



OSAWA

DRILLS & END MILLS



2018 CATALOGUE

MATERIALS		HARDNESS/Rm
P1	Free cutting steel and structural steel	< 500 N/mm ²
P2	Carbon steel and low alloy steel	500-700 N/mm ²
P3	Medium alloy steel and heat treated steel	600-800 N/mm ²
P4	High alloy steel	800-1000 N/mm ²
P5	Tool steel	900-1200 N/mm ²
P6	High tensile strength steel	1200-1600 N/mm ²
M1	Ferritic stainless steel	400-700 N/mm ²
M2	Austenitic stainless steel (good machinability)	500-750 N/mm ²
M3	Austenitic stainless steel (medium machinability)	550-850 N/mm ²
M4	Martensitic stainless steel	650-950 N/mm ²
M5	PH stainless steel	800-1250 N/mm ²
K1	Grey cast iron	150-250 HB
K2	Nodular cast iron	150-350 HB
K3	Austenitic cast iron	120-260 HB
K4	ADI cast iron	250-500 HB
N1	Aluminium alloys ≤ 12% Si	
N2	Aluminium alloys > 12% Si	
N3	Copper	
N4	Bronze and brass	
N5	Plastic materials	
N6	Fiber and composites	
S1	Heat resistant super alloys (HRSA) - good machinability	< 25 HRC
S2	Heat resistant super alloys (HRSA) - medium machinability	25-35 HRC
S3	Heat resistant super alloys (HRSA) - low machinability	35-45 HRC
S4	Low alloy titanium (good machinability)	
S5	High alloy titanium (medium machinability)	
H1	Hardened steel	50-56 HRC
H2	Hardened bearing steel	54-62 HRC
H3	Hardened tool steel	60-65 HRC
H4	Hardened martensitic stainless steel	50-56 HRC
H5	Hardened white cast iron	48-55 HRC

✚ REFER TO PAGES 15-39 FOR THE COMPLETE LIST OF WORKPIECE MATERIALS.

🇮🇹 CONSULTARE PAGG. 15-39 PER LA LISTA COMPLETA DEI MATERIALI

🇩🇪 AUF DEN SEITEN 15 BIS 39 FÜR DIE VOLLSTÄNDIGE LISTE VON WERKSTOFFMATERIALIEN

🇫🇷 CONSULTER DE LA PAGE 15 À LA PAGE 39 POUR LA LISTE COMPLÈTE DES MATÉRIAUX

🇪🇸 CONSULTAR DESDE PÁG. 15 A PÁG. 39 PARA LA LISTA COMPLETA DE LOS MATERIALES

🇷🇺 ПОЛНЫЙ СПИСОК ОБРАБАТЫВАЕМЫХ МАТЕРИАЛОВ СМОТРИ НА СТР. 15-39.

2018 CATALOGUE



Osawa is a trademark owned by Sorma S.p.A. which is on a mission to provide the cutting tool market with solid tools for milling and drilling. Based on the well-established know how of Sorma S.p.A., coming from Japanese and European best technologies, the brand Osawa was launched in 2001 and groups different tools manufacturers located worldwide (Europe, Far East and USA). To keep up with the evolution of production systems and costs, Sorma is increasing its investments in China, Taiwan and Korea, always putting quality first: Osawa producers are strictly selected on the strength of their tools' performances and they are all certified ISO 9001. Such structure makes Osawa able to meet a very wide spectrum of customers' requests, even on most critical applications. Its production flexibility together with the highly qualified direction of Sorma gives Osawa the possibility to have high profile tools in any item of the range.

*Arturo Sorgato
President - Sorma S.p.A.*



Osawa è un marchio registrato da Sorma S.p.A. che ha la mission di offrire al mercato dell'industria meccanica utensili integrali per foratura e fresatura. Basato sull'esperienza maturata da Sorma con le migliori tecnologie giapponesi ed europee, il marchio Osawa è stato lanciato nel 2001 e raggruppa diversi produttori di utensili collocati in varie parti del mondo (Europa, Estremo Oriente e USA). Per far fronte all'evoluzione dei sistemi e dei costi di produzione, Sorma sta incrementando i propri investimenti in Cina, Taiwan e Corea, facendo sempre della qualità il proprio baluardo: i produttori Osawa sono selezionati severamente sulla base delle prestazioni dei loro utensili e sono tutti certificati ISO 9001. Questa struttura permette ad Osawa di far fronte ad un ampio quadro di richieste da parte dei clienti, anche nelle applicazioni più critiche. La sua flessibilità produttiva, insieme alla direzione altamente qualificata di Sorma, danno la possibilità ad Osawa di offrire utensili di alto profilo in ogni componente della gamma.

*Arturo Sorgato
Presidente - Sorma S.p.A.*



Osawa ist eine geschützte Handelsmarke der Firma Sorma S.p.A., die als Ziel, ein umfangreiches Angebot von Bohr- und Fräswerkzeugen für den Maschinenbau anbieten soll. Dank der langen Erfahrung, die Sorma während der Jahrzehnte sammeln konnte, und der besten japanischen und europäischen Technologien, wurde im Jahre 2001 die Handelsmarke Osawa gegründet. Osawa enthält hochwertige Werkzeuge von verschiedenen ausgelesenen Herstellern aus aller Welt (Europa, Ferner Osten, USA). Um den Schritt der ständigen Entwicklung der Fertigungsprozesse und Produktionskosten halten zu können, hat Sorma seine Investitionen in China, Taiwan und Korea erhöht, ohne selbstverständlich auf die Qualität zu verzichten, die seit immer im Mittelpunkt steht. Die Osawa Lieferanten sind auf sehr sorgfältiger Weise ausgewählt, verfügen alle über eine ISO 9001 Zertifizierung, und müssen die streng angeforderten Leistungsverhältnisse der Werkzeuge einhalten können. Dieser Hintergrund ermöglicht Osawa ein sehr breites Spektrum von Anfragen zu befriedigen, auch für die kritischsten Anwendungsfälle. Seine Flexibilität bei den verschiedenen Fertigungsprozesse, in Verbindung mit einer hochqualifizierten Führung der Firma Sorma, gibt Osawa die Möglichkeit hochwertige Werkzeuge in den verschiedenen Produktsegmente anzubieten.

*Arturo Sorgato
Präsident - Sorma S.p.A.*



Osawa est une marque déposée par Sorma S.p.A. qui a la mission d'offrir au marché de l'industrie mécanique des outils monobloc pour le perçage et le fraisage. Basée sur l'expérience acquise par Sorma avec les meilleures technologies japonaises et européennes, la marque Osawa a été lancée en 2001 et elle regroupe plusieurs producteurs d'outils qui se trouvent partout dans le monde (Europe, Extrême Orient et USA). Pour faire face à l'évolution des procédés de fabrication et des coûts de production, Sorma est en train d'augmenter ses propres investissements en Chine, à Taiwan et en Corée, en faisant toujours de la qualité son point de force : les producteurs Osawa sont sélectionnés sévèrement en fonction de la performance de leurs outils, et sont tous certifiés ISO 9001. Cette structure permet à Osawa de faire face à un large cadre de demandes de la part des clients, aussi dans les applications les plus critiques. Sa flexibilité productive, sous la direction hautement qualifiée de Sorma, donne à Osawa la possibilité d'offrir des outils de haut profil pour chaque composant de la gamme.

Arturo Sorgato
Président - Sorma S.p.A.



Osawa es una marca registrada de Sorma S.p.A. cuya misión es ofrecer al mercado de la industria mecánica herramientas integrales para el taladrado y el fresado. Basada en la experiencia adquirida por Sorma con las mejores tecnologías Japonesas y Europeas, la marca Osawa fue lanzada en el 2001 y reúne a diferentes fabricantes de herramientas ubicados en varias partes del mundo (Europa, Extremo Oriente y EE.UU.). Para hacer frente a la evolución de los sistemas y de los costes de producción, Sorma está aumentando su inversión en China, Taiwán y Corea, haciendo siempre de la calidad el propio baluarte: los productores Osawa se seleccionan basándose en el rendimiento de sus herramientas y son todos certificados ISO 9001. Esta estructura permite a Osawa de hacer frente a un panorama amplio de peticiones por parte de los clientes, incluso en las aplicaciones más críticas. Su flexibilidad productiva, junto a la dirección de profesionales altamente calificados de Sorma, dan la posibilidad a Osawa de ofrecer herramientas de alto perfil en cada componente de la gama.

Arturo Sorgato
Presidente - Sorma S.p.A.



Osawa - это марка зарегистрированная ЗАО «Sorma S.p.A.», которая включает в себя широкую гамму продукции интегрального осевого инструмента для сверления и фрезерования, применяемого в металлообрабатывающей промышленности. Компания «Sorma» обладает передовыми технологиями, накопленными благодаря многолетнему опыту работы с лучшими японскими и европейскими производителями. Марка Osawa появилась в 2001 году и объединила ведущих производителей инструментов, расположенных в разных частях мира (Европе, Дальнем Востоке и США). Следуя требованиям современного рынка по оптимизации стоимости и качества продукции, компания «Sorma» увеличила свои инвестиции в производство в таких странах как Китай, Тайвань и Корея, при условии соблюдения высочайших стандартов качества: все производители Osawa проходят строгий контроль качества продукции и высоких производственных стандартов. Всё производство сертифицировано согласно стандартам ISO 9001. Благодаря этому, продукция Osawa может быть применена для решения широкого спектра даже самых сложных задач и в состоянии удовлетворить требования потребителя возникающих при металлообработке. Гибкое производство Osawa, совместно с высококвалифицированным специалистами компании «Sorma», позволяют предложить качественный инструмент по всем направлениям продукции.

Arturo Sorgato
Президент ЗАО «Sorma S.p.A.»

WARNING

read carefully before using our products

- Tools may chatter if broken. The wearing of eye protection is strongly advised in the vicinity of the working area.
- The correct using condition and handling of our tools is essential to ensure maximum life and hazard-free operation.
- Cutting tools have sharp edges and care must be taken when handling to avoid cuts/lacerations to unprotected hands.
- The wearing of gloves is forbidden as the gloves may entangle with turning tools.
- Tools may hurt the user's feet when falling off. Safety shoes should be put on at all time.
- While fitting the tools to machine spindles and/or sleeves, care should be taken to avoid subjecting them to shock or impact.
- Check that the workpieces are properly seated and securely held in the chuck before switching on machine power.
- Do not use a tool which cutting edges are worn-out or chipped severely.
- Grinding operations may produce potentially hazardous dust particles or vapour. Adequate ventilation equipment should be provided.

VORSICHT

bitte sorgfältig durchlesen, bevor Sie unsere Produkte gebrauchen

- Beschädigte Werkzeuge können vibrieren, es wird daher dringend empfohlen Schutzbrillen in der Nähe der Arbeitsstelle zu tragen.
- Ordnungsgemäße Handhabung und Arbeitsvoraussetzung sind Grundbedingungen für lange Lebensdauer und Sicherheit.
- Die Schneidkanten der Werkzeuge sind sehr scharf und können ungeschützte Hände verletzen. Vorsicht bei der Handhabung.
- Handschuhe können sich mit drehenden Werkzeugen verfangen, sie sind daher verboten.
- Unfallschutzschuhe ständig anziehen: beim Hinunterfallen können die Werkzeuge die Füße verletzen.
- Beim Einsetzen der Werkzeuge auf die Maschinen ist darauf zu achten, Stöße zu vermeiden.
- Prüfen Sie vor Inbetriebnahme der Maschine die genaue Befestigung der Werkstücke.
- Werkzeuge mit beschädigten Schneiden nicht mehr verwenden.
- Beim Schleifen können gefährliche Partikel oder Gase entstehen. Angemessene Entlüftung muß gewährleistet sein.

ADVERTENCIAS

leer atentamente antes de comenzar a utilizar nuestros productos

- Si las herramientas están rotas, pueden vibrar. Se aconseja absolutamente el uso de gafas de protección cuando se está cerca del área de trabajo.
- El uso correcto de nuestras herramientas es esencial para asegurarse la mayor duración y para evitar operaciones peligrosas.
- Las herramientas de corte poseen bordes muy afilados que pueden causar heridas en las manos si no están debidamente protegidas.
- Está prohibido el uso de guantes. El tejido puede pegarse al filo y ser arrastrado por la herramienta en rotación.
- Las herramientas que caen pueden dañar los pies del operador. El calzado de protección contra accidentes debe usarse en todo momento.
- Si se fija una herramienta a la máquina tener la precaución de no averiarla.
- Controlar el posicionamiento perfecto y la fijación de la pieza a mecanizar antes de accionar la máquina.
- No utilizar herramientas muy gastadas o averiadas.
- Cuando se afila una herramienta pueden formarse polvos y vapores peligrosos. Disponer un sistema de ventilación adecuado.

AVVERTENZE

leggere attentamente prima dell'utilizzo dei nostri prodotti

- Gli utensili, se rotti, possono vibrare. L'uso di occhiali protettivi è assolutamente consigliato in prossimità dell' area di lavoro.
- Il corretto utilizzo dei nostri utensili è essenziale al fine di assicurarne la miglior durata ed evitare operazioni pericolose.
- Gli utensili da taglio hanno un tagliente molto affilato che può procurare ferite alle mani se non protette adeguatamente.
- L'uso di guanti è vietato. Il tessuto può legarsi al tagliente ed essere trascinato dall'utensile in rotazione.
- Gli utensili che cadono possono danneggiare i piedi dell'operatore. Le scarpe antinfortunistiche devono essere indossate in qualsiasi momento
- Nel fissare l'utensile alla macchina fare sempre attenzione a non danneggiarlo.
- Controllare il perfetto posizionamento e fissaggio del pezzo da lavorare prima di azionare la macchina.
- Non riutilizzare utensili fortemente usurati o danneggiati.
- La riaffilatura può generare polveri e vapori pericolosi. Attrezzarsi con un sistema di ventilazione adeguato.

AVERTISSEMENT

à lire attentivement avant utilisation de nos produits

- Les outils si cassés peuvent vibrer. Le port de lunettes de sécurité près de la zone de travail est vivement recommandé.
- Des conditions d'emploi correctes de nos produits sont essentielles pour assurer une durée de vie maximum et éviter des accidents.
- Les outils ont des arêtes vives et peuvent blesser les mains non protégées.
- Le port de gants près d'outils en rotation est interdit car ils peuvent être happés par l'outil.
- Des outils tombant à terre peuvent blesser les pieds de l'opérateur : le port de chaussures de sécurité est conseillé.
- En montant les outils sur le porte-outils, veiller à éviter les chocs.
- S'assurer que la pièce soit parfaitement fixée avant de mettre la machine en route.
- Ne pas utiliser des outils usés ou endommagés.
- Le réaffûtage des outils peut provoquer des vapeurs et des poussières dangereuses qui devront être convenablement aspirées.

ПРЕДУПРЕЖДЕНИЕ

внимательно прочитайте перед использованием нашей продукции

- Повреждённый инструмент подвержен вибрациям. Настоятельно рекомендуется использование средств защиты глаз, в непосредственной близости от рабочей зоны.
- Правильное использование нашего инструмента обеспечит максимальный срок его службы и безопасность работы.
- Режущий инструмент, имеет острые кромки, поэтому необходимо соблюдать осторожность при его использовании.
- Использование перчаток запрещено, так как ткань перчатки может зацепиться за части инструмента, что может привести к травмам при вращении инструмента.
- При падении инструмент может повредить ноги пользователя. Во время работы с инструментом должна быть использована специальная защитная обувь.
- Устанавливать инструмент в станок необходимо с осторожностью, во избежание его повреждения.
- Необходимо проверить надёжность крепления заготовки до включения станка.
- Не использовать повторно повреждённый или пришедший в негодность инструмент.
- Переточка инструмента может привести к образованию опасных испарений и пыли. Строго рекомендуется использование соответствующих вентиляционных систем.

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5 MAIN SECTIONS

- 1 carbide drills
- 2 HSS drills
- 3 micrograin carbide end mills
- 4 HSS end mills
- 5 carbide burrs

5 MACRO SEZIONI

- 1 punte in metallo duro
- 2 punte in HSS
- 3 frese in metallo duro micrograna
- 4 frese in HSSCo e HSSP
- 5 lime rotative in metallo duro

5 HAUPTABSCHNITTE

- 1 VHM Bohrer
- 2 HSS Bohrer
- 3 VHM Fräser Mikrokörnung
- 4 Fräser aus HSSCo und HSSP
- 5 Hartmetall-Rotierfräser

5 CHAPITRES

- 1 forets en carbure
- 2 forets en HSS
- 3 fraises en carbure micrograin
- 4 fraises en HSSCo et HSSP
- 5 limes rotatives en carbure

5 MACRO SECCIONES

- 1 brocas en metal duro
- 2 brocas en HSS
- 3 fresas en metal duro micrograno
- 4 fresas en HSS/Co y HSSP
- 5 limas rotativas en metal duro

5 ПОДРАЗДЕЛОВ

- 1 твёрдосплавные свёрла
- 2 свёрла из быстрорежущей стали
- 3 фрезы из мелкозернистого твёрдого сплава
- 4 фрезы из порошковой и легированной Co быстрорежущей стали
- 5 борфрезы твёрдосплавные

PRODUCT SEARCH

- RICERCA PRODOTTI
- PRODUKTSUCHE
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- BÚSQUEDA PRODUCTOS
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1

Alphanumeric index

Indice alfanumerico Alphanumerischer Index

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ALPHANUMERIC INDEX

If product code (e.g. ITEM No. 118N) is known, check the alphanumeric index at page 12.

INDICE ALFANUMERICO

Conoscendo il codice prodotto (es. ITEM No. 118N), consultare l'indice alfanumerico a pag. 12.

ALPHANUMERISCHER INDEX

Wenn Sie die Art.Nr kennen (z.B. ART.Nr 118N), können Sie die entsprechende Seite durch den Alphanumerischen Index - Seite 12 - finden.

INDEX ALPHANUMÉRIQUE

En connaissant le code produit (ex. ITEM No. 118N), consulter l'index alphanumérique à la page 12.

ÍNDICE ALFANUMÉRICO

Conociendo el producto (ej. ITEM No. 118N), consultar el índice alfanumérico en pág. 12.

АЛФАВИТНЫЙ УКАЗАТЕЛЬ

Если артикул (т.е. код № 118n) известен, смотрите алфавитный указатель на стр. 12.

2

The image shows a screenshot of the catalog's index and a detailed product page for the G2CSB2 drill bit. In the index, the 'G2 general purpose' entry is circled in red. The product page shows the G2CSB2 drill bit with its technical specifications table. The product name 'G2CSB2' is circled in red on the product page. The table below is a reproduction of the technical specifications table from the product page.

D	D (Inch)	R	R (Inch)	SHANK	L	FL	L	Z	OSP No.	Stock
1	3/8-0.000	0.00	0.0000	A	2	30	0	0	G2CSB2010	●
1.5	3/8-0.000	0.25	0.0015	A	3	30	0	0	G2CSB2015	●
2	3/8-0.000	0.50	0.0030	A	4	30	0	0	G2CSB2020	●
2.5	3/8-0.000	0.75	0.0045	A	5	30	0	0	G2CSB2025	●
3	3/8-0.000	1.00	0.0060	A	6	30	0	0	G2CSB2030	●
3.5	3/8-0.000	1.25	0.0075	A	7	30	0	0	G2CSB2035	●
4	3/8-0.000	1.50	0.0090	A	8	30	0	0	G2CSB2040	●
4.5	3/8-0.000	1.75	0.0105	A	9	30	0	0	G2CSB2045	●
5	3/8-0.000	2.00	0.0120	A	10	30	0	0	G2CSB2050	●
5.5	3/8-0.000	2.25	0.0135	A	11	30	0	0	G2CSB2055	●
6	3/8-0.000	2.50	0.0150	A	12	30	0	0	G2CSB2060	●
6.5	3/8-0.000	2.75	0.0165	A	13	30	0	0	G2CSB2065	●
7	3/8-0.000	3.00	0.0180	A	14	30	0	0	G2CSB2070	●
8	3/8-0.000	4.00	0.0240	B	18	30	0	0	G2CSB2080	●
9	3/8-0.000	4.50	0.0270	B	18	35	0	0	G2CSB2090	●
10	3/8-0.000	5.00	0.0300	B	20	35	0	0	G2CSB2100	●
11	3/8-0.000	5.50	0.0330	B	20	35	0	0	G2CSB2110	●
12	3/8-0.000	6.00	0.0360	B	24	35	0	0	G2CSB2120	●
16	3/8-0.000	8.00	0.0480	B	30	35	0	0	G2CSB2160	●
20	3/8-0.000	10.00	0.0600	B	36	35	0	0	G2CSB2200	●

GENERAL AND THUMB INDEX

If product series (e.g. G2) is known, check general index at page 5 or follow the thumb index.

INDICE E RUBRICATURA

Conoscendo la serie prodotto (es. G2), consultare l'indice generale a pag. 5 o seguire la rubricatura.

INDEX UND DAUMEN INDEX

Wenn die Produktgruppe bekannt ist (z.B. G2), schlagen Sie im Index -Seite 5- nach, oder folgend Sie dem Daumen Index.

INDEX ET RUBRIQUE

En connaissant la référence du produit (ex. G2), consulter l'index général à la page 5 ou suivre la rubrique.

ÍNDICE Y DIRECTORIO

Conociendo la serie de producto (ej. G2), consultar el índice general en pág. 5 o seguir el directorio.

ОГЛАВЛЕНИЕ И РУБРИКАТОР

Если известна серия продукции (т.е. g2), смотри общее оглавление на стр. 5 или используйте рубрикатор.

PRODUCT SEARCH

- 🇮🇹 RICERCA PRODOTTI
- 🇩🇪 PRODUKTSUCHE
- 🇫🇷 RECHERCHE PRODUITS
- 🇪🇸 BÚSQUEDA PRODUCTOS
- 🇷🇺 ПОДБОР ИНСТРУМЕНТА

3

Selection Guide OSAWA

Indice grafico • Auswahllhilfe • Índice gráfico • Índice gráfico • Рыководство по выбору

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SUH MINI short and long 5xD + 30xD	384SUH MINI 143	385SUH MINI 149	386SUH MINI 153	387SUH MINI 159	388SUH MINI 163	389SUH MINI 169	390SUH MINI 173	391SUH MINI 179
HL long and extra long 12xD + 30xD	392HL 173	393HL 179	394HL 183	395HL 189	396HL 193	397HL 199	398HL 203	399HL 209
NC spotting 90° - 120°	CS-DTA 10 200	CS-DTA 120 200	CS-DTA 180 200	CS-DTA 240 200	CS-DTA 300 200	CS-DTA 360 200	CS-DTA 420 200	CS-DTA 480 200

SELECTION GUIDE

An easy graphic index with tool and application information is available at the beginning of each section.

GUIDA ALLA SELEZIONE

All'inizio di ogni macro sezione è disponibile un indice grafico con informazioni relative all'utensile e alle sue applicazioni.

AUSWAHLHILFE

Am Anfang von jedem Hauptabschnitt ist ein grafischer Index, mit Infos bezüglich des Werkzeugs und seinem Anwendungsfeld, vorhanden.

GUIDE DE SÉLECTION

Un index graphique avec les informations relatives à l'outil et à ses applications est disponible au début de chaque chapitre.

GUÍA DE SELECCIÓN

Al inicio de cada macro sección está disponible un índice gráfico con informaciones relativas a la herramienta y a sus aplicaciones.

ПОМОЩНИК ПО ПОДБОРУ

В начале каждого подраздела находится простой графический индекс инструмента, который даёт информацию об инструменте и его применении.

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- HSS DRILLS page 208
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PRODUCT PAGE

- 🇮🇹 PAGINA PRODOTTO
- 🇩🇪 SEITE DES PRODUKTS
- 🇫🇷 PAGE PRODUIT
- 🇪🇸 PÁGINA PRODUCTO
- 🇷🇺 СТРАНИЦА АРТИКУЛА


G2 - General purpose - Square OSAWA

G2CS2
cylindrical shank, 2 flutes



OSAWA NORM N HRC PV200 <45 HRC

P M K N S H



D	D Tol.	C	C Tol.	d(h6)	l	l1	L	Z	EDP No.	Stock
1	0/-0.020			4	3		50	2	G2CS2010	●
1.5	0/-0.020			4	4.5		50	2	G2CS2015	●
2	0/-0.020			4	6		50	2	G2CS2020	●
2.5	0/-0.020			4	7		50	2	G2CS2025	●
3	0/-0.020			4	8		50	2	G2CS2030	●
3.5	0/-0.020			4	10		50	2	G2CS2035	●
4	0/-0.020			4	11		50	2	G2CS2040	●
4.5	0/-0.020			6	13		50	2	G2CS2045	●
5	0/-0.020			6	13		50	2	G2CS2050	●
5.5	0/-0.020			6	13		50	2	G2CS2055	●
6	0/-0.020			6	15		50	2	G2CS2060	●
6.5	0/-0.025			8	17		60	2	G2CS2065	●
7	0/-0.025			8	17		60	2	G2CS2070	●
7.5	0/-0.025			8	17		60	2	G2CS2075	●
8	0/-0.025			8	20		60	2	G2CS2080	●
8.5	0/-0.025			10	23		75	2	G2CS2085	●
9	0/-0.025			10	23		75	2	G2CS2090	●
10	0/-0.025			10	30		75	2	G2CS2100	●
10.5	0/-0.025			12	25		75	2	G2CS2105	●
11	0/-0.025			12	28		75	2	G2CS2110	●
12	0/-0.025			12	30		75	2	G2CS2120	●
13	0/-0.030			16	33		100	2	G2CS2130	●
14	0/-0.030			14	26		83	2	G2CS2140	●
15	0/-0.030			16	40		100	2	G2CS2150	●
16	0/-0.030			16	32		92	2	G2CS2160	●
17	0/-0.030			20	40		100	2	G2CS2170	●
18	0/-0.030			20	40		100	2	G2CS2180	●
20	0/-0.030			20	40		100	2	G2CS2200	●

● stock standard ○ non-standard stock ▽ stock exhaustion

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- 🇮🇹 Product code or ITEM nr.
- 🇮🇹 Codice prodotto o ITEM No.
- 🇩🇪 Name des Produkts oder Artikelnummer
- 🇫🇷 Code produit ou ITEM No.
- 🇪🇸 Código producto o ITEM No.
- 🇷🇺 Артикул или КОД №

- 🇮🇹 Icons
- 🇮🇹 Icone descrittive
- 🇩🇪 Beschreibende Symbole
- 🇫🇷 Icônes descriptives
- 🇪🇸 Iconos descriptivos
- 🇷🇺 Икона

- 🇮🇹 ISO Materials table with black or white stars to indicate applicability
- 🇮🇹 Tabella materiali ISO con stellina nera o bianca per indicazione applicabilità
- 🇩🇪 ISO Materialtabelle, mit weissem oder schwarzem Stern je nach Anwendbarkeit
- 🇫🇷 Tableau des matières ISO avec étoile noire ou blanche pour indiquer l'application
- 🇪🇸 Tabla materiales ISO con estrella negra y blanca para indicar aplicabilidad
- 🇷🇺 Таблица материалов ISO с чёрными или белыми звёздочками обозначающие применяемость

- 🇮🇹 Machining icons available also in the parameters tables (Only for milling)
- 🇮🇹 Icone di lavorazione, riportate anche nelle tabelle parametri (solo per fresatura)
- 🇩🇪 Bearbeitungssymbole, sind auch bei der Tabelle der Parameter vorhanden (nur für Fräsen)
- 🇫🇷 Icônes d'usinage, reportées également dans le tableau des paramètres (seulement pour le fraisage).
- 🇪🇸 Iconos de mecanizado, indicados también en la tabla de parámetros (solo para fresado)
- 🇷🇺 Иконки обработки обозначенные также в таблицах с рабочими параметрами (Только для фрезерования)

- 🇮🇹 Dimensions table with EDP Nr. and stock classification
- 🇮🇹 Tabella dimensionale con codice prodotto (EDP No.) e classificazione stock
- 🇩🇪 Tabelle mit Abmessungen, Art.Nummer (EDP Nr.), Verfügbarkeit
- 🇫🇷 Tableau des dimensions avec code produit (EDP No.) et classification du stock
- 🇪🇸 Tabla de dimensiones con código producto (EDP No.) y clasificación de stock
- 🇷🇺 Таблица размеров с кодом артикула и складской классификацией

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2691LS	279	GB305	327	MEXLN2	528	WDD 60°	693
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2701LS	294	HF342	418	MEXLNB2	570	WL3	667
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3512SUH MINI	148	HF444	409	MEXM2SC	526	WS3	665
3515HL	178	HF445	413	MEXMB2	566	WS4(6)	671
3520HL	183	HF450	467	MEXMB2SC	568	WSA2	663
3520SUH MINI	152	HF451	471	SA	703	WSB2	681
3525HL	188	HF452	479	SB	704	WSFR	677
3525SUH MINI	156	HF542	435	SC	705	WTM	695
3530HL	193	HF642	446	SD	706	WWK	697
3530SUH MINI	160	HF643	449	SE	707		
353ALH	119	HF742	452	SF	708		
353HPU	83	HF743	455	SG	709		
353HRC	129	HF840	390	SH	710		
353HTA	58	HF842	421	SJ	711		
353PU	83	HF844	405	SK	712		
353SUH	105	HF850	463	SL	713		
353TA	58	HF852	475	SM	714		
355ALH	123	HF861	458	SN	715		
355HPU	92	HF942	438	TAFFR	687		
355HTA	66	HF943	442	TAFM	685		
355PU	92	HFA53	504	TAWL2	661		
355SUH	111	HFAL3	501	TAWL3	667		
355SUH MINI	140	HFAL4	498	TAWL4(6)	673		
355TA	66	MCA212R	519	TAWLB2	683		
3584HTA	74	MDA310	514	TAWLFR	679		
358SUH MINI	144	MDA311	514	TAWS2	658		
980SUTA	224	MDA312	514	TAWS3	665		
990SUTA	228	MDCAB2	521	TAWS4(6)	671		
A15FW	716	MDCL2	368	TAWSB2	681		
A16FW	716	MDCL4	378	TAWSFR	677		
BUR10	716	MDCSA1	507	TAWSH3	669		
CSDTA 120°	200	MDCSA2	509	TAWSR	675		
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MATERIALS		HARDNESS/Rm	
P1	<ul style="list-style-type: none"> Free cutting steel and structural steel Acciai automatici e acciai strutturali Automatenstähle und Baustähle 	<ul style="list-style-type: none"> Aciers pour décolletage et aciers structurels Aceros de fácil mecanización y aceros de construcción Автоматные и конструкционные стали 	< 500 N/mm ²
P2	<ul style="list-style-type: none"> Carbon steel and low alloy steel Acciai al carbonio e acciai basso legati Kohlenstoff-Stähle und niedriglegierte Stähle 	<ul style="list-style-type: none"> Aciers au carbone et aciers faiblement alliés Aceros al carbono y aceros de baja aleación Углеродистые и низколегированные стали 	500-700 N/mm ²
P3	<ul style="list-style-type: none"> Medium alloy steel and heat treated steel Acciai medio legati e acciai di bonifica Mittellegierte Stähle und Vergütungsstähle 	<ul style="list-style-type: none"> Aciers moyennement alliés et aciers trempés et recuits Aceros de media aleación y aceros bonificados Среднелегированные и отожженные стали 	600-800 N/mm ²
P4	<ul style="list-style-type: none"> High alloy steel Acciai alto legati Hochlegierte Stähle 	<ul style="list-style-type: none"> Aciers fortement alliés Aceros de alta aleación Высоколегированные стали 	800-1000 N/mm ²
P5	<ul style="list-style-type: none"> Tool steel Acciai per utensili Werkzeugstähle 	<ul style="list-style-type: none"> Aciers pour outils Aceros para herramientas Инструментальные стали 	900-1200 N/mm ²
P6	<ul style="list-style-type: none"> High tensile strength steel Acciai ad alta resistenza HSLA-Stähle 	<ul style="list-style-type: none"> Aciers haute résistance Aceros de alta resistencia Высокопрочная сталь 	1200-1600 N/mm ²
M1	<ul style="list-style-type: none"> Ferritic stainless steel Acciai inossidabili ferritici Ferritische Edelstahl 	<ul style="list-style-type: none"> Aciers inoxydables ferritiques Aceros inoxidables ferríticos Ферритные нержавеющие стали 	400-700 N/mm ²
M2	<ul style="list-style-type: none"> Austenitic stainless steel (good machinability) Acciai inossidabili austenitici - buona lavorabilità Austenitische Edelstahl - gute Verarbeitbarkeit 	<ul style="list-style-type: none"> Aciers inoxydables austénitiques - bonne usinabilité Aceros inoxidables austeníticos - fácil mecanización Аустенитные нержавеющие стали (хорошая обрабатываемость) 	500-750 N/mm ²
M3	<ul style="list-style-type: none"> Austenitic stainless steel (medium machinability) Acciai inossidabili austenitici - media lavorabilità Austenitische Edelstahl - mittlere Verarbeitbarkeit 	<ul style="list-style-type: none"> Aciers inoxydables austénitiques - moyenne usinabilité Aceros inoxidables austeníticos - maquinabilidad media Аустенитные нержавеющие стали (средняя обрабатываемость) 	550-850 N/mm ²
M4	<ul style="list-style-type: none"> Martensitic stainless steel Acciai inossidabili martensitici Martensitische Edelstahl 	<ul style="list-style-type: none"> Aciers inoxydables martensitiques Aceros inoxidables martensíticos Мартенситные нержавеющие стали 	650-950 N/mm ²
M5	<ul style="list-style-type: none"> PH stainless steel Acciai inossidabili PH - indurenti per precipitazione Ausscheidungshärtbare Edelstahl 	<ul style="list-style-type: none"> Aciers inoxydables à durcissement par précipitation Aceros inoxidables PH Нержавеющие стали PH 	800-1250 N/mm ²

INFO
TYPHOON TA-HTA-4HTA
TYPHOON PU-HPU
TYPHOON SUH
TYPHOON ALH
TYPHOON HRC
TYPHOON SUH MINI
TYPHOON HL
C-SD-TA
LFTA
SUTA
HSS-HSS/CO DRILLS
G2
MDTA
HF VH/UP
MEF
ALU
MEX
UH
HSS/CO-HSSP END MILLS
CARBIDE BURRS

INFO
TYPHOON TA-HTA-4HTA
TYPHOON PU-HPU
TYPHOON SUH
TYPHOON ALH
TYPHOON HRC
TYPHOON SUH MINI
TYPHOON HL
C-SD-TA
LFTA
SUTA
HSS-HSS/CO DRILLS
G2
MDTA
HF VH/UP
MEF
ALU
MEX
UH
HSS/CO-HSSP END MILLS
CARBIDE BURRS

MATERIALS	HARDNESS/Rm
K1 <ul style="list-style-type: none"> Grey cast iron Ghise grigie Grauguss 	<ul style="list-style-type: none"> Fonte grise Fundición gris Серый чугун <p>150-250 HB</p>
K2 <ul style="list-style-type: none"> Nodular cast iron Ghise sferoidali Sphäroguss 	<ul style="list-style-type: none"> Fonte nodulaire Fundición nodular Чугун с шаровидным графитом <p>150-350 HB</p>
K3 <ul style="list-style-type: none"> Austenitic cast iron Ghise austenitiche Austenitischer Guss 	<ul style="list-style-type: none"> Fonte austénitique Fundición austenítica Аустенитный чугун <p>120-260 HB</p>
K4 <ul style="list-style-type: none"> ADI cast iron Ghise ADI ADI Guss 	<ul style="list-style-type: none"> Fonte ADI Fundición ADI Отпущенный ковкий чугун <p>250-500 HB</p>
N1 <ul style="list-style-type: none"> Aluminium alloys ≤ 12% Si Leghe di alluminio ≤ 12% Si Aluminiumlegierungen ≤ 12% Si 	<ul style="list-style-type: none"> Alliages d'aluminium ≤ 12 % Si Aleación de aluminio ≤ 12% Si Алюминиевое литье ≤ 12% Si
N2 <ul style="list-style-type: none"> Aluminium alloys > 12% Si Leghe di alluminio > 12% Si Aluminiumlegierungen > 12% Si 	<ul style="list-style-type: none"> Alliages d'aluminium > 12 % Si Aleación de aluminio > 12% Si Алюминиевое литье > 12% Si
N3 <ul style="list-style-type: none"> Copper Rame Kupfer 	<ul style="list-style-type: none"> Cuivre Cobre Медные сплавы
N4 <ul style="list-style-type: none"> Bronze and brass Bronzo e ottone Bronze und Messing 	<ul style="list-style-type: none"> Bronze et laiton Bronce y latón Бронзы и Латуни
N5 <ul style="list-style-type: none"> Plastic materials Materiali plastici Kunststoffmaterialien 	<ul style="list-style-type: none"> Matériaux plastiques Materiales plásticos Пластические материалы
N6 <ul style="list-style-type: none"> Fiber and composites Fibre e compositi Faserwerkstoffe und Verbundwerkstoffe 	<ul style="list-style-type: none"> Fibres et composites Fibras y compuestos Композитные материалы

MATERIALS		HARDNESS/Rm	
S	<ul style="list-style-type: none"> Heat resistant super alloys (HRSA) - good machinability Leghe resistenti al calore - buona lavorabilità Warmfeste Legierungen - gute Verarbeitbarkeit 	<ul style="list-style-type: none"> Alliages résistants à la chaleur - bonne usinabilité Aleaciones resistentes al calor de fácil mecanización Жаропрочные суперсплавы (хорошая обрабатываемость) 	< 25 HRC
	<ul style="list-style-type: none"> Heat resistant super alloys (HRSA) - medium machinability Leghe resistenti al calore - media lavorabilità Warmfeste Legierungen - mittlere Verarbeitbarkeit 	<ul style="list-style-type: none"> Alliages résistants à la chaleur - moyenne usinabilité Aleaciones resistentes al calor de media mecanización Жаропрочные суперсплавы (средняя обрабатываемость) 	25-35 HRC
	<ul style="list-style-type: none"> Heat resistant super alloys (HRSA) - low machinability Leghe resistenti al calore - difficile lavorabilità Warmfeste Legierungen - schwere Verarbeitbarkeit 	<ul style="list-style-type: none"> Alliages résistants à la chaleur - faible usinabilité Aleaciones resistentes al calor de difícil mecanización Жаропрочные суперсплавы (плохая обрабатываемость) 	35-45 HRC
	<ul style="list-style-type: none"> Low alloy titanium (good machinability) Leghe di titanio basso legate e medio legate Niederlegierte und mittellegierte Titanlegierungen 	<ul style="list-style-type: none"> Alliages de titane faiblement alliés et moyennement alliés Aleaciones de titanio de fácil mecanización Низколегированные титановые сплавы (хорошая обрабатываемость) 	
	<ul style="list-style-type: none"> High alloy titanium (medium machinability) Leghe di titanio medio legate e alto legate Mittellegierte und hochlegierte Titanlegierungen 	<ul style="list-style-type: none"> Alliages de titane moyennement alliés et fortement alliés Aleaciones de titanio de media mecanización Высоколегированные титановые сплавы (средняя обрабатываемость) 	
H	<ul style="list-style-type: none"> Hardened steel Acciai temprati generali Allgemeine gehärtete Stähle 	<ul style="list-style-type: none"> Aciers trempés Aceros templados Закаленные стали 	50-56 HRC
	<ul style="list-style-type: none"> Hardened bearing steel Acciai temprati per cuscinetti Gehärtete Kugellagerstähle 	<ul style="list-style-type: none"> Aciers trempés pour roulements Aceros templados para rodamientos Закаленные подшипниковые стали 	54-62 HRC
	<ul style="list-style-type: none"> Hardened tool steel Acciai temprati per utensili Gehärtete Werkzeugstähle 	<ul style="list-style-type: none"> Aciers trempés pour outils Aceros templados para herramientas Закаленные инструментальные стали 	60-65 HRC
	<ul style="list-style-type: none"> Hardened martensitic stainless steel Acciai inossidabili martensitici temprati Gehärtete martensitische Edelstahlstähle 	<ul style="list-style-type: none"> Aciers inoxydables martensitiques trempés Aceros inoxidables martensíticos templados Закаленные мартенситные нержавеющие стали 	50-56 HRC
	<ul style="list-style-type: none"> Hardened white cast iron Ghise bianche temprate Gehärteter Weißguss 	<ul style="list-style-type: none"> Fonte blanche trempée Fundición blanca templada Закаленный белый чугун 	48-55 HRC

INFO

- TYPHOON TA-HTA-4HTA
- TYPHOON PU-HPU
- TYPHOON SUH
- TYPHOON ALH
- TYPHOON HRC
- TYPHOON SUH MINI
- TYPHOON HL
- C-SD-TA
- LFTA
- SUTA
- HSS-HSS/CO DRILLS
- G2
- MDTA
- HF VH/UP
- MEF
- ALU
- MEX
- UH
- HSS/CO-HSSP END MILLS
- CARBIDE BURRS

INFO
TYPHOON TA-HTA-4HTA
TYPHOON PU-HPU
TYPHOON SUH
TYPHOON ALH
TYPHOON HRC
TYPHOON SUH MINI
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CARBIDE BURRS

MATERIALS	TRADE MARK	AISI-ASTM	W.-Nr	DIN	BS
P1 < 500 N/mm² 🇩🇪 Free cutting steel and structural steel 🇮🇹 Acciai automatici e acciai strutturali 🇩🇪 Automatenstähle und Baustähle 🇫🇷 Aciers pour décolletage et aciers structurels 🇪🇸 Aceros de fácil mecanización y aceros de construcción 🇷🇺 Автоматные и конструкционные стали	AVP	1213	1.0715	9 SMn 28	230 M 07
		12 L 13	1.0718	9 SMnPb 28	
		1108	1.0721	10 S 20	210 M 15
		11 L 08	1.0722	10 SPb 20	
			1.0723	15 S 20	210 A 15
		1140	1.0726	35 S 20	212 M 36
		1146	1.0727	46 S 20	212 M 44
	AVZ	1215	1.0736	9 SMn 36	240 M 07
		12 L 14	1.0737	9 SMnPb 36	
			1.0037	St 37-2	
	PR80	A29	1.0765	36 SMnPb 14	
		A 573 Gr. 58	1.0116	St 37-3	4360-40 C
		A 573 Gr. 70	1.0144	St 44-3 N	4360-43 C
		1010	1.0301	C 10	045 M 10
		1015	1.0401	C 15	080 M 15
	1023	1.0402	C 22	050 A 20	
		1.0570	St 52-3	4360-50 C	
	1015	1.1141	Ck 15	080 M 15	
	1025	1.1158	Ck 25	060 A 25	
P2 500-700 N/mm² 🇩🇪 Carbon steel and low alloy steel 🇮🇹 Acciai al carbonio e acciai basso legati 🇩🇪 Kohlenstoff-Stähle und niedriglegierte Stähle 🇫🇷 Aciers au carbone et aciers faiblement alliés 🇪🇸 Aceros al carbono y aceros de baja aleación 🇷🇺 Углеродистые и низколегированные стали			1.2162	21 MnCr 5	
		A 204 Gr. A	1.5415	15 Mo 3	1501-240
		4520	1.5423	16 Mo 5	1503-245-420
		3310, 9314	1.5752	14 NiCr 14	655 M 13
		4320	1.5919	15 CrNi 6	S 107
			1.6587	18 CrNiMo 7 6	820 A 16
		5115	1.7131	16 MnCr 5	527 M 17
			1.7139	16 MnCrS 5	
		5120	1.7147	20 MnCr 5	
		5120 H	1.7149	20 MnCrS 5	
		A 182-F11, F12	1.7335	13 CrMo 4 4	1501-620 Gr. 27
		A 387 Gr. 12 Cl. 2	1.7337	16 CrMo 4 4	1501-620 Gr. 27
		A 182-F22	1.7380	10 CrMo 9 10	1501-622 Gr. 31
		1035	1.0501	C 35	060 A 35
		1045	1.0503	C 45	80 M 46
	1040	1.0511	C 40	080 M 40	
	1055	1.0535	St 70-2		
	1060	1.0601	C 60	080 A 62	
	1039	1.1157	40 Mn 4	150 M 36	
	1330	1.1165	30 Mn 5	120 M 36	
	1335	1.1167	36 Mn 5	150 M 36	
	1035	1.1181	Ck 35	080 M 36	
	1045	1.1191	Ck 45	080 M 46	
	1064	1.1221	Ck 60	080 A 62	
	1060	1.1740	C 60 W		
P3 600-800 N/mm² 🇩🇪 Medium alloy steel and heat treated steel 🇮🇹 Acciai medio legati e acciai di bonifica 🇩🇪 Mittellegierte Stähle und Vergütungsstähle 🇫🇷 Aciers moyennement alliés et aciers trempés et recuits 🇪🇸 Aceros de media aleación y aceros bonificados 🇷🇺 Среднелегированные и отожженные стали		9255	1.0904	55 Si 7	250 A 53
		4142, 4140	1.1201	42 CrMo 4	708 M 40
		4142, 4140	1.7225	42 CrMo 4	708 M 40
		4135	1.2330	35 CrMo 4	708 A 37
		S1	1.2542	45 WCrV 7	BS 1
		L6	1.2714	56 NiCrMoV 7	BH 224-5
		5045	1.5121	46 MnSi 4	
		3135	1.5710	36 NiCr 6	640 A 35
		3435	1.5736	36 NiCr 10	
		9840	1.6511	36 CrNiMo 4	816 M 40
		4340	1.6582	34 CrNiMo 6	817 M 40
		5132	1.7033	34 Cr 4	530 A 32
		5140	1.7035	41 Cr 4	530 M 40
		4130	1.7218	25 CrMo 4	708 M 25
			1.7361	32 CrMo 12	722 M 24
	6150	1.8159	50 CrV 4	735 A 50	
	A 355 Cl. A	1.8509	41 CrAlMo 7	905 M 39	

SS	AFNOR	UNE-IHA	JIS	UNI	EN	UNS	GOST
1912	S 250	11SMn28	SUM 22	CF 9 SMn 28	11 SMn30	G12130	
1914	S 250 Pb	11SMnPb28	SUM 22 L	CF 9 SMnPb 28	11 SMnPb30	G12134	
	10 F 1			CF 10 S 20	10 S 20		
	10 PbF 2	10 SPb 20		CF 10 SPb 20			
1922		F.210.F	SUM 32		15 SMn13		
1957	35 MF 4	F.210.G			35 S20	G11400	40
1973	45 MF 4				46 S20	G11460	
	S 300	12 SMn 35		CF 9 SMn 36	11 SMn37	G12150	
1926	S 300 Pb	F.2114-12		CF 9 SMnPb 36	11 SMnPb 37	G12144	
1311	E 24-2		STKM 12 C	Fe 360 B	S235JR		16D
			Cf 35 SMnPb 10	36SMnPb14			
1312, 1313	E 24-3, E 24-4			Fe 360 D FF	S235JRG2		18kp
1412, 1414	E 28-3, E 28-4		SM 41 C	Fe 430 D FF	S275J2G3		St14kP
	AF 34 C 10, XC 10	F.110	S 10 C	C 10	C 10	G10100	10
1350	AF3 7 C 12, XC 18	F.111		C 15, C 16		G10170	15
1450	C 20	F.112		C 20, C 21	C22+N	G10200	20
2172, 2132	E 36-3, E 36-4		SM 50 YA	Fe 510 B	S355JR		17G1S
1370	XC 15, XC 18	F.1511	S 15 C, S 15 CK	C 15, C 16	C 15R	G10170	15
	XC 25	F.1120	S 25 C	C 25		G10250	25
	20 NC 5		SCR 420 H				
2912	15 D 3	16 Mo3		16 Mo 3	16 Mo 3		
			SB 450 M	16 Mo 5		G45200	
	12 NC 15		SNC 815 (H)		14 NiCr 14	G33106	20X2H4A
	16 NC 6			16 CrNi 4			
	18 NCD 6			18 NiCrMo 7	18 NiCrMo 7 6		
2511	16 MC 5	F.1516	SCR 415	16 MnCr 5	16 MnCr 5	G51170	12KHN2
					16 MnCrS 5		18HG
	20 MC 5		SMnC 420 (H)	20 MnCr 5	20 MnCr 5	G51200	20KH
	20 MnCrS 5		SMnC 21 H		20 MnCrS 5		20KH
2216	15 CD 3.5			14 CrMo 4 5	13 CrMo 4 5		12KHM
2216	15 CD 4.5			14 CrMo 4 5			
2218	10 CD 9.10			12 CrMo 9 10	10 CrMo 9 10	J21890	12KH8
1550	AF 55 C 35	F.113		C 35	C35+N	G10350	35
1650	AF 65 C 45	F.114	S 45 C	C 45	E 335	G10430	45
	AF 60 C 40	F.114.A	S 40 C	C 40	C40+N		40
1655	A 70-2			Fe 690	E 360		55
	CC 55			C 60	C60+N	G10600	60
	35 M 5					G10390	40G
			SMn 1 H, SCMn 2		G 28 Mn6	G13300	30G2
2120	40 M 5	F.411	SMn 438 (H), SCMn 3		G 28 Mn6+QT	G13350	35G2
1572	XC 38 H1	F.1130	S 35 C	C 35	C 35E	G10340	35
1672	XC 42	F.1140	S 45 C	C 45	C 45E	G10420	45
1665, 1678	XC 60	F.1150	S 58 C	C 60	C 60E	G10640	60
	Y3 55		SK 7				60
2085, 2090	55 S 7			55 Si 8	55 SiCr7		55S2
2244	42 CD 4		SCM 440 (H)	42 CrMo 4	42 CrMo 4	G41400	38HM
2244	42 CD 4	F.1252	SCM 440 (H)	42 CrMo 4	42 CrMo 4	G41400	38HM
2234	34 CD 4	F.1250		35 CrMo 4		T51620	35KHM
2710				45 WCrV 8 KU		T41901	5KHV2S
			SKT 4	56 NiCrMoV7-KU		T61206	5KHNV
	35 NC 6		SNC 236				
	35 NC 11		SNC 631 (H)	35 NiCr 9			
	40 NCD 3			38 NiCrMo 4 (KB)	36CrNiMo4+TA	G98400	
2541	35 NCD 6	F.1280	SNCM 447	35 NiCrMo 6 (KW)	34 CrNiMo 6		38H2N2MA
	32 C 4	35Cr4	SCr 430 (H)	34 Cr 4 (KB)	34 Cr 4	G51320	35KH
	42 C 4	42 Cr 4	SCr 440 (H)	41 Cr 4	41 Cr 4	G51400	40H
2225	25 CD 4 S	F.1251/55Cr3	SCM 425	25 CrMo 4 (KB)	25 CrMo 4	G41300	20KHM
2240	30 CD 12	F.124.A		32 CrMo 12			
2230	50 CV 4	F.143	SUP 10	51 CrV 4	50 CrV 4	H61500	50KHFA
2940	40 CAD 6.12	F.1740	SACM 645	41 CrAlMo 7	41 CrAlMo 7 10	K24065	

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MATERIALS	TRADE MARK	AISI-ASTM	W.-Nr	DIN	BS	
P4 800-1000 N/mm² High alloy steel Acciai alto legati Hochlegierte Stähle Aciers fortement alliés Aceros de alta aleación Высоколегированные стали		1070	1.1231	Ck 67	060 A 67	
		1095	1.1274	Ck 101	060 A 96	
		W1	1.1545	C 105 W1		
			1.1645	C 105 W2		
		W1	1.1663	C 125 W		
		L2	1.2210	115 CrV 3		
		O1	1.2510	100 MnCrW 4	BO 1	
		K720	O2	1.2842	90 MnCrV 8	BO 2
		HARDOX HiTuf				
		52100	1.3505	100 Cr 6	534 A 99	
P5 900-1200 N/mm² Tool steel Acciai per utensili Werkzeugstähle Aciers pour outils Aceros para herramientas Инструментальные стали	TOOLOX 33					
	K100	D3	1.2080	X 210 Cr 12	BD 3	
	M310		1.2083	X 42 Cr 13		
	M201		1.2311	40 CrMnMo 7		
	M200-HOLDAX		1.2312	40 CrMnMoS 86		
			1.2316	X 36 CrMo 17		
	W300	H11	1.2343	X 38 CrMoV 5 1	BH 11	
	W302	H13	1.2344	X 40 CrMoV 5 1	BH 13	
		A2	1.2363	X 100 CrMoV 5 1	BA 2	
	W320	H10	1.2365	X 32 CrMoV 3 3	BH 10	
	K110		1.2379	X 155 CrMo 12 1		
			1.2436	X 210 CrW 12		
			1.2601	X 165 CrMoV 12		
		L6	1.2713	55 NiCrMoV 6		
	W500		1.2714	56 NiCrMoV 7		
	M238		1.2738	40 CrMnNiMo8 6 4		
		M35	1.3243	S 6-5-2-5		
		M42	1.3247	S 2-10-1-8	BM 42	
		T4	1.3255	S 18-1-2-5	BT 4	
	S600	M2	1.3343	S 6-5-2	BM 2	
	M7	1.3348	S 2-9-2			
TOOLOX 40						
	T1	1.3355	S 18-0-1	BT 1		
VANADIS 4						
VANADIS 10						
P6 1200-1600 N/mm² High tensile strength steel Acciai ad alta resistenza HSLA-Stähle Aciers haute résistance Aceros de alta resistencia Высокопрочная сталь	TOOLOX 44					
	HARDOX 400					
	HARDOX 450					
	HARDOX 500					
	WELDOX 1100					
	CREUSABRO DUAL					
	CREUSABRO 8000					
	W720		1.6358	X 2 NiCrMo 18 9 5		
	MARAGING		1.2706	X 3 NiCrMo 18 8 5		

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CARBIDE BURRS

MATERIALS	TRADE MARK	AISI-ASTM	W.-Nr	DIN	BS	
M1 400-700 N/mm² 🇩🇪 Ferritic stainless steel 🇮🇹 Acciai inossidabili ferritici 🇪🇸 Ferritische Edelstähle 🇫🇷 Aciers inoxydables ferritiques 🇪🇸 Aceros inoxidable ferríticos 🇷🇺 Ферритные нержавеющие стали		405	1.4002	X 6 CrAl 13	405 S 17	
		430	1.4016	X 6 Cr 17	430 S 15	
		430 F	1.4104	X 12 CrMoS 17		
		434	1.4113	X 6 CrMo 17	434 S 17	
		CA-6NM	1.4313	X 5 CrNi 13 4	425 C 11	
		430 Ti	1.4510	X 6 CrTi 17		
		409	1.4512	X 5 CrTi 12	409 S 17	
M2 500-750 N/mm² 🇩🇪 Austenitic stainless steel (good machinability) 🇮🇹 Acciai inossidabili austenitici - buona lavorabilità 🇪🇸 Austenitische Edelstähle - gute Verarbeitbarkeit 🇫🇷 Aciers inoxydables austénitiques - bonne usinabilité 🇪🇸 Aceros inoxidable austeníticos - fácil mecanización 🇷🇺 Аустенитные нержавеющие стали (хорошая обрабатываемость)		303	1.4305	X 10 CrNiS 18 9	303 S 31	
		302	1.4300	X 12 CrNi 18 8	302 S 25	
		304, 304 H	1.4301	X 6 CrNi 18 10	304 S 31	
		305	1.4303	X5 CrNi 18 12	305 S 19	
		304 L	1.4306	X 2 CrNi 19 11	304 S 12	
		301	1.4310	X 12 CrNi 17 7	301 S 21	
		304	1.4350	X5 CrNi 18 9	304 S 31	
		347	1.4550	X 6 CrNiNb 18 10	347 S 31	
M3 550-850 N/mm² 🇩🇪 Austenitic stainless steel (medium machinability) 🇮🇹 Acciai inossidabili austenitici - media lavorabilità 🇪🇸 Austenitische Edelstähle - mittlere Verarbeitbarkeit 🇫🇷 Aciers inoxydables austénitiques - moyenne usinabilité 🇪🇸 Aceros inoxidable austeníticos - maquinabilidad media 🇷🇺 Аустенитные нержавеющие стали (средняя обрабатываемость)		310 S	1.4335	X 12 CrNi 25 21	310 S 24	
		316	1.4401	X 5 CrNiMo 17 12 2	316 S 31	
		316 LN	1.4429	X 2 CrNiMoN 17 13 3	316 S 62	
		316 L	1.4435	X 2 CrNiMo 18 14 3	316 S 12	
		317 L	1.4438	X2 CrNiMo 18 16	317 S 12	
		329	1.4460	X 4 CrNiMo 27 5 2		
		DUPLEX	F 51-329 A	1.4462	X 2 CrNiMoN 22 5	332 S 15
		317	1.4466	X 5 CrNi 18 15	317 S 16	
		321	1.4541	X10 CrNiTi 18 9	321 S 12	
		347	1.4550	X10 CrNiNb 18 9	347 S 17	
		316 Ti	1.4571	X10 CrNiMoTi 18 10	320 S 17	
		309	1.4828	X15 CrNiSi 20 12	309 S 24	
		330	1.4864	X12 NiCrSi 36 16		
	253 MA	1.4893	X 9 CrNiSiN 21 11 2	310 S 31		
	3RE60	1.4417	X 2 CrNiMoSi 19 5			
M4 650-950 N/mm² 🇩🇪 Martensitic stainless steel 🇮🇹 Acciai inossidabili martensitici 🇪🇸 Martensitische Edelstähle 🇫🇷 Aciers inoxydables martensitiques 🇪🇸 Aceros inoxidable martensíticos 🇷🇺 Мартенситные нержавеющие стали		403	1.4000	X 6 Cr 13	403 S 17	
		416	1.4005	X 12 CrS 13	416 S 21	
		410, CA-15	1.4006	X 10 Cr 13	410 S 21	
		420	1.4021	X 20 Cr 13	420 S 37	
		420F	1.4028	X 30 Cr 13	420 S 45	
		420	1.4031	X 40 Cr 13	420 S 45	
		431	1.4057	X 20 CrNi 17 2		
		440 A	1.4109	X 65 CrMo 14		
		440 B	1.4112	X 90 CrMoV 18	409 S 19	
		440 C	1.4125	X 105 CrMo 17		
		SUPER DUPLEX	F 53-329 S1	1.4410	X 2 CrNiMoN 25 7 4	
		SUPER DUPLEX	F 55-329 S	1.4501	X 2 CrNiMoCuWN 15 7 4	
		904L	1.4539	X 2 NiCrMoCu 25 20 5	904 S 13	
		329 A				
		254 SMO		1.4529	X 1 CrNiMoN 20 18 7	
		PH13-8Mo	XM-13	1.4534	X 3 CrNiMoAl 13 8 2	
	654 SMO		1.4652	X 2 CrNiMoN 25 22 7		
	Alloy 800		1.4876	X 10 NiCrAlTi 32 20		
M5 800-1250 N/mm² 🇩🇪 PH stainless steel 🇮🇹 Acciai inossidabili PH - indurenti per precipitazione 🇪🇸 Ausscheidungshärtbare Edelstähle 🇫🇷 Aciers inoxydables à durcissement par précipitation 🇪🇸 Aceros inoxidable PH 🇷🇺 Нержавеющие стали PH	15-5-PH	XM-12	1.4540	X 4 CrNiCuNb 16 4		
	17-4-PH	630	1.4542	X 5 CrNiNb 16 4		
	17-7-PH	631	1.4568	X 7 CrNiAl 17 7	301 S 81	
	A286	660	1.4943	X 4 NiCrTi 25 15	HR 51	

