	1.7033	–
5132 H	37 Cr 4	530 A 36	SCr 435 H	G51320	37 Cr 4	38 C 4	36 CrMn 4	–	–	–	1.7034	–
5140	41 Cr 4	530 M 40	SCr 440 H	G51400	41 Cr 4	42 C 4	41 Cr 4	–	–	–	1.7035	–
–	28 CrS 4	–	–	–	28CrS4	28CrS4	–	–	–	–	1.7036	–
–	34 CrS 4	34 CrS 4	–	–	34 CrS 4	34 CrS 4	34 CrS 4	–	–	–	1.7037	–
–	41 CrS 4	41 CrS 4	–	–	41 CrS 4	41 CrS 4	41 CrS 4	2245	–	–	1.7039	–
–	38 Cr 4	–	–	–	38 Cr 4	–	38 Cr 4	–	–	–	1.7043	–
5140	42 Cr 4	530 A 40	SCr 440	–	40 NiCrMo 3	42 C 4 TS	40 NiCrMo 3	2245	–	–	1.7045	–
–	54 SiCr 6	–	–	–	–	54 SC 6	–	–	–	–	1.7102	–
–	67 SiCr 5	–	–	–	67 SiCr 5	–	67 SiCr 5	–	–	–	1.7103	–
9262	60 SiCr 7	–	–	–	60 SiCr 8	–	–	–	–	–	1.7108	–
–	52 SiCrNi 5	–	–	–	–	52 SCN 5	–	–	–	–	1.7117	–
5115	16 MnCr 5	527 M 17	SCR 415	G 51150	16 MnCr 5 KD	16 MC 5	16 MnCr 5	2173	–	–	1.7131	–
–	49 CrMo 4	–	SCM 445	–	–	–	–	–	–	–	1.7238	–
–	16 CrMo 4	18 CrMo4	SCM 418 H	–	18 CrMo 4	15 CD 3.5	18 CrMo 4	–	–	–	1.7242	–
–	10 CrMo 11	–	–	–	–	12 CD 10	–	–	–	–	1.7276	–
–	16 CrMo 9 3	–	–	–	–	20 CD 8	–	–	–	–	1.7281	–
–	22 CrMoS 3 5	–	–	–	22 CrMoS 3-5	22 CrMoS 3-5	–	–	–	–	1.7333	–
A 387 Gr. 12 Cl. 2	16 CrMo 4 4	–	–	K11564	–	–	A 18 CrMo 4 5 KW	–	–	–	1.7337	–
–	12 CrMo 8 5	–	–	K21509	–	–	–	–	–	–	1.7358	–
–	12 CrMo 19 5	3606-625	SCMV 6	K41545	X 12 CrMo 5	Z 10 CD 5.05	16 CrMo 20 5	–	–	–	1.7362	–
–	X 7 CrMo 6 1	B 5	–	S50281	CM 5-IG	–	–	–	–	–	1.7373	–
–	12 CrMo 9 10	–	–	–	–	12 CrMo 9-10	–	–	–	–	1.7375	–
–	SG-CrMo 9	–	–	S50480	–	–	–	–	–	–	1.7388	–
–	51 CrMoV 4	–	–	–	51 CrMoV 4	51 CDV 4	51 CrMoV 4	–	–	–	1.7701	–
–	21 CrMoV 5 7	–	–	K14073	21 CrMoV 5-7	20 CDV 5.07	–	–	–	–	1.7709	–
–	20 CrMoVTiB 4 10	–	–	–	20 CrMoVTiB 4-10	20 CrMoVTiB 4-10	–	–	–	–	1.7729	–
6150	50 CrV 4	735 A 50	SUP 10	G61500	51 CrV 4	50 CV 4	50 CrV 4	2230	–	–	1.8159	–
–	PS 275 TMK	S 275 ML	–	–	S 275 ML	S 275 ML	S 275 ML	–	–	–	1.8819	–
–	S 355 G1 M	–	–	–	S 355 G 1 M	–	–	–	–	–	1.8822	–
–	BTStE 460 TM	S 460 ML	–	–	S 460 ML	E 460	S 460 ML	–	–	–	1.8838	–
–	S 500 ML	–	–	–	S 500 ML	–	–	–	–	–	1.8839	–

NOTA: Para a legenda, veja a página Y217.

(continuação)

P4 Lista dos materiais das peças • Aço • P4 *(continuação)*

Aços-liga e aços ferramenta P4 *Teor: C>.25%* *Resistência a Tensão RM (MPa)*: 850–1400* *Dureza (HB): 350–450 (HRC): 35–48*

AISI**	DIN	BTS	JIS	UNS	EN	AFNOR	UNI	SIS	SAE	ASTM	Número do Material	Referência do fabricante
–	S 275 MH	–	–	–	S 275 MH	–	S 275 MH	–	–	–	1.8843	–
–	S 275 MLH	–	–	–	S 275 MLH	–	S 275 MLH	–	–	–	1.8844	–
–	S 355 MH	–	–	–	S 355 MH	–	S 355 MH	–	–	–	1.8845	–
–	S 355 MLH	–	–	–	S 355 MLH	–	S 355 MLH	–	–	–	1.8846	–
–	S 420 MH	–	–	–	S 420 MH	–	S 420 MH	–	–	–	1.8847	–
–	S 420 MLH	–	–	–	S 420 MLH	–	S 420 MLH	–	–	–	1.8848	–
–	S 460 MH	–	–	–	S 460 MH	–	S 460 MH	–	–	–	1.8849	–
–	S 460 MLH	–	–	–	S 460 MLH	–	S 460 MLH	–	–	–	1.8850	–
–	FStE 355 OS 4/ S420G5Q	–	–	–	S 420 G 2	–	–	–	–	–	1.8853	–
–	P 550 QL	–	–	–	P 550 QL	–	–	–	–	–	1.8878	–
–	StE 460	S 460 N	–	–	S 460 N	E 460	S 460N	–	–	–	1.8901	–
A 633 Gr. E	St E 420	S 420 N	SM 50 C	K02002	FeE 420 KGN	E 420-I	Fe E 420 KG	2143	–	–	1.8902	–
–	TStE 460	S 460 L	–	–	S 460 NL	E460	S 460 NL	–	–	–	1.8903	–
–	S 550 Q	–	–	–	S 550 Q	E 550	S 550 Q	–	–	–	1.8904	–
A 633 Gr. E	St E 460	P 460 N	SM 53 B	K02900	P 460 N	E 460-I	Fe E 460 KG	2143	–	–	1.8905	–
–	BGH 8906	55 F	–	–	S 460 QL	S 460 QL	S 460 QL	–	–	–	1.8906	–
–	St E 500	–	SM 58	K02001	–	–	–	–	–	–	1.8907	–
–	S 460 Q	55 F	–	–	S 460 Q	E 460	S 460 Q	–	–	–	1.8908	–
–	S 420 NL/TStE 420	S 420 NL	STK 540	K02002	S 420 NL	E 420 T-I	Fe E 420 KT	–	–	–	1.8912	–
–	EStE 420/ S420NL1	–	STK 540	–	–	–	–	–	–	–	1.8913	–
–	S 620 Q	–	–	–	S 620 Q	E 620	S 620 Q	–	–	–	1.8914	–
–	T St E 460/ P460NL1	P 460 NL 1	–	K02900	P 460 NL1	E 460 T-I	Fe E 460 KT	–	–	–	1.8915	–
–	S 460 QL1	55 F	–	–	S 460 QL 1	–	–	–	–	–	1.8916	–
–	T St E 500	–	–	K02001	–	E 500 T-I	–	–	–	–	1.8917	–
–	EStE 460/ P460Nl2	P 460 NL 2	–	–	P 460 NL 2	P 460 NL 2	P 460 NL 2	–	–	–	1.8918	–
–	EStE 500/ S500NL1	–	–	–	S 500 NL 1	–	–	–	–	–	1.8919	–
–	TStE 690 VB/ S690G2QL	–	–	K11646	S 690 G 2 QL	–	–	–	–	–	1.8921	–
–	S 690 G 4 QL/ TStE 690 VC	–	–	–	S 690 G 4 QL	–	–	–	–	–	1.8922	–
–	S 590 QL/TStE 590 V	–	–	–	S 590 QL	–	–	–	–	–	1.8923	–
–	S 500 Q (StE 500 V)	–	–	–	S 500 Q	E 500	S 500 Q	2614	–	–	1.8924	–
–	S 890 QL 1 (EStE 90 V)	–	–	–	S 890 QL 1	–	–	–	–	–	1.8925	–
–	S 690 QL (TStE 690 V)	–	SHY 685 NS	–	S 690 QL	–	–	–	–	–	1.8928	–
–	TStE 690 VD/ S690G3QL	–	–	–	S 690 G 3 QL	–	–	–	–	–	1.8929	–
–	S 690 Q/StE 690 V	–	SHY 685 N	–	S 690 Q	E 690	S 690 Q	–	–	–	1.8931	–
–	WSt E 420/ P420NH	S 420 NL	STK 540	K02002	S 420 NL	S 420 NL	Fe E 420 KW	–	–	–	1.8932	–
–	S 960 QL/TStE 960 V	–	–	–	S 960 QL	–	–	–	–	–	1.8933	–
–	WSt E 460/ P460NH	P 460 NH	–	K02900	P 460 NH	P 460 NH	Fe E 460 KW	–	–	–	1.8935	–
–	P420 QH	–	–	–	P 420 QH	–	–	–	–	–	1.8936	–
–	TStE 770 V/ S770QL	–	–	–	S 770 QL	–	–	–	–	–	1.8938	–
–	EStE 790 V/ S790QL1	–	–	–	S 790 QL 1	–	–	–	–	–	1.8939	–
–	S 960 Q	–	–	–	S 960 Q	E 960 T-II	S 960 Q	–	–	–	1.8941	–
–	S 550 G 1 QL 1/ EStE 550 VA	–	–	–	S 550 G 1 QL 1	–	–	–	–	–	1.8944	–
–	S 355 J 0 WP	WR 50 A	–	–	S 355 J0 WP	E 36 W-A3	S 355 J0 WP	–	–	–	1.8945	–
–	S 355 J 2 WP	S 355 J 2 WP	–	–	S 355 J2 WP	E36W-A4	S 355 J2 WP	–	–	–	1.8946	–
–	L 415 QB	–	–	–	L 415 QB	L 415 QB	–	–	–	–	1.8947	–
–	L 360 QB	–	–	–	L 360 QB	L 360 QB	–	–	–	–	1.8948	–
–	L 450 QB	–	–	–	L 450 QB	L 450 QB	–	–	–	–	1.8952	–
–	S 460 NH (FGS 47)	–	–	–	S 460 NH	–	S 460 NH	–	–	–	1.8953	–
–	EStE620VA/S 620 G 1 QL 1	–	–	–	S 620 G 1 QL 1	–	–	–	–	–	1.8954	–
–	L 485 QB	–	–	–	L 485 QB	L 485 QB	–	–	–	–	1.8955	–
–	S 460 NLH/FG S 47	–	–	–	S 460 NLH	–	S460NLH	–	–	–	1.8956	–
–	L 555 QB	–	–	–	L 555 QB	L 555 QB	–	–	–	–	1.8957	–
–	9 CrNiCuP 3 2 4	WR 50 A	SPA-H	K11430	–	–	–	–	–	–	1.8962	–
–	WTSt 52-3	WR 50 C	SMA 58 W	K11430	S 355 J 2 G 1 W	E 36 W-A2	–	–	–	–	1.8963	–
–	EStE 690 VA	–	–	–	S 690 G1 QL1	–	–	–	–	–	1.8964	–
–	S 355 J 2 G 2 W	S 355 J 2 G 2 W	–	–	S 355 J 2 G 2 W	S 355 J 2 G 2 W	S 355 J 2 G 2 W	–	–	–	1.8965	–
–	S 355 K 2 G 1 W	S 355 K 2 G 1 W	SMA 490 CW	–	S 355 K2 G1 W	S 355 K2 G1 W	S 355 K 2 G 1 W	–	–	–	1.8966	–
–	S 355 K 2 G 2 W	S 355 K 2 G 2 W	–	–	S 355 K2G2W	S 355 K 2 G 2 W	S 355 K 2 G 2 W	–	–	–	1.8967	–
–	QStE 600 TM/S 600 MC	–	–	–	S 600 MC	E 620 D	S 600 MC	–	–	–	1.8969	–
–	StE 415..7/L 415 NB	–	–	–	L 415 NB	L 415 NB	–	–	–	–	1.8972	–
–	StE 415.7 TM/L 415 MB	–	–	–	L 415 MB	L 415 MB	–	–	–	–	1.8973	–
–	S 700 MC (QStE 690 TM)	–	–	–	S 700 MC	E 690 D	S 700 MC	–	–	–	1.8974	–
–	L 450 MB/StE 445.7 TM	–	–	–	L 450 MB	L 450 MB	–	–	–	–	1.8975	–
–	S 650 MC (QStE 650 TM)	–	–	–	S 650 MC	E 620 D	S 650 MC	–	–	–	1.8976	–
–	L 485 MB/StE 480.7 TM	–	–	–	L 485 MB	L 485 MB	–	–	–	–	1.8977	–
–	StE 550.7 TM/L 555 MB	–	–	–	L 555 MB	L 555 MB	–	–	–	–	1.8978	–

(continuação)

P4 Lista dos materiais das peças • Aço • P4 *(continuação)*

Aços-liga e aços ferramenta P4 *Teor: C>.25%* *Resistência a Tensão RM (MPa)*: 850–1400* *Dureza (HB): 350–450 (HRC): 35–48*

AISI**	DIN	BTS	JIS	UNS	EN	AFNOR	UNI	SIS	SAE	ASTM	Número do Material	Referência do fabricante
A 570 Gr. 50	St 50-2	4360-50 B	SS 50	–	E 295	A 50-2	Fe 490	2172	–	–	1.0050	–
–	St 60-2	4360-55 E	SM 58	–	E 335	A 60-2	Fe 60-2	1650	–	–	1.0060	–
–	St 70-2	E 360	–	–	E 360	A 70-2	Fe 70-2	1655	–	–	1.0070	–
–	C4D	–	–	–	C 4 D	FM 5	C 4 D	–	–	–	1.0300	–
–	C 22 8	–	–	–	P 250 GH	–	–	–	–	–	1.0460	–
–	H 260/ZSt E 260	H 240 LA	–	–	H 240 LA	E 240 C	–	–	–	–	1.0480	–
–	ZStE 380/H 380	H 360 L A	–	–	H 360 LA	E 355 C	–	–	–	–	1.0550	–
–	GL-E - 40 (S 390 G 3 S)	–	–	–	S 390 G 3 S	–	–	–	–	–	1.0560	–
–	C60D	–	–	–	C 60 D	FM 60	C 60 D	–	–	–	1.0610	–
–	C 64/64 Mn 3	–	–	–	C 64	–	–	–	–	–	1.0640	–
–	38 SMn 28	38 SMn 28	–	–	38 SMn 28	38 SMn 28	–	–	–	–	1.0760	–
–	QSt E 260 TM/5260 MC	–	–	–	S 260 MC	41 S 7	Fe E 275 TM	–	–	–	1.0970	–
–	C3D2	–	–	–	C 3 D 2	FM 5	C 3 D 2	–	–	–	1.1110	–
1330	28 Mn 6	150 M 28	SCMn 1	G 13300	28 Mn 6	35 M 5	C 28 Mn	–	–	–	1.1170	–
–	C 42 E Al/Ck 42 Al	–	–	–	S 355 G15	–	–	–	–	–	1.1190	–
–	C56D2/D 55-2	–	–	–	C 56 D 2	FM 56	C 56 D 2	–	–	–	1.1220	–
–	C 70 W1	–	–	–	CT 70	C 70 E 2 U	C 70 K U	–	–	–	1.1520	–
–	C 70 W2	–	–	–	C 70 U	–	–	–	–	–	1.1620	–
–	C 45 W	–	–	–	C 45 U	Y3 42	–	–	–	–	1.1730	–
–	C 60 W	–	SK 7	–	–	Y3 55	–	–	–	–	1.1740	–
–	100 CrMn 6	–	–	K19195	100 CrMn 6	100 CM 6	–	–	–	–	1.3520	–
–	28 B 2	–	SWRCHB 26	–	C 30 B	20 B 3	–	–	–	–	1.5510	–
5130	28 Cr 4	530 A 30	–	G51300	28 Cr 4	30 CD 4	–	–	–	–	1.7030	–
–	S 420 G1 M	–	–	–	P 550 M	–	–	–	–	–	1.8830	–
–	St E 380	–	SM 50 B	–	S 380 N	–	Fe E 390 KG	–	–	–	1.8900	–
–	TStE 380/ S380NL	–	–	–	S 380 NL	–	Fe E 390 KT	2117	–	–	1.8910	–
–	TStE 690 VA/ S690G1QL	–	–	–	S 690 G 1 QL	–	–	–	–	–	1.8920	–
–	WSt E 380/ P380Nh	–	–	–	P 380 NH	–	Fe E 390 KW	2116	–	–	1.8930	–
–	S 890 Q	–	–	–	S 890 Q	S 890 Q	S 890 Q	–	–	–	1.8940	–

P5 Lista dos materiais das peças • Aço • P5

P5 Aços Inoxidáveis Ferríticos, Martensíticos e PH de Alta Resistência *Resistência a Tensão RM (MPa)*: 600–900* *Dureza (HB): <330 (HRC): <35*