SS	AFNOR	UNE-IHA	JIS	UNI	EN	UNS	GOST
	Z 8 CA 12	F.3111	SUS 405	X 6 CrAl 13			
2320	Z 8 C 17	F.3113	SUS 430	X 8 Cr 17	X 6 Cr 17	S43000	12KH17
2383	Z 10 CF 17	F.3117	SUS 430 F	X 10 CrS 17			
2325	Z 8 CD 17.01		SUS 434	X 8 CrMo 17			
2385	Z 5 CN 13.4		SCS 5	X 6 CrNi 13 04	X 3 CrNiMo 13 3	J91540	
	Z 4 CT 17		SUS 430 LX	X 6 CrTi 17			
	Z 6 CT 12		SUH 409	X 5 CrTi 12			
2322	Z 18 C 25				X 18 CrN 28	S44600	15KH28
2346	Z 10 CNF 18.09	F.3508	SUS 303	X 10 CrNi 18 09	X 10 CrNiS 18 9	S30300	12KH19N9
2331	Z 12 CN 18		SUS 302		X 12 CrNi 18 8	S30200	12KH18N9
2333	Z 6 CN 18.09	F.3551	SUS 304	X 5 CrNi 18 11	X 5 CrNi 18 9	S30400	08KH18N10
	Z 8 CN 18.12		SUS 305	X 8 CrNi 19 10			
2352	Z 2 CN 18.10	F.3503	SUS 304 L	X 3 Cr Ni 18 11	X 2 CrNi 19 11	S30403	03KH18N11
(2331)	Z 12 CN 17.07	F.3517	SUS 301	X 12 CrNi 17 07	X 9 CrNi 18 8	S30100	07KH16N6
2333	Z 6 CN 18.09	F.3551	SUS 304	X 5 CrNi 18 10			
2338	Z 6 C NNb 18.10		SUS 347	X 6 CrNiNb 18 11	X 6 CrNiNb 18 10	S34700	08KH18N12B
2371	Z 2 CN 18 .10 Az		SUS 304 LN	X 2 CrNiN 18 11	X 2 CrNiN 18 10	S30453	03KH18N11
2361	Z 12 CN 25.20		SUH 310, SUS 310 S	X 6 CrNi 26 20	X 12 CrNi 25 21	S31008	12KH25N20
2347	Z 3 CND 17.11.1	F.3543	SUS 316	X 5 CrNiMo 17 12	X 5 CrNiMo 17 12 2	S31600	08KH17H13M2T
2375	Z 2 CND 17.13 Az		SUS 316 LN	X 2 CrNiMoN 17 13 3	X 2 CrNiMoN 17 13 3	S31653	03KH16N15M3
2353	Z 2 CND 17.13		SCS 16, SUS 316 L	X 2 CrNiMo 17 13 2	X 2 CrNiMo 18 14 3	S31603	03KH17N14M3
2367	Z 2 CND 19.15		SUS 317 L	X2CrNiMo18 16			
2324	Z 3 CND 25.7 Az	F.3309	SUS 329 J 1	X 3 CrNiMo 27 5 2	X 3 CrNiMo 27 5 2	S32900	
2377	Z 2 CND 22.05 Az			X 2 CrNiMoN 22 5	X 2 CrNiMoN 22 5 3	S31803	
2366			SUS 317	X 5 CrNi 18 15	X 3 CrNiMo 18 12 3	S31700	08KH17H15M3T
2337	Z 6 CND 18.10	F.3553	SUS 321	X6CrNiTi18 11			
2338	Z 6 C NNb 18.10	F.3552	SUS 347	X6CrNiNb18 11			
2350	Z 6 CNDT 17.12	F.3535	-	X6CrNiMoTi 17 12			
	Z 15 CN 24.13		SUS 309	X16 CrNi 24 14			
	Z 12 NCS 35.16		SUH 330				
2368					X 9 CrNiSiN 21 11 2	S30815	
2376	Z 2 CND 18.05.03				X 2 CrNiMoSi 19 5	S31500	
2301	Z 6 C 12	F.3110	SUS 403	X 6 Cr 13	X 6 Cr 13	S41008	08KH13
	Z 11 CF 13	F.3411	SUS 416	X 12 CrS 13			
2302	Z 10 C 13	F.3401	SUS 410	X 12 Cr 13	X 12 Cr 13	S41000	12KH13, 08KH13
2303	Z 20 C 13	F.3402	SUS 420 J1	X 20 Cr 13	X 20 Cr 13	S42000	20KH13
2304	Z 30 C 13	F.3403	SUS 420 J2	X 30 Cr 13			
2304	Z 40 C 14	F.3404	SUS 420	X 40 Cr 14	X 39 Cr 13	S40280	40KH13
2321	Z 15 CNi 16.02	F.3427	SUS 431	X 16 CrNi 16			
	Z 70 D 14		SUS 440 A		X 70 CrMo 15	S44002	
2327	Z 2 CND 18 05		SUS 440 B	X CrTi 12	X 90 CrMoV 18	S44003	95KH18
	Z 100 CD 17		SUS 440 C	X 105 CrMo 17	X 105 CrMo 17	S44004	95KH18
2328	Z 3 CND 25.07 Az			X 2 CrNiMoN 25 7 4	X 2 CrNiMoN 25 7 4	S32750	
				X 2 CrNiMoCuWN 15 7 4		S32760	
2562	Z 2 NCDU 25 20				X 2 NiCrMoCu 25 20 5	N08904	
2778	Z 1 CNDU 20.18.05 Az			X 1 CrNiMoN 20 18 7	X 1 CrNiMoN 20 18 7	S31254	
					X 6 NiCrTiMoV 25 15	S13800	
					X 1 CrNiMoN 25 22 8	S32654	
	Z 10 NC 32.21		NCF 800		X 10 NiCrAlTi 32 20	N08800	
	Z 4 C NNb 16.4 M					S15500	
			SUS 630				
2388	Z 9 CAN 17.7		SUS 631	X 7 CrNiAl 17 7	X 3 CrNiMoAl 13 8 2	S17700	09KH17N7YU1
2570	Z 6 NCTDV 25.15		SUH 660		X 5 CrNiCuNb 16 4	S66286	

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	MATERIALS	TRADE MARK	AISI-ASTM	W.-Nr	DIN	BS	
K1	150-250 HB Grey cast iron Ghise grigia Grauguss Fonte grise Fundición gris Серый чугун		A48-20B	0.6010	GG-10	Grade 100	
			A48 25 B	0.6015	GG-15	Grade 150	
			A48 30 B	0.6020	GG-20	Grade 220	
			G 3500		GG-220 HB		
			A48 35 B	0.6025	GG-25	Grade 260	
			A48 45 B	0.6030	GG-30	Grade 300	
			A48 50 B	0.6035	GG-35	Grade 350	
K2	150-350 HB Nodular cast iron Ghise sferoidali Sphäroguss Fonte nodulaire Fundición nodular Чугун с шаровидным графитом						
K3	120-260 HB Austenitic cast iron Ghise austenitiche Austenitischer Guss Fonte austénitica Fundición austenítica Аустенитный чугун	(Tempered)	A220 60004		GTS-55-04	P 540/5	
			Ni-Resist 2	A436 Type 2	0.6660	GGL-NiCr 20 2	Grade F2
			Ni-Resist 3	A436 Type 3	0.6676	GGL-NiCr 30 3	Grade F3
			Ni-Resist 1	A436 Type 1	0.6655	GGL-NiCuCr 15 6 2	Grade F1
			Ni-Resist D-5	A439 Type D-5	0.7683	GGG-Ni 35	
			Ni-Resist D-2	A436 Type D-2	0.7660	GGG-NiCr 20 2	Grade S2
			Ni-Resist D-3	A436 Type D-3	0.7676	GGG-NiCr 30 3	Grade S3
			Nodumag	-	0.7652	GGG-NiMn 13 7	Grade S6
			Ni-Resist D-2M	A439 Type D-2M	0.7673	GGG-NiMn 23 4	Grade S2M
K4	250-500 HB ADI cast iron Ghise ADI ADI Guss Fonte ADI Fundición ADI Отпущенный ковкий чугун	ADI 800	850/550/10		GJS-800-8		
		ADI 1000	1050/700/7		GJS-1000-5		
		ADI 1200	1200/850/4		GJS-1200-2		
		ADI 1400	1400/1100/1		GJS-1400-1		
		ADI 1600	1600/1300/-		GJS-1600-1		

SS	AFNOR	UNE-IHA	JIS	UNI	EN	UNS	GOST
01 10-00			FC 100	G 10			Sc 10
01 15-00	Ft 15 D	FG 15	FC 150	G15	EN-GJL-150	F11601	Sc 15
01 20-00	Ft 20 D	FG 20	FC 200	G20	EN-GJL-200	F12101	Sc 20
02 19-00					EN-GJL-215		
01 25-00	Ft 25 D	FG 25	FC 250	G25	EN-GJL-250	F12401	Sc 25
01 30-00	Ft 30 D	FG 30	FC 300	G30	EN-GJL-300	F13101	Sc 30
01 35-00	Ft 35 D	FG 35	FC 350	G35	EN-GJL-350	F13502	Sc 35
0140-00	Ft 40 D		FC 40				
					EN-GJV-300		
					EN-GJV-350		
					EN-GJV-400		
					EN-GJV-450		
					EN-GJV-500		
07 17-15	FGS 370-17		FCD 350-22L		EN-GJS-350-22		
07 17-02	FGS 400-12	FGE 38-17	FCD 400-18L	GS 400-12	EN-GJS-400-15	F32800	Vc 42-12
07 17-12	FGS-370-17			GSO 42/17	EN-GJS-400-18	F32800	Vc 42-12
07 27-02	FGS 500-7	FGE 50-7	FCD 500-7	GS 500-7	EN-GJS-500-7	F33800	Vc 50-2
07 32-03	FGS 600-3	FGE 60-2	FCD 600-3	GS 600-3	EN-GJS-600-3	F34100	Vc 60-2
07 37-01	FGS 700-2	FGS 70-2	FCD 700-2	GS 700-2	EN-GJS-700-2	F34800	Vc 70-2
08 54-00	P 540/5		PCMP55-04	P 55-04	EN-GJMB-550-4	F24130	
05 23-00	FGL Ni20 Cr2				EN-GJLA-XNiCr 20-2	F41002	
	FGL Ni30 Cr3				EN-GJLA-XNiCr 30-3	F41004	
	FGL Ni15 Cu6 Cr2				EN-GJLA-XNiCuCr15-6-2	F41000	
	FGS Ni35				EN-GJSA-XNi35	F43006	
	FGS Ni20 Cr2				EN-GJSA-XNiCr20-2	F43000	
	FGS Ni30 Cr3				EN-GJSA-XNiCr30-3	F43003	
07 72-00	FGS Ni13 Mn7				EN-GJSA-XNiMn13-7	-	
	FGS Ni23 Mn4				EN-GJSA-XNiMn23-4	F43010	
					EN-GJS-800-8	ADI grade 1	
					EN-GJS-1000-5	ADI grade 2	
					EN-GJS-1200-2	ADI grade 3	
					EN-GJS-1400-1	ADI grade 4	
					EN-GJS-1600-1	ADI grade 5	

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MATERIALS	TRADE MARK	AISI-ASTM	W.-Nr	DIN	BS	
N1		A1200	3.0205	Al 99	1C	
		A1050/1050A	3.0255	Al 99.5	1B	
		1070/1070A	3.0275	Al 99.7		
		1080/1080A	3.0285	Al 99.8	1A	
			3.0515	AlMn1	N3	
		Aluman 100		3.0517	AlMn1Cu	
			3105	3.0505	AlMn0.5Mg0.5	N31
			3005	3.0525	AlMn1Mg0.5	
			3004	3.0526	AlMn1Mg1	
			6012	3.0615	AlMgSiPb	
		Avional 660	2014/2014A	3.1255	AlCuSiMn	H15
		Avional 050	2117	3.1305	AlCuMg0.5	L86
		Avional 100	2017/2017A	3.1325	AlCuMg 1	(H14)
		Avional 150	2024	3.1355	AlCuMg 2	DTD5090
		–	2030	3.1645	AlCuMgPb	–
		Recidal 11	2011	3.1655	AlCuBiPb	FC1
			A380	3.2161	G-AlSi8Cu3	
			B26	3.2341	G-AlSi5Mg	LM25
		Anticorodal 063		3.3206	AlMgSi0.5	(H9)
				3.3210	AlMgSi0.7	(H10)
		Anticorodal 061	6061	3.3211	AlMg1SiCu	H20
		Peraluman 080		3.3315	AlMg1	N41
		Peraluman 150	5050	3.3316	AlMg1.5	
		Peraluman 250	5052	3.3523	AlMg2.5	
			5251	3.3525	AlMg2Mn0.3	N4
		Peraluman 350	5154	3.3535	AlMg3	N5/N56
			5454	3.3537	AlMg2.7Mn	N51
		Peraluman 440	5083	3.3547	AlMg4.5Mn	N8
		Peraluman 500	5056	3.3555	AlMg5	N6
		Anticorodal 061	6061	3.3211	AlMg1SiCu	H20
		Anticorodal 100	6082	3.2315	AlMgSi 1	H30
		Aldrey 051	6101		EAlMgSi0.5	E91E
		6106		AlMgSiMn		
		6463				
		6262				
		7010		AlZn6MgCu	DTD5130	
		7020	3.4335	AlZn4.5Mg1	H17	
	Ergal 55	7075	3.4365	AlZnMgCu1.5	2L95	

- ✦ Aluminium alloys ≤ 12% Si
- 🇮🇹 Leghe di alluminio ≤ 12% Si
- 🇩🇪 Aluminiumlegierungen ≤ 12% Si
- 🇫🇷 Alliages d'aluminium ≤ 12 % Si
- 🇪🇸 Aleación de aluminio ≤ 12% Si
- 🇷🇺 Алюминиевое литье ≤ 12% Si

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4010	A4	L-3001	A1×3	9001/1			
4007	A5		A1×1	9001/2	AW-1050A	AA1050A	
	A7						
	A8						
4054		L-3811			AW-3103	AA3103	
	A-M1/3003		A3003		AW-3003	AA3003	
	AMG0.5			9003/4			
	AM1G	L-3820		9003/2			
	ASGPB						
4338	A-U4SG/2014	L-3130		9002/3	AW-2014	AA2014	
	AU2G			9002/1			
	AU4G	L-3120	A3×2	9002/2			
	AU4G1	L-3140	A3×4	9002/4			
4335	AU4Pb	L-3121	–	9002/8			
4355	A-U5PbBi/2011	L-3192	A2011	9002/5	AW-2011	AA2011	
4251					AC-46200	A13800	
4244	A-S7G		AC 4C	3599	AC-42000		
4103	A-GS/6060	L-3441		9006/1	AW-6060	AA6060	
4104,4107	A-GSUC/6061	L-3454	(A6063)		AW-6063	AA6005	
	AGSUC	L-3420	A2×4	9006/2			
4106	A-G0.6	L-3350		9005/1	AW-5005	AA5005	
				9005/7			
4120	AG2.5C	L-3360	A2×1	9005/2			
	AG2M	L-3361					
	AG3			9005/8			
	AG2.5MC	L-3391	A2×9	9005/3			
4140	AG4.5MC	L-3321	A2×7	9005/5			
	A-G5						
	AGSUC		A2×4	9006/2			
4212	ASGM 0.7	L-3451	–	9006/4			
	AGS/L						
				9007/4			
4425	AZ5G	L-3741	–	9007/1	AW-7020	AA7020	
	AZ5GU	L-3710	A34×6	9007/2	AW-7075	AA7075	

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MATERIALS	TRADE MARK	AISI-ASTM	W.-Nr	DIN	BS	
N2 ✦ Aluminium alloys > 12% Si 🇮🇹 Leghe di alluminio > 12% Si 🇩🇪 Aluminiumlegierungen > 12% Si 🇫🇷 Alliages d'aluminium > 12 % Si 🇪🇸 Aleación de aluminio > 12% Si 🇷🇺 Алюминиевое литье > 12% Si		AMS 4442	3.5103	G-MgSe3Zn2Zr1	MAG6-TE	
				G-AISI2		
				G-AISI4.5	DTD716A	
			355.1		G-AISI5	LM16
			A356	3.2371	G-AISI7Mg	LM25
			A380		G-AISI8Cu3	LM24
				3.2373	G-AISI9Mg	
			A360	3.2381	G-AISI10Mg	LM9
				3.2383	G-AISI10Mg (Cu)	(LM9)
			A413.0	3.2582	GD-AISI12	
			A413.1	3.2583	G-AISI12(Cu)	LM20
			A413.2	3.2581	G-AISI12	LM6
				3.3561	G-ALMg5	LM5
			319		G-AISI6Cu4	LM21
			319.2		G-AISI6Cu4	LM4
					-	LM2
			319.2		G-AISI6Cu4	LM22
			204			AEA 24860
						LM28
			336.0			LM13
				3.5812	G-MgAl8Zn1	MAG1
				3.5312	G-MgAl3Zn	-
				3.5912	G-MgAl9Zn1	MAG7
				3.5101	G-MgZn4SE1Zr1	MAG5
				3.5102	G-MgZn5Th2Zr1	
			3.5106	G-MgAg3SE2Zr1	MAG 12	
		AZ61A	3.5612	G-MgAl6Zn	MAG-E-121	
		AZ80A	3.5812	G-MgAl8Zn		
			3.2315	AlMgSi1	H30	
		B85	3.2381	G-AISI10Mg	LM9	
		A413.2	3.2382	GD-AISI12		
		B390.0				

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	ZRE1				MN65120 41000	M12330 -	
	AS4G					ALSi5Mg	
	AS4GU				45300	ALSi5Cu 1	
4244	A-S7G		AC4C		42000	ALSi7Mg	
4250	A-S9U3		AC4B		46500	Al Si9 Cu3 (Fe) (Zn)	
4253	A-S10G				43100 43200	Al Si 10 Mg	
4247							
4260	A-S12				47000	Al Si 12 (Cu)	
4261	A-S12U		AC3A		44100	Al Si 12	
4252	A-SU12		AC4A		51300	ALMg 6	
	A-S5UZ		AC2A		45000	Al Si 6 Cu 4	
	A-S5U3		AC2A		45200	Al Si 5 Cu 3 Mn	
			ADC12				
	A-S5U		AC2A		45400	Al Si 5 Cu 3	
	A-U5GT		AC1B		2100	Al Cu 4 Mg Ti	
						ALSi18Cu1Mg1Ni1	
	A-S12UN		AC8A			ALSi12Cu1Mg1Ni1	
	G-A9						
	G-A9Z1						
	G-Z4TR						
	G-Ag22.5						
	G-A6-Z1				MG-P-63	M11600	
	(G-A7-Z1)				MG-P-61		
4212	A-SGM0.7/6082				AW-6082	AA6082	
4253	A-S10G				AC-43400 AC-44200	A13600	
			ADC14				

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MATERIALS	TRADE MARK	AISI-ASTM	W.-Nr	DIN	BS	
N3			2.0060	E-Cu57	C101	
			2.0065	E-Cu58	-	
			2.0070	SE Cu	-	
				-	C102	
				-	-	
			2.0090	SF Cu	C106	
				-	C104	
				-	C110	
				-	C105	
			2.0040	OF Cu	C103	
			CA952	2.0940-01	CuAl10Fe	AB1
			CA955	2.0975-01	CuAl10Ni	AB2
				2.0872	CuNi10Fe1Mn	CN102
					CuNi10Zn45	
				2.0790	CuNi18Zn19Pb	
			CA937	2.1176	CuPb10Sn	LB2
				2.1050-01	CuSn10	CT1
				2.1087	CuSn10Zn	
				2.0240	CuZn15	CZ102
				2.0321	CuZn37	CZ108
				2.0530	CuZn38Sn1	
				2.0401	CuZn39Pb3	CZ121
				2.0402	CuZn40Pb2	CZ120
				2.1202	SB Cu	C107
				2.1356	Cu Mn 3	-
				2.1522	Cu Si2 Mn	-
					-	C108
					-	CC101
					-	CC102
					-	CC102
			2.0857	-	-	
				-	CB101	
				-	C112	
				-	-	
				-	-	
				-	CS101	
				-	C109	
				-	C111	

- Copper
- Rame
- Kupfer
- Cuivre
- Cobre
- Медные сплавы

🇮🇹 Materiali
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-	Cu/a1		C1100	E-Cu57	CW004A	C11000	
-	-		-	-	-	-	
-	-		-	-	CW021A	C10300	
-	-		-	-	CW005A	C11020	
-	-		-	-	CW023A	C12000	
-	Cu/b		C1220	-	CW024A	C12200	
-	-		-	-	CW006A	C12500	
-	-		-	-	CW009A	C10100	
-	-		-	-	-	-	
-	Cu/c1		C1020	-	CW008A	C10200	
5710	CuAl10Fe				CC331G	C95200	BrA9ZH3L
5716	CuAl10Ni5Fe5				CC333G	C95500	BrA10ZH4N4L
5667	CuNi10Fe1Mn					C70600	
	CuNi18Zn19Pb1					C76300	
5640	CuSn10Pb10				CW352H	C93700	
5443	CuSn10				CC480K	C90700	
5458						C90500	
5112	CuZn15		C2300		CW502L	C23000	L90
5150	CuZn37				CW508L	C27200	
					CW717R	C46400	LO60-1
5170	CuZn39Pb3				CW614N	C38500	
5168	CuZn39Pb2				CW612N	C37800	
-	-		-	-	-	C14200	
-	-		-	-	-	-	
-	-		-	-	-	-	
-	-		-	-	-	C16200	
-	-		-	-	CW105C	C18200	
-	-		-	-	CW106C	-	
-	-		-	-	CW111C	C70250	
-	-		-	-	CW112C	C70320	
-	-		-	-	CW101C	C17200	
-	-		-	-	CW104C	C17500	
-	-		-	-	CW120C	C15000	
-	-		-	-	CW115C	C65100	
-	-		-	-	CW116C	C65500	
-	-		-	-	CW118C	C14500	
-	-		-	-	CW114C	C14700	

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MATERIALS	TRADE MARK	AISI-ASTM	W.-Nr	DIN	BS	
N4 Bronze and brass Bronzo e ottone Bronze und Messing Bronze et laiton Bronce y latón Бронзы и Латунни		C50700	2.1010	CuSn2	–	
		C51100	2.1016	CuSn4	PB101	
		C51000	–	CUSn5	PB102	
		C51900	2.1020	CuSn6	PB103	
		C52100	2.1030	CUSn8	PB104	
		C54400				
					CuSn10	
					CuSn12	
				2.1020	CuSn6	PB103
		AMPCO 18				
		AMPCO 21				
		AMPCO 22				
				2.0220	CuZn5	CZ125
				2.0230	CuZn10	Cz101
				2.0240	CuZn15	CZ102
				2.0250	CuZn20	CZ103
				2.0261	CuZn28	
				2.0265	CuZn30	CZ106
				2.0280	CuZn33	
				2.0335	CuZn36	CZ107
				2.0321	CuZn37	CZ108
				2.0360	CuZn40	CZ109
				2.0331	CuZn36Pb1.5	CZ119
				2.0331	CuZn36Pb1.5	CZ119
				2.0375	CuZn36Pb3	CZ124
				2.0371	CuZn38Pb1.5	CZ128
				2.0372	CuZn39Pb0.5	CZ123
					CuZn38Pb2	
				2.0380	CuZn39Pb2	CZ131 / (CZ128)
				2.0401	CuZn39Pb3	CZ121
			2.0402	CuZn40Pb2	CZ122	
			2.0410	CuZn44Pb2	CZ130	
			2.0470	CuZn28Sn1	CZ111	
			2.0530	CuZn38Sn1		
			–	CuZn19Sn		
			2.0460	CuZn20Al2	CZ110	
			2.0561	CuZn40Al1		
			2.0550	CuZn40Al2		
			–	CuZn20Al2As		
			2.0572	CuZn40Mn2	CZ136	
			2.0932	CuAl8Fe3		
			2.0966	CuAl10Ni5Fe4	CA104	
N5 Plastic materials Materiali plastici Kunststoffmaterialien Matériaux plastiques Materiales plásticos Пластические материалы	Polycarbonate (PC)					
N6 Fiber and composites Fibre e compositi Faserwerkstoffe und Verbundwerkstoffe Fibres et composites Fibras y compuestos Композитные материалы	T300					
	T700					
	T800					
	HTA					
	Epoxy					
	PPS					
	PEEK					
	Epoxy					
	HX					
	E-glass					
Kevlar						

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C-SD-TA
LFTA
SUTA
HSS-HSS/CO DRILLS
G2
MDTA
HF VH/UP
MEF
ALU
MEX
UH
HSS/CO-HSSP END MILLS
CARBIDE BURRS

MATERIALS	TRADE MARK	STRUCTURE	MF*	AISI-ASTM	W.-Nr	DIN
S1 < 25 HRC 🇩🇪 Heat resistant super alloys (HRSA) - good machinability 🇮🇹 Leghe resistenti al calore - buona lavorabilità 🇩🇪 Warmfeste Legierungen - gute Verarbeitbarkeit 🇫🇷 Alliages résistants à la chaleur - bonne usinabilité 🇪🇸 Aleaciones resistentes al calor de fácil mecanización 🇷🇺 Жаропрочные суперсплавы (хорошая обрабатываемость)	Nickel 201	Nickel based superalloys	4.3			
	17-4 PH (solubilized)	Iron based superalloys	2.1			
	AM 350	Iron based superalloys	1.8			
	Lapelloy	Iron based superalloys	1.8			
	17-7 (precipitation)	Iron based superalloys	1.8			
	Hastelloy C (plate)	Nickel based superalloys	1.8	N10002		NiCr17Mo17FeW
	Hastelloy S	Nickel based superalloys	1.8			
	Inconel 625 (cast)	Nickel based superalloys	1.7	N06625	2.4856	NiCr22Mo9Nb
	A 286 (plate)	Iron based superalloys	1.4			
	IN 801	Iron based superalloys	1.4			
	M 308	Iron based superalloys	1.4			
	Hastelloy B-2	Nickel based superalloys	1.4		2.4617	
	Hastelloy C (cast)	Nickel based superalloys	1.4	N10002		NiCr17Mo17FeW
	Hastelloy C-22	Nickel based superalloys	1.4			
	Hastelloy N (forged)	Nickel based superalloys	1.4	N10003		
	Inconel 600	Nickel based superalloys	1.4	N06600	2.4816	
	Inconel 601	Nickel based superalloys	1.4	N06601	2.4851	NiCr23Fe
	Inconel 706	Nickel based superalloys	1.4			
Inconel X750 (solubilized)	Nickel based superalloys	1.4	N07750	2.4669	NiCr 15 Fe 7 TiAl	
S2 25-35 HRC 🇩🇪 Heat resistant super alloys (HRSA) - medium machinability 🇮🇹 Leghe resistenti al calore - media lavorabilità 🇩🇪 Warmfeste Legierungen - mittlere Verarbeitbarkeit 🇫🇷 Alliages résistants à la chaleur - moyenne usinabilité 🇪🇸 Aleaciones resistentes al calor de media mecanización 🇷🇺 Жаропрочные суперсплавы (средняя обрабатываемость)	A 286 (Isolubilizzato)	Iron based superalloys	1.3			
	AM 350 (cast)	Iron based superalloys	1.3			
	Incoloy 800	Iron based superalloys	1.3	N08800	1.4876	X10NiCrAlTi32-21
	Incoloy 825	Iron based superalloys	1.3	N08825	2.4858	NiCr21Mo
	Hastelloy C-276	Nickel based superalloys	1.3			
	Hastelloy C-4	Nickel based superalloys	1.3			
	Hastelloy D	Nickel based superalloys	1.3			
	Hastelloy G	Nickel based superalloys	1.3			
	Hastelloy G-3	Nickel based superalloys	1.3			
	Hastelloy N (cast)	Nickel based superalloys	1.3	N10003		
	Hastelloy W	Nickel based superalloys	1.3			
	Hastelloy X	Nickel based superalloys	1.3	N06002	2.4665	NiCr22FeMo
	Inconel 625 (pipe)	Nickel based superalloys	1.3	N06625	2.4856	NiCr22Mo9Nb
	Inconel 708 (forged)	Nickel based superalloys	1.3			
	Nimonic 80	Nickel based superalloys	1.3	N06075	2.4630	NiCr20Ti
	Nimonic 105	Nickel based superalloys	1.3			
	A 286 (precipitation)	Iron based superalloys	1.1			
	AM 355	Iron based superalloys	1.1			
	IN 800	Iron based superalloys	1.1			
	N 155	Iron based superalloys	1.1			
	15-5 PH	Iron based superalloys	1.1			
	17-4 PH (Isolubilizzato)	Iron based superalloys	1.1			
	Incoloy 909	Iron based superalloys	1.1			
	Stellite 21	Cobalt based superalloys	1.1			
	Stellite 30	Cobalt based superalloys	1.1			
	Stellite 31	Cobalt based superalloys	1.1			
	Inconel 625 (forged)	Nickel based superalloys	1.1	N06625	2.4856	NiCr22Mo9Nb
	Inconel 713	Nickel based superalloys	1.1			
	Inconel 718 (cast)	Nickel based superalloys	1.1	N07718	2.4668	NiCr19Fe19NbMo
	Inconel 718 (pipe)	Nickel based superalloys	1.1	N07718	2.4668	NiCr19Fe19NbMo
	Inconel 901	Nickel based superalloys	1.1			
	Nimonic 81	Nickel based superalloys	1.1	N07080	2.4631	NiCr20TiAl
	Nimonic 263	Nickel based superalloys	1.1			
Waspalloy (cast)	Nickel based superalloys	1.1	N07001	2.4654	NiCr20Co14MoTi	

* Machinability Factor based on Inconel 718 (forged) = 1.0

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CARBIDE BURRS

MATERIALS	TRADE MARK	STRUCTURE	MF*	AISI-ASTM	W.-Nr	DIN	
S3 🇩🇪 Heat resistant super alloys (HRSA) - low machinability 🇮🇹 Leghe resistenti al calore - difficile lavorabilità 🇩🇪 Warmfeste Legierungen - schwere Verarbeitbarkeit 🇫🇷 Alliages résistants à la chaleur - faible usinabilité 🇪🇸 Aleaciones resistentes al calor de difícil mecanización 🇷🇺 Жаропрочные суперсплавы (плохая обрабатываемость)	Cobalt based superalloys	Haynes 188 (pipe)	1.0				
	Nickel based superalloys	Inconel X750 (precipitation)	1.0	N07750	2.4669	NiCr 15 Fe 7 TiAl	
	Nickel based superalloys	Inconel 718 (forged)	1.0	N07718	2.4668	NiCr19Fe19NbMo	
	Nickel based superalloys	Nimonic 115	1.0				
	Nickel based superalloys	Waspalloy (forged)	1.0	N07001	2.4654	NiCr20Co14MoTi	
	Cobalt based superalloys	Haynes 25	0.9				
	Cobalt based superalloys	Haynes 188 (forged)	0.9				
	Nickel based superalloys	Udimet 500	0.9			NiCr18cCoMoAlTi	
	Nickel based superalloys	Udimet 700	0.9			NiCo15Cr15MoAlTi	
	Nickel based superalloys	Nimonic 90	0.7				
	Nickel based superalloys	Nimonic 91	0.7				
	Nickel based superalloys	Nimonic 101	0.7				
	Nickel based superalloys	Mar-M 247	0.7			NiCo10W10Cr9AlTi	
	Nickel based superalloys	Mar-M 200	0.6			NiW13Co10Cr9AlTi	
Cobalt based superalloys	H 531	0.4					
Nickel based superalloys	Rene 95	0.4					
Cobalt based superalloys	Air Resist	0.3					
S4 🇩🇪 Low alloy titanium (good machinability) 🇮🇹 Leghe di titanio basso legate e medio legate 🇩🇪 Niedriglegierte und mittellegierte Titanlegierungen 🇫🇷 Alliages de titane faiblement alliés et moyennement alliés 🇪🇸 Aleaciones de titanio de fácil mecanización 🇷🇺 Низколегированные титановые сплавы (хорошая обрабатываемость)		Grade 1		265-G1		TiAl2Sn4Zr2MoSi	
		Grade 2		265-G2		TiAl2Sn4Zr6Mo	
		Grade 3 (13 HRC)		265-G3	3.7055	Ti 99.6	
		Grade 9 (15 HRC)			3.7195	Ti3Al2.5V	
						TiAl7Mo4	
					3.7115	TiAl5Sn2.5	
					3.7124	TiCu2.5	
					3.7155	TiAl6Zr5Mo0.5	
					-	TiAl5Mo4Sn4Si0.5	
					3.7175	TiAl6V6Sn2	
				3.7185	TiAl4Mo4Sn2		
				3.7025	Ti 99.8		
				3.7035	Ti 99.7a		
S5 🇩🇪 High alloy titanium (medium machinability) 🇮🇹 Leghe di titanio medio legate e alto legate 🇩🇪 Mittellegierte und hochlegierte Titanlegierungen 🇫🇷 Alliages de titane moyennement alliés et fortement alliés 🇪🇸 Aleaciones de titanio de media mecanización 🇷🇺 Высоколегированные титановые сплавы (средняя обрабатываемость)		Grade 4 (23 HRC)		265-G4			
		Grade 5 (36 HRC)			3.7164	Ti6Al4V	
		Grade 6 (36 HRC)					Ti5Al2.5Sn
		Grade 23 (35 HRC)			3.7165	Ti6Al4VELI	
		6242 (34 HRC)			4975		TiAl2Sn4Zr2MoSi
		6246 (39 HRC)					TiAl2Sn4Zr6Mo
							TiV10Fe2Al3

* Machinability Factor based on Inconel 718 (forged) = 1.0

🇮🇹 Materiali
 🇩🇪 Werkstoffmaterialien
 🇫🇷 Matériaux
 🇪🇸 Materiales
 🇷🇺 Материалы

BS	SS	AFNOR	UNE-IHA	JIS	UNI	EN	UNS	GOST
HR505		NC19FeNB						
Hr8		Nc19FeNb						
		NC20K14						
		NCK19DAT						
		NCKD20AT						
							R50250	
							R50400	
							R50550	
						Ti9	R56320	
TA14/17		T-A6V						
		TA 1						
		TA 2-5						
							R50700	
TA10-13/TA29		T-A5E				TiAl6V4	R56400	
							R54250	
TA11							R56401	
							R56260	

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G2

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MEF

ALU

MEX

UH

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CARBIDE BURRS

MATERIALS	W.-Nr	DIN	BS	SS	AFNOR
H1 Hardened steel Acciai temprati generali Allgemeine gehärtete Stähle Aciers trempés Aceros templados Закаленные стали	1.7131	16 MnCr 5	527 M 17	2511	16 MC 5
	1.1201	42 CrMo 4	708 M40	2244	42 CD 4
	1.1231	Ck 67	060 A 67	1770	XC 68
	1.1248	Ck 75	060 A 78	1774, 1778	XC 75
	1.1274	Ck 101	060 A 96	1870	
	1.1545	C 105 W1		1880	Y1 105
	1.2550	60 WCrV 7			55 WC 20
	1.7176	55 Cr 3	527 A 60	2253	55 C 3
H2 Hardened bearing steel Acciai temprati per cuscinetti Gehärtete Kugellagerstähle Aciers trempés pour roulements Aceros templados para rodamientos Закаленные подшипниковые стали	1.3401	X 120 Mn 12	BW 10	2183	Z 120 M 12
	1.2210	115 CrV 3			100 C 3
	1.2510	100 MnCrW 4	BO 1	2140	90 MWCV 5
	1.2842	90 MnCrV 8	BO 2		90 MV 8
H3 Hardened tool steel Acciai per utensili temprati Gehärtete Werkzeugstähle Aciers trempés pour outils Aceros templados para herramientas Закаленные инструментальные стали	1.3505	100 Cr 6	534 A 99	2258	100 C 6
	1.2344	X 40 CrMoV 5 1	BH 13	2242	Z 40 CDV 5
	1.2363	X 100 CrMoV 5 1	BA 2	2260	Z 100 CDV 5
	1.2379	X 155 CrVMo 12 1	BD 2		Z 160 CDV 12
	1.2436	X 210 CrW 12		2312	
	1.2601	X 165 CrMoV 12		2310	
	1.2713	55 NiCrMoV 6			55 NCDV 7
	1.3243	S 6-5-2-5		2723	Z 85 WDKCV 06-05-05-04-02
	1.3247	S 2-10-1-8	BM 42		Z 110 DKCWV 09-08-04
	1.3343	S 6-5-2	BM 2	2722	Z 85 WDCV 06-05-04-0
H4 Hardened martensitic stainless steel Acciai inossidabili martensitici temprati Gehärtete martensitische Edelmstähle Aciers inoxydables martensitiques temprés Aceros inoxidables martensíticos temprados Закаленные мартенситные нержавеющие стали	1.3355	S 18-0-1	BT 1		Z 80 WCV 18-04-01
	1.4021	X 20 Cr 13	420 S 37	2303	Z 20 C 13
	1.4109	X 65 CrMo 14			Z 70 D 14
	1.4112	X 90 CrMoV 18	409 S 19	2327	Z 2 CND 18 05
	1.4125	X 105 CrMo 17			Z 100 CD 17
	1.4534	X 3 CrNiMoAl 13 8 2			
	1.4542	X 5 CrNiCuNb 17 4			Z 6 CNU 17.4
	1.4568	X 7 CrNiAl 17 7	301 S 81	2388	Z 9 CAN 17.7
H5 Hardened white cast iron Ghise bianche temprate Gehärteter Weißguss Fonte blanche temprée Fundición blanca temprada Закаленный белый чугун	1.4943	X 4 NiCrTi 25 15	HR 51	2570	Z 6 NCTDV 25.15
	G-X330 NiCr 4 2	FB Ni4 Cr2 BC	Grade 2 A	05 12-00	Grade 2 A
	G-X260 NiCr 4 2	FB Ni4 Cr2 HC	Grade 2 B	05 13-00	Grade 2 B
	G-X300 CrNiSi 9 5 2	FB Cr9 Ni5	Grade 2 C, D, E	04 57-00	Grade 2 C, D, E

Materiali
 Werkstoffmaterialien
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UNE-IHA	JIS	UNI	EN	UNS	GOST
	SCR 415	16 MnCr 5	16 MnCr 5	G51170	
	SCM 440 (H)	42 CrMo 4	42 CrMo 4	G41400	
		C 70	C 67S	G10700	
		C 75	C 75S	G10780	
	SUP 4		C 100S	G10950	
		C 100 KU	C 105U		
		55 WCrV 8 KU			
	SUP 9 (A)	55 Cr 3	55 Cr 3	G51550	
	SC MnH 1				
		107 CrV 3 KU	107 CrV 3	T61202	
	SKS 3	95 MnWCr 5 KU		T31501	
		90 MnVCr 8 KU	90 MnCrV 8	T31502	
	SUJ 2	100 Cr 6	100 Cr 6	G51986	
	SKD 61	X 40 CrMo 5 1 1 KU	X 40 CrMoV 5 1	T20813	
	SKD 12	X 100 CrMoV 5 1 KU	X 100 CrMoV 5	T30102	
	SKD 11	X 155 CrVMo 12 1 KU	X 155 CrVMo 12 1	T30402	
	SKD 2	X 215 CrW 12 1 KU			
		X 165 CrMoW 12 KU			
	SKT 4			T61206	
	SKH 55	HS 6-5-2-5	HS 6-5-2-5		
	SKH 51	HS 2-9-1-8	HS 2-10-1-8	T11342	
	SKH 9, SKH 51	HS 6-5-2	HS 6-5-2	T11302	
	SKH 2	HS 18-0-1	HS 18-0-1	T12001	
	SUS 420 J 1	X 20 Cr 13	X 20 Cr 13	S42000	
	SUS 440 A		X 70 CrMo 15	S44002	
	SUS 440 B	X CrTi 12	X 90 CrMoV 18	S44003	
	SUS 440 C	X 105 CrMo 17	X 105 CrMo 17	S44004	
			X 3 CrNiMoAl 13 8 2	S13800	
	SCS 24, SUS 630		X 5 CrNiCuNb 16 4	S17400	
	SUS 631	X 7 CrNiAl 17 7	X 7 CrNiAl 17 7	S17700	
	SUH 660		X 6 NiCrTiMoV 25 15	S66286	
			EN-GJN-HV520	F45001	
			EN-GJN-HV550	F45000	
			EN-GJN-HV600(X-Cr11)	F45003	

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🇮🇹 Durezza 🇩🇪 Härte 🇫🇷 Dureté 🇵🇱 Dureza 🇷🇺 Твёрдость

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HRC	VICKERS	BRINELL HARDNESS		ROCKWELL HARDNESS			ROCKWELL SUPERFICIAL HARDNESS			SHORE HARDNESS	N/mm ² TENSILE STRENGTH	HRC
		standard ball	tungsten carbide ball	A scale	B scale	D scale	15-N scale	30-N scale	45-N scale			
68	940	-	-	85.6	-	76.9	93.2	84.4	75.4	97	-	68
67	900	-	-	85.0	-	76.1	92.9	83.6	74.2	95	-	67
66	865	-	-	84.5	-	75.4	92.5	82.8	73.3	92	-	66
65	832	-	(739)	83.9	-	74.5	92.2	81.9	72.0	91	-	65
64	800	-	(722)	83.4	-	73.8	91.8	81.1	71.0	88	-	64
63	772	-	(705)	82.8	-	73.0	91.4	80.1	69.9	87	-	63
62	746	-	(688)	82.3	-	72.2	91.1	79.3	68.8	85	-	62
61	720	-	(670)	81.8	-	71.5	90.7	78.4	67.7	83	-	61
60	697	-	(654)	81.2	-	70.7	90.2	77.5	66.7	81	-	60
59	674	-	(634)	80.7	-	69.9	89.8	76.6	65.5	80	-	59
58	653	-	615	80.1	-	69.2	89.3	75.7	64.3	78	-	58
57	633	-	595	79.6	-	68.5	88.9	74.8	63.2	76	-	57
56	613	-	577	79.0	-	67.7	88.3	73.9	62.0	75	-	56
55	595	-	560	78.5	-	66.9	87.9	73.0	60.9	74	2075	55
54	577	-	543	78.0	-	66.1	87.4	72.0	59.8	72	2015	54
53	560	-	525	77.4	-	65.4	86.9	71.2	58.6	71	1950	53
52	544	(500)	512	76.8	-	64.6	86.4	70.2	57.4	69	1880	52
51	528	(487)	496	76.3	-	63.8	85.9	69.4	56.1	68	1820	51
50	513	(475)	481	75.9	-	63.1	85.5	68.5	55.0	67	1760	50
49	498	(464)	469	75.2	-	62.1	85.0	67.6	53.8	66	1695	49
48	484	451	455	74.7	-	61.4	84.5	66.7	52.5	64	1635	48
47	471	442	443	74.1	-	60.8	83.9	65.8	51.4	63	1580	47
46	458	432	432	73.6	-	60.0	83.5	64.8	50.3	62	1530	46
45	446	421	421	73.1	-	59.2	83.0	64.0	49.0	60	1480	45
44	434	409	409	72.5	-	58.5	82.5	63.1	47.8	58	1435	44
43	423	400	400	72.0	-	57.7	82.0	62.2	46.7	57	1385	43
42	412	390	390	71.5	-	56.9	81.5	61.3	45.5	56	1340	42
41	402	381	381	70.9	-	56.2	80.9	60.4	44.3	55	1295	41
40	392	371	371	70.4	-	55.4	80.4	59.5	43.1	54	1250	40
39	382	362	362	69.9	-	54.6	79.9	58.6	41.9	52	1215	39
38	372	353	353	69.4	-	53.8	79.4	57.7	40.8	51	1180	38
37	363	344	344	68.9	-	53.1	78.8	56.8	39.6	50	1160	37
36	354	336	336	68.4	(109.0)	52.3	78.3	55.9	38.4	49	1115	36
35	345	327	327	67.9	(108.5)	51.5	77.7	55.0	37.2	48	1080	35
34	336	319	319	67.4	(108.0)	50.8	77.2	54.2	36.1	47	1055	34
33	327	311	311	66.8	(107.5)	50.0	76.6	53.3	34.9	46	1025	33
32	318	301	301	66.3	(107.0)	49.2	76.1	52.1	33.7	44	1000	32
31	310	294	294	65.8	(106.0)	48.4	75.6	51.3	32.5	43	980	31
30	302	286	286	65.3	(105.5)	47.7	75.0	50.4	31.3	42	950	30
29	294	279	279	64.7	(104.5)	47.0	74.5	49.5	30.1	41	930	29
28	286	271	271	64.3	(104.0)	46.1	73.9	48.6	28.9	41	910	28
27	279	264	264	63.8	(103.0)	45.2	73.3	47.7	27.8	40	880	27
26	272	258	258	63.3	(102.5)	44.6	72.8	46.8	26.7	38	860	26
25	266	253	253	62.8	(101.5)	43.8	72.2	45.9	25.5	38	840	25
24	260	247	247	62.4	(101.0)	43.1	71.6	45.0	24.3	37	825	24
23	254	243	243	62.0	100.0	42.1	71.0	44.0	23.1	36	805	23
22	248	237	237	61.5	99.0	41.6	70.5	43.2	22.0	35	785	22
21	243	231	231	61.0	98.5	40.9	69.9	42.3	20.7	35	770	21
20	238	226	226	60.5	97.8	40.1	69.4	41.5	19.6	34	760	20
(18)	230	219	219	-	96.7	-	-	-	-	33	730	(18)
(16)	222	212	212	-	95.5	-	-	-	-	32	705	(16)
(14)	213	203	203	-	93.9	-	-	-	-	31	675	(14)
(12)	204	194	194	-	92.3	-	-	-	-	29	650	(12)
(10)	196	187	187	-	90.7	-	-	-	-	28	620	(10)
(8)	188	179	179	-	89.5	-	-	-	-	27	600	(8)
(6)	180	171	171	-	87.1	-	-	-	-	26	580	(6)
(4)	173	165	165	-	85.5	-	-	-	-	25	550	(4)
(2)	166	158	158	-	83.5	-	-	-	-	24	530	(2)
(0)	160	152	152	-	81.7	-	-	-	-	24	515	(0)

✳️ CUTTING SPEED 🇮🇹 VELOCITÀ DI TAGLIO 🇩🇪 SCHNITTGESCHWINDIGKEIT
 ⚙️ VITESSE DE COUPE 🇪🇸 VELOCIDAD DE CORTE 🇷🇺 СКОРОСТЬ РЕЗАНИЯ

$$V_c = \frac{D \times \pi \times n}{1000} \quad \text{m/min}$$

⚙️ SPLINDLE SPEED 🇮🇹 VELOCITÀ DI ROTAZIONE MANDRINO 🇩🇪 SPINDELGESCHWINDIGKEIT
 ⚙️ VITESSE DE ROTATION DU MANDRIN 🇪🇸 VELOCIDAD DE ROTACIÓN DEL MANDRIL 🇷🇺 ЧАСТОТА ВРАЩЕНИЯ ШПИНДЕЛЯ

$$n = \frac{V_c \times 1000}{\pi \times D} \quad \text{rpm}$$

✳️ FEED PER REVOLUTION 🇮🇹 AVANZAMENTO PER GIRO 🇩🇪 VORSCHUB PRO UMDREHUNG
 ⚙️ AVANCE PAR TOUR 🇪🇸 AVANCE POR VUELTA 🇷🇺 ОБОРОТНАЯ ПОДАЧА

$$f_n = \frac{V_f}{n} \quad \text{mm/rev} \qquad f_n = f_z \times z \quad \text{mm/rev}$$

✳️ FEED RATE 🇮🇹 VELOCITÀ DI AVANZAMENTO 🇩🇪 VORSCHUBSGESCHWINDIGKEIT
 ⚙️ VITESSE D'AVANCE 🇪🇸 VELOCIDAD DE AVANCE 🇷🇺 МИНУТНАЯ ПОДАЧА

$$V_f = f_n \times n \quad \text{mm/min}$$

✳️ FEED/TOOTH 🇮🇹 AVANZAMENTO/TAGLIENTE 🇩🇪 VORSCHUB/SCHNEIDE
 ⚙️ AVANCE/ARÊTE DE COUPE 🇪🇸 AVANCE/FILO 🇷🇺 ПОДАЧА НА ЗУБ

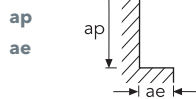
$$f_z = \frac{V_f}{n \times z} \quad \text{mm}$$

✳️ METAL (CHIP) REMOVAL RATE 🇮🇹 VOLUME TRUCIULO ASPORTATO 🇩🇪 VOLUMEN ABGETRAGENER SPÄNE
 ⚙️ VOLUME DE COPEAU 🇪🇸 VOLUMEN VIRUTA EXTRAÍDA 🇷🇺 ОБЪЕМ УДАЛЕННОЙ СТРУЖКИ

$$Q = \frac{a_p \times a_e \times V_f}{1000} \quad \text{cm}^3/\text{min}$$

D ✳️ DIAMETER 🇮🇹 DIAMETRO 🇩🇪 DURCHMESSER 🇫🇷 DIAMÈTRE 🇪🇸 DIÁMETRO 🇷🇺 ДИАМЕТР

Z ✳️ NUMBER OF TEETH 🇮🇹 NUMERO TAGLIENTI 🇩🇪 SCHNEIDENANZAHL ⚙️ NUMÉRO DE DENTS 🇪🇸 NÚMERO DE DIENTES 🇷🇺 КОЛИЧЕСТВО ЗУБЬЕВ



INFO
TYPHOON TA-HTA-4HTA
TYPHOON PU-HPU
TYPHOON SUH
TYPHOON ALH
TYPHOON HRC
TYPHOON SUH MINI
TYPHOON HL
C-SD-TA
LFTA
SUTA
HSS-HSS/CO DRILLS
G2
MDTA
HF VH/UP
MEF
ALU
MEX
UH
HSS/CO-HSSP END MILLS
CARBIDE BURRS

CARBIDE DRILLS






















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TYPHOON PU - HPU .	81
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TYPHOON ALH .	117
TYPHOON HRC .	127
TYPHOON SUH MINI .	133
TYPHOON HL .	165
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🇮🇹 Legenda 🇩🇪 Verzeichnis 🇫🇷 Légende 🇪🇸 Leyenda 🇷🇺 Условные обозначения













STOCK			
●	<ul style="list-style-type: none"> 🇩🇪 stock standard 🇮🇹 stock standard 🇩🇪 Standard Lager 	<ul style="list-style-type: none"> 🇫🇷 stock standard 🇪🇸 stock estándar 🇷🇺 складская позиция 	
○	<ul style="list-style-type: none"> 🇩🇪 non-standard stock 🇮🇹 stock non standard 🇩🇪 nicht Standard Lager 	<ul style="list-style-type: none"> 🇫🇷 stock non standard 🇪🇸 stock no estándar 🇷🇺 не складская позиция 	
▽	<ul style="list-style-type: none"> 🇩🇪 stock exhaustion 🇮🇹 esaurimento stock 🇩🇪 Vorraterschöpfung 	<ul style="list-style-type: none"> 🇫🇷 épuisement du stock 🇪🇸 agotamiento de stock 🇷🇺 складские остатки 	



🇩🇪 APPLICATION GUIDELINES 🇮🇹 INDICAZIONI PER L'APPLICAZIONE 🇩🇪 LEITFADEN ZUR ANWENDUNG 🇫🇷 INDICATIONS POUR L'APPLICATION 🇪🇸 INDICACIONES PARA SU APLICACIÓN 🇷🇺 УКАЗАНИЯ ПО ПРИМЕНЕНИЮ			
★	<ul style="list-style-type: none"> 🇩🇪 1st choice 🇮🇹 1a scelta 🇩🇪 1. Wahl 	<ul style="list-style-type: none"> 🇫🇷 1er choix 🇪🇸 1ª elección 🇷🇺 1-й выбор 	
☆	<ul style="list-style-type: none"> 🇩🇪 suitable 🇮🇹 adatto 🇩🇪 geeignet 	<ul style="list-style-type: none"> 🇫🇷 adapté 🇪🇸 adecuado 🇷🇺 пригоден 	

🇩🇪 SHANK 🇮🇹 ATTACCO 🇩🇪 SCHAFT 🇫🇷 QUEUE 🇪🇸 MANGO 🇷🇺 ХВОСТОВИК			
	<ul style="list-style-type: none"> 🇩🇪 cylindrical shank 🇮🇹 attacco cilindrico 🇩🇪 zylindrischer Schaft 	<ul style="list-style-type: none"> 🇫🇷 queue cylindrique 🇪🇸 mango cilíndrico 🇷🇺 цилиндрическое крепление 	





🇩🇪 GEOMETRY 🇮🇹 GEOMETRIA 🇩🇪 GEOMETRIE 🇫🇷 GÉOMÉTRIE 🇪🇸 GEOMETRÍA 🇷🇺 ГЕОМЕТРИЯ			
  	<ul style="list-style-type: none"> 🇩🇪 general purpose 🇮🇹 uso generico 🇩🇪 allgemeine Anwendung 	<ul style="list-style-type: none"> 🇫🇷 applications génériques 🇪🇸 uso genérico 🇷🇺 общего назначения 	
  	<ul style="list-style-type: none"> 🇩🇪 general purpose with inside coolant 🇮🇹 uso generico con refrigerazione interna 🇩🇪 allgemeine Anwendung mit innerer Kühlmittelzuführung 	<ul style="list-style-type: none"> 🇫🇷 applications génériques à trous d'huile 🇪🇸 uso genérico con refrigeración interna 🇷🇺 общего назначения с внутренней подачей СОЖ 	
  	<ul style="list-style-type: none"> 🇩🇪 4 guides chamfer with inside coolant 🇮🇹 4 fasi con refrigerazione interna 🇩🇪 Führungsfasen mit innerer Kühlmittelzuführung 	<ul style="list-style-type: none"> 🇫🇷 4 listels à trous d'huile 🇪🇸 4 fases con refrigeración interna 🇷🇺 4 направляющих с внутренней подачей СОЖ 	
  	<ul style="list-style-type: none"> 🇩🇪 universal application 🇮🇹 applicazione universale 🇩🇪 Universelle Anwendung 	<ul style="list-style-type: none"> 🇫🇷 application universelle 🇪🇸 aplicación universal 🇷🇺 универсальное применение 	
  	<ul style="list-style-type: none"> 🇩🇪 universal application with inside coolant 🇮🇹 applicazione universale con refrigerazione interna 🇩🇪 Universelle Anwendung mit Innenkühlung 	<ul style="list-style-type: none"> 🇫🇷 application universelle avec lubrification interne 🇪🇸 aplicación universal con refrigeración interna 🇷🇺 универсальное применение с внутренним охлаждением 	
  	<ul style="list-style-type: none"> 🇩🇪 stainless steel with inside coolant 🇮🇹 acciaio inossidabile con refrigerazione interna 🇩🇪 rostfreien Stahl mit innerer Kühlmittelzuführung 	<ul style="list-style-type: none"> 🇫🇷 acier inoxydable à trous d'huile 🇪🇸 acero inoxidable con refrigeración interna 🇷🇺 нержавеющей сталь с внутренней подачей СОЖ 	
  	<ul style="list-style-type: none"> 🇩🇪 aluminium with inside coolant 🇮🇹 alluminio con refrigerazione interna 🇩🇪 Aluminium mit innerer Kühlmittelzuführung 	<ul style="list-style-type: none"> 🇫🇷 aluminium à trous d'huile 🇪🇸 aluminio con refrigeración interna 🇷🇺 алюминий с внутренней подачей СОЖ 	

🇮🇹 Legenda 🇸🇪 Verzeichnis 🇫🇷 Légende 🇪🇸 Leyenda 🇷🇺 Условные обозначения

🇬🇧 GEOMETRY 🇮🇹 GEOMETRIA 🇸🇪 GEOMETRIE 🇫🇷 GÉOMÉTRIE 🇪🇸 GEOMETRÍA 🇷🇺 ГЕОМЕТРИЯ	
 HRC  150°+C45°  15°	<p>🇬🇧 hardened steel 🇮🇹 acciaio temprato 🇸🇪 Hartstahl</p> <p>🇫🇷 acier trempé 🇪🇸 acero templado 🇷🇺 закалённая сталь</p>
 SUN MINI  135°  30°	<p>🇬🇧 wide range of materials, with inside coolant, mini 🇮🇹 ampia gamma di materiali, con refrigerazione interna, mini 🇸🇪 breite Auswahl an Materialien, mit Innenkühlung, mini</p> <p>🇫🇷 large gamme de matériaux, avec lubrification interne, mini 🇪🇸 amplia gama de materiales, con refrigeración interna, mini 🇷🇺 широкий выбор материалов, с внутренним охлаждением, мини</p>
 HL  135°  30°	<p>🇬🇧 wide range of materials, with inside coolant, long 🇮🇹 ampia gamma di materiali, con refrigerazione interna, lunga 🇸🇪 breite Auswahl an Materialien, mit Innenkühlung, lang</p> <p>🇫🇷 large gamme de matériaux, avec lubrification interne, longue 🇪🇸 amplia gama de materiales, con refrigeración interna, larga 🇷🇺 широкий выбор материалов, с внутренним охлаждением, длинная</p>
 SD  90-120°  30°	<p>🇬🇧 NC starting drill 🇮🇹 punte da centri NC 🇸🇪 NC Anbohrer mit Spitzenwinkel</p> <p>🇫🇷 forets à centrer NC 🇪🇸 brocas de hacer punto NC 🇷🇺 центровочные свёрла для станков с ЧПУ</p>

🇬🇧 MATERIAL 🇮🇹 MATERIALE 🇸🇪 WERKSTOFF 🇫🇷 MATIÈRE 🇪🇸 MATERIAL 🇷🇺 МАТЕРИАЛ	
 MG  ...	<p>🇬🇧 micrograin 🇮🇹 micrograna 🇸🇪 Mikrokörnung</p> <p>🇫🇷 micrograin 🇪🇸 micrograno 🇷🇺 микрoзернистый твёрдый сплав</p>

🇬🇧 SURFACE TREATMENT 🇮🇹 TRATTAMENTO SUPERFICIALE 🇸🇪 OBERFLÄCHENBEHANDLUNG 🇫🇷 TREATMENT DE SURFACE 🇪🇸 TRATAMIENTO SUPERFICIAL 🇷🇺 ОБРАБОТКА ПОВЕРХНОСТИ	
 BR  ...	<p>🇬🇧 uncoated 🇮🇹 non rivestito 🇸🇪 unbeschichtet</p> <p>🇫🇷 non revêtu 🇪🇸 no revestido 🇷🇺 без покрытия</p>
 POLISHED  ...	<p>🇬🇧 polished 🇮🇹 lappato 🇸🇪 geläppt</p> <p>🇫🇷 poli 🇪🇸 pulido 🇷🇺 полированный</p>

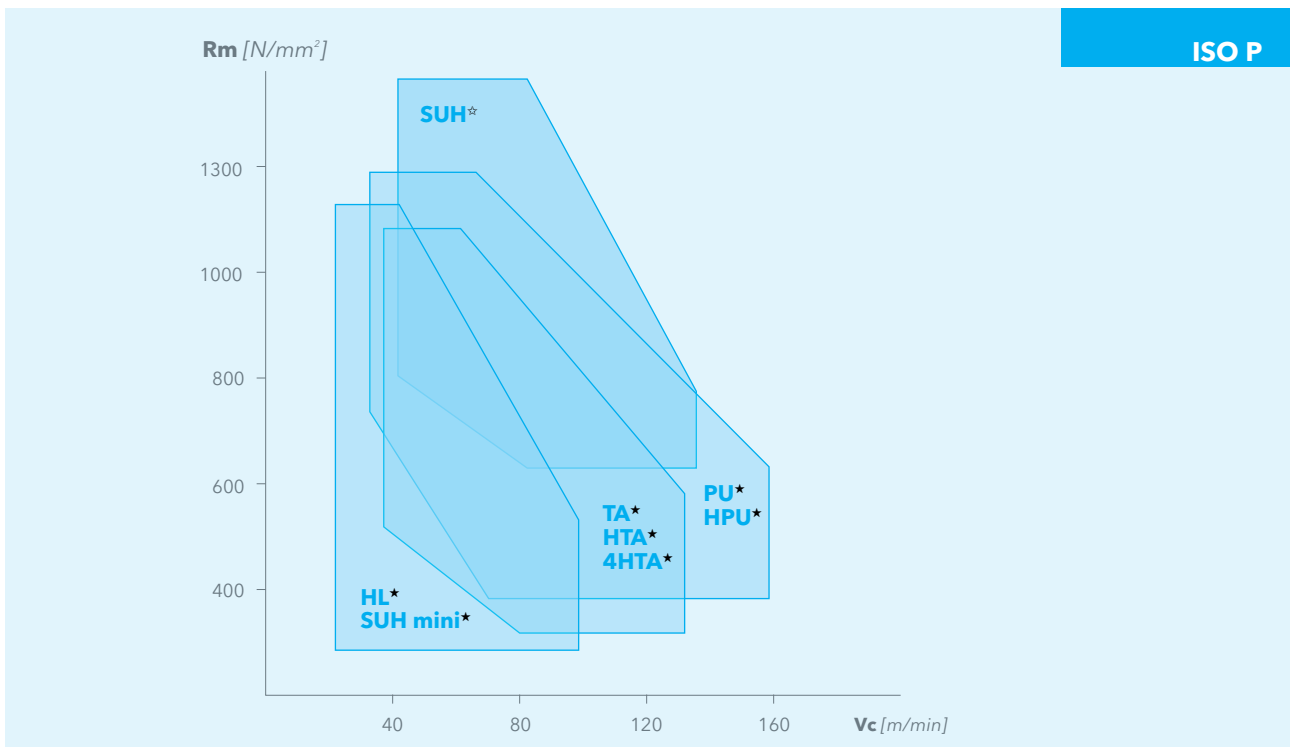
🇬🇧 COATINGS 🇮🇹 RIVESTIMENTI 🇸🇪 BESCHICHTUNGEN 🇫🇷 REVÊTEMENTS 🇪🇸 RECUBRIMIENTOS 🇷🇺 ПОКРЫТИЕ					
		 PV200	 PV250	 PV300	 PV1000
<p>🇬🇧 hardness (HV) 🇮🇹 durezza (HV) 🇸🇪 Härte (HV)</p> <p>🇫🇷 durezza (HV) 🇪🇸 dureza (HV) 🇷🇺 твёрдость (HV)</p>	<p>🇬🇧 hardness (HV) 🇮🇹 durezza (HV) 🇸🇪 Härte (HV)</p> <p>🇫🇷 durezza (HV) 🇪🇸 dureza (HV) 🇷🇺 твёрдость (HV)</p>	3300	3300	3300	3600
<p>🇬🇧 friction coefficient 🇮🇹 coefficiente d'attrito 🇸🇪 Reibungskoeffizient</p> <p>🇫🇷 coefficiente de rozamiento 🇪🇸 coeficiente de rozamiento 🇷🇺 коэффициент трения</p>	<p>🇬🇧 friction coefficient 🇮🇹 coefficiente d'attrito 🇸🇪 Reibungskoeffizient</p> <p>🇫🇷 coeficiente de rozamiento 🇪🇸 coeficiente de rozamiento 🇷🇺 коэффициент трения</p>	0.3	0.3	0.3	0.25
<p>🇬🇧 thickness (μ) 🇮🇹 spessore (μ) 🇸🇪 dicke (μ)</p> <p>🇫🇷 espesor (μ) 🇪🇸 espesor (μ) 🇷🇺 толщина (мкм)</p>	<p>🇬🇧 thickness (μ) 🇮🇹 spessore (μ) 🇸🇪 dicke (μ)</p> <p>🇫🇷 espesor (μ) 🇪🇸 espesor (μ) 🇷🇺 толщина (мкм)</p>	3	2.5+3.5	2.5+3.5	2+3
<p>🇬🇧 max working temperature (°C) 🇮🇹 temperatura max (°C) 🇸🇪 högste Temperatur (°C)</p> <p>🇫🇷 température maximale (°C) 🇪🇸 temperatura máx (°C) 🇷🇺 макс. температура (°C)</p>	<p>🇬🇧 max working temperature (°C) 🇮🇹 temperatura max (°C) 🇸🇪 högste Temperatur (°C)</p> <p>🇫🇷 température maximale (°C) 🇪🇸 temperatura máx (°C) 🇷🇺 макс. температура (°C)</p>	950°	900°	1100°	1200°

	ITEM No.	PAGE	
TA-HTA-4HTA general purpose 3xD - 5xD - 8xD	343TA	54	
	318N	54	
	353TA	58	
	353HTA	58	
	355TA	66	
	355HTA	66	
	3584HTA	74	
PU-HPU universal application 3xD - 5xD	353PU	83	
	353HPU	83	
	355PU	92	
	355HPU	92	
SUH stainless steel 3xD - 5xD	353SUH	105	
	355SUH	111	
ALH non-ferrous material 3xD - 5xD	353ALH	119	
	355ALH	123	
HRC hardened steel 45-62 HRC 3xD	353HRC	129	
SUH MINI short, long and extra long 5xD ÷ 30xD	355SUH MINI	140	
	358SUH MINI	144	
	3512SUH MINI	148	
	3520SUH MINI	152	
	3525SUH MINI	156	
	3530SUH MINI	160	
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	3530HL	193	
NC spotting 90° - 120°	CS-D-TA 90	200	
	CS-D-TA 120	200	

RANGE	DRILLING DEPTH	NORM	TYPE	MATERIAL / COATING	HRC	POINT ANGLE	HELIX ANGLE	CHAMFER	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H
1-16	3xD	DIN6539	TA	MG PV200		140°	30°		★	☆	☆	☆		
1-13	3xD	DIN6539	TA	MG BR		140°	30°		★	☆	☆	☆		
3-20	3xD	DIN6537K	TA	MG PV200		140°	30°		★	☆	☆		☆	
3-20	3xD	DIN6537K	HTA	MG PV200		140°	30°		★	☆	☆	☆	☆	
3-20	5xD	DIN3537L	TA	MG PV200		140°	30°		★	☆	☆		☆	
3-20	5xD	DIN3537L	HTA	MG PV200		140°	30°		★	☆	☆	☆	☆	
3-16	8xD	OSAWA	4HTA	MG PV300		140°	30°		★	★	★	☆	☆	
3-20	3xD	DIN6537K	PU	MG PV250		140°	30°	45°	★	★	★	☆	★	
3-20	3xD	DIN6537K	HPU	MG PV250		140°	30°	45°	★	★	★	☆	★	
3-20	5xD	DIN6537L	PU	MG PV250		140°	30°	45°	★	★	★	☆	★	
3-20	5xD	DIN6537L	HPU	MG PV250		140°	30°	45°	★	★	★	☆	★	
3-20	3xD	DIN6537K	SUH	MG PV300		140°	30°		☆	★	☆	☆	☆	
3-20	5xD	DIN6537L	SUH	MG PV300		140°	30°		☆	★	☆	☆	☆	
3-20	3xD	DIN6537K	ALH	MG POLISHED		130°	30°					★		
3-20	5xD	DIN6537L	ALH	MG POLISHED		130°	30°					★		
2.6-14.2	3xD	DIN6537K	HRC	MG PV1000	45-62	150°	15°	45°						★
1-3	5xD	OSAWA	SUH MINI	MG PV300		135°	30°		★	★	★	☆	☆	
1-3	8xD	OSAWA	SUH MINI	MG PV300		135°	30°		★	★	★	☆	☆	
1-3	12xD	OSAWA	SUH MINI	MG PV300		135°	30°		★	★	★	☆	☆	
1-3	20xD	OSAWA	SUH MINI	MG PV300		135°	30°		★	★	★	☆	☆	
1-3	25xD	OSAWA	SUH MINI	MG PV300		135°	30°		★	★	★	☆	☆	
1-3	30xD	OSAWA	SUH MINI	MG PV300		135°	30°		★	★	★	☆	☆	
3.1-10	12xD	OSAWA	HL	MG PV250		135°	30°		★	★	★	☆	☆	
3.1-10	15xD	OSAWA	HL	MG PV250		135°	30°		★	★	★	☆	☆	
3.1-10	20xD	OSAWA	HL	MG PV250		135°	30°		★	★	★	☆	☆	
3.1-9.5	25xD	OSAWA	HL	MG PV250		135°	30°		★	★	★	☆	☆	
3.1-8	30xD	OSAWA	HL	MG PV250		135°	30°		★	★	★	☆	☆	
6-16		OSAWA	SD	MG PV200		90°	30°		★	★	★	★	☆	
6-16		OSAWA	SD	MG PV200		120°	30°		★	★	★	★	☆	

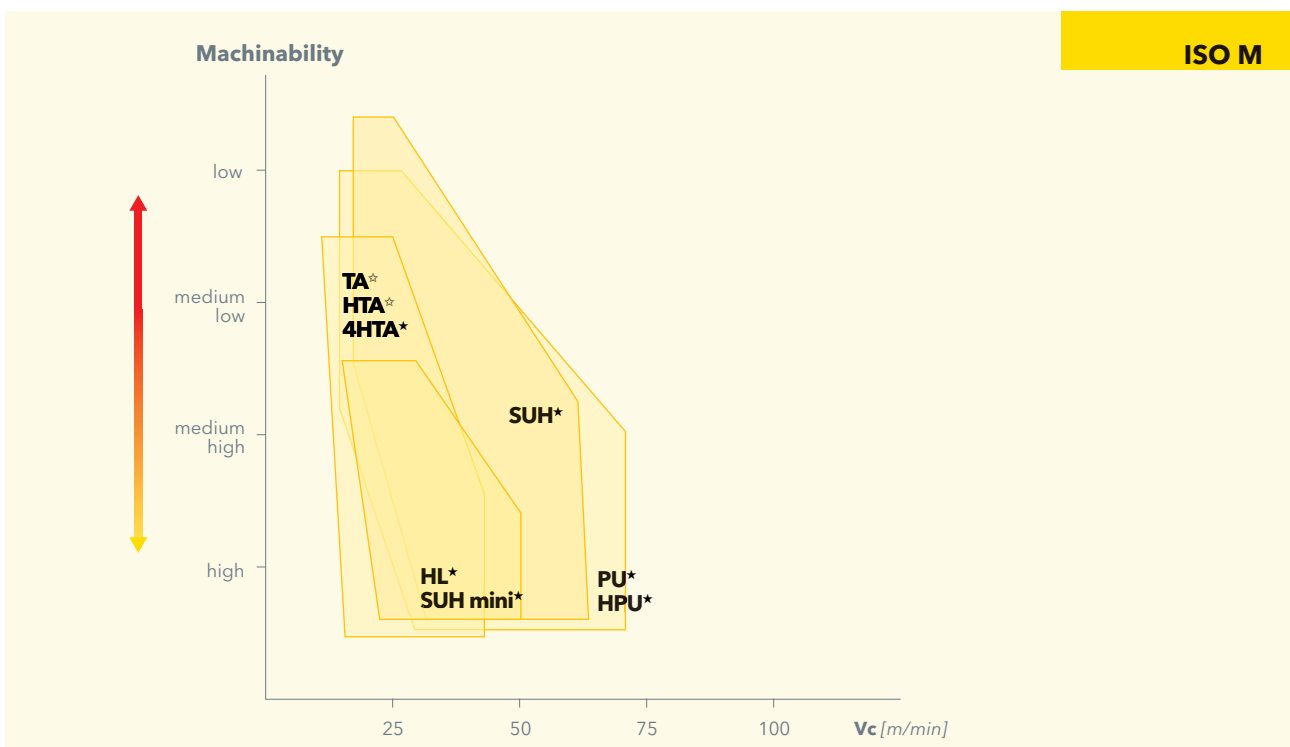
★ 1st choice ☆ suitable

STEEL APPLICATION



★ 1st choice ☆ suitable

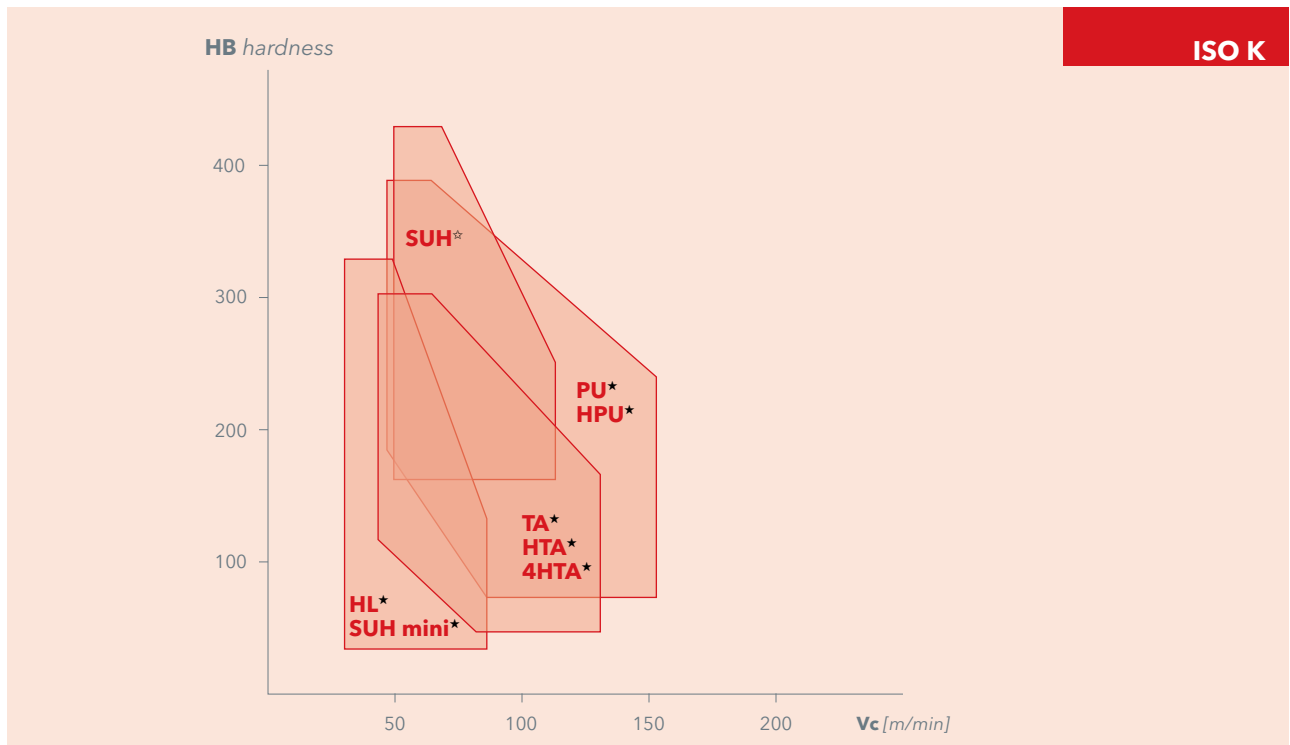
STAINLESS STEEL APPLICATION



★ 1st choice ☆ suitable

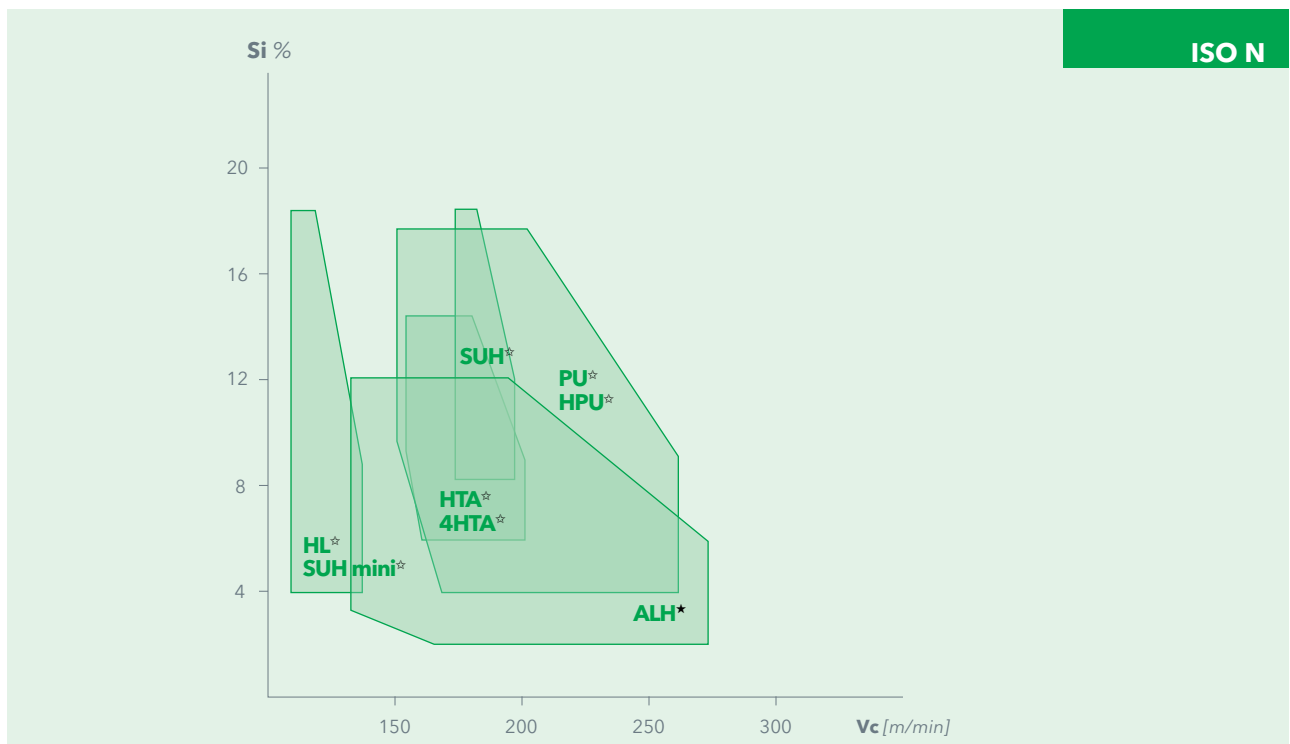
- TA : general purpose (page 51)
- HTA : general purpose with inside coolant (page 51)
- 4HTA : 4 margins general purpose with inside coolant (page 51)
- PU : universal purpose (page 81)
- HPU : universal purpose with inside coolant (page 81)
- SUH : special purpose with inside coolant (page 103)
- SUH MINI : miniature 5xD ÷ 30xD with inside coolant (page 133)
- HL : long 12xD ÷ 30xD (page 165)

CAST IRON APPLICATION



★ 1st choice ☆ suitable

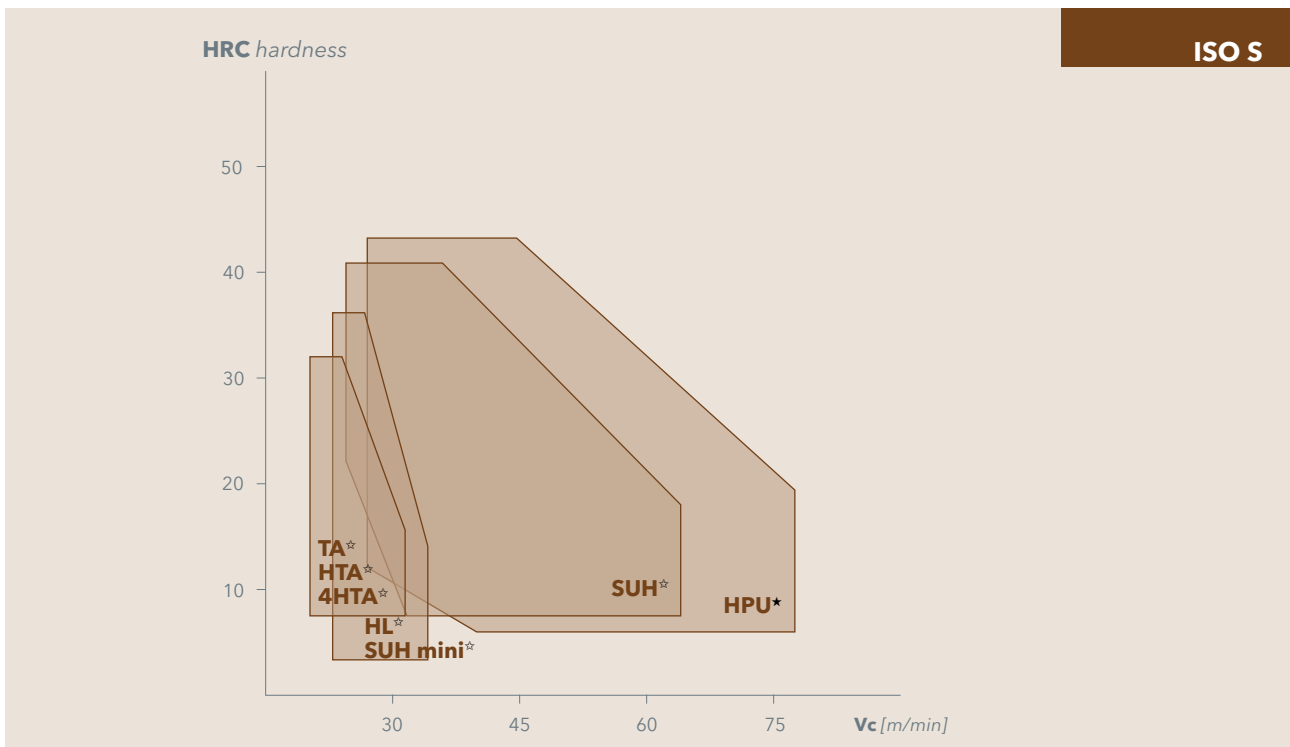
NON-FERROUS MATERIALS APPLICATION



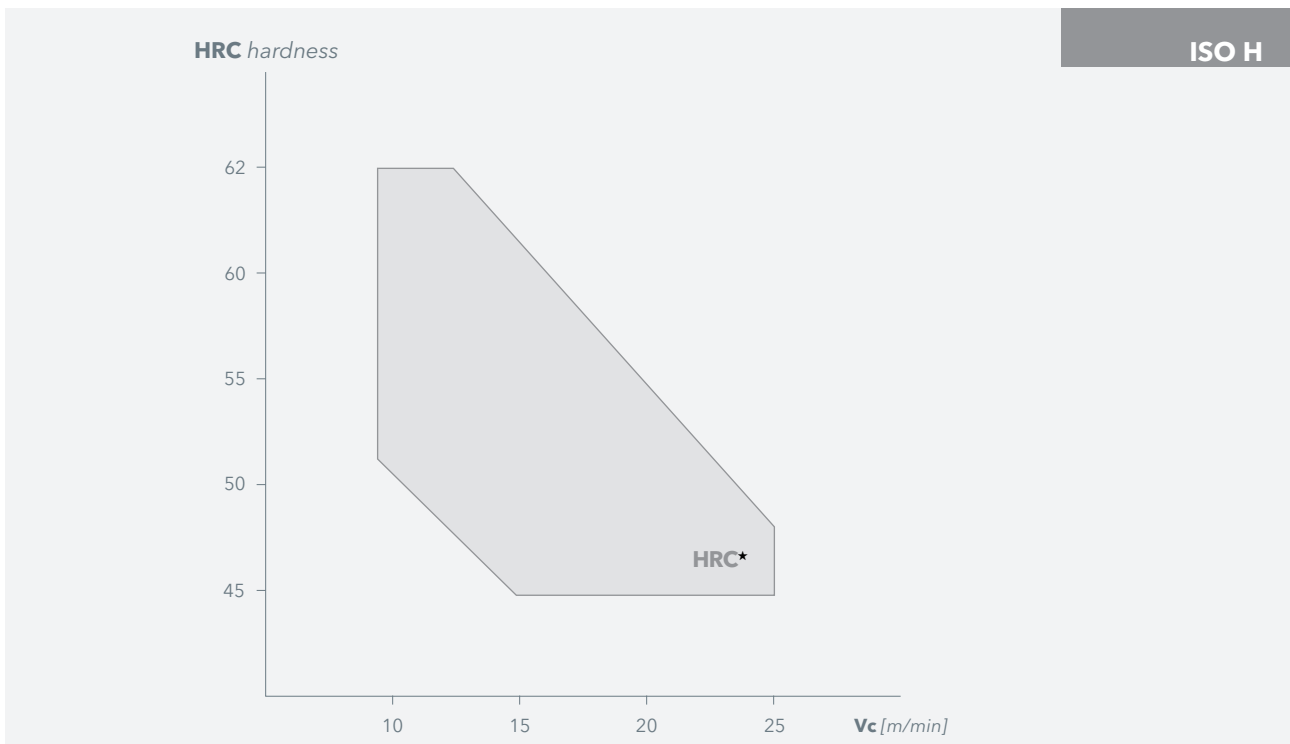
★ 1st choice ☆ suitable

- TA : general purpose (page 51)
- HTA : general purpose with inside coolant (page 51)
- 4HTA : 4 margins general purpose with inside coolant (page 51)
- PU : universal purpose (page 81)
- HPU : universal purpose with inside coolant (page 81)
- SUH : special purpose with inside coolant (page 103)
- ALH : special purpose with inside coolant (page 117)
- SUH MINI : miniature 5xD ÷ 30xD with inside coolant (page 133)
- HL : long 12xD ÷ 30xD (page 165)

SUPER ALLOYS APPLICATION



HARDENED STEEL APPLICATION



- TA : general purpose (page 51)
- HTA : general purpose with inside coolant (page 51)
- 4HTA : 4 margins general purpose with inside coolant (page 51)
- HPU : universal purpose with inside coolant (page 81)
- SUH : special purpose with inside coolant (page 103)
- HRC : special purpose (page 127)
- SUH MINI : miniature 5xD ÷ 30xD with inside coolant (page 133)
- HL : long 12xD ÷ 30xD (page 165)



INFO
TYPHOON TA-HTA-4HTA
TYPHOON PU-HPU
TYPHOON SUH
TYPHOON ALH
TYPHOON HRC
TYPHOON SUH MINI
TYPHOON HL
C-SD-TA
LFTA
SUTA
HSS-HSS/CO DRILLS
G2
MDTA
HF VH/UP
MEF
ALU
MEX
UH
HSS/CO-HSSP END MILLS
CARBIDE BURRS

TYPHOON TA-HTA-4HTA

HIGH PERFORMANCE - GENERAL PURPOSE

🇺🇸 The tool of choice for multi-purpose drilling on ISO P, M, K below 1100 N/mm².

🇮🇹 La soluzione ideale per la foratura di materiali ISO P, M, K sino a 1100 N/mm².

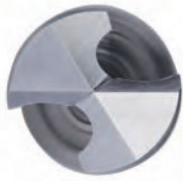
🇩🇪 Die optimale Lösung für das Bohren der Materialien ISO P, M, K bis zu 1100 N/mm².

🇫🇷 La solution idéale pour le perçage de matériaux ISO P, M, K jusqu'à 1100 N/mm².

🇪🇸 La solución ideal para el taladro de materiales ISO P, M, K hasta 1100 N/mm².

🇷🇺 Идеальное решение для сверления материалов по ISO P, M, K до 1100 Н/мм².

INFO
TYPHOON TA-HTA-4HTA
TYPHOON PU-HPU
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HSS-HSS/CO DRILLS
G2
MDTA
HF VH/UP
MEF
ALU
MEX
UH
HSS/CO-HSSP END MILLS
CARBIDE BURRS


TA

HTA

TA-HTA

- Self-centering geometry for accurate holes
- Curved cutting edge for low cutting forces.
- High relief angle: reduces cutting forces, improves chip shape and ejection
- Wide chip pocket: improves chip ejection
- Back taper geometry: improves the cutting performance
- Modified oil holes: improves coolant feed
- Substrate and coating: specifically selected for high wear resistance, long and reliable life


TA-HTA

- Affûtage autocentré pour un perçage plus précis
- Profil de l'arête ondulé pour faible effort de coupe
- Géométrie de l'arête avec dépouille accentuée pour réduire l'effort de coupe et améliorer la forme et le contrôle des copeaux
- Goujures recourbées et larges pour améliorer l'évacuation des copeaux
- Géométrie du corps avec conicité arrière pour faciliter la coupe
- Trous d'arrosage avec géométrie modifiée pour apporter une lubrification plus importante.
- Substrat et revêtement spécifiques pour garantir durée et fiabilité


TA-HTA

- Affilatura autocentrante per fori precisi
- Profilo del tagliente ondulato per basso sforzo di taglio
- Geometria del tagliente con spoglia accentuata per ridurre lo sforzo di taglio e migliorare la forma e il controllo dei trucioli
- Gole ricurve e ampie per migliorare l'evacuazione dei trucioli
- Geometria del corpo con conicità posteriore per agevolare l'azione di taglio
- Fori di refrigerazione con geometria modificata per un maggior apporto di refrigerante
- Substrato e rivestimento specifici per garantire durata e affidabilità


TA-HTA

- Afilado autocentrante para agujeros precisos
- Perfil del filo ondulado, para bajo esfuerzo de corte
- Geometría del filo con salida acentuada para reducir el esfuerzo de corte y mejorar la forma y el control de las virutas
- Ranuras curvadas y amplias para mejorar la evacuación de las virutas
- Geometría del cuerpo con conicidad posterior para facilitar la acción de corte
- Agujeros de refrigeración con geometría modificada para una mayor aportación de refrigerante
- Sustrato y revestimiento específicos para garantizar duración y fiabilidad


TA-HTA

- Selbstzentrierender Schliff für präzise Bohrungen
- Gewelltes Schneidkantenprofil für geringen Schneiddruck
- Geometrie der Schneidkante mit ausgeprägtem Hinterschliff zur Reduzierung des Schneiddrucks und zur Verbesserung der Späneform und -kontrolle
- Gebogene und breite Nuten zur Verbesserung der Späneabführung
- Geometrie des Körpers mit konischem hinteren Bereich zur Erleichterung des Schnittvorgangs
- Kühlöffnungen mit abgeänderter Geometrie für einen verbesserten Kühlmittelzufluss
- Spezielles Trägermaterial und spezielle Beschichtung zur Gewährleistung von Standzeit und Zuverlässigkeit


TA-HTA

- Самоцентрирующаяся заточка для сверления отверстий высокой точности
- Закругленный профиль режущей кромки для низких режущих усилий
- Большой угол наклона спиральной канавки для уменьшения сил резания и улучшения условий удаления стружки
- Широкие стружечные канавки для лучшего вывода стружки
- Геометрия с обратным конусом для повышения производительности
- Большие отверстия: увеличена эффективность подвода СОЖ
- Специальное покрытие для повышения стойкости инструмента


4HTA

4HTA 8xD

- Self-centering geometry for accurate holes
- 4 margin lands: reliable machining for highly accurate and straight holes even in deep drilling
- Straight cutting edge: short chips for easy evacuation and high reliability
- Special edge design: high performance and edge protection
- Back taper geometry: improves the cutting performance
- Chip pocket finishing: highly polished to reduce welding and improves chip ejection
- Large oil holes: improves coolant feed
- Substrate and coating: specifically selected for high wear resistance, long and reliable life


4HTA 8xD

- Affilatura autocentrante per fori precisi
- Geometria con "4 Margini": fori rettilinei e precisi, anche nel caso di profondità elevate.
- Profilo del tagliente diritto e rinforzato: genera trucioli corti e garantisce grande affidabilità
- Geometria del tagliente con affilatura specifica a protezione del tagliente e degli spigoli
- Geometria del corpo con conicità posteriore per agevolare l'azione di taglio
- Finitura gole: lappate per ridurre il problema dell'incollaggio e facilitare l'evacuazione dei trucioli
- Fori di refrigerazione con geometria modificata per un maggior apporto di refrigerante
- Substrato e rivestimento specifici per garantire durata e affidabilità


4HTA 8xD

- Selbstzentrierender Schliff für präzise Bohrungen
- Geometrie mit „4 Fasen“: gerade und präzise Bohrungen, auch bei großen Tiefen.
- Gerades und verstärktes Schneidkantenprofil: zur Erzeugung kurzer Späne und zur Gewährleistung hoher Zuverlässigkeit
- Geometrie der Schneidkante mit speziellem Schliff zum Schutz von Schneidkante und Kanten
- Geometrie des Körpers mit konischem hinteren Bereich zur Erleichterung des Schnitvorgangs
- Schlichtbearbeitung der Nuten: geläppt, um Probleme durch Verkleben zu reduzieren und um die Späneabführung zu erleichtern
- Kühlöffnungen mit abgeänderter Geometrie für einen verbesserten Kühlmittelzufluss
- Spezielles Trägermaterial und spezielle Beschichtung zur Gewährleistung von Standzeit und Zuverlässigkeit


4HTA 8xD

- Affûtage autocentré pour un perçage plus précis.
- Géométrie avec « 4 listels » : trous droits et précis, même en présence de trous profonds.
- Profil de l'arête droit et renforcé : il génère des copeaux courts et garantit une grande fiabilité
- Géométrie de l'arête avec affûtage spécifique pour protéger l'arête et les angles
- Géométrie du corps avec conicité arrière pour faciliter l'action de coupe
- Finition des goujures : polie pour réduire le problème du collage et faciliter l'évacuation des copeaux
- Trous de lubrification avec géométrie modifiée pour un apport de lubrifiant plus important
- Substrat et revêtement spécifiques pour garantir durée et fiabilité


4HTA 8xD

- Afilado autocentrante para agujeros precisos
- Geometría con «4 Márgenes»: agujeros rectilíneos y precisos, incluso en caso de profundidades elevadas.
- Perfil del filo recto y reforzado: genera virutas cortas y garantiza una gran fiabilidad
- Geometría del filo con afilado específico para proteger el filo y los ángulos
- Geometría del cuerpo con conicidad posterior para facilitar la acción de corte
- Acabado ranuras: lapeadas para reducir el problema del encolado y facilitar la evacuación de las virutas
- Agujeros de refrigeración con geometría modificada para una mayor aportación de refrigerante
- Sustrato y revestimiento específicos para garantizar duración y fiabilidad


4HTA 8xD

- Самоцентрирующаяся заточка для сверления отверстий высокой точности
- Геометрия с 4 режущими кромками: надежная обработка и высокая точность отверстия, даже при глубоком сверлении
- Прямые режущие кромки: легкий вывод короткой стружки и высокая эффективность
- Геометрия режущих кромок со специальной заточкой: высокая производительность и защита кромок
- Геометрия с обратным конусом: повышение производительности
- Отполированные стружечные канавки: уменьшают вероятность приваривания стружки и облегчают ее вывод
- Большие отверстия: увеличена эффективность подвода СОЖ
- Специальное покрытие для повышения стойкости инструмента

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MEF
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UH
HSS/CO-HSSP END MILLS
CARBIDE BURRS

343TA-318N

general purpose, coated (343TA) and uncoated (318N)

3XD

DIN
6539

TA

MG
PV200

MG
BR

140°

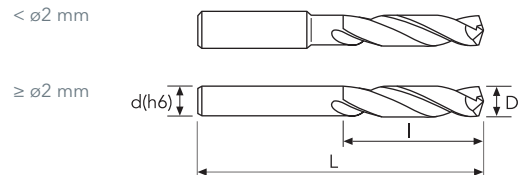
30°

343TA
318N



P	M	K	N	S	H	
★	☆	☆	☆			343TA
★	☆	☆	☆			318N

★ 1st choice ☆ suitable



						343TA		318N	
D(h7)	D Tol.	d(h6)	l	l1	L	EDP No.	Stock	EDP No.	Stock
1.00	0/-0.010	2	6		40	343TA0100	●	P318N0100	●
1.10	0/-0.010	2	7		40	343TA0110	●	P318N0110	●
1.20	0/-0.010	2	8		40	343TA0120	●	P318N0120	●
1.30	0/-0.010	2	8		40	343TA0130	●	P318N0130	●
1.40	0/-0.010	2	9		40	343TA0140	●	P318N0140	●
1.50	0/-0.010	2	9		40	343TA0150	●	P318N0150	●
1.60	0/-0.010	2	10		40	343TA0160	●	P318N0160	●
1.70	0/-0.010	2	10		40	343TA0170	●	P318N0170	●
1.80	0/-0.010	2	11		40	343TA0180	●	P318N0180	●
1.90	0/-0.010	2	11		40	343TA0190	●	P318N0190	●
2.00	0/-0.010	2	12		40	343TA0200	●	P318N0200	●
2.10	0/-0.010	2.1	12		40	343TA0210	●	P318N0210	●
2.20	0/-0.010	2.2	13		40	343TA0220	●	P318N0220	●
2.30	0/-0.010	2.3	13		46	343TA0230	●	P318N0230	●
2.40	0/-0.010	2.4	14		46	343TA0240	●	P318N0240	●
2.50	0/-0.010	2.5	14		46	343TA0250	●	P318N0250	●
2.60	0/-0.010	2.6	14		46	343TA0260	●	P318N0260	●
2.70	0/-0.010	2.7	16		46	343TA0270	●	P318N0270	●
2.80	0/-0.010	2.8	16		49	343TA0280	●	P318N0280	●
2.90	0/-0.010	2.9	16		49	343TA0290	●	P318N0290	●
3.00	0/-0.010	3	16		49	343TA0300	●	P318N0300	●
3.10	0/-0.012	3.1	18		49	343TA0310	●	P318N0310	●
3.20	0/-0.012	3.2	18		49	343TA0320	●	P318N0320	●
3.30	0/-0.012	3.3	18		52	343TA0330	●	P318N0330	●
3.40	0/-0.012	3.4	20		52	343TA0340	●	P318N0340	●
3.50	0/-0.012	3.5	20		52	343TA0350	●	P318N0350	●
3.60	0/-0.012	3.6	20		52	343TA0360	●	P318N0360	●
3.70	0/-0.012	3.7	20		52	343TA0370	●	P318N0370	●
3.80	0/-0.012	3.8	22		55	343TA0380	●	P318N0380	●
3.90	0/-0.012	3.9	22		55	343TA0390	●	P318N0390	●
4.00	0/-0.012	4	22		55	343TA0400	●	P318N0400	●
4.10	0/-0.012	4.1	22		55	343TA0410	●	P318N0410	●
4.20	0/-0.012	4.2	22		55	343TA0420	●	P318N0420	●
4.30	0/-0.012	4.3	24		58	343TA0430	●	P318N0430	●
4.40	0/-0.012	4.4	24		58	343TA0440	●	P318N0440	●
4.50	0/-0.012	4.5	24		58	343TA0450	●	P318N0450	●
4.60	0/-0.012	4.6	24		58	343TA0460	●	P318N0460	●
4.70	0/-0.012	4.7	24		58	343TA0470	●	P318N0470	●
4.80	0/-0.012	4.8	26		62	343TA0480	●	P318N0480	●

● stock standard ○ non-standard stock ▽ stock exhaustion

343TA-318N

general purpose, coated (343TA) and uncoated (318N)

3XD

DIN
6539

TA

MG
PV200

MG
BR

140°

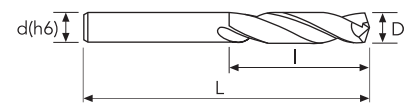
30°

343TA 318N



P	M	K	N	S	H	
★	☆	☆	☆			343TA
★	☆	☆	☆			318N

★ 1st choice ☆ suitable



D(h7)	D Tol.	d(h6)	l	l1	L	343TA		318N	
						EDP No.	Stock	EDP No.	Stock
4.90	0/-0.012	4.9	26		62	343TA0490	●	P318N0490	●
5.00	0/-0.012	5	26		62	343TA0500	●	P318N0500	●
5.10	0/-0.012	5.1	26		62	343TA0510	●	P318N0510	●
5.20	0/-0.012	5.2	26		62	343TA0520	●	P318N0520	●
5.30	0/-0.012	5.3	26		66	343TA0530	●	P318N0530	●
5.40	0/-0.012	5.4	28		66	343TA0540	●	P318N0540	●
5.50	0/-0.012	5.5	28		66	343TA0550	●	P318N0550	●
5.60	0/-0.012	5.6	28		66	343TA0560	●	P318N0560	●
5.70	0/-0.012	5.7	28		66	343TA0570	●	P318N0570	●
5.80	0/-0.012	5.8	28		70	343TA0580	●	P318N0580	●
5.90	0/-0.012	5.9	28		70	343TA0590	●	P318N0590	●
6.00	0/-0.012	6	28		70	343TA0600	●	P318N0600	●
6.10	0/-0.015	6.1	31		70	343TA0610	●	P318N0610	●
6.20	0/-0.015	6.2	31		70	343TA0620	●	P318N0620	●
6.30	0/-0.015	6.3	31		70	343TA0630	●	P318N0630	●
6.40	0/-0.015	6.4	31		70	343TA0640	●	P318N0640	●
6.50	0/-0.015	6.5	31		70	343TA0650	●	P318N0650	●
6.60	0/-0.015	6.6	31		70	343TA0660	●	P318N0660	●
6.70	0/-0.015	6.7	31		70	343TA0670	●	P318N0670	●
6.80	0/-0.015	6.8	34		74	343TA0680	●	P318N0680	●
6.90	0/-0.015	6.9	34		74	343TA0690	●	P318N0690	●
7.00	0/-0.015	7	34		74	343TA0700	●	P318N0700	●
7.10	0/-0.015	7.1	34		74	343TA0710	●	P318N0710	●
7.20	0/-0.015	7.2	34		74	343TA0720	●	P318N0720	●
7.30	0/-0.015	7.3	34		79	343TA0730	●	P318N0730	●
7.40	0/-0.015	7.4	34		79	343TA0740	●	P318N0740	●
7.50	0/-0.015	7.5	34		79	343TA0750	●	P318N0750	●
7.60	0/-0.015	7.6	37		79	343TA0760	●	P318N0760	○
7.70	0/-0.015	7.7	37		79	343TA0770	●	P318N0770	○
7.80	0/-0.015	7.8	37		79	343TA0780	●	P318N0780	●
7.90	0/-0.015	7.9	37		79	343TA0790	●	P318N0790	○
8.00	0/-0.015	8	37		79	343TA0800	●	P318N0800	●
8.10	0/-0.015	8.1	37		79	343TA0810	●	P318N0810	●
8.20	0/-0.015	8.2	37		79	343TA0820	●	P318N0820	●
8.30	0/-0.015	8.3	37		84	343TA0830	●	P318N0830	●
8.40	0/-0.015	8.4	37		84	343TA0840	●	P318N0840	○
8.50	0/-0.015	8.5	37		84	343TA0850	●	P318N0850	●
8.60	0/-0.015	8.6	40		84	343TA0860	●	P318N0860	●
8.70	0/-0.015	8.7	40		84	343TA0870	●	P318N0870	●

- INFO
- TYPHOON TA-HTA-4HTA
- TYPHOON PU-HPU
- TYPHOON SUH
- TYPHOON ALH
- TYPHOON HRC
- TYPHOON SUH MINI
- TYPHOON HL
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- G2
- MDTA
- HF VH/UP
- MEF
- ALU
- MEX
- UH
- HSS/CO-HSSP END MILLS
- CARBIDE BURRS

● stock standard ○ non-standard stock ▽ stock exhaustion

343TA

	Material Group ISO 513	P1 P2 P3			M1 M2			K1			N1 N2		
	Hardness/Rm	< 800 N/mm ²			< 750 N/mm ²			150-250 HB					
	Vc (m/min)	80-100			35-45			80-100			140-180		
	D (mm)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)
1	28660	0.050	1430	12740	0.035	450	28660	0.050	1430	50960	0.065	3310	
2	14330	0.070	1000	6370	0.049	310	14330	0.070	1000	25480	0.091	2320	
3	9550	0.086	820	4250	0.060	260	9550	0.086	820	16990	0.112	1900	
4	7170	0.126	900	3180	0.088	280	7170	0.126	900	12740	0.164	2090	
5	5730	0.131	750	2550	0.092	230	5730	0.131	750	10190	0.170	1740	
6	4780	0.145	690	2120	0.102	220	4780	0.145	690	8490	0.189	1600	
7	4090	0.165	670	1820	0.116	210	4090	0.165	670	7280	0.215	1560	
8	3580	0.185	660	1590	0.130	210	3580	0.185	660	6370	0.241	1530	
9	3180	0.205	650	1420	0.144	200	3180	0.205	650	5660	0.267	1510	
10	2870	0.224	640	1270	0.157	200	2870	0.224	640	5100	0.291	1490	
11	2610	0.244	640	1160	0.171	200	2610	0.244	640	4630	0.317	1470	
12	2390	0.263	630	1060	0.184	200	2390	0.263	630	4250	0.342	1450	
13	2200	0.282	620	980	0.197	190	2200	0.282	620	3920	0.367	1440	
14	2050	0.302	620	910	0.211	190	2050	0.302	620	3640	0.393	1430	
15	1910	0.315	600	850	0.221	190	1910	0.315	600	3400	0.410	1390	
16	1790	0.336	600	800	0.235	190	1790	0.336	600	3180	0.437	1390	

318N

	Material Group ISO 513	P1 P2 P3			M1 M2			K1			N1 N2		
	Hardness/Rm	< 800 N/mm ²			< 750 N/mm ²			150-250 HB					
	Vc (m/min)	60-80			20-30			50-70			100-140		
	D (mm)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)
1	22290	0.035	780	7960	0.025	200	19110	0.032	600	38220	0.046	1740	
2	11150	0.050	560	3980	0.035	140	9550	0.045	430	19110	0.065	1240	
3	7430	0.065	480	2650	0.046	120	6370	0.059	370	12740	0.085	1080	
4	5570	0.080	450	1990	0.056	110	4780	0.072	340	9550	0.104	990	
5	4460	0.095	420	1590	0.067	110	3820	0.086	330	7640	0.124	940	
6	3720	0.110	410	1330	0.077	100	3180	0.099	310	6370	0.143	910	
7	3180	0.125	400	1140	0.088	100	2730	0.113	310	5460	0.163	890	
8	2790	0.140	390	1000	0.098	100	2390	0.126	300	4780	0.182	870	
9	2480	0.155	380	880	0.109	100	2120	0.140	300	4250	0.202	860	
10	2230	0.170	380	800	0.119	100	1910	0.153	290	3820	0.221	840	
11	2030	0.185	380	720	0.130	90	1740	0.167	290	3470	0.241	830	
12	1860	0.200	370	660	0.140	90	1590	0.180	290	3180	0.260	830	
13	1710	0.215	370	610	0.151	90	1470	0.194	280	2940	0.280	820	

- INFO
- TYPHOON TA-HTA-4HTA
- TYPHOON PU-HPU
- TYPHOON SUH
- TYPHOON ALH
- TYPHOON HRC
- TYPHOON SUH MINI
- TYPHOON HL
- C-SD-TA
- LFTA
- SUTA
- HSS-HSS/CO DRILLS
- G2
- MDTA
- HF VH/UP
- MEF
- ALU
- MEX
- UH
- HSS/CO-HSSP END MILLS
- CARBIDE BURRS

353TA-353HTA

general purpose, TA and HTA (through coolant)

3XD

DIN
6537K

TA

HTA

MG
PV200

140°

30°

353TA 353HTA



353TA



353HTA

P	M	K	N	S	H
★	☆	☆	☆	☆	☆

353TA

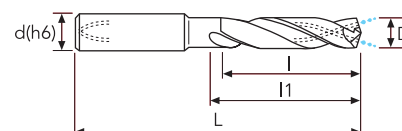
353HTA

★ 1st choice ☆ suitable

353TA



353HTA

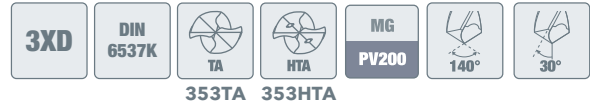


D(m7)	D Tol.	d(h6)	l	l1	L	353TA		353HTA	
						EDP No.	Stock	EDP No.	Stock
3.00	+0.012/+0.002	6	14	20	62	353TA0300	●	353HTA0300	●
3.10	+0.016/+0.004	6	14	20	62	353TA0310	●	353HTA0310	●
3.20	+0.016/+0.004	6	14	20	62	353TA0320	●	353HTA0320	●
3.30	+0.016/+0.004	6	14	20	62	353TA0330	●	353HTA0330	●
3.40	+0.016/+0.004	6	14	20	62	353TA0340	●	353HTA0340	●
3.50	+0.016/+0.004	6	14	20	62	353TA0350	●	353HTA0350	●
3.60	+0.016/+0.004	6	14	20	62	353TA0360	●	353HTA0360	●
3.70	+0.016/+0.004	6	14	20	62	353TA0370	●	353HTA0370	●
3.80	+0.016/+0.004	6	17	24	66	353TA0380	●	353HTA0380	●
3.90	+0.016/+0.004	6	17	24	66	353TA0390	●	353HTA0390	●
4.00	+0.016/+0.004	6	17	24	66	353TA0400	●	353HTA0400	●
4.10	+0.016/+0.004	6	17	24	66	353TA0410	●	353HTA0410	●
4.20	+0.016/+0.004	6	17	24	66	353TA0420	●	353HTA0420	●
4.30	+0.016/+0.004	6	17	24	66	353TA0430	●	353HTA0430	●
4.40	+0.016/+0.004	6	17	24	66	353TA0440	●	353HTA0440	●
4.50	+0.016/+0.004	6	17	24	66	353TA0450	●	353HTA0450	●
4.60	+0.016/+0.004	6	17	24	66	353TA0460	●	353HTA0460	●
4.70	+0.016/+0.004	6	17	24	66	353TA0470	●	353HTA0470	●
4.80	+0.016/+0.004	6	20	28	66	353TA0480	●	353HTA0480	●
4.90	+0.016/+0.004	6	20	28	66	353TA0490	●	353HTA0490	●
5.00	+0.016/+0.004	6	20	28	66	353TA0500	●	353HTA0500	●
5.10	+0.016/+0.004	6	20	28	66	353TA0510	●	353HTA0510	●
5.20	+0.016/+0.004	6	20	28	66	353TA0520	●	353HTA0520	●
5.30	+0.016/+0.004	6	20	28	66	353TA0530	●	353HTA0530	●
5.40	+0.016/+0.004	6	20	28	66	353TA0540	●	353HTA0540	●
5.50	+0.016/+0.004	6	20	28	66	353TA0550	●	353HTA0550	●
5.60	+0.016/+0.004	6	20	28	66	353TA0560	●	353HTA0560	●
5.70	+0.016/+0.004	6	20	28	66	353TA0570	●	353HTA0570	●
5.80	+0.016/+0.004	6	20	28	66	353TA0580	●	353HTA0580	●
5.90	+0.016/+0.004	6	20	28	66	353TA0590	●	353HTA0590	●
6.00	+0.016/+0.004	6	20	28	66	353TA0600	●	353HTA0600	●
6.10	+0.021/+0.006	8	24	34	79	353TA0610	●	353HTA0610	●
6.20	+0.021/+0.006	8	24	34	79	353TA0620	●	353HTA0620	●
6.30	+0.021/+0.006	8	24	34	79	353TA0630	●	353HTA0630	●
6.40	+0.021/+0.006	8	24	34	79	353TA0640	●	353HTA0640	●
6.50	+0.021/+0.006	8	24	34	79	353TA0650	●	353HTA0650	●
6.60	+0.021/+0.006	8	24	34	79	353TA0660	●	353HTA0660	●
6.70	+0.021/+0.006	8	24	34	79	353TA0670	●	353HTA0670	●
6.80	+0.021/+0.006	8	24	34	79	353TA0680	●	353HTA0680	●

● stock standard ○ non-standard stock ▽ stock exhaustion

353TA-353HTA

general purpose, TA and HTA (through coolant)



353TA



353HTA

P	M	K	N	S	H
★	☆	☆	☆	☆	
★	☆	☆	☆	☆	

353TA

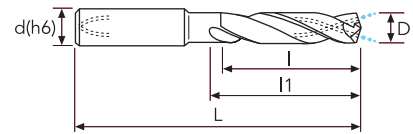
353HTA

★ 1st choice ☆ suitable

353TA



353HTA



D(m7)	D Tol.	d(h6)	l	l1	L	353TA		353HTA	
						EDP No.	Stock	EDP No.	Stock
6.90	+0.021/+0.006	8	24	34	79	353TA0690	●	353HTA0690	●
7.00	+0.021/+0.006	8	24	34	79	353TA0700	●	353HTA0700	●
7.10	+0.021/+0.006	8	29	41	79	353TA0710	●	353HTA0710	●
7.20	+0.021/+0.006	8	29	41	79	353TA0720	●	353HTA0720	●
7.30	+0.021/+0.006	8	29	41	79	353TA0730	●	353HTA0730	●
7.40	+0.021/+0.006	8	29	41	79	353TA0740	●	353HTA0740	●
7.50	+0.021/+0.006	8	29	41	79	353TA0750	●	353HTA0750	●
7.60	+0.021/+0.006	8	29	41	79	353TA0760	●	353HTA0760	●
7.70	+0.021/+0.006	8	29	41	79	353TA0770	●	353HTA0770	●
7.80	+0.021/+0.006	8	29	41	79	353TA0780	●	353HTA0780	●
7.90	+0.021/+0.006	8	29	41	79	353TA0790	●	353HTA0790	●
8.00	+0.021/+0.006	8	29	41	79	353TA0800	●	353HTA0800	●
8.10	+0.021/+0.006	10	35	47	89	353TA0810	●	353HTA0810	●
8.20	+0.021/+0.006	10	35	47	89	353TA0820	●	353HTA0820	●
8.30	+0.021/+0.006	10	35	47	89	353TA0830	●	353HTA0830	●
8.40	+0.021/+0.006	10	35	47	89	353TA0840	●	353HTA0840	●
8.50	+0.021/+0.006	10	35	47	89	353TA0850	●	353HTA0850	●
8.60	+0.021/+0.006	10	35	47	89	353TA0860	●	353HTA0860	●
8.70	+0.021/+0.006	10	35	47	89	353TA0870	●	353HTA0870	●
8.80	+0.021/+0.006	10	35	47	89	353TA0880	●	353HTA0880	●
8.90	+0.021/+0.006	10	35	47	89	353TA0890	●	353HTA0890	●
9.00	+0.021/+0.006	10	35	47	89	353TA0900	●	353HTA0900	●
9.10	+0.021/+0.006	10	35	47	89	353TA0910	●	353HTA0910	●
9.20	+0.021/+0.006	10	35	47	89	353TA0920	●	353HTA0920	●
9.30	+0.021/+0.006	10	35	47	89	353TA0930	●	353HTA0930	●
9.40	+0.021/+0.006	10	35	47	89	353TA0940	●	353HTA0940	●
9.50	+0.021/+0.006	10	35	47	89	353TA0950	●	353HTA0950	●
9.60	+0.021/+0.006	10	35	47	89	353TA0960	●	353HTA0960	●
9.70	+0.021/+0.006	10	35	47	89	353TA0970	●	353HTA0970	●
9.80	+0.021/+0.006	10	35	47	89	353TA0980	●	353HTA0980	●
9.90	+0.021/+0.006	10	35	47	89	353TA0990	●	353HTA0990	●
10.00	+0.021/+0.006	10	35	47	89	353TA1000	●	353HTA1000	●
10.10	+0.025/+0.007	12	40	55	102	353TA1010	●		
10.20	+0.025/+0.007	12	40	55	102	353TA1020	●	353HTA1020	●
10.30	+0.025/+0.007	12	40	55	102	353TA1030	●		
10.40	+0.025/+0.007	12	40	55	102	353TA1040	●	353HTA1040	●
10.50	+0.025/+0.007	12	40	55	102	353TA1050	●	353HTA1050	●
10.60	+0.025/+0.007	12	40	55	102	353TA1060	●	353HTA1060	●
10.70	+0.025/+0.007	12	40	55	102	353TA1070	●		

INFO
TYPHOON TA-HTA-4HTA
TYPHOON PU-HPJ
TYPHOON SUH
TYPHOON ALH
TYPHOON HRC
TYPHOON SUH MINI
TYPHOON HL
C-SD-TA
LFTA
SUTA
HSS-HSS/CO DRILLS
G2
MDTA
HF VH/UP
MEF
ALU
MEX
UH
HSS/CO-HSSP END MILLS
CARBIDE BURRS

● stock standard ○ non-standard stock ▽ stock exhaustion

353TA-353HTA

general purpose, TA and HTA (through coolant)

3XD

DIN
6537K

TA

HTA

MG
PV200

140°

30°

353TA 353HTA



353TA



353HTA

P	M	K	N	S	H
★	☆	☆	☆	☆	☆

353TA

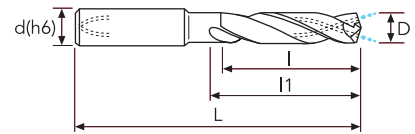
353HTA

★ 1st choice ☆ suitable

353TA



353HTA



D(m7)	D Tol.	d(h6)	l	l1	L	353TA		353HTA	
						EDP No.	Stock	EDP No.	Stock
10.80	+0.025/+0.007	12	40	55	102	353TA1080	●	353HTA1080	●
10.90	+0.025/+0.007	12	40	55	102	353TA1090	○	353HTA1090	○
11.00	+0.025/+0.007	12	40	55	102	353TA1100	●	353HTA1100	●
11.10	+0.025/+0.007	12	40	55	102	353TA1110	○		
11.20	+0.025/+0.007	12	40	55	102	353TA1120	●	353HTA1120	●
11.30	+0.025/+0.007	12	40	55	102	353TA1130	●	353HTA1130	●
11.40	+0.025/+0.007	12	40	55	102	353TA1140	○		
11.50	+0.025/+0.007	12	40	55	102	353TA1150	●	353HTA1150	●
11.60	+0.025/+0.007	12	40	55	102	353TA1160	○		
11.70	+0.025/+0.007	12	40	55	102	353TA1170	○		
11.80	+0.025/+0.007	12	40	55	102	353TA1180	●	353HTA1180	●
11.90	+0.025/+0.007	12	40	55	102	353TA1190	○		
12.00	+0.025/+0.007	12	40	55	102	353TA1200	●	353HTA1200	●
12.20	+0.025/+0.007	14	43	60	107	353TA1220	●	353HTA1220	●
12.50	+0.025/+0.007	14	43	60	107	353TA1250	●	353HTA1250	●
12.80	+0.025/+0.007	14	43	60	107	353TA1280	●	353HTA1280	●
13.00	+0.025/+0.007	14	43	60	107	353TA1300	●	353HTA1300	●
13.30	+0.025/+0.007	14	43	60	107			353HTA1330	●
13.50	+0.025/+0.007	14	43	60	107	353TA1350	●	353HTA1350	●
13.80	+0.025/+0.007	14	43	60	107			353HTA1380	●
14.00	+0.025/+0.007	14	43	60	107	353TA1400	●	353HTA1400	●
14.50	+0.025/+0.007	16	45	65	115	353TA1450	●	353HTA1450	●
15.00	+0.025/+0.007	16	65	65	115	353TA1500	●	353HTA1500	●
15.30	+0.025/+0.007	16	65	65	115			353HTA1530	●
15.50	+0.025/+0.007	16	65	65	115	353TA1550	●	353HTA1550	●
15.80	+0.025/+0.007	16	65	65	115			353HTA1580	●
16.00	+0.025/+0.007	16	65	65	115	353TA1600	●	353HTA1600	●
16.50	+0.025/+0.007	18	73	73	123	353TA1650	●	353HTA1650	●
17.00	+0.025/+0.007	18	73	73	123	353TA1700	●	353HTA1700	●
17.50	+0.025/+0.007	18	73	73	123	353TA1750	●	353HTA1750	●
18.00	+0.025/+0.007	18	73	73	123	353TA1800	●	353HTA1800	●
18.50	+0.029/+0.008	20	79	79	131	353TA1850	●	353HTA1850	●
19.00	+0.029/+0.008	20	79	79	131	353TA1900	●	353HTA1900	●
19.50	+0.029/+0.008	20	79	79	131	353TA1950	●	353HTA1950	●
20.00	+0.029/+0.008	20	79	79	131	353TA2000	●	353HTA2000	●

● stock standard ○ non-standard stock ▽ stock exhaustion

353TA

	Material Group ISO 513	P1 P2			P3 P4			P5			P6		
	Hardness/Rm	500-700 N/mm ²			600-1000 N/mm ²			900-1200 N/mm ²			1200-1400 N/mm ²		
	Vc (m/min)	90-110			80-100			50-70			30-50		
	D (mm)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)
3	10620	0.100	1060	9550	0.085	810	6370	0.075	480	4250	0.060	260	
4	7960	0.110	880	7170	0.094	670	4780	0.083	390	3180	0.066	210	
5	6370	0.120	760	5730	0.102	580	3820	0.090	340	2550	0.072	180	
6	5310	0.135	720	4780	0.115	550	3180	0.101	320	2120	0.081	170	
7	4550	0.150	680	4090	0.128	520	2730	0.113	310	1820	0.090	160	
8	3980	0.165	660	3580	0.140	500	2390	0.124	300	1590	0.099	160	
9	3540	0.180	640	3180	0.153	490	2120	0.135	290	1420	0.108	150	
10	3180	0.195	620	2870	0.166	480	1910	0.146	280	1270	0.117	150	
11	2900	0.210	610	2610	0.179	470	1740	0.158	270	1160	0.126	150	
12	2650	0.230	610	2390	0.196	470	1590	0.173	270	1060	0.138	150	
13	2450	0.250	610	2200	0.213	470	1470	0.188	280	980	0.150	150	
14	2270	0.270	610	2050	0.230	470	1360	0.203	280	910	0.162	150	
15	2120	0.290	610	1910	0.247	470	1270	0.218	280	850	0.174	150	
16	1990	0.310	620	1790	0.264	470	1190	0.233	280	800	0.186	150	
17	1870	0.330	620	1690	0.281	470	1120	0.248	280	750	0.198	150	
18	1770	0.350	620	1590	0.298	470	1060	0.263	280	710	0.210	150	
19	1680	0.370	620	1510	0.315	470	1010	0.278	280	670	0.222	150	
20	1590	0.390	620	1430	0.332	470	960	0.293	280	640	0.234	150	