AISI**	DIN	BTS	JIS	UNS	EN	AFNOR	UNI	SIS	SAE	ASTM	Número do Material	Referência do fabricante
410 S	X 7 Cr 14	–	–	–	–	–	–	–	–	–	1.4001	–
405	X 6 CrAl 13	405 S 17	SUS 405	S40500	X 6 CrAl 13	Z 6 CA 13	X 6 CrAl 13	2302	–	–	1.4002	–
–	X 2 CrNi 1 2	–	–	–	Hyfab3/12	CLC4003	F12N(Mn<1,50)	–	–	–	1.4003	–
416	X 12CrS 13	416 S 21	SUS416	S41600	X 12 CrS 13	Z 12 CF 13	X12CrS13	2380	–	–	1.4005	ATI 416™
410	X 12Cr 13	410 S 21	SUS410	S 41000	(X 12 Cr 13 KD)	Z 12 C 13	X12Cr13	2302	–	–	1.4006	ATI 410™
414	GX 8 CrNi 1 3	410 C 21	SCS 1	S41400	GX 7 CrNiMo 12-1	Z 12 CN 13 M	GX 12 Cr 13	–	–	–	1.4008	–
–	X 8 Cr 14	–	SUS Y 410	S41080	X 8 Cr 13 KE	–	–	–	–	–	1.4009	B13Fe
–	GX 12 Cr 1 2	–	–	–	GX12Cr12	GX12Cr12	–	–	–	–	1.4011	–
–	N 3 2 0 (LW)	–	–	–	3S62	–	–	–	–	–	1.4014	–
–	X 8 Cr 18	–	SUS Y 430	S43080	–	–	–	–	–	–	1.4015	B17Fe
430	X 8 Cr 17	430 S 15	SUS430	S 43000	X 8 Cr 17	Z8C17	X8Cr17	2320	–	–	1.4016	ATI 430™
–	X 6 CrNi 17 1	–	–	–	X6CrNi17-1	F17N	X6CrNi17-1	–	–	–	1.4017	–
420	X20Cr13	420 S 37	SUS 420J1	S42000	X 20 Cr 13	Z20C13	X20Cr13	2303	–	–	1.4021	ATI 420™
403	X 15 Cr 13	420 S 29	SUS 410 J1	J91201	X 15 Cr 13	Z 12 C 13 M	X 12 Cr 13	2301	–	A403M	1.4024	ATI 403™
–	GX 20 Cr 1 4	420 C 29	SCS 2	–	–	Z 20 C 13 M	–	–	–	A743-4	1.4027	–
420	X 40 Cr 13	–	SUS 420 J2	S42080	X 40 Cr 13	Z 40 C 14	X 40 Cr 14	2304	–	–	1.4031	–
–	GX 120 Cr 29	425 C 11	–	–	–	–	–	–	–	F30C	1.4086	–
430 F	X 12 CrMoS 17	441 S 29	SUS 430 F	S 43020	X 14 CrMoS 17	Z 10 CF 17	X 10 CrS 17	2383	–	–	1.4104	–
430	X 4 CrMoS 18	–	SUS 430F	–	X 6 CrMoS 17	Z 6 CDF 18 - 02	–	–	–	–	1.4105	–
–	X 2 CrMoSiS 18 2 1	–	–	J91151	–	–	–	–	–	CA15	1.4106	–
–	GX 8 CrNi 1 2	–	–	–	GX 8 CrNi 12	GX8CrNi 12	G X 8 CrNi 12	–	–	–	1.4107	–
434	X 6CrMo 17	434 S 17	SUS434	S43400	434S17	Z8CD17-01	X8CrMo17	2325	–	–	1.4113	AL 434
–	X 15 CrMo 13	–	–	–	–	–	–	–	–	–	1.4119	–
–	GX 70 CrMo 29 2	–	–	–	–	Z 60 CD 29.2 M	–	–	–	–	1.4136	–
–	X 2 CrNi 24 12	309 S 93	–	–	X 2 CrNi 24 13 KE	Z 2 CN 24-14	–	–	–	–	1.4332	CN23/12-IG
–	X 5 NiCr 32 21	–	–	S33200	–	–	–	–	–	B536	1.4333	H521
–	GX 5 CrNiMo 16 5	–	–	–	GX 4 CrNiMo 16-5-1	GX4CrNiMo 16-5-1	G X 4 CrNiMo 16-5-1	–	–	–	1.4405	–
–	ERO 4411 A	–	–	–	GX 4 CrNiMo 16-5-2	GX 4 CrNiMo 16-5-2	–	–	–	–	1.4411	–
–	X 38 CrMo 14	–	–	–	–	–	–	–	–	–	1.4419	–
–	X 8 CrTi 18	–	–	–	X 6 Cr 18 KE	–	–	–	–	–	1.4502	–
430 Nb	X 6 CrNb 17	–	SUS 430 LX	–	X 3 CrNb 17	Z 8 CNb 17	X 6 CrNb 17	–	–	–	1.4511	AXC525
409	X 6 CrTi 12	409 S 19	SUH 409	S40900	X 5 CrTi 12	Z 6 CT 12	X 6 CrTi 12	–	–	–	1.4512	–
–	X 6 CrNiTi 12	–	–	–	X 6 CrNiTi 12	X 6 CrNiTi 12	X 6 CrNiTi 12	–	–	–	1.4516	–
–	X 2 CrTi 17	–	SUS 430 LX	–	X 2 CrTi 17	F 20T	X 2 CrTi 17	–	–	–	1.4520	–
–	X 8 CrMoTi 17	–	–	–	X 2 CrMoTiS 18 2	X2CrMoTiS18-2	–	–	–	–	1.4523	1802
–	GX 5 CrNiCu 16 4	–	–	–	GX 5 CrNiCu 16-4	GX 5 CrNiCu 16-4	–	–	–	–	1.4525	–
–	X 6 CrMoNb 17 1	–	–	–	X 6 CrMoNb 17-1	X6CrMoNb 17-1	F 17 MNb	–	–	–	1.4526	–
904 L	X 1 NiCrMoCuN 25 20 5	904 S 13	–	N08904	X 1 NiCrMoCuN 25 20 5	Z 1 NCDU 25 20	–	2562	–	–	1.4539	ATI 904L™
348	X 5 CrNiNb 18 10	S 527	–	J92640	–	–	X 6 CrNiNb 18 11	–	–	–	1.4546	ATI 348™
–	X 5 CrNiNb 19 9	–	SUS Y 347	S34780	X 5 CrNiNb 20 10 KE	Z 6 CNNb 20-10	–	–	–	–	1.4551	–
–	GX 7 NiCrMoCuNb 42 20	–	–	–	GX 7 NiCrMoCuNb 4220	–	–	–	–	–	1.4559	–
–	X 5 CrNiMoNb 19 12	318 S 96	–	S31980	X 5 CrNiMoNb 19 12 03 KE	Z 4 CNDSNb 19-12-03	–	–	–	–	1.4576	–
–	X 2 CrAlTi 18 2	–	–	–	X 2 CrAlTi 18-2	DMV 59	X 2 CrAlTi 18-2	–	–	–	1.4605	–
–	X 10 CrAl 7	–	–	–	X 10 CrAl 7	–	–	–	–	–	1.4713	–

NOTA: Para a legenda, veja a página Y217.

(continuação)

P5 Lista dos materiais das peças • Aço • P5 *(continuação)*

P5 Aços Inoxidáveis Ferríticos, Martensíticos e PH de Alta Resistência *Resistência a Tensão RM (MPa)*: 600–900* *Dureza (HB): <330 (HRC): <35*

AISI**	DIN	BTS	JIS	UNS	EN	AFNOR	UNI	SIS	SAE	ASTM	Número do Material	Referência do fabricante
–	X 215 Cr 12	–	–	–	–	–	–	–	–	–	1.4721	–
H-12	X 10 CrAl 13	BH 12	SUS 405	T20812	X 10 CrAl 13	Z 10 C 13	X 10 CrAl 12	–	–	–	1.4724	–
430	X 10 CrAl 18	(430 S 15)	SUH 21	S43000	–	Z 10 CAS 18	(X 8 Cr 17)	–	–	–	1.4742	–
446	X 10 CrAl 25	–	SUH 442	S44600	X 10 CrAl 24	Z 10 CAS 24	X 16 Cr 26	2322	–	–	1.4762	–
–	GX 40 CrNiSi 27 4	–	–	J92605	–	–	–	–	–	–	1.4823	–
–	X 12 CrNi 22 12	311 S 94	SUS Y 309	S30980	X 15 CrNi 23 13	–	X 16 CrNi 23 14	–	–	309	1.4829	–
–	X 9 CrNiSiNCe 21 11 2	–	–	–	X 9 CrNiSiNCe 21-11-2	–	–	–	–	–	1.4835	–
314	X 15 CrNiSi 25 20	314 S 25	SUH 310	S31400	X 15 CrNiSi 25 20	Z 15 CNS 25.20	X 16 CrNiSi 25 20	–	–	–	1.4841	Cronifer® 2520
–	X 12 CrNi 25 20	310 S 94	–	S31080	X 12 CrNi 26 21 KE	Z 12 CN 26-21	–	–	–	–	1.4842	–
–	CrNi 25 20	–	SCS 18	S31400	–	–	–	–	–	–	1.4843	–
310 S	X 12 CrNi 25 21	310 S 24	SUS 310 S	S31008	X 8 CrNi 25 21	Z 12 CN 25.20	X 6 CrNi 25 20	2361	–	–	1.4845	ATI 310S™
HK	X 40 CrNiSi 25 20	310 C 40	SCH 21	J94204	–	–	GX 40 CrNi 26 20	–	–	–	1.4848	–
–	GX 40 NiCrSiNb 38-18	–	–	–	3072.76	–	–	–	–	–	1.4849	–
–	GX 10 NiCrNb 32 20	–	–	J95151	–	–	–	–	–	–	1.4859	–
330	X 12 NiCrSi 35 16	NA 17	SUH 330	N08330	X 12 NiCrSi 35 1 6	Z 12 NCS 37.18	–	–	–	–	1.4864	–
–	X40NiCrSi38-18	330 C 40	SCH15/SCH16	J94605	330C11/330C40/331C40	–	GX50NiCr39-19	–	–	–	1.4865	–
–	GX 50 CrNi 30-30	–	–	N08801	–	Z5NCT3220	–	–	–	–	1.4868	–
B163	X 10 NiCrAlTi 32 20	NA 15	NCF800(TP)	–	NA15(H)	Z10NC32.21	–	–	B163	–	1.4876	B163
–	X 6 NiCrNbCe 32 27	–	–	–	X 6 NiCrNbCe 32-27	–	–	–	–	–	1.4877	–
–	X 12 NiCrSi 35 19	–	–	N08830	X1 0 NiCrSi 35 19	–	–	–	–	–	1.4886	330
–	X 10 NiCrSiNb 35 22	–	–	–	X10NiCrSiNb35-22	–	–	–	–	–	1.4887	–
–	X 10 CrMoV 9 1	–	–	S59180	X 10 CrMoV 9-1	–	–	–	–	–	1.4903	–
–	X 20 CrMoV 12 1	–	–	–	X 20 CrMoV 11-1	–	X 20 CrMoV 12 01 KW	2317	–	–	1.4922	–
–	GX 22 CrMoV 12 1	–	–	–	G-X 22 CrMoV 12 1	GX23CrMoV12-1	G X 23 CrMoV 12-1	–	–	–	1.4931	–
422	X 20 CrMoWV 12 1	–	SUH 616	S42200	–	–	X 22 CrMoWV 12 1	–	–	–	1.4935	–
661	X 12 CrCoNi 21 20	–	SUH 661	R30155	–	–	–	–	–	–	1.4971	–
R30155	X 12 CrCoNiMoWNb 21 20 20	–	–	R30155	X 12 CrCoNiMoWNb 21 20 20	Z 12 CKNDWNb 21.20.20	N-155	–	–	–	1.4974	–
–	X 40 CoCrNi 20 20	–	–	–	–	Z 42 CNKDWNb	–	–	–	–	1.4977	–
403	X 6 Cr 13	403 S 17	SUS 403	S 40300	X 6 Cr 13	Z 6 C 13	X 6 Cr 13	2301	–	A240	1.4000	ATI 410S™
439	X 6 CrTi 17	–	SUS 430 LX	S 43035	X 8 CrTi 1 7	Z 8 CT 1 7	X 6 CrTi 17	–	–	–	1.4510	430 Ti
–	X 22 CrMoV 1 -1 = ST12T	–	–	–	–	–	–	–	–	A437-76 Classe B4B	–	ATI FV448™
409 Cb	–	–	–	–	–	–	–	–	–	–	–	ATI 409Cb™
436 S	–	–	–	–	–	–	–	–	–	–	–	ATI 436S™
439 HP	–	–	–	S43035	–	–	–	–	–	–	–	ATI 439 HP™
441 HP	–	–	–	–	–	–	–	–	–	–	–	ATI 441 HP™
–	–	–	–	S44735	–	–	–	–	–	A240	–	AL 29-4C®
–	–	–	–	–	–	–	–	–	–	B625	–	ATI E-BRITE®
403Cb	–	–	–	–	–	–	–	–	–	–	–	T656
420 modificado	–	–	–	–	–	–	–	–	–	–	–	Stavax ESR
–	–	–	–	–	–	–	–	–	–	–	–	420HC
–	–	–	–	–	–	–	–	–	–	–	–	CPM 154
–	–	–	–	–	–	–	–	–	–	–	–	CPM® S30V®
–	–	–	–	–	–	–	–	–	–	–	–	CPM® S35VN®
420 V	–	–	–	–	–	–	–	–	–	–	–	CPM® S90V®
–	–	–	–	–	–	–	–	–	–	–	–	M390
422	–	–	–	S42200	–	–	–	–	–	–	–	616

P6 Lista dos materiais das peças • Aço • P6

P6 Aços Inoxidáveis Ferríticos, Martensíticos e PH de Alta Resistência
Dureza (HB): 350–450 (HRC): 35–48
Resistência a Tensão RM (MPa): 900–1350*

AISI**	DIN	BTS	JIS	UNS	EN	AFNOR	UNI	SIS	SAE	ASTM	Número do Material	Referência do fabricante
–	17-7 PH	301 S 81	SUS 631	S17700	X 7 CrNiAl 17-7	X7CrNiAl17-7;Z9CNA17-07	X 7 CrNiAl 17-7	2388	–	A693	1.4564	ATI 17-7™
–	GX 22 CrNi 17	ANC 2	–	J91803	–	Z 20 CN 17.2 M	–	–	–	CB30	1.4059	–
–	GX 30 CrSi 6	–	–	–	–	–	–	–	–	–	1.4710	–
–	GX 4 CrNi 13 4	–	–	–	GX 4 CrNi 13-4	GX 4 CrNi 13-4	GX 4 CrNi 13-4	–	–	–	1.4317	–
–	GX 40 CrSi 17	–	–	–	–	–	GX 35 Cr 17	–	–	–	1.4740	–
–	GX 40 CrSi 24	–	SCH 1	–	–	–	GX 35 Cr 13	–	–	–	1.4745	–
–	GX 40 CrSi 28	452 C 11	SCH 2	J92605	–	–	GX 35 Cr 28	–	–	CC50	1.4776	–
–	X 105 CrCoMo 18 2	–	–	–	–	–	–	–	–	–	1.4528	N690
440 C	X 105CrMo 17	–	SUS 440C	S44004	X 105 CrMo 17	Z 100 CD 17	X 105 CrMo 17	–	–	–	1.4125	ATI 440C™
–	X 110 CrMoV 15	–	SUS 430 LX	–	–	Z 4 CN b 17	X 6 CrNb 17	–	–	–	1.4111	–
5718.9	X 12 CrNiMo 12	S.151	–	S64152	–	Z12CNDV12	–	–	–	–	1.4939	ATI Jethete™ M152
–	X 12 CrNiMoV 12 3	–	–	–	X 12 CrNiMoV 12-3	X 12 CrNiMoV 12-3	–	–	–	–	1.4938	T522
–	X 15 TN	–	–	–	420S25	Z40CDV16-02	X40CrMoVN16-2	–	–	F899	1.4123	X 15 TN
15-5 PH	X 15 U 5 W	–	–	S15500	–	Z6CNU15.05	–	–	–	A564/ A693/A705	1.4545	ATI 15-5™
–	X 19 CrMoNbVN 11 1	–	–	–	–	Z 21 CDNbV 11	–	–	–	–	1.4913	Jethete X19
431	X 19 CrNi 17 2	431 S 29	SUS 431	S 43100	X 19 CrNi 17 2	Z 15 CN 16.02	X 16 CrNi 16	2321	–	–	1.4057	431 (HT)
–	X 20 CrMo 17 1	–	–	–	–	–	–	–	–	–	1.4115	B17MoFe
420F Mod	X 22 CrMoNiS 13 1	–	–	–	–	–	–	–	–	–	1.4121	Bioline 4C27A
–	X 22 CrMoV 12 1	762	–	–	X 22 CrMoV 12-1	Z 21 CDV 12	X 22 CrMoV 12 1	–	–	–	1.4923	Jethete X20
420	X 29 CrS 13	416 S 37	SUS 416	–	X 29 CrS 13	Z29CF13	X 29 CrS 13	–	–	–	1.4029	–
–	X 3 CrNiCuTi 12 9	–	–	S45500	–	–	X 6 CrNiNb 18 11	–	–	–	1.4543	ATI 455™
13-8 PH	X 3 CrNiMoAl 13 8 2	–	–	S13800	–	Z4 CNDAT 13 09	–	–	–	–	1.4534	ATI 13-8Mo™
420 F	X 30 Cr 13	420 S 45	SUS420J2	S42020	X 30 Cr 13	Z 30 C 13	X 30 Cr 13	2304	–	CA40	1.4028	–
–	X 30CrMoN 15 1	–	–	–	420S45	Z33C13	–	2304	–	–	1.4108	N360
–	X 35 CrMo 17	–	–	–	X 39 CrMo 17 1	X39CrMo17-1	X 35 CrMo 17	–	–	–	1.4122	–
–	X 4 CrNiCuNb 16 4	–	–	J92200	–	Z 4 CNUNb 16.4 M	–	–	–	–	1.4540	–
415 M	X 4 CrNiMo 16 5 1	–	–	–	X 4 CrNiMo 16 5 1	Z 6 CND 16.05.01	–	2387	–	–	1.4418	APX4
–	X 40 CrNi 25 21	310 S 98	SCH 13	–	–	–	–	–	–	–	1.4846	–
–	X 40 CrSiMo 10 2	–	SUH3	–	X 40 CrSiMo 10-2	Z40CSD10	–	–	–	–	1.4731	–
420	X 45 Cr 13	(420 S45)	–	–	X 45 Cr 13	Z 40 C 14	X 40 Cr 14	–	–	–	1.4034	–
–	X 45 CrMoV 15	–	–	–	X 50 CrMoV 15	Z 50 CD 15	X 50 CrMoV 15	–	–	–	1.4116	UGI 4116N
HNV3	X 45 CrSi 9 3	–	SUH1	–	401S45	Z45CS9	X45CrSi8	–	HNV3	–	1.4718	–
HNV 2	X 45 SiCr 4	–	–	S64006	–	–	–	–	–	–	1.4704	–
CA 6-NM	X 5 CrNi 134	425 C 11	SCS 5	J91540	X 3 CrNiMo 13 4	Z 4 CDN 13.4	X 6 CrNi 13 04	2385	–	–	1.4313	–
630	X 5 CrNiCuNb 16 4	–	SUS 630	–	X 5 CrNiCuNb 16-4	Z6CNU17.04	–	–	–	CB7Cu	1.4542	UGIMA® 4542
17-4 PH	X 5 CrNiCuNb 17 4 4	–	SUS 630	S17400	X 5 CrNiCuNb 16-4	X5CrNiCuNb16.4	–	–	–	A693	1.4548	–
–	X 5 CrNiMoCuNb 14 5	–	–	–	X 5 CrNiMoCuNb 14-5	X 5 CrNiMoCuNb 14-5	X 5 CrNiMoCuNb 14-5	–	–	–	1.4594	–
–	X 50 CoCrNi 20 20	–	–	–	–	–	–	–	–	–	1.4978	–
EV8	X 53 CrMnNiN 2 9	349 S 54	SUH35/SUH36	S63008	349S54	Z52CMN21.09	X53CrMnNiN21-9	–	EV8	–	1.4871	–
–	X 55 CrMo 14	–	–	–	–	Z 50 CD 13	–	–	–	–	1.4110	–
–	X 60 CrMnMoVNbN 21 10	–	–	–	–	Z 60 CMDVNb 21-10 Az	–	–	–	–	1.4785	–
440 A	X 65 CrMo 14	–	SUS 440A	S44002	X 70 CrMo 15	Z 70 CD 14	–	–	–	–	1.4109	ATI 440A™
–	X 7 CrNiAl 17 7	301 S 81	SUS 631	S17700	X 7 CrNiAl 17-7	X7CrNiAl17-7;Z9CNA17-07	X 7 CrNiAl 17-7	2388	–	A693	1.4568	–
632	X 7 CrNiMoAl 15 7	–	–	S15700	–	–	–	–	–	–	1.4574	PH 15-7 Mo®
–	X 8 CrCoNiMo 10 6	Z 9 CKD 11	–	–	S152	Z10CKD10	–	–	–	–	1.4911	ATI FV535™
15-7 PH	X 8 CrNiMoAl 15 7 2	–	–	S15700	X 8 CrNiMoAl 15-7-2	Z8CNDA15.07	X 8 CrNiMoAl 15-7-2	–	–	A693	1.4532	ATI 15-7™
HNV 6	X 80 CrNiSi 20	443 S 65	SUH 4	S65006	X 80 CrNiSi 20	Z 80 CSN 20.02	X 80 CrSiNi 20	–	–	–	1.4747	–
–	X 85 CrMoV 18 2	–	–	–	X 85 CrMoV 18 2	Z 85 CDMV 18.02	X 85 CrMoV 19 3	–	–	–	1.4748	–
440 B	X 90 CrMoV 18	409 S 1 9	SUS 440 B	S44003	X 90 CrMoV 18	Z 3 CT 1 2	X 6 Cr Ti 1 2	–	–	–	1.4112	–
–	X45CrNiW18-9	331 S 40	SUH31	–	X 45 CrNiW 18 9	Z35CNWS14.14	X45CrNiW18-9	–	–	–	1.4873	–

NOTA: Para a legenda, veja a página Y217.

M1 Lista dos materiais das peças • Aço Inoxidável • M1

M1 Aço inoxidável Austenístico *Resistência a Tensão RM (MPa)*: <600* *Dureza (HB): 130–200*

AISI**	DIN	BTS	JIS	UNS	EN	AFNOR	UNI	SIS	SAE	ASTM	Número do Material	Referência do fabricante
CF-8	X 6 CrNi 18 9	304 C 15	SCS 13	–	X 2 CrNiN 18 7	Z 6 CN 18.10 M	G X 5 CrNi 19-10	2333	–	CF8	1.4308	CF-8
–	X 2 NiCr 18 16	–	–	–	–	Z 3 CDT 18-02	–	–	–	–	1.4321	–
–	X 1 CrNi 25 21	–	–	–	X 1 CrNi 25 21	X1CrNi25-21	X 1 CrNi 25-21	–	–	–	1.4335	Uranus 65
610	X1CrNiSi 18-15-4	–	–	S30600	X 1 CrNiSi 18-15-4	Z1 CNS 17.5	X 1 CrNiSi 18-15-4	–	–	A240-97A	1.4361	ATI 610™
CF-8M	X 6 CrNiMo 18 10	316 C 16	SCS 14	J92900	GX 5 CrNiMo 19-11-2	GX5CrNiMo 19-11-2	G X 5 CrNiMo 19-11-2	2343	–	–	1.4408	–
–	GX 2 CrNiMo 19 11 2	–	–	–	GX 2 CrNiMo 19-11-2	GX 2 CrNiMo 19-11-2	GX 2 CrNiMo 19-11-2	–	–	–	1.4409	–
–	ER0 4412 AHMo	–	–	J92900	GX 5 CrNiMo19-11-3	GX 5 CrNiMo 19-11-3	–	–	–	A743CF8M	1.4412	–
–	ER0 4416 AHCRMo	–	–	–	GX 2 NiCrMoN 25-20-5	GX2NiCrMoN 25-20-5	–	–	–	–	1.4416	–
–	GX 6 CrNiMo 18 12	317 C 12	–	–	–	–	–	–	–	–	1.4437	–
–	X 2 CrNiMo 18 16 5	–	–	S31780	–	–	–	–	–	–	1.4440	–
–	GX 2 CrNiMoN 17 1 3 4	–	–	–	GX 2 CrNiMoN 17 1 3 4	–	–	–	–	–	1.4446	–
–	GX 6 CrNiMo 17 13	317 C 16	–	J93000	–	–	–	–	–	CG8M	1.4448	–
–	GX 2 NiCrMo 28 20 2	–	–	–	GX 2 NiCrMo 28-20-2	GX 2 NiCrMo 28-20-2	GX 2 NiCrMo 28-20-2	–	–	–	1.4458	–
–	GX 4 NiCrCuMo 30 20 4	–	–	–	GX 4 NiCrCuMo 30-20-4	GX 4 NiCrCuMo 30-20-4	–	–	–	–	1.4527	–
–	GX 5 CrNiNb 18 9	347 C 17	SCS 21	J92710	GX 5 CrNiNb 19-11	Z 4 CNNb 19.10 M	G-X 5 CrNiNb 19-11	–	–	–	1.4552	–
–	GX 2 CrNiMoCuN 20 18 6	–	–	–	GX 2 CrNiMoCuN 20-18-6	GX 2 CrNiMoCuN 20-18-6	–	–	–	–	1.4557	–
–	X 3 CrNiCuMo 17 11 3 2	–	–	–	X 3 CrNiCuMo17 11 3 2	X3CrNiCuMo 17-11-3-2	X 3 CrNiCuMo 17-11-3-2	–	–	–	1.4578	–
–	GX 5 CrNiMoNb 18 10	318 C 17	SCS 22	–	GX 5 CrNiMoNb 19-11-2	Z 4 CNDNb 18.12 M	GX 6 CRNOMONB 20 11	–	–	–	1.4581	–
–	GX 2 NiCrMoCu 25 2 0 5	–	–	–	GX 2 NiCrMoCu 25-20-5	GX 2 NiCrMoCu 25-20-5	–	–	–	–	1.4584	–
–	GX 7 CrNiMoCuNb 18 18	–	–	J94651	–	–	–	–	–	–	1.4585	–
–	GX 2 NiCrMoCuN 29 25 5	–	–	–	GX 2 NiCrMoCuN 29-25-5	GX 2 NiCrMoCuN 29-25-5	–	–	–	–	1.4587	–
–	GX 2 NiCrMoCuN 25 20 6	–	–	–	GX 2 NiCrMoCuN 25-20-6	GX 2 NiCrMoCuN 25-20-6	–	–	–	–	1.4588	–
–	GX 25 CrNiSi 18 9	302 C 35	–	J92602	–	–	G X 16 CrNi 20 10	–	–	CF20	1.4825	–
–	GX 40 CrNiSi 22 9	–	SCH 12	J92603	–	–	–	–	–	–	1.4826	–
–	GX 50 CrNiNb 25 22	–	–	–	–	–	–	–	–	–	1.4836	–
–	GX 40 CrNiSi 25 12	309 C 30	SCS 17	J93503	–	–	GX 35 CrNi 25 12	–	–	CE30	1.4837	–
334	X 8 CrNiAlTi 20 20	–	–	S33400	–	–	–	–	–	–	1.4847	ATI 334™
–	GX 40 NiCrSiNb 38 18	–	–	N08004	–	–	–	–	–	–	1.4849	–
–	GX 40 NiCrSiNb 35 25	–	–	–	–	–	–	–	–	–	1.4852	–
–	GX 40 NiCrSi 35 25	–	–	J95705	–	–	GX 50 NiCr 35 25	–	–	–	1.4857	–
105 MA	BGH 4892	–	–	–	–	–	–	–	–	–	1.4892	–
–	X 3 CrNi 18 11	–	–	–	–	–	X 2 CrNiN 18 11	–	–	–	1.4949	–
–	X 2 CrNiMo 19 12	316 S 93	–	S31683	x 2 CrNiMo 19 13 03 KE	Z 2 CND 19-12-03	–	–	–	–	1.4430	–
–	GX 7 NiCrMoCuNb 25 20	–	SCS 23	J95150	10.204.3.1B	Z 3 NCDU 25.20 M	GX 5 NiCrCuMo 29 21	–	–	–	1.4500	–
–	X 3 CrNiCu 19 9 2	–	–	–	S 124 M	PHYHQ 4560	304 RH1	–	–	–	1.4560	ACX276
–	–	–	–	S63198	–	–	–	–	19-9 DL	–	–	19-9 DL
–	X 2 CrNiMoN 17 13 3	–	–	–	–	Z 2 CND 17.13	X 2 CrNiMoN 17 13 3	–	–	–	–	–
332	–	–	–	N08800	–	–	–	–	–	–	–	ATI 332™
–	–	–	–	N08367	–	–	–	–	–	–	–	AL-6XN®
611	–	–	–	S30601	–	–	–	–	–	A240-97A	–	ATI 611™

M2 Lista dos materiais das peças • Aço Inoxidável • M2

M2 Aços Inoxidáveis Austeníticos de Alta Resistência e Aços Inoxidáveis Fundidos *Resistência a Tensão RM (MPa)*: 600–800*
Dureza (HB): 150–230 (HRC): <25

AISI**	DIN	BTS	JIS	UNS	EN	AFNOR	UNI	SIS	SAE	ASTM	Número do Material	Referência do fabricante
304 H	X 5 CrNi 18 10	304 S 15	SUS 304	S30409	X 6 CrNi 18 10 KD	Z 6 CN 18.09	X 5 CrNi 18 10	2332	–	–	1.4301	–
–	X 5 CrNi 19 9	308 S 96	–	S30888	X 6CrNi 20 10 KE	–	–	–	–	–	1.4302	–
305	X 4 CrNi 18 12	305 S 19	SUS 305	S30500	X 4 CrNi18 12 KD	Z 5 CN 18.12	X 4 CrNi 19 10	–	–	–	1.4303	–
303	X 10 CrNiS 18 9	303 S 21	SUS 303	S30300	X 10 CrNiS 18 9	Z 10 CNF 18.09	X 10 CrNiS 18 09	2346	–	–	1.4305	ATI 303™
304 L	X 2 CrNi 19 11	304 C 12	SUS 304L	S30403	X 3 CrNi18 10 KD	Z 2 CN 18.09	GX 2 CrNi 19 10	2352	–	CF3	1.4306	ATI 304L™
304 L	X 2 CrNi 18 9	304 S 11	SUS 304L	–	X 2 CrNi 18 9	CLC18.9.L	X 2 CrNi 18-9	–	–	–	1.4307	–
–	GX 2 CrNi 19 11	304 C 12	–	J92500	GX2CrNi19-11	GX2CrNi19-11	GX2CrNi19-11	2352	–	CF3	1.4309	–
304 LN	X 2 CrNiN 18 10	304 S 62	SUS 304 LN	S30453	X 2 CrNiN 18 10	Z 8 CN 18.12	X 8 CrNi 19 10	2371	–	–	1.4311	–
305	GX 10 CrNi 18 8	302 C 25	SCS 12	–	–	Z 10 CN 18.9 M	–	–	–	–	1.4312	ATI 305™
308 L	X 2 CrNi 19 9	308 S 92	SUS Y 308L	S30883	X 2 CrNi 20 10 KE	Z 2 CN 20.10	–	–	–	–	1.4316	–
–	X 2 CrNiN 18 7	–	–	–	X 2 CrNiN 18-7	18-7L	18-7L	–	–	–	1.4318	–
302	X 10 CrNi 18 9	302 S 26	SUS 302	S20200	302S31	Z10CN18-09	X 10 CrNi 18 09	2330	–	–	1.4319	ATI 302™
301	X 10 CrNi 18 9	302 S 26	–	J92501	X 10 CrNi 18 9	–	–	–	–	–	1.4324	–
–	X 10 CrNi 30 9	312 S 94	–	–	X 12 CrNi 30 09 KE	Z 10 CN 31-10	–	–	–	–	1.4337	–
–	X 3 CrNi 13 4	–	–	S41086	X 3 CrNi 14 04 KE	–	–	–	–	–	1.4351	410NiMo
202	X 3CrMnNiN 18 8 7	–	–	–	284S16	Z8CMN18-08-05	–	–	–	–	1.4371	–
201	X 12 CrMnNiN 17 7 5	284 S 16	SUS 201	–	X 12 CrMnNiN 17-7-5	X 12 CrMnNiN17-7-5	X 12 CrMnNiN 17-7-5	–	–	–	1.4372	ACX060
316	X 5 CrNiMo 17 12 2	316 S 16	SUS 316	S31600	X6 CrNiMo 17 12 2 KD	Z 6 CND 17.11	X 5 CrNiMo 17 12	2347	–	–	1.4401	ATI 316™
316L	X 2 CrNiMo 17 13 2	316 S 12	SUS 316 L	S31603	GX 3 CrNiMo 17 12 2 KD	Z 3 CND 19.10 M	GX 2 CrNiMo 19 11	2348	–	–	1.4404	ATI 316L™
316 LN	X 2 CrNiMoN 17 12 2	316 S 61	SUS 316 LN	S31653	X 3 CrNiMoN 17 12 2	Z 2 CND 17.12 Az	X 2 CrNiMoN 17 12	2353	–	–	1.4406	ATI 316LN™
–	X 5 CrNiMo 13 4	–	–	J91550	–	Z 6 CND 16.05.01	–	–	–	–	1.4407	–
–	X12CrNiMoS18-11	–	–	–	–	Z3CNDF17-13	–	–	–	–	1.4427	Chronifer® Special KL
316L	X 2 CrNiMo 17 12 3	316 S 13	SUS 316L	–	X 2 CrNiMo 17 12 2	Z 3 CND 17-13-30	X 2 CrNiMo 17-12-3	2348/2353/2354	–	–	1.4432	–
–	X 2 CrNiMoN 18 12 4	–	–	–	317 LN	CLC18.12.4.LN	X2CrNiMoN1812-4	–	–	–	1.4434	–
316 L	X 2 CrNiMo 18 14 3	316 S 11	SCS 16	S31603	X 2 CrNiMo 18 16	Z 2 CND 17.13	X 2 CrNiMo 17 13	2353	–	–	1.4435	–
316	X 5 CrNiMo 17 1 3 3	316 S 16	SUS 316	S31600	X6 CrNiMo 18 13 3 KD	Z 6 CND 17.12	X 5 CrNiMo 17 13	2343	–	–	1.4436	–
317 L	X 2 CrNiMo 18 16 4	317 S 12	SUS 317 L	S31703	X 3 CrNiMo 18 16 4	Z 2 CND 19.15	X 2 CrNiMo 18 15	2367	–	–	1.4438	ATI 317L™
–	X 2 CrNiMoN 17 13 5	–	–	–	X 3 CrNiMo 17 13 5	Z 3 CND 18.14-05 AZ	–	–	–	–	1.4439	–
–	X 2 CrNiMo 18 15 4	–	–	S31675	–	X 3 CrNiMoN 19-14	–	–	–	–	1.4442	–
317	X 5 CrNiMo 17 13	317 S 16	SUS 317	S31700	–	–	X 5 CrNiMo 18 15	–	–	–	1.4449	AL 317L+E55
–	X 5 CrNiCuNb 16 4	–	–	–	–	Z7CNU16.04	–	–	–	–	1.4452	–
–	–	–	–	S21904	–	–	–	–	–	A666	1.4454	ATI 219
–	X 2 CrNiMnMoN 20 16	–	–	–	X 2 CrNiMnMoN 20 15 08 KE	–	–	–	–	–	1.4455	–
–	X 1 CrNiMoN 25 2 5 2	–	–	S31050	–	–	–	–	–	–	1.4465	2RE69

(continuação)

M2 Lista dos materiais das peças • Aço Inoxidável • M2 *(continuação)*

M2 Aços Inoxidáveis Austeníticos de Alta Resistência e Aços Inoxidáveis Fundidos ***Resistência a Tensão RM (MPa)*: 600–800***
Dureza (HB): 150–230 (HRC): <25