353HTA

	Material Group ISO 513	P1 P2			P3 P4			P5			P6		
	Hardness/Rm	500-700 N/mm ²			600-1000 N/mm ²			900-1200 N/mm ²			1200-1400 N/mm ²		
	Vc (m/min)	100-140			80-120			70-90			50-70		
	D (mm)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)
3	12740	0.110	1400	10620	0.099	1050	8490	0.088	750	6370	0.077	490	
4	9550	0.130	1240	7960	0.117	930	6370	0.104	660	4780	0.091	430	
5	7640	0.150	1150	6370	0.135	860	5100	0.120	610	3820	0.105	400	
6	6370	0.170	1080	5310	0.153	810	4250	0.136	580	3180	0.119	380	
7	5460	0.190	1040	4550	0.171	780	3640	0.152	550	2730	0.133	360	
8	4780	0.210	1000	3980	0.189	750	3180	0.168	530	2390	0.147	350	
9	4250	0.230	980	3540	0.207	730	2830	0.184	520	2120	0.161	340	
10	3820	0.250	960	3180	0.225	720	2550	0.200	510	1910	0.175	330	
11	3470	0.260	900	2900	0.234	680	2320	0.208	480	1740	0.182	320	
12	3180	0.280	890	2650	0.252	670	2120	0.224	470	1590	0.196	310	
13	2940	0.300	880	2450	0.270	660	1960	0.240	470	1470	0.210	310	
14	2730	0.320	870	2270	0.288	650	1820	0.256	470	1360	0.224	300	
15	2550	0.340	870	2120	0.306	650	1700	0.272	460	1270	0.238	300	
16	2390	0.360	860	1990	0.324	640	1590	0.288	460	1190	0.252	300	
17	2250	0.370	830	1870	0.333	620	1500	0.296	440	1120	0.259	290	
18	2120	0.380	810	1770	0.342	610	1420	0.304	430	1060	0.266	280	
19	2010	0.390	780	1680	0.351	590	1340	0.312	420	1010	0.273	280	
20	1910	0.400	760	1590	0.360	570	1270	0.320	410	960	0.280	270	

- INFO
- TYPHOON TA-HTA-4HTA
- TYPHOON PU-HPU
- TYPHOON SUH
- TYPHOON ALH
- TYPHOON HRC
- TYPHOON SUH MINI
- TYPHOON HL
- C-SD-TA
- LFTA
- SUTA
- HSS-HSS/CO DRILLS
- G2
- MDTA
- HF VH/UP
- MEF
- ALU
- MEX
- UH
- HSS/CO-HSSP END MILLS
- CARBIDE BURRS

353TA

Material Group ISO 513	M1 M2			M3			M4			M5		
	< 750 N/mm ²			550-850 N/mm ²			650-950 N/mm ²			850-1200 N/mm ²		
	Vc (m/min)			25-45			20-30			15-25		
	D (mm)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)
3	4780	0.070	330	3720	0.060	220	2650	0.053	140	2120	0.042	90
4	3580	0.077	280	2790	0.065	180	1990	0.058	110	1590	0.046	70
5	2870	0.084	240	2230	0.071	160	1590	0.063	100	1270	0.050	60
6	2390	0.095	230	1860	0.080	150	1330	0.071	90	1060	0.057	60
7	2050	0.105	220	1590	0.089	140	1140	0.079	90	910	0.063	60
8	1790	0.116	210	1390	0.098	140	1000	0.087	90	800	0.069	60
9	1590	0.126	200	1240	0.107	130	880	0.095	80	710	0.076	50
10	1430	0.137	200	1110	0.116	130	800	0.102	80	640	0.082	50
11	1300	0.147	190	1010	0.125	130	720	0.110	80	580	0.088	50
12	1190	0.161	190	930	0.137	130	660	0.121	80	530	0.097	50
13	1100	0.175	190	860	0.149	130	610	0.131	80	490	0.105	50
14	1020	0.189	190	800	0.161	130	570	0.142	80	450	0.113	50
15	960	0.203	190	740	0.173	130	530	0.152	80	420	0.122	50
16	900	0.217	200	700	0.184	130	500	0.163	80	400	0.130	50
17	840	0.231	190	660	0.196	130	470	0.173	80	370	0.139	50
18	800	0.245	200	620	0.208	130	440	0.184	80	350	0.147	50
19	750	0.259	190	590	0.220	130	420	0.194	80	340	0.155	50
20	720	0.273	200	560	0.232	130	400	0.205	80	320	0.164	50



353HTA

Material Group ISO 513	M1 M2			M3			M4			M5		
	< 750 N/mm ²			550-850 N/mm ²			650-950 N/mm ²			850-1200 N/mm ²		
	Vc (m/min)			30-50			25-35			15-25		
	D (mm)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)
3	5310	0.070	370	4250	0.056	240	3180	0.049	160	2120	0.042	90
4	3980	0.090	360	3180	0.072	230	2390	0.063	150	1590	0.054	90
5	3180	0.100	320	2550	0.080	200	1910	0.070	130	1270	0.060	80
6	2650	0.110	290	2120	0.088	190	1590	0.077	120	1060	0.066	70
7	2270	0.130	300	1820	0.104	190	1360	0.091	120	910	0.078	70
8	1990	0.150	300	1590	0.120	190	1190	0.105	120	800	0.090	70
9	1770	0.160	280	1420	0.128	180	1060	0.112	120	710	0.096	70
10	1590	0.175	280	1270	0.140	180	960	0.123	120	640	0.105	70
11	1450	0.180	260	1160	0.144	170	870	0.126	110	580	0.108	60
12	1330	0.200	270	1060	0.160	170	800	0.140	110	530	0.120	60
13	1220	0.215	260	980	0.172	170	730	0.151	110	490	0.129	60
14	1140	0.230	260	910	0.184	170	680	0.161	110	450	0.138	60
15	1060	0.245	260	850	0.196	170	640	0.172	110	420	0.147	60
16	1000	0.260	260	800	0.208	170	600	0.182	110	400	0.156	60
17	940	0.270	250	750	0.216	160	560	0.189	110	370	0.162	60
18	880	0.285	250	710	0.228	160	530	0.200	110	350	0.171	60
19	840	0.300	250	670	0.240	160	500	0.210	110	340	0.180	60
20	800	0.310	250	640	0.248	160	480	0.217	100	320	0.186	60



- INFO
- TYPHOON TA-HTA-4HTA
- TYPHOON PU-HPU
- TYPHOON SUH
- TYPHOON ALH
- TYPHOON HRC
- TYPHOON SUH MINI
- TYPHOON HL
- C-SD-TA
- LFTA
- SUTA
- HSS-HSS/CO DRILLS
- G2
- MDTA
- HF VH/UP
- MEF
- ALU
- MEX
- UH
- HSS/CO-HSSP END MILLS
- CARBIDE BURRS

353TA

	Material Group ISO 513	K1			K2			K3			K4		
	Hardness/Rm	150-250 HB			150-350 HB			120-260 HB			250-500 HB		
	Vc (m/min)	90-110			80-100			50-70			30-50		
	D (mm)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)
3	10620	0.100	1060	9550	0.085	810	6370	0.075	480	4250	0.060	260	
4	7960	0.110	880	7170	0.094	670	4780	0.083	390	3180	0.066	210	
5	6370	0.120	760	5730	0.102	580	3820	0.090	340	2550	0.072	180	
6	5310	0.135	720	4780	0.115	550	3180	0.101	320	2120	0.081	170	
7	4550	0.150	680	4090	0.128	520	2730	0.113	310	1820	0.090	160	
8	3980	0.165	660	3580	0.140	500	2390	0.124	300	1590	0.099	160	
9	3540	0.180	640	3180	0.153	490	2120	0.135	290	1420	0.108	150	
10	3180	0.195	620	2870	0.166	480	1910	0.146	280	1270	0.117	150	
11	2900	0.210	610	2610	0.179	470	1740	0.158	270	1160	0.126	150	
12	2650	0.230	610	2390	0.196	470	1590	0.173	270	1060	0.138	150	
13	2450	0.250	610	2200	0.213	470	1470	0.188	280	980	0.150	150	
14	2270	0.270	610	2050	0.230	470	1360	0.203	280	910	0.162	150	
15	2120	0.290	610	1910	0.247	470	1270	0.218	280	850	0.174	150	
16	1990	0.310	620	1790	0.264	470	1190	0.233	280	800	0.186	150	
17	1870	0.330	620	1690	0.281	470	1120	0.248	280	750	0.198	150	
18	1770	0.350	620	1590	0.298	470	1060	0.263	280	710	0.210	150	
19	1680	0.370	620	1510	0.315	470	1010	0.278	280	670	0.222	150	
20	1590	0.390	620	1430	0.332	470	960	0.293	280	640	0.234	150	

353HTA

	Material Group ISO 513	K1			K2			K3			K4		
	Hardness/Rm	150-250 HB			150-350 HB			120-260 HB			250-500 HB		
	Vc (m/min)	100-120			80-100			60-80			50-70		
	D (mm)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)
3	11680	0.110	1280	9550	0.099	950	7430	0.088	650	6370	0.077	490	
4	8760	0.130	1140	7170	0.117	840	5570	0.104	580	4780	0.091	430	
5	7010	0.150	1050	5730	0.135	770	4460	0.120	540	3820	0.105	400	
6	5840	0.170	990	4780	0.153	730	3720	0.136	510	3180	0.119	380	
7	5000	0.190	950	4090	0.171	700	3180	0.152	480	2730	0.133	360	
8	4380	0.210	920	3580	0.189	680	2790	0.168	470	2390	0.147	350	
9	3890	0.230	890	3180	0.207	660	2480	0.184	460	2120	0.161	340	
10	3500	0.250	880	2870	0.225	650	2230	0.200	450	1910	0.175	330	
11	3180	0.260	830	2610	0.234	610	2030	0.208	420	1740	0.182	320	
12	2920	0.280	820	2390	0.252	600	1860	0.224	420	1590	0.196	310	
13	2690	0.300	810	2200	0.270	590	1710	0.240	410	1470	0.210	310	
14	2500	0.320	800	2050	0.288	590	1590	0.256	410	1360	0.224	300	
15	2340	0.340	800	1910	0.306	580	1490	0.272	410	1270	0.238	300	
16	2190	0.360	790	1790	0.324	580	1390	0.288	400	1190	0.252	300	
17	2060	0.370	760	1690	0.333	560	1310	0.296	390	1120	0.259	290	
18	1950	0.380	740	1590	0.342	540	1240	0.304	380	1060	0.266	280	
19	1840	0.390	720	1510	0.351	530	1170	0.312	370	1010	0.273	280	
20	1750	0.400	700	1430	0.360	510	1110	0.320	360	960	0.280	270	

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- CARBIDE BURRS

353HTA

Material Group ISO 513	N1 > 5% Si			N2			N4					
	Hardness/Rm											
	Vc (m/min)			180-220			160-200			160-180		
D (mm)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)			
3	21230	0.132	2800	19110	0.119	2270	18050	0.119	2140			
4	15920	0.156	2480	14330	0.140	2010	13540	0.140	1900			
5	12740	0.180	2290	11460	0.162	1860	10830	0.162	1750			
6	10620	0.204	2170	9550	0.184	1750	9020	0.184	1660			
7	9100	0.228	2070	8190	0.205	1680	7730	0.205	1590			
8	7960	0.252	2010	7170	0.227	1630	6770	0.227	1540			
9	7080	0.276	1950	6370	0.248	1580	6020	0.248	1500			
10	6370	0.300	1910	5730	0.270	1550	5410	0.270	1460			
11	5790	0.312	1810	5210	0.281	1460	4920	0.281	1380			
12	5310	0.336	1780	4780	0.302	1450	4510	0.302	1360			
13	4900	0.360	1760	4410	0.324	1430	4160	0.324	1350			
14	4550	0.384	1750	4090	0.346	1410	3870	0.346	1340			
15	4250	0.408	1730	3820	0.367	1400	3610	0.367	1330			
16	3980	0.432	1720	3580	0.389	1390	3380	0.389	1310			
17	3750	0.444	1670	3370	0.400	1350	3180	0.400	1270			
18	3540	0.456	1610	3180	0.410	1310	3010	0.410	1240			
19	3350	0.468	1570	3020	0.421	1270	2850	0.421	1200			
20	3180	0.480	1530	2870	0.432	1240	2710	0.432	1170			



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353TA

	Material Group ISO 513	S1 S2			S3			S4			S5		
	Hardness/Rm	< 35 HRC			35-45 HRC								
	Vc (m/min)	25-35			15-25			30-40			20-30		
	D (mm)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)
3	3180	0.045	140	2120	0.032	70	3720	0.043	160	2650	0.036	100	
4	2390	0.050	120	1590	0.035	60	2790	0.047	130	1990	0.040	80	
5	1910	0.054	100	1270	0.038	50	2230	0.051	110	1590	0.043	70	
6	1590	0.061	100	1060	0.043	50	1860	0.058	110	1330	0.049	60	
7	1360	0.068	90	910	0.047	40	1590	0.064	100	1140	0.054	60	
8	1190	0.074	90	800	0.052	40	1390	0.071	100	1000	0.059	60	
9	1060	0.081	90	710	0.057	40	1240	0.077	100	880	0.065	60	
10	960	0.088	80	640	0.061	40	1110	0.083	90	800	0.070	60	
11	870	0.095	80	580	0.066	40	1010	0.090	90	720	0.076	50	
12	800	0.104	80	530	0.072	40	930	0.098	90	660	0.083	50	
13	730	0.113	80	490	0.079	40	860	0.107	90	610	0.090	50	
14	680	0.122	80	450	0.085	40	800	0.115	90	570	0.097	60	
15	640	0.131	80	420	0.091	40	740	0.124	90	530	0.104	60	
16	600	0.140	80	400	0.098	40	700	0.133	90	500	0.112	60	
17	560	0.149	80	370	0.104	40	660	0.141	90	470	0.119	60	
18	530	0.158	80	350	0.110	40	620	0.150	90	440	0.126	60	
19	500	0.167	80	340	0.117	40	590	0.158	90	420	0.133	60	
20	480	0.176	80	320	0.123	40	560	0.167	90	400	0.140	60	

353HTA

	Material Group ISO 513	S1 S2			S3			S4			S5		
	Hardness/Rm	< 35 HRC			35-45 HRC								
	Vc (m/min)	30-40			20-30			40-60			30-40		
	D (mm)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)
3	3720	0.046	170	2650	0.032	90	5310	0.044	230	3720	0.037	140	
4	2790	0.055	150	1990	0.039	80	3980	0.052	210	2790	0.044	120	
5	2230	0.063	140	1590	0.044	70	3180	0.060	190	2230	0.050	110	
6	1860	0.073	140	1330	0.051	70	2650	0.069	180	1860	0.058	110	
7	1590	0.080	130	1140	0.056	60	2270	0.076	170	1590	0.064	100	
8	1390	0.090	130	1000	0.063	60	1990	0.086	170	1390	0.072	100	
9	1240	0.100	120	880	0.070	60	1770	0.095	170	1240	0.080	100	
10	1110	0.110	120	800	0.077	60	1590	0.105	170	1110	0.088	100	
11	1010	0.120	120	720	0.084	60	1450	0.114	170	1010	0.096	100	
12	930	0.130	120	660	0.091	60	1330	0.124	160	930	0.104	100	
13	860	0.137	120	610	0.096	60	1220	0.130	160	860	0.110	90	
14	800	0.145	120	570	0.102	60	1140	0.138	160	800	0.116	90	
15	740	0.153	110	530	0.107	60	1060	0.145	150	740	0.122	90	
16	700	0.160	110	500	0.112	60	1000	0.152	150	700	0.128	90	
17	660	0.170	110	470	0.119	60	940	0.162	150	660	0.136	90	
18	620	0.180	110	440	0.126	60	880	0.171	150	620	0.144	90	
19	590	0.190	110	420	0.133	60	840	0.181	150	590	0.152	90	
20	560	0.200	110	400	0.140	60	800	0.190	150	560	0.160	90	

- INFO
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- TYPHOON HL
- C-SD-TA
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- SUTA
- HSS-HSS/CO DRILLS
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- UH
- HSS/CO-HSSP END MILLS
- CARBIDE BURRS

355TA-355HTA

general purpose, TA and HTA (through coolant)

5XD

DIN 6537L

TA

HTA

MG PV200

140°

30°

355TA 355HTA



355TA



355HTA

P	M	K	N	S	H
★	☆	☆	☆	☆	☆

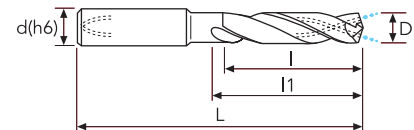
355TA
355HTA

★ 1st choice ☆ suitable

355TA



355HTA



D(m7)	D Tol.	d(h6)	l	l1	L	355TA		355HTA	
						EDP No.	Stock	EDP No.	Stock
3.00	+0.012/+0.002	6	23	28	66	355TA0300	●	355HTA0300	●
3.10	+0.016/+0.004	6	23	28	66	355TA0310	●	355HTA0310	●
3.20	+0.016/+0.004	6	23	28	66	355TA0320	●	355HTA0320	●
3.30	+0.016/+0.004	6	23	28	66	355TA0330	●	355HTA0330	●
3.40	+0.016/+0.004	6	23	28	66	355TA0340	●	355HTA0340	●
3.50	+0.016/+0.004	6	23	28	66	355TA0350	●	355HTA0350	●
3.60	+0.016/+0.004	6	23	28	66	355TA0360	●	355HTA0360	●
3.70	+0.016/+0.004	6	23	28	66	355TA0370	●	355HTA0370	●
3.80	+0.016/+0.004	6	29	36	74	355TA0380	●	355HTA0380	●
3.90	+0.016/+0.004	6	29	36	74	355TA0390	●	355HTA0390	●
4.00	+0.016/+0.004	6	29	36	74	355TA0400	●	355HTA0400	●
4.10	+0.016/+0.004	6	29	36	74	355TA0410	●	355HTA0410	●
4.20	+0.016/+0.004	6	29	36	74	355TA0420	●	355HTA0420	●
4.30	+0.016/+0.004	6	29	36	74	355TA0430	●	355HTA0430	●
4.40	+0.016/+0.004	6	29	36	74	355TA0440	●	355HTA0440	●
4.50	+0.016/+0.004	6	29	36	74	355TA0450	●	355HTA0450	●
4.60	+0.016/+0.004	6	29	36	74	355TA0460	●	355HTA0460	●
4.70	+0.016/+0.004	6	29	36	74	355TA0470	●	355HTA0470	●
4.80	+0.016/+0.004	6	35	44	82	355TA0480	●	355HTA0480	●
4.90	+0.016/+0.004	6	35	44	82	355TA0490	●	355HTA0490	●
5.00	+0.016/+0.004	6	35	44	82	355TA0500	●	355HTA0500	●
5.10	+0.016/+0.004	6	35	44	82	355TA0510	●	355HTA0510	●
5.20	+0.016/+0.004	6	35	44	82	355TA0520	●	355HTA0520	●
5.30	+0.016/+0.004	6	35	44	82	355TA0530	●	355HTA0530	●
5.40	+0.016/+0.004	6	35	44	82	355TA0540	●	355HTA0540	●
5.50	+0.016/+0.004	6	35	44	82	355TA0550	●	355HTA0550	●
5.60	+0.016/+0.004	6	35	44	82	355TA0560	●	355HTA0560	●
5.70	+0.016/+0.004	6	35	44	82	355TA0570	●	355HTA0570	●
5.80	+0.016/+0.004	6	35	44	82	355TA0580	●	355HTA0580	●
5.90	+0.016/+0.004	6	35	44	82	355TA0590	●	355HTA0590	●
6.00	+0.016/+0.004	6	35	44	82	355TA0600	●	355HTA0600	●
6.10	+0.021/+0.006	8	43	53	91	355TA0610	●	355HTA0610	●
6.20	+0.021/+0.006	8	43	53	91	355TA0620	●	355HTA0620	●
6.30	+0.021/+0.006	8	43	53	91	355TA0630	●	355HTA0630	●
6.40	+0.021/+0.006	8	43	53	91	355TA0640	●	355HTA0640	●
6.50	+0.021/+0.006	8	43	53	91	355TA0650	●	355HTA0650	●
6.60	+0.021/+0.006	8	43	53	91	355TA0660	●	355HTA0660	●
6.70	+0.021/+0.006	8	43	53	91	355TA0670	●	355HTA0670	●
6.80	+0.021/+0.006	8	43	53	91	355TA0680	●	355HTA0680	●

● stock standard ○ non-standard stock ▽ stock exhaustion

355TA-355HTA

general purpose, TA and HTA (through coolant)

5XD

DIN 6537L

TA

HTA

MG PV200

140°

30°

355TA 355HTA



355TA



355HTA

P	M	K	N	S	H
★	☆	☆	☆	☆	
★	☆	☆	☆	☆	

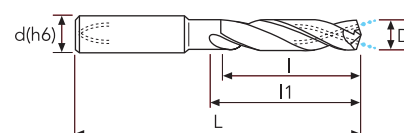
355TA
355HTA

★ 1st choice ☆ suitable

355TA



355HTA



D(m7)	D Tol.	d(h6)	l	l1	L	355TA		355HTA	
						EDP No.	Stock	EDP No.	Stock
6.90	+0.021/+0.006	8	43	53	91	355TA0690	●	355HTA0690	●
7.00	+0.021/+0.006	8	43	53	91	355TA0700	●	355HTA0700	●
7.10	+0.021/+0.006	8	43	53	91	355TA0710	●	355HTA0710	●
7.20	+0.021/+0.006	8	43	53	91	355TA0720	●	355HTA0720	●
7.30	+0.021/+0.006	8	43	53	91	355TA0730	●	355HTA0730	●
7.40	+0.021/+0.006	8	43	53	91	355TA0740	●	355HTA0740	●
7.50	+0.021/+0.006	8	43	53	91	355TA0750	●	355HTA0750	●
7.60	+0.021/+0.006	8	43	53	91	355TA0760	●	355HTA0760	●
7.70	+0.021/+0.006	8	43	53	91	355TA0770	●	355HTA0770	●
7.80	+0.021/+0.006	8	43	53	91	355TA0780	●	355HTA0780	●
7.90	+0.021/+0.006	8	43	53	91	355TA0790	●	355HTA0790	●
8.00	+0.021/+0.006	8	43	53	91	355TA0800	●	355HTA0800	●
8.10	+0.021/+0.006	10	49	61	103	355TA0810	●	355HTA0810	●
8.20	+0.021/+0.006	10	49	61	103	355TA0820	●	355HTA0820	●
8.30	+0.021/+0.006	10	49	61	103	355TA0830	●	355HTA0830	●
8.40	+0.021/+0.006	10	49	61	103	355TA0840	●	355HTA0840	●
8.50	+0.021/+0.006	10	49	61	103	355TA0850	●	355HTA0850	●
8.60	+0.021/+0.006	10	49	61	103	355TA0860	●	355HTA0860	●
8.70	+0.021/+0.006	10	49	61	103	355TA0870	●	355HTA0870	●
8.80	+0.021/+0.006	10	49	61	103	355TA0880	●	355HTA0880	●
8.90	+0.021/+0.006	10	49	61	103	355TA0890	●	355HTA0890	●
9.00	+0.021/+0.006	10	49	61	103	355TA0900	●	355HTA0900	●
9.10	+0.021/+0.006	10	49	61	103	355TA0910	●	355HTA0910	●
9.20	+0.021/+0.006	10	49	61	103	355TA0920	●	355HTA0920	●
9.30	+0.021/+0.006	10	49	61	103	355TA0930	●	355HTA0930	●
9.40	+0.021/+0.006	10	49	61	103	355TA0940	●	355HTA0940	●
9.50	+0.021/+0.006	10	61	61	103	355TA0950	●	355HTA0950	●
9.60	+0.021/+0.006	10	61	61	103	355TA0960	●	355HTA0960	●
9.70	+0.021/+0.006	10	61	61	103	355TA0970	●	355HTA0970	●
9.80	+0.021/+0.006	10	61	61	103	355TA0980	●	355HTA0980	●
9.90	+0.021/+0.006	10	61	61	103	355TA0990	●	355HTA0990	●
10.00	+0.021/+0.006	10	61	61	103	355TA1000	●	355HTA1000	●
10.10	+0.025/+0.007	12	71	71	118	355TA1010	●		
10.20	+0.025/+0.007	12	71	71	118	355TA1020	●	355HTA1020	●
10.30	+0.025/+0.007	12	71	71	118	355TA1030	●		
10.40	+0.025/+0.007	12	71	71	118	355TA1040	○		
10.50	+0.025/+0.007	12	71	71	118	355TA1050	●	355HTA1050	●
10.60	+0.025/+0.007	12	71	71	118	355TA1060	●		
10.70	+0.025/+0.007	12	71	71	118	355TA1070	●		

INFO
TYPHOON TA-HTA-4HTA
TYPHOON PU-HPJ
TYPHOON SUH
TYPHOON ALH
TYPHOON HRC
TYPHOON SUH MINI
TYPHOON HL
C-SD-TA
LFTA
SUTA
HSS-HSS/CO DRILLS
G2
MDTA
HF VH/UP
MEF
ALU
MEX
UH
HSS/CO-HSSP END MILLS
CARBIDE BURRS

● stock standard ○ non-standard stock ▽ stock exhaustion

355TA-355HTA

general purpose, TA and HTA (through coolant)

5XD

DIN 6537L

TA

HTA

MG PV200

140°

30°

355TA 355HTA



355TA



355HTA

P	M	K	N	S	H
★	☆	☆	☆	☆	☆

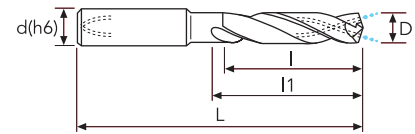
355TA
355HTA

★ 1st choice ☆ suitable

355TA



355HTA



D(m7)	D Tol.	d(h6)	l	l1	L	355TA		355HTA	
						EDP No.	Stock	EDP No.	Stock
10.80	+0.025/+0.007	12	71	71	118	355TA1080	●	355HTA1080	●
10.90	+0.025/+0.007	12	71	71	118	355TA1090	○	355HTA1090	○
11.00	+0.025/+0.007	12	71	71	118	355TA1100	●	355HTA1100	●
11.10	+0.025/+0.007	12	71	71	118	355TA1110	○		
11.20	+0.025/+0.007	12	71	71	118	355TA1120	●	355HTA1120	●
11.30	+0.025/+0.007	12	71	71	118	355TA1130	●	355HTA1130	●
11.40	+0.025/+0.007	12	71	71	118	355TA1140	●		
11.50	+0.025/+0.007	12	71	71	118	355TA1150	●	355HTA1150	●
11.60	+0.025/+0.007	12	71	71	118	355TA1160	○		
11.70	+0.025/+0.007	12	71	71	118	355TA1170	●		
11.80	+0.025/+0.007	12	71	71	118	355TA1180	●	355HTA1180	●
11.90	+0.025/+0.007	12	71	71	118	355TA1190	○		
12.00	+0.025/+0.007	12	71	71	118	355TA1200	●	355HTA1200	●
12.20	+0.025/+0.007	14	77	77	124	355TA1220	●	355HTA1220	●
12.50	+0.025/+0.007	14	77	77	124	355TA1250	●	355HTA1250	●
12.80	+0.025/+0.007	14	77	77	124			355HTA1280	●
13.00	+0.025/+0.007	14	77	77	124	355TA1300	●	355HTA1300	●
13.30	+0.025/+0.007	14	77	77	124			355HTA1330	●
13.50	+0.025/+0.007	14	77	77	124	355TA1350	●	355HTA1350	●
13.80	+0.025/+0.007	14	77	77	124			355HTA1380	●
14.00	+0.025/+0.007	14	77	77	124	355TA1400	●	355HTA1400	●
14.50	+0.025/+0.007	16	83	83	133	355TA1450	●	355HTA1450	●
15.00	+0.025/+0.007	16	83	83	133	355TA1500	●	355HTA1500	●
15.30	+0.025/+0.007	16	83	83	133			355HTA1530	●
15.50	+0.025/+0.007	16	83	83	133	355TA1550	●	355HTA1550	●
15.80	+0.025/+0.007	16	83	83	133			355HTA1580	●
16.00	+0.025/+0.007	16	83	83	133	355TA1600	●	355HTA1600	●
16.50	+0.025/+0.007	18	93	93	143	355TA1650	●	355HTA1650	●
17.00	+0.025/+0.007	18	93	93	143	355TA1700	●	355HTA1700	●
17.50	+0.025/+0.007	18	93	93	143	355TA1750	●	355HTA1750	●
18.00	+0.025/+0.007	18	93	93	143	355TA1800	●	355HTA1800	●
18.50	+0.029/+0.008	20	101	101	153	355TA1850	●	355HTA1850	●
19.00	+0.029/+0.008	20	101	101	153	355TA1900	●	355HTA1900	●
19.50	+0.029/+0.008	20	101	101	153	355TA1950	○	355HTA1950	●
20.00	+0.029/+0.008	20	101	101	153	355TA2000	●	355HTA2000	●

● stock standard ○ non-standard stock ▽ stock exhaustion

355TA

	Material Group ISO 513	P1 P2			P3 P4			P5			P6		
	Hardness/Rm	500-700 N/mm ²			600-1000 N/mm ²			900-1200 N/mm ²			1200-1400 N/mm ²		
	Vc (m/min)	80-100			70-90			40-60			20-40		
	D (mm)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)
3	9550	0.085	810	8490	0.068	580	5310	0.060	320	3180	0.043	140	
4	7170	0.094	670	6370	0.075	480	3980	0.065	260	2390	0.047	110	
5	5730	0.102	580	5100	0.082	420	3180	0.071	230	1910	0.051	100	
6	4780	0.115	550	4250	0.092	390	2650	0.080	210	1590	0.057	90	
7	4090	0.128	520	3640	0.102	370	2270	0.089	200	1360	0.064	90	
8	3580	0.140	500	3180	0.112	360	1990	0.098	200	1190	0.070	80	
9	3180	0.153	490	2830	0.122	350	1770	0.107	190	1060	0.077	80	
10	2870	0.166	480	2550	0.133	340	1590	0.116	180	960	0.083	80	
11	2610	0.179	470	2320	0.143	330	1450	0.125	180	870	0.089	80	
12	2390	0.196	470	2120	0.156	330	1330	0.137	180	800	0.098	80	
13	2200	0.213	470	1960	0.170	330	1220	0.149	180	730	0.106	80	
14	2050	0.230	470	1820	0.184	330	1140	0.161	180	680	0.115	80	
15	1910	0.247	470	1700	0.197	340	1060	0.173	180	640	0.123	80	
16	1790	0.264	470	1590	0.211	340	1000	0.184	180	600	0.132	80	
17	1690	0.281	470	1500	0.224	340	940	0.196	180	560	0.140	80	
18	1590	0.298	470	1420	0.238	340	880	0.208	180	530	0.149	80	
19	1510	0.315	470	1340	0.252	340	840	0.220	180	500	0.157	80	
20	1430	0.332	470	1270	0.265	340	800	0.232	190	480	0.166	80	

355HTA

	Material Group ISO 513	P1 P2			P3 P4			P5			P6		
	Hardness/Rm	500-700 N/mm ²			600-1000 N/mm ²			900-1200 N/mm ²			1200-1400 N/mm ²		
	Vc (m/min)	100-120			80-100			60-80			40-60		
	D (mm)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)
3	11680	0.094	1090	9550	0.070	670	7430	0.056	420	5310	0.047	250	
4	8760	0.111	970	7170	0.083	590	5570	0.066	370	3980	0.055	220	
5	7010	0.128	890	5730	0.096	550	4460	0.077	340	3180	0.064	200	
6	5840	0.145	840	4780	0.108	520	3720	0.087	320	2650	0.072	190	
7	5000	0.162	810	4090	0.121	500	3180	0.097	310	2270	0.081	180	
8	4380	0.179	780	3580	0.134	480	2790	0.107	300	1990	0.089	180	
9	3890	0.196	760	3180	0.147	470	2480	0.117	290	1770	0.098	170	
10	3500	0.213	740	2870	0.159	460	2230	0.128	280	1590	0.106	170	
11	3180	0.221	700	2610	0.166	430	2030	0.133	270	1450	0.111	160	
12	2920	0.238	690	2390	0.179	430	1860	0.143	270	1330	0.119	160	
13	2690	0.255	690	2200	0.191	420	1710	0.153	260	1220	0.128	160	
14	2500	0.272	680	2050	0.204	420	1590	0.163	260	1140	0.136	160	
15	2340	0.289	680	1910	0.217	410	1490	0.173	260	1060	0.145	150	
16	2190	0.306	670	1790	0.230	410	1390	0.184	260	1000	0.153	150	
17	2060	0.315	650	1690	0.236	400	1310	0.189	250	940	0.157	150	
18	1950	0.323	630	1590	0.242	390	1240	0.194	240	880	0.162	140	
19	1840	0.332	610	1510	0.249	380	1170	0.199	230	840	0.166	140	
20	1750	0.340	600	1430	0.255	360	1110	0.204	230	800	0.170	140	

- INFO
- TYPHOON TA-HTA-4HTA
- TYPHOON PU-HPU
- TYPHOON SUH
- TYPHOON ALH
- TYPHOON HRC
- TYPHOON SUH MINI
- TYPHOON HL
- C-SD-TA
- LFTA
- SUTA
- HSS-HSS/CO DRILLS
- G2
- MDTA
- HF VH/UP
- MEF
- ALU
- MEX
- UH
- HSS/CO-HSSP END MILLS
- CARBIDE BURRS

355TA

Material Group ISO 513	M1 M2			M3			M4			M5		
	< 750 N/mm ²			550-850 N/mm ²			650-950 N/mm ²			850-1200 N/mm ²		
	30-50			25-35			20-30			15-25		
Vc (m/min)	n	fn	Vf	n	fn	Vf	n	fn	Vf	n	fn	Vf
D (mm)	(rpm)	(mm/rev)	(mm/min)	(rpm)	(mm/rev)	(mm/min)	(rpm)	(mm/rev)	(mm/min)	(rpm)	(mm/rev)	(mm/min)
3	4250	0.060	250	3180	0.048	150	2650	0.042	110	2120	0.030	60
4	3180	0.065	210	2390	0.052	130	1990	0.046	90	1590	0.033	50
5	2550	0.071	180	1910	0.057	110	1590	0.050	80	1270	0.036	50
6	2120	0.080	170	1590	0.064	100	1330	0.056	70	1060	0.040	40
7	1820	0.089	160	1360	0.071	100	1140	0.062	70	910	0.045	40
8	1590	0.098	160	1190	0.079	90	1000	0.069	70	800	0.049	40
9	1420	0.107	150	1060	0.086	90	880	0.075	70	710	0.054	40
10	1270	0.116	150	960	0.093	90	800	0.081	60	640	0.058	40
11	1160	0.125	140	870	0.100	90	720	0.087	60	580	0.062	40
12	1060	0.137	150	800	0.109	90	660	0.096	60	530	0.068	40
13	980	0.149	150	730	0.119	90	610	0.104	60	490	0.074	40
14	910	0.161	150	680	0.129	90	570	0.112	60	450	0.080	40
15	850	0.173	150	640	0.138	90	530	0.121	60	420	0.086	40
16	800	0.184	150	600	0.148	90	500	0.129	60	400	0.092	40
17	750	0.196	150	560	0.157	90	470	0.137	60	370	0.098	40
18	710	0.208	150	530	0.167	90	440	0.146	60	350	0.104	40
19	670	0.220	150	500	0.176	90	420	0.154	60	340	0.110	40
20	640	0.232	150	480	0.186	90	400	0.162	60	320	0.116	40



355HTA

Material Group ISO 513	M1 M2			M3			M4			M5		
	< 750 N/mm ²			550-850 N/mm ²			650-950 N/mm ²			850-1200 N/mm ²		
	30-50			25-35			20-30			10-20		
Vc (m/min)	n	fn	Vf	n	fn	Vf	n	fn	Vf	n	fn	Vf
D (mm)	(rpm)	(mm/rev)	(mm/min)	(rpm)	(mm/rev)	(mm/min)	(rpm)	(mm/rev)	(mm/min)	(rpm)	(mm/rev)	(mm/min)
3	4250	0.060	250	3180	0.048	150	2650	0.042	110	1590	0.036	60
4	3180	0.077	240	2390	0.061	150	1990	0.054	110	1190	0.046	50
5	2550	0.085	220	1910	0.068	130	1590	0.060	90	960	0.051	50
6	2120	0.094	200	1590	0.075	120	1330	0.065	90	800	0.056	40
7	1820	0.111	200	1360	0.088	120	1140	0.077	90	680	0.066	50
8	1590	0.128	200	1190	0.102	120	1000	0.089	90	600	0.077	50
9	1420	0.136	190	1060	0.109	120	880	0.095	80	530	0.082	40
10	1270	0.149	190	960	0.119	110	800	0.104	80	480	0.089	40
11	1160	0.153	180	870	0.122	110	720	0.107	80	430	0.092	40
12	1060	0.170	180	800	0.136	110	660	0.119	80	400	0.102	40
13	980	0.183	180	730	0.146	110	610	0.128	80	370	0.110	40
14	910	0.196	180	680	0.156	110	570	0.137	80	340	0.117	40
15	850	0.208	180	640	0.167	110	530	0.146	80	320	0.125	40
16	800	0.221	180	600	0.177	110	500	0.155	80	300	0.133	40
17	750	0.230	170	560	0.184	100	470	0.161	80	280	0.138	40
18	710	0.242	170	530	0.194	100	440	0.170	70	270	0.145	40
19	670	0.255	170	500	0.204	100	420	0.179	70	250	0.153	40
20	640	0.264	170	480	0.211	100	400	0.184	70	240	0.158	40



INFO
TYPHOON TA-HTA-4HTA
TYPHOON PU-HPU
TYPHOON SUH
TYPHOON ALH
TYPHOON HRC
TYPHOON SUH MINI
TYPHOON HL
C-SD-TA
LFTA
SUTA
HSS-HSS/CO DRILLS
G2
MDTA
HF VH/UP
MEF
ALU
MEX
UH
HSS/CO-HSSP END MILLS
CARBIDE BURRS



355TA

	Material Group ISO 513	K1			K2			K3			K4		
	Hardness/Rm	150-250 HB			150-350 HB			120-260 HB			250-500 HB		
	Vc (m/min)	80-100			70-90			40-60			20-40		
	D (mm)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)
3	9550	0.085	810	8490	0.068	580	5310	0.060	320	3180	0.043	140	
4	7170	0.094	670	6370	0.075	480	3980	0.065	260	2390	0.047	110	
5	5730	0.102	580	5100	0.082	420	3180	0.071	230	1910	0.051	100	
6	4780	0.115	550	4250	0.092	390	2650	0.080	210	1590	0.057	90	
7	4090	0.128	520	3640	0.102	370	2270	0.089	200	1360	0.064	90	
8	3580	0.140	500	3180	0.112	360	1990	0.098	200	1190	0.070	80	
9	3180	0.153	490	2830	0.122	350	1770	0.107	190	1060	0.077	80	
10	2870	0.166	480	2550	0.133	340	1590	0.116	180	960	0.083	80	
11	2610	0.179	470	2320	0.143	330	1450	0.125	180	870	0.089	80	
12	2390	0.196	470	2120	0.156	330	1330	0.137	180	800	0.098	80	
13	2200	0.213	470	1960	0.170	330	1220	0.149	180	730	0.106	80	
14	2050	0.230	470	1820	0.184	330	1140	0.161	180	680	0.115	80	
15	1910	0.247	470	1700	0.197	340	1060	0.173	180	640	0.123	80	
16	1790	0.264	470	1590	0.211	340	1000	0.184	180	600	0.132	80	
17	1690	0.281	470	1500	0.224	340	940	0.196	180	560	0.140	80	
18	1590	0.298	470	1420	0.238	340	880	0.208	180	530	0.149	80	
19	1510	0.315	470	1340	0.252	340	840	0.220	180	500	0.157	80	
20	1430	0.332	470	1270	0.265	340	800	0.232	190	480	0.166	80	

355HTA

	Material Group ISO 513	K1			K2			K3			K4		
	Hardness/Rm	150-250 HB			150-350 HB			120-260 HB			250-500 HB		
	Vc (m/min)	90-110			70-90			50-70			40-60		
	D (mm)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)
3	10620	0.094	990	8490	0.084	710	6370	0.075	480	5310	0.065	350	
4	7960	0.111	880	6370	0.099	630	4780	0.088	420	3980	0.077	310	
5	6370	0.128	810	5100	0.115	590	3820	0.102	390	3180	0.089	280	
6	5310	0.145	770	4250	0.130	550	3180	0.116	370	2650	0.101	270	
7	4550	0.162	730	3640	0.145	530	2730	0.129	350	2270	0.113	260	
8	3980	0.179	710	3180	0.161	510	2390	0.143	340	1990	0.125	250	
9	3540	0.196	690	2830	0.176	500	2120	0.156	330	1770	0.137	240	
10	3180	0.213	680	2550	0.191	490	1910	0.170	320	1590	0.149	240	
11	2900	0.221	640	2320	0.199	460	1740	0.177	310	1450	0.155	220	
12	2650	0.238	630	2120	0.214	450	1590	0.190	300	1330	0.167	220	
13	2450	0.255	620	1960	0.230	450	1470	0.204	300	1220	0.179	220	
14	2270	0.272	620	1820	0.245	450	1360	0.218	300	1140	0.190	220	
15	2120	0.289	610	1700	0.260	440	1270	0.231	290	1060	0.202	210	
16	1990	0.306	610	1590	0.275	440	1190	0.245	290	1000	0.214	210	
17	1870	0.315	590	1500	0.283	420	1120	0.252	280	940	0.220	210	
18	1770	0.323	570	1420	0.291	410	1060	0.258	270	880	0.226	200	
19	1680	0.332	560	1340	0.298	400	1010	0.265	270	840	0.232	190	
20	1590	0.340	540	1270	0.306	390	960	0.272	260	800	0.238	190	

- INFO
- TYPHOON TA-HTA-4HTA
- TYPHOON PU-HPU
- TYPHOON SUH
- TYPHOON ALH
- TYPHOON HRC
- TYPHOON SUH MINI
- TYPHOON HL
- C-SD-TA
- LFTA
- SUTA
- HSS-HSS/CO DRILLS
- G2
- MDTA
- HF VH/UP
- MEF
- ALU
- MEX
- UH
- HSS/CO-HSSP END MILLS
- CARBIDE BURRS

355HTA

Material Group ISO 513	N1 > 5% Si			N2			N4					
	Hardness/Rm											
	Vc (m/min)			180-220			160-200			160-180		
D (mm)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)			
3	21230	0.112	2380	19110	0.101	1930	18050	0.090	1620			
4	15920	0.133	2110	14330	0.119	1710	13540	0.106	1440			
5	12740	0.153	1950	11460	0.138	1580	10830	0.122	1330			
6	10620	0.173	1840	9550	0.156	1490	9020	0.139	1250			
7	9100	0.194	1760	8190	0.174	1430	7730	0.155	1200			
8	7960	0.214	1710	7170	0.193	1380	6770	0.171	1160			
9	7080	0.235	1660	6370	0.211	1340	6020	0.188	1130			
10	6370	0.255	1620	5730	0.230	1320	5410	0.204	1100			
11	5790	0.265	1540	5210	0.239	1240	4920	0.212	1040			
12	5310	0.286	1520	4780	0.257	1230	4510	0.228	1030			
13	4900	0.306	1500	4410	0.275	1210	4160	0.245	1020			
14	4550	0.326	1490	4090	0.294	1200	3870	0.261	1010			
15	4250	0.347	1470	3820	0.312	1190	3610	0.277	1000			
16	3980	0.367	1460	3580	0.330	1180	3380	0.294	990			
17	3750	0.377	1420	3370	0.340	1140	3180	0.302	960			
18	3540	0.388	1370	3180	0.349	1110	3010	0.310	930			
19	3350	0.398	1330	3020	0.358	1080	2850	0.318	910			
20	3180	0.408	1300	2870	0.367	1050	2710	0.326	880			



- INFO
- TYPHOON TA-HTA-4HTA
- TYPHOON PU-HPU
- TYPHOON SUH
- TYPHOON ALH
- TYPHOON HRC
- TYPHOON SUH MINI
- TYPHOON HL
- C-SD-TA
- LFTA
- SUTA
- HSS-HSS/CO DRILLS
- G2
- MDTA
- HF VH/UP
- MEF
- ALU
- MEX
- UH
- HSS/CO-HSSP END MILLS
- CARBIDE BURRS



355TA

	Material Group ISO 513	S1 S2			S3			S4			S5		
	Hardness/Rm	< 35 HRC			35-45 HRC								
	Vc (m/min)	20-30			10-20			25-35			15-25		
	D (mm)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)
3	2650	0.038	100	1590	0.027	40	3180	0.036	120	2120	0.031	60	
4	1990	0.042	80	1190	0.029	40	2390	0.040	100	1590	0.034	50	
5	1590	0.046	70	960	0.032	30	1910	0.044	80	1270	0.037	50	
6	1330	0.052	70	800	0.036	30	1590	0.049	80	1060	0.041	40	
7	1140	0.057	70	680	0.040	30	1360	0.055	70	910	0.046	40	
8	1000	0.063	60	600	0.044	30	1190	0.060	70	800	0.050	40	
9	880	0.069	60	530	0.048	30	1060	0.065	70	710	0.055	40	
10	800	0.075	60	480	0.052	30	960	0.071	70	640	0.060	40	
11	720	0.080	60	430	0.056	20	870	0.076	70	580	0.064	40	
12	660	0.088	60	400	0.062	20	800	0.084	70	530	0.070	40	
13	610	0.096	60	370	0.067	20	730	0.091	70	490	0.077	40	
14	570	0.103	60	340	0.072	20	680	0.098	70	450	0.083	40	
15	530	0.111	60	320	0.078	20	640	0.105	70	420	0.089	40	
16	500	0.119	60	300	0.083	20	600	0.113	70	400	0.095	40	
17	470	0.126	60	280	0.088	20	560	0.120	70	370	0.101	40	
18	440	0.134	60	270	0.094	30	530	0.127	70	350	0.107	40	
19	420	0.142	60	250	0.099	20	500	0.134	70	340	0.113	40	
20	400	0.149	60	240	0.104	30	480	0.142	70	320	0.119	40	

355HTA

	Material Group ISO 513	S1 S2			S3			S4			S5		
	Hardness/Rm	< 35 HRC			35-45 HRC								
	Vc (m/min)	25-35			15-25			40-50			25-35		
	D (mm)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)
3	3180	0.039	120	2120	0.027	60	4780	0.037	180	3180	0.031	100	
4	2390	0.047	110	1590	0.033	50	3580	0.044	160	2390	0.037	90	
5	1910	0.054	100	1270	0.037	50	2870	0.051	150	1910	0.043	80	
6	1590	0.062	100	1060	0.043	50	2390	0.059	140	1590	0.050	80	
7	1360	0.068	90	910	0.048	40	2050	0.065	130	1360	0.054	70	
8	1190	0.077	90	800	0.054	40	1790	0.073	130	1190	0.061	70	
9	1060	0.085	90	710	0.060	40	1590	0.081	130	1060	0.068	70	
10	960	0.094	90	640	0.065	40	1430	0.089	130	960	0.075	70	
11	870	0.102	90	580	0.071	40	1300	0.097	130	870	0.082	70	
12	800	0.111	90	530	0.077	40	1190	0.105	120	800	0.088	70	
13	730	0.116	90	490	0.082	40	1100	0.111	120	730	0.093	70	
14	680	0.123	80	450	0.086	40	1020	0.117	120	680	0.099	70	
15	640	0.130	80	420	0.091	40	960	0.124	120	640	0.104	70	
16	600	0.136	80	400	0.095	40	900	0.129	120	600	0.109	70	
17	560	0.145	80	370	0.101	40	840	0.137	120	560	0.116	60	
18	530	0.153	80	350	0.107	40	800	0.145	120	530	0.122	60	
19	500	0.162	80	340	0.113	40	750	0.153	120	500	0.129	60	
20	480	0.170	80	320	0.119	40	720	0.162	120	480	0.136	70	

- INFO
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- TYPHOON PU-HPU
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- MEF
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- MEX
- UH
- HSS/CO-HSSP END MILLS
- CARBIDE BURRS

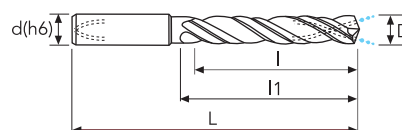
3584HTA

4-margin lands, long (8xD), 4HTA (through coolant)



P	M	K	N	S	H
★	★	★	☆	☆	

★ 1st choice ☆ suitable



D(m7)	D Tol.	d(h6)	l	l1	L	EDP No.	Stock
3.00	+0.012/+0.002	6	32	40	85	358HTA0300	●
3.10	+0.016/+0.004	6	32	40	85	358HTA0310	●
3.20	+0.016/+0.004	6	32	40	85	358HTA0320	●
3.30	+0.016/+0.004	6	32	40	85	358HTA0330	●
3.40	+0.016/+0.004	6	32	40	85	358HTA0340	●
3.50	+0.016/+0.004	6	32	40	85	358HTA0350	●
3.60	+0.016/+0.004	6	36	40	85	358HTA0360	●
3.70	+0.016/+0.004	6	36	40	85	358HTA0370	●
3.80	+0.016/+0.004	6	36	40	85	358HTA0380	●
3.90	+0.016/+0.004	6	36	40	85	358HTA0390	○
4.00	+0.016/+0.004	6	38	46	85	358HTA0400	●
4.10	+0.016/+0.004	6	38	46	85	358HTA0410	●
4.20	+0.016/+0.004	6	38	46	85	358HTA0420	●
4.30	+0.016/+0.004	6	40	46	97	358HTA0430	●
4.40	+0.016/+0.004	6	40	46	97	358HTA0440	○
4.50	+0.016/+0.004	6	44	46	97	358HTA0450	●
4.60	+0.016/+0.004	6	44	46	97	358HTA0460	●
4.70	+0.016/+0.004	6	44	46	97	358HTA0470	●
4.80	+0.016/+0.004	6	44	46	97	358HTA0480	●
4.90	+0.016/+0.004	6	44	46	97	358HTA0490	○
5.00	+0.016/+0.004	6	48	57	97	358HTA0500	●
5.10	+0.016/+0.004	6	48	57	97	358HTA0510	●
5.20	+0.016/+0.004	6	48	57	97	358HTA0520	●
5.30	+0.016/+0.004	6	48	57	97	358HTA0530	●
5.40	+0.016/+0.004	6	48	57	97	358HTA0540	○
5.50	+0.016/+0.004	6	48	57	97	358HTA0550	●
5.60	+0.016/+0.004	6	48	57	97	358HTA0560	●
5.70	+0.016/+0.004	6	48	57	97	358HTA0570	○
5.80	+0.016/+0.004	6	48	57	97	358HTA0580	●
5.90	+0.016/+0.004	6	48	57	97	358HTA0590	●
6.00	+0.016/+0.004	6	48	57	97	358HTA0600	●
6.10	+0.021/+0.006	8	64	76	116	358HTA0610	●
6.20	+0.021/+0.006	8	64	76	116	358HTA0620	●
6.30	+0.021/+0.006	8	64	76	116	358HTA0630	●
6.40	+0.021/+0.006	8	64	76	116	358HTA0640	○
6.50	+0.021/+0.006	8	64	76	116	358HTA0650	●
6.60	+0.021/+0.006	8	64	76	116	358HTA0660	○
6.70	+0.021/+0.006	8	64	76	116	358HTA0670	●
6.80	+0.021/+0.006	8	64	76	116	358HTA0680	●

● stock standard ○ non-standard stock ▽ stock exhaustion

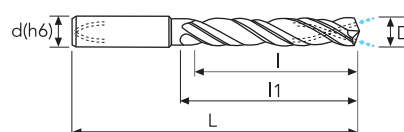
3584HTA

4-margin lands, long (8xD), 4HTA (through coolant)



P	M	K	N	S	H
★	★	★	☆	☆	

★ 1st choice ☆ suitable



D(m7)	D Tol.	d(h6)	l	l1	L	EDP No.	Stock
6.90	+0.021/+0.006	8	64	76	116	358HTA0690	●
7.00	+0.021/+0.006	8	64	76	116	358HTA0700	●
7.10	+0.021/+0.006	8	64	76	116	358HTA0710	●
7.20	+0.021/+0.006	8	64	76	116	358HTA0720	●
7.30	+0.021/+0.006	8	64	76	116	358HTA0730	●
7.40	+0.021/+0.006	8	64	76	116	358HTA0740	●
7.50	+0.021/+0.006	8	64	76	116	358HTA0750	●
7.60	+0.021/+0.006	8	64	76	116	358HTA0760	●
7.70	+0.021/+0.006	8	64	76	116	358HTA0770	○
7.80	+0.021/+0.006	8	64	76	116	358HTA0780	●
7.90	+0.021/+0.006	8	64	76	116	358HTA0790	○
8.00	+0.021/+0.006	8	64	76	116	358HTA0800	●
8.10	+0.021/+0.006	10	80	95	142	358HTA0810	●
8.20	+0.021/+0.006	10	80	95	142	358HTA0820	●
8.30	+0.021/+0.006	10	80	95	142	358HTA0830	●
8.40	+0.021/+0.006	10	80	95	142	358HTA0840	○
8.50	+0.021/+0.006	10	80	95	142	358HTA0850	●
8.60	+0.021/+0.006	10	80	95	142	358HTA0860	●
8.70	+0.021/+0.006	10	80	95	142	358HTA0870	●
8.80	+0.021/+0.006	10	80	95	142	358HTA0880	●
8.90	+0.021/+0.006	10	80	95	142	358HTA0890	○
9.00	+0.021/+0.006	10	80	95	142	358HTA0900	●
9.10	+0.021/+0.006	10	80	95	142	358HTA0910	●
9.20	+0.021/+0.006	10	80	95	142	358HTA0920	●
9.30	+0.021/+0.006	10	80	95	142	358HTA0930	●
9.40	+0.021/+0.006	10	80	95	142	358HTA0940	○
9.50	+0.021/+0.006	10	80	95	142	358HTA0950	●
9.60	+0.021/+0.006	10	80	95	142	358HTA0960	○
9.70	+0.021/+0.006	10	80	95	142	358HTA0970	○
9.80	+0.021/+0.006	10	80	95	142	358HTA0980	●
9.90	+0.021/+0.006	10	80	95	142	358HTA0990	○
10.00	+0.021/+0.006	10	80	95	142	358HTA1000	●
10.20	+0.025/+0.007	12	96	114	163	358HTA1020	●
10.50	+0.025/+0.007	12	96	114	163	358HTA1050	●
10.80	+0.025/+0.007	12	96	114	163	358HTA1080	●
11.00	+0.025/+0.007	12	96	114	163	358HTA1100	●
11.20	+0.025/+0.007	12	96	114	163	358HTA1120	●
11.30	+0.025/+0.007	12	96	114	163	358HTA1130	○
11.50	+0.025/+0.007	12	96	114	163	358HTA1150	●

INFO
TYPHOON TA-HTA-4HTA
TYPHOON PU-HPU
TYPHOON SUH
TYPHOON ALH
TYPHOON HRC
TYPHOON SUH MINI
TYPHOON HL
C-SD-TA
LFTA
SUTA
HSS-HSS/CO DRILLS
G2
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HF VH/UP
MEF
ALU
MEX
UH
HSS/CO-HSSP END MILLS
CARBIDE BURRS

● stock standard ○ non-standard stock ▽ stock exhaustion

3584HTA

Material Group ISO 513	P1 P2			P3 P4			P5			P6		
	500-700 N/mm ²			600-1000 N/mm ²			900-1200 N/mm ²			1200-1400 N/mm ²		
	100-120			80-100			50-70			40-60		
Vc (m/min)	n	fn	Vf	n	fn	Vf	n	fn	Vf	n	fn	Vf
D (mm)	(rpm)	(mm/rev)	(mm/min)	(rpm)	(mm/rev)	(mm/min)	(rpm)	(mm/rev)	(mm/min)	(rpm)	(mm/rev)	(mm/min)
3	11680	0.072	840	9550	0.065	620	6370	0.058	370	5310	0.050	270
4	8760	0.089	780	7170	0.080	570	4780	0.071	340	3980	0.062	250
5	7010	0.106	740	5730	0.095	550	3820	0.085	320	3180	0.074	240
6	5840	0.122	710	4780	0.110	520	3180	0.098	310	2650	0.085	230
7	5000	0.139	700	4090	0.125	510	2730	0.111	300	2270	0.097	220
8	4380	0.155	680	3580	0.140	500	2390	0.124	300	1990	0.109	220
9	3890	0.172	670	3180	0.155	490	2120	0.138	290	1770	0.120	210
10	3500	0.188	660	2870	0.169	490	1910	0.150	290	1590	0.132	210
11	3180	0.205	650	2610	0.185	480	1740	0.164	290	1450	0.144	210
12	2920	0.221	650	2390	0.199	480	1590	0.177	280	1330	0.155	210
13	2690	0.238	640	2200	0.214	470	1470	0.190	280	1220	0.167	200
14	2500	0.254	640	2050	0.229	470	1360	0.203	280	1140	0.178	200
15	2340	0.270	630	1910	0.243	460	1270	0.216	270	1060	0.189	200
16	2190	0.286	630	1790	0.257	460	1190	0.229	270	1000	0.200	200



Material Group ISO 513	M1 M2			M3			M4			M5		
	< 750 N/mm ²			550-850 N/mm ²			650-950 N/mm ²			850-1200 N/mm ²		
	40-50			30-40			20-30			15-25		
Vc (m/min)	n	fn	Vf	n	fn	Vf	n	fn	Vf	n	fn	Vf
D (mm)	(rpm)	(mm/rev)	(mm/min)	(rpm)	(mm/rev)	(mm/min)	(rpm)	(mm/rev)	(mm/min)	(rpm)	(mm/rev)	(mm/min)
3	4780	0.070	330	3720	0.056	210	2650	0.049	130	2120	0.042	90
4	3580	0.090	320	2790	0.072	200	1990	0.063	130	1590	0.054	90
5	2870	0.100	290	2230	0.080	180	1590	0.070	110	1270	0.060	80
6	2390	0.110	260	1860	0.088	160	1330	0.077	100	1060	0.066	70
7	2050	0.130	270	1590	0.104	170	1140	0.091	100	910	0.078	70
8	1790	0.150	270	1390	0.120	170	1000	0.105	110	800	0.090	70
9	1590	0.160	250	1240	0.128	160	880	0.112	100	710	0.096	70
10	1430	0.175	250	1110	0.140	160	800	0.123	100	640	0.105	70
11	1300	0.180	230	1010	0.144	150	720	0.126	90	580	0.108	60
12	1190	0.200	240	930	0.160	150	660	0.140	90	530	0.120	60
13	1100	0.215	240	860	0.172	150	610	0.151	90	490	0.129	60
14	1020	0.230	230	800	0.184	150	570	0.161	90	450	0.138	60
15	960	0.245	240	740	0.196	150	530	0.172	90	420	0.147	60
16	900	0.260	230	700	0.208	150	500	0.182	90	400	0.156	60



- INFO
- TYPHOON TA-HTA-4HTA
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- TYPHOON SUH
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- TYPHOON HL
- C-SD-TA
- LFTA
- SUTA
- HSS-HSS/CO DRILLS
- G2
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- UH
- HSS/CO-HSSP END MILLS
- CARBIDE BURRS

3584HTA

Material Group ISO 513	K1			K2			K3			K4		
	150-250 HB			150-350 HB			120-260 HB			250-500 HB		
	Vc (m/min)			80-100			50-70			40-60		
D (mm)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)
3	11680	0.072	840	9550	0.065	620	6370	0.058	370	5310	0.050	270
4	8760	0.089	780	7170	0.080	570	4780	0.071	340	3980	0.062	250
5	7010	0.106	740	5730	0.095	550	3820	0.085	320	3180	0.074	240
6	5840	0.122	710	4780	0.110	520	3180	0.098	310	2650	0.085	230
7	5000	0.139	700	4090	0.125	510	2730	0.111	300	2270	0.097	220
8	4380	0.155	680	3580	0.140	500	2390	0.124	300	1990	0.109	220
9	3890	0.172	670	3180	0.155	490	2120	0.138	290	1770	0.120	210
10	3500	0.188	660	2870	0.169	490	1910	0.150	290	1590	0.132	210
11	3180	0.205	650	2610	0.185	480	1740	0.164	290	1450	0.144	210
12	2920	0.221	650	2390	0.199	480	1590	0.177	280	1330	0.155	210
13	2690	0.238	640	2200	0.214	470	1470	0.190	280	1220	0.167	200
14	2500	0.254	640	2050	0.229	470	1360	0.203	280	1140	0.178	200
15	2340	0.270	630	1910	0.243	460	1270	0.216	270	1060	0.189	200
16	2190	0.286	630	1790	0.257	460	1190	0.229	270	1000	0.200	200



Material Group ISO 513	N1 > 5% Si			N2			N4					
	160-200			140-180			130-170					
	Vc (m/min)			140-180			130-170					
D (mm)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)			
3	19110	0.086	1650	16990	0.078	1320	15920	0.078	1240			
4	14330	0.107	1530	12740	0.096	1220	11940	0.096	1150			
5	11460	0.127	1460	10190	0.114	1170	9550	0.114	1090			
6	9550	0.146	1400	8490	0.132	1120	7960	0.132	1050			
7	8190	0.167	1370	7280	0.150	1090	6820	0.150	1020			
8	7170	0.186	1330	6370	0.167	1070	5970	0.167	1000			
9	6370	0.206	1310	5660	0.186	1050	5310	0.186	990			
10	5730	0.226	1290	5100	0.203	1040	4780	0.203	970			
11	5210	0.246	1280	4630	0.221	1030	4340	0.221	960			
12	4780	0.265	1270	4250	0.239	1010	3980	0.239	950			
13	4410	0.286	1260	3920	0.257	1010	3670	0.257	940			
14	4090	0.305	1250	3640	0.274	1000	3410	0.274	940			
15	3820	0.324	1240	3400	0.292	990	3180	0.292	930			
16	3580	0.343	1230	3180	0.309	980	2990	0.309	920			



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3584HTA

Material Group ISO 513	S1 S2			S3			S4			S5		
	< 35 HRC			35-45 HRC								
	25-35			15-25			35-45			25-35		
Vc (m/min)	n	fn	Vf	n	fn	Vf	n	fn	Vf	n	fn	Vf
D (mm)	(rpm)	(mm/rev)	(mm/min)	(rpm)	(mm/rev)	(mm/min)	(rpm)	(mm/rev)	(mm/min)	(rpm)	(mm/rev)	(mm/min)
3	3180	0.046	150	2120	0.032	70	4250	0.044	190	3180	0.037	120
4	2390	0.055	130	1590	0.039	60	3180	0.052	170	2390	0.044	110
5	1910	0.063	120	1270	0.044	60	2550	0.060	150	1910	0.050	100
6	1590	0.073	120	1060	0.051	50	2120	0.069	150	1590	0.058	90
7	1360	0.080	110	910	0.056	50	1820	0.076	140	1360	0.064	90
8	1190	0.090	110	800	0.063	50	1590	0.086	140	1190	0.072	90
9	1060	0.100	110	710	0.070	50	1420	0.095	130	1060	0.080	80
10	960	0.110	110	640	0.077	50	1270	0.105	130	960	0.088	80
11	870	0.120	100	580	0.084	50	1160	0.114	130	870	0.096	80
12	800	0.130	100	530	0.091	50	1060	0.124	130	800	0.104	80
13	730	0.137	100	490	0.096	50	980	0.130	130	730	0.110	80
14	680	0.145	100	450	0.102	50	910	0.138	130	680	0.116	80
15	640	0.153	100	420	0.107	40	850	0.145	120	640	0.122	80
16	600	0.160	100	400	0.112	40	800	0.152	120	600	0.128	80



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TYPHOON PU-HPU

HIGH PERFORMANCE - UNIVERSAL APPLICATION

- 🇬🇧 Universal high performance drills for ISO P, M, K, N, S.
- 🇮🇹 Punte universali ad alto rendimento per applicazione su materiali ISO P, M, K, N, S.
- 🇩🇪 Universelle Hochleistungsbohrer für Anwendungen auf den Materialien ISO P, M, K, N, S.
- 🇫🇷 Forets universels haute performance pour des applications sur des matériaux ISO P, M, K, N, S.
- 🇪🇸 Puntas universales de alto rendimiento para aplicación en materiales ISO P, M, K, N, S.
- 🇷🇺 Универсальные высокопроизводительные сверла для обработки материалов по ISO P, M, K, N, S.