AISI**	DIN	BTS	JIS	UNS	EN	AFNOR	UNI	SIS	SAE	ASTM	Número do Material	Referência do fabricante
–	X 1 CrNiMoN 25 22 2	–	–	–	725 LN	DMV 25.22.2	X 1 CrNiMoN 25-22-2	–	–	–	1.4466	–
–	X 1 NiCrMoCuN 25 20 6	–	–	–	–	–	–	–	–	–	1.4529	Uranus B26 6Mo
–	GX 2 NiCrMoCuN 25 20	–	–	J94650	GX 2 CrNiMoCuN 25-20-6	–	–	–	–	–	1.4536	–
–	X 1 CrNiMoCuN 25 25 5	–	–	–	X 1 CrNiMoCuN 25-25-5	X 1 CrNiMoCuN 25-25-5	X 1 CrNiMoCuN 25-25-5	–	–	–	1.4537	–
321	X 6 CrNiTi 18 10	321 S 12	SUS 321	S32100	X 6 CrNiTi 18 10	Z 6 CNT 18.10	X 6 CrNiTi 18 11	2337	–	–	1.4541	ATI 321™
321	A 700	304 S 31	–	J92630	–	Z 10 CNT 18 11	X 6 CrNiTi 18 11	–	–	–	1.4544	–
–	X 1 CrNiMoCuN 20 18 7	X 1 CrNiMoCuN 20 18 7	–	S31254	X 1 CrNiMoCuN 20-18-7	X 1 CrNiMoCuN 20-18-7	X 1 CrNiMoCuN 20-18-7	–	–	–	1.4547	Uranus B25 6Mo
–	X 2 NiCrAlTi 32 20	–	NCF 800 TB	–	–	–	–	–	–	–	1.4558	–
–	X 1 NiCrMoCuN 31 27 4	–	–	–	X 1 NiCrMoCu 31 27 4	X 1 NiCrMoCuN 31 -27-4	X 1 NiCrMoCuN 31 -27-4	2584	–	–	1.4563	–
–	X 3 CrNiCu 18 9 4	394 S 17	SUS XM7	–	X3CrNiCu18-9-4	304CU	304K	–	–	–	1.4567	–
316 Ti	X 6 CrNiMoTi 17 12 2	320 S 31	SUS 316Ti	–	X 6 CrNiMoTi 17 12 2	Z 6 CNDT 17.12	X 6 CrNiMoTi 17 12	2350	–	–	1.4571	ATI 316Ti™
–	GX 5 CrNiMoNb 23 9	–	–	–	–	–	–	–	–	–	1.4572	–
316 Ti	X 10 CrNiMoTi 18 12	320 S 33	SUS 316Ti	S31635	–	–	X 6 CrNiMoTi 17 13	–	–	–	1.4573	–
318	X 10 CrNiMoNb 18 12	–	–	–	–	–	X 6 CrNiMoNb 17 13	–	–	–	1.4583	–
–	X 2 CrNiCu 19 10	–	–	–	X 2 CrNiCu 19-10	TX 304L	–	–	–	–	1.4650	–
–	X1CrNiMoCuN24-22-8	–	–	S32654	–	–	–	–	–	–	1.4652	654 SMO®
–	153 MA	–	–	S30415	X 6 CrNiSiNCe 19 10	–	–	–	–	–	1.4818	153 MA™
–	X 20 CrNiSi 25 4	–	–	S44635	X 15 CrNiSi 25 4	Z 20 CNS 25.04	X 20 CrNiSi 25 4	–	–	–	1.4821	–
309	X 15 CrNiSi 20 12	309 S 24	SUH 309	S30900	X 15 CrNiSi 20 12	Z 15 CNS 20.12	X 16 CrNiSi 25,20	–	–	–	1.4828	ATI 309™
309 S	X 7 CrNi 23 14	309 S 24	SUS 309 S	J93400	X 12 CrNi 23 13	Z 15 CN 24.13	X 6 CrNi 23 14	–	–	–	1.4833	–
–	353 MA	–	–	S35315	X 6 NiCrSiNCe 35-25	–	–	–	–	–	1.4854	353 MA®
–	X 8 NiCrSi 38 18	NA 17	–	N08330	–	Z 12 NCS 37.18	–	–	–	–	1.4862	–
–	X 33 CrNiMnN 23 8	–	–	–	X 33 CrNiMnN 23-8	X 33 CrNiMnN 23-8	–	–	–	–	1.4866	–
EV 12	X 55 CrMnNiN 20 8	–	–	S63012	X 55 CrMnNiN 20-8	Z 55 CMN 20.08 Az	–	–	–	–	1.4875	–
321	X 12 CrNiTi 18 9	321 S 20	SUS 321	S32100	X 10 CrNiTi 18 10	Z 6 CNT 18.12	X 6 CrNiTi 18.11	2337	–	–	1.4878	ACX315
EV 11	X 70 CrMnNiN 21 6	–	–	S63011	–	–	X 70 CrMnNiN 21 6	–	–	–	1.4881	–
–	X 50 CrMnNiNbN 21 9	–	–	–	X 50 CrMnNiNbN 21-9	Z 50 CMNNb 21.09	–	–	–	–	1.4882	–
–	X 7 CrNiNb 18 10	–	SUS347H	S34709	X7CrNiNb18-10	X7CrNiNb18-10	–	–	–	–	1.4912	–
316 H	X 6 CrNiMo 17 13	316 S 51	–	S31609	X 6 CrNiMo 17 12 2	Z 6 CND 17-13 B	–	–	–	–	1.4919	–
321 H	X 8 CrNiTi 18 10	–	–	–	X 6 CrNiTiB 18-10	Z 6 CNT 18-10 B	X 6 CrNiTiB 11	–	–	–	1.4941	–
A660	X 4 NiCrTi 25 15	HR251	SUH 660	S66286	–	Z 6 NCTDV 25.15 B	–	–	–	–	1.4943	Discaloy
–	X 6 CrNiWNb 16 16	–	–	–	–	–	–	–	–	–	1.4945	–
–	X 6 CrNi 18 11	304 S 51	–	S30480	X 6 CrNi 18 10	Z 6 CN 18-09	X 5 CrNi 18 10 KW	2333	–	–	1.4948	–
–	X 6 CrNi 25 20	–	–	–	310 H	–	–	–	–	–	1.4951	–
–	X 8 CrNiNb 16 13	347 S 51	–	–	–	–	–	–	–	–	1.4961	–
–	Esshete12 50	–	–	S21500	X 10 CrNiMoMnNbVB 15-10-1	X 10 CrNiMoMnNbVB 15-10-1	–	–	–	A213	1.4982	Esshete 1250
–	X 8 CrNiMoBNb 16 16	–	–	–	X 7 CrNiMoBNb 16-16	–	–	–	–	–	1.4986	–
301	X 12 CrNi 17 7	301 S 21	SUS 301	S30100	X 12 CrNi 17 7	Z 12 CN 17.07	X 12 CrNi 17 07	2331	–	–	1.4310	ATI 301™
–	GX 40 CrNi 27 4	–	–	J92615	–	–	GX 35 CrNi 28 05	–	–	–	1.4340	–
304	X 5 CrNi 18 9	304 S 31	SUS 304	S30400	1	Z6CN18.09	X5CrNi1810	2332/2333	–	A276	1.4350	ATI 304™
–	X 15 CrNiMn 18 8	307 S 98	–	–	X 15 CrNiMn 18 08 KE	Z 8 CNM 19-09-07	–	–	–	–	1.4370	–
S32750	GX 10 CrNiMo 18 9	–	SCS 14 A	S32750	X 2 CrNiMoN 25-7-4	Z 5 CND 20.10 M	X 2 CrNiMoN 25-7-4	–	–	–	1.4410	–
–	X 5 CrNiMo 18 11	315 S 16	–	–	–	–	–	2340	–	–	1.4420	–
347	X 6 CrNiNb 18 10	347 S 17	SUS 347	S34700	X 6 CrNiNb 18 10	Z 6 CNNb 18.10	X 6 CrNiNb 18 11	2338	–	–	1.4550	ATI 347™
316 Cb	X 6 CrNiMoNb 17 12 2	318 S 17	–	–	X 6 CrNiMoNb 17 12 2	Z 6 CNDNb 17.12	X 6 CrNiMoNb 17 12	–	–	–	1.4580	–
–	X 3 CrNiMoN 17 13	–	–	–	X 3 CrNiMoN 17-13-3	–	X 2 CrNiMoN 17 12	–	–	–	1.4910	–
–	X 6 CrNi 23 13	–	–	–	309 H	–	–	–	–	–	1.4950	–
A286	X 6 NiCrTiMoVB 25-15-2	286 S 31	–	S66286	X 6 NiCrTiMoVB 21-15-2	–	–	–	–	–	1.4980	Incoloy A 286
XM-19	–	–	–	S20910	–	–	–	–	–	F1314	–	ATI XM-19™
303 plus X	–	–	–	S30310	–	–	–	–	–	XM-5	–	303 plus X
–	X 2 CrNi 18 13 3	–	–	–	–	–	–	–	–	–	–	Staybrite® 4435NCu
218	–	–	–	S21800	–	–	–	–	–	–	–	Nitronic 60
201LN	–	–	–	S20153	–	–	–	–	–	–	–	ATI 201LN™-MIL
–	X 2 CrNiMoN 17 13 3	–	–	–	–	Z 2 CND 17.13	X 2 CrNiMoN 17 13 3	–	–	–	–	AL 316LXN
–	–	–	–	S31675	–	–	–	–	–	F1586	–	ATI REX 734™
–	–	–	–	–	–	–	–	–	–	–	–	P558
–	X 1 NiCrMoCu 22 24 6	–	–	–	–	–	–	–	–	–	–	Uranus B66
–	–	–	–	–	–	–	–	–	–	–	–	ATI Datalloy 2®
–	–	–	–	–	–	–	–	–	–	–	–	ATI Staballoy® AG17®
–	–	–	–	–	–	–	–	–	–	–	–	P530
–	X 1 NiCrMoCu 31 27 4	–	–	N08028	–	–	–	–	–	–	–	Uranus B28
–	–	–	–	–	–	–	–	–	–	–	–	P750
–	–	–	–	–	–	–	–	–	–	–	–	P750-I
–	X 4 CrNiMoN 21 9 4	–	–	–	–	–	–	–	–	F1586	–	M30NW
–	–	–	–	–	–	–	–	–	–	–	–	P550
–	–	–	–	–	–	–	–	–	–	–	–	P580
–	–	–	–	–	–	–	–	–	–	–	–	P650
–	–	–	–	–	–	–	–	–	–	–	–	ATI Datalloy HP™

NOTA: Para a legenda, veja a página Y217.

M3 Lista dos materiais das peças • Aço Inoxidável • M3

M3 Aço inoxidável Duplex *Resistência a Tensão RM (MPa)*: <800* *Dureza (HB): 135–275 (HRC): <30*

AISI**	DIN	BTS	JIS	UNS	EN	AFNOR	UNI	SIS	SAE	ASTM	Número do Material	Referência do fabricante
–	GX 120 CrMo 29 2	–	–	–	–	–	–	–	–	F30M	1.4138	PK324
–	X 2 CrMnNiN 21 5 1	–	–	S32101	–	–	–	–	–	–	1.4162	LDX2101
–	GX 6 CrNiN 26 7	–	–	–	GX 6 CrNiN 26-7	–	–	–	–	–	1.4347	–
S32304	X 2 CrNiN 23 4	–	–	S32304	SAF 2304	35 N	X 2 CrNiN 23-4	2327	–	A240	1.4362	ATI 2304™
S31500	X 2 CrNiMoSi 19 5	–	–	S39215	GX 2 CrNiMoN 25-7-3	GX 2 CrNiMoN 25-7-3	–	2376	–	–	1.4417	–
S31803	X 2 CrNiMoN 22 5 3	318 S 13	SUS 329J 3L	S31803 & S32205	X 2 CrNiMoN 22 5 3	Z 3 CND 22.05 AZ	X 2 CrNiMoN 22-5-3	2377	F51	2205	1.4462	ATI 2205™
–	GX 6 CrNiMo 24 8 2	–	–	–	–	–	–	–	–	–	1.4463	–
–	GX 2 CrNiMoN 25 6 3	–	–	–	GX 2 CrNiMoN 25-6-3	GX 2 CrNiMoN 25-6-3	–	–	–	–	1.4468	–
–	GX 2 CrNiMoN 26 7 4	–	–	J93404	GX 2 CrNiMoN 26-7-4	GX 2 CrNiMoN 26-7-4	GX 2 CrNiMoN 26-7-4	–	–	–	1.4469	–
–	X 2 CrNiMoCuWN 25 7 4	–	–	S32760	X 2 CrNiMoCuWN 25 7 4	X 2 CrNiMoCuWN 25-7-4	X 2 CrNiMoCuWN 25-7-4	–	–	F 55	1.4501	F55
2507	X 2 CrNiMoCuN 25 6 3	–	–	–	X 2 CrNiMoCuN 25-6-3	DMV25.7Cu	329SK	–	–	–	1.4507	Uranus 52N+
–	GX 2 CrNiMoCuWN 25 8 4	–	–	–	X 6 CrNiCu 18 10 4 KD	Z 4 CNUD 17-11-03 FF	–	–	–	–	1.4508	–
–	GX 2 CrNiMoCuN 25 6 3 3	–	–	–	GX 2 CrNiMoCuN 25-6-3-3	GX 2 CrNiMoCuN 25-6-3-3	GX 2 CrNiMoCuN 25-6-3-3	–	–	–	1.4517	–
–	X 4 CrNiMoNb 25 7	–	SCS 22	–	–	–	–	–	–	–	1.4582	PK343
–	BGH 4593	–	–	–	GX 3 CrNiMoCuN 24 6 2 3	–	–	–	–	–	1.4593	Noridur®
329	X 4 CrNiMo 27 5 2	–	SUS 329 J1	S32900	X 3 CrNiMo 27 5 2	X 2 CrNiMo 25-7-3	X 3 CrNiMo 27-5-2	2324	–	A240	1.4460	10RE51
–	GX 2 CrNiMoN 22 5 3	–	–	–	GX 2 CrNiMoN 22-5-3	GX 2 CrNiMoN 22-5-3	GX 2 CrNiMoN 22-5-3	–	–	–	1.4470	–
S32550	–	–	–	S32550	–	–	–	–	–	–	–	Ferralium® liga 255
–	–	–	–	S32003	–	–	–	–	–	–	–	ATI 2003®
–	–	–	–	S80211	–	–	–	–	–	–	–	ATI 2102™
–	–	–	–	S32550	–	–	–	–	–	–	–	ATI 255™
–	–	–	–	S34565	–	–	–	–	–	–	–	ATI 4565™
–	X 2 CrNiMoN 25 6 3	–	–	–	–	–	–	–	–	–	–	Uranus 47N+
–	–	–	–	–	–	–	F60	–	–	32760	–	Zeron® 100

Ferro fundido

K1 Lista de materiais das peças • Ferro fundido • K1

K1 Ferro Fundido Cinzento *Resistência a Tensão RM (MPa)*: 125–500* *Dureza (HB): 120–290 (HRC): <32*

AISI**	DIN	BTS	JIS	UNS	EN	AFNOR	UNI	SIS	SAE	ASTM	Número do Material	Referência do fabricante
–	GG-150HB	–	–	–	GJL-HB 170	–	–	–	–	–	0.6012	–
A48-25 B	GG-15	Classe 150	FC 150	–	GJL-150	FGL 150	G 15	0115-00	–	A 48 Classe 25	0.6015	–
–	GG-170HB	–	–	N06985	GJL-HB 205	–	–	–	–	–	0.6017	–
–	GG-190HB	–	–	N06022	GJL-HB 230	–	–	–	–	–	0.6022	–
A48-35 B	GG-25	Classe 260	FC 250	–	GJL-250	FGL 250	G 25	0125-00	–	A 48 Classe 35	0.6025	–
–	GG-26	–	FC260	–	–	–	G 26	0126-00	–	–	0.6026	–
–	GG-220HB	–	–	W06027	GJL-HB 250	FGL 250	–	–	–	–	0.6027	–
–	GG-240HB	–	–	–	GJL-HB 275	–	–	–	–	–	0.6032	–
A48-50 B	GG-35	Classe 350	FC 350	–	GJL-350	FGL 350	G 35	0135-00	–	A 48 Classe 50	0.6035	–
–	GG-260HB	–	–	–	GJL-HB 275	–	–	–	–	–	0.6037	–
A48-20 B	GG-10	Classe 100	FC 100	–	GJL-100	FGL 100	G 10	0110-00	–	A 48 Classe 20	0.6010	–
A48-30 B	GG-20	Classe 220	FC 200	W06020	GJL-200	FGL 200	G 20	0120-00	–	A 48 Classe 30	0.6020	–
A48-45 B	GG-30	Classe 300	FC 300	–	GJL-300	FGL 300	G 30	0130-00	–	A 48 Classe 45	0.6030	–
A48-55 B	GG-40	Classe 400	–	–	GJL-400	FGL 400	–	0140-00	–	A 48 Classe 55	0.6040	–
A48-40	–	–	–	–	–	–	–	–	–	A 48 Classe 40	–	–
A48-60	–	–	–	–	–	–	–	–	–	A 48 Classe 60	–	–
–	–	–	–	–	–	–	–	–	G1800	A 159 G1800	–	–
–	–	–	–	–	–	–	–	–	G3000	A 159 G3000	–	–
–	–	–	–	–	–	–	–	–	G10H18	A 159 G3000	–	–
–	–	–	–	–	–	–	–	–	G11H18	A 159 G3000	–	–
–	–	–	–	–	–	–	–	–	G3500	A 159 G3500	–	–
–	–	–	–	–	–	–	–	–	G11H20	A 159 G3500	–	–
–	–	–	–	–	–	–	–	–	G4000	A 159 G4000	–	–
–	–	–	–	–	–	–	–	–	G13H19	A 159 G4000	–	–
–	–	–	–	–	–	–	–	–	G12H21	A 159 G4000	–	–
–	–	–	–	–	–	–	–	–	G9H12	A 159 G1800	–	–
–	GG-26-Cr	–	–	–	–	–	–	–	–	–	–	–
–	GG-25-Cr	–	–	–	–	–	–	–	–	–	–	–

K2 Lista de materiais das peças • Ferro fundido • K2

K2 Ferros dúcteis (ferros nodulares) de baixa e média resistência e ferros de grafita compactada (CGI) *Resistência a Tensão RM (MPa)*: <600*
Dureza (HB): 130–260 (HRC): <28

AISI**	DIN	BTS	JIS	UNS	EN	AFNOR	UNI	SIS	SAE	ASTM	Número do Material	Referência do fabricante
–	GGL-NiMn137	L-NiMn 13 7	FCA NiMn 13 7	F43000	GJLA-XNiMn 13-7	L-NM 13 7	–	–	–	–	0.6652	–
A 436 Tipo 1	GGL- NiCuCr1562	L-NiCuCr 15 6 2	FCA -NiCuCr 15 6 2	F41000	GJLA-XNiCuCr 15-6-2	L-NUC 15 6 2	–	–	–	–	0.6655	–
A 436 Tipo 1b	GGL-NiCuCr1563	L-NiCuCr 15 6 3	FCA-NiCuCr 15 6 3	F41001	GJLA-XNiCuCr 15-6-3	L-NUC 15 6 3	–	–	–	–	0.6656	–
A 436 Tipo 2b	GGL-NiCr203	L-NiCr 20 3	FCA-NiCr 20 3	F41003	GJLA-XNiCr 20-3	L-NC 20 3	–	–	–	–	0.6661	–
–	GGL-NiSiCr2053	L-NiSiCr 20 5 3	FCA-NiSiCr 20 5 3	–	GJLA-XNiSiCr 20-5-3	L-NSC 20 5 3	–	–	–	–	0.6667	–
A 436 Tipo 3	GGL- NiCr303	L-NiCr 30 3	FCA-NiCr 30 3	F41004	GJLA-XNiCr 30-3	L-NC 30 3	–	–	–	–	0.6676	–
–	GGG-35.3	–	–	–	GJS-350-22	–	–	0717-15	–	–	0.7033	–
–	GGG-40.3	SNG 370/17	FCD 370	–	GJS-400-18	FGS 370-17	GSO 42/15	0717-15	–	–	0.7043	–
–	GGG-45	–	FCD 450	–	–	–	–	–	–	–	0.7045	–
–	–	–	–	–	–	FGS450.10	–	–	–	–	0.7049	–
–	GGG-65	–	–	–	–	–	–	–	–	–	0.7065	–
–	GGG-NiMn137	S-NiMn 13 7	FCDA-NiMn 13 7	–	GJSA-XNiMn 13-7	S-Mn 13 7	–	0772-00	–	–	0.7652	–
–	GGG-NiCrNb202	S2W	FCDA-NiCrNb 20 2	–	GJSA-XNiCrNb 20-2	–	–	–	–	–	0.7659	–
A 439 Tipo D-2B	GGG-NiCr203	S-NiCr 20 3	FCDA-NiCr 20 3	F43001	GJSA-XNiCr 20-3	–	–	–	–	–	0.7661	–
–	GGG-NiSiCr2052	S-NiSiCr 20 5 2	FCDA-NiSiCr 20 5 2	–	GJSA-XNiSiCr 20-5-2	S-NSC 20 5 2	–	–	–	–	0.7665	–
A 571 Tipo D-2M	GGG-NiMn234	S-NiMn 23 4	FCDA-NiMn 23 4	–	GJSA-XNiMn 23-4	S-NM 23 4	–	–	–	–	0.7673	–
A 439 Tipo D-3	GGG-NiCr303	S-NiCr 30 3	FCDA-NiCr 30 3	F43003	GJSA-XNiCr 30-3	S-NC 30 3	–	–	–	–	0.7676	–
A 439 Tipo D-3A	GGG-NiCr301	S-NiCr 30 1	FCDA-NiCr 30 1	F43004	GJSA-XNiCr 30-1	S-NC 30 1	–	–	–	–	0.7677	–
–	GGG-NiSiCr3055	–	FCDA-NiSiCr 30 5 5	–	GJSA-XNiSiCr 30-5-5	–	–	–	–	–	0.7679	–
A 439 Tipo D-5	GGG-Ni35	S-Ni 35	FCDA-Ni 35	F43006	GJSA-XNi 35	S-N 35	–	–	–	–	0.7683	–
A 439 Tipo D-5A	GGG-NiCr353	S-NiCr 35 3	FCDA-NiCr 35 3	F43007	GJSA-XNiCr 35-3	S-NC 35 3	–	–	–	–	0.7685	–
–	GGG-NiSiCr3552	–	FCDA-NiSiCr 35 5 2	–	GJSA-XNiSiCr 35-5-2	FGS Ni35 Si 5 Cr2	–	–	–	–	0.7688	–
–	GTW-35-04	W 35-04	FCMW 330 classe 1	–	GJMW-35-0-4	MB 35-7	W 35-04	–	–	–	0.8035	–
–	GTW-S-38-1 2	W 38-12	–	–	GJMW-360-12	MB 300-12	–	–	–	–	0.8038	–
–	GTW-45-07	W 45-07	FCMWP 440 classe 3	–	GJMW-450-7	MB 450-7	GMB 45	–	–	–	0.8045	–
–	GTW-55	–	–	–	–	–	GMB 55	–	–	–	0.8055	–
–	GTW-65	–	–	–	–	–	GMB 65	–	–	–	0.8065	–
32510	GTS-35-10	B 340/12	FCMP 330	–	GJMB-350-10	MN 350-10	–	815	–	–	0.8135	–
40010	GTS-45-06	P 440/7	FCMP 440	–	GJMB-450-6	MN 450 - 6	P 45-06	852	–	–	0.8145	–
50005	GTS-55-04	P 510/4	FCMP 490	–	GJMB-550-4	MN 550-4	P 55-04	854	–	–	0.8155	–
70003	GTS-65-02	P 570/3	FCMP 540	–	GJMB-650-2	MN 650-3	P 65-02	0858-00, 0856-00	–	–	0.8165	–
90001	GTS-70-02	P 690/2	FCMP 690	–	GJMB-700-2	MN 700-2	P 70-02	0862-03; 0864-03	–	–	0.8170	–
–	GGV-30	–	–	–	GJV-300	–	–	–	–	–	0.9991	–
A 436 Tipo 2	GGL-NiCr202	L-NiCr 20 2	FCA-NiCr 20 2	F41002	GJLA-XNiCr 20-2	L-NC 20 2	–	0523-00	–	–	0.6660	–
A 436 Tipo 4	GGL- NiSiCr3055	L-NiSiCr 30 5 5	FCA-NiSiCr 30 5 5	F41005	GJLA-XNiSiCr 30-5-5	L-NSC 30 5 5	–	–	–	–	0.6680	–
60-40-18	GGG-40	SNG 420/12	FCD 400 classe 1	F32800	GJS-400-15	FGS400-12	GS400-12	0717-02	60-40-18	60-40-18	0.7040	–
65-45-12	GGG-50	SNG 500/7	FCD 500	F33100	GJS-500-7	FGS 500-7	GS 500/7	0727-02	65-45-12	65-45-12	0.7050	–
–	GGG-60	SNG 600/3	FCD 600-3	–	GJS-600-3	–	GS 600/3	–	80-55-06	80-55-06	0.7060	–
100-70-03	GGG-70	SNG 700/2	FCD 700	F34800	GJS-700-2	FGS 700-2	GS 700-2	0737-01	100-70-03	100-70-03	0.7070	–
120-90-02	GGG-80	SNG 800/2	FCD 800	F36200	GJS-800-2	FGS 800-2	GS 800-2	–	120-90-02	120-90-02	0.7080	–
A 439 Tipo D-2	GGG-NiCr202	L-NiCuCr 20 2	FCDA-NiCr 20 2	–	GJSA-XNiCr 20-2	L-NC 20 2	–	0523-00	–	–	0.7660	–
A 439 Tipo D-2C	GGG-Ni22	S-Ni 22	FCDA-Ni 22	F43002	GJSA-XNi 22	S-N 22	–	–	–	–	0.7670	–
A 439 Tipo D-4	GGG-NiSiCr3053	S-NiSiCr 30 5 5	FCDA-NiSiCr 30 5 4	F43005	GJSA-XNiSiCr 30-5-3	S-NSC 30 5 5	–	–	–	–	0.7680	–
–	GTW-40-05	W 40-05	FCMW 370	–	GJMW-400-5	MB 400-5	GMB 40	–	–	–	0.8040	–
–	GGV-40	–	–	–	GJV-400	–	–	–	–	–	0.9990	–
80-55-06	–	–	–	F33800	–	FGS 350-22	–	0732-03	D5506	–	–	–
–	–	–	–	–	–	–	–	–	D4018	–	–	–
–	–	–	–	–	–	–	–	–	D400	–	–	–
–	–	–	–	–	–	–	–	–	D4512	–	–	–
–	–	–	–	–	–	–	–	–	D450	–	–	–
–	–	–	–	–	–	–	–	–	M3210	–	–	–
–	–	–	–	–	–	–	–	–	M4504	–	–	–
–	–	–	–	–	–	–	–	–	M5003	–	–	–
–	–	–	–	–	–	–	–	–	M5503	–	–	–
–	–	–	–	–	–	–	–	–	M7002	–	–	–
–	–	–	–	–	–	–	–	–	D7003	–	–	–
–	–	–	–	–	–	–	–	–	M8501	A 602 M8501	–	–
–	GGV-45	–	–	–	GJV-450	–	–	–	–	–	–	–
–	GGG--SiMo3.08	–	–	–	–	–	–	–	–	–	–	–
–	GGG--SiMo4.10	–	–	–	–	–	–	–	–	–	–	–
–	GGG--SiMo5.10	–	–	–	–	–	–	–	–	–	–	–
–	–	–	–	–	–	–	–	–	–	–	–	HPI C13 06
–	GGV-35	–	–	–	GJV-350	–	–	–	–	–	–	–
–	GGV-50	–	–	–	GJV-500	–	–	–	–	–	–	–

K3 Lista de materiais das peças • Ferro fundido • K3

K3 ferro dúctil de alta resistência e ferro dúctil austenitizado (ADI) *Resistência a Tensão RM (MPa)*: >600* *Dureza (HB): 180–350 (HRC): <43*

AISI**	DIN	BTS	JIS	UNS	EN	AFNOR	UNI	SIS	SAE	ASTM	Número do Material	Referência do fabricante
–	–	–	–	–	–	–	–	–	–	A 897 125-80-10	–	–
–	–	–	–	–	–	–	–	–	–	A 897 150-100-7	–	–
–	–	–	–	–	–	–	–	–	–	A 897 175-125-4	–	–
–	–	–	–	–	–	–	–	–	–	A 897 200-150-1	–	–
–	–	–	–	–	–	–	–	–	–	A 897 230-185	–	–

NOTA: Para a legenda, veja a página Y217.

N1 Lista dos materiais das peças • Metais não ferrosos • N1

N1 Alumínio forjado

AISI**	DIN	BTS	JIS	UNS	EN	AFNOR	UNI	SIS	SAE	ASTM	Número do Material	Referência do fabricante
1080	Al99.8	–	1A	–	–	–	–	–	–	–	3.0128	–
1050	Al99.5	L 31	1B	–	–	A 59050 C	–	–	–	–	3.0255	–
–	SG-Al 99,5	–	–	–	–	–	–	–	–	–	3.0259	–
1070	Al99.7	–	–	–	–	–	4508	–	–	–	3.0275	–
3103	AlMn	–	N3	–	–	–	–	–	–	–	3.0515	–
3003	AlMnCu	–	–	–	–	–	–	–	–	–	3.0517	–
3005	AlMn1Mg0.5	–	–	–	–	–	–	–	–	–	3.0525	–
3004	AlMn1Mg1	–	–	–	–	–	–	–	–	–	3.0526	–
–	AlMgSiPb	–	–	–	–	–	–	–	–	–	3.0615	–
–	SG-Al 99,5Ti	–	–	–	–	–	–	–	–	–	3.0805	–
–	SG-Al 99,5 Ti	–	–	–	–	–	–	–	–	–	3.0805	–
2014	AlCuSiMn	–	H15	–	–	A-U4SG	3581	–	–	–	3.1255	–
2017	AlCuMg 1	–	–	–	AW-2017 A	A-U4G	3579	–	–	–	3.1325	–
2024	AlCuMg 2	–	L97	–	AW-2024	A-U4G1	–	–	–	–	3.1355	–
–	AlCuMgPb	–	–	–	–	–	–	–	–	–	3.1645	–
2011	AlCuBiPb	–	FC1	–	–	A-U5PbBi	6362	–	–	–	3.1655	–
6082	AlMgSi 1	–	H30	–	AW-6005 A	A-SGM0.7	3571	–	–	–	3.2315	–
6060	AlMgSi0.5	–	–	–	–	–	–	–	–	–	3.3206	–
6063	AlMgSi0.7	–	H9	–	–	A-GS	3569	–	–	–	3.3206	–
6463	EAlMgSi0.5	–	91E	–	–	–	–	–	–	–	3.3207	–
5005	AlMg 1	–	N41	–	AW-6082	A-G0.6	5764-66	–	–	–	3.3315	–
5050	–	–	–	–	–	–	–	–	–	–	3.3316	–
5052	AlMg2.5	–	2L56	–	–	A-G2.5C	4574	–	–	–	3.3523	–
5754	AlMg 3	–	N5	–	–	A-G3M	3575	–	–	–	3.3535	–
5454	AlMg2.5Mn	–	N51	–	–	A-G2.5MC	7789	–	–	–	3.3537	–
5086	AlMg4Mn	–	–	–	–	–	–	–	–	–	3.3545	–
–	SG-Al Mg 4,5 Mn Zr	–	–	–	–	–	–	–	–	–	3.3546	–
5083	AlMg4,5Mn	–	N8	–	–	A-G4.5MC	7790	–	–	–	3.3547	–
5056	AlMg5	–	N6	–	–	A-G5	3576	–	–	–	3.3549	–
–	AlMg 5	–	–	–	–	–	–	–	–	–	3.3555	–
7050	AlZnMgCu0,5	L 86	–	–	–	AZ 4 GU/9051	811-04	–	–	–	3.4144	–
7020	AlZn4.5Mg1	–	H17	–	–	A-Z5G	–	–	–	–	3.4335	–
7022	AlZnMgCu0.5	–	–	–	–	–	–	–	–	–	3.4345	–
–	AlZn5,5MgCu	–	–	–	–	–	–	–	–	–	3.4365	–
7075	AlZnMgCu 1.5	–	DTD5074	A97075	AL-P7075	A-Z5GU	3735	–	7075	–	3.4365	–
1.000	Al99.5H	L31	–	–	–	A59050C	–	–	–	–	3.0250	–
–	Al99.8	–	–	–	–	–	–	–	–	–	3.0280	–
–	AlMg3Mn	–	–	–	–	–	–	–	–	–	–	–
2025	–	–	A 2025 FD	A92025	–	–	–	–	2025	B 247 2025	–	–
1100	–	–	–	–	–	–	–	–	–	–	–	–
3105	–	–	–	–	–	–	–	–	–	–	–	–
5657	AlMg0.8Si	–	–	–	–	–	–	–	–	–	–	–
6070	–	–	–	–	–	–	–	–	–	–	–	–
6262	–	–	–	–	–	–	–	–	–	–	–	–
7003	–	–	–	–	–	–	–	–	–	–	–	–
2050	–	–	–	–	–	–	–	–	–	–	–	–
7475	–	–	–	–	–	–	–	–	–	–	–	–
7175	–	–	–	–	–	–	–	–	–	–	–	–
7178	–	–	–	–	–	–	–	–	–	–	–	–
5251	AlMg2Mo3	–	N4	–	–	A-G2M	3574	–	–	–	–	–
6151	–	–	–	–	–	–	–	–	–	–	–	–
7001	–	–	–	–	–	–	–	–	–	–	–	–
7040	–	–	–	–	–	–	–	–	–	–	–	–

N2 Lista dos materiais das peças • Metais não ferrosos • N2

N2 Ligas de magnésio e ligas de alumínio de baixo teor de silício *Teor: Si <12,2%*

AISI**	DIN	BTS	JIS	UNS	EN	AFNOR	UNI	SIS	SAE	ASTM	Número do Material	Referência do fabricante
–	SG-Al99,8	–	–	–	–	–	–	–	–	–	3.0286	–
–	G-AlCu 4 TiMg	–	–	–	–	–	–	–	–	–	3.1371	–
–	G-AlCu 4 TiMg	–	–	–	–	–	–	–	–	–	3.1371	–
–	G-AlCu 5 Ni 1,5	–	–	–	–	–	–	–	–	–	3.1754	–
–	G-AlCu 4 Ti	–	–	–	–	–	–	–	–	–	3.1841	–
–	G-AlSi 5 Cu 1	–	–	–	–	–	–	–	–	–	3.2131	–
–	G-AlSi 6 Cu 4	–	–	–	–	–	–	–	–	–	3.2151	–
–	G-AlSi 8 Cu 3	–	–	–	–	–	–	–	–	–	3.2161	–
–	G-AlSi 9 Cu 3	–	–	–	–	–	–	–	–	–	3.2163	–
–	G-AlSi 1 1	–	–	–	–	–	–	–	–	–	3.2211	–
–	SG-AlSi 5	–	–	–	–	–	–	–	–	–	3.2245	–
–	SG-AlSi 5	–	–	–	–	–	–	–	–	–	3.2245	–
–	G-AlSi 5 Mg	–	–	–	–	–	–	–	–	–	3.2341	–
4218 B	G-AlSi 7 Mg	–	–	–	–	–	–	–	–	–	3.2371	–
–	G-AlSi 9 Mg	–	–	–	–	–	–	–	–	–	3.2373	–
–	G-AlSi 10 Mg	–	–	–	–	–	–	–	–	–	3.2381	–
–	G-D AlSi 10 Mg	–	–	–	–	–	–	–	–	–	3.2382	–
A 360.2	G-AlSi 10 Mg(Cu)	LM 9	–	–	–	–	–	4253	–	–	3.2383	–
A 413.0	G-D AlSi 12	–	–	–	–	–	–	4247	–	–	3.2582	–
–	SG-AlSi 12	–	–	–	–	–	–	–	–	–	3.2585	–
–	G-D AlSi 12(Cu)	–	–	–	–	–	–	–	–	–	3.2982	–
6061	AlMgSiCu	–	H20	–	–	A-GSUC	6170	–	–	–	3.3211	–
–	G-AlMg 3 Si	–	–	–	–	–	–	–	–	–	3.3241	–
–	G-AlMg 5 Si	–	–	–	–	–	–	–	–	–	3.3261	–
–	G-D AlMg 9	–	–	–	–	–	–	–	–	–	3.3292	–
–	G-AlMg5Si(Cu,Mn)	–	–	–	–	–	–	–	–	–	3.3458	–
–	SG-AlMg 3	–	–	–	–	–	–	–	–	–	3.3536	–

(continuação)

N2 Lista dos materiais das peças • Metais não ferrosos • N2 *(continuação)*

N2 Ligas de magnésio e ligas de alumínio de baixo teor de silício *Teor: Si <12,2%*

AISI**	DIN	BTS	JIS	UNS	EN	AFNOR	UNI	SIS	SAE	ASTM	Número do Material	Referência do fabricante
–	G-AlMg 3	–	–	–	–	–	–	–	–	–	3.3541	–
–	SG-AlMg 4,5 Mn	–	–	–	–	–	–	–	–	–	3.3548	–
–	SG-AlMg 5	–	–	–	–	–	–	–	–	–	3.3556	–
–	G-AlMg 5	–	–	–	–	–	–	–	–	–	3.3561	–
ZE 41	G-MgZn 4 SE 1 Zr 1	MAG 5	–	–	MCMgZn 4 RE 1 Zr	G-Z 4 TR	–	–	–	–	3.5101	–
–	G-MgZn 5 Th 2 Zr 1	–	–	–	–	–	–	–	–	–	3.5102	–
EZ 33	MgSE 3 Zn 2 Zr 1	MAG 6	–	–	MCMgRE 3 Zn 2 Zr	G-TR 3 Z 2	–	–	–	–	3.5103	–
–	MgAl 9 Zn 1	–	–	–	–	–	–	–	–	–	3.5104	–
–	G-MgTh 3 Zn 2 Zr 1	–	–	–	–	–	–	–	–	–	3.5105	–
QE 22	G-MgAg 3 SE 2 Zr 1	MAG 12	–	–	MCMgRE 2 Ag 2 Zr	G-Ag 22,5	–	–	–	–	3.5106	–
–	G-D MgAl 6 Zn 1	–	–	–	–	–	–	–	–	–	3.5612	–
–	G-D MgAl 6	–	–	–	–	–	–	–	–	–	3.5662	–
AZ 81	G-MgAl 8 Zn 1	MAG 1	–	–	MCMgAl 8 Zn 1	G-A 9	–	–	–	–	3.5812	–
AZ 91	G-MgAl 9 Zn 1	MAG 7	–	–	MCMgAl 9 Zn 1	G-A 9 Z 1	–	–	–	–	3.5912	–
–	G-MgAl 8 Zn 1	–	–	–	–	–	–	–	–	–	3.5200	–
AS 41	G-D MgAl 4 Si 1	–	–	–	MCMgAl4Si	G-A4S 1	–	–	–	–	3.5470	–
–	G-AlZn10Si8Mg	–	–	–	–	–	–	–	–	–	–	–
AS 7 G	AlSi7Mg	–	–	–	–	–	–	–	–	–	–	–
2117	–	–	–	–	–	–	–	–	–	–	–	–
2218	AlCuMgNi2	–	–	–	–	–	–	–	–	–	–	–
2091	–	–	–	–	–	–	–	–	–	–	–	–
8090	–	–	–	–	–	–	–	–	–	–	–	–
2090	–	–	–	–	–	–	–	–	–	–	–	–
2224	–	–	–	–	–	–	–	–	–	–	–	–
2094	–	–	–	–	–	–	–	–	–	–	–	–
2095	–	–	–	–	–	–	–	–	–	–	–	–
2097	–	–	–	–	–	–	–	–	–	–	–	–
2098	–	–	–	–	–	–	–	–	–	–	–	–
2099	–	–	–	–	–	–	–	–	–	–	–	–
2195	–	–	–	–	–	–	–	–	–	–	–	–
2196	–	–	–	–	–	–	–	–	–	–	–	–
2197	–	–	–	–	–	–	–	–	–	–	–	–
2198	–	–	–	–	–	–	–	–	–	–	–	–
2297	–	–	–	–	–	–	–	–	–	–	–	–
2397	–	–	–	–	–	–	–	–	–	–	–	–
8017	–	–	–	–	–	–	–	–	–	–	–	–
8024	–	–	–	–	–	–	–	–	–	–	–	–
8091	–	–	–	–	–	–	–	–	–	–	–	–
8093	–	–	–	–	–	–	–	–	–	–	–	–
2199	–	–	–	–	–	–	–	–	–	–	–	–

N3 Lista dos materiais das peças • Metais não ferrosos • N3

N3 Ligas de magnésio e ligas de alumínio de alto teor de silício *Teor: Si >12,2%*

AISI**	DIN	BTS	JIS	UNS	EN	AFNOR	UNI	SIS	SAE	ASTM	Número do Material	Referência do fabricante
A 413.1	G-AlSi 12(Cu)	LM 20	–	–	–	–	–	4260	–	–	3.2583	–
A 413.2	G-AlSi 12	LM 6	–	–	–	–	–	4261	–	–	3.2581	–
–	G-AlSi17Cu4Mg	–	–	–	–	–	–	–	–	–	–	–
–	GK-AlSi18CuNiMg	–	–	–	–	–	–	–	–	–	–	–
–	GK-AlSi21CuNiMg	–	–	–	–	–	–	–	–	–	–	–
–	GK-AlSi12CuNiMg	–	–	–	–	–	–	–	–	–	–	–
–	GK-AlSi25CuNiMg	–	–	–	–	–	–	–	–	–	–	–
–	G-AlSi 21 CuNiMg	–	–	–	–	–	–	–	–	–	–	–
4032	–	–	–	–	–	–	–	–	–	–	–	–

N4 Lista dos materiais das peças • Metais não ferrosos • N4

N4 À base de cobre, latão e zinco em um intervalo de índice de usinabilidade de 70–100

AISI**	DIN	BTS	JIS	UNS	EN	AFNOR	UNI	SIS	SAE	ASTM	Número do Material	Referência do fabricante
C 11000	E-Cu 58	C 101	–	–	–	Cn-a2	–	–	–	–	2.0065	–
C 81100	G-CuL 45	HCC 1	–	–	–	–	–	–	–	–	2.0082	–
C 81100	G-Cu L 50	HCC 1	–	–	–	–	–	–	–	–	2.0085	–
–	CuZn 40 MnPb	–	–	–	–	–	–	–	–	–	2.0241	–
C 26000	CuZn 30	CZ 102	C 2600	–	–	CuZn 30	–	–	–	–	2.0265	–
C 27200	CuZn 37	CZ 108	–	–	–	CuZn 37	C 2720	–	–	–	2.0321	–
–	CuZn 36 Pb 1.5	–	–	–	–	–	–	–	–	–	2.0331	–
–	S-CuZn40	–	–	–	–	–	–	–	–	–	2.0366	–
–	CuZn 39 Pb 3 + D567	–	–	–	–	–	–	–	–	–	2.0401	–
–	CuZn 40 Pb 2	–	–	–	–	–	–	–	–	–	2.0402	–
B-198	G-CuZn 15Si 4	–	–	–	–	–	–	–	–	–	2.0492	–
–	CuZn 40Al 1	–	–	–	–	–	–	–	–	–	2.0561	–
–	G-KCuZn 38 Al	–	–	–	–	–	–	–	–	–	2.0591	–
C 86500	G-CuZn 35 Al 1	HTB 1	–	–	–	U-Z 36 N 3	–	–	–	–	2.0592	–
–	G-KCuZn 37 Al 1	–	–	–	–	–	–	–	–	–	2.0595	–
C 86200	G-CuZn 34 Al 2	HTB 1	–	–	–	U-Z 36 N 3	–	–	–	–	2.0596	–
–	G-CuZn 25 Al 5	–	–	–	–	–	–	–	–	–	2.0598	–
–	S - CuNi 30 Fe	–	–	–	–	–	–	–	–	–	2.0837	–
–	CuNi 10 Fe 1 Mn	–	–	–	–	–	–	–	–	–	2.0872	–

NOTA: Para a legenda, veja a página Y217.