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TYPHOON PU-HPU
HIGH PERFORMANCE - UNIVERSAL APPLICATION

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CARBIDE BURRS


PU

HPU


- Self-centering geometry for accurate holes
- Reinforced geometry for higher feed rate
- Wide flute for smoother chip ejection
- Straight cutting edge: high chipping resistance and short chip shape
- Thicker chisel edge: enables higher feed rate
- 45° chamfer for wear and chipping protection
- Selected substrate and last generation coating for great wear resistance and long life even at high cutting speed



- Affûtage autocentré pour des trous précis
- Géométrie renforcée pour des vitesses d'avance élevées
- Géométrie des goujures large pour une évacuation meilleure des copeaux
- Géométrie de l'arête rectiligne : très robuste, elle permet de former des copeaux courts
- Géométrie de l'arête transversale : épaissie pour permettre des avancements plus élevés
- Angles de l'arête biseautés à 45° pour les protéger de l'usure et des éclats
- Substrat en carbure et revêtement spécifique pour garantir une longue durée à des vitesses de coupe élevées



- Affilatura autocentrante per fori precisi
- Geometria rinforzata per elevati avanzamenti
- Geometria gole ampia per una migliore evacuazione dei trucioli
- Geometria del tagliente rettilineo: molto robusta che permette di formare trucioli corti
- Geometria del tagliente trasversale: inspessita per consentire avanzamenti più elevati
- Spigoli del tagliente smussati a 45° per proteggerli da usura e scheggiature
- Substrato in metallo duro e rivestimento specifici per garantire lunga durata anche a velocità di taglio elevate



- Afilado autocentrante para agujeros precisos
- Geometría reforzada para elevados avances
- Geometría de las ranuras amplia para una mejor evacuación de las virutas
- Geometría del filo rectilíneo: muy resistente, que permite formar virutas cortas
- Geometría del filo transversal: engrosada para permitir avances más elevados
- Ángulos del filo redondeados a 45° para protegerlos del desgaste y astillado
- Sustrato en metal duro y revestimiento específicos para garantizar una larga duración incluso a velocidades de corte elevadas



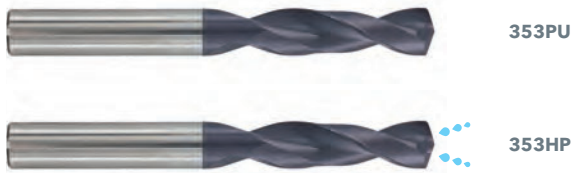
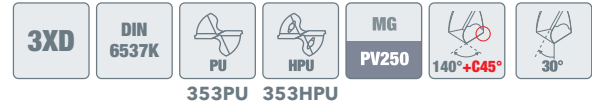
- Selbstzentrierender Schliff für präzise Bohrungen
- Verstärkte Geometrie für erhöhten Vorschub
- Breite Geometrie der Nuten für eine verbesserte Späneabführung
- Gerade Geometrie der Schneidkante: äußerst robust, wodurch kurze Späne erzeugt werden
- Transversale Geometrie der Schneidkante: verstärkt für erhöhten Vorschub
- Im 45°-Winkel angefasste Schneidkanten zum Schutz gegen Verschleiß und Absplintern
- Trägermaterial aus Hartmetall und spezielle Beschichtung zur Gewährleistung einer langen Lebensdauer auch bei hohen Schnittgeschwindigkeiten



- Самоцентрирующаяся заточка для сверления отверстий высокой точности
- Усиленная геометрия для работы с высокими подачами
- Широкие канавки для хорошего отвода стружки
- Прямые режущие кромки: формирование короткой стружки и предотвращение ее пакетирования
- Увеличенная перемычка: позволяет увеличить подачу
- Фаски 45° для защиты от износа и пакетирования стружки
- Специальное покрытие последнего поколения для повышения стойкости и надежности при работе с высокими скоростями резания

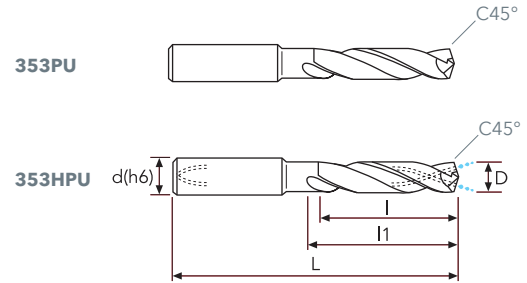
353PU-353HPU

universal application, high productivity,
PU and HPU (through coolant)



P	M	K	N	S	H
★	★	★	☆	★	

★ 1st choice ☆ suitable



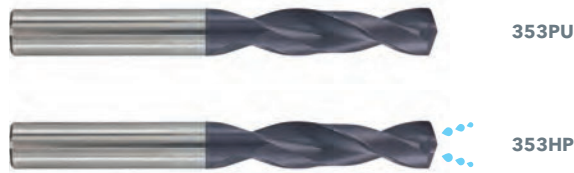
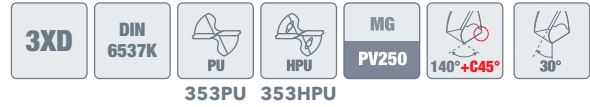
D(m7)	D Tol.	d(h6)	l	l1	L	353PU		353HPU	
						EDP No.	Stock	EDP No.	Stock
3.00	+0.012/+0.002	6	14	20	62	353PU0300	●	353HPU0300	●
3.10	+0.016/+0.004	6	14	20	62	353PU0310	●	353HPU0310	●
3.20	+0.016/+0.004	6	14	20	62	353PU0320	●	353HPU0320	●
3.30	+0.016/+0.004	6	14	20	62	353PU0330	●	353HPU0330	●
3.40	+0.016/+0.004	6	14	20	62	353PU0340	●	353HPU0340	●
3.50	+0.016/+0.004	6	14	20	62	353PU0350	●	353HPU0350	●
3.60	+0.016/+0.004	6	14	20	62	353PU0360	●	353HPU0360	●
3.70	+0.016/+0.004	6	14	20	62	353PU0370	●	353HPU0370	●
3.80	+0.016/+0.004	6	17	24	66	353PU0380	●	353HPU0380	●
3.90	+0.016/+0.004	6	17	24	66	353PU0390	●	353HPU0390	●
4.00	+0.016/+0.004	6	17	24	66	353PU0400	●	353HPU0400	●
4.10	+0.016/+0.004	6	17	24	66	353PU0410	●	353HPU0410	●
4.20	+0.016/+0.004	6	17	24	66	353PU0420	●	353HPU0420	●
4.30	+0.016/+0.004	6	17	24	66	353PU0430	●	353HPU0430	●
4.40	+0.016/+0.004	6	17	24	66	353PU0440	●	353HPU0440	●
4.50	+0.016/+0.004	6	17	24	66	353PU0450	●	353HPU0450	●
4.60	+0.016/+0.004	6	17	24	66	353PU0460	●	353HPU0460	●
4.70	+0.016/+0.004	6	17	24	66	353PU0470	●	353HPU0470	●
4.80	+0.016/+0.004	6	20	28	66	353PU0480	●	353HPU0480	●
4.90	+0.016/+0.004	6	20	28	66	353PU0490	●	353HPU0490	●
5.00	+0.016/+0.004	6	20	28	66	353PU0500	●	353HPU0500	●
5.10	+0.016/+0.004	6	20	28	66	353PU0510	●	353HPU0510	●
5.20	+0.016/+0.004	6	20	28	66	353PU0520	●	353HPU0520	●
5.30	+0.016/+0.004	6	20	28	66	353PU0530	●	353HPU0530	●
5.40	+0.016/+0.004	6	20	28	66	353PU0540	●	353HPU0540	●
5.50	+0.016/+0.004	6	20	28	66	353PU0550	●	353HPU0550	●
5.60	+0.016/+0.004	6	20	28	66	353PU0560	●	353HPU0560	●
5.70	+0.016/+0.004	6	20	28	66	353PU0570	●	353HPU0570	●
5.80	+0.016/+0.004	6	20	28	66	353PU0580	●	353HPU0580	●
5.90	+0.016/+0.004	6	20	28	66	353PU0590	●	353HPU0590	●
6.00	+0.016/+0.004	6	20	28	66	353PU0600	●	353HPU0600	●
6.10	+0.021/+0.006	8	24	34	79	353PU0610	●	353HPU0610	●
6.20	+0.021/+0.006	8	24	34	79	353PU0620	●	353HPU0620	●
6.30	+0.021/+0.006	8	24	34	79	353PU0630	●	353HPU0630	●
6.40	+0.021/+0.006	8	24	34	79	353PU0640	●	353HPU0640	●
6.50	+0.021/+0.006	8	24	34	79	353PU0650	●	353HPU0650	●
6.60	+0.021/+0.006	8	24	34	79	353PU0660	●	353HPU0660	●
6.70	+0.021/+0.006	8	24	34	79	353PU0670	●	353HPU0670	●
6.80	+0.021/+0.006	8	24	34	79	353PU0680	●	353HPU0680	●

INFO
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CARBIDE BURRS

● stock standard ○ non-standard stock ▽ stock exhaustion

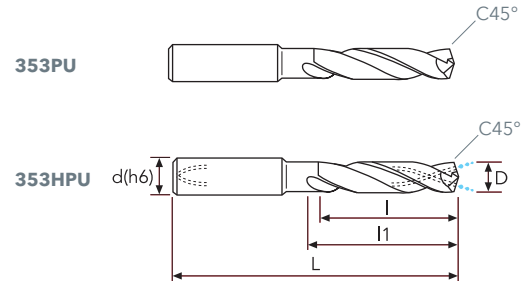
353PU-353HPU

universal application, high productivity,
PU and HPU (through coolant)



P	M	K	N	S	H
★	★	★	☆	★	

★ 1st choice ☆ suitable

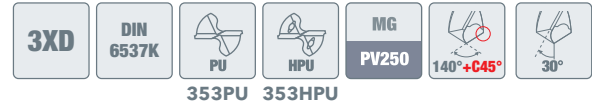


D(m7)	D Tol.	d(h6)	l	l1	L	353PU		353HPU	
						EDP No.	Stock	EDP No.	Stock
6.90	+0.021/+0.006	8	24	34	79	353PU0690	●	353HPU0690	●
7.00	+0.021/+0.006	8	24	34	79	353PU0700	●	353HPU0700	●
7.10	+0.021/+0.006	8	29	41	79	353PU0710	●	353HPU0710	●
7.20	+0.021/+0.006	8	29	41	79	353PU0720	●	353HPU0720	●
7.30	+0.021/+0.006	8	29	41	79	353PU0730	●	353HPU0730	●
7.40	+0.021/+0.006	8	29	41	79	353PU0740	●	353HPU0740	●
7.50	+0.021/+0.006	8	29	41	79	353PU0750	●	353HPU0750	●
7.60	+0.021/+0.006	8	29	41	79	353PU0760	●	353HPU0760	●
7.70	+0.021/+0.006	8	29	41	79	353PU0770	●	353HPU0770	●
7.80	+0.021/+0.006	8	29	41	79	353PU0780	●	353HPU0780	●
7.90	+0.021/+0.006	8	29	41	79	353PU0790	●	353HPU0790	●
8.00	+0.021/+0.006	8	29	41	79	353PU0800	●	353HPU0800	●
8.10	+0.021/+0.006	10	35	47	89	353PU0810	●	353HPU0810	●
8.20	+0.021/+0.006	10	35	47	89	353PU0820	●	353HPU0820	●
8.30	+0.021/+0.006	10	35	47	89	353PU0830	●	353HPU0830	●
8.40	+0.021/+0.006	10	35	47	89	353PU0840	●	353HPU0840	●
8.50	+0.021/+0.006	10	35	47	89	353PU0850	●	353HPU0850	●
8.60	+0.021/+0.006	10	35	47	89	353PU0860	●	353HPU0860	●
8.70	+0.021/+0.006	10	35	47	89	353PU0870	●	353HPU0870	●
8.80	+0.021/+0.006	10	35	47	89	353PU0880	●	353HPU0880	●
8.90	+0.021/+0.006	10	35	47	89	353PU0890	●	353HPU0890	●
9.00	+0.021/+0.006	10	35	47	89	353PU0900	●	353HPU0900	●
9.10	+0.021/+0.006	10	35	47	89	353PU0910	●	353HPU0910	●
9.20	+0.021/+0.006	10	35	47	89	353PU0920	●	353HPU0920	●
9.30	+0.021/+0.006	10	35	47	89	353PU0930	●	353HPU0930	●
9.40	+0.021/+0.006	10	35	47	89	353PU0940	●	353HPU0940	●
9.50	+0.021/+0.006	10	35	47	89	353PU0950	●	353HPU0950	●
9.60	+0.021/+0.006	10	35	47	89	353PU0960	●	353HPU0960	●
9.70	+0.021/+0.006	10	35	47	89	353PU0970	●	353HPU0970	●
9.80	+0.021/+0.006	10	35	47	89	353PU0980	●	353HPU0980	●
9.90	+0.021/+0.006	10	35	47	89	353PU0990	●	353HPU0990	●
10.00	+0.021/+0.006	10	35	47	89	353PU1000	●	353HPU1000	●
10.10	+0.025/+0.007	12	40	55	102	353PU1010	●	353HPU1010	●
10.20	+0.025/+0.007	12	40	55	102	353PU1020	●	353HPU1020	●
10.30	+0.025/+0.007	12	40	55	102	353PU1030	●	353HPU1030	●
10.40	+0.025/+0.007	12	40	55	102	353PU1040	●	353HPU1040	●
10.50	+0.025/+0.007	12	40	55	102	353PU1050	●	353HPU1050	●
10.60	+0.025/+0.007	12	40	55	102	353PU1060	●	353HPU1060	●
10.70	+0.025/+0.007	12	40	55	102	353PU1070	●	353HPU1070	●

● stock standard ○ non-standard stock ▽ stock exhaustion

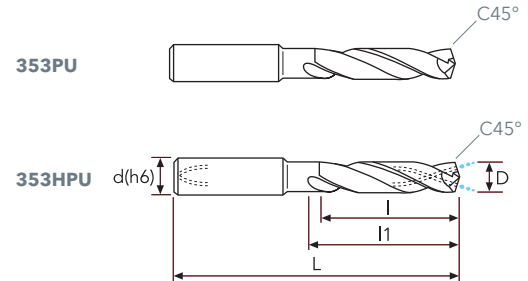
353PU-353HPU

universal application, high productivity,
PU and HPU (through coolant)



P	M	K	N	S	H
★	★	★	☆	★	

★ 1st choice ☆ suitable



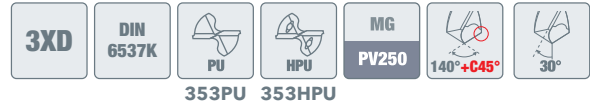
D(m7)	D Tol.	d(h6)	l	l1	L	353PU		353HPU	
						EDP No.	Stock	EDP No.	Stock
10.80	+0.025/+0.007	12	40	55	102	353PU1080	●	353HPU1080	●
10.90	+0.025/+0.007	12	40	55	102	353PU1090	●	353HPU1090	●
11.00	+0.025/+0.007	12	40	55	102	353PU1100	●	353HPU1100	●
11.10	+0.025/+0.007	12	40	55	102	353PU1110	●	353HPU1110	●
11.20	+0.025/+0.007	12	40	55	102	353PU1120	●	353HPU1120	●
11.30	+0.025/+0.007	12	40	55	102	353PU1130	●	353HPU1130	●
11.40	+0.025/+0.007	12	40	55	102	353PU1140	●	353HPU1140	●
11.50	+0.025/+0.007	12	40	55	102	353PU1150	●	353HPU1150	●
11.60	+0.025/+0.007	12	40	55	102	353PU1160	●	353HPU1160	●
11.70	+0.025/+0.007	12	40	55	102	353PU1170	●	353HPU1170	●
11.80	+0.025/+0.007	12	40	55	102	353PU1180	●	353HPU1180	●
11.90	+0.025/+0.007	12	40	55	102	353PU1190	●	353HPU1190	●
12.00	+0.025/+0.007	12	40	55	102	353PU1200	●	353HPU1200	●
12.10	+0.025/+0.007	14	43	60	107	353PU1210	●	353HPU1210	●
12.20	+0.025/+0.007	14	43	60	107	353PU1220	●	353HPU1220	●
12.30	+0.025/+0.007	14	43	60	107	353PU1230	●	353HPU1230	●
12.40	+0.025/+0.007	14	43	60	107	353PU1240	●	353HPU1240	●
12.50	+0.025/+0.007	14	43	60	107	353PU1250	●	353HPU1250	●
12.60	+0.025/+0.007	14	43	60	107	353PU1260	●	353HPU1260	●
12.70	+0.025/+0.007	14	43	60	107	353PU1270	●	353HPU1270	●
12.80	+0.025/+0.007	14	43	60	107	353PU1280	●	353HPU1280	●
12.90	+0.025/+0.007	14	43	60	107	353PU1290	●	353HPU1290	●
13.00	+0.025/+0.007	14	43	60	107	353PU1300	●	353HPU1300	●
13.10	+0.025/+0.007	14	43	60	107	353PU1310	●	353HPU1310	●
13.20	+0.025/+0.007	14	43	60	107	353PU1320	●	353HPU1320	●
13.30	+0.025/+0.007	14	43	60	107	353PU1330	●	353HPU1330	●
13.40	+0.025/+0.007	14	43	60	107	353PU1340	●	353HPU1340	●
13.50	+0.025/+0.007	14	43	60	107	353PU1350	●	353HPU1350	●
13.60	+0.025/+0.007	14	43	60	107	353PU1360	●	353HPU1360	●
13.70	+0.025/+0.007	14	43	60	107	353PU1370	●	353HPU1370	●
13.80	+0.025/+0.007	14	43	60	107	353PU1380	●	353HPU1380	●
13.90	+0.025/+0.007	14	43	60	107	353PU1390	●	353HPU1390	●
14.00	+0.025/+0.007	14	43	60	107	353PU1400	●	353HPU1400	●
14.10	+0.025/+0.007	16	45	65	115	353PU1410	●	353HPU1410	●
14.20	+0.025/+0.007	16	45	65	115	353PU1420	●	353HPU1420	●
14.30	+0.025/+0.007	16	45	65	115	353PU1430	●	353HPU1430	●
14.50	+0.025/+0.007	16	45	65	115	353PU1450	●	353HPU1450	●
14.60	+0.025/+0.007	16	45	65	115	353PU1460	●	353HPU1460	●
14.70	+0.025/+0.007	16	45	65	115	353PU1470	●	353HPU1460	●

INFO
TYPHOON TA-HTA-4HTA
TYPHOON PU-HPU
TYPHOON SUH
TYPHOON ALH
TYPHOON HRC
TYPHOON SUH MINI
TYPHOON HL
C-SD-TA
LFTA
SUTA
HSS-HSS/CO DRILLS
G2
MDTA
HF VH/UP
MEF
ALU
MEX
UH
HSS/CO-HSSP END MILLS
CARBIDE BURRS

● stock standard ○ non-standard stock ▽ stock exhaustion

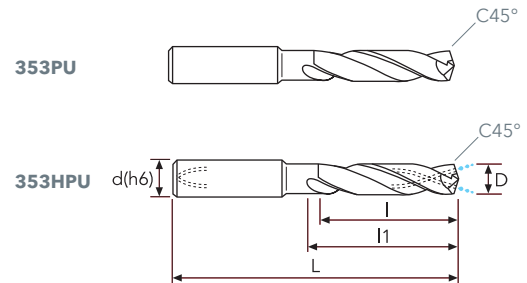
353PU-353HPU

universal application, high productivity,
PU and HPU (through coolant)



P	M	K	N	S	H
★	★	★	☆	★	

★ 1st choice ☆ suitable



D(m7)	D Tol.	d(h6)	l	l1	L	353PU		353HPU	
						EDP No.	Stock	EDP No.	Stock
14.80	+0.025/+0.007	16	45	65	115	353PU1480	●	353HPU1480	●
15.00	+0.025/+0.007	16	65	65	115	353PU1500	●	353HPU1500	●
15.10	+0.025/+0.007	16	65	65	115	353PU1510	●	353HPU1510	●
15.20	+0.025/+0.007	16	65	65	115	353PU1520	●	353HPU1520	●
15.30	+0.025/+0.007	16	65	65	115	353PU1530	●	353HPU1530	●
15.50	+0.025/+0.007	16	65	65	115	353PU1550	●	353HPU1550	●
15.60	+0.025/+0.007	16	65	65	115	353PU1560	●	353HPU1560	●
15.70	+0.025/+0.007	16	65	65	115	353PU1570	●	353HPU1570	●
15.80	+0.025/+0.007	16	65	65	115	353PU1580	●	353HPU1580	●
16.00	+0.025/+0.007	16	65	65	115	353PU1600	●	353HPU1600	●
16.10	+0.025/+0.007	18	73	73	123			353HPU1610	●
16.20	+0.025/+0.007	18	73	73	123			353HPU1620	●
16.30	+0.025/+0.007	18	73	73	123			353HPU1630	●
16.50	+0.025/+0.007	18	73	73	123	353PU1650	●	353HPU1650	●
16.70	+0.025/+0.007	18	73	73	123			353HPU1670	●
16.80	+0.025/+0.007	18	73	73	123			353HPU1680	●
17.00	+0.025/+0.007	18	73	73	123	353PU1700	●	353HPU1700	●
17.10	+0.025/+0.007	18	73	73	123			353HPU1710	●
17.20	+0.025/+0.007	18	73	73	123			353HPU1720	●
17.50	+0.025/+0.007	18	73	73	123	353PU1750	●	353HPU1750	●
17.60	+0.025/+0.007	18	73	73	123			353HPU1760	●
17.70	+0.025/+0.007	18	73	73	123			353HPU1770	●
17.80	+0.025/+0.007	18	73	73	123			353HPU1780	●
18.00	+0.025/+0.007	18	73	73	123	353PU1800	●	353HPU1800	●
18.10	+0.029/+0.008	20	79	79	131			353HPU1810	●
18.20	+0.029/+0.008	20	79	79	131			353HPU1820	●
18.30	+0.029/+0.008	20	79	79	131			353HPU1830	●
18.50	+0.029/+0.008	20	79	79	131	353PU1850	●	353HPU1850	●
18.60	+0.029/+0.008	20	79	79	131			353HPU1860	●
18.70	+0.029/+0.008	20	79	79	131			353HPU1870	●
18.80	+0.029/+0.008	20	79	79	131			353HPU1880	●
19.00	+0.029/+0.008	20	79	79	131	353PU1900	●	353HPU1900	●
19.20	+0.029/+0.008	20	79	79	131			353HPU1920	●
19.30	+0.029/+0.008	20	79	79	131			353HPU1930	●
19.50	+0.029/+0.008	20	79	79	131	353PU1950	●	353HPU1950	●
19.60	+0.029/+0.008	20	79	79	131			353HPU1960	●
19.80	+0.029/+0.008	20	79	79	131			353HPU1980	●
20.00	+0.029/+0.008	20	79	79	131	353PU2000	●	353HPU2000	●

● stock standard ○ non-standard stock ▽ stock exhaustion

353PU

	Material Group ISO 513	P1 P2			P3 P4			P5			P6		
	Hardness/Rm	500-700 N/mm ²			600-1000 N/mm ²			900-1200 N/mm ²			1200-1400 N/mm ²		
	Vc (m/min)	110-130			90-110			60-80			40-60		
	D (mm)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)
3	12740	0.110	1400	10620	0.094	990	7430	0.083	610	5310	0.066	350	
4	9550	0.120	1150	7960	0.102	810	5570	0.090	500	3980	0.072	290	
5	7640	0.130	990	6370	0.111	700	4460	0.098	430	3180	0.078	250	
6	6370	0.145	920	5310	0.123	650	3720	0.109	400	2650	0.087	230	
7	5460	0.160	870	4550	0.136	620	3180	0.120	380	2270	0.096	220	
8	4780	0.175	840	3980	0.149	590	2790	0.131	370	1990	0.105	210	
9	4250	0.190	810	3540	0.162	570	2480	0.143	350	1770	0.114	200	
10	3820	0.205	780	3180	0.174	550	2230	0.154	340	1590	0.123	200	
11	3470	0.220	760	2900	0.187	540	2030	0.165	330	1450	0.132	190	
12	3180	0.240	760	2650	0.204	540	1860	0.180	330	1330	0.144	190	
13	2940	0.260	760	2450	0.221	540	1710	0.195	330	1220	0.156	190	
14	2730	0.285	780	2270	0.242	550	1590	0.214	340	1140	0.171	190	
15	2550	0.310	790	2120	0.264	560	1490	0.233	350	1060	0.186	200	
16	2390	0.335	800	1990	0.285	570	1390	0.251	350	1000	0.201	200	
17	2250	0.360	810	1870	0.306	570	1310	0.270	350	940	0.216	200	
18	2120	0.385	820	1770	0.327	580	1240	0.289	360	880	0.231	200	
19	2010	0.410	820	1680	0.349	590	1170	0.308	360	840	0.246	210	
20	1910	0.435	830	1590	0.370	590	1110	0.326	360	800	0.261	210	

353HPU

	Material Group ISO 513	P1 P2			P3 P4			P5			P6		
	Hardness/Rm	500-700 N/mm ²			600-1000 N/mm ²			900-1200 N/mm ²			1200-1400 N/mm ²		
	Vc (m/min)	140-160			120-150			90-110			60-80		
	D (mm)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)
3	15920	0.127	2010	13800	0.114	1570	10620	0.101	1070	7430	0.089	660	
4	11940	0.150	1790	10350	0.135	1390	7960	0.120	950	5570	0.105	580	
5	9550	0.173	1650	8280	0.155	1290	6370	0.138	880	4460	0.121	540	
6	7960	0.196	1560	6900	0.176	1210	5310	0.156	830	3720	0.137	510	
7	6820	0.219	1490	5910	0.197	1160	4550	0.175	800	3180	0.153	490	
8	5970	0.242	1440	5180	0.217	1130	3980	0.193	770	2790	0.169	470	
9	5310	0.265	1400	4600	0.238	1100	3540	0.212	750	2480	0.185	460	
10	4780	0.288	1370	4140	0.259	1070	3180	0.230	730	2230	0.201	450	
11	4340	0.299	1300	3760	0.269	1010	2900	0.239	690	2030	0.209	420	
12	3980	0.322	1280	3450	0.290	1000	2650	0.258	680	1860	0.225	420	
13	3670	0.345	1270	3180	0.311	990	2450	0.276	680	1710	0.242	410	
14	3410	0.368	1250	2960	0.331	980	2270	0.294	670	1590	0.258	410	
15	3180	0.391	1240	2760	0.352	970	2120	0.313	660	1490	0.274	410	
16	2990	0.414	1240	2590	0.373	970	1990	0.331	660	1390	0.290	400	
17	2810	0.426	1200	2440	0.383	930	1870	0.340	640	1310	0.298	390	
18	2650	0.437	1160	2300	0.393	900	1770	0.350	620	1240	0.306	380	
19	2510	0.449	1130	2180	0.404	880	1680	0.359	600	1170	0.314	370	
20	2390	0.460	1100	2070	0.414	860	1590	0.368	590	1110	0.322	360	

- INFO
- TYPHOON TA-HTA-4HTA
- TYPHOON PU-HPU
- TYPHOON SUH
- TYPHOON ALH
- TYPHOON HRC
- TYPHOON SUH MINI
- TYPHOON HL
- C-SD-TA
- LFTA
- SUTA
- HSS-HSS/CO DRILLS
- G2
- MDTA
- HF VH/UP
- MEF
- ALU
- MEX
- UH
- HSS/CO-HSSP END MILLS
- CARBIDE BURRS

353PU

	Material Group ISO 513	M1 M2			M3			M4			M5		
	Hardness/Rm	< 750 N/mm ²			550-850 N/mm ²			650-950 N/mm ²			850-1200 N/mm ²		
	Vc (m/min)	45-55			35-45			25-35			20-30		
	D (mm)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)
	3	5310	0.077	410	4250	0.065	280	3180	0.058	180	2650	0.046	120
	4	3980	0.084	330	3180	0.071	230	2390	0.063	150	1990	0.050	100
	5	3180	0.091	290	2550	0.077	200	1910	0.068	130	1590	0.055	90
	6	2650	0.102	270	2120	0.086	180	1590	0.076	120	1330	0.061	80
	7	2270	0.112	250	1820	0.095	170	1360	0.084	110	1140	0.067	80
	8	1990	0.123	240	1590	0.104	170	1190	0.092	110	1000	0.074	70
	9	1770	0.133	240	1420	0.113	160	1060	0.100	110	880	0.080	70
	10	1590	0.144	230	1270	0.122	150	960	0.108	100	800	0.086	70
	11	1450	0.154	220	1160	0.131	150	870	0.116	100	720	0.092	70
	12	1330	0.168	220	1060	0.143	150	800	0.126	100	660	0.101	70
	13	1220	0.182	220	980	0.155	150	730	0.137	100	610	0.109	70
	14	1140	0.200	230	910	0.170	150	680	0.150	100	570	0.120	70
	15	1060	0.217	230	850	0.184	160	640	0.163	100	530	0.130	70
	16	1000	0.235	230	800	0.199	160	600	0.176	110	500	0.141	70
	17	940	0.252	240	750	0.214	160	560	0.189	110	470	0.151	70
	18	880	0.270	240	710	0.229	160	530	0.202	110	440	0.162	70
	19	840	0.287	240	670	0.244	160	500	0.215	110	420	0.172	70
	20	800	0.305	240	640	0.259	170	480	0.228	110	400	0.183	70

353HPU

	Material Group ISO 513	M1 M2			M3			M4			M5		
	Hardness/Rm	< 750 N/mm ²			550-850 N/mm ²			650-950 N/mm ²			850-1200 N/mm ²		
	Vc (m/min)	60-80			50-70			35-45			20-40		
	D (mm)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)
	3	7430	0.082	610	6370	0.066	420	4250	0.058	240	3180	0.049	160
	4	5570	0.097	540	4780	0.078	370	3180	0.068	220	2390	0.058	140
	5	4460	0.112	500	3820	0.090	340	2550	0.078	200	1910	0.067	130
	6	3720	0.127	470	3180	0.102	320	2120	0.089	190	1590	0.076	120
	7	3180	0.142	450	2730	0.114	310	1820	0.099	180	1360	0.085	120
	8	2790	0.157	440	2390	0.126	300	1590	0.110	170	1190	0.094	110
	9	2480	0.172	430	2120	0.138	290	1420	0.120	170	1060	0.103	110
	10	2230	0.187	420	1910	0.150	290	1270	0.131	170	960	0.112	110
	11	2030	0.194	390	1740	0.155	270	1160	0.136	160	870	0.117	100
	12	1860	0.209	390	1590	0.167	270	1060	0.147	160	800	0.126	100
	13	1710	0.224	380	1470	0.179	260	980	0.157	150	730	0.135	100
	14	1590	0.239	380	1360	0.191	260	910	0.167	150	680	0.144	100
	15	1490	0.254	380	1270	0.203	260	850	0.178	150	640	0.152	100
	16	1390	0.269	370	1190	0.215	260	800	0.188	150	600	0.161	100
	17	1310	0.277	360	1120	0.221	250	750	0.194	150	560	0.166	90
	18	1240	0.284	350	1060	0.227	240	710	0.199	140	530	0.170	90
	19	1170	0.292	340	1010	0.233	240	670	0.204	140	500	0.175	90
	20	1110	0.299	330	960	0.239	230	640	0.209	130	480	0.179	90

353PU

	Material Group ISO 513	K1			K2			K3			K4		
	Hardness/Rm	150-250 HB			150-350 HB			120-260 HB			250-500 HB		
	Vc (m/min)	110-130			90-110			60-80			40-60		
	D (mm)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)
3	12740	0.110	1400	10620	0.094	990	7430	0.083	610	5310	0.066	350	
4	9550	0.120	1150	7960	0.102	810	5570	0.090	500	3980	0.072	290	
5	7640	0.130	990	6370	0.111	700	4460	0.098	430	3180	0.078	250	
6	6370	0.145	920	5310	0.123	650	3720	0.109	400	2650	0.087	230	
7	5460	0.160	870	4550	0.136	620	3180	0.120	380	2270	0.096	220	
8	4780	0.175	840	3980	0.149	590	2790	0.131	370	1990	0.105	210	
9	4250	0.190	810	3540	0.162	570	2480	0.143	350	1770	0.114	200	
10	3820	0.205	780	3180	0.174	550	2230	0.154	340	1590	0.123	200	
11	3470	0.220	760	2900	0.187	540	2030	0.165	330	1450	0.132	190	
12	3180	0.240	760	2650	0.204	540	1860	0.180	330	1330	0.144	190	
13	2940	0.260	760	2450	0.221	540	1710	0.195	330	1220	0.156	190	
14	2730	0.285	780	2270	0.242	550	1590	0.214	340	1140	0.171	190	
15	2550	0.310	790	2120	0.264	560	1490	0.233	350	1060	0.186	200	
16	2390	0.335	800	1990	0.285	570	1390	0.251	350	1000	0.201	200	
17	2250	0.360	810	1870	0.306	570	1310	0.270	350	940	0.216	200	
18	2120	0.385	820	1770	0.327	580	1240	0.289	360	880	0.231	200	
19	2010	0.410	820	1680	0.349	590	1170	0.308	360	840	0.246	210	
20	1910	0.435	830	1590	0.370	590	1110	0.326	360	800	0.261	210	

353HPU

	Material Group ISO 513	K1			K2			K3			K4		
	Hardness/Rm	150-250 HB			150-350 HB			120-260 HB			250-500 HB		
	Vc (m/min)	120-140			100-120			80-100			60-80		
	D (mm)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)
3	13800	0.127	1750	11680	0.114	1330	9550	0.101	970	7430	0.089	660	
4	10350	0.150	1550	8760	0.135	1180	7170	0.120	860	5570	0.105	580	
5	8280	0.173	1430	7010	0.155	1090	5730	0.138	790	4460	0.121	540	
6	6900	0.196	1350	5840	0.176	1030	4780	0.156	750	3720	0.137	510	
7	5910	0.219	1290	5000	0.197	980	4090	0.175	710	3180	0.153	490	
8	5180	0.242	1250	4380	0.217	950	3580	0.193	690	2790	0.169	470	
9	4600	0.265	1220	3890	0.238	930	3180	0.212	670	2480	0.185	460	
10	4140	0.288	1190	3500	0.259	910	2870	0.230	660	2230	0.201	450	
11	3760	0.299	1120	3180	0.269	860	2610	0.239	620	2030	0.209	420	
12	3450	0.322	1110	2920	0.290	850	2390	0.258	620	1860	0.225	420	
13	3180	0.345	1100	2690	0.311	840	2200	0.276	610	1710	0.242	410	
14	2960	0.368	1090	2500	0.331	830	2050	0.294	600	1590	0.258	410	
15	2760	0.391	1080	2340	0.352	820	1910	0.313	600	1490	0.274	410	
16	2590	0.414	1070	2190	0.373	820	1790	0.331	590	1390	0.290	400	
17	2440	0.426	1040	2060	0.383	790	1690	0.340	580	1310	0.298	390	
18	2300	0.437	1010	1950	0.393	770	1590	0.350	560	1240	0.306	380	
19	2180	0.449	980	1840	0.404	740	1510	0.359	540	1170	0.314	370	
20	2070	0.460	950	1750	0.414	720	1430	0.368	530	1110	0.322	360	

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- LFTA
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353PU

	Material Group ISO 513	N1 > 5%Si			N2			N3 N4				
	Hardness/Rm											
	Vc (m/min)	220-260			200-240			160-200				
D (mm)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)			
3	25480	0.132	3360	23350	0.119	2770	19110	0.106	2020			
4	19110	0.144	2750	17520	0.130	2270	14330	0.115	1650			
5	15290	0.156	2390	14010	0.140	1970	11460	0.125	1430			
6	12740	0.174	2220	11680	0.157	1830	9550	0.139	1330			
7	10920	0.192	2100	10010	0.173	1730	8190	0.154	1260			
8	9550	0.210	2010	8760	0.189	1660	7170	0.168	1200			
9	8490	0.228	1940	7780	0.205	1600	6370	0.182	1160			
10	7640	0.246	1880	7010	0.221	1550	5730	0.197	1130			
11	6950	0.264	1830	6370	0.238	1510	5210	0.211	1100			
12	6370	0.288	1830	5840	0.259	1510	4780	0.230	1100			
13	5880	0.312	1830	5390	0.281	1510	4410	0.250	1100			
14	5460	0.342	1870	5000	0.308	1540	4090	0.274	1120			
15	5100	0.372	1900	4670	0.335	1560	3820	0.298	1140			
16	4780	0.402	1920	4380	0.362	1580	3580	0.322	1150			
17	4500	0.432	1940	4120	0.389	1600	3370	0.346	1160			
18	4250	0.462	1960	3890	0.416	1620	3180	0.370	1180			
19	4020	0.492	1980	3690	0.443	1630	3020	0.394	1190			
20	3820	0.522	1990	3500	0.470	1640	2870	0.418	1200			



353HPU

	Material Group ISO 513	N1 > 5%Si			N2			N3 N4				
	Hardness/Rm											
	Vc (m/min)	240-280			220-260			180-220				
D (mm)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)			
3	27600	0.152	4190	25480	0.139	3550	21230	0.111	2360			
4	20700	0.179	3710	19110	0.164	3140	15920	0.132	2090			
5	16560	0.207	3430	15290	0.190	2900	12740	0.152	1930			
6	13800	0.235	3240	12740	0.215	2740	10620	0.172	1830			
7	11830	0.262	3100	10920	0.240	2620	9100	0.192	1750			
8	10350	0.290	3000	9550	0.266	2540	7960	0.213	1690			
9	9200	0.317	2920	8490	0.291	2470	7080	0.233	1650			
10	8280	0.345	2860	7640	0.316	2420	6370	0.253	1610			
11	7530	0.359	2700	6950	0.329	2290	5790	0.263	1520			
12	6900	0.386	2670	6370	0.354	2260	5310	0.283	1500			
13	6370	0.414	2640	5880	0.380	2230	4900	0.304	1490			
14	5910	0.442	2610	5460	0.405	2210	4550	0.324	1470			
15	5520	0.469	2590	5100	0.430	2190	4250	0.344	1460			
16	5180	0.497	2570	4780	0.455	2180	3980	0.364	1450			
17	4870	0.511	2490	4500	0.468	2110	3750	0.374	1400			
18	4600	0.524	2410	4250	0.481	2040	3540	0.385	1360			
19	4360	0.538	2350	4020	0.493	1980	3350	0.395	1320			
20	4140	0.552	2290	3820	0.506	1930	3180	0.405	1290			



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353PU

Material Group ISO 513	S1 S2			S3			S4			S5		
	< 35 HRC			35-45 HRC								
	30-40			20-30			35-45			25-35		
Vc (m/min)	n	fn	Vf	n	fn	Vf	n	fn	Vf	n	fn	Vf
D (mm)	(rpm)	(mm/rev)	(mm/min)	(rpm)	(mm/rev)	(mm/min)	(rpm)	(mm/rev)	(mm/min)	(rpm)	(mm/rev)	(mm/min)
3	3720	0.050	180	2650	0.035	90	4250	0.047	200	3180	0.040	130
4	2790	0.054	150	1990	0.038	80	3180	0.051	160	2390	0.043	100
5	2230	0.059	130	1590	0.041	70	2550	0.056	140	1910	0.047	90
6	1860	0.065	120	1330	0.046	60	2120	0.062	130	1590	0.052	80
7	1590	0.072	110	1140	0.050	60	1820	0.068	120	1360	0.058	80
8	1390	0.079	110	1000	0.055	60	1590	0.075	120	1190	0.063	70
9	1240	0.086	110	880	0.060	50	1420	0.081	120	1060	0.068	70
10	1110	0.092	100	800	0.065	50	1270	0.088	110	960	0.074	70
11	1010	0.099	100	720	0.069	50	1160	0.094	110	870	0.079	70
12	930	0.108	100	660	0.076	50	1060	0.103	110	800	0.086	70
13	860	0.117	100	610	0.082	50	980	0.111	110	730	0.094	70
14	800	0.128	100	570	0.090	50	910	0.122	110	680	0.103	70
15	740	0.140	100	530	0.098	50	850	0.133	110	640	0.112	70
16	700	0.151	110	500	0.106	50	800	0.143	110	600	0.121	70
17	660	0.162	110	470	0.113	50	750	0.154	120	560	0.130	70
18	620	0.173	110	440	0.121	50	710	0.165	120	530	0.139	70
19	590	0.185	110	420	0.129	50	670	0.175	120	500	0.148	70
20	560	0.196	110	400	0.137	50	640	0.186	120	480	0.157	80



353HPU

Material Group ISO 513	S1 S2			S3			S4			S5		
	< 35 HRC			35-45 HRC								
	40-60			25-45			50-70			40-60		
Vc (m/min)	n	fn	Vf	n	fn	Vf	n	fn	Vf	n	fn	Vf
D (mm)	(rpm)	(mm/rev)	(mm/min)	(rpm)	(mm/rev)	(mm/min)	(rpm)	(mm/rev)	(mm/min)	(rpm)	(mm/rev)	(mm/min)
3	5310	0.057	300	3720	0.040	150	6370	0.054	340	5310	0.046	240
4	3980	0.067	270	2790	0.047	130	4780	0.064	310	3980	0.054	210
5	3180	0.078	250	2230	0.054	120	3820	0.074	280	3180	0.062	200
6	2650	0.088	230	1860	0.062	110	3180	0.084	270	2650	0.070	190
7	2270	0.098	220	1590	0.069	110	2730	0.093	260	2270	0.079	180
8	1990	0.109	220	1390	0.076	110	2390	0.103	250	1990	0.087	170
9	1770	0.119	210	1240	0.083	100	2120	0.113	240	1770	0.095	170
10	1590	0.129	210	1110	0.091	100	1910	0.123	230	1590	0.104	160
11	1450	0.135	200	1010	0.094	100	1740	0.128	220	1450	0.108	160
12	1330	0.145	190	930	0.101	90	1590	0.138	220	1330	0.116	150
13	1220	0.155	190	860	0.109	90	1470	0.147	220	1220	0.124	150
14	1140	0.166	190	800	0.116	90	1360	0.157	210	1140	0.132	150
15	1060	0.176	190	740	0.123	90	1270	0.167	210	1060	0.141	150
16	1000	0.186	190	700	0.130	90	1190	0.177	210	1000	0.149	150
17	940	0.191	180	660	0.134	90	1120	0.182	200	940	0.153	140
18	880	0.197	170	620	0.138	90	1060	0.187	200	880	0.157	140
19	840	0.202	170	590	0.141	80	1010	0.192	190	840	0.161	140
20	800	0.207	170	560	0.145	80	960	0.197	190	800	0.166	130



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355PU-355HPU

universal application, high productivity,
PU and HPU (through coolant)

5XD

DIN
6537L

PU

HPU

MG
PV250

140°+C45°

30°

355PU 355HPU



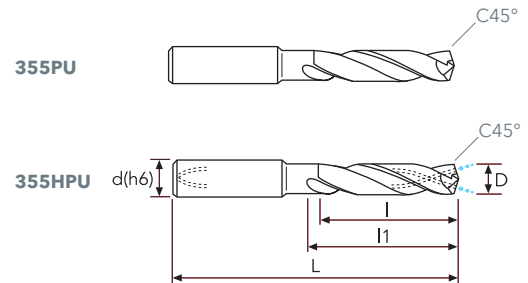
355PU



355HPU

P	M	K	N	S	H
★	★	★	☆	★	

★ 1st choice ☆ suitable

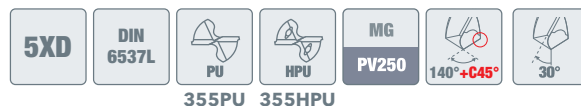


D(m7)	D Tol.	d(h6)	l	l1	L	355PU		355HPU	
						EDP No.	Stock	EDP No.	Stock
3.00	+0.012/+0.002	6	23	28	66	355PU0300	●	355HPU0300	●
3.10	+0.016/+0.004	6	23	28	66	355PU0310	●	355HPU0310	●
3.20	+0.016/+0.004	6	23	28	66	355PU0320	●	355HPU0320	●
3.25	+0.016/+0.004	6	23	28	66			355HPU0325	●
3.30	+0.016/+0.004	6	23	28	66	355PU0330	●	355HPU0330	●
3.40	+0.016/+0.004	6	23	28	66	355PU0340	●	355HPU0340	●
3.50	+0.016/+0.004	6	23	28	66	355PU0350	●	355HPU0350	●
3.60	+0.016/+0.004	6	23	28	66	355PU0360	●	355HPU0360	●
3.70	+0.016/+0.004	6	23	28	66	355PU0370	●	355HPU0370	●
3.80	+0.016/+0.004	6	29	36	74	355PU0380	●	355HPU0380	●
3.90	+0.016/+0.004	6	29	36	74	355PU0390	●	355HPU0390	●
4.00	+0.016/+0.004	6	29	36	74	355PU0400	●	355HPU0400	●
4.10	+0.016/+0.004	6	29	36	74	355PU0410	●	355HPU0410	●
4.20	+0.016/+0.004	6	29	36	74	355PU0420	●	355HPU0420	●
4.30	+0.016/+0.004	6	29	36	74	355PU0430	●	355HPU0430	●
4.40	+0.016/+0.004	6	29	36	74	355PU0440	●	355HPU0440	●
4.50	+0.016/+0.004	6	29	36	74	355PU0450	●	355HPU0450	●
4.60	+0.016/+0.004	6	29	36	74	355PU0460	●	355HPU0460	●
4.65	+0.016/+0.004	6	29	36	74			355HPU0465	●
4.70	+0.016/+0.004	6	29	36	74	355PU0470	●	355HPU0470	●
4.80	+0.016/+0.004	6	35	44	82	355PU0480	●	355HPU0480	●
4.90	+0.016/+0.004	6	35	44	82	355PU0490	●	355HPU0490	●
5.00	+0.016/+0.004	6	35	44	82	355PU0500	●	355HPU0500	●
5.10	+0.016/+0.004	6	35	44	82	355PU0510	●	355HPU0510	●
5.20	+0.016/+0.004	6	35	44	82	355PU0520	●	355HPU0520	●
5.30	+0.016/+0.004	6	35	44	82	355PU0530	●	355HPU0530	●
5.40	+0.016/+0.004	6	35	44	82	355PU0540	●	355HPU0540	●
5.50	+0.016/+0.004	6	35	44	82	355PU0550	●	355HPU0550	●
5.55	+0.016/+0.004	6	35	44	82			355HPU0555	●
5.60	+0.016/+0.004	6	35	44	82	355PU0560	●	355HPU0560	●
5.70	+0.016/+0.004	6	35	44	82	355PU0570	●	355HPU0570	●
5.80	+0.016/+0.004	6	35	44	82	355PU0580	●	355HPU0580	●
5.90	+0.016/+0.004	6	35	44	82	355PU0590	●	355HPU0590	●
6.00	+0.016/+0.004	6	35	44	82	355PU0600	●	355HPU0600	●
6.10	+0.021/+0.006	8	43	53	91	355PU0610	●	355HPU0610	●
6.20	+0.021/+0.006	8	43	53	91	355PU0620	●	355HPU0620	●
6.30	+0.021/+0.006	8	43	53	91	355PU0630	●	355HPU0630	●
6.40	+0.021/+0.006	8	43	53	91	355PU0640	●	355HPU0640	●
6.50	+0.021/+0.006	8	43	53	91	355PU0650	●	355HPU0650	●

● stock standard ○ non-standard stock ▽ stock exhaustion

355PU-355HPU

universal application, high productivity,
PU and HPU (through coolant)



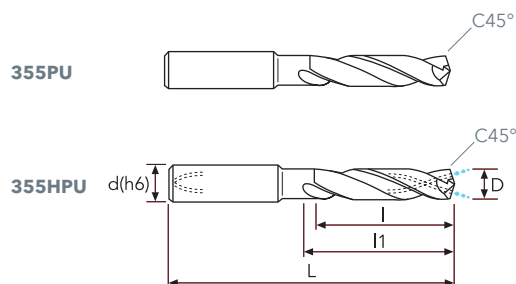
355PU



355HPU

P	M	K	N	S	H
★	★	★	☆	★	

★ 1st choice ☆ suitable



D(m7)	D Tol.	d(h6)	l	l1	L	355PU		355HPU	
						EDP No.	Stock	EDP No.	Stock
6.60	+0.021/+0.006	8	43	53	91	355PU0660	●	355HPU0660	●
6.70	+0.021/+0.006	8	43	53	91	355PU0670	●	355HPU0670	●
6.80	+0.021/+0.006	8	43	53	91	355PU0680	●	355HPU0680	●
6.90	+0.021/+0.006	8	43	53	91	355PU0690	●	355HPU0690	●
7.00	+0.021/+0.006	8	43	53	91	355PU0700	●	355HPU0700	●
7.10	+0.021/+0.006	8	43	53	91	355PU0710	●	355HPU0710	●
7.20	+0.021/+0.006	8	43	53	91	355PU0720	●	355HPU0720	●
7.30	+0.021/+0.006	8	43	53	91	355PU0730	●	355HPU0730	●
7.40	+0.021/+0.006	8	43	53	91	355PU0740	●	355HPU0740	●
7.45	+0.021/+0.006	8	43	53	91			355HPU0745	●
7.50	+0.021/+0.006	8	43	53	91	355PU0750	●	355HPU0750	●
7.60	+0.021/+0.006	8	43	53	91	355PU0760	●	355HPU0760	●
7.70	+0.021/+0.006	8	43	53	91	355PU0770	●	355HPU0770	●
7.80	+0.021/+0.006	8	43	53	91	355PU0780	●	355HPU0780	●
7.90	+0.021/+0.006	8	43	53	91	355PU0790	●	355HPU0790	●
8.00	+0.021/+0.006	8	43	53	91	355PU0800	●	355HPU0800	●
8.10	+0.021/+0.006	10	49	61	103	355PU0810	●	355HPU0810	●
8.20	+0.021/+0.006	10	49	61	103	355PU0820	●	355HPU0820	●
8.30	+0.021/+0.006	10	49	61	103	355PU0830	●	355HPU0830	●
8.40	+0.021/+0.006	10	49	61	103	355PU0840	●	355HPU0840	●
8.50	+0.021/+0.006	10	49	61	103	355PU0850	●	355HPU0850	●
8.60	+0.021/+0.006	10	49	61	103	355PU0860	●	355HPU0860	●
8.70	+0.021/+0.006	10	49	61	103	355PU0870	●	355HPU0870	●
8.80	+0.021/+0.006	10	49	61	103	355PU0880	●	355HPU0880	●
8.90	+0.021/+0.006	10	49	61	103	355PU0890	●	355HPU0890	●
9.00	+0.021/+0.006	10	49	61	103	355PU0900	●	355HPU0900	●
9.10	+0.021/+0.006	10	49	61	103	355PU0910	●	355HPU0910	●
9.20	+0.021/+0.006	10	49	61	103	355PU0920	●	355HPU0920	●
9.25	+0.021/+0.006	10	49	61	103			355HPU0925	●
9.30	+0.021/+0.006	10	49	61	103	355PU0930	●	355HPU0930	●
9.40	+0.021/+0.006	10	49	61	103	355PU0940	●	355HPU0940	●
9.45	+0.021/+0.006	10	49	61	103			355HPU0945	●
9.50	+0.021/+0.006	10	61	61	103	355PU0950	●	355HPU0950	●
9.60	+0.021/+0.006	10	61	61	103	355PU0960	●	355HPU0960	●
9.70	+0.021/+0.006	10	61	61	103	355PU0970	●	355HPU0970	●
9.80	+0.021/+0.006	10	61	61	103	355PU0980	●	355HPU0980	●
9.90	+0.021/+0.006	10	61	61	103	355PU0990	●	355HPU0990	●
10.00	+0.021/+0.006	10	61	61	103	355PU1000	●	355HPU1000	●
10.10	+0.025/+0.007	12	71	71	118	355PU1010	●	355HPU1010	●

INFO
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TYPHOON HL
C-SD-TA
LFTA
SUTA
HSS-HSS/CO DRILLS
G2
MDTA
HF VH/UP
MEF
ALU
MEX
UH
HSS/CO-HSSP END MILLS
CARBIDE BURRS

● stock standard ○ non-standard stock ▽ stock exhaustion

355PU-355HPU

universal application, high productivity,
PU and HPU (through coolant)

5XD

DIN
6537L

PU

HPU

MG
PV250

140°+C45°

30°

355PU 355HPU

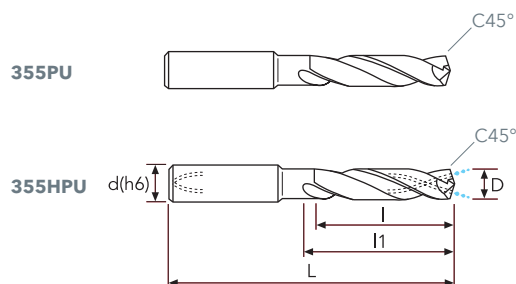


355PU

355HPU

P	M	K	N	S	H
★	★	★	☆	★	

★ 1st choice ☆ suitable

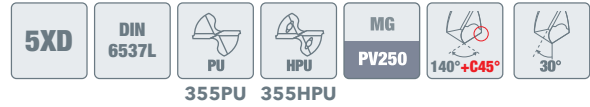


D(m7)	D Tol.	d(h6)	l	l1	L	355PU		355HPU	
						EDP No.	Stock	EDP No.	Stock
10.20	+0.025/+0.007	12	71	71	118	355PU1020	●	355HPU1020	●
10.30	+0.025/+0.007	12	71	71	118	355PU1030	●	355HPU1030	●
10.40	+0.025/+0.007	12	71	71	118	355PU1040	●	355HPU1040	●
10.50	+0.025/+0.007	12	71	71	118	355PU1050	●	355HPU1050	●
10.60	+0.025/+0.007	12	71	71	118	355PU1060	●	355HPU1060	●
10.70	+0.025/+0.007	12	71	71	118	355PU1070	●	355HPU1070	●
10.80	+0.025/+0.007	12	71	71	118	355PU1080	●	355HPU1080	●
10.90	+0.025/+0.007	12	71	71	118	355PU1090	●	355HPU1090	●
11.00	+0.025/+0.007	12	71	71	118	355PU1100	●	355HPU1100	●
11.10	+0.025/+0.007	12	71	71	118	355PU1110	●	355HPU1110	●
11.20	+0.025/+0.007	12	71	71	118	355PU1120	●	355HPU1120	●
11.25	+0.025/+0.007	12	71	71	118			355HPU1125	●
11.30	+0.025/+0.007	12	71	71	118	355PU1130	●	355HPU1130	●
11.40	+0.025/+0.007	12	71	71	118	355PU1140	●	355HPU1140	●
11.50	+0.025/+0.007	12	71	71	118	355PU1150	●	355HPU1150	●
11.60	+0.025/+0.007	12	71	71	118	355PU1160	●	355HPU1160	●
11.70	+0.025/+0.007	12	71	71	118	355PU1170	●	355HPU1170	●
11.80	+0.025/+0.007	12	71	71	118	355PU1180	●	355HPU1180	●
11.90	+0.025/+0.007	12	71	71	118	355PU1190	●	355HPU1190	●
12.00	+0.025/+0.007	12	71	71	118	355PU1200	●	355HPU1200	●
12.10	+0.025/+0.007	14	77	77	124	355PU1210	●	355HPU1210	●
12.20	+0.025/+0.007	14	77	77	124	355PU1220	●	355HPU1220	●
12.30	+0.025/+0.007	14	77	77	124			355HPU1230	●
12.40	+0.025/+0.007	14	77	77	124			355HPU1240	●
12.50	+0.025/+0.007	14	77	77	124	355PU1250	●	355HPU1250	●
12.60	+0.025/+0.007	14	77	77	124			355HPU1260	●
12.70	+0.025/+0.007	14	77	77	124	355PU1270	●	355HPU1270	●
12.80	+0.025/+0.007	14	77	77	124	355PU1280	●	355HPU1280	●
12.90	+0.025/+0.007	14	77	77	124			355HPU1290	●
13.00	+0.025/+0.007	14	77	77	124	355PU1300	●	355HPU1300	●
13.10	+0.025/+0.007	14	77	77	124	355PU1310	●	355HPU1310	●
13.20	+0.025/+0.007	14	77	77	124	355PU1320	●	355HPU1320	●
13.30	+0.025/+0.007	14	77	77	124	355PU1330	●	355HPU1330	●
13.40	+0.025/+0.007	14	77	77	124			355HPU1340	●
13.50	+0.025/+0.007	14	77	77	124	355PU1350	●	355HPU1350	●
13.60	+0.025/+0.007	14	77	77	124			355HPU1360	●
13.70	+0.025/+0.007	14	77	77	124	355PU1370	●	355HPU1370	●
13.80	+0.025/+0.007	14	77	77	124	355PU1380	●	355HPU1380	●
13.90	+0.025/+0.007	14	77	77	124			355HPU1390	●

● stock standard ○ non-standard stock ▽ stock exhaustion

355PU-355HPU

universal application, high productivity,
PU and HPU (through coolant)