(continuação)

N4 Lista dos materiais das peças • Metais não ferrosos • N4 *(continuação)*

N4 À base de cobre, latão e zinco em um intervalo de índice de usinabilidade de 70–100

AISI**	DIN	BTS	JIS	UNS	EN	AFNOR	UNI	SIS	SAE	ASTM	Número do Material	Referência do fabricante
–	S - CuNi 10 Fe	–	–	–	–	–	–	–	–	–	2.0873	–
–	CuNi 30 Mn 1 Fe	–	–	–	–	–	–	–	–	–	2.0882	–
–	SG-Cu Al 8	–	–	–	–	–	–	–	–	–	2.0921	–
–	SG-CuAl 8 Ni 2	–	–	–	–	–	–	–	–	–	2.0922	–
–	SG-CuAl 9 Ni5 Fe	–	–	–	–	–	–	–	–	–	2.0927	–
–	CuAl 10 Fe 3 Mn 2	CA 103	–	–	–	U-A 10 Fe	–	–	–	–	2.0936	–
–	SG-Cu Al 10 Fe	–	–	–	–	–	–	–	–	–	2.0937	–
C 63000	CuAl 10 Ni 5 Fe 4	Ca 104	–	–	–	U-A 10 N	–	–	–	–	2.0966	–
B-148-52	G-CuAl 10 Ni	–	–	–	–	–	–	–	–	–	2.0975	–
–	SG-Cu Sn	–	–	–	–	–	–	–	–	–	2.1006	–
–	SG-Cu Sn 6	–	–	–	–	–	–	–	–	–	2.1022	–
C 90800	G-CuSn 12	Pb 2	–	–	–	UE 12 P	–	–	–	–	2.1052	–
–	G-CuSn 12 Pb	–	–	–	–	–	–	–	–	–	2.1061	–
–	G-CuSn 10 Zn	–	–	–	–	–	–	–	–	–	2.1086	–
C 93200	G-CuSn 7 ZnPb	–	–	–	–	U-E 7 Z 5 Pb 4	–	–	–	–	2.1091	–
–	G-CuSn 6 ZnNi	LG 4	–	–	–	–	–	–	–	–	2.1093	–
C 83600	G-CuSn 5 ZnPb	LG 2	–	–	–	U-E 5 Pb 5 Z 5	–	–	–	–	2.1096	–
–	G-CuSn 2 ZnPb	–	–	–	–	–	–	–	–	–	2.1098	–
C 93700	G-CuPb 10 Sn	LB 2	–	–	–	U-E 10 Pb 10	–	–	–	–	2.1176	–
C 93800	G-CuPb 15 Sn	LB 1	–	–	–	U-Pb 15 E 8	–	–	–	–	2.1182	–
C 94100	G-CuPb 20 Sn	LB 5	–	–	–	U-Pb 20	–	–	–	–	2.1188	–
C 81500	G-CuCrF 35	CC1-FF	–	–	–	–	–	–	–	–	2.1292	–
C 18200	CuCrZr	CC 102	–	–	–	U-Cr 0,8 Zr	–	–	–	–	2.1293	–
–	SG-Cu Mn 13 Al 7	–	–	–	–	–	–	–	–	–	2.1367	–
–	SG-Cu Si 3	–	–	–	–	–	–	–	–	–	2.1461	–
CuSi 3 Mn	–	–	–	–	–	–	–	–	–	–	2.1525	–
–	OF-Cu	–	–	–	–	–	–	–	–	–	2.0040	–
B-120	E-Cu 57	–	–	–	–	–	–	–	–	–	2.0060	–
C 10300	SE-Cu	C 101	–	–	–	Cu-c1	–	–	–	–	2.0070	–
–	CuZn 5	–	–	–	–	–	–	–	–	–	2.0220	–
C 23000	CuZn 15	CZ 102	C 2300	–	–	CuZn 15	–	–	–	–	2.0240	–
–	G-CuZn 33 Pb	–	–	–	–	–	–	–	–	–	2.0290	–
–	CuZn 36 Pb 2	–	–	–	–	–	–	–	–	–	2.0330	–
–	G-CuZn 37 Pb	–	–	–	–	–	–	–	–	–	2.0340	–
–	CuZn 40	–	–	–	–	–	–	–	–	–	2.0360	–
–	CuZn 39 Pb 2	–	–	–	–	–	–	–	–	–	2.0380	–
–	CuZn 20 Al 2	–	–	–	–	–	–	–	–	–	2.0460	–
–	CuZn 37Al 1	–	–	–	–	–	–	–	–	–	2.0510	–
–	CuZn 40 Al 2	–	–	–	–	–	–	–	–	–	2.0550	–
–	G-CuZn 40 Fe	–	–	–	–	–	–	–	–	–	2.0590	–
–	G-CuAl 10 Fe	–	–	–	–	–	–	–	–	–	2.0940	–
C 90700	G-CuSn 10	CT 1	–	–	–	–	–	–	–	–	2.1050	–
C 91700	G-CuSn 12 Ni	–	–	–	–	–	–	–	–	–	2.1060	–
–	C35100	–	–	–	–	–	–	–	–	–	–	–
–	17665	–	–	C95500	–	–	–	–	–	–	–	–
–	MS60	–	–	–	–	–	–	–	–	–	–	–

N5 Lista dos materiais das peças • Metais não ferrosos • N5

N5 Náilon, plásticos, borrachas, fenóis, resinas e fibra de vidro

AISI**	DIN	BTS	JIS	UNS	EN	AFNOR	UNI	SIS	SAE	ASTM	Número do Material	Referência do fabricante
–	LEXAN	–	–	–	–	–	–	–	–	–	–	–
–	HOSTALEN	–	–	–	–	–	–	–	–	–	–	–
–	Poliestireno	–	–	–	–	–	–	–	–	–	–	–
–	Makrolon	–	–	–	–	–	–	–	–	–	–	–

N6 Lista dos materiais das peças • Metais não ferrosos • N6

N6 Carbono, compósitos de grafite e polímeros reforçados com fibras de carbono (CFRP)

AISI**	DIN	BTS	JIS	UNS	EN	AFNOR	UNI	SIS	SAE	ASTM	Número do Material	Referência do fabricante
–	GFK	–	–	–	–	–	–	–	–	–	–	–
–	CFK	–	–	–	–	–	–	–	–	–	–	–
Grafite	–	–	–	–	–	–	–	–	–	–	–	–
CFRP	–	–	–	–	–	–	–	–	–	–	–	–

S1 Lista dos materiais das peças • Ligas resistentes à altas temperaturas • S1

S1 Ligas resistentes a altas temperaturas, à base de ferro *Resistência a Tensão RM (MPa)*: 500–1200* *Dureza (HB): 160–260 (HRC): 25–48*

AISI**	DIN	BTS	JIS	UNS	EN	AFNOR	UNI	SIS	SAE	ASTM	Número do Material	Referência do fabricante
–	X 10 Cr 25	–	–	–	–	–	–	–	–	–	1.3811	–
–	D 1 a	–	–	–	–	–	–	–	–	–	1.3915	–
–	D 3	BD 3	–	–	X 210 Cr 1 2	Z 200 C 12	X 205 Cr 12 KU	–	–	–	1.3916	–
–	RNi 12	–	–	–	–	–	–	–	–	–	1.3926	–
–	RNi 8	–	–	–	–	–	–	–	–	–	1.3927	–
–	GX 2 NiCoMoTi1 7 10	–	–	–	–	–	–	–	–	–	1.6351	Maraging
6501, 6512, 6520	X 2 NiCoMo 18 8 5	–	–	UNS K92890	S162	Z2NKD18.8	–	–	–	ASTM A646	1.6359	ATI VascoMax® C-250
–	X 2 NiCoMo 18-8-5	–	–	K92890	–	–	–	–	–	–	1.6359	Maraging
–	X 1 CrNiCoMo 13 8 5	–	–	–	–	–	–	–	–	–	–	Maraging
–	Ni 36	–	–	–	–	–	–	–	–	–	1.3910	Magnifer 36
–	Ni 46	–	–	–	–	–	–	–	–	–	1.3920	–
–	X 2 CrNiCoMo 12 8 5	–	–	–	–	–	–	–	–	–	1.6980	Maraging
ASTM B463	–	–	–	UNS N08020	–	–	–	–	–	ASTM B463	2.4660	20CB-3
ASTM A666	–	–	–	–	–	–	–	–	–	ASTM A666	–	6/21/09
ASTM B753	–	–	–	–	–	–	–	–	–	ASTM B753	–	AL 4750
S66286	–	–	NAS 660	UNS S66286	–	–	A-286	–	–	–	–	ATI A286™
–	–	–	–	UNS K92810	–	–	–	–	–	–	–	ATI VascoMax® C-200
6514	–	–	–	UNS K93120	–	–	–	–	–	–	–	ATI VascoMax® C-300
–	–	–	–	–	–	–	–	–	–	–	–	ATI VascoMax® C-350
–	–	–	–	–	–	–	–	–	–	–	–	ATI VascoMax® T-200
6518, 6519, 6591	–	–	–	–	–	–	–	–	–	–	–	ATI VascoMax® T-250
–	–	–	–	–	–	–	–	–	–	–	–	ATI VascoMax® T-300
5725	–	–	–	–	–	Z3NCT25	–	–	SAE 16-25-6	–	–	Discaloy 16-25-6
ASTM A638	–	–	–	–	–	Z3NCT25	–	–	Discaloy	ASTM A638	–	Discaloy 24
–	–	–	–	R30556	–	–	–	–	–	–	–	Haynes® 556
5768	X 12 CrCoNi 21 20	–	–	–	–	Z12CKNDWNb21.20.20	–	–	–	–	–	Haynes 556
ASTM F30	–	–	–	–	–	–	–	–	Invar	ASTM F30	–	Invar 42
5768	–	–	–	UNS R30155	–	Z12CNKDW20	–	–	–	–	–	Multimet N-155
–	–	–	–	–	–	–	–	–	–	–	–	Multimet N-156
5533	X 40 CoCrNi 20 20	–	–	–	–	Z42CKNDW	–	–	–	–	–	S 590
–	X 2 NiCrAlTi 32 20	–	–	–	–	–	–	–	–	–	–	Sanicro 30
AISI:665	–	–	–	–	–	Z8NCTDA2613	–	–	–	–	–	W-545

S2 Lista dos materiais das peças • Ligas resistentes à altas temperaturas • S2

S2 Ligas resistentes a altas temperaturas, à base de cobalto *Resistência a Tensão RM (MPa)*: 1000–1450* *Dureza (HB): 250–450 (HRC): 25–48*

AISI**	DIN	BTS	JIS	UNS	EN	AFNOR	UNI	SIS	SAE	ASTM	Número do Material	Referência do fabricante
–	CoCr 26 Ni 9 Mo	–	–	–	–	–	–	–	–	–	2.4681	–
–	CoCr 25 NiW	–	–	–	–	KC25WN	–	–	–	ASTM A567	2.4682	Stellite® 31 (X40)
–	CoCr 22 NiW	–	–	–	–	–	–	–	–	–	2.4683	–
–	CoCr 28 Mo	–	–	–	–	KC27D5NFe	–	–	–	ASTM F-75	2.4691	HS 21
–	CoCr 20 Ni 15 Mo	–	–	–	–	–	–	–	–	–	2.4711	–
–	CoCr 29 Mo	–	–	–	–	–	–	–	–	–	2.4723	–
–	CoCr 33 W	–	–	–	–	–	–	–	–	–	2.4775	–
–	CoCr 28	–	–	–	–	–	–	–	–	–	2.4778	–
–	CoCr 28 Nb	–	–	–	–	–	–	–	–	–	2.4779	–
–	–	–	–	–	–	–	–	–	–	ASTM F90	2.4964	F 90
–	–	–	–	R30605	–	KC20WN	–	–	–	–	2.4964	Haynes 25
–	CoCr 20 W 15 Ni	HR 240	–	R30605	–	KC20WN	–	–	–	5759	2.4964	L 605
–	CoCr 20 W 15 Ni	–	–	Versão de fundição de L605	–	KC20WN	–	–	–	5759	2.4964	Stellite 25
AMS 5399	NiCr 19 Co 11 MoTi	–	–	–	–	NC 19 KDT	–	–	–	–	2.4973	–
–	CoCr 20 Ni 20 W	–	–	–	–	–	–	–	–	5534	2.4979	S 816
–	CoCr20NiW	–	–	–	–	–	–	–	–	–	2.4989	–
–	–	–	–	R31537 & R31538	–	CoCr28Mo	–	–	–	ASTM F1537	–	F 1537
–	–	–	–	–	–	–	–	–	–	ASTM F562	–	F 562
–	–	–	–	–	–	–	–	–	–	ASTM F563	–	F 563
–	–	–	–	R30188	–	KC22N22W14Fe	–	–	–	–	–	Haynes 188
AISI 670	CoCr 20 W 15 Ni	–	–	–	–	KC20WN	–	–	–	–	–	HS 25
–	CoCr 26 Ni 14 Mo	–	–	–	–	–	–	–	–	5380	–	HS 30
–	CoCr 19 W 14 NiB	–	–	–	–	–	–	–	–	–	–	HS 36
–	–	–	–	–	–	–	–	–	–	–	–	L 251
–	CoCrW 10 TaZrB	–	–	–	–	KC21W10Ta9	–	–	–	–	–	MAR-M 302
–	CoCr 22 W 9 TaZrNb	–	–	–	–	KC21W9Ta	–	–	–	–	–	MAR-M 322
–	CoCr 24 Ni 10 WTaZrB	–	–	–	–	KC23N10W7Ta	–	–	–	–	–	MAR-M 509
–	–	–	–	–	–	KC20N20Ta7	–	–	–	–	–	MAR-M 905
–	CoCr 20 Ni 20 Ta	–	–	–	–	KC20N20Ta7	–	–	–	–	–	MAR-M 918
–	–	–	–	R30159	–	–	–	–	–	–	–	MP159
–	–	–	–	R30035	–	–	–	–	–	–	–	MP35N
–	–	–	–	–	–	KC33W13	–	–	–	–	–	Stellite 1
–	–	–	–	–	–	KC28W8	–	–	–	–	–	Stellite 12
–	–	–	–	–	–	KC22N22W14Fe	–	–	–	–	–	Stellite 188
–	–	–	–	–	–	KC26NW	–	–	–	–	–	Stellite 6
–	–	–	–	–	–	–	–	–	–	–	–	Stellite 8 (F75)
–	CoCr 25 Ni 20 MoWNb	–	–	–	–	KC25N20DFeWNb	–	–	–	–	–	V-36
–	CoCr 21 Mo 11 W	–	–	–	–	KC21W11ANbT	–	–	–	–	–	WI-52
–	–	–	–	–	–	KC25N10W7Fe	–	–	–	–	–	X 45
–	–	–	–	–	–	–	–	–	J-1570	–	–	–
–	K13C20N126Fe15D7	–	–	R3003 & R3008	–	K13C20N126Fe15D7	–	–	–	ASTM F1058	–	–

NOTA: Para a legenda, veja a página Y217.

S3 Lista dos materiais das peças • Ligas resistentes à altas temperaturas • S3

S3 Ligas resistentes a altas temperaturas, à base de níquel *Resistência a Tensão RM (MPa)*: 600–1700* *Dureza (HB): 160–450 (HRC): <48*