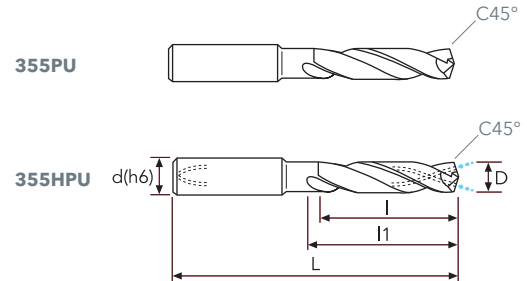


355PU

355HPU

P	M	K	N	S	H
★	★	★	☆	★	

★ 1st choice ☆ suitable



D(m7)	D Tol.	d(h6)	l	l1	L	355PU		355HPU	
						EDP No.	Stock	EDP No.	Stock
14.00	+0.025/+0.007	14	77	77	124	355PU1400	●	355HPU1400	●
14.10	+0.025/+0.007	16	83	83	133			355HPU1410	●
14.20	+0.025/+0.007	16	83	83	133			355HPU1420	●
14.30	+0.025/+0.007	16	83	83	133			355HPU1430	●
14.40	+0.025/+0.007	16	83	83	133			355HPU1440	●
14.50	+0.025/+0.007	16	83	83	133	355PU1450	●	355HPU1450	●
14.60	+0.025/+0.007	16	83	83	133			355HPU1460	●
14.70	+0.025/+0.007	16	83	83	133			355HPU1470	●
14.80	+0.025/+0.007	16	83	83	133			355HPU1480	●
14.90	+0.025/+0.007	16	83	83	133			355HPU1490	●
15.00	+0.025/+0.007	16	83	83	133	355PU1500	●	355HPU1500	●
15.10	+0.025/+0.007	16	83	83	133			355HPU1510	●
15.20	+0.025/+0.007	16	83	83	133			355HPU1520	●
15.30	+0.025/+0.007	16	83	83	133	355PU1530	●	355HPU1530	●
15.40	+0.025/+0.007	16	83	83	133			355HPU1540	●
15.50	+0.025/+0.007	16	83	83	133	355PU1550	●	355HPU1550	●
15.60	+0.025/+0.007	16	83	83	133			355HPU1560	●
15.70	+0.025/+0.007	16	83	83	133			355HPU1570	●
15.80	+0.025/+0.007	16	83	83	133	355PU1580	●	355HPU1580	●
15.90	+0.025/+0.007	16	83	83	133			355HPU1590	●
16.00	+0.025/+0.007	16	83	83	133	355PU1600	●	355HPU1600	●
16.10	+0.025/+0.007	18	93	93	143			355HPU1610	●
16.20	+0.025/+0.007	18	93	93	143			355HPU1620	●
16.30	+0.025/+0.007	18	93	93	143			355HPU1630	●
16.40	+0.025/+0.007	18	93	93	143			355HPU1640	●
16.50	+0.025/+0.007	18	93	93	143	355PU1650	●	355HPU1650	●
16.60	+0.025/+0.007	18	93	93	143			355HPU1660	●
16.70	+0.025/+0.007	18	93	93	143			355HPU1670	●
16.80	+0.025/+0.007	18	93	93	143			355HPU1680	●
16.90	+0.025/+0.007	18	93	93	143			355HPU1690	●
17.00	+0.025/+0.007	18	93	93	143	355PU1700	●	355HPU1700	●
17.10	+0.025/+0.007	18	93	93	143			355HPU1710	●
17.20	+0.025/+0.007	18	93	93	143			355HPU1720	●
17.30	+0.025/+0.007	18	93	93	143			355HPU1730	●
17.40	+0.025/+0.007	18	93	93	143			355HPU1740	●
17.50	+0.025/+0.007	18	93	93	143	355PU1750	●	355HPU1750	●
17.60	+0.025/+0.007	18	93	93	143			355HPU1760	●
17.70	+0.025/+0.007	18	93	93	143			355HPU1770	●
17.80	+0.025/+0.007	18	93	93	143			355HPU1780	●

INFO
TYPHOON TA-HTA-4HTA
TYPHOON PU-HPU
TYPHOON SUH
TYPHOON ALH
TYPHOON HRC
TYPHOON SUH MINI
TYPHOON HL
C-SD-TA
LFTA
SUTA
HSS-HSS/CO DRILLS
G2
MDTA
HF VH/UP
MEF
ALU
MEX
UH
HSS/CO-HSSP END MILLS
CARBIDE BURRS

● stock standard ○ non-standard stock ▽ stock exhaustion

355PU-355HPU

universal application, high productivity,
PU and HPU (through coolant)

5XD

DIN 6537L

MG
PV250

355PU 355HPU



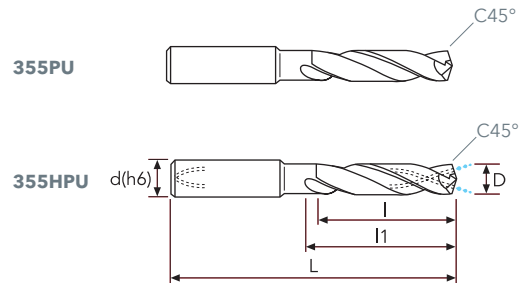
355PU



355HPU

P	M	K	N	S	H
★	★	★	☆	★	

★ 1st choice ☆ suitable



D(m7)	D Tol.	d(h6)	l	l1	L	355PU		355HPU	
						EDP No.	Stock	EDP No.	Stock
17.90	+0.025/+0.007	18	93	93	143			355HPU1790	●
18.00	+0.025/+0.007	18	93	93	143	355PU1800	●	355HPU1800	●
18.10	+0.029/+0.008	20	101	101	153			355HPU1810	●
18.20	+0.029/+0.008	20	101	101	153			355HPU1820	●
18.30	+0.029/+0.008	20	101	101	153			355HPU1830	●
18.40	+0.029/+0.008	20	101	101	153			355HPU1840	●
18.50	+0.029/+0.008	20	101	101	153	355PU1850	●	355HPU1850	●
18.60	+0.029/+0.008	20	101	101	153			355HPU1860	●
18.70	+0.029/+0.008	20	101	101	153			355HPU1870	●
18.80	+0.029/+0.008	20	101	101	153			355HPU1880	●
18.90	+0.029/+0.008	20	101	101	153			355HPU1890	●
19.00	+0.029/+0.008	20	101	101	153	355PU1900	●	355HPU1900	●
19.10	+0.029/+0.008	20	101	101	153			355HPU1910	●
19.20	+0.029/+0.008	20	101	101	153			355HPU1920	●
19.30	+0.029/+0.008	20	101	101	153			355HPU1930	●
19.40	+0.029/+0.008	20	101	101	153			355HPU1940	●
19.50	+0.029/+0.008	20	101	101	153	355PU1950	●	355HPU1950	●
19.60	+0.029/+0.008	20	101	101	153			355HPU1960	●
19.70	+0.029/+0.008	20	101	101	153			355HPU1970	●
19.80	+0.029/+0.008	20	101	101	153			355HPU1980	●
19.90	+0.029/+0.008	20	101	101	153			355HPU1990	●
20.00	+0.029/+0.008	20	101	101	153	355PU2000	●	355HPU2000	●

● stock standard ○ non-standard stock ▽ stock exhaustion

355PU

	Material Group ISO 513	P1 P2			P3 P4			P5			P6		
	Hardness/Rm	500-700 N/mm ²			600-1000 N/mm ²			900-1200 N/mm ²			1200-1400 N/mm ²		
	Vc (m/min)	100-120			80-100			50-70			30-50		
	D (mm)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)
3	11680	0.094	1090	9550	0.075	710	6370	0.065	420	4250	0.047	200	
4	8760	0.102	890	7170	0.082	590	4780	0.071	340	3180	0.051	160	
5	7010	0.111	770	5730	0.088	510	3820	0.077	300	2550	0.055	140	
6	5840	0.123	720	4780	0.099	470	3180	0.086	270	2120	0.062	130	
7	5000	0.136	680	4090	0.109	440	2730	0.095	260	1820	0.068	120	
8	4380	0.149	650	3580	0.119	430	2390	0.104	250	1590	0.074	120	
9	3890	0.162	630	3180	0.129	410	2120	0.113	240	1420	0.081	110	
10	3500	0.174	610	2870	0.139	400	1910	0.122	230	1270	0.087	110	
11	3180	0.187	590	2610	0.150	390	1740	0.131	230	1160	0.094	110	
12	2920	0.204	600	2390	0.163	390	1590	0.143	230	1060	0.102	110	
13	2690	0.221	590	2200	0.177	390	1470	0.155	230	980	0.111	110	
14	2500	0.242	610	2050	0.194	400	1360	0.170	230	910	0.121	110	
15	2340	0.264	620	1910	0.211	400	1270	0.184	230	850	0.132	110	
16	2190	0.285	620	1790	0.228	410	1190	0.199	240	800	0.142	110	
17	2060	0.306	630	1690	0.245	410	1120	0.214	240	750	0.153	110	
18	1950	0.327	640	1590	0.262	420	1060	0.229	240	710	0.164	120	
19	1840	0.349	640	1510	0.279	420	1010	0.244	250	670	0.174	120	
20	1750	0.370	650	1430	0.296	420	960	0.259	250	640	0.185	120	

355HPU

	Material Group ISO 513	P1 P2			P3 P4			P5			P6		
	Hardness/Rm	500-700 N/mm ²			600-1000 N/mm ²			900-1200 N/mm ²			1200-1400 N/mm ²		
	Vc (m/min)	130-150			110-130			80-100			50-70		
	D (mm)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)
3	14860	0.108	1600	12740	0.081	1030	9550	0.065	620	6370	0.054	340	
4	11150	0.127	1420	9550	0.095	910	7170	0.076	550	4780	0.064	300	
5	8920	0.147	1310	7640	0.110	840	5730	0.088	500	3820	0.073	280	
6	7430	0.166	1230	6370	0.125	790	4780	0.100	480	3180	0.083	260	
7	6370	0.186	1180	5460	0.139	760	4090	0.111	460	2730	0.093	250	
8	5570	0.205	1140	4780	0.154	740	3580	0.123	440	2390	0.103	250	
9	4950	0.225	1110	4250	0.169	720	3180	0.135	430	2120	0.112	240	
10	4460	0.244	1090	3820	0.183	700	2870	0.147	420	1910	0.122	230	
11	4050	0.254	1030	3470	0.191	660	2610	0.152	400	1740	0.127	220	
12	3720	0.274	1020	3180	0.205	650	2390	0.164	390	1590	0.137	220	
13	3430	0.293	1010	2940	0.220	650	2200	0.176	390	1470	0.147	220	
14	3180	0.313	990	2730	0.235	640	2050	0.188	380	1360	0.156	210	
15	2970	0.332	990	2550	0.249	640	1910	0.199	380	1270	0.166	210	
16	2790	0.352	980	2390	0.264	630	1790	0.211	380	1190	0.176	210	
17	2620	0.362	950	2250	0.271	610	1690	0.217	370	1120	0.181	200	
18	2480	0.371	920	2120	0.279	590	1590	0.223	350	1060	0.186	200	
19	2350	0.381	900	2010	0.286	570	1510	0.229	350	1010	0.191	190	
20	2230	0.391	870	1910	0.293	560	1430	0.235	340	960	0.196	190	

- INFO
- TYPHOON TA-HTA-4HTA
- TYPHOON PU-HPU
- TYPHOON SUH
- TYPHOON ALH
- TYPHOON HRC
- TYPHOON SUH MINI
- TYPHOON HL
- C-SD-TA
- LFTA
- SUTA
- HSS-HSS/CO DRILLS
- G2
- MDTA
- HF VH/UP
- MEF
- ALU
- MEX
- UH
- HSS/CO-HSSP END MILLS
- CARBIDE BURRS

355PU

	Material Group ISO 513	M1 M2			M3			M4			M5		
	Hardness/Rm	< 750 N/mm ²			550-850 N/mm ²			650-950 N/mm ²			850-1200 N/mm ²		
	Vc (m/min)	40-50			30-40			25-35			20-30		
	D (mm)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)
	3	4780	0.065	310	3720	0.052	190	3180	0.046	150	2650	0.033	90
4	3580	0.071	260	2790	0.057	160	2390	0.050	120	1990	0.036	70	
5	2870	0.077	220	2230	0.062	140	1910	0.054	100	1590	0.039	60	
6	2390	0.086	210	1860	0.069	130	1590	0.060	100	1330	0.043	60	
7	2050	0.095	200	1590	0.076	120	1360	0.067	90	1140	0.048	50	
8	1790	0.104	190	1390	0.083	120	1190	0.073	90	1000	0.052	50	
9	1590	0.113	180	1240	0.090	110	1060	0.079	80	880	0.057	50	
10	1430	0.122	170	1110	0.098	110	960	0.085	80	800	0.061	50	
11	1300	0.131	170	1010	0.105	110	870	0.092	80	720	0.065	50	
12	1190	0.143	170	930	0.114	110	800	0.100	80	660	0.071	50	
13	1100	0.155	170	860	0.124	110	730	0.108	80	610	0.077	50	
14	1020	0.170	170	800	0.136	110	680	0.119	80	570	0.085	50	
15	960	0.184	180	740	0.148	110	640	0.129	80	530	0.092	50	
16	900	0.199	180	700	0.159	110	600	0.140	80	500	0.100	50	
17	840	0.214	180	660	0.171	110	560	0.150	80	470	0.107	50	
18	800	0.229	180	620	0.183	110	530	0.160	80	440	0.115	50	
19	750	0.244	180	590	0.195	120	500	0.171	90	420	0.122	50	
20	720	0.259	190	560	0.207	120	480	0.181	90	400	0.129	50	

355HPU

	Material Group ISO 513	M1 M2			M3			M4			M5		
	Hardness/Rm	< 750 N/mm ²			550-850 N/mm ²			650-950 N/mm ²			850-1200 N/mm ²		
	Vc (m/min)	50-70			40-60			30-40			20-30		
	D (mm)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)
	3	6370	0.070	450	5310	0.056	300	3720	0.049	180	2650	0.042	110
4	4780	0.083	390	3980	0.066	260	2790	0.058	160	1990	0.050	100	
5	3820	0.095	360	3180	0.076	240	2230	0.067	150	1590	0.057	90	
6	3180	0.108	340	2650	0.086	230	1860	0.076	140	1330	0.065	90	
7	2730	0.121	330	2270	0.097	220	1590	0.085	130	1140	0.072	80	
8	2390	0.133	320	1990	0.107	210	1390	0.093	130	1000	0.080	80	
9	2120	0.146	310	1770	0.117	210	1240	0.102	130	880	0.088	80	
10	1910	0.159	300	1590	0.127	200	1110	0.111	120	800	0.095	80	
11	1740	0.165	290	1450	0.132	190	1010	0.116	120	720	0.099	70	
12	1590	0.178	280	1330	0.142	190	930	0.125	120	660	0.107	70	
13	1470	0.191	280	1220	0.152	190	860	0.133	110	610	0.114	70	
14	1360	0.203	280	1140	0.163	190	800	0.142	110	570	0.122	70	
15	1270	0.216	270	1060	0.173	180	740	0.151	110	530	0.130	70	
16	1190	0.229	270	1000	0.183	180	700	0.160	110	500	0.137	70	
17	1120	0.235	260	940	0.188	180	660	0.165	110	470	0.141	70	
18	1060	0.241	260	880	0.193	170	620	0.169	100	440	0.145	60	
19	1010	0.248	250	840	0.198	170	590	0.173	100	420	0.149	60	
20	960	0.254	240	800	0.203	160	560	0.178	100	400	0.152	60	

355PU

	Material Group ISO 513	K1			K2			K3			K4		
	Hardness/Rm	150-250 HB			150-350 HB			120-260 HB			250-500 HB		
	Vc (m/min)	100-120			80-100			50-70			30-50		
	D (mm)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)
3	11680	0.094	1090	9550	0.075	710	6370	0.065	420	4250	0.047	200	
4	8760	0.102	890	7170	0.082	590	4780	0.071	340	3180	0.051	160	
5	7010	0.111	770	5730	0.088	510	3820	0.077	300	2550	0.055	140	
6	5840	0.123	720	4780	0.099	470	3180	0.086	270	2120	0.062	130	
7	5000	0.136	680	4090	0.109	440	2730	0.095	260	1820	0.068	120	
8	4380	0.149	650	3580	0.119	430	2390	0.104	250	1590	0.074	120	
9	3890	0.162	630	3180	0.129	410	2120	0.113	240	1420	0.081	110	
10	3500	0.174	610	2870	0.139	400	1910	0.122	230	1270	0.087	110	
11	3180	0.187	590	2610	0.150	390	1740	0.131	230	1160	0.094	110	
12	2920	0.204	600	2390	0.163	390	1590	0.143	230	1060	0.102	110	
13	2690	0.221	590	2200	0.177	390	1470	0.155	230	980	0.111	110	
14	2500	0.242	610	2050	0.194	400	1360	0.170	230	910	0.121	110	
15	2340	0.264	620	1910	0.211	400	1270	0.184	230	850	0.132	110	
16	2190	0.285	620	1790	0.228	410	1190	0.199	240	800	0.142	110	
17	2060	0.306	630	1690	0.245	410	1120	0.214	240	750	0.153	110	
18	1950	0.327	640	1590	0.262	420	1060	0.229	240	710	0.164	120	
19	1840	0.349	640	1510	0.279	420	1010	0.244	250	670	0.174	120	
20	1750	0.370	650	1430	0.296	420	960	0.259	250	640	0.185	120	

355HPU

	Material Group ISO 513	K1			K2			K3			K4		
	Hardness/Rm	150-250 HB			150-350 HB			120-260 HB			250-500 HB		
	Vc (m/min)	110-130			90-110			65-85			45-65		
	D (mm)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)
3	12740	0.108	1370	10620	0.097	1030	7960	0.086	680	5840	0.075	440	
4	9550	0.127	1210	7960	0.114	910	5970	0.102	610	4380	0.089	390	
5	7640	0.147	1120	6370	0.132	840	4780	0.117	560	3500	0.103	360	
6	6370	0.166	1060	5310	0.150	790	3980	0.133	530	2920	0.116	340	
7	5460	0.186	1010	4550	0.167	760	3410	0.149	510	2500	0.130	330	
8	4780	0.205	980	3980	0.185	740	2990	0.164	490	2190	0.144	310	
9	4250	0.225	960	3540	0.202	720	2650	0.180	480	1950	0.157	310	
10	3820	0.244	930	3180	0.220	700	2390	0.196	470	1750	0.171	300	
11	3470	0.254	880	2900	0.229	660	2170	0.203	440	1590	0.178	280	
12	3180	0.274	870	2650	0.246	650	1990	0.219	440	1460	0.192	280	
13	2940	0.293	860	2450	0.264	650	1840	0.235	430	1350	0.205	280	
14	2730	0.313	850	2270	0.282	640	1710	0.250	430	1250	0.219	270	
15	2550	0.332	850	2120	0.299	630	1590	0.266	420	1170	0.233	270	
16	2390	0.352	840	1990	0.317	630	1490	0.282	420	1090	0.246	270	
17	2250	0.362	810	1870	0.326	610	1410	0.289	410	1030	0.253	260	
18	2120	0.371	790	1770	0.334	590	1330	0.297	400	970	0.260	250	
19	2010	0.381	770	1680	0.343	580	1260	0.305	380	920	0.267	250	
20	1910	0.391	750	1590	0.352	560	1190	0.313	370	880	0.274	240	

- INFO
- TYPHOON TA-HTA-4HTA
- TYPHOON PU-HPU
- TYPHOON SUH
- TYPHOON ALH
- TYPHOON HRC
- TYPHOON SUH MINI
- TYPHOON HL
- C-SD-TA
- LFTA
- SUTA
- HSS-HSS/CO DRILLS
- G2
- MDTA
- HF VH/UP
- MEF
- ALU
- MEX
- UH
- HSS/CO-HSSP END MILLS
- CARBIDE BURRS

355PU

	Material Group ISO 513	N1 > 5%Si			N2			N3 N4				
	Hardness/Rm											
	Vc (m/min)	200-240			180-220			140-180				
D (mm)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)			
3	23350	0.112	2620	21230	0.101	2140	16990	0.090	1530			
4	17520	0.122	2140	15920	0.110	1750	12740	0.098	1250			
5	14010	0.133	1860	12740	0.119	1520	10190	0.106	1080			
6	11680	0.148	1730	10620	0.133	1410	8490	0.118	1000			
7	10010	0.163	1630	9100	0.147	1340	7280	0.131	950			
8	8760	0.179	1560	7960	0.161	1280	6370	0.143	910			
9	7780	0.194	1510	7080	0.174	1230	5660	0.155	880			
10	7010	0.209	1470	6370	0.188	1200	5100	0.167	850			
11	6370	0.224	1430	5790	0.202	1170	4630	0.180	830			
12	5840	0.245	1430	5310	0.220	1170	4250	0.196	830			
13	5390	0.265	1430	4900	0.239	1170	3920	0.212	830			
14	5000	0.291	1450	4550	0.262	1190	3640	0.233	850			
15	4670	0.316	1480	4250	0.285	1210	3400	0.253	860			
16	4380	0.342	1500	3980	0.308	1220	3180	0.273	870			
17	4120	0.367	1510	3750	0.330	1240	3000	0.294	880			
18	3890	0.393	1530	3540	0.353	1250	2830	0.314	890			
19	3690	0.418	1540	3350	0.376	1260	2680	0.335	900			
20	3500	0.444	1550	3180	0.399	1270	2550	0.355	910			



355HPU

	Material Group ISO 513	N1 > 5%Si			N2			N3 N4				
	Hardness/Rm											
	Vc (m/min)	230-270			210-250			170-210				
D (mm)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)			
3	26540	0.129	3420	24420	0.116	2840	20170	0.090	1820			
4	19900	0.152	3030	18310	0.137	2510	15130	0.107	1620			
5	15920	0.176	2800	14650	0.158	2320	12100	0.123	1490			
6	13270	0.199	2650	12210	0.179	2190	10080	0.140	1410			
7	11370	0.223	2530	10460	0.201	2100	8640	0.156	1350			
8	9950	0.246	2450	9160	0.222	2030	7560	0.172	1300			
9	8850	0.270	2390	8140	0.243	1980	6720	0.189	1270			
10	7960	0.293	2330	7320	0.264	1930	6050	0.205	1240			
11	7240	0.305	2210	6660	0.274	1830	5500	0.213	1170			
12	6630	0.328	2180	6100	0.296	1800	5040	0.230	1160			
13	6120	0.352	2150	5630	0.317	1780	4650	0.246	1150			
14	5690	0.375	2140	5230	0.338	1770	4320	0.263	1140			
15	5310	0.399	2120	4880	0.359	1750	4030	0.279	1130			
16	4980	0.422	2100	4580	0.380	1740	3780	0.296	1120			
17	4680	0.434	2030	4310	0.391	1680	3560	0.304	1080			
18	4420	0.446	1970	4070	0.401	1630	3360	0.312	1050			
19	4190	0.457	1920	3860	0.412	1590	3180	0.320	1020			
20	3980	0.469	1870	3660	0.422	1550	3030	0.328	1000			



355PU

	Material Group ISO 513	S1 S2			S3			S4			S5		
	Hardness/Rm	< 35 HRC			35-45 HRC								
	Vc (m/min)	25-35			15-25			30-40			20-30		
	D (mm)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)
3	3180	0.042	130	2120	0.029	60	3720	0.040	150	2650	0.034	90	
4	2390	0.046	110	1590	0.032	50	2790	0.044	120	1990	0.037	70	
5	1910	0.050	90	1270	0.035	40	2230	0.047	110	1590	0.040	60	
6	1590	0.055	90	1060	0.039	40	1860	0.053	100	1330	0.044	60	
7	1360	0.061	80	910	0.043	40	1590	0.058	90	1140	0.049	60	
8	1190	0.067	80	800	0.047	40	1390	0.064	90	1000	0.054	50	
9	1060	0.073	80	710	0.051	40	1240	0.069	90	880	0.058	50	
10	960	0.078	80	640	0.055	40	1110	0.074	80	800	0.063	50	
11	870	0.084	70	580	0.059	30	1010	0.080	80	720	0.067	50	
12	800	0.092	70	530	0.064	30	930	0.087	80	660	0.073	50	
13	730	0.099	70	490	0.070	30	860	0.094	80	610	0.080	50	
14	680	0.109	70	450	0.076	30	800	0.104	80	570	0.087	50	
15	640	0.119	80	420	0.083	30	740	0.113	80	530	0.095	50	
16	600	0.128	80	400	0.090	40	700	0.122	90	500	0.103	50	
17	560	0.138	80	370	0.096	40	660	0.131	90	470	0.110	50	
18	530	0.147	80	350	0.103	40	620	0.140	90	440	0.118	50	
19	500	0.157	80	340	0.110	40	590	0.149	90	420	0.125	50	
20	480	0.166	80	320	0.116	40	560	0.158	90	400	0.133	50	

355HPU

	Material Group ISO 513	S1 S2			S3			S4			S5		
	Hardness/Rm	< 35 HRC			35-45 HRC								
	Vc (m/min)	35-55			20-40			45-65			35-55		
	D (mm)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)
3	4780	0.048	230	3180	0.034	110	5840	0.046	270	4780	0.039	190	
4	3580	0.057	200	2390	0.040	100	4380	0.054	240	3580	0.046	160	
5	2870	0.066	190	1910	0.046	90	3500	0.063	220	2870	0.053	150	
6	2390	0.075	180	1590	0.052	80	2920	0.071	210	2390	0.060	140	
7	2050	0.084	170	1360	0.059	80	2500	0.079	200	2050	0.067	140	
8	1790	0.092	170	1190	0.065	80	2190	0.088	190	1790	0.074	130	
9	1590	0.101	160	1060	0.071	80	1950	0.096	190	1590	0.081	130	
10	1430	0.110	160	960	0.077	70	1750	0.104	180	1430	0.088	130	
11	1300	0.114	150	870	0.080	70	1590	0.109	170	1300	0.091	120	
12	1190	0.123	150	800	0.086	70	1460	0.117	170	1190	0.099	120	
13	1100	0.132	150	730	0.092	70	1350	0.125	170	1100	0.106	120	
14	1020	0.141	140	680	0.099	70	1250	0.134	170	1020	0.113	110	
15	960	0.150	140	640	0.105	70	1170	0.142	170	960	0.120	110	
16	900	0.158	140	600	0.111	70	1090	0.150	160	900	0.127	110	
17	840	0.163	140	560	0.114	60	1030	0.155	160	840	0.130	110	
18	800	0.167	130	530	0.117	60	970	0.159	150	800	0.134	110	
19	750	0.172	130	500	0.120	60	920	0.163	150	750	0.137	100	
20	720	0.176	130	480	0.123	60	880	0.167	150	720	0.141	100	

- INFO
- TYPHOON TA-HTA-4HTA
- TYPHOON PU-HPU
- TYPHOON SUH
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- CARBIDE BURRS



TYPHOON SUH

HIGH PERFORMANCE - STAINLESS STEEL

🇬🇧 High performance tools for stainless steel (ISO M), steel (ISO P), cast iron (ISO K) and HRSA super alloys (ISO S) below 45 HRC.

🇮🇹 Punte ad alto rendimento per la foratura di acciaio inossidabile (ISO M), acciaio (ISO P), ghisa (ISO K) e super leghe (ISO S) sino a 45 HRC.

🇩🇪 Hochleistungsbohrer für das Bohren von rostfreiem Stahl (ISO M), Stahl (ISO P), Gusseisen (ISO K) und Superlegierungen (ISO S) bis 45 HRC.

🇫🇷 Forets haute performance pour le perçage de l'acier inoxydable (ISO M), de l'acier (ISO P), de la fonte (ISO K) et des super alliages (ISO S) jusqu'à 45 HRC.

🇪🇸 Puntas de alto rendimiento para el taladro de acero inoxidable (ISO M), acero (ISO P), hierro fundido (ISO K) e súper aleaciones (ISO S) hasta 45 HRC.

🇷🇺 Высокопроизводительный инструмент для обработки нержавеющей стали (ISO M), стали (ISO P), чугуна (ISO K) и жаропрочных сплавов (ISO S) с твёрдостью до 45 HRC.

INFO
TYPHOON TA-HTA-4HTA
TYPHOON PU-HPU
TYPHOON SUH
TYPHOON ALH
TYPHOON HRC
TYPHOON SUH MINI
TYPHOON HL
C-SD-TA
LFTA
SUTA
HSS-HSS/CO DRILLS
G2
MDTA
HF VH/UP
MEF
ALU
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UH
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CARBIDE BURRS

TYPHOON SUH
HIGH PERFORMANCE - STAINLESS STEEL

INFO
TYPHOON TA-HTA-4HTA
TYPHOON PU-HPU
TYPHOON SUH
TYPHOON ALH
TYPHOON HRC
TYPHOON SUH MINI
TYPHOON HL
C-SD-TA
LFTA
SUTA
HSS-HSS/CO DRILLS
G2
MDTA
HF VH/UP
MEF
ALU
MEX
UH
HSS/CO-HSSP END MILLS
CARBIDE BURRS



- Self-centering geometry: highly accurate holes
- Straight cutting edge: short chips for easy evacuation and high reliability
- Special edge design: high performance and edge protection
- Back taper geometry: improves the cutting efficiency
- Chip pocket finishing: highly polished to reduce welding and improve chip ejection
- Large oil holes: improves coolant feed
- Substrate and coating: specifically selected for high wear resistance, long and reliable life



- Affûtage autocentré pour l'exécution de trous précis
- Profil de l'arête droit et renforcé : il génère des copeaux courts et garantit une grande fiabilité
- Géométrie de l'arête avec affûtage spécifique pour protéger l'arête et les angles
- Géométrie du corps avec conicité arrière pour faciliter l'action de coupe
- Finition des goujures : polie pour réduire le problème du collage et facilitent l'évacuation des copeaux
- Trous de lubrification avec géométrie modifiée pour un apport de lubrifiant plus important
- Substrat et revêtement spécifiques pour garantir durée et fiabilité



- Affilatura autocentrante per l'esecuzione di fori precisi
- Profilo del tagliente diritto e rinforzato: genera trucioli corti e garantisce grande affidabilità
- Geometria del tagliente con affilatura specifica a protezione del tagliente e degli spigoli
- Geometria del corpo con conicità posteriore per agevolare l'azione di taglio
- Finitura gole: lappate per ridurre il problema dell'incollaggio e facilitare l'evacuazione dei trucioli
- Fori di refrigerazione con geometria modificata per un maggior apporto di refrigerante
- Substrato e rivestimento specifici per garantire durata e affidabilità



- Afilado autocentrante para la ejecución de agujeros precisos
- Perfil del filo recto y reforzado: genera virutas cortas y garantiza una gran fiabilidad
- Geometría del filo con afilado específico para proteger el filo y los ángulos
- Geometría del cuerpo con conicidad posterior para facilitar la acción de corte
- Acabado ranuras: lapeadas para reducir el problema del encolado y facilitar la evacuación de las virutas
- Agujeros de refrigeración con geometría modificada para una mayor aportación de refrigerante
- Substrato y revestimiento específicos para garantizar duración y fiabilidad



- Selbstzentrierender Schliff für die Herstellung von präzisen Bohrungen
- Gerades und verstärktes Schneidkantenprofil: zur Erzeugung kurzer Späne und zur Gewährleistung hoher Zuverlässigkeit
- Geometrie der Schneidkante mit speziellem Schliff zum Schutz von Schneidkante und Kanten
- Geometrie des Körpers mit konischem hinteren Bereich zur Erleichterung des Schnittvorgangs
- Schlichtbearbeitung der Nuten: geläpft, um Probleme durch Verkleben zu reduzieren und um die Späneabführung zu erleichtern
- Kühlöffnungen mit abgeänderter Geometrie für einen verbesserten Kühlmittelzufluss
- Spezielles Trägermaterial und spezielle Beschichtung zur Gewährleistung von Standzeit und Zuverlässigkeit



- Самоцентрирующаяся геометрия: высокая точность отверстий
- Прямые режущие кромки: формирование короткой стружки и высокая надежность
- Геометрия режущей кромки со специальной заточкой: высокая производительность и защита кромок
- Геометрия с обратным конусом: увеличивает эффективность обработки
- Отполированные стружечные канавки: уменьшают вероятность приваривания стружки и облегчают ее вывод
- Широкие каналы для СОЖ: увеличена эффективность подвода СОЖ
- Специальное покрытие для повышения стойкости инструмента

353SUH

stainless steel, polished flutes, SUH (through coolant)



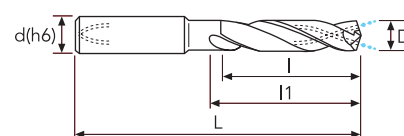
3XD

DIN 6537K

MG PV300

P	M	K	N	S	H
☆	★	☆	☆	☆	

★ 1st choice ☆ suitable



D(m7)	D Tol.	d(h6)	l	l1	L	EDP No.	Stock
3.00	+0.012/+0.002	6	14	20	62	353SUH0300	●
3.10	+0.016/+0.004	6	14	20	62	353SUH0310	●
3.20	+0.016/+0.004	6	14	20	62	353SUH0320	●
3.30	+0.016/+0.004	6	14	20	62	353SUH0330	●
3.40	+0.016/+0.004	6	14	20	62	353SUH0340	●
3.50	+0.016/+0.004	6	14	20	62	353SUH0350	●
3.60	+0.016/+0.004	6	14	20	62	353SUH0360	●
3.70	+0.016/+0.004	6	14	20	62	353SUH0370	●
3.80	+0.016/+0.004	6	17	24	66	353SUH0380	●
3.90	+0.016/+0.004	6	17	24	66	353SUH0390	●
4.00	+0.016/+0.004	6	17	24	66	353SUH0400	●
4.10	+0.016/+0.004	6	17	24	66	353SUH0410	●
4.20	+0.016/+0.004	6	17	24	66	353SUH0420	●
4.30	+0.016/+0.004	6	17	24	66	353SUH0430	●
4.40	+0.016/+0.004	6	17	24	66	353SUH0440	●
4.50	+0.016/+0.004	6	17	24	66	353SUH0450	●
4.60	+0.016/+0.004	6	17	24	66	353SUH0460	●
4.70	+0.016/+0.004	6	17	24	66	353SUH0470	●
4.80	+0.016/+0.004	6	20	28	66	353SUH0480	●
4.90	+0.016/+0.004	6	20	28	66	353SUH0490	●
5.00	+0.016/+0.004	6	20	28	66	353SUH0500	●
5.10	+0.016/+0.004	6	20	28	66	353SUH0510	●
5.20	+0.016/+0.004	6	20	28	66	353SUH0520	●
5.30	+0.016/+0.004	6	20	28	66	353SUH0530	●
5.40	+0.016/+0.004	6	20	28	66	353SUH0540	●
5.50	+0.016/+0.004	6	20	28	66	353SUH0550	●
5.60	+0.016/+0.004	6	20	28	66	353SUH0560	●
5.70	+0.016/+0.004	6	20	28	66	353SUH0570	●
5.80	+0.016/+0.004	6	20	28	66	353SUH0580	●
5.90	+0.016/+0.004	6	20	28	66	353SUH0590	●
6.00	+0.016/+0.004	6	20	28	66	353SUH0600	●
6.10	+0.021/+0.006	8	24	34	79	353SUH0610	●
6.20	+0.021/+0.006	8	24	34	79	353SUH0620	●
6.30	+0.021/+0.006	8	24	34	79	353SUH0630	●
6.40	+0.021/+0.006	8	24	34	79	353SUH0640	●
6.50	+0.021/+0.006	8	24	34	79	353SUH0650	●
6.60	+0.021/+0.006	8	24	34	79	353SUH0660	●
6.70	+0.021/+0.006	8	24	34	79	353SUH0670	●
6.80	+0.021/+0.006	8	24	34	79	353SUH0680	●

INFO
TYPHOON TA-HTA-4HTA
TYPHOON PU-HPU
TYPHOON SUH
TYPHOON ALH
TYPHOON HRC
TYPHOON SUH MINI
TYPHOON HL
C-SD-TA
LFTA
SUTA
HSS-HSS/CO DRILLS
G2
MDTA
HF VH/UP
MEF
ALU
MEX
UH
HSS/CO-HSSP END MILLS
CARBIDE BURRS

● stock standard ○ non-standard stock ▽ stock exhaustion

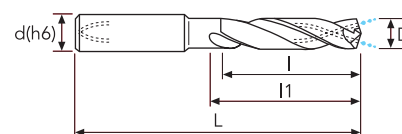
353SUH

stainless steel, polished flutes, SUH (through coolant)



P	M	K	N	S	H
☆	★	☆	☆	☆	

★ 1st choice ☆ suitable



D(m7)	D Tol.	d(h6)	l	l1	L	EDP No.	Stock
6.90	+0.021/+0.006	8	24	34	79	353SUH0690	●
7.00	+0.021/+0.006	8	24	34	79	353SUH0700	●
7.10	+0.021/+0.006	8	29	41	79	353SUH0710	●
7.20	+0.021/+0.006	8	29	41	79	353SUH0720	●
7.30	+0.021/+0.006	8	29	41	79	353SUH0730	●
7.40	+0.021/+0.006	8	29	41	79	353SUH0740	●
7.50	+0.021/+0.006	8	29	41	79	353SUH0750	●
7.60	+0.021/+0.006	8	29	41	79	353SUH0760	●
7.70	+0.021/+0.006	8	29	41	79	353SUH0770	●
7.80	+0.021/+0.006	8	29	41	79	353SUH0780	●
7.90	+0.021/+0.006	8	29	41	79	353SUH0790	●
8.00	+0.021/+0.006	8	29	41	79	353SUH0800	●
8.10	+0.021/+0.006	10	35	47	89	353SUH0810	●
8.20	+0.021/+0.006	10	35	47	89	353SUH0820	●
8.30	+0.021/+0.006	10	35	47	89	353SUH0830	●
8.40	+0.021/+0.006	10	35	47	89	353SUH0840	●
8.50	+0.021/+0.006	10	35	47	89	353SUH0850	●
8.60	+0.021/+0.006	10	35	47	89	353SUH0860	●
8.70	+0.021/+0.006	10	35	47	89	353SUH0870	●
8.80	+0.021/+0.006	10	35	47	89	353SUH0880	●
8.90	+0.021/+0.006	10	35	47	89	353SUH0890	●
9.00	+0.021/+0.006	10	35	47	89	353SUH0900	●
9.10	+0.021/+0.006	10	35	47	89	353SUH0910	●
9.20	+0.021/+0.006	10	35	47	89	353SUH0920	●
9.30	+0.021/+0.006	10	35	47	89	353SUH0930	●
9.40	+0.021/+0.006	10	35	47	89	353SUH0940	●
9.50	+0.021/+0.006	10	35	47	89	353SUH0950	●
9.60	+0.021/+0.006	10	35	47	89	353SUH0960	●
9.70	+0.021/+0.006	10	35	47	89	353SUH0970	●
9.80	+0.021/+0.006	10	35	47	89	353SUH0980	●
9.90	+0.021/+0.006	10	35	47	89	353SUH0990	●
10.00	+0.021/+0.006	10	35	47	89	353SUH1000	●
10.20	+0.025/+0.007	12	40	55	102	353SUH1020	●
10.50	+0.025/+0.007	12	40	55	102	353SUH1050	●
10.80	+0.025/+0.007	12	40	55	102	353SUH1080	●
11.00	+0.025/+0.007	12	40	55	102	353SUH1100	●
11.20	+0.025/+0.007	12	40	55	102	353SUH1120	○
11.30	+0.025/+0.007	12	40	55	102	353SUH1130	○
11.50	+0.025/+0.007	12	40	55	102	353SUH1150	●

● stock standard ○ non-standard stock ▽ stock exhaustion

353SUH

Material Group ISO 513	P1 P2			P3 P4			P5			P6					
	Hardness/Rm			500-700 N/mm ²			600-1000 N/mm ²			900-1200 N/mm ²			1200-1400 N/mm ²		
	Vc (m/min)			130-150			100-140			80-100			55-75		
	D (mm)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)		
3	14860	0.118	1760	12740	0.106	1360	9550	0.095	900	6900	0.083	570			
4	11150	0.140	1560	9550	0.126	1200	7170	0.112	800	5180	0.098	510			
5	8920	0.161	1440	7640	0.145	1110	5730	0.129	740	4140	0.113	470			
6	7430	0.183	1360	6370	0.164	1050	4780	0.146	700	3450	0.128	440			
7	6370	0.204	1300	5460	0.184	1000	4090	0.163	670	2960	0.143	420			
8	5570	0.226	1260	4780	0.203	970	3580	0.181	650	2590	0.158	410			
9	4950	0.247	1220	4250	0.223	950	3180	0.198	630	2300	0.173	400			
10	4460	0.269	1200	3820	0.242	920	2870	0.215	620	2070	0.188	390			
11	4050	0.280	1130	3470	0.252	870	2610	0.224	580	1880	0.196	370			
12	3720	0.301	1120	3180	0.271	860	2390	0.241	580	1730	0.211	360			
13	3430	0.323	1110	2940	0.290	850	2200	0.258	570	1590	0.226	360			
14	3180	0.344	1090	2730	0.310	850	2050	0.275	560	1480	0.241	360			
15	2970	0.366	1090	2550	0.329	840	1910	0.292	560	1380	0.256	350			
16	2790	0.387	1080	2390	0.348	830	1790	0.310	550	1290	0.271	350			
17	2620	0.398	1040	2250	0.358	810	1690	0.318	540	1220	0.278	340			
18	2480	0.409	1010	2120	0.368	780	1590	0.327	520	1150	0.286	330			
19	2350	0.419	990	2010	0.377	760	1510	0.335	510	1090	0.293	320			
20	2230	0.430	960	1910	0.387	740	1430	0.344	490	1040	0.301	310			



Material Group ISO 513	M1 M2			M3			M4			M5					
	Hardness/Rm			< 750 N/mm ²			550-850 N/mm ²			650-950 N/mm ²			850-1200 N/mm ²		
	Vc (m/min)			50-70			40-60			30-40			20-30		
	D (mm)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)		
3	6370	0.077	490	5310	0.061	330	3720	0.054	200	2650	0.046	120			
4	4780	0.091	430	3980	0.073	290	2790	0.064	180	1990	0.055	110			
5	3820	0.105	400	3180	0.084	270	2230	0.073	160	1590	0.063	100			
6	3180	0.119	380	2650	0.095	250	1860	0.083	150	1330	0.071	90			
7	2730	0.133	360	2270	0.106	240	1590	0.093	150	1140	0.080	90			
8	2390	0.147	350	1990	0.117	230	1390	0.103	140	1000	0.088	90			
9	2120	0.161	340	1770	0.129	230	1240	0.112	140	880	0.096	80			
10	1910	0.175	330	1590	0.140	220	1110	0.122	140	800	0.105	80			
11	1740	0.182	320	1450	0.145	210	1010	0.127	130	720	0.109	80			
12	1590	0.196	310	1330	0.157	210	930	0.137	130	660	0.117	80			
13	1470	0.210	310	1220	0.168	200	860	0.147	130	610	0.126	80			
14	1360	0.224	300	1140	0.179	200	800	0.157	130	570	0.134	80			
15	1270	0.238	300	1060	0.190	200	740	0.166	120	530	0.143	80			
16	1190	0.252	300	1000	0.201	200	700	0.176	120	500	0.151	80			
17	1120	0.259	290	940	0.207	190	660	0.181	120	470	0.155	70			
18	1060	0.266	280	880	0.212	190	620	0.186	120	440	0.159	70			
19	1010	0.273	280	840	0.218	180	590	0.191	110	420	0.164	70			
20	960	0.280	270	800	0.224	180	560	0.196	110	400	0.168	70			



353SUH

	Material Group ISO 513	K1			K2			K3			K4		
	Hardness/Rm	150-250 HB			150-350 HB			120-260 HB			250-500 HB		
	Vc (m/min)	110-130			90-110			70-90			55-75		
	D (mm)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)
3	12740	0.118	1510	10620	0.106	1130	8490	0.095	800	6900	0.083	570	
4	9550	0.140	1330	7960	0.126	1000	6370	0.112	710	5180	0.098	510	
5	7640	0.161	1230	6370	0.145	920	5100	0.129	660	4140	0.113	470	
6	6370	0.183	1160	5310	0.164	870	4250	0.146	620	3450	0.128	440	
7	5460	0.204	1120	4550	0.184	840	3640	0.163	590	2960	0.143	420	
8	4780	0.226	1080	3980	0.203	810	3180	0.181	570	2590	0.158	410	
9	4250	0.247	1050	3540	0.223	790	2830	0.198	560	2300	0.173	400	
10	3820	0.269	1030	3180	0.242	770	2550	0.215	550	2070	0.188	390	
11	3470	0.280	970	2900	0.252	730	2320	0.224	520	1880	0.196	370	
12	3180	0.301	960	2650	0.271	720	2120	0.241	510	1730	0.211	360	
13	2940	0.323	950	2450	0.290	710	1960	0.258	510	1590	0.226	360	
14	2730	0.344	940	2270	0.310	700	1820	0.275	500	1480	0.241	360	
15	2550	0.366	930	2120	0.329	700	1700	0.292	500	1380	0.256	350	
16	2390	0.387	920	1990	0.348	690	1590	0.310	490	1290	0.271	350	
17	2250	0.398	890	1870	0.358	670	1500	0.318	480	1220	0.278	340	
18	2120	0.409	870	1770	0.368	650	1420	0.327	460	1150	0.286	330	
19	2010	0.419	840	1680	0.377	630	1340	0.335	450	1090	0.293	320	
20	1910	0.430	820	1590	0.387	620	1270	0.344	440	1040	0.301	310	

	Material Group ISO 513	N2			N4							
	Hardness/Rm											
	Vc (m/min)	180-220			160-200							
	D (mm)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)					
3	21230	0.128	2710	19110	0.128	2440						
4	15920	0.151	2400	14330	0.151	2160						
5	12740	0.174	2220	11460	0.174	2000						
6	10620	0.197	2100	9550	0.197	1880						
7	9100	0.221	2010	8190	0.221	1810						
8	7960	0.244	1940	7170	0.244	1750						
9	7080	0.267	1890	6370	0.267	1700						
10	6370	0.290	1850	5730	0.290	1660						
11	5790	0.302	1750	5210	0.302	1570						
12	5310	0.325	1730	4780	0.325	1550						
13	4900	0.348	1710	4410	0.348	1540						
14	4550	0.372	1690	4090	0.372	1520						
15	4250	0.395	1680	3820	0.395	1510						
16	3980	0.418	1660	3580	0.418	1500						
17	3750	0.430	1610	3370	0.430	1450						
18	3540	0.441	1560	3180	0.441	1400						
19	3350	0.453	1520	3020	0.453	1370						
20	3180	0.464	1480	2870	0.464	1330						

- INFO
- TYPHOON TA-HTA-4HTA
- TYPHOON PU-HPU
- TYPHOON SUH
- TYPHOON ALH
- TYPHOON HRC
- TYPHOON SUH MINI
- TYPHOON HL
- C-SD-TA
- LFTA
- SUTA
- HSS-HSS/CO DRILLS
- G2
- MDTA
- HF VH/UP
- MEF
- ALU
- MEX
- UH
- HSS/CO-HSSP END MILLS
- CARBIDE BURRS

353SUH

Material Group ISO 513	S1 S2			S3			S4			S5		
	Hardness/Rm			35-45 HRC			45-65			35-55		
	Vc (m/min)			30-50			20-40			35-55		
D (mm)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)
3	4250	0.053	230	3180	0.037	120	5840	0.051	300	4780	0.043	200
4	3180	0.063	200	2390	0.044	110	4380	0.060	260	3580	0.050	180
5	2550	0.073	190	1910	0.051	100	3500	0.069	240	2870	0.058	170
6	2120	0.082	170	1590	0.058	90	2920	0.078	230	2390	0.066	160
7	1820	0.092	170	1360	0.064	90	2500	0.087	220	2050	0.074	150
8	1590	0.102	160	1190	0.071	80	2190	0.097	210	1790	0.081	150
9	1420	0.111	160	1060	0.078	80	1950	0.106	210	1590	0.089	140
10	1270	0.121	150	960	0.085	80	1750	0.115	200	1430	0.097	140
11	1160	0.126	150	870	0.088	80	1590	0.119	190	1300	0.101	130
12	1060	0.135	140	800	0.095	80	1460	0.129	190	1190	0.108	130
13	980	0.145	140	730	0.102	70	1350	0.138	190	1100	0.116	130
14	910	0.155	140	680	0.108	70	1250	0.147	180	1020	0.124	130
15	850	0.164	140	640	0.115	70	1170	0.156	180	960	0.132	130
16	800	0.174	140	600	0.122	70	1090	0.165	180	900	0.139	130
17	750	0.179	130	560	0.125	70	1030	0.170	180	840	0.143	120
18	710	0.184	130	530	0.129	70	970	0.175	170	800	0.147	120
19	670	0.189	130	500	0.132	70	920	0.179	160	750	0.151	110
20	640	0.194	120	480	0.135	70	880	0.155	140	720	0.155	110



- INFO
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- HSS-HSS/CO DRILLS
- G2
- MDTA
- HF VH/UP
- MEF
- ALU
- MEX
- UH
- HSS/CO-HSSP END MILLS
- CARBIDE BURRS

355SUH

stainless steel, polished flutes, SUH (through coolant)



5XD

DIN
6537L

SUH

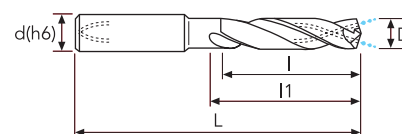
MG
PV300

140°

30°

P	M	K	N	S	H
☆	★	☆	☆	☆	

★ 1st choice ☆ suitable



D(m7)	D Tol.	d(h6)	l	l1	L	EDP No.	Stock
3.00	+0.012/+0.002	6	23	28	66	355SUH0300	●
3.10	+0.016/+0.004	6	23	28	66	355SUH0310	●
3.20	+0.016/+0.004	6	23	28	66	355SUH0320	●
3.30	+0.016/+0.004	6	23	28	66	355SUH0330	●
3.40	+0.016/+0.004	6	23	28	66	355SUH0340	●
3.50	+0.016/+0.004	6	23	28	66	355SUH0350	●
3.60	+0.016/+0.004	6	23	28	66	355SUH0360	●
3.70	+0.016/+0.004	6	23	28	66	355SUH0370	●
3.80	+0.016/+0.004	6	29	36	74	355SUH0380	●
3.90	+0.016/+0.004	6	29	36	74	355SUH0390	●
4.00	+0.016/+0.004	6	29	36	74	355SUH0400	●
4.10	+0.016/+0.004	6	29	36	74	355SUH0410	●
4.20	+0.016/+0.004	6	29	36	74	355SUH0420	●
4.30	+0.016/+0.004	6	29	36	74	355SUH0430	●
4.40	+0.016/+0.004	6	29	36	74	355SUH0440	●
4.50	+0.016/+0.004	6	29	36	74	355SUH0450	●
4.60	+0.016/+0.004	6	29	36	74	355SUH0460	●
4.70	+0.016/+0.004	6	29	36	74	355SUH0470	●
4.80	+0.016/+0.004	6	35	44	82	355SUH0480	●
4.90	+0.016/+0.004	6	35	44	82	355SUH0490	●
5.00	+0.016/+0.004	6	35	44	82	355SUH0500	●
5.10	+0.016/+0.004	6	35	44	82	355SUH0510	●
5.20	+0.016/+0.004	6	35	44	82	355SUH0520	●
5.30	+0.016/+0.004	6	35	44	82	355SUH0530	●
5.40	+0.016/+0.004	6	35	44	82	355SUH0540	●
5.50	+0.016/+0.004	6	35	44	82	355SUH0550	●
5.60	+0.016/+0.004	6	35	44	82	355SUH0560	●
5.70	+0.016/+0.004	6	35	44	82	355SUH0570	●
5.80	+0.016/+0.004	6	35	44	82	355SUH0580	●
5.90	+0.016/+0.004	6	35	44	82	355SUH0590	●
6.00	+0.016/+0.004	6	35	44	82	355SUH0600	●
6.10	+0.021/+0.006	8	43	53	91	355SUH0610	●
6.20	+0.021/+0.006	8	43	53	91	355SUH0620	●
6.30	+0.021/+0.006	8	43	53	91	355SUH0630	●
6.40	+0.021/+0.006	8	43	53	91	355SUH0640	●
6.50	+0.021/+0.006	8	43	53	91	355SUH0650	●
6.60	+0.021/+0.006	8	43	53	91	355SUH0660	●
6.70	+0.021/+0.006	8	43	53	91	355SUH0670	●
6.80	+0.021/+0.006	8	43	53	91	355SUH0680	●

- INFO
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- MEF
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- HSS/CO-HSSP END MILLS
- CARBIDE BURRS

● stock standard ○ non-standard stock ▽ stock exhaustion

355SUH

stainless steel, polished flutes, SUH (through coolant)

5XD

DIN
6537L

SUH

MG
PV300

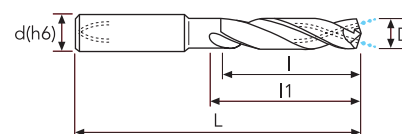
140°

30°



P	M	K	N	S	H
☆	★	☆	☆	☆	

★ 1st choice ☆ suitable



D(m7)	D Tol.	d(h6)	l	l1	L	EDP No.	Stock
6.90	+0.021/+0.006	8	43	53	91	355SUH0690	●
7.00	+0.021/+0.006	8	43	53	91	355SUH0700	●
7.10	+0.021/+0.006	8	43	53	91	355SUH0710	●
7.20	+0.021/+0.006	8	43	53	91	355SUH0720	●
7.30	+0.021/+0.006	8	43	53	91	355SUH0730	●
7.40	+0.021/+0.006	8	43	53	91	355SUH0740	●
7.50	+0.021/+0.006	8	43	53	91	355SUH0750	●
7.60	+0.021/+0.006	8	43	53	91	355SUH0760	●
7.70	+0.021/+0.006	8	43	53	91	355SUH0770	●
7.80	+0.021/+0.006	8	43	53	91	355SUH0780	●
7.90	+0.021/+0.006	8	43	53	91	355SUH0790	●
8.00	+0.021/+0.006	8	43	53	91	355SUH0800	●
8.10	+0.021/+0.006	10	49	61	103	355SUH0810	●
8.20	+0.021/+0.006	10	49	61	103	355SUH0820	●
8.30	+0.021/+0.006	10	49	61	103	355SUH0830	●
8.40	+0.021/+0.006	10	49	61	103	355SUH0840	●
8.50	+0.021/+0.006	10	49	61	103	355SUH0850	●
8.60	+0.021/+0.006	10	49	61	103	355SUH0860	●
8.70	+0.021/+0.006	10	49	61	103	355SUH0870	●
8.80	+0.021/+0.006	10	49	61	103	355SUH0880	●
8.90	+0.021/+0.006	10	49	61	103	355SUH0890	●
9.00	+0.021/+0.006	10	49	61	103	355SUH0900	●
9.10	+0.021/+0.006	10	49	61	103	355SUH0910	●
9.20	+0.021/+0.006	10	49	61	103	355SUH0920	●
9.30	+0.021/+0.006	10	49	61	103	355SUH0930	●
9.40	+0.021/+0.006	10	49	61	103	355SUH0940	●
9.50	+0.021/+0.006	10	61	61	103	355SUH0950	●
9.60	+0.021/+0.006	10	61	61	103	355SUH0960	●
9.70	+0.021/+0.006	10	61	61	103	355SUH0970	●
9.80	+0.021/+0.006	10	61	61	103	355SUH0980	●
9.90	+0.021/+0.006	10	61	61	103	355SUH0990	●
10.00	+0.021/+0.006	10	61	61	103	355SUH1000	●
10.20	+0.025/+0.007	12	71	71	118	355SUH1020	●
10.30	+0.025/+0.007	12	71	71	118	355SUH1030	●
10.50	+0.025/+0.007	12	71	71	118	355SUH1050	●
10.80	+0.025/+0.007	12	71	71	118	355SUH1080	●
11.00	+0.025/+0.007	12	71	71	118	355SUH1100	●
11.20	+0.025/+0.007	12	71	71	118	355SUH1120	●
11.30	+0.025/+0.007	12	71	71	118	355SUH1130	●

● stock standard ○ non-standard stock ▽ stock exhaustion

355SUH

Material Group ISO 513	P1 P2			P3 P4			P5			P6				
	500-700 N/mm ²			600-1000 N/mm ²			900-1200 N/mm ²			1200-1400 N/mm ²				
	Vc (m/min)			120-140			100-120			70-90			45-65	
D (mm)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)		
3	13800	0.101	1390	11680	0.075	880	8490	0.060	510	5840	0.050	290		
4	10350	0.119	1230	8760	0.089	780	6370	0.071	450	4380	0.059	260		
5	8280	0.137	1130	7010	0.103	720	5100	0.082	420	3500	0.069	240		
6	6900	0.155	1070	5840	0.117	680	4250	0.093	400	2920	0.078	230		
7	5910	0.174	1030	5000	0.130	650	3640	0.104	380	2500	0.087	220		
8	5180	0.192	990	4380	0.144	630	3180	0.115	370	2190	0.096	210		
9	4600	0.210	970	3890	0.158	610	2830	0.126	360	1950	0.105	200		
10	4140	0.228	950	3500	0.171	600	2550	0.137	350	1750	0.114	200		
11	3760	0.238	890	3180	0.178	570	2320	0.143	330	1590	0.119	190		
12	3450	0.256	880	2920	0.192	560	2120	0.154	330	1460	0.128	190		
13	3180	0.274	870	2690	0.206	550	1960	0.164	320	1350	0.137	190		
14	2960	0.292	870	2500	0.219	550	1820	0.175	320	1250	0.146	180		
15	2760	0.311	860	2340	0.233	550	1700	0.186	320	1170	0.155	180		
16	2590	0.329	850	2190	0.247	540	1590	0.197	310	1090	0.164	180		
17	2440	0.338	820	2060	0.254	520	1500	0.203	300	1030	0.169	170		
18	2300	0.347	800	1950	0.260	510	1420	0.208	300	970	0.174	170		
19	2180	0.356	780	1840	0.267	490	1340	0.214	290	920	0.178	160		
20	2070	0.366	760	1750	0.274	480	1270	0.219	280	880	0.183	160		



Material Group ISO 513	M1			M3			M4			M5				
	< 750 N/mm ²			550-850 N/mm ²			650-950 N/mm ²			850-1200 N/mm ²				
	Vc (m/min)			40-60			30-50			25-35			15-25	
D (mm)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)		
3	5310	0.065	350	4250	0.052	220	3180	0.046	150	2120	0.039	80		
4	3980	0.077	310	3180	0.062	200	2390	0.054	130	1590	0.046	70		
5	3180	0.089	280	2550	0.071	180	1910	0.062	120	1270	0.053	70		
6	2650	0.101	270	2120	0.081	170	1590	0.071	110	1060	0.061	60		
7	2270	0.113	260	1820	0.090	160	1360	0.079	110	910	0.068	60		
8	1990	0.125	250	1590	0.100	160	1190	0.087	100	800	0.075	60		
9	1770	0.137	240	1420	0.109	160	1060	0.096	100	710	0.082	60		
10	1590	0.148	240	1270	0.119	150	960	0.104	100	640	0.089	60		
11	1450	0.154	220	1160	0.124	140	870	0.108	90	580	0.093	50		
12	1330	0.166	220	1060	0.133	140	800	0.116	90	530	0.100	50		
13	1220	0.178	220	980	0.143	140	730	0.125	90	490	0.107	50		
14	1140	0.190	220	910	0.152	140	680	0.133	90	450	0.114	50		
15	1060	0.202	210	850	0.162	140	640	0.141	90	420	0.121	50		
16	1000	0.214	210	800	0.171	140	600	0.150	90	400	0.128	50		
17	940	0.220	210	750	0.176	130	560	0.154	90	370	0.132	50		
18	880	0.226	200	710	0.181	130	530	0.158	80	350	0.135	50		
19	840	0.232	190	670	0.185	120	500	0.162	80	340	0.139	50		
20	800	0.238	190	640	0.190	120	480	0.166	80	320	0.143	50		



355SUH

	Material Group ISO 513	K1			K2			K3			K4		
	Hardness/Rm	150-250 HB			150-350 HB			120-260 HB			250-500 HB		
	Vc (m/min)	100-120			80-100			55-75			40-60		
	D (mm)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)
3	11680	0.101	1170	9550	0.090	860	6900	0.080	550	5310	0.070	370	
4	8760	0.119	1040	7170	0.107	770	5180	0.095	490	3980	0.083	330	
5	7010	0.137	960	5730	0.123	710	4140	0.110	450	3180	0.096	310	
6	5840	0.155	910	4780	0.140	670	3450	0.124	430	2650	0.109	290	
7	5000	0.174	870	4090	0.156	640	2960	0.139	410	2270	0.122	280	
8	4380	0.192	840	3580	0.173	620	2590	0.154	400	1990	0.134	270	
9	3890	0.210	820	3180	0.189	600	2300	0.168	390	1770	0.147	260	
10	3500	0.228	800	2870	0.206	590	2070	0.183	380	1590	0.160	250	
11	3180	0.238	760	2610	0.214	560	1880	0.190	360	1450	0.166	240	
12	2920	0.256	750	2390	0.230	550	1730	0.205	350	1330	0.179	240	
13	2690	0.274	740	2200	0.247	540	1590	0.219	350	1220	0.192	230	
14	2500	0.292	730	2050	0.263	540	1480	0.234	350	1140	0.205	230	
15	2340	0.311	730	1910	0.280	530	1380	0.249	340	1060	0.217	230	
16	2190	0.329	720	1790	0.296	530	1290	0.263	340	1000	0.230	230	
17	2060	0.338	700	1690	0.304	510	1220	0.270	330	940	0.237	220	
18	1950	0.347	680	1590	0.313	500	1150	0.278	320	880	0.243	210	
19	1840	0.356	660	1510	0.321	480	1090	0.285	310	840	0.249	210	
20	1750	0.366	640	1430	0.329	470	1040	0.292	300	800	0.256	200	

	Material Group ISO 513	N2			N4								
	Hardness/Rm												
	Vc (m/min)	180-220			160-200								
	D (mm)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)						
3	21230	0.109	2300	19110	0.096	1840							
4	15920	0.128	2040	14330	0.114	1630							
5	12740	0.148	1890	11460	0.132	1510							
6	10620	0.168	1780	9550	0.149	1420							
7	9100	0.188	1710	8190	0.167	1370							
8	7960	0.207	1650	7170	0.184	1320							
9	7080	0.227	1610	6370	0.202	1290							
10	6370	0.247	1570	5730	0.219	1260							
11	5790	0.257	1490	5210	0.228	1190							
12	5310	0.276	1470	4780	0.246	1170							
13	4900	0.296	1450	4410	0.263	1160							
14	4550	0.316	1440	4090	0.281	1150							
15	4250	0.336	1430	3820	0.298	1140							
16	3980	0.355	1410	3580	0.316	1130							
17	3750	0.365	1370	3370	0.325	1090							
18	3540	0.375	1330	3180	0.333	1060							
19	3350	0.385	1290	3020	0.342	1030							
20	3180	0.395	1260	2870	0.351	1010							

- INFO
- TYPHOON TA-HTA-4HTA
- TYPHOON PU-HPU
- TYPHOON SUH
- TYPHOON ALH
- TYPHOON HRC
- TYPHOON SUH MINI
- TYPHOON HL
- C-SD-TA
- LFTA
- SUTA
- HSS-HSS/CO DRILLS
- G2
- MDTA
- HF VH/UP
- MEF
- ALU
- MEX
- UH
- HSS/CO-HSSP END MILLS
- CARBIDE BURRS

355SUH

Material Group ISO 513	S1 S2		S3			S4			S5			
	< 35 HRC			35-45 HRC								
	25-45			15-35			40-60			30-50		
Vc (m/min)												
D (mm)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)
3	3720	0.045	170	2650	0.032	80	5310	0.043	230	4250	0.036	150
4	2790	0.053	150	1990	0.037	70	3980	0.051	200	3180	0.043	140
5	2230	0.062	140	1590	0.043	70	3180	0.059	190	2550	0.049	130
6	1860	0.070	130	1330	0.049	70	2650	0.066	180	2120	0.056	120
7	1590	0.078	120	1140	0.055	60	2270	0.074	170	1820	0.063	110
8	1390	0.086	120	1000	0.060	60	1990	0.082	160	1590	0.069	110
9	1240	0.095	120	880	0.066	60	1770	0.090	160	1420	0.076	110
10	1110	0.103	110	800	0.072	60	1590	0.098	160	1270	0.082	100
11	1010	0.107	110	720	0.075	50	1450	0.102	150	1160	0.086	100
12	930	0.115	110	660	0.081	50	1330	0.109	150	1060	0.092	100
13	860	0.123	110	610	0.086	50	1220	0.117	140	980	0.099	100
14	800	0.132	110	570	0.092	50	1140	0.125	140	910	0.105	100
15	740	0.140	100	530	0.098	50	1060	0.133	140	850	0.112	100
16	700	0.148	100	500	0.104	50	1000	0.141	140	800	0.118	90
17	660	0.152	100	470	0.106	50	940	0.145	140	750	0.122	90
18	620	0.156	100	440	0.109	50	880	0.148	130	710	0.125	90
19	590	0.160	90	420	0.112	50	840	0.152	130	670	0.128	90
20	560	0.164	90	400	0.115	50	800	0.156	130	640	0.132	80



- INFO
- TYPHOON TA-HTA-4HTA
- TYPHOON PU-HPU
- TYPHOON SUH
- TYPHOON ALH
- TYPHOON HRC
- TYPHOON SUH MINI
- TYPHOON HL
- C-SD-TA
- LFTA
- SUTA
- HSS-HSS/CO DRILLS
- G2
- MDTA
- HF VH/UP
- MEF
- ALU
- MEX
- UH
- HSS/CO-HSSP END MILLS
- CARBIDE BURRS



TYPHOON ALH

HIGH PERFORMANCE - NON-FERROUS MATERIALS

- 🇬🇧 Drills specifically designed for non-ferrous materials (ISO N).
- 🇮🇹 Punte progettate appositamente per la foratura di materiali non ferrosi (ISO N).
- 🇩🇪 Eigens für das Bohren von nicht eisenhaltigen Materialien (ISO N) entwickelte Bohrer.
- 🇫🇷 Forets conçus spécialement pour le perçage de matériaux non ferreux (ISO N).
- 🇪🇸 Puntas proyectadas específicamente para el taladro de materiales no ferrosos (ISO N).
- 🇷🇺 Свёрла, разработанные специально для сверления отверстий в цветных металлах (ISO N).

INFO

TYPHOON
TA-HTA-4HTA

TYPHOON
PU-HPU

TYPHOON
SUH

TYPHOON
ALH

TYPHOON
HRC

TYPHOON
SUH MINI

TYPHOON
HL

C-SD-TA

LFTA

SUTA

HSS-HSS/CO
DRILLS

G2

MDTA

HF VH/UP

MEF

ALU

MEX

UH

HSS/CO-HSSP
END MILLS

CARBIDE
BURRS

TYPHOON ALH

HIGH PERFORMANCE - NON-FERROUS MATERIALS

INFO
TYPHOON TA-HTA-4HTA
TYPHOON PU-HPU
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TYPHOON ALH
TYPHOON HRC
TYPHOON SUH MINI
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HF VH/UP
MEF
ALU
MEX
UH
HSS/CO-HSSP END MILLS
CARBIDE BURRS



- Self-centering geometry: highly accurate holes
- Straight cutting edge and highly positive geometry: low cutting forces to prevent welding
- Chip pocket: wide and curved to improve the chip ejection
- Back taper geometry: improves the cutting efficiency
- Chip pocket finishing: highly polished to reduce welding and improve chip ejection
- Modified oil holes: improves coolant feed
- Substrate: specifically selected for high wear resistance, long and reliable life



- Affûtage autocentré pour l'exécution de trous précis
- Profil de l'arête droit avec affûtage spécifique pour réduire l'effort de coupe
- Géométrie des goujures : arquées et larges pour faciliter l'évacuation des copeaux
- Géométrie du corps avec conicité arrière pour faciliter l'action de coupe
- Finition des goujures : polie pour réduire le problème du collage et faciliter l'évacuation des copeaux
- Trous de lubrification avec géométrie modifiée pour un apport de lubrifiant plus important
- Substrat spécifique pour garantir durée et fiabilité



- Affilatura autocentrante per l'esecuzione di fori precisi
- Profilo del tagliente diritto con affilatura specifica per ridurre lo sforzo di taglio
- Geometria delle gole: arcuate e ampie per agevolare l'evacuazione dei trucioli
- Geometria del corpo con conicità posteriore per agevolare l'azione di taglio
- Finitura gole: lappate per ridurre il problema dell'incollaggio e facilitare l'evacuazione dei trucioli
- Fori di refrigerazione con geometria modificata per un maggior apporto di refrigerante
- Substrato specifico per garantire durata e affidabilità



- Afilado autocentrante para la ejecución de agujeros precisos
- Perfil del borde recto con afilado específico para reducir el esfuerzo de corte
- Geometría de las ranuras: arqueadas y amplias para facilitar la evacuación de las virutas
- Geometría del cuerpo con conicidad posterior para facilitar la acción de corte
- Acabado ranuras: lapeadas para reducir el problema del encolado y facilitar la evacuación de las virutas
- Agujeros de refrigeración con geometría modificada para una mayor aportación de refrigerante
- Substrato específico para garantizar duración y fiabilidad



- Selbstzentrierender Schliff für die Herstellung von präzisen Bohrungen
- Gerades Schneidkantenprofil mit Spezialschliff zur Reduzierung des Schneiddrucks
- Geometrie der Nuten: gebogen und breit zur Vereinfachung der Späneabführung
- Geometrie des Körpers mit konischem hinteren Bereich zur Erleichterung des Schnittvorgangs
- Schlichtbearbeitung der Nuten: geläpft, um Probleme durch Verkleben zu reduzieren und um die Späneabführung zu erleichtern
- Kühlöffnungen mit abgeänderter Geometrie für einen verbesserten Kühlmittelzufluss
- Spezielles Trägermaterial zur Gewährleistung von Lebensdauer und Zuverlässigkeit



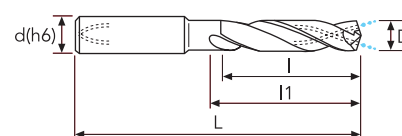
- Самоцентрирующаяся геометрия: высокая точность отверстий
- Прямые режущие кромки и большой передний угол: низкие силы резания
- Стружечные канавки: широкие с большим наклоном для надежной эвакуации стружки
- Геометрия с обратным конусом: увеличивает эффективность обработки
- Отполированные стружечные канавки: уменьшают вероятность приваривания стружки и облегчают ее вывод
- Большие отверстия: увеличена эффективность подвода СОЖ
- Специальное покрытие для повышения стойкости инструмента

353ALH

aluminium, polished flutes, ALH (through coolant)



★ 1st choice ☆ suitable



D(m7)	D Tol.	d(h6)	l	l1	L	EDP No.	Stock
3.00	+0.012/+0.002	6	14	20	62	353ALH0300	●
3.10	+0.016/+0.004	6	14	20	62	353ALH0310	●
3.20	+0.016/+0.004	6	14	20	62	353ALH0320	●
3.30	+0.016/+0.004	6	14	20	62	353ALH0330	●
3.40	+0.016/+0.004	6	14	20	62	353ALH0340	●
3.50	+0.016/+0.004	6	14	20	62	353ALH0350	●
3.60	+0.016/+0.004	6	14	20	62	353ALH0360	●
3.70	+0.016/+0.004	6	14	20	62	353ALH0370	●
3.80	+0.016/+0.004	6	17	24	66	353ALH0380	●
3.90	+0.016/+0.004	6	17	24	66	353ALH0390	●
4.00	+0.016/+0.004	6	17	24	66	353ALH0400	●
4.10	+0.016/+0.004	6	17	24	66	353ALH0410	●
4.20	+0.016/+0.004	6	17	24	66	353ALH0420	●
4.30	+0.016/+0.004	6	17	24	66	353ALH0430	●
4.40	+0.016/+0.004	6	17	24	66	353ALH0440	○
4.50	+0.016/+0.004	6	17	24	66	353ALH0450	●
4.60	+0.016/+0.004	6	17	24	66	353ALH0460	●
4.70	+0.016/+0.004	6	17	24	66	353ALH0470	●
4.80	+0.016/+0.004	6	20	28	66	353ALH0480	●
4.90	+0.016/+0.004	6	20	28	66	353ALH0490	○
5.00	+0.016/+0.004	6	20	28	66	353ALH0500	●
5.10	+0.016/+0.004	6	20	28	66	353ALH0510	●
5.20	+0.016/+0.004	6	20	28	66	353ALH0520	●
5.30	+0.016/+0.004	6	20	28	66	353ALH0530	●
5.40	+0.016/+0.004	6	20	28	66	353ALH0540	○
5.50	+0.016/+0.004	6	20	28	66	353ALH0550	●
5.60	+0.016/+0.004	6	20	28	66	353ALH0560	●
5.70	+0.016/+0.004	6	20	28	66	353ALH0570	●
5.80	+0.016/+0.004	6	20	28	66	353ALH0580	●
5.90	+0.016/+0.004	6	20	28	66	353ALH0590	○
6.00	+0.016/+0.004	6	20	28	66	353ALH0600	●
6.10	+0.021/+0.006	8	24	34	79	353ALH0610	●
6.20	+0.021/+0.006	8	24	34	79	353ALH0620	●
6.30	+0.021/+0.006	8	24	34	79	353ALH0630	●
6.40	+0.021/+0.006	8	24	34	79	353ALH0640	○
6.50	+0.021/+0.006	8	24	34	79	353ALH0650	●
6.60	+0.021/+0.006	8	24	34	79	353ALH0660	○
6.70	+0.021/+0.006	8	24	34	79	353ALH0670	●
6.80	+0.021/+0.006	8	24	34	79	353ALH0680	●

- INFO
- TYPHOON TA-HTA-4HTA
- TYPHOON PU-HPU
- TYPHOON SUH
- TYPHOON ALH
- TYPHOON HRC
- TYPHOON SUH MINI
- TYPHOON HL
- C-SD-TA
- LFTA
- SUTA
- HSS-HSS/CO DRILLS
- G2
- MDTA
- HF VH/UP
- MEF
- ALU
- MEX
- UH
- HSS/CO-HSSP END MILLS
- CARBIDE BURRS

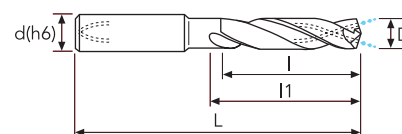
● stock standard ○ non-standard stock ▽ stock exhaustion

353ALH

aluminium, polished flutes, ALH (through coolant)



★ 1st choice ☆ suitable



D(m7)	D Tol.	d(h6)	l	l1	L	EDP No.	Stock
6.90	+0.021/+0.006	8	24	34	79	353ALH0690	○
7.00	+0.021/+0.006	8	24	34	79	353ALH0700	●
7.10	+0.021/+0.006	8	29	41	79	353ALH0710	○
7.20	+0.021/+0.006	8	29	41	79	353ALH0720	●
7.30	+0.021/+0.006	8	29	41	79	353ALH0730	○
7.40	+0.021/+0.006	8	29	41	79	353ALH0740	○
7.50	+0.021/+0.006	8	29	41	79	353ALH0750	●
7.60	+0.021/+0.006	8	29	41	79	353ALH0760	○
7.70	+0.021/+0.006	8	29	41	79	353ALH0770	○
7.80	+0.021/+0.006	8	29	41	79	353ALH0780	●
7.90	+0.021/+0.006	8	29	41	79	353ALH0790	○
8.00	+0.021/+0.006	8	29	41	79	353ALH0800	●
8.10	+0.021/+0.006	10	35	47	89	353ALH0810	○
8.20	+0.021/+0.006	10	35	47	89	353ALH0820	●
8.30	+0.021/+0.006	10	35	47	89	353ALH0830	●
8.40	+0.021/+0.006	10	35	47	89	353ALH0840	○
8.50	+0.021/+0.006	10	35	47	89	353ALH0850	●
8.60	+0.021/+0.006	10	35	47	89	353ALH0860	●
8.70	+0.021/+0.006	10	35	47	89	353ALH0870	○
8.80	+0.021/+0.006	10	35	47	89	353ALH0880	●
8.90	+0.021/+0.006	10	35	47	89	353ALH0890	○
9.00	+0.021/+0.006	10	35	47	89	353ALH0900	●
9.10	+0.021/+0.006	10	35	47	89	353ALH0910	○
9.20	+0.021/+0.006	10	35	47	89	353ALH0920	○
9.30	+0.021/+0.006	10	35	47	89	353ALH0930	○
9.40	+0.021/+0.006	10	35	47	89	353ALH0940	○
9.50	+0.021/+0.006	10	35	47	89	353ALH0950	●
9.60	+0.021/+0.006	10	35	47	89	353ALH0960	○
9.70	+0.021/+0.006	10	35	47	89	353ALH0970	○
9.80	+0.021/+0.006	10	35	47	89	353ALH0980	○
9.90	+0.021/+0.006	10	35	47	89	353ALH0990	○
10.00	+0.021/+0.006	10	35	47	89	353ALH1000	●
10.20	+0.025/+0.007	12	40	55	102	353ALH1020	●
10.30	+0.025/+0.007	12	40	55	102	353ALH1030	●
10.50	+0.025/+0.007	12	40	55	102	353ALH1050	●
10.80	+0.025/+0.007	12	40	55	102	353ALH1080	○
11.00	+0.025/+0.007	12	40	55	102	353ALH1100	●
11.20	+0.025/+0.007	12	40	55	102	353ALH1120	○
11.30	+0.025/+0.007	12	40	55	102	353ALH1130	○

● stock standard ○ non-standard stock ▽ stock exhaustion

353ALH

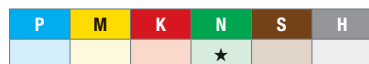
Material Group ISO 513	N1			N2			N3 N4			N5				
	Hardness/Rm													
	Vc (m/min)			260-300			230-270			200-240			280-320	
D (mm)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)		
3	29720	0.160	4760	26540	0.152	4030	23350	0.136	3180	31850	0.176	5610		
4	22290	0.190	4240	19900	0.181	3590	17520	0.162	2830	23890	0.209	4990		
5	17830	0.220	3920	15920	0.209	3330	14010	0.187	2620	19110	0.242	4620		
6	14860	0.250	3720	13270	0.238	3150	11680	0.213	2480	15920	0.275	4380		
7	12740	0.280	3570	11370	0.266	3020	10010	0.238	2380	13650	0.308	4200		
8	11150	0.310	3460	9950	0.295	2930	8760	0.264	2310	11940	0.341	4070		
9	9910	0.340	3370	8850	0.323	2860	7780	0.289	2250	10620	0.374	3970		
10	8920	0.370	3300	7960	0.352	2800	7010	0.315	2200	9550	0.407	3890		
11	8110	0.400	3240	7240	0.380	2750	6370	0.340	2170	8690	0.440	3820		
12	7430	0.430	3190	6630	0.409	2710	5840	0.366	2130	7960	0.473	3770		
13	6860	0.460	3160	6120	0.437	2670	5390	0.391	2110	7350	0.506	3720		
14	6370	0.490	3120	5690	0.466	2650	5000	0.417	2080	6820	0.539	3680		
15	5940	0.520	3090	5310	0.494	2620	4670	0.442	2060	6370	0.572	3640		
16	5570	0.550	3060	4980	0.523	2600	4380	0.468	2050	5970	0.605	3610		
17	5250	0.580	3050	4680	0.551	2580	4120	0.493	2030	5620	0.638	3590		
18	4950	0.610	3020	4420	0.580	2560	3890	0.519	2020	5310	0.671	3560		
19	4690	0.640	3000	4190	0.608	2550	3690	0.544	2010	5030	0.704	3540		
20	4460	0.670	2990	3980	0.637	2530	3500	0.570	1990	4780	0.737	3520		



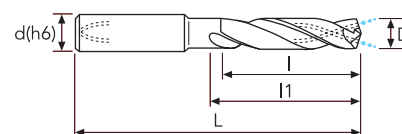
- INFO
- TYPHOON TA-HTA-4HTA
- TYPHOON PU-HPU
- TYPHOON SUH
- TYPHOON ALH
- TYPHOON HRC
- TYPHOON SUH MINI
- TYPHOON HL
- C-SD-TA
- LFTA
- SUTA
- HSS-HSS/CO DRILLS
- G2
- MDTA
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- MEF
- ALU
- MEX
- UH
- HSS/CO-HSSP END MILLS
- CARBIDE BURRS

355ALH

aluminium, polished flutes, ALH (through coolant)



★ 1st choice ☆ suitable



D(m7)	D Tol.	d(h6)	l	l1	L	EDP No.	Stock
3.00	+0.012/+0.002	6	23	28	66	355ALH0300	●
3.10	+0.016/+0.004	6	23	28	66	355ALH0310	○
3.20	+0.016/+0.004	6	23	28	66	355ALH0320	●
3.30	+0.016/+0.004	6	23	28	66	355ALH0330	●
3.40	+0.016/+0.004	6	23	28	66	355ALH0340	●
3.50	+0.016/+0.004	6	23	28	66	355ALH0350	●
3.60	+0.016/+0.004	6	23	28	66	355ALH0360	●
3.70	+0.016/+0.004	6	23	28	66	355ALH0370	●
3.80	+0.016/+0.004	6	29	36	74	355ALH0380	●
3.90	+0.016/+0.004	6	29	36	74	355ALH0390	○
4.00	+0.016/+0.004	6	29	36	74	355ALH0400	●
4.10	+0.016/+0.004	6	29	36	74	355ALH0410	○
4.20	+0.016/+0.004	6	29	36	74	355ALH0420	●
4.30	+0.016/+0.004	6	29	36	74	355ALH0430	●
4.40	+0.016/+0.004	6	29	36	74	355ALH0440	○
4.50	+0.016/+0.004	6	29	36	74	355ALH0450	●
4.60	+0.016/+0.004	6	29	36	74	355ALH0460	○
4.70	+0.016/+0.004	6	29	36	74	355ALH0470	○
4.80	+0.016/+0.004	6	35	44	82	355ALH0480	●
4.90	+0.016/+0.004	6	35	44	82	355ALH0490	○
5.00	+0.016/+0.004	6	35	44	82	355ALH0500	●
5.10	+0.016/+0.004	6	35	44	82	355ALH0510	●
5.20	+0.016/+0.004	6	35	44	82	355ALH0520	●
5.30	+0.016/+0.004	6	35	44	82	355ALH0530	○
5.40	+0.016/+0.004	6	35	44	82	355ALH0540	○
5.50	+0.016/+0.004	6	35	44	82	355ALH0550	●
5.60	+0.016/+0.004	6	35	44	82	355ALH0560	●
5.70	+0.016/+0.004	6	35	44	82	355ALH0570	○
5.80	+0.016/+0.004	6	35	44	82	355ALH0580	●
5.90	+0.016/+0.004	6	35	44	82	355ALH0590	○
6.00	+0.016/+0.004	6	35	44	82	355ALH0600	●
6.10	+0.021/+0.006	8	43	53	91	355ALH0610	○
6.20	+0.021/+0.006	8	43	53	91	355ALH0620	●
6.30	+0.021/+0.006	8	43	53	91	355ALH0630	○
6.40	+0.021/+0.006	8	43	53	91	355ALH0640	○
6.50	+0.021/+0.006	8	43	53	91	355ALH0650	●
6.60	+0.021/+0.006	8	43	53	91	355ALH0660	○
6.70	+0.021/+0.006	8	43	53	91	355ALH0670	●
6.80	+0.021/+0.006	8	43	53	91	355ALH0680	●

- INFO
- TYPHOON TA-HTA-4HTA
- TYPHOON PU-HPU
- TYPHOON SUH
- TYPHOON ALH
- TYPHOON HRC
- TYPHOON SUH MINI
- TYPHOON HL
- C-SD-TA
- LFTA
- SUTA
- HSS-HSS/CO DRILLS
- G2
- MDTA
- HF VH/UP
- MEF
- ALU
- MEX
- UH
- HSS/CO-HSSP END MILLS
- CARBIDE BURRS

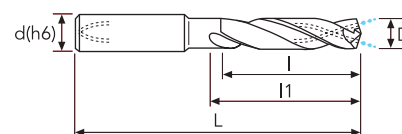
● stock standard ○ non-standard stock ▽ stock exhaustion

355ALH

aluminium, polished flutes, ALH (through coolant)



★ 1st choice ☆ suitable



D(m7)	D Tol.	d(h6)	l	l1	L	EDP No.	Stock
6.90	+0.021/+0.006	8	43	53	91	355ALH0690	●
7.00	+0.021/+0.006	8	43	53	91	355ALH0700	●
7.10	+0.021/+0.006	8	43	53	91	355ALH0710	○
7.20	+0.021/+0.006	8	43	53	91	355ALH0720	●
7.30	+0.021/+0.006	8	43	53	91	355ALH0730	○
7.40	+0.021/+0.006	8	43	53	91	355ALH0740	○
7.50	+0.021/+0.006	8	43	53	91	355ALH0750	●
7.60	+0.021/+0.006	8	43	53	91	355ALH0760	○
7.70	+0.021/+0.006	8	43	53	91	355ALH0770	○
7.80	+0.021/+0.006	8	43	53	91	355ALH0780	●
7.90	+0.021/+0.006	8	43	53	91	355ALH0790	○
8.00	+0.021/+0.006	8	43	53	91	355ALH0800	●
8.10	+0.021/+0.006	10	49	61	103	355ALH0810	○
8.20	+0.021/+0.006	10	49	61	103	355ALH0820	●
8.30	+0.021/+0.006	10	49	61	103	355ALH0830	○
8.40	+0.021/+0.006	10	49	61	103	355ALH0840	○
8.50	+0.021/+0.006	10	49	61	103	355ALH0850	●
8.60	+0.021/+0.006	10	49	61	103	355ALH0860	○
8.70	+0.021/+0.006	10	49	61	103	355ALH0870	○
8.80	+0.021/+0.006	10	49	61	103	355ALH0880	●
8.90	+0.021/+0.006	10	49	61	103	355ALH0890	○
9.00	+0.021/+0.006	10	49	61	103	355ALH0900	●
9.10	+0.021/+0.006	10	49	61	103	355ALH0910	○
9.20	+0.021/+0.006	10	49	61	103	355ALH0920	○
9.30	+0.021/+0.006	10	49	61	103	355ALH0930	○
9.40	+0.021/+0.006	10	49	61	103	355ALH0940	○
9.50	+0.021/+0.006	10	61	61	103	355ALH0950	●
9.60	+0.021/+0.006	10	61	61	103	355ALH0960	○
9.70	+0.021/+0.006	10	61	61	103	355ALH0970	○
9.80	+0.021/+0.006	10	61	61	103	355ALH0980	○
9.90	+0.021/+0.006	10	61	61	103	355ALH0990	○
10.00	+0.021/+0.006	10	61	61	103	355ALH1000	●
10.20	+0.025/+0.007	12	71	71	118	355ALH1020	●
10.50	+0.025/+0.007	12	71	71	118	355ALH1050	●
10.80	+0.025/+0.007	12	71	71	118	355ALH1080	○
11.00	+0.025/+0.007	12	71	71	118	355ALH1100	●
11.20	+0.025/+0.007	12	71	71	118	355ALH1120	○
11.30	+0.025/+0.007	12	71	71	118	355ALH1130	○
11.50	+0.025/+0.007	12	71	71	118	355ALH1150	●

● stock standard ○ non-standard stock ▽ stock exhaustion

355ALH

Material Group ISO 513	N1			N2			N3 N4			N5				
	Hardness/Rm													
	Vc (m/min)			240-280			200-240			180-220			260-300	
D (mm)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)		
3	27600	0.136	3750	23350	0.129	3020	21230	0.116	2450	29720	0.150	4450		
4	20700	0.162	3340	17520	0.153	2690	15920	0.137	2190	22290	0.178	3960		
5	16560	0.187	3100	14010	0.178	2490	12740	0.159	2030	17830	0.206	3670		
6	13800	0.213	2930	11680	0.202	2360	10620	0.181	1920	14860	0.234	3470		
7	11830	0.238	2820	10010	0.226	2260	9100	0.202	1840	12740	0.262	3340		
8	10350	0.264	2730	8760	0.250	2190	7960	0.224	1780	11150	0.290	3230		
9	9200	0.289	2660	7780	0.275	2140	7080	0.246	1740	9910	0.318	3150		
10	8280	0.315	2600	7010	0.299	2090	6370	0.267	1700	8920	0.346	3090		
11	7530	0.340	2560	6370	0.323	2060	5790	0.289	1670	8110	0.374	3030		
12	6900	0.366	2520	5840	0.347	2030	5310	0.311	1650	7430	0.402	2990		
13	6370	0.391	2490	5390	0.371	2000	4900	0.332	1630	6860	0.430	2950		
14	5910	0.417	2460	5000	0.396	1980	4550	0.354	1610	6370	0.458	2920		
15	5520	0.442	2440	4670	0.420	1960	4250	0.376	1600	5940	0.486	2890		
16	5180	0.468	2420	4380	0.444	1950	3980	0.397	1580	5570	0.514	2860		
17	4870	0.493	2400	4120	0.468	1930	3750	0.419	1570	5250	0.542	2850		
18	4600	0.519	2390	3890	0.493	1920	3540	0.441	1560	4950	0.570	2820		
19	4360	0.544	2370	3690	0.517	1910	3350	0.462	1550	4690	0.598	2810		
20	4140	0.570	2360	3500	0.541	1890	3180	0.484	1540	4460	0.626	2790		



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INFO
TYPHOON TA-HTA-4HTA
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TYPHOON HRC
TYPHOON MINI SUH
TYPHOON HL
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SUTA
HSS-HSS/CO DRILLS
G2
MDTA
HF VH/UP
MEF
ALU
MEX
UH
HSS/CO-HSSP END MILLS
CARBIDE BURRS

TYPHOON HRC

HIGH PERFORMANCE - HARDENED STEEL 45÷62 HRC

🇩🇪 Reliable high precision drills for hardened steel 45÷62 HRC.

🇮🇹 Punte ad alta precisione per la foratura di acciai temprati 45÷62 HRC.

🇩🇪 Hohe Präzision und zuverlässige Bohrungen für gehärteten Stahl 45÷62 HRC.

🇫🇷 Forets haute précision et fiables pour acier trempé 45÷62 HRC.

🇪🇸 Brocas de alta precisión para aceros templados 45÷62 HRC.

🇷🇺 Высокоточные и высокопроизводительные сверла для обработки сталей с твердостью 45÷62 HRC.

TYPHOON HRC

HIGH PERFORMANCE - HARDENED STEEL 45÷62 HRC

INFO
TYPHOON TA-HTA-4HTA
TYPHOON PU-HPU
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SUTA
HSS-HSS/CO DRILLS
G2
MDTA
HF VH/UP
MEF
ALU
MEX
UH
HSS/CO-HSSP END MILLS
CARBIDE BURRS



- Drills for hardened steel 45÷62 HRC
- Self-centering geometry: high accurate holes
- Straight and reinforced edge: high stability and chipping resistance
- 45° chamfer: edge corners protection
- Thicker web: high rigidity and stability
- 15° helix angle: low helix for higher rigidity
- Substrate and coating: specifically selected for high wear resistance, long and reliable life



- Forets pour aciers trempés 45÷62 HRC
- Affûtage autocentré pour l'exécution de trous précis
- Profil de l'arête droit et renforcé
- Géométrie des angles : protection avec biseau à 45°
- Cœur très épais pour garantir rigidité et stabilité
- Angle de l'hélice à 15° : angle peu accentué pour une solidité maximale
- Substrat et revêtement spécifiques pour garantir durée et fiabilité



- Punta per acciai temprati 45÷62 HRC
- Affilatura autocentrante per l'esecuzione di fori precisi
- Profilo del tagliente diritto e rinforzato
- Geometria degli spigoli: protezione con smusso a 45°
- Nocciolo molto spesso per garantire rigidità e stabilità
- Angolo dell'elica a 15°: angolo poco accentuato per massima robustezza
- Substrato e rivestimento specifici per garantire durata e affidabilità



- Brocas para aceros templados 45÷62 HRC
- Geometría autocentrante para la realización de agujeros precisos
- Perfil del filo recto y reforzado
- Geometría de las bordes: protección con redondeo a 45°
- Núcleo muy grueso para garantizar rigidez y estabilidad
- Ángulo de la hélice a 15°: ángulo poco accentuado para la máxima resistencia
- Substrato y revestimiento específicos para garantizar duración y fiabilidad



- Bohrer für gehärteten Stahl 45-62 HRC
- Selbstzentrierender Schliff für die Herstellung von präzisen Bohrungen
- Gerades und verstärktes Schneidkantenprofil
- Geometrie der Kanten: Schutzfase mit 45°
- Sehr starker Kern zur Gewährleistung von Steifigkeit und Stabilität
- Anstellwinkel 15°: geringer Winkel für maximale Robustheit
- Spezielles Trägermaterial und spezielle Beschichtung zur Gewährleistung von Standzeit und Zuverlässigkeit



- Свёрла для закалённой стали 45÷62 HRC
- Самоцентрирующаяся геометрия: высокая точность отверстий
- Прямые усиленные кромки: высокая стабильность резания и предотвращение пакетирования
- Фаска 45°: защита кромок
- Утолщенная сердцевина: высокая жесткость и стабильность
- Угол наклона винтовой канавки 15°: маленький угол для высокой жесткости
- Специальное покрытие для повышения стойкости инструмента

353HRC

hardened steel 45±62 HRC



3XD

DIN
6537K

HRC

MG
PV1000

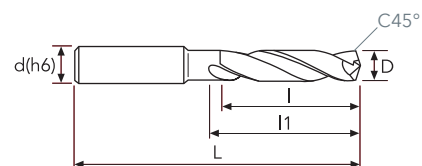
45±62
HRC

150°+C45°

15°



★ 1st choice ☆ suitable



D(h7)	D Tol.	d(h6)	l	l1	L	EDP No.	Stock
2.60	0/-0.010	6	14	20	62	353HRC0260	●
3.00	0/-0.010	6	14	20	62	353HRC0300	●
3.30	0/-0.012	6	14	20	62	353HRC0330	●
3.40	0/-0.012	6	14	20	62	353HRC0340	●
3.50	0/-0.012	6	14	20	62	353HRC0350	●
3.70	0/-0.012	6	14	20	62	353HRC0370	●
3.80	0/-0.012	6	17	24	66	353HRC0380	●
4.00	0/-0.012	6	17	24	66	353HRC0400	●
4.10	0/-0.012	6	17	24	66	353HRC0410	●
4.20	0/-0.012	6	17	24	66	353HRC0420	●
4.30	0/-0.012	6	17	24	66	353HRC0430	●
4.50	0/-0.012	6	17	24	66	353HRC0450	●
4.60	0/-0.012	6	17	24	66	353HRC0460	●
4.80	0/-0.012	6	20	28	66	353HRC0480	●
5.00	0/-0.012	6	20	28	66	353HRC0500	●
5.10	0/-0.012	6	20	28	66	353HRC0510	●
5.20	0/-0.012	6	20	28	66	353HRC0520	●
5.30	0/-0.012	6	20	28	66	353HRC0530	●
5.50	0/-0.012	6	20	28	66	353HRC0550	●
5.60	0/-0.012	6	20	28	66	353HRC0560	●
5.80	0/-0.012	6	20	28	66	353HRC0580	●
6.00	0/-0.012	6	20	28	66	353HRC0600	●
6.10	0/-0.015	8	29	41	79	353HRC0610	●
6.20	0/-0.015	8	29	41	79	353HRC0620	●
6.50	0/-0.015	8	29	41	79	353HRC0650	●
6.80	0/-0.015	8	29	41	79	353HRC0680	●
6.90	0/-0.015	8	29	41	79	353HRC0690	●
7.00	0/-0.015	8	29	41	79	353HRC0700	●
7.40	0/-0.015	8	29	41	79	353HRC0740	●
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7.80	0/-0.015	8	29	41	79	353HRC0780	●
8.00	0/-0.015	8	29	41	79	353HRC0800	●
8.10	0/-0.015	10	35	47	89	353HRC0810	●
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8.60	0/-0.015	10	35	47	89	353HRC0860	●
8.70	0/-0.015	10	35	47	89	353HRC0870	●
8.80	0/-0.015	10	35	47	89	353HRC0880	●
9.00	0/-0.015	10	35	47	89	353HRC0900	●

- INFO
- TYPHOON TA-HTA-4HTA
- TYPHOON PU-HPU
- TYPHOON SUH
- TYPHOON ALH
- TYPHOON HRC**
- TYPHOON MINI SUH
- TYPHOON HL
- C-SD-TA
- LFTA
- SUTA
- HSS-HSS/CO DRILLS
- G2
- MDTA
- HF VH/UP
- MEF
- ALU
- MEX
- UH
- HSS/CO-HSSP END MILLS
- CARBIDE BURRS

● stock standard ○ non-standard stock ▽ stock exhaustion

353HRC

Material Group ISO 513	H1 H4			H2			H3			H5		
	50-56 HRC			54-62 HRC			< 62 HRC			48-55 HRC		
	15-25			12-18			8-12			20-30		
Vc (m/min)	n	fn	Vf	n	fn	Vf	n	fn	Vf	n	fn	Vf
D (mm)	(rpm)	(mm/rev)	(mm/min)	(rpm)	(mm/rev)	(mm/min)	(rpm)	(mm/rev)	(mm/min)	(rpm)	(mm/rev)	(mm/min)
3	2120	0.020	40	1590	0.017	30	1060	0.013	10	2650	0.020	50
4	1590	0.030	50	1190	0.026	30	800	0.020	20	1990	0.030	60
5	1270	0.040	50	960	0.034	30	640	0.026	20	1590	0.040	60
6	1060	0.050	50	800	0.043	30	530	0.033	20	1330	0.050	70
7	910	0.060	50	680	0.051	30	450	0.039	20	1140	0.060	70
8	800	0.070	60	600	0.060	40	400	0.046	20	1000	0.070	70
9	710	0.080	60	530	0.068	40	350	0.052	20	880	0.080	70
10	640	0.090	60	480	0.077	40	320	0.059	20	800	0.090	70
11	580	0.100	60	430	0.085	40	290	0.065	20	720	0.100	70
12	530	0.110	60	400	0.094	40	270	0.072	20	660	0.110	70
13	490	0.120	60	370	0.102	40	240	0.078	20	610	0.120	70
14.2	450	0.130	60	340	0.111	40	230	0.085	20	570	0.130	70



- INFO
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- CARBIDE BURRS



TYPHOON SUH MINI

HIGH PERFORMANCE - MINIATURE SHORT, LONG AND EXTRA LONG

🇬🇧 Miniature drills, from short (5xD) to extra-long (30xD) type, suitable for ISO P, M, K, N, S materials.

🇮🇹 Mini punte corte (5xD), lunghe ed extra-lunghe (30xD), adatte alla foratura di materiali ISO P, M, K, N, S.

🇩🇪 Kurze (5xD), lange und extra-lange (30xD) Kleinstbohrer für das Bohren der Materialien ISO P, M, K, N, S.

🇫🇷 Mini forets courts (5xD), longs et extra-longs (30xD), appropriés au perçage de matériaux ISO P, M, K, N, S.

🇪🇸 Mini brocas cortas (5xD), largas y extra largas (30xD), adecuadas para el taladro de materiales ISO P, M, K, N, S.

🇷🇺 Мини-свёрла от коротких (5xD) до супердлинных (30xD). Пригодны для обработки отверстий в материалах по ISO P, M, K, N, S.

INFO
TYPHOON TA-HTA-4HTA
TYPHOON PU-HPU
TYPHOON SUH
TYPHOON ALH
TYPHOON HRC
TYPHOON SUH MINI
TYPHOON HL
C-SD-TA
LFTA
SUTA
HSS-HSS/CO DRILLS
G2
MDTA
HF VH/UP
MEF
ALU
MEX
UH
HSS/CO-HSSP END MILLS
CARBIDE BURRS

TYPHOON SUH MINI

HIGH PERFORMANCE - MINIATURE SHORT AND LONG



- Miniature drills are manufactured with unified 3 mm shank
- Oil holes for internal coolant feed
- Self-centering geometry: highly accurate holes
- Straight and reinforced edge: high stability and chipping resistance
- Edge geometry: special design for edge and corners protection
- Chip pocket: highly polished to prevent welding and to improve the chip ejection
- Substrate and coating: specifically selected for high wear resistance, long and reliable life
- Available from Ø1 mm to Ø3 mm
- Different cutting length types from short (5xD) to extra-long (30xD)



- Mini forets fabriqués avec une tige unifiée ayant un diamètre de 3 mm
- Trous de lubrification
- Affûtage autocentré pour l'exécution de trous précis et peu d'efforts de coupe
- Profil de l'arête droit et renforcé : il génère des copeaux courts et garantit une grande fiabilité
- Géométrie de l'arête avec affûtage spécifique pour protéger l'arête et les angles
- Finition des goujures : polie pour réduire le problème du collage et faciliter l'évacuation des copeaux
- Substrat et revêtement : spécifiques pour garantir durée et fiabilité
- Disponibles du Ø1 mm au Ø3 mm
- Différents types de longueur, de la plus courte (5xD) aux extra-longues (30xD)



- Mini-punte costruite con gambo unificato Ø3 mm
- Fori di refrigerazione
- Affilatura autocentrante per l'esecuzione di fori precisi e bassi sforzi di taglio
- Profilo del tagliente diritto e rinforzato: genera trucioli corti e garantisce grande affidabilità
- Geometria del tagliente con affilatura specifica a protezione del tagliente e degli spigoli
- Finitura gole: lappate per ridurre il problema dell'incollaggio e facilitare l'evacuazione dei trucioli
- Substrato e rivestimento: specifici per garantire durata e affidabilità
- Disponibili da Ø1 mm a Ø3 mm
- Differenti tipi di lunghezza, dalle corte (5XD) alle extra-lunghe (30XD)



- Mini-brocas fabricadas con mango unificado con diámetro de 3 mm
- Agujeros de refrigeración
- Afilado autocentrante para la realización de agujeros precisos y bajos esfuerzos de corte
- Perfil del filo recto y reforzado: genera virutas cortas y garantiza una gran fiabilidad
- Geometría del filo con afilado específico para proteger el filo y los ángulos
- Acabado ranuras: lapeadas para reducir el problema del encolado y facilitar la evacuación de las virutas
- Substrato y revestimiento: específicos para garantizar duración y fiabilidad
- Disponibles de Ø1 mm a Ø3mm
- Diferentes tipos de longitud, desde las cortas (5XD) hasta las extra-largas (30XD)



- Kleinstbohrer mit genormtem Schaft und einem Durchmesser von 3 mm
- Kühlöffnungen
- Selbstzentrierender Schliff für präzise Bohrungen und geringen Schneiddruck
- Gerades und verstärktes Schneidkantenprofil: zur Erzeugung kurzer Späne und zur Gewährleistung hoher Zuverlässigkeit
- Geometrie der Schneidkante mit speziellem Schliff zum Schutz von Schneidkante und Kanten
- Schlichtbearbeitung der Nuten: geläpft, um Probleme durch Verkleben zu reduzieren und um die Späneabführung zu erleichtern
- Trägermaterial und Beschichtung: speziell zur Gewährleistung von Standzeit und Zuverlässigkeit
- Erhältlich von Ø1 mm bis Ø3 mm
- Verschiedene Längen, von kurz (5XD) bis extra-lang (30XD)



- Мини-свёрла с унифицированным 3х мм хвостовиком
- Отверстия для подвода СОЖ
- Самоцентрирующаяся геометрия: высокая точность отверстий
- Прямые усиленные кромки: высокая стабильность резания и предотвращение пакетирования
- Геометрия режущей кромки со специальной заточкой для защиты лезвия и кромок
- Отполированные стружечные канавки: уменьшают вероятность приваривания стружки и облегчают ее вывод
- Специальное покрытие для повышения стойкости инструмента
- Доступны диаметром от Ø1 мм до Ø3 мм
- Различные длины: от коротких (5XD) до супердлинных (30XD)

INFO
TYPHOON TA-HTA-4HTA
TYPHOON PU-HPU
TYPHOON SUH
TYPHOON ALH
TYPHOON HRC
TYPHOON SUH MINI
TYPHOON HL
C-SD-TA
LFTA
SUTA
HSS-HSS/CO DRILLS
G2
MDTA
HF VH/UP
MEF
ALU
MEX
UH
HSS/CO-HSSP END MILLS
CARBIDE BURRS

MACHINING OF DEEP HOLES PERPENDICULAR TO THE SURFACE

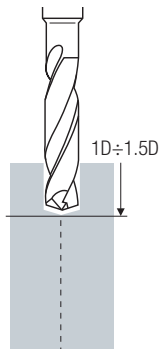
ESECUZIONE FORI PROFONDI ORTOGONALI ALLA SUPERFICIE

HERSTELLUNG TIEFER RECHTWINKLIGER BOHRUNGEN

EXÉCUTION DE TROUS PROFONDS ORTHOGONAUX À LA SURFACE

MECANIZADO DE AGUJEROS PROFUNDOS PERPENDICULARES A LA SUPERFÍCIE

СВЕРЛЕНИЕ ГЛУБОКИХ ОТВЕРСТИЙ ПЕРПЕНДИКУЛЯРНО ОБРАБАТЫВАЕМОЙ ПОВЕРХНОСТИ


STEP 1

As pilot drill (1xD, 1.5xD), please use 343TA with head angle 140° (SUH MINI=135°) and m7 tolerance (SUH MINI=h7)

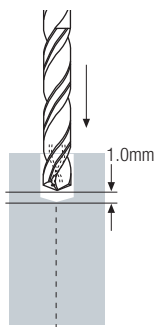
Utilizzare una punta 343TA con angolo in testa di 140° (SUH MINI=135°) e tolleranza m7 (SUH MINI=h7), per eseguire un foro pilota (1xD - 1.5xD) molto preciso

Einen Bohrer 343TA mit einem Spitzenwinkel von 140° (SUH MINI=135°) und Toleranz m7 (SUH MINI=h7) für die Herstellung einer äußerst präzisen Richtbohrung (1xD - 1.5xD) verwenden.

Utiliser un foret 343TA avec un angle en bout de 140° (SUH MINI=135°) et une tolérance m7 (SUH MINI=h7), pour effectuer un trou pilote (1xD - 1.5xD) très précis.

Utilice una broca 343TA con ángulo de punta de 140° (SUH MINI=135°) y tolerancia m7 (SUH MINI=h7), para realizar un agujero piloto (1xD - 1.5xD) muy preciso

Для пилотного отверстия (1xD - 1.5xD) используйте сверло 343TA с углом при вершине 140° (SUH MINI=135°) и допуском на диаметр m7 (SUH MINI=h7).


STEP 2

With coolant feed OFF, enter the pilot hole with SUH MINI drill at Vc=20 m/min and fn=0.3 mm/rev. Position the SUH MINI drill at 1 mm from the end of the pilot hole, then start supplying the coolant and start drilling.

Senza azionare il refrigerante interno, entrare con la punta lunga serie SUH MINI all'interno del foro. Vc=20 m/min, fn=0.3 mm/rev. Posizionare la punta SUH MINI sino a 1 mm dal fondo del foro pilota. Azionare il refrigerante interno ad alta pressione e cominciare la foratura.

Ohne Aktivierung der internen Kühlung, einen langen Bohrer der Serie SUH MINI in die Bohrung einführen. Vc=20 m/min, fn=0,3 mm/U. Den Bohrer SUH MINI bis 1 mm vom Ende der Richtbohrung ansetzen. Die interne Kühlung mit Hochdruck aktivieren und mit der Bohrung beginnen.

Sans actionner la lubrification interne, entrer avec le foret long série SUH MINI à l'intérieur du trou. Vc=20 m/min, fn=0.3 mm/rév. Placer le foret SUH MINI jusqu'à 1 mm du fond du trou pilote. Actionner la lubrification interne à haute pression et commencer le perçage.

Sin accionar el refrigerante interno, entre con la broca larga de la serie SUH MINI dentro del agujero. Vc=20m/min, fn=0.3mm/rev. Posicione la broca SUH MINI hasta 1 mm. del fondo del agujero piloto. Accione el refrigerante interno a alta presión y comience el taladro.

Без подачи СОЖ, введите длинное сверло серии SUH MINI внутрь пилотного отверстия с режимами Vc=20 м/мин и fn=0,3 мм/об. Спозиционируйте сверло SUH MINI на расстоянии 1 мм от дна отверстия. Включите подачу СОЖ и начните сверление.

TYPHOON SUH MINI

HIGH PERFORMANCE - MINIATURE SHORT AND LONG

INFO
TYPHOON TA-HTA-4HTA
TYPHOON PU-HPU
TYPHOON SUH
TYPHOON ALH
TYPHOON HRC
TYPHOON SUH MINI
TYPHOON HL
C-SD-TA
LFTA
SUTA
HSS-HSS/CO DRILLS
G2
MDTA
HF VH/UP
MEF
ALU
MEX
UH
HSS/CO-HSSP END MILLS
CARBIDE BURRS


STEP 3


Make continue drilling operation without steps for chip ejection.
In case of through holes, reduce the feed by 30% before the hole exit (approx. 1 mm).
Stop the coolant feed.



Furare senza step per scarico trucioli.
Nel caso di fori passanti, 1 mm prima di aver completato il foro, ridurre l'avanzamento del 30%.
Fermare il refrigerante.



Für die Späneabführung Stufenlos bohren.
Bei Durchgangsbohrungen 1 mm vor Fertigstellung der Bohrung den Vorschub um 30% reduzieren.
Die Kühlung deaktivieren.



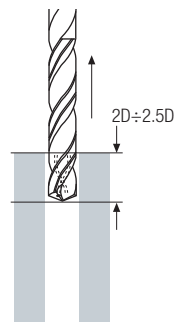
Perçer sans step pour l'évacuation des copeaux.
En présence de trous débouchants, 1 mm avant d'avoir terminé le trou, réduire l'avance de 30%.
Arrêter la lubrification.



Taladre sin step para la descarga de virutas.
En el caso de agujeros pasantes, 1 mm antes de haber completado el agujero, reduzca el avance un 30%.
Pare el refrigerante.



Сверлите без остановок и выводов инструмента.
В случае обработки сквозного отверстия, снизьте подачу на 30%, за 1 мм до выхода.
Отключите подачу СОЖ.


STEP 4


Withdraw the drill using max rpm and double fn, until 2xD from the hole entrance.



Ritirare la punta utilizzando il massimo dei giri disponibili e il doppio dell'avanzamento consigliato sino ad una profondità 2xD.



Den Bohrer zurückziehen, dabei die maximal verfügbare Drehzahl und den doppelten Wert des empfohlenen Vorschubs bis zu einer Tiefe 2xD einsetzen.



Retirer le foret en utilisant le maximum de tours disponibles et le double de l'avancement conseillé jusqu'à une profondeur 2xD.



Retire la broca utilizando el máximo de rpm disponibles y el doble del avance aconsejado hasta una profundidad 2xD.



Выньте сверло до уровня 2xD, используя максимальную частоту вращения и двойную подачу.


STEP 5


Completing the exit from the hole by using slow and constant speed.



Completare l'ultimo tratto di arretramento con velocità ridotta e costante.



Den letzten Abschnitt beim Zurückziehen mit reduzierter und konstanter Geschwindigkeit fertigstellen.



Terminer la dernière partie du perçage avec une vitesse réduite et constante.



Complete el último tramo de retroceso con velocidad reducida y constante.



Полностью выньте сверло на заниженных режимах.

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UH
HSS/CO-HSSP END MILLS
CARBIDE BURRS

MACHINING OF DEEP HOLES ON SLANTED OR IRREGULAR SURFACES

ESECUZIONE FORI PROFONDI SU SUPERFICI IRREGOLARI O OBLIQUE

HERSTELLUNG TIEFER BOHRUNGEN AUF SCHRÄGEN ODER UNREGELMÄSSIGEN OBERFLÄCHEN

EXÉCUTION DE TROUS PROFONDS SUR DES SURFACES IRRÉGULIÈRES OU OBLIQUES

MECANIZADO DE AGUJEROS PROFUNDOS SOBRE SUPERFÍCIES IRREGULARES U OBLICUAS

ОБРАБОТКА ГЛУБОКИХ ОТВЕРСТИЙ НА НАКЛОННЫХ ИЛИ НЕРОВНЫХ ПЛОСКОСТЯХ


STEP 1

Prepare a flat surface of the same size as the drilling diameter.

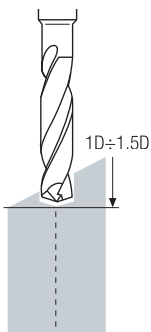
Realizzare una superficie piana utilizzando una fresa con tagliente frontale. Il piano realizzato deve avere le stesse dimensioni del diametro di foratura profonda.

Eine ebene Oberfläche, durch einen Fräser mit stirnseitiger Schneidkante, herstellen. Die hergestellte Oberfläche muss dieselben Abmessungen des Durchmessers der tiefen Bohrung aufweisen.

Réaliser une surface plane en utilisant une fraise avec une arête frontale. Le plan réalisé doit avoir les mêmes dimensions que le diamètre de perçage profond.

Realizar una superficie plana usando una fresa con filo frontal. El plano realizado tiene que tener las mismas dimensiones que el diámetro de taladro profundo.

Подготовьте ровную поверхность с помощью концевой фрезы. Эта поверхность должна быть того же размера, что и диаметр будущего глубокого отверстия.


STEP 2

As pilot drill (1xD, 1.5xD), please use 343TA with head angle 140° (SUH MINI=135°) and m7 tolerance (SUH MINI=h7).

Utilizzare una punta 343TA con angolo in testa di 140° (SUH MINI=135°) e tolleranza m7 (SUH MINI=h7), per eseguire un foro pilota (1xD -1.5xD) molto preciso.

Einen Bohrer 343TA mit einem Spitzenwinkel von 140° (SUH MINI=135°) und Toleranz m7 (SUH MINI=h7) für die Herstellung einer äußerst präzisen Richtbohrung (1xD - 1.5xD) verwenden.

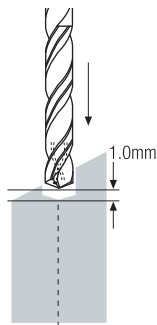
Utiliser un foret 343TA avec un angle en bout de 140° (SUH MINI=135°) et une tolérance m7 (SUH MINI=h7), pour effectuer un trou pilote (1xD -1.5xD) très précis.

Utilice una broca 343TA con ángulo punta de 140° (SUH MINI=135°) y tolerancia m7 (SUH MINI=h7), para realizar un agujero piloto (1xD -1,5xD) muy preciso.

Для пилотного отверстия (1xD -1.5xD) используйте сверло 343TA с углом при вершине 140° (SUH MINI=135°) и допуском на диаметр m7 (SUH MINI=h7).

TYPHOON SUH MINI
HIGH PERFORMANCE - MINIATURE SHORT AND LONG

INFO
TYPHOON TA-HTA-4HTA
TYPHOON PU-HPU
TYPHOON SUH
TYPHOON ALH
TYPHOON HRC
TYPHOON SUH MINI
TYPHOON HL
C-SD-TA
LFTA
SUTA
HSS-HSS/CO DRILLS
G2
MDTA
HF VH/UP
MEF
ALU
MEX
UH
HSS/CO-HSSP END MILLS
CARBIDE BURRS


STEP 3


With coolant feed OFF, enter the pilot hole with SUH MINI drill at $V_c=20$ m/min and $f_n=0.3$ mm/rev. Position the SUH MINI drill at 1 mm from the end of the pilot hole, then start supplying the coolant and start drilling.



Sans actionner la lubrification interne, entrer avec le foret long série SUH MINI à l'intérieur du trou. $V_c=20$ m/min, $f_n=0.3$ mm/rév. Placer le foret SUH MINI jusqu'à 1 mm du fond du trou pilote. Actionner la lubrification interne à haute pression et commencer le perçage.



Senza azionare il refrigerante interno, entrare con la punta lunga serie SUH MINI all'interno del foro. $V_c=20$ m/min, $f_n=0.3$ mm/rev. Posizionare la punta SUH MINI sino a 1 mm dal fondo del foro pilota. Azionare il refrigerante interno ad alta pressione e cominciare la foratura.



Sin accionar el refrigerante interno, entre con la broca larga de la serie SUH MINI dentro del agujero. $V_c=20$ m/min, $f_n=0.3$ mm/rev. Posicione la broca SUH MINI hasta 1 mm. del fondo del agujero piloto. Accione el refrigerante interno a alta presión y comience el taladro.



Ohne Aktivierung der internen Kühlung, einen langen Bohrer der Serie SUH MINI in die Bohrung einführen. $V_c=20$ m/min, $f_n=0,3$ mm/U. Den Bohrer SUH MINI bis 1 mm vom Ende der Richtbohrung ansetzen. Die interne Kühlung mit Hochdruck aktivieren und mit der Bohrung beginnen.



Без включения СОЖ, введите длинное сверло серии SUH MINI внутрь пилотного отверстия с режимами $V_c=20$ м/мин и $f_n=0.3$ мм/об. Спозиционируйте сверло SUH MINI на расстоянии 1 мм от дна отверстия. Включите подачу СОЖ и начните сверление.


STEP 4


Make continue drilling operation without steps for chip ejection. In case of through holes, reduce the feed by 30% before the hole exit (approx. 1 mm). Stop the coolant feed.



Perçer sans step pour l'évacuation des copeaux. En présence de trous débouchants, 1 mm avant d'avoir terminé le trou, réduire l'avance de 30 %. Arrêter la lubrification.



Forare senza step per scarico trucioli. Nel caso di fori passanti, 1 mm prima di aver completato il foro, ridurre l'avanzamento del 30%. Fermare il refrigerante.



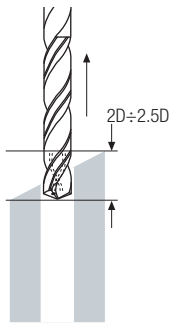
Taladre sin step para la descarga de virutas. En el caso de agujeros pasantes, 1 mm antes de haber completado el agujero, reduzca el avance un 30%. Pare el refrigerante.





Für die Späneabführung Stufenlos bohren. Bei Durchgangsbohrungen 1 mm vor Fertigstellung der Bohrung den Vorschub um 30% reduzieren. Die Kühlung deaktivieren.





Сверлите без остановок и выводов инструмента. В случае обработки сквозного отверстия, снизьте подачу на 30%, за 1 мм до выхода. Отключите подачу СОЖ.



STEP 5


 Withdraw the drill using max rpm and double f_n , until $2xD \div 2.5xD$ from the hole entrance.

 Ritirare la punta utilizzando il massimo dei giri disponibili e il doppio dell'avanzamento consigliato sino ad una profondità $2xD \div 2.5xD$.


 Den Bohrer zurückziehen, dabei die maximal verfügbare Drehzahl und den doppelten Wert des empfohlenen Vorschubs bis zu einer Tiefe $2xD \div 2.5xD$ einsetzen.


 Retirer le foret en utilisant le maximum de tours disponibles et le double de l'avancement conseillé jusqu'à une profondeur $2xD \div 2.5xD$.


 Retire la broca utilizando el máximo de rpm disponibles y el doble del avance aconsejado hasta una profundidad de $2xD \div 2.5xD$.


 Выньте сверло до уровня $2xD$, используя максимальную частоту вращения и двойную подачу.



STEP 6


 Completing the exit from the hole by using slow and constant speed.

 Completare l'ultimo tratto di arretramento con velocità ridotta e costante.

 Den letzten Abschnitt beim Zurückziehen mit reduzierter und konstanter Geschwindigkeit fertigstellen.

 Terminer la dernière partie du perçage avec une vitesse réduite et constante.

 Complete el último tramo de retroceso con velocidad reducida y constante.

 Полностью выньте сверло на заниженных режимах.