AISI**	DIN	BTS	JIS	UNS	EN	AFNOR	UNI	SIS	SAE	ASTM	Número do Material	Referência do fabricante
–	X 7 NiCrCoMo 54 20	–	–	–	–	–	–	–	–	–	1.2789	–
–	Ni 99,7 Mg 0,07	–	–	J24053	–	–	–	–	–	A 915 J24053	2.4053	–
–	LC-Ni 99,6	–	–	N02201	–	–	–	–	–	–	2.4061	–
–	–	–	–	N02200	–	–	–	–	–	–	2.4066	200
Níquel 200	Ni 99,2	NA 11	–	N02200	–	–	–	–	–	–	2.4066	–
–	–	–	–	N02201	–	–	–	–	–	–	2.4068	201
Níquel 201	LC-Ni 99	NA 12	–	–	–	–	–	–	–	–	2.4068	–
–	NiMn 1	–	–	–	–	–	–	–	–	–	2.4106	–
–	NiMn 1 C	–	–	–	–	–	–	–	–	–	2.4108	–
–	NiMn 1,5	–	–	–	–	–	–	–	–	–	2.4109	–
–	NiMn 3 Al	–	–	–	–	–	–	–	–	–	2.4122	–
–	NiMn 3 SiMg	–	–	–	–	–	–	–	–	–	2.4126	–
–	NiCr 2 Mn	–	–	–	–	–	–	–	–	–	2.4145	–
–	NiCr 2 MnSi	–	–	–	–	–	–	–	–	–	2.4146	–
–	NiCr 5 MnSi	–	–	–	–	–	–	–	–	–	2.4151	–
–	SG-NiTi 4	NA32	–	–	NA 32	–	–	–	–	–	2.4155	–
CZ-100	G-Ni 93 C	–	–	–	–	–	–	–	–	–	2.4175	–
–	NiCr 4 Mn	–	–	–	–	–	–	–	–	–	2.4199	–
M 35-1/2	G-NiCu 30 Nb	–	–	N24030	–	–	–	–	–	–	2.4365	–
–	EL-NiCu 30 Mn	–	–	N04402	–	–	–	–	–	–	2.4366	–
M 30-H	G-NiCu 30 Si 3	–	–	–	–	–	–	–	–	–	2.4367	–
M-255	G-NiCu 30 Si 4	–	–	–	–	–	–	–	–	–	2.4368	–
–	NiCu 30 Al	–	–	–	–	–	–	–	–	–	2.4374	–
–	NiCu 30 Al	NA 18	–	N05500	3072.76	NU 30 AT	–	–	–	–	2.4375	Monel® K500
–	SG-NiCu 30 MnTi	NA 33	–	–	–	–	–	–	–	–	2.4377	–
–	NiFe 16 CuCr	–	–	–	–	–	–	–	–	–	2.4501	–
–	G-NiMo 16 CrW	–	–	–	–	–	–	–	–	–	2.4537	–
–	NiCr 21 Mo 14 W	–	–	N26022	–	–	–	–	–	–	2.4602	INCONEL® liga 622
–	NiCr 30 FeMo	–	–	–	–	–	–	–	–	–	2.4603	Hastelloy® G-30
–	–	–	–	N06059	–	–	–	–	–	ASTM B575	2.4605	Allcorr
–	NiCr 23 Mo 16 Al	–	–	–	–	–	–	–	–	–	2.4605	–
–	SG/UP-NiCr 23 Mo 16	–	–	–	–	–	–	–	–	–	2.4607	–
–	NiCr 26 MoW	–	–	–	–	–	–	–	–	–	2.4608	–
–	SG-NiMo 27	–	–	–	–	–	–	–	–	–	2.4615	–
–	NiMo 28	–	–	N10665	–	NiMo 28	–	–	–	–	2.4617	–
–	NiCr 22 Mo 6 Cu	–	–	–	–	–	–	–	–	–	2.4618	–
–	–	–	–	N06985	–	–	–	–	–	–	2.4619	Hastelloy G-3
–	NiCr 22 Mo 7 Cu	–	–	N06985	–	–	–	–	–	–	2.4619	–
–	SG-NiCr 23 Al	NA 49	–	–	–	–	–	–	–	–	2.4626	–
–	SG-NiCr 22 Co 12 Mo	NA 50	–	–	–	–	–	–	–	–	2.4627	–
–	NiCr 20 Ti	HR5	–	N06075	HR5, 203.4	NC 20 T	–	–	–	–	2.4630	Nimonic® 75
–	NiCr 20 TiAl	NA 20	NCF 80A	N07080	HR401, 601	NC 20 TA	–	–	–	–	2.4631	Nimonic 80A
–	NiCr 20 Co 18 Ti	NA 36	–	N07090	HR2, 202	NC20KTA	–	–	–	–	2.4632	Nimonic 90
–	NiCo 20 Cr 15 MoAlTi	–	–	N13021	HR3	NCKD20ATV	–	–	–	–	2.4634	Nimonic 105
–	NiCo 15 Cr 15 MoAlTi	HR4	–	–	HR401, 601	NCVK15ATD	–	–	–	–	2.4636	Nimonic 115
AISI 687	NiCo 15 Cr 15 MoAlTi	–	–	–	–	NCKD20AT	–	–	–	–	2.4636	Udimet® 700
–	NiCr 22 Mo 8 AlCuTi	–	–	–	–	–	–	–	–	–	2.4637	–
–	SG-NiCr 20	NA 34	–	–	–	–	–	–	–	–	2.4639	–
–	NiCr 21 Mo 6 Cu	–	NCF 600 TP	–	–	–	–	–	–	–	2.4641	–
–	NiCr 29 Fe	–	NCF 690	N06690	–	NC 30 Fe	–	–	–	–	2.4642	INCONEL® liga 690
–	NiCr 25 FeAlYC	–	–	–	–	–	–	–	–	–	2.4647	–
–	NiCr 20 CoMoTi	NA 38	NCF 690	N07263	HR10	NCK 20 D	–	–	–	–	2.4650	Nimonic C263
–	EL-NiCr 26 Mo	–	–	–	–	–	–	–	–	–	2.4652	–
–	NiCr 19 Co 14 Mo 4 Ti	–	–	N07001	–	NC20K14Y	–	–	–	–	2.4654	Waspaloy
–	SG-NiCr 29 Mo	–	–	–	–	–	–	–	–	–	2.4656	–
–	NiCr 70 30	–	–	N06008	–	–	–	–	–	–	2.4658	–
–	SG-NiCr 30 Mo 5 W	–	–	–	–	–	–	–	–	–	2.4659	–
–	EL-NiCr 29 Mo 5 W	–	–	–	–	–	–	–	–	–	2.4661	–
–	NiFe 35 Cr 14 MoTi	–	–	N09901	–	Z8NCDT42	–	–	–	–	2.4662	INCOLOY® 901
–	NiCr 13 Mo 6 Ti 3	–	–	N09901	–	Z8NCDT42	–	–	–	–	2.4662	Nimonic 901
–	NiCr 23 Co 12 Mo	–	–	N06617	–	NC22K12D9A	–	–	–	–	2.4663	INCONEL® liga 617
–	NiCr 22 FeMo	–	–	N06002	HR6, 204	NC22FeD	–	–	–	–	2.4665	Hastelloy X
–	NiCr 22 Fe 18 Mo	NA 40	–	N06002	–	NC22FeD	–	–	–	–	2.4665	INCONEL liga HX
–	NiCr 18 CoMo	–	–	–	–	NKCD20ATU	–	–	–	–	2.4666	Nimonic PK25
–	SG-NiCr 19 NbMoTi	NA 51	–	–	–	–	–	–	–	–	2.4667	–
–	NiCr 19 FeNbMo	–	–	N07718	HR8	NC 19 Fe Nb	–	–	–	–	2.4668	INCONEL liga 718
–	NiCr 15 Fe 7 TiAl	–	–	N07750	–	NC 15 Fe 7 TA	–	–	–	–	2.4669	INCONEL liga X750
–	G-NiCr 12 Al 6 MoNb	–	–	–	–	–	–	–	–	–	2.4671	–
–	G-NiCr 20 Co 20 MoTi	–	–	–	–	–	–	–	–	–	2.4672	–
–	NiCo 15 Cr 10 MoAlTi	–	–	N13100	–	NK15CAT	–	–	–	–	2.4674	IN 100
–	NiCo 15 Cr 10 MoAlTi	–	–	–	–	NK15C10A5T	–	–	–	–	2.4674	René 100
–	G-NiCo 15 Cr 10 AlTiMo	–	–	–	–	–	–	–	–	–	2.4674	–
–	G-NiCo 10 W 10 CrAlNb	–	–	–	–	–	–	–	–	–	2.4676	–
–	G-NiCr 50	–	–	–	–	–	–	–	–	–	2.4678	–
–	G-NiCr 35	–	–	–	–	–	–	–	–	–	2.4679	–
–	–	–	–	N10665	–	–	–	–	–	N7M	2.4685	Hastelloy B-2
CW-12 MW	G-NiMo 17 CrW	–	–	–	–	–	–	–	–	–	2.4686	–
–	NiCr 25 Mo 7 Ti	–	–	–	–	–	–	–	–	–	2.4693	–
–	NiCr 16 Fe 7 TiAl	–	–	N 07751	–	–	–	–	–	–	2.4694	INCONEL liga 751
–	G-NiCr 20 Mo 15	–	–	–	–	–	–	–	–	–	2.4697	–
–	NiCr 22 W 14 Mo	–	–	–	–	–	–	–	–	–	2.4733	–
–	NiCr 20 AlY	–	–	–	–	–	–	–	–	–	2.4764	–
–	NiCr 17 AlWY	–	–	–	–	–	–	–	–	–	2.4765	–
–	SG-NiCr 20 Nb	NA 35	–	–	–	–	–	–	–	–	2.4806	–
–	G-NiCr 50 Nb	–	–	–	–	–	–	–	–	–	2.4813	–
–	NiCr 15 Fe	NA 14	NCF 600	N06600	3072.76	NC 15 Fe	–	–	–	–	2.4816	INCONEL liga 600
–	G-NiMo 30	–	–	N10276	–	NC 15 D 14 KFe	–	–	–	–	2.4819	Hastelloy C-276
ASME SB575	NiMo 16 Cr 15 W	–	–	N10276	–	NC 17 D	–	–	–	–	2.4819	Nimonic C276

(continuação)

S3 Lista dos materiais das peças • Ligas resistentes à altas temperaturas • S3 *(continuação)*

S3 Ligas resistentes a altas temperaturas, à base de níquel *Resistência a Tensão RM (MPa)*: 600–1700* *Dureza (HB): 160–450 (HRC): <48*

AISI**	DIN	BTS	JIS	UNS	EN	AFNOR	UNI	SIS	SAE	ASTM	Número do Material	Referência do fabricante
–	SG-NiCr 21 Mo 9 Nb	–	–	–	–	–	–	–	–	–	2.4831	–
–	NiCr 20 Mo 15	–	–	–	–	–	–	–	–	–	2.4836	–
–	SG-NiCr 20 Mo 15	–	–	–	–	–	–	–	–	–	2.4839	–
–	–	–	–	N06601	–	–	–	–	–	–	2.4851	Haynes® 601
–	NiCr 23 Fe	–	NCF 601	N06601	–	NC 23 Fe 14 A	–	–	–	–	2.4851	INCOLNEL liga 601
–	NiFe 33 Cr 25 Co	–	–	–	–	–	–	–	–	–	2.4854	–
–	NiCr 19 Mo 9 Si	–	–	–	–	–	–	–	–	–	2.4855	–
ASME SB443	NiCr 22 Mo 9 Nb	–	–	N06625	–	NC 22 Fe DNb	–	–	–	–	2.4856	Haynes 625
ASME SB443.4	NiCr 22 Mo 9 Nb	NA 21	NCF 625	N06625	–	NC 22 Fe DNb	–	–	–	–	2.4856	INCONEL liga 625
ASME SB163	NiCr 21 Mo	–	–	N08825	3072.76	NC21FeDU	–	–	–	–	2.4858	INCOLOY® 825
–	NiCr 60 15	–	–	–	–	–	–	–	–	–	2.4867	–
–	NiCr 80 20	–	–	–	–	–	–	–	–	–	2.4869	–
–	NiCr 20 AlSi	–	–	–	–	–	–	–	–	–	2.4872	–
–	G-NiCr 28 W	–	–	–	–	–	–	–	–	–	2.4879	Centralloy® 4879
–	NiCr 17 Mo 17 FeW	–	–	N10002	–	NC17DWY	–	–	–	CW12MW	2.4883	Hastelloy C
–	G-NiMo 16 Cr	–	–	–	–	–	–	–	–	–	2.4883	–
–	SG-NiMo 16 Cr 16 W	NA 48	–	–	–	–	–	–	–	–	2.4886	–
–	G-NiCr 13 MoAl	–	–	–	–	–	–	–	–	–	2.4888	–
–	NiCr 20 Ti	HR 5	–	N06621	–	NC 20 T	–	–	–	–	2.4951	–
–	NiCr 20 TiAl	NA 20	NCF 80 A	N07080	–	NC 20 TA	–	–	–	–	2.4952	–
–	NiFe 25 Cr 20 NbTi	–	–	–	NiFe 25 Cr 20 NbTi	–	–	–	–	–	2.4955	–
–	NiCr 20 Co 18 Ti	NA 19	–	N07090	–	–	–	–	–	–	2.4969	–
–	NiCr 22 W 12 Fe	–	–	–	–	–	–	–	–	–	2.4972	–
–	NiCr 19 Co 11 MoTi	–	–	N07041	–	NC19KDT	–	–	–	–	2.4973	René 41
–	NiFeCr 12 Mo	–	–	–	–	–	–	–	–	–	2.4975	–
–	NiCr 20 Mo	–	–	–	–	–	–	–	–	–	2.4976	–
–	NiCr 20 CoMo	–	–	–	–	–	–	–	–	–	2.4982	–
–	NiCr 18 Co	–	–	N07500	–	–	–	–	–	–	2.4983	Co500
AISI 684	NiCr 18 CoMoAlTi	–	–	N07500	–	NCK19DAT	–	–	–	–	2.4983	Udimet® 500
–	Ni 99,6	NA 46	–	–	–	–	–	–	–	–	2.4060	–
–	NiMn 2	–	–	–	–	–	–	–	–	–	2.4110	–
SZ-100	G-Ni 95	–	–	–	–	–	–	–	–	–	2.4170	–
–	G-Ni 93 Si	–	–	–	–	–	–	–	–	–	2.4180	–
–	NiCu 30 Fe	–	–	N04400	3072.76	NU30	–	–	–	–	2.4360	Monel® 400
–	NiCu 30 Ti	–	–	–	–	–	–	–	–	–	2.4370	Monel 60
–	NiFe 44	–	–	–	–	–	–	–	–	–	2.4420	Magnifer 53
–	NiFe 16 CuMo	–	–	–	–	–	–	–	–	–	2.4530	Perm 77
–	NiFeK 6040	–	–	–	–	–	–	–	–	–	2.4560	–
–	NiMo 16 Cr 16 Ti	NA 45	–	N26455	–	–	–	–	–	–	2.4610	Hastelloy C-4
–	–	–	–	–	–	20CB-3	–	–	–	ASTM B463	2.4660	INCOLOY 020
–	NiCr 20 CuMo	–	–	N08020	–	–	–	–	–	–	2.4660	–
–	G-NiCr 13 Al 16 MoNb	–	–	–	HC203	NC13AD	–	–	–	–	2.4670	Nimocast 713
–	G-NiCr 50 Nb	–	–	–	–	–	–	–	–	–	2.4680	–
–	NiMo 23 Cr 8 Fe	–	–	–	–	–	–	–	–	–	2.4710	–
–	NiMo 30	–	–	–	–	ND27FeV	–	–	–	N-12 MV	2.4810	Hastelloy B
–	NiCr 45 23	–	–	–	–	–	–	–	–	–	2.4890	–
–	–	–	–	N13017	–	NK17C15D5AT	–	–	–	–	–	Astroloy
–	–	–	–	–	–	–	–	–	–	–	–	Centralloy® 60HTD
AISI 686	–	–	–	–	–	NC15Fe10D5AT	–	–	–	–	–	GMR 235
–	NiCr 16 MoAl	–	–	–	–	NC15D5FeAT	–	–	–	–	–	GMR 235-D
–	–	–	–	–	–	–	–	–	–	CW6M	–	Hastelloy C-22
–	–	–	–	N06007	–	NC22Fe19D6KTa	–	–	–	–	–	Hastelloy G
–	–	–	–	N10003	–	–	–	–	–	–	–	Hastelloy N
–	–	–	–	N06635	–	NC15D14KFe	–	–	–	–	–	Hastelloy S
–	–	–	–	N10004	–	–	–	–	–	–	–	Hastelloy W
–	–	–	–	N07263	–	NC20K20D6T	–	–	–	–	–	Haynes® 263
–	–	–	–	–	–	–	–	–	–	–	–	Haynes 282
–	NiCr 15 Fe	–	–	N06600	–	–	–	–	–	–	–	Haynes 600
–	–	–	–	–	–	–	–	–	–	–	–	Haynes 75
–	NiCo 32 Cr 26 Mo	–	–	–	–	–	–	–	–	–	–	HS27
–	–	–	–	N06102	–	–	–	–	–	–	–	IN 102
ASME SB409	X 10 NiCrAlTi 32-20	–	–	N08800	3082.76	Z10NC3221	–	–	–	–	–	INCOLOY 800
–	–	–	–	–	–	Z4NC3221	–	–	–	–	–	INCOLOY 802
–	–	–	–	–	–	NC29Fe25	–	–	–	–	–	INCOLOY 804
–	NiFe 42 K 15 Nb	–	–	N19903	–	Z3NK28	–	–	–	–	–	INCOLOY 903
–	–	–	–	N19907	–	–	–	–	–	–	–	INCOLOY 907
–	–	–	–	N09925	–	–	–	–	–	–	–	INCOLOY 925
–	–	–	–	N09945	–	–	–	–	–	–	–	INCOLOY 945
ASME SB575	–	–	–	–	–	NiMo16Cr15	–	–	–	–	–	INCONEL LIGA 22
–	–	–	–	–	–	–	–	–	–	–	–	INCONEL LIGA 230
–	–	–	–	–	–	–	–	–	–	–	–	INCONEL LIGA 600SP
–	–	–	–	–	–	–	–	–	–	–	–	INCONEL LIGA 62
–	–	–	–	N06626	–	–	–	–	–	–	–	INCONEL LIGA 625LCF
–	–	–	–	–	–	NC15A	–	–	–	–	–	INCONEL LIGA 702
–	–	–	–	N09706	–	NFe10C16NbT	–	–	–	–	–	INCONEL LIGA 706
–	–	–	–	N07718	–	–	–	–	–	–	–	INCONEL LIGA 718 OP
–	–	–	–	–	–	NC16Fe8TM	–	–	–	–	–	INCONEL LIGA 721
–	NiCr 16 FeTi	–	–	N07722	–	NC16FeTi	–	–	–	–	–	INCONEL LIGA 722
–	–	–	–	R30783	–	–	–	–	–	–	–	INCONEL LIGA 783
–	–	–	–	N09925	–	–	–	–	–	B983 N09925	–	INCONEL LIGA 925
–	–	–	–	N10276	–	–	–	–	–	–	–	INCONEL LIGA C-276
–	–	–	–	N07754	–	–	–	–	–	–	–	INCONEL LIGA MA754
–	–	–	–	N07751	–	–	–	–	–	–	–	INCONEL LIGA X751
–	–	–	–	K93600 K93603	–	–	–	–	–	ASTM F1684	–	INVAR® 36
–	NiCr 20 Co 18 Ti	–	–	–	–	–	–	–	–	–	–	Jessop G81
–	G-NiCr 19 Co	–	–	N07252	–	–	–	–	–	–	–	M 252
–	–	–	–	N04405	–	–	–	–	–	–	–	Monel® R405

NOTA: Para a legenda, veja a página Y217.

(continuação)

S3 Lista dos materiais das peças • Ligas resistentes à altas temperaturas • S3 *(continuação)*

S3 Ligas resistentes a altas temperaturas, à base de níquel *Resistência a Tensão RM (MPa)*: 600–1700* *Dureza (HB): 160–450 (HRC): <48*

AISI**	DIN	BTS	JIS	UNS	EN	AFNOR	UNI	SIS	SAE	ASTM	Número do Material	Referência do fabricante
–	NiFe 33 Cr 17 Mo	–	–	–	–	–	–	–	–	–	–	Nimocast PD16
–	–	–	–	–	HC202	NC20N13	–	–	–	–	–	Nimocast PE10
–	–	–	–	–	–	NC19K18Fe5TA	–	–	–	–	–	Nimonic® 95
ASME SB575	–	–	–	N06022	–	–	–	–	–	–	–	Nimonic C22
–	NiCr 22 Fe 18 Mo	–	–	–	HR6, 204	NC22FeD	–	–	–	–	–	Nimonic PE13
–	NiFe 33 Cr 17 Mo	–	–	–	HR207	NW11AC	–	–	–	–	–	Nimonic PE16
–	NiCr 20 Co 16 MoTi	–	–	–	–	NC19KDUN	–	–	–	–	–	Nimonic PK33
–	–	–	NCF 3015	–	–	–	–	–	–	–	–	NiReVa 3015
AISI 686	–	–	–	–	–	–	–	–	–	–	–	R-235
AISI 690	–	–	–	–	–	Z6NKCDT38	–	–	–	–	–	Refractaloy 26
–	–	–	–	–	–	NK10C8W7ATaTD	–	–	–	–	–	René 125
–	–	–	–	–	–	NK15C14D6AWT	–	–	–	–	–	René 65
–	–	–	–	–	–	NC15K15ADT	–	–	–	–	–	René 77
–	–	–	–	–	–	NC14K9T5DWA	–	–	–	–	–	René 80
–	–	–	–	–	–	NC14K8	–	–	–	–	–	René 95
–	NiTa 9 Co 8 W 6 CrAl	–	–	–	–	NTa9K7C6W5A5DT	–	–	–	–	–	TRW VIA
–	NiCr 19 NbMo	–	–	–	–	NC18Fe18Nb6DWT	–	–	–	–	–	Udimet® 630
–	–	–	–	–	–	NCK18TDA	–	–	–	–	–	Udimet 710
–	–	–	–	–	–	NC18K15TDA	–	–	–	–	–	Udimet 720

S4 Lista dos materiais das peças • Ligas resistentes à altas temperaturas • S4

S4 Titânio e ligas de titânio *Resistência a Tensão RM (MPa)*: 900–1600* *Dureza (HB): 300–400 (HRC): 33–48*

AISI**	DIN	BTS	JIS	UNS	EN	AFNOR	UNI	SIS	SAE	ASTM	Número do Material	Referência do fabricante
R 50250	Ti-99.8	2 TA 1	–	UNS R50250	TA6, TA7, TA8, TA9	AIR:9182T35	–	–	–	ASTM B381F1	3.7025	ATI 30 CP Classe 1
R 50400	Ti-99.7	2 TA 2-5	–	UNS R50400	TA2.5	AIR:9182T40	–	–	–	ASTM B381F2	3.7035	ATI 40 CP Classe 2
–	SG-Ti 2	–	–	–	–	–	–	–	–	–	3.7036	–
R 50550	Ti-99.6	TA 3	–	UNS R50550	TA2, TA3, TA4, TA5	AIR:9182T50	–	–	–	ASTM B381F3	3.7055	ATI 55 CP Classe 3
R 50700	Ti-99.5	2 TA 6-9	–	UNS R50700	–	AIR:9182T60	–	–	–	ASTM B381F4	3.7065	ATI 70 CP Classe 4
–	TiNi 0,8 Mo 0,3	–	–	UNS R53400	–	–	–	–	Ti-3Al-1.5Mn	ASTM Classe 12	3.7105	–
Ti 5Al-2.5Sn	TiAl 5 Sn 2,5	–	–	UNS R54520	TA 14,17	T-A5E	–	–	Ti-5Al-2.5Sn	–	3.7115	ATI Classe 6
–	TiCu 2	2 TA 21-24	–	–	–	–	–	–	Ti-2Cu	–	3.7124	–
R 54620	TiAl 6 Sn 2 Zr 4 Mo 2 Si	–	–	UNS R54620	–	–	–	–	Ti-6Al-2Sn-2Zr-4Mo-2Si	–	3.7145	–
–	TiAl 6 ZrMo 0,5	TA 43	–	–	–	–	–	–	Ti-6-5-0.5	–	3.7155	–
R 56400	TiAl 6 V 4	TA 10-13	TC4	UNS R56400	TA10 TA11 TA12 TA13 TA28 TA56	TA6V	–	–	Ti-6Al-4V	–	3.7164	ATI 6-4™
–	TiAl 6 V4	–	TC4	UNS R56400	TA10 TA11 TA12 TA13 TA28 TA56	TA6V; AIR:9183	–	–	Ti-6Al-4V (Beta)	–	3.7164	–
R 56620	TiAl 6 V 6 Sn2	–	–	UNS R56620	–	–	–	–	Ti-6Al-6V-2Sn	–	3.7175	ATI 6-6-2™
–	TiAl 4 Mo 4 Sn 2	TA 45-51	–	–	–	–	–	–	Ti-4Al-4Mo-2Sn	–	3.7185	–
–	TiAl 3 V2.5	–	–	UNS R56320	–	–	–	–	Ti-3Al-2.5V	ASTM Classe 9	3.7195	ATI 3-2.5-MIL™
R 52250	Ti 1 Pd	TP 1	–	UNS R 52250	–	–	–	–	–	ASTM Classe 11	3.7225	–
R 52400	Ti 2 Pd	–	–	UNS R 52400	–	–	–	–	–	ASTM Classe 7	3.7235	–
–	Ti 3 Pd	–	–	–	–	–	–	–	–	–	3.7255	–
–	TiAl 5 Fe 2,5	–	–	–	–	–	–	–	Ti-5Al-2.5Fe	–	3.7110	–
–	TiV13Cr11Al3	–	–	–	–	–	–	–	Ti-13V-11Cr-3Al	–	–	11/13/03
–	Ti-10V-2Fe-3Al	–	–	–	–	–	–	–	Ti-10.2.3	–	–	ATI 10-2-3™
–	–	–	–	UNS R58153	–	–	–	–	Ti-15-333	–	–	ATI 15-333™
–	–	–	–	–	–	–	–	–	Ti-15Mo (Alfa + Beta)	–	–	ATI 15Mo™ (Alfa + Beta)
–	–	–	–	–	–	–	–	–	Ti-15Mo (Beta)	–	–	ATI 15Mo™ (Beta)
–	Ti5Al2Sn2Zr4Cr4Mo	–	–	UNS R58650	–	–	–	–	–	–	–	ATI 17™
–	TIAl 3 V 8 Cr 6 Mo 4 Z 4	–	–	–	–	–	–	–	Ti-3Al-8V-6Cr-4Mo-4Zr	ASTN Classe 19	–	ATI 38-644™
–	–	–	–	UNS R54250	–	–	–	–	Ti-425	ASTM B265	–	ATI 425®
–	–	–	–	–	–	–	–	–	Ti-425 MIL	–	–	ATI 425®-MIL
–	TiAl 4 Mo 4 Sn 2 Si 0.5	–	–	–	5103	T-A4DE	–	–	Ti-4Al-4Mo-2Sn-0.5Si	–	–	ATI 4-4-2™
–	–	–	–	–	–	–	–	–	Ti-45Nb	–	–	ATI 45Nb™
–	–	–	–	–	–	–	–	–	Ti-5Al-5V-5Mo-3Cr	–	–	ATI 5-5-5-3 PM™
–	–	–	–	–	–	–	–	–	Ti-6Al-2Sn-2Zr-2Mn-2Cr-0.2Si	–	–	ATI 6-2222™
–	–	–	–	UNS R54620	–	–	–	–	Ti-6Al-4Zr-2Mo-2Sn	–	–	ATI 6-2-4-2 PM™
–	TiAl6Zr4Mo2Sn2	–	–	UNS R54620 modificado	–	–	–	–	Ti-6Al-4Zr-2Mo-2Sn-0.2Si	–	–	ATI 6-2-4-2-Si PM™
–	–	–	–	UNS R56260	–	–	–	–	Ti-6-2-4-6	–	–	ATI 6-2-4-6™
–	–	–	–	UNS R56401	–	–	–	–	Ti-6Al-4V ELI	–	–	ATI 6-4 ELI™
–	TiAl 6 V4	–	–	UNS R56400	TA10 TA11 TA12 TA13 TA28 TA56	TA6V; AIR:9183	–	–	Ti-6Al-4V MIL	–	–	ATI 6-4-MIL™
–	TiAl 6 V4	–	–	UNS R56400	TA10 TA11 TA12 TA13 TA28 TA56	TA6V; AIR:9183	–	–	Ti-6Al-4V MIL (HT)	–	–	ATI 6-4-MIL™
–	–	–	–	UNS R56700	–	–	–	–	Ti-6-7	ASTM F 1295	–	ATI 6-7™
–	TiAl8Mo1V1	–	–	UNS R54810	–	–	–	–	Ti-8Al-1Mo-1V	–	–	ATI 8-1-1™
–	–	–	–	–	–	–	–	–	Ti-15Mo-3Nb-3Al-0.2Si	ASTM Classe 21	–	Beta 21-S
–	–	–	–	–	–	–	–	–	Ti-12Mo-6Zr-2Fe	–	–	TMZF
–	TiAl7Nb	–	–	–	–	–	–	–	Ti-6Al-7Nb	–	–	–
–	TiAl7Mo4	–	–	–	–	–	–	–	–	ASTM B381	–	–
–	TiAl 4 Mo 4 Sn 4 Si 0.5	–	–	–	5203	–	–	–	Ti-4Al-4Mo-4Sn-0.5Si	–	–	–
–	TiA6Zr5Mo0.5Si0.25	–	–	–	–	T.AGZ.50	–	–	Ti-6Al-5Zr-0.5Mo-0.25Si	–	–	–
–	TiAl6Zr5Mo4CuSi0.2	–	–	–	M201	–	–	–	Ti-6Al-5Zr-4Mo-Cu-0.2Si	–	–	–
–	–	–	TC18	–	–	–	–	–	Ti-5Al-5Mo-5V-1Cr-1Fe	–	–	–
–	–	–	–	UNS %58210	–	–	–	–	Ti Beta 21 S	ASTM Classe 21	–	–
Ti 98.8	Ti 98.8	–	–	–	–	–	–	–	–	–	–	–
Ti 99.9	Ti 99.9	–	–	–	–	–	–	–	–	–	–	–
–	TiAL 6 Sn 2 Zr 4 Mo 2	–	–	–	–	–	–	–	–	–	–	–

NOTA: Para a legenda, veja a página Y217.

H1 Lista dos materiais das peças • Aços e ferros endurecidos • H1

H1 Materiais endurecidos Dureza (HRC): 44–48

AISI**	DIN	BTS	JIS	UNS	EN	AFNOR	UNI	SIS	SAE	ASTM	Número do Material	Referência do fabricante
H 11	X 38 CrMoV 5 H1	BH 11	SKD 6	T20811	X 38 CrMoV 5 H1	Z 38 CDV 5	X 37 CrMoV 5 1 KU	–	–	–	1.2343	–
H11	X 38 CrMoV 5 H1	BH 11	SKD 6	T20811	X 38 CrMoV 5 H1	Z 38 CDV 5	X 37 CrMoV 5 1 KU	–	–	–	1.2343	–
H 13	X 40 CrMoV 5 1	BH 13	SKD 61	T20813	X 40 CrMoV 5 1	Z 40 CDV 5	X 40 CrMoV 5 1 1 KU	2242	–	–	1.2344	–
H 10	X 32 CrMoV 3 3	BH 10	SKD 7	T 20810	X 32 CrMoV 12H-28	32 DCV 28	30 CrMoV 12 27 KU	–	–	–	1.2365	–
H19	X 45 CrCoVW 5 5 5	–	–	–	–	–	–	–	–	–	1.2678	–
A 532 I B NiCr-LC	GX 260 NiCr 42	Classe 2 A	0512-00	F45001	GJH-X260NiCr 4-2	–	–	0512-00	–	–	0.9620	–
L6	–	–	–	–	–	55 NCDV 07 (HT)	–	–	–	–	–	–

H2 Lista dos materiais das peças • Aços e ferros endurecidos • H2

H2 Materiais endurecidos Dureza (HRC): 48–55

AISI**	DIN	BTS	JIS	UNS	EN	AFNOR	UNI	SIS	SAE	ASTM	Número do Material	Referência do fabricante
A 532 I A NiCr-HC	G-X 330 NiCr 42	Classe 2 B	0513-00	F45000	GJH-X330NiCr 4-2	FB Ni 4 Cr2 HC	–	0513-00	–	–	0.9625	–
H 21	X 30 WCrV 93	BH 21	SKD 5	T 20821	X 30 WCrV 9 3	Z 30 WCV 9	X 30 WCrV 9 3 KU	–	–	–	1.2581	–
H 12	X 37 CrMoW 5 1	BH 12	SKD 62	T20812	–	Z 35 CWDV 5	X 35 CrMoW 05 KU	–	–	–	1.2606	–
–	G-X 300 NiMo 3 Mg	–	–	–	GJH-X300NiMo 3 Mg	–	–	–	–	–	0.9610	–
A 532 I B NiCr-LC	GX 260 NiCr 42	Classe 2 A	0512-00	F45001	GJH-X260NiCr 4-2	–	–	0512-00	–	–	0.9620	–
A 532 III A 25% Cr	GX 260 Cr 27	Classe 3 D	0466-00	–	GJH-X260Cr 27	–	–	–	–	–	0.9650	–
–	X 2 NiCoMoTi 180905	–	–	–	–	Z 2 NKD 180905	–	–	–	–	–	Liga Durimphy
K12	–	–	–	–	–	–	–	–	–	–	–	ATI K12 MIL

H3 Lista dos materiais das peças • Aços e ferros endurecidos • H3

H3 Materiais endurecidos Dureza (HRC): 56–60

AISI**	DIN	BTS	JIS	UNS	EN	AFNOR	UNI	SIS	SAE	ASTM	Número do Material	Referência do fabricante
A 532 IIC15% CrMo-HC	G-X 300CrMo 15 3	Classe 3 A	–	–	GJH-X300CrMo 15-3	–	–	–	–	–	0.9635	–
–	G-X 300 CrMoNi 15 2 1	Classe 3 B	–	F45005	GJH-X300CrMoNi15-2-1	–	–	–	–	–	0.9640	–
A 532 IID20% CrMo-LC	GX 260 CrMoNi 20 2 1	Classe 3 C	–	F45007	GJH-X260CrMoNi20-2-1	–	–	–	–	–	0.9645	–
A 532 III A 25% Cr	G-X 300 CrMo 27 1	Classe 3 E	–	–	GJH-X300CrMo 27-1	–	–	–	–	–	0.9655	–
A 2	X 100 CrMoV 5 1	SKD 12	–	–	BA 2	Z 100 CDV 5 (HT)	X 100 CrMoV 51 KU	2260	–	–	1.2363	–
D7 (HT)	–	–	–	T30407	–	Z 230 CVA 12 04	–	–	–	–	1.2378	–
O 2	90 MnCrV 8	BO 2	–	T31502	90 MnV 8	90 MnV 8	90 MnVCr 8 KU	–	–	–	1.2842	–
A 532 I D Ni-HiCr	G-X 300 CrNiSi 95 2	Classe 2 C	0457-00	F45003	GJH-X300CrNiSi 9-5-2	–	–	–	–	–	0.9630	Tipo Ni duro 4
S 1	60 WCrV 7	BS 1	–	–	6020 WCrV 8	55 WC 20	55 WCrV 8 KU	–	–	–	1.2550	–
S 1	60 WCrV 7	BS 1	–	–	60 WCrV 8	55 WC 20	55 WCrV 8 UK	–	–	–	1.2550	–
S 7	50 CrMoV 13 14	–	–	–	–	–	–	–	–	–	–	Cryodur 2357
K 12 (HT)	–	–	–	–	–	–	–	–	–	–	–	ATI K12-MIL

H4 Lista dos materiais das peças • Aços e ferros endurecidos • H4

H4 Materiais endurecidos Dureza (HRC): >60

AISI**	DIN	BTS	JIS	UNS	EN	AFNOR	UNI	SIS	SAE	ASTM	Número do Material	Referência do fabricante
W 108	C 80 W 1	–	–	T72301	C 80 U	Y1 90	C 80 KU	1880	–	–	1.1525	–
D 2	X 155 CrVMo 12 1	BD 2	SKD §§	T 30402	X 153 CrMoV 12	Z 160 CDV 12	X 155 CrVMo 12 1 KU	2310	–	–	1.2379	–
–	100 WV4	–	SKS 21	–	–	–	–	–	–	–	1.2515	–
D 3	X 210 Cr 12	BD 3	SKD 1	T30403	X 210 Cr 1 2	Z 200 C 12	X 205 Cr 12 KU	–	–	–	1.2080	–
O 7	110 WCrV 5	–	–	–	–	–	–	–	–	–	–	–
–	Mh97 + Pb	–	–	–	–	–	–	–	–	–	–	LAW 100 Pb

Legenda da lista dos materiais das peças

* 1 Mpa = 145 psi
** Inclui especificações de materiais ASTM e SAE.
AISI — Instituto Americano de Ferro e Aço
AFNOR — Organização Nacional Francesa para Padronização
AMS — Especificações de Materiais Aeroespaciais
ASTM — Sociedade Norte-americana de Engenheiros Mecânicos
BS — Padrões Britânicos
DIN — Instituto Alemão para Padronização
EN — Padrões Europeus
JIS — Padrões Industriais Japoneses
SAE — Sociedade de Engenheiros Automotivos
SIS — Instituto de Padrões Suecos
UNI — Organização Italiana para Padronização
UNS — Sistema de Codificação Unificado

Serviço e suporte

Suporte à aplicação do cliente (CAS)

Obtenha respostas rápidas e confiáveis para os seus problemas de usinagem de metais mais difíceis

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Fácil acesso para conhecimento comprovado em usinagem!

Os Engenheiros de Aplicação do Cliente da Kennametal ajudam os clientes e grupos de engenharia em todo o mundo, com seleção especializada de ferramentas e recomendações de aplicação para toda a gama de ferramentas Kennametal.

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MELHORES FERRAMENTAS E TECNOLOGIAS DE SUPORTE	Base de dados de materiais. Calculadores de aplicação. Especialistas em performance de ferramental.



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Áustria	Alemão	0800 202873	eu.techsupport@kennametal.com
Bélgica	Inglês/Francês	0800 80850	eu.techsupport@kennametal.com
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Dinamarca	Inglês	808 89298	na.techsupport@kennametal.com
Finlândia	Inglês	0800 919412	na.techsupport@kennametal.com
França	Francês	080 5540 367	eu.techsupport@kennametal.com
Alemanha	Alemão	0800 0006651	eu.techsupport@kennametal.com
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Israel	Inglês	1809 449889	na.techsupport@kennametal.com
Itália	Italiano	800 916561	eu.techsupport@kennametal.com
Japão	Inglês	03 3820 2855	ap-kmt.techsupport@kennametal.com
Coreia do Sul	Inglês	+82 2 2100 6100	ap-kmt.techsupport@kennametal.com
Malásia	Inglês	1800 812 990	ap-kmt.techsupport@kennametal.com
México	Espanhol	1800 253 0758	na.techsupport@kennametal.com
Holanda	Inglês	0800 0201 130	eu.techsupport@kennametal.com
Nova Zelândia	Inglês	0800 450 941	ap-kmt.techsupport@kennametal.com
Noruega	Inglês	800 10080	na.techsupport@kennametal.com
Polônia	Polonês	0080 04411887	eu.techsupport@kennametal.com
Rússia (telefone fixo)	Russo	8800 5556394	eu.techsupport@kennametal.com
Rússia (telefone celular)	Russo	+7 8005556394	eu.techsupport@kennametal.com
Cingapura	Inglês	1800 6221031	ap-kmt.techsupport@kennametal.com
África do Sul	Inglês	0800 981643	na.techsupport@kennametal.com
Suécia	Inglês	020799246	na.techsupport@kennametal.com
Taiwan	Inglês	0800 666 197	ap-kmt.techsupport@kennametal.com
Tailândia	Inglês	1800 4417820	ap-kmt.techsupport@kennametal.com
Reino Unido	Inglês	0800 032 8339	na.techsupport@kennametal.com
Ucrânia	Russo	0800502664	eu.techsupport@kennametal.com
EUA	Inglês	800 835 3668	na.techsupport@kennametal.com

Os números mostrados servem somente aos países listados.

SEGURANÇA DA USINAGEM DE METAIS

INSTRUÇÕES IMPORTANTES DE SEGURANÇA

Leia antes de usar as ferramentas deste catálogo!

Riscos de projéteis e de fragmentação:

As operações modernas de usinagem envolvem altas velocidades dos fusos e das ferramentas, além de altas temperaturas e forças de corte. Cavacos quentes de metal podem ser lançados da peça durante a usinagem. Embora as ferramentas de corte sejam projetadas e produzidas para resistir a altas forças e temperaturas de corte, elas, algumas vezes, podem se fragmentar, especialmente se forem submetidas a estresse excessivo, impacto grave ou outro abuso.

Para evitar ferimentos:

- Use sempre equipamento de proteção individual (EPI) apropriado, inclusive óculos de segurança, quando operar máquinas de usinagem ou trabalhar próximo delas.
- Certifique-se sempre de que todas as proteções da máquina estejam posicionadas corretamente.

Riscos respiratórios e de contato com a pele:

Retificar carboneto ou outros materiais de ferramentas de corte avançadas produz pó ou névoa contendo partículas metálicas. Respirar esse pó ou névoa (especialmente por longos períodos) pode causar doenças pulmonares temporárias ou permanentes, ou piorar condições médicas preexistentes. O contato com essa poeira ou névoa pode irritar os olhos, a pele e as mucosas, e pode piorar condições de pele preexistentes.

Para evitar ferimentos:

- Ao retificar, use sempre máscaras de proteção respiratória e óculos de proteção.
- Providencie um sistema de ventilação, bem como colete, e descarte apropriadamente a poeira, névoa ou lama de retificação.
- Evite o contato com poeira ou névoa.

Para obter mais informações, leia a ficha de dados de segurança de material fornecida pela Kennametal e consulte: “General Industry Safety and Health Regulations” (Normas Gerais de Segurança e Saúde da Indústria), parte 1910 e título 29 do “Code of federal regulations” (Código de normas federais americanas).

Essas instruções de segurança são diretrizes gerais. Muitas variáveis afetam as operações de usinagem. É impossível cobrir todas as situações específicas. As informações técnicas incluídas neste catálogo e as recomendações de práticas de usinagem podem não se aplicar à sua operação específica. Para obter mais informações, consulte o folheto de segurança de usinagem da Kennametal, disponível gratuitamente na Kennametal pelo telefone 724 539 5747 ou pelo fax 724 539 5439. Para perguntas específicas sobre produtos ou sobre meio ambiente, entre em contato com nosso Escritório Corporativo de Meio Ambiente, Saúde e Segurança pelo telefone 724 539 5066 ou pelo fax 724 539 5372.

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