INFO
TYPHOON TA-HTA-4HTA
TYPHOON PU-HPU
TYPHOON SUH
TYPHOON ALH
TYPHOON HRC
TYPHOON SUH MINI
TYPHOON HL
C-SD-TA
LFTA
SUTA
HSS-HSS/CO DRILLS
G2
MDTA
HF VH/UP
MEF
ALU
MEX
UH
HSS/CO-HSSP END MILLS
CARBIDE BURRS

355SUH MINI

	Material Group ISO 513	P1 P2			P3 P4			P5			P6		
	Hardness/Rm	500-700 N/mm ²			600-1000 N/mm ²			900-1200 N/mm ²			1200-1400 N/mm ²		
	Vc (m/min)	55-65*			50-60*			45-55*			40-50*		
	D (mm)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)
1.0	19100	0,026	500	17510	0,027	480	15920	0,028	450	14330	0,029	420	
1.1	17370	0,029	500	15920	0,030	480	14470	0,031	450	13030	0,032	420	
1.2	15920	0,031	500	14590	0,033	480	13270	0,034	450	11940	0,035	420	
1.3	14690	0,034	500	13470	0,036	480	12250	0,037	450	11020	0,038	420	
1.4	13650	0,037	500	12510	0,038	480	11370	0,040	450	10240	0,041	420	
1.5	12740	0,042	530	11670	0,044	510	10610	0,045	480	9550	0,048	460	
1.6	11940	0,044	530	10950	0,047	510	9950	0,048	480	8960	0,051	460	
1.7	11240	0,047	530	10300	0,050	510	9370	0,051	480	8430	0,055	460	
1.8	10610	0,050	530	9730	0,052	510	8850	0,054	480	7960	0,058	460	
1.9	10060	0,053	530	9220	0,055	510	8380	0,057	480	7540	0,061	460	
2.0	9550	0,058	550	8760	0,062	540	7960	0,065	520	7170	0,070	500	
2.1	9100	0,060	550	8340	0,065	540	7580	0,069	520	6830	0,073	500	
2.2	8690	0,063	550	7960	0,068	540	7240	0,072	520	6520	0,077	500	
2.3	8310	0,066	550	7620	0,071	540	6920	0,075	520	6230	0,080	500	
2.4	7960	0,069	550	7300	0,074	540	6640	0,078	520	5970	0,084	500	
2.5	7640	0,076	580	7010	0,080	560	6370	0,085	540	5730	0,091	520	
2.6	7350	0,079	580	6740	0,083	560	6130	0,088	540	5510	0,094	520	
2.7	7080	0,082	580	6490	0,086	560	5900	0,092	540	5310	0,098	520	
2.8	6830	0,085	580	6260	0,089	560	5690	0,095	540	5120	0,102	520	
2.9	6590	0,088	580	6040	0,093	560	5490	0,098	540	4940	0,105	520	
3.0	6370	0,094	600	5840	0,099	580	5310	0,107	570	4780	0,115	550	

*if the machine tool or the equipment wouldn't allow to reach the requested rpm, please use the max. available rpm recalculating the Vf value (Vf=n available x fn)

	Material Group ISO 513	M1 M2			M3			M4			M5		
	Hardness/Rm	< 750 N/mm ²			550-850 N/mm ²			650-950 N/mm ²			850-1200 N/mm ²		
	Vc (m/min)	30-40*			25-35*			23-33*			19-29*		
	D (mm)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)
1.0	11140	0,027	300	9550	0,029	280	8920	0,027	240	7640	0,017	130	
1.1	10130	0,030	300	8690	0,032	280	8110	0,030	240	6950	0,019	130	
1.2	9290	0,032	300	7960	0,035	280	7430	0,032	240	6370	0,020	130	
1.3	8570	0,035	300	7350	0,038	280	6860	0,035	240	5880	0,022	130	
1.4	7960	0,038	300	6830	0,041	280	6370	0,038	240	5460	0,024	130	
1.5	7430	0,043	320	6370	0,047	300	5950	0,044	260	5100	0,029	150	
1.6	6970	0,046	320	5970	0,050	300	5570	0,047	260	4780	0,031	150	
1.7	6560	0,049	320	5620	0,053	300	5250	0,050	260	4500	0,033	150	
1.8	6190	0,052	320	5310	0,056	300	4960	0,052	260	4250	0,035	150	
1.9	5870	0,055	320	5030	0,060	300	4700	0,055	260	4030	0,037	150	
2.0	5570	0,063	350	4780	0,069	330	4460	0,063	280	3820	0,045	170	
2.1	5310	0,066	350	4550	0,073	330	4250	0,066	280	3640	0,047	170	
2.2	5070	0,069	350	4350	0,076	330	4060	0,069	280	3480	0,049	170	
2.3	4850	0,072	350	4160	0,079	330	3880	0,072	280	3330	0,051	170	
2.4	4650	0,075	350	3980	0,083	330	3720	0,075	280	3190	0,053	170	
2.5	4460	0,085	380	3820	0,092	350	3570	0,084	300	3060	0,062	190	
2.6	4290	0,089	380	3680	0,095	350	3430	0,087	300	2940	0,065	190	
2.7	4130	0,092	380	3540	0,099	350	3310	0,091	300	2830	0,067	190	
2.8	3980	0,095	380	3420	0,102	350	3190	0,094	300	2730	0,070	190	
2.9	3850	0,099	380	3300	0,106	350	3080	0,097	300	2640	0,072	190	
3.0	3720	0,108	400	3190	0,116	370	2980	0,107	320	2550	0,082	210	

*if the machine tool or the equipment wouldn't allow to reach the requested rpm, please use the max. available rpm recalculating the Vf value (Vf=n available x fn)

- INFO
- TYPHOON TA-HTA-4HTA
- TYPHOON PU-HPU
- TYPHOON SUH
- TYPHOON ALH
- TYPHOON HRC
- TYPHOON SUH MINI
- TYPHOON HL
- C-SD-TA
- LFTA
- SUTA
- HSS-HSS/CO DRILLS
- G2
- MDTA
- HF VH/UP
- MEF
- ALU
- MEX
- UH
- HSS/CO-HSSP END MILLS
- CARBIDE BURRS

355SUH MINI

Material Group ISO 513	K1			K2			K3			K4					
	150-250 HB			150-350 HB			120-260 HB			250-500 HB					
	Vc (m/min)			62-72*			56-66*			51-61*			45-55*		
	D (mm)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)		
1.0	21330	0,037	780	19420	0,039	750	17830	0,039	700	15920	0,043	690			
1.1	19390	0,040	780	17650	0,042	750	16210	0,043	700	14470	0,048	690			
1.2	17770	0,044	780	16180	0,046	750	14860	0,047	700	13270	0,052	690			
1.3	16410	0,048	780	14940	0,050	750	13720	0,051	700	12250	0,056	690			
1.4	15240	0,051	780	13870	0,054	750	12740	0,055	700	11370	0,061	690			
1.5	14220	0,060	860	12950	0,065	840	11890	0,064	760	10610	0,070	740			
1.6	13330	0,065	860	12140	0,069	840	11140	0,068	760	9950	0,074	740			
1.7	12550	0,069	860	11430	0,073	840	10490	0,072	760	9370	0,079	740			
1.8	11850	0,073	860	10790	0,078	840	9910	0,077	760	8850	0,084	740			
1.9	11230	0,077	860	10220	0,082	840	9390	0,081	760	8380	0,088	740			
2.0	10670	0,088	940	9710	0,095	920	8920	0,091	810	7960	0,099	790			
2.1	10160	0,093	940	9250	0,099	920	8490	0,095	810	7580	0,104	790			
2.2	9700	0,097	940	8830	0,104	920	8110	0,100	810	7240	0,109	790			
2.3	9280	0,101	940	8450	0,109	920	7750	0,105	810	6920	0,114	790			
2.4	8890	0,106	940	8090	0,114	920	7430	0,109	810	6640	0,119	790			
2.5	8530	0,129	1100	7770	0,129	1000	7130	0,126	900	6370	0,133	850			
2.6	8210	0,134	1100	7470	0,134	1000	6860	0,131	900	6130	0,139	850			
2.7	7900	0,139	1100	7200	0,139	1000	6610	0,136	900	5900	0,144	850			
2.8	7620	0,144	1100	6940	0,144	1000	6370	0,141	900	5690	0,149	850			
2.9	7360	0,149	1100	6700	0,149	1000	6150	0,146	900	5490	0,155	850			
3.0	7110	0,169	1200	6480	0,170	1100	5950	0,168	1000	5310	0,179	950			



*if the machine tool or the equipment wouldn't allow to reach the requested rpm, please use the max. available rpm recalculating the Vf value (Vf=n available x fn)

Material Group ISO 513	N1			N2			N3 N4			N5					
	80-90*			60-70*			65-75*			80-90*					
	Vc (m/min)			80-90*			60-70*			65-75*			80-90*		
	D (mm)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)		
1.0	27060	0,039	1050	20690	0,039	800	22280	0,034	750	27060	0,042	1150			
1.1	24600	0,043	1050	18810	0,043	800	20260	0,037	750	24600	0,047	1150			
1.2	22550	0,047	1050	17240	0,046	800	18570	0,040	750	22550	0,051	1150			
1.3	20810	0,050	1050	15920	0,050	800	17140	0,044	750	20810	0,055	1150			
1.4	19330	0,054	1050	14780	0,054	800	15920	0,047	750	19330	0,059	1150			
1.5	18040	0,067	1200	13800	0,065	900	14860	0,057	850	18040	0,072	1300			
1.6	16910	0,071	1200	12930	0,070	900	13930	0,061	850	16910	0,077	1300			
1.7	15920	0,075	1200	12170	0,074	900	13110	0,065	850	15920	0,082	1300			
1.8	15030	0,080	1200	11500	0,078	900	12380	0,069	850	15030	0,086	1300			
1.9	14240	0,084	1200	10890	0,083	900	11730	0,072	850	14240	0,091	1300			
2.0	13530	0,096	1300	10350	0,097	1000	11140	0,081	900	13530	0,103	1400			
2.1	12890	0,101	1300	9860	0,101	1000	10610	0,085	900	12890	0,109	1400			
2.2	12300	0,106	1300	9410	0,106	1000	10130	0,089	900	12300	0,114	1400			
2.3	11770	0,110	1300	9000	0,111	1000	9690	0,093	900	11770	0,119	1400			
2.4	11280	0,115	1300	8620	0,116	1000	9290	0,097	900	11280	0,124	1400			
2.5	10830	0,129	1400	8280	0,139	1150	8920	0,112	1000	10830	0,139	1500			
2.6	10410	0,134	1400	7960	0,144	1150	8570	0,117	1000	10410	0,144	1500			
2.7	10020	0,140	1400	7670	0,150	1150	8260	0,121	1000	10020	0,150	1500			
2.8	9670	0,145	1400	7390	0,156	1150	7960	0,126	1000	9670	0,155	1500			
2.9	9330	0,150	1400	7140	0,161	1150	7690	0,130	1000	9330	0,161	1500			
3.0	9020	0,166	1500	6900	0,188	1300	7430	0,148	1100	9020	0,177	1600			



*if the machine tool or the equipment wouldn't allow to reach the requested rpm, please use the max. available rpm recalculating the Vf value (Vf=n available x fn)

355SUH MINI

Material Group ISO 513	S1 S2			S3			S4			S5		
	< 35 HRC			35-45 HRC								
	20-30*			17-27*			25-35*			23-33*		
Vc (m/min)	n	fn	Vf	n	fn	Vf	n	fn	Vf	n	fn	Vf
D (mm)	(rpm)	(mm/rev)	(mm/min)	(rpm)	(mm/rev)	(mm/min)	(rpm)	(mm/rev)	(mm/min)	(rpm)	(mm/rev)	(mm/min)
1.0	7960	0,013	100	7010	0,010	70	9550	0,021	200	8920	0,019	170
1.1	7240	0,014	100	6370	0,011	70	8690	0,023	200	8110	0,021	170
1.2	6640	0,015	100	5840	0,012	70	7960	0,025	200	7430	0,023	170
1.3	6130	0,016	100	5390	0,013	70	7350	0,027	200	6860	0,025	170
1.4	5690	0,018	100	5010	0,014	70	6830	0,029	200	6370	0,027	170
1.5	5310	0,024	130	4670	0,019	90	6370	0,036	230	5950	0,034	200
1.6	4980	0,026	130	4380	0,021	90	5970	0,039	230	5570	0,036	200
1.7	4690	0,028	130	4120	0,022	90	5620	0,041	230	5250	0,038	200
1.8	4430	0,029	130	3890	0,023	90	5310	0,043	230	4960	0,040	200
1.9	4190	0,031	130	3690	0,024	90	5030	0,046	230	4700	0,043	200
2.0	3980	0,038	150	3510	0,031	110	4780	0,054	260	4460	0,050	225
2.1	3790	0,040	150	3340	0,033	110	4550	0,057	260	4250	0,053	225
2.2	3620	0,041	150	3190	0,034	110	4350	0,060	260	4060	0,055	225
2.3	3460	0,043	150	3050	0,036	110	4160	0,063	260	3880	0,058	225
2.4	3320	0,045	150	2920	0,038	110	3980	0,065	260	3720	0,060	225
2.5	3190	0,056	180	2810	0,046	130	3820	0,079	300	3570	0,070	250
2.6	3070	0,059	180	2700	0,048	130	3680	0,082	300	3430	0,073	250
2.7	2950	0,061	180	2600	0,050	130	3540	0,085	300	3310	0,076	250
2.8	2850	0,063	180	2510	0,052	130	3420	0,088	300	3190	0,078	250
2.9	2750	0,065	180	2420	0,054	130	3300	0,091	300	3080	0,081	250
3.0	2660	0,071	190	2340	0,060	140	3190	0,110	350	2980	0,101	300



*if the machine tool or the equipment wouldn't allow to reach the requested rpm, please use the max. available rpm recalculating the Vf value (Vf=n available x fn)

- INFO
- TYPHOON TA-HTA-4HTA
- TYPHOON PU-HPU
- TYPHOON SUH
- TYPHOON ALH
- TYPHOON HRC
- TYPHOON SUH MINI
- TYPHOON HL
- C-SD-TA
- LFTA
- SUTA
- HSS-HSS/CO DRILLS
- G2
- MDTA
- HF VH/UP
- MEF
- ALU
- MEX
- UH
- HSS/CO-HSSP END MILLS
- CARBIDE BURRS

358SUH MINI

	Material Group ISO 513	P1 P2			P3 P4			P5			P6		
	Hardness/Rm	500-700 N/mm ²			600-1000 N/mm ²			900-1200 N/mm ²			1200-1400 N/mm ²		
	Vc (m/min)	55-65*			50-60*			45-55*			40-50*		
	D (mm)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)
1.0	19100	0,026	500	17510	0,027	480	15920	0,028	450	14330	0,029	420	
1.1	17370	0,029	500	15920	0,030	480	14470	0,031	450	13030	0,032	420	
1.2	15920	0,031	500	14590	0,033	480	13270	0,034	450	11940	0,035	420	
1.3	14690	0,034	500	13470	0,036	480	12250	0,037	450	11020	0,038	420	
1.4	13650	0,037	500	12510	0,038	480	11370	0,040	450	10240	0,041	420	
1.5	12740	0,042	530	11670	0,044	510	10610	0,045	480	9550	0,048	460	
1.6	11940	0,044	530	10950	0,047	510	9950	0,048	480	8960	0,051	460	
1.7	11240	0,047	530	10300	0,050	510	9370	0,051	480	8430	0,055	460	
1.8	10610	0,050	530	9730	0,052	510	8850	0,054	480	7960	0,058	460	
1.9	10060	0,053	530	9220	0,055	510	8380	0,057	480	7540	0,061	460	
2.0	9550	0,058	550	8760	0,062	540	7960	0,065	520	7170	0,070	500	
2.1	9100	0,060	550	8340	0,065	540	7580	0,069	520	6830	0,073	500	
2.2	8690	0,063	550	7960	0,068	540	7240	0,072	520	6520	0,077	500	
2.3	8310	0,066	550	7620	0,071	540	6920	0,075	520	6230	0,080	500	
2.4	7960	0,069	550	7300	0,074	540	6640	0,078	520	5970	0,084	500	
2.5	7640	0,076	580	7010	0,080	560	6370	0,085	540	5730	0,091	520	
2.6	7350	0,079	580	6740	0,083	560	6130	0,088	540	5510	0,094	520	
2.7	7080	0,082	580	6490	0,086	560	5900	0,092	540	5310	0,098	520	
2.8	6830	0,085	580	6260	0,089	560	5690	0,095	540	5120	0,102	520	
2.9	6590	0,088	580	6040	0,093	560	5490	0,098	540	4940	0,105	520	
3.0	6370	0,094	600	5840	0,099	580	5310	0,107	570	4780	0,115	550	

*if the machine tool or the equipment wouldn't allow to reach the requested rpm, please use the max. available rpm recalculating the Vf value (Vf=n available x fn)

	Material Group ISO 513	M1 M2			M3			M4			M5		
	Hardness/Rm	< 750 N/mm ²			550-850 N/mm ²			650-950 N/mm ²			850-1200 N/mm ²		
	Vc (m/min)	30-40*			25-35*			23-33*			19-29*		
	D (mm)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)
1.0	11140	0,027	300	9550	0,029	280	8920	0,027	240	7640	0,017	130	
1.1	10130	0,030	300	8690	0,032	280	8110	0,030	240	6950	0,019	130	
1.2	9290	0,032	300	7960	0,035	280	7430	0,032	240	6370	0,020	130	
1.3	8570	0,035	300	7350	0,038	280	6860	0,035	240	5880	0,022	130	
1.4	7960	0,038	300	6830	0,041	280	6370	0,038	240	5460	0,024	130	
1.5	7430	0,043	320	6370	0,047	300	5950	0,044	260	5100	0,029	150	
1.6	6970	0,046	320	5970	0,050	300	5570	0,047	260	4780	0,031	150	
1.7	6560	0,049	320	5620	0,053	300	5250	0,050	260	4500	0,033	150	
1.8	6190	0,052	320	5310	0,056	300	4960	0,052	260	4250	0,035	150	
1.9	5870	0,055	320	5030	0,060	300	4700	0,055	260	4030	0,037	150	
2.0	5570	0,063	350	4780	0,069	330	4460	0,063	280	3820	0,045	170	
2.1	5310	0,066	350	4550	0,073	330	4250	0,066	280	3640	0,047	170	
2.2	5070	0,069	350	4350	0,076	330	4060	0,069	280	3480	0,049	170	
2.3	4850	0,072	350	4160	0,079	330	3880	0,072	280	3330	0,051	170	
2.4	4650	0,075	350	3980	0,083	330	3720	0,075	280	3190	0,053	170	
2.5	4460	0,085	380	3820	0,092	350	3570	0,084	300	3060	0,062	190	
2.6	4290	0,089	380	3680	0,095	350	3430	0,087	300	2940	0,065	190	
2.7	4130	0,092	380	3540	0,099	350	3310	0,091	300	2830	0,067	190	
2.8	3980	0,095	380	3420	0,102	350	3190	0,094	300	2730	0,070	190	
2.9	3850	0,099	380	3300	0,106	350	3080	0,097	300	2640	0,072	190	
3.0	3720	0,108	400	3190	0,116	370	2980	0,107	320	2550	0,082	210	

*if the machine tool or the equipment wouldn't allow to reach the requested rpm, please use the max. available rpm recalculating the Vf value (Vf=n available x fn)

- INFO
- TYPHOON TA-HTA-4HTA
- TYPHOON PU-HPU
- TYPHOON SUH
- TYPHOON ALH
- TYPHOON HRC
- TYPHOON SUH MINI
- TYPHOON HL
- C-SD-TA
- LFTA
- SUTA
- HSS-HSS/CO DRILLS
- G2
- MDTA
- HF VH/UP
- MEF
- ALU
- MEX
- UH
- HSS/CO-HSSP END MILLS
- CARBIDE BURRS

358SUH MINI

Material Group ISO 513	K1			K2			K3			K4					
	150-250 HB			150-350 HB			120-260 HB			250-500 HB					
	Vc (m/min)			62-72*			56-66*			51-61*			45-55*		
	D (mm)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)		
1.0	21330	0,037	780	19420	0,039	750	17830	0,039	700	15920	0,043	690			
1.1	19390	0,040	780	17650	0,042	750	16210	0,043	700	14470	0,048	690			
1.2	17770	0,044	780	16180	0,046	750	14860	0,047	700	13270	0,052	690			
1.3	16410	0,048	780	14940	0,050	750	13720	0,051	700	12250	0,056	690			
1.4	15240	0,051	780	13870	0,054	750	12740	0,055	700	11370	0,061	690			
1.5	14220	0,060	860	12950	0,065	840	11890	0,064	760	10610	0,070	740			
1.6	13330	0,065	860	12140	0,069	840	11140	0,068	760	9950	0,074	740			
1.7	12550	0,069	860	11430	0,073	840	10490	0,072	760	9370	0,079	740			
1.8	11850	0,073	860	10790	0,078	840	9910	0,077	760	8850	0,084	740			
1.9	11230	0,077	860	10220	0,082	840	9390	0,081	760	8380	0,088	740			
2.0	10670	0,088	940	9710	0,095	920	8920	0,091	810	7960	0,099	790			
2.1	10160	0,093	940	9250	0,099	920	8490	0,095	810	7580	0,104	790			
2.2	9700	0,097	940	8830	0,104	920	8110	0,100	810	7240	0,109	790			
2.3	9280	0,101	940	8450	0,109	920	7750	0,105	810	6920	0,114	790			
2.4	8890	0,106	940	8090	0,114	920	7430	0,109	810	6640	0,119	790			
2.5	8530	0,129	1100	7770	0,129	1000	7130	0,126	900	6370	0,133	850			
2.6	8210	0,134	1100	7470	0,134	1000	6860	0,131	900	6130	0,139	850			
2.7	7900	0,139	1100	7200	0,139	1000	6610	0,136	900	5900	0,144	850			
2.8	7620	0,144	1100	6940	0,144	1000	6370	0,141	900	5690	0,149	850			
2.9	7360	0,149	1100	6700	0,149	1000	6150	0,146	900	5490	0,155	850			
3.0	7110	0,169	1200	6480	0,170	1100	5950	0,168	1000	5310	0,179	950			



*if the machine tool or the equipment wouldn't allow to reach the requested rpm, please use the max. available rpm recalculating the Vf value (Vf=n available x fn)

Material Group ISO 513	N1			N2			N3 N4			N5					
	80-90*			60-70*			65-75*			80-90*					
	Vc (m/min)			80-90*			60-70*			65-75*			80-90*		
	D (mm)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)		
1.0	27060	0,039	1050	20690	0,039	800	22280	0,034	750	27060	0,042	1150			
1.1	24600	0,043	1050	18810	0,043	800	20260	0,037	750	24600	0,047	1150			
1.2	22550	0,047	1050	17240	0,046	800	18570	0,040	750	22550	0,051	1150			
1.3	20810	0,050	1050	15920	0,050	800	17140	0,044	750	20810	0,055	1150			
1.4	19330	0,054	1050	14780	0,054	800	15920	0,047	750	19330	0,059	1150			
1.5	18040	0,067	1200	13800	0,065	900	14860	0,057	850	18040	0,072	1300			
1.6	16910	0,071	1200	12930	0,070	900	13930	0,061	850	16910	0,077	1300			
1.7	15920	0,075	1200	12170	0,074	900	13110	0,065	850	15920	0,082	1300			
1.8	15030	0,080	1200	11500	0,078	900	12380	0,069	850	15030	0,086	1300			
1.9	14240	0,084	1200	10890	0,083	900	11730	0,072	850	14240	0,091	1300			
2.0	13530	0,096	1300	10350	0,097	1000	11140	0,081	900	13530	0,103	1400			
2.1	12890	0,101	1300	9860	0,101	1000	10610	0,085	900	12890	0,109	1400			
2.2	12300	0,106	1300	9410	0,106	1000	10130	0,089	900	12300	0,114	1400			
2.3	11770	0,110	1300	9000	0,111	1000	9690	0,093	900	11770	0,119	1400			
2.4	11280	0,115	1300	8620	0,116	1000	9290	0,097	900	11280	0,124	1400			
2.5	10830	0,129	1400	8280	0,139	1150	8920	0,112	1000	10830	0,139	1500			
2.6	10410	0,134	1400	7960	0,144	1150	8570	0,117	1000	10410	0,144	1500			
2.7	10020	0,140	1400	7670	0,150	1150	8260	0,121	1000	10020	0,150	1500			
2.8	9670	0,145	1400	7390	0,156	1150	7960	0,126	1000	9670	0,155	1500			
2.9	9330	0,150	1400	7140	0,161	1150	7690	0,130	1000	9330	0,161	1500			
3.0	9020	0,166	1500	6900	0,188	1300	7430	0,148	1100	9020	0,177	1600			



*if the machine tool or the equipment wouldn't allow to reach the requested rpm, please use the max. available rpm recalculating the Vf value (Vf=n available x fn)

358SUH MINI

Material Group ISO 513	S1 S2			S3			S4			S5		
	< 35 HRC			35-45 HRC								
	20-30*			17-27*			25-35*			23-33*		
Vc (m/min)	n	fn	Vf	n	fn	Vf	n	fn	Vf	n	fn	Vf
D (mm)	(rpm)	(mm/rev)	(mm/min)	(rpm)	(mm/rev)	(mm/min)	(rpm)	(mm/rev)	(mm/min)	(rpm)	(mm/rev)	(mm/min)
1.0	7960	0,013	100	7010	0,010	70	9550	0,021	200	8920	0,019	170
1.1	7240	0,014	100	6370	0,011	70	8690	0,023	200	8110	0,021	170
1.2	6640	0,015	100	5840	0,012	70	7960	0,025	200	7430	0,023	170
1.3	6130	0,016	100	5390	0,013	70	7350	0,027	200	6860	0,025	170
1.4	5690	0,018	100	5010	0,014	70	6830	0,029	200	6370	0,027	170
1.5	5310	0,024	130	4670	0,019	90	6370	0,036	230	5950	0,034	200
1.6	4980	0,026	130	4380	0,021	90	5970	0,039	230	5570	0,036	200
1.7	4690	0,028	130	4120	0,022	90	5620	0,041	230	5250	0,038	200
1.8	4430	0,029	130	3890	0,023	90	5310	0,043	230	4960	0,040	200
1.9	4190	0,031	130	3690	0,024	90	5030	0,046	230	4700	0,043	200
2.0	3980	0,038	150	3510	0,031	110	4780	0,054	260	4460	0,050	225
2.1	3790	0,040	150	3340	0,033	110	4550	0,057	260	4250	0,053	225
2.2	3620	0,041	150	3190	0,034	110	4350	0,060	260	4060	0,055	225
2.3	3460	0,043	150	3050	0,036	110	4160	0,063	260	3880	0,058	225
2.4	3320	0,045	150	2920	0,038	110	3980	0,065	260	3720	0,060	225
2.5	3190	0,056	180	2810	0,046	130	3820	0,079	300	3570	0,070	250
2.6	3070	0,059	180	2700	0,048	130	3680	0,082	300	3430	0,073	250
2.7	2950	0,061	180	2600	0,050	130	3540	0,085	300	3310	0,076	250
2.8	2850	0,063	180	2510	0,052	130	3420	0,088	300	3190	0,078	250
2.9	2750	0,065	180	2420	0,054	130	3300	0,091	300	3080	0,081	250
3.0	2660	0,071	190	2340	0,060	140	3190	0,110	350	2980	0,101	300



*if the machine tool or the equipment wouldn't allow to reach the requested rpm, please use the max. available rpm recalculating the Vf value (Vf=n available x fn)

- INFO
- TYPHOON TA-HTA-4HTA
- TYPHOON PU-HPU
- TYPHOON SUH
- TYPHOON ALH
- TYPHOON HRC
- TYPHOON SUH MINI
- TYPHOON HL
- C-SD-TA
- LFTA
- SUTA
- HSS-HSS/CO DRILLS
- G2
- MDTA
- HF VH/UP
- MEF
- ALU
- MEX
- UH
- HSS/CO-HSSP END MILLS
- CARBIDE BURRS

3512SUH MINI

Material Group ISO 513	P1 P2			P3 P4			P5			P6		
	500-700 N/mm ²			600-1000 N/mm ²			900-1200 N/mm ²			1200-1400 N/mm ²		
	52-62*			47-57*			42-52*			37-47*		
Hardness/Rm												
Vc (m/min)												
D (mm)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)
1.0	18150	0,026	480	16550	0,027	450	14960	0,027	400	13370	0,028	370
1.1	16500	0,029	480	15050	0,030	450	13600	0,029	400	12160	0,030	370
1.2	15120	0,032	480	13800	0,033	450	12470	0,032	400	11140	0,033	370
1.3	13960	0,034	480	12740	0,035	450	11510	0,035	400	10290	0,036	370
1.4	12960	0,037	480	11830	0,038	450	10690	0,037	400	9550	0,039	370
1.5	12100	0,042	510	11040	0,043	480	9980	0,045	450	8920	0,045	400
1.6	11340	0,045	510	10350	0,046	480	9350	0,048	450	8360	0,048	400
1.7	10680	0,048	510	9740	0,049	480	8800	0,051	450	7870	0,051	400
1.8	10080	0,051	510	9200	0,052	480	8320	0,054	450	7430	0,054	400
1.9	9550	0,053	510	8720	0,055	480	7880	0,057	450	7040	0,057	400
2.0	9080	0,058	530	8280	0,062	510	7480	0,065	485	6690	0,066	440
2.1	8640	0,061	530	7890	0,065	510	7130	0,068	485	6370	0,069	440
2.2	8250	0,064	530	7530	0,068	510	6800	0,071	485	6080	0,072	440
2.3	7890	0,067	530	7200	0,071	510	6510	0,075	485	5820	0,076	440
2.4	7560	0,070	530	6900	0,074	510	6240	0,078	485	5570	0,079	440
2.5	7260	0,077	560	6620	0,082	540	5990	0,087	520	5350	0,090	480
2.6	6980	0,080	560	6370	0,085	540	5760	0,090	520	5150	0,093	480
2.7	6720	0,083	560	6130	0,088	540	5550	0,094	520	4960	0,097	480
2.8	6480	0,086	560	5920	0,091	540	5350	0,097	520	4780	0,100	480
2.9	6260	0,089	560	5710	0,095	540	5160	0,101	520	4610	0,104	480
3.0	6050	0,096	580	5520	0,101	560	4990	0,108	540	4460	0,117	520



*if the machine tool or the equipment wouldn't allow to reach the requested rpm, please use the max. available rpm recalculating the Vf value (Vf=n available x fn)

Material Group ISO 513	M1 M2			M3			M4			M5		
	< 750 N/mm ²			550-850 N/mm ²			650-950 N/mm ²			850-1200 N/mm ²		
	27-37*			22-32			20-30*			16-26*		
Hardness/Rm												
Vc (m/min)												
D (mm)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)
1.0	10190	0,027	280	8600	0,030	260	7960	0,028	220	6690	0,016	110
1.1	9260	0,030	280	7820	0,033	260	7240	0,030	220	6080	0,018	110
1.2	8490	0,033	280	7170	0,036	260	6640	0,033	220	5570	0,020	110
1.3	7840	0,036	280	6620	0,039	260	6130	0,036	220	5150	0,021	110
1.4	7280	0,038	280	6140	0,042	260	5690	0,039	220	4780	0,023	110
1.5	6790	0,044	300	5730	0,049	280	5310	0,047	250	4460	0,029	130
1.6	6370	0,047	300	5380	0,052	280	4980	0,050	250	4180	0,031	130
1.7	6000	0,050	300	5060	0,055	280	4690	0,053	250	3940	0,033	130
1.8	5660	0,053	300	4780	0,059	280	4430	0,056	250	3720	0,035	130
1.9	5370	0,056	300	4530	0,062	280	4190	0,060	250	3520	0,037	130
2.0	5100	0,065	330	4300	0,072	310	3980	0,068	270	3350	0,045	150
2.1	4850	0,068	330	4100	0,076	310	3790	0,071	270	3190	0,047	150
2.2	4630	0,071	330	3910	0,079	310	3620	0,075	270	3040	0,049	150
2.3	4430	0,074	330	3740	0,083	310	3460	0,078	270	2910	0,052	150
2.4	4250	0,078	330	3590	0,086	310	3320	0,081	270	2790	0,054	150
2.5	4080	0,086	350	3440	0,096	330	3190	0,091	290	2680	0,063	170
2.6	3920	0,089	350	3310	0,100	330	3070	0,094	290	2580	0,066	170
2.7	3780	0,093	350	3190	0,103	330	2950	0,098	290	2480	0,069	170
2.8	3640	0,096	350	3070	0,107	330	2850	0,102	290	2390	0,071	170
2.9	3520	0,099	350	2970	0,111	330	2750	0,105	290	2310	0,074	170
3.0	3400	0,112	380	2870	0,125	360	2660	0,117	310	2230	0,085	190



*if the machine tool or the equipment wouldn't allow to reach the requested rpm, please use the max. available rpm recalculating the Vf value (Vf=n available x fn)

- INFO
- TYPHOON TA-HTA-4HTA
- TYPHOON PU-HPU
- TYPHOON SUH
- TYPHOON ALH
- TYPHOON HRC
- TYPHOON SUH MINI
- TYPHOON HL
- C-SD-TA
- LFTA
- SUTA
- HSS-HSS/CO DRILLS
- G2
- MDTA
- HF VH/UP
- MEF
- ALU
- MEX
- UH
- HSS/CO-HSSP END MILLS
- CARBIDE BURRS

3512SUH MINI

Material Group ISO 513	K1			K2			K3			K4					
	Hardness/Rm			150-250 HB			150-350 HB			120-260 HB			250-500 HB		
	Vc (m/min)			57-67*			49-59*			46-56*			40-50*		
	D (mm)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)		
1.0	19740	0,035	700	17190	0,040	680	16240	0,038	620	14330	0,041	590			
1.1	17940	0,039	700	15630	0,044	680	14760	0,042	620	13030	0,045	590			
1.2	16450	0,043	700	14330	0,047	680	13530	0,046	620	11940	0,049	590			
1.3	15180	0,046	700	13230	0,051	680	12490	0,050	620	11020	0,054	590			
1.4	14100	0,050	700	12280	0,055	680	11600	0,053	620	10240	0,058	590			
1.5	13160	0,059	770	11460	0,064	730	10830	0,063	680	9550	0,066	630			
1.6	12340	0,062	770	10750	0,068	730	10150	0,067	680	8960	0,070	630			
1.7	11610	0,066	770	10110	0,072	730	9550	0,071	680	8430	0,075	630			
1.8	10970	0,070	770	9550	0,076	730	9020	0,075	680	7960	0,079	630			
1.9	10390	0,074	770	9050	0,081	730	8550	0,080	680	7540	0,084	630			
2.0	9870	0,082	810	8600	0,091	780	8120	0,089	720	7170	0,095	680			
2.1	9400	0,086	810	8190	0,095	780	7730	0,093	720	6830	0,100	680			
2.2	8970	0,090	810	7820	0,100	780	7380	0,098	720	6520	0,104	680			
2.3	8580	0,094	810	7480	0,104	780	7060	0,102	720	6230	0,109	680			
2.4	8230	0,098	810	7170	0,109	780	6770	0,106	720	5970	0,114	680			
2.5	7900	0,113	890	6880	0,118	810	6500	0,118	770	5730	0,126	720			
2.6	7590	0,117	890	6620	0,122	810	6250	0,123	770	5510	0,131	720			
2.7	7310	0,122	890	6370	0,127	810	6020	0,128	770	5310	0,136	720			
2.8	7050	0,126	890	6140	0,132	810	5800	0,133	770	5120	0,141	720			
2.9	6810	0,131	890	5930	0,137	810	5600	0,138	770	4940	0,146	720			
3.0	6580	0,143	940	5730	0,154	880	5420	0,149	810	4780	0,159	760			



*if the machine tool or the equipment wouldn't allow to reach the requested rpm, please use the max. available rpm recalculating the Vf value (Vf=n available x fn)

Material Group ISO 513	N1			N2			N3 N4			N5					
	Hardness/Rm														
	Vc (m/min)			75-85*			55-65*			60-70*			75-85*		
	D (mm)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)		
1.0	25470	0,033	850	19100	0,037	700	20690	0,030	630	25470	0,039	1000			
1.1	23150	0,037	850	17370	0,040	700	18810	0,033	630	23150	0,043	1000			
1.2	21220	0,040	850	15920	0,044	700	17240	0,037	630	21220	0,047	1000			
1.3	19590	0,043	850	14690	0,048	700	15920	0,040	630	19590	0,051	1000			
1.4	18190	0,047	850	13650	0,051	700	14780	0,043	630	18190	0,055	1000			
1.5	16980	0,059	1000	12740	0,063	800	13800	0,051	700	16980	0,065	1100			
1.6	15920	0,063	1000	11940	0,067	800	12930	0,054	700	15920	0,069	1100			
1.7	14980	0,067	1000	11240	0,071	800	12170	0,058	700	14980	0,073	1100			
1.8	14150	0,071	1000	10610	0,075	800	11500	0,061	700	14150	0,078	1100			
1.9	13410	0,075	1000	10060	0,080	800	10890	0,064	700	13410	0,082	1100			
2.0	12740	0,086	1100	9550	0,094	900	10350	0,077	800	12740	0,094	1200			
2.1	12130	0,091	1100	9100	0,099	900	9860	0,081	800	12130	0,099	1200			
2.2	11580	0,095	1100	8690	0,104	900	9410	0,085	800	11580	0,104	1200			
2.3	11080	0,099	1100	8310	0,108	900	9000	0,089	800	11080	0,108	1200			
2.4	10610	0,104	1100	7960	0,113	900	8620	0,093	800	10610	0,113	1200			
2.5	10190	0,118	1200	7640	0,131	1000	8280	0,109	900	10190	0,128	1300			
2.6	9800	0,122	1200	7350	0,136	1000	7960	0,113	900	9800	0,133	1300			
2.7	9440	0,127	1200	7080	0,141	1000	7670	0,117	900	9440	0,138	1300			
2.8	9100	0,132	1200	6830	0,146	1000	7390	0,122	900	9100	0,143	1300			
2.9	8780	0,137	1200	6590	0,152	1000	7140	0,126	900	8780	0,148	1300			
3.0	8490	0,153	1300	6370	0,173	1100	6900	0,145	1000	8490	0,165	1400			



*if the machine tool or the equipment wouldn't allow to reach the requested rpm, please use the max. available rpm recalculating the Vf value (Vf=n available x fn)

3512SUH MINI

Material Group ISO 513	S1 S2			S3			S4			S5				
	Hardness/Rm			< 35 HRC			35-45 HRC							
	Vc (m/min)			17-27*			15-25*			23-33*			21-31*	
D (mm)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)		
1.0	7010	0,013	90	6370	0,010	65	8920	0,020	180	8280	0,019	160		
1.1	6370	0,014	90	5790	0,011	65	8110	0,022	180	7530	0,021	160		
1.2	5840	0,015	90	5310	0,012	65	7430	0,024	180	6900	0,023	160		
1.3	5390	0,017	90	4900	0,013	65	6860	0,026	180	6370	0,025	160		
1.4	5010	0,018	90	4550	0,014	65	6370	0,028	180	5920	0,027	160		
1.5	4670	0,024	110	4250	0,019	80	5950	0,037	220	5520	0,034	185		
1.6	4380	0,025	110	3980	0,020	80	5570	0,039	220	5180	0,036	185		
1.7	4120	0,027	110	3750	0,021	80	5250	0,042	220	4870	0,038	185		
1.8	3890	0,028	110	3540	0,023	80	4960	0,044	220	4600	0,040	185		
1.9	3690	0,030	110	3360	0,024	80	4700	0,047	220	4360	0,042	185		
2.0	3510	0,037	130	3190	0,031	100	4460	0,056	250	4140	0,051	210		
2.1	3340	0,039	130	3040	0,033	100	4250	0,059	250	3950	0,053	210		
2.2	3190	0,041	130	2900	0,034	100	4060	0,062	250	3770	0,056	210		
2.3	3050	0,043	130	2770	0,036	100	3880	0,064	250	3600	0,058	210		
2.4	2920	0,045	130	2660	0,038	100	3720	0,067	250	3450	0,061	210		
2.5	2810	0,053	150	2550	0,047	120	3570	0,078	280	3310	0,071	235		
2.6	2700	0,056	150	2450	0,049	120	3430	0,082	280	3190	0,074	235		
2.7	2600	0,058	150	2360	0,051	120	3310	0,085	280	3070	0,077	235		
2.8	2510	0,060	150	2280	0,053	120	3190	0,088	280	2960	0,079	235		
2.9	2420	0,062	150	2200	0,055	120	3080	0,091	280	2860	0,082	235		
3.0	2340	0,077	180	2130	0,061	130	2980	0,101	300	2760	0,091	250		



*if the machine tool or the equipment wouldn't allow to reach the requested rpm, please use the max. available rpm recalculating the Vf value (Vf=n available x fn)

- INFO
- TYPHOON TA-HTA-4HTA
- TYPHOON PU-HPU
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- TYPHOON HL
- C-SD-TA
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CUTTING PARAMETERS

3520SUH MINI

Material Group ISO 513	P1 P2			P3 P4			P5			P6		
	500-700 N/mm ²			600-1000 N/mm ²			900-1200 N/mm ²			1200-1400 N/mm ²		
	52-62*			47-57*			42-52*			37-47*		
Vc (m/min)	n	fn	Vf	n	fn	Vf	n	fn	Vf	n	fn	Vf
D (mm)	(rpm)	(mm/rev)	(mm/min)	(rpm)	(mm/rev)	(mm/min)	(rpm)	(mm/rev)	(mm/min)	(rpm)	(mm/rev)	(mm/min)
1.0	18150	0,026	480	16550	0,027	450	14960	0,027	400	13370	0,028	370
1.1	16500	0,029	480	15050	0,030	450	13600	0,029	400	12160	0,030	370
1.2	15120	0,032	480	13800	0,033	450	12470	0,032	400	11140	0,033	370
1.3	13960	0,034	480	12740	0,035	450	11510	0,035	400	10290	0,036	370
1.4	12960	0,037	480	11830	0,038	450	10690	0,037	400	9550	0,039	370
1.5	12100	0,042	510	11040	0,043	480	9980	0,045	450	8920	0,045	400
1.6	11340	0,045	510	10350	0,046	480	9350	0,048	450	8360	0,048	400
1.7	10680	0,048	510	9740	0,049	480	8800	0,051	450	7870	0,051	400
1.8	10080	0,051	510	9200	0,052	480	8320	0,054	450	7430	0,054	400
1.9	9550	0,053	510	8720	0,055	480	7880	0,057	450	7040	0,057	400
2.0	9080	0,058	530	8280	0,062	510	7480	0,065	485	6690	0,066	440
2.1	8640	0,061	530	7890	0,065	510	7130	0,068	485	6370	0,069	440
2.2	8250	0,064	530	7530	0,068	510	6800	0,071	485	6080	0,072	440
2.3	7890	0,067	530	7200	0,071	510	6510	0,075	485	5820	0,076	440
2.4	7560	0,070	530	6900	0,074	510	6240	0,078	485	5570	0,079	440
2.5	7260	0,077	560	6620	0,082	540	5990	0,087	520	5350	0,090	480
2.6	6980	0,080	560	6370	0,085	540	5760	0,090	520	5150	0,093	480
2.7	6720	0,083	560	6130	0,088	540	5550	0,094	520	4960	0,097	480
2.8	6480	0,086	560	5920	0,091	540	5350	0,097	520	4780	0,100	480
2.9	6260	0,089	560	5710	0,095	540	5160	0,101	520	4610	0,104	480
3.0	6050	0,096	580	5520	0,101	560	4990	0,108	540	4460	0,117	520



*if the machine tool or the equipment wouldn't allow to reach the requested rpm, please use the max. available rpm recalculating the Vf value (Vf=n available x fn)

Material Group ISO 513	M1 M2			M3			M4			M5		
	< 750 N/mm ²			550-850 N/mm ²			650-950 N/mm ²			850-1200 N/mm ²		
	27-37*			22-32*			20-30*			16-26*		
Vc (m/min)	n	fn	Vf	n	fn	Vf	n	fn	Vf	n	fn	Vf
D (mm)	(rpm)	(mm/rev)	(mm/min)	(rpm)	(mm/rev)	(mm/min)	(rpm)	(mm/rev)	(mm/min)	(rpm)	(mm/rev)	(mm/min)
1.0	10190	0,027	280	8600	0,030	260	7960	0,028	220	6690	0,016	110
1.1	9260	0,030	280	7820	0,033	260	7240	0,030	220	6080	0,018	110
1.2	8490	0,033	280	7170	0,036	260	6640	0,033	220	5570	0,020	110
1.3	7840	0,036	280	6620	0,039	260	6130	0,036	220	5150	0,021	110
1.4	7280	0,038	280	6140	0,042	260	5690	0,039	220	4780	0,023	110
1.5	6790	0,044	300	5730	0,049	280	5310	0,047	250	4460	0,029	130
1.6	6370	0,047	300	5380	0,052	280	4980	0,050	250	4180	0,031	130
1.7	6000	0,050	300	5060	0,055	280	4690	0,053	250	3940	0,033	130
1.8	5660	0,053	300	4780	0,059	280	4430	0,056	250	3720	0,035	130
1.9	5370	0,056	300	4530	0,062	280	4190	0,060	250	3520	0,037	130
2.0	5100	0,065	330	4300	0,072	310	3980	0,068	270	3350	0,045	150
2.1	4850	0,068	330	4100	0,076	310	3790	0,071	270	3190	0,047	150
2.2	4630	0,071	330	3910	0,079	310	3620	0,075	270	3040	0,049	150
2.3	4430	0,074	330	3740	0,083	310	3460	0,078	270	2910	0,052	150
2.4	4250	0,078	330	3590	0,086	310	3320	0,081	270	2790	0,054	150
2.5	4080	0,086	350	3440	0,096	330	3190	0,091	290	2680	0,063	170
2.6	3920	0,089	350	3310	0,100	330	3070	0,094	290	2580	0,066	170
2.7	3780	0,093	350	3190	0,103	330	2950	0,098	290	2480	0,069	170
2.8	3640	0,096	350	3070	0,107	330	2850	0,102	290	2390	0,071	170
2.9	3520	0,099	350	2970	0,111	330	2750	0,105	290	2310	0,074	170
3.0	3400	0,112	380	2870	0,125	360	2660	0,117	310	2230	0,085	190



*if the machine tool or the equipment wouldn't allow to reach the requested rpm, please use the max. available rpm recalculating the Vf value (Vf=n available x fn)

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- TYPHOON TA-HTA-4HTA
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- HSS/CO-HSSP END MILLS
- CARBIDE BURRS

3520SUH MINI

Material Group ISO 513	K1			K2			K3			K4					
	Hardness/Rm			150-250 HB			150-350 HB			120-260 HB			250-500 HB		
	Vc (m/min)			57-67*			49-59*			46-56*			40-50*		
	D (mm)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)		
1.0	19740	0,035	700	17190	0,040	680	16240	0,038	620	14330	0,041	590			
1.1	17940	0,039	700	15630	0,044	680	14760	0,042	620	13030	0,045	590			
1.2	16450	0,043	700	14330	0,047	680	13530	0,046	620	11940	0,049	590			
1.3	15180	0,046	700	13230	0,051	680	12490	0,050	620	11020	0,054	590			
1.4	14100	0,050	700	12280	0,055	680	11600	0,053	620	10240	0,058	590			
1.5	13160	0,059	770	11460	0,064	730	10830	0,063	680	9550	0,066	630			
1.6	12340	0,062	770	10750	0,068	730	10150	0,067	680	8960	0,070	630			
1.7	11610	0,066	770	10110	0,072	730	9550	0,071	680	8430	0,075	630			
1.8	10970	0,070	770	9550	0,076	730	9020	0,075	680	7960	0,079	630			
1.9	10390	0,074	770	9050	0,081	730	8550	0,080	680	7540	0,084	630			
2.0	9870	0,082	810	8600	0,091	780	8120	0,089	720	7170	0,095	680			
2.1	9400	0,086	810	8190	0,095	780	7730	0,093	720	6830	0,100	680			
2.2	8970	0,090	810	7820	0,100	780	7380	0,098	720	6520	0,104	680			
2.3	8580	0,094	810	7480	0,104	780	7060	0,102	720	6230	0,109	680			
2.4	8230	0,098	810	7170	0,109	780	6770	0,106	720	5970	0,114	680			
2.5	7900	0,113	890	6880	0,118	810	6500	0,118	770	5730	0,126	720			
2.6	7590	0,117	890	6620	0,122	810	6250	0,123	770	5510	0,131	720			
2.7	7310	0,122	890	6370	0,127	810	6020	0,128	770	5310	0,136	720			
2.8	7050	0,126	890	6140	0,132	810	5800	0,133	770	5120	0,141	720			
2.9	6810	0,131	890	5930	0,137	810	5600	0,138	770	4940	0,146	720			
3.0	6580	0,143	940	5730	0,154	880	5420	0,149	810	4780	0,159	760			



*if the machine tool or the equipment wouldn't allow to reach the requested rpm, please use the max. available rpm recalculating the Vf value (Vf=n available x fn)

Material Group ISO 513	N1			N2			N3 N4			N5					
	Hardness/Rm														
	Vc (m/min)			75-85*			55-65*			60-70*			75-85*		
	D (mm)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)		
1.0	25470	0,033	850	19100	0,037	700	20690	0,030	630	25470	0,039	1000			
1.1	23150	0,037	850	17370	0,040	700	18810	0,033	630	23150	0,043	1000			
1.2	21220	0,040	850	15920	0,044	700	17240	0,037	630	21220	0,047	1000			
1.3	19590	0,043	850	14690	0,048	700	15920	0,040	630	19590	0,051	1000			
1.4	18190	0,047	850	13650	0,051	700	14780	0,043	630	18190	0,055	1000			
1.5	16980	0,059	1000	12740	0,063	800	13800	0,051	700	16980	0,065	1100			
1.6	15920	0,063	1000	11940	0,067	800	12930	0,054	700	15920	0,069	1100			
1.7	14980	0,067	1000	11240	0,071	800	12170	0,058	700	14980	0,073	1100			
1.8	14150	0,071	1000	10610	0,075	800	11500	0,061	700	14150	0,078	1100			
1.9	13410	0,075	1000	10060	0,080	800	10890	0,064	700	13410	0,082	1100			
2.0	12740	0,086	1100	9550	0,094	900	10350	0,077	800	12740	0,094	1200			
2.1	12130	0,091	1100	9100	0,099	900	9860	0,081	800	12130	0,099	1200			
2.2	11580	0,095	1100	8690	0,104	900	9410	0,085	800	11580	0,104	1200			
2.3	11080	0,099	1100	8310	0,108	900	9000	0,089	800	11080	0,108	1200			
2.4	10610	0,104	1100	7960	0,113	900	8620	0,093	800	10610	0,113	1200			
2.5	10190	0,118	1200	7640	0,131	1000	8280	0,109	900	10190	0,128	1300			
2.6	9800	0,122	1200	7350	0,136	1000	7960	0,113	900	9800	0,133	1300			
2.7	9440	0,127	1200	7080	0,141	1000	7670	0,117	900	9440	0,138	1300			
2.8	9100	0,132	1200	6830	0,146	1000	7390	0,122	900	9100	0,143	1300			
2.9	8780	0,137	1200	6590	0,152	1000	7140	0,126	900	8780	0,148	1300			
3.0	8490	0,153	1300	6370	0,173	1100	6900	0,145	1000	8490	0,165	1400			



*if the machine tool or the equipment wouldn't allow to reach the requested rpm, please use the max. available rpm recalculating the Vf value (Vf=n available x fn)

3520SUH MINI

	Material Group ISO 513			S1 S2			S3			S4			S5		
	Hardness/Rm			< 35 HRC			35-45 HRC								
	Vc (m/min)			17-27*			15-25*			23-33*			21-31*		
D (mm)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)			
1.0	7010	0,013	90	6370	0,010	65	8920	0,020	180	8280	0,019	160			
1.1	6370	0,014	90	5790	0,011	65	8110	0,022	180	7530	0,021	160			
1.2	5840	0,015	90	5310	0,012	65	7430	0,024	180	6900	0,023	160			
1.3	5390	0,017	90	4900	0,013	65	6860	0,026	180	6370	0,025	160			
1.4	5010	0,018	90	4550	0,014	65	6370	0,028	180	5920	0,027	160			
1.5	4670	0,024	110	4250	0,019	80	5950	0,037	220	5520	0,034	185			
1.6	4380	0,025	110	3980	0,020	80	5570	0,039	220	5180	0,036	185			
1.7	4120	0,027	110	3750	0,021	80	5250	0,042	220	4870	0,038	185			
1.8	3890	0,028	110	3540	0,023	80	4960	0,044	220	4600	0,040	185			
1.9	3690	0,030	110	3360	0,024	80	4700	0,047	220	4360	0,042	185			
2.0	3510	0,037	130	3190	0,031	100	4460	0,056	250	4140	0,051	210			
2.1	3340	0,039	130	3040	0,033	100	4250	0,059	250	3950	0,053	210			
2.2	3190	0,041	130	2900	0,034	100	4060	0,062	250	3770	0,056	210			
2.3	3050	0,043	130	2770	0,036	100	3880	0,064	250	3600	0,058	210			
2.4	2920	0,045	130	2660	0,038	100	3720	0,067	250	3450	0,061	210			
2.5	2810	0,053	150	2550	0,047	120	3570	0,078	280	3310	0,071	235			
2.6	2700	0,056	150	2450	0,049	120	3430	0,082	280	3190	0,074	235			
2.7	2600	0,058	150	2360	0,051	120	3310	0,085	280	3070	0,077	235			
2.8	2510	0,060	150	2280	0,053	120	3190	0,088	280	2960	0,079	235			
2.9	2420	0,062	150	2200	0,055	120	3080	0,091	280	2860	0,082	235			
3.0	2340	0,077	180	2130	0,061	130	2980	0,101	300	2760	0,091	250			



*if the machine tool or the equipment wouldn't allow to reach the requested rpm, please use the max. available rpm recalculating the Vf value (Vf=n available x fn)

- INFO
- TYPHOON TA-HTA-4HTA
- TYPHOON PU-HPU
- TYPHOON SUH
- TYPHOON ALH
- TYPHOON HRC
- TYPHOON SUH MINI
- TYPHOON HL
- C-SD-TA
- LFTA
- SUTA
- HSS-HSS/CO DRILLS
- G2
- MDTA
- HF VH/UP
- MEF
- ALU
- MEX
- UH
- HSS/CO-HSSP END MILLS
- CARBIDE BURRS

CUTTING PARAMETERS

3525SUH MINI

Material Group ISO 513	P1 P2			P3 P4			P5			P6		
	500-700 N/mm ²			600-1000 N/mm ²			900-1200 N/mm ²			1200-1400 N/mm ²		
	47-57*			42-52*			37-47*			32-42*		
Hardness/Rm	500-700 N/mm ²			600-1000 N/mm ²			900-1200 N/mm ²			1200-1400 N/mm ²		
Vc (m/min)	47-57*			42-52*			37-47*			32-42*		
D (mm)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)
1.0	16550	0,027	440	14960	0,028	420	13370	0,028	370	11780	0,029	340
1.1	15050	0,029	440	13600	0,031	420	12160	0,030	370	10710	0,032	340
1.2	13800	0,032	440	12470	0,034	420	11140	0,033	370	9820	0,035	340
1.3	12740	0,035	440	11510	0,036	420	10290	0,036	370	9060	0,038	340
1.4	11830	0,037	440	10690	0,039	420	9550	0,039	370	8420	0,040	340
1.5	11040	0,043	480	9980	0,045	450	8920	0,045	400	7860	0,048	380
1.6	10350	0,046	480	9350	0,048	450	8360	0,048	400	7360	0,052	380
1.7	9740	0,049	480	8800	0,051	450	7870	0,051	400	6930	0,055	380
1.8	9200	0,052	480	8320	0,054	450	7430	0,054	400	6550	0,058	380
1.9	8720	0,055	480	7880	0,057	450	7040	0,057	400	6200	0,061	380
2.0	8280	0,062	510	7480	0,064	480	6690	0,064	430	5890	0,071	420
2.1	7890	0,065	510	7130	0,067	480	6370	0,068	430	5610	0,075	420
2.2	7530	0,068	510	6800	0,071	480	6080	0,071	430	5360	0,078	420
2.3	7200	0,071	510	6510	0,074	480	5820	0,074	430	5120	0,082	420
2.4	6900	0,074	510	6240	0,077	480	5570	0,077	430	4910	0,086	420
2.5	6620	0,082	540	5990	0,085	510	5350	0,088	470	4720	0,097	460
2.6	6370	0,085	540	5760	0,089	510	5150	0,091	470	4530	0,102	460
2.7	6130	0,088	540	5550	0,092	510	4960	0,095	470	4370	0,105	460
2.8	5920	0,091	540	5350	0,095	510	4780	0,098	470	4210	0,109	460
2.9	5710	0,095	540	5160	0,099	510	4610	0,102	470	4070	0,113	460
3.0	5520	0,103	570	4990	0,108	540	4460	0,112	500	3930	0,125	490



*if the machine tool or the equipment wouldn't allow to reach the requested rpm, please use the max. available rpm recalculating the Vf value (Vf=n available x fn)

Material Group ISO 513	M1 M2			M3			M4			M5		
	< 750 N/mm ²			550-850 N/mm ²			650-950 N/mm ²			850-1200 N/mm ²		
	23-33*			20-30*			17-27*			13-23*		
Hardness/Rm	< 750 N/mm ²			550-850 N/mm ²			650-950 N/mm ²			850-1200 N/mm ²		
Vc (m/min)	23-33*			20-30*			17-27*			13-23*		
D (mm)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)
1.0	8920	0,028	250	7960	0,030	240	7010	0,029	200	5730	0,016	90
1.1	8110	0,031	250	7240	0,033	240	6370	0,031	200	5210	0,017	90
1.2	7430	0,034	250	6640	0,036	240	5840	0,034	200	4780	0,019	90
1.3	6860	0,036	250	6130	0,039	240	5390	0,037	200	4410	0,020	90
1.4	6370	0,039	250	5690	0,042	240	5010	0,040	200	4100	0,022	90
1.5	5950	0,047	280	5310	0,050	265	4670	0,047	220	3820	0,029	110
1.6	5570	0,050	280	4980	0,053	265	4380	0,050	220	3590	0,031	110
1.7	5250	0,053	280	4690	0,057	265	4120	0,053	220	3370	0,033	110
1.8	4960	0,056	280	4430	0,060	265	3890	0,057	220	3190	0,034	110
1.9	4700	0,060	280	4190	0,063	265	3690	0,060	220	3020	0,036	110
2.0	4460	0,070	310	3980	0,073	290	3510	0,071	250	2870	0,045	130
2.1	4250	0,073	310	3790	0,077	290	3340	0,075	250	2730	0,048	130
2.2	4060	0,076	310	3620	0,080	290	3190	0,078	250	2610	0,050	130
2.3	3880	0,080	310	3460	0,084	290	3050	0,082	250	2500	0,052	130
2.4	3720	0,083	310	3320	0,087	290	2920	0,086	250	2390	0,054	130
2.5	3570	0,095	340	3190	0,097	310	2810	0,096	270	2300	0,065	150
2.6	3430	0,099	340	3070	0,101	310	2700	0,100	270	2210	0,068	150
2.7	3310	0,103	340	2950	0,105	310	2600	0,104	270	2130	0,070	150
2.8	3190	0,107	340	2850	0,109	310	2510	0,108	270	2050	0,073	150
2.9	3080	0,110	340	2750	0,113	310	2420	0,112	270	1980	0,076	150
3.0	2980	0,124	370	2660	0,128	340	2340	0,124	290	1910	0,094	180



*if the machine tool or the equipment wouldn't allow to reach the requested rpm, please use the max. available rpm recalculating the Vf value (Vf=n available x fn)

- INFO
- TYPHOON TA-HTA-4HTA
- TYPHOON PU-HPU
- TYPHOON SUH
- TYPHOON ALH
- TYPHOON HRC
- TYPHOON SUH MINI
- TYPHOON HL
- C-SD-TA
- LFTA
- SUTA
- HSS-HSS/CO DRILLS
- G2
- MDTA
- HF VH/UP
- MEF
- ALU
- MEX
- UH
- HSS/CO-HSSP END MILLS
- CARBIDE BURRS

3525SUH MINI

Material Group ISO 513	K1			K2			K3			K4		
	150-250 HB			150-350 HB			120-260 HB			250-500 HB		
	Vc (m/min)			44-54*			40-50*			35-45*		
	D (mm)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)
1.0	18150	0,021	380	15600	0,022	340	14330	0,022	310	12740	0,023	290
1.1	16500	0,023	380	14180	0,024	340	13030	0,024	310	11580	0,025	290
1.2	15120	0,025	380	13000	0,026	340	11940	0,026	310	10610	0,027	290
1.3	13960	0,027	380	12000	0,028	340	11020	0,028	310	9800	0,030	290
1.4	12960	0,029	380	11140	0,031	340	10240	0,030	310	9100	0,032	290
1.5	12100	0,031	380	10400	0,033	340	9550	0,032	310	8490	0,034	290
1.6	11340	0,041	460	9750	0,040	390	8960	0,041	370	7960	0,043	340
1.7	10680	0,043	460	9180	0,042	390	8430	0,044	370	7490	0,045	340
1.8	10080	0,046	460	8670	0,045	390	7960	0,046	370	7080	0,048	340
1.9	9550	0,048	460	8210	0,048	390	7540	0,049	370	6710	0,051	340
2.0	9080	0,051	460	7800	0,050	390	7170	0,052	370	6370	0,053	340
2.1	8640	0,059	510	7430	0,063	470	6830	0,061	420	6070	0,066	400
2.2	8250	0,062	510	7090	0,066	470	6520	0,064	420	5790	0,069	400
2.3	7890	0,065	510	6790	0,069	470	6230	0,067	420	5540	0,072	400
2.4	7560	0,067	510	6500	0,072	470	5970	0,070	420	5310	0,075	400
2.5	7260	0,070	510	6240	0,075	470	5730	0,073	420	5100	0,078	400
2.6	6980	0,083	580	6000	0,088	530	5510	0,087	480	4900	0,092	450
2.7	6720	0,086	580	5780	0,092	530	5310	0,090	480	4720	0,095	450
2.8	6480	0,090	580	5570	0,095	530	5120	0,094	480	4550	0,099	450
2.9	6260	0,093	580	5380	0,099	530	4940	0,097	480	4390	0,103	450
3.0	6050	0,096	580	5200	0,102	530	4780	0,100	480	4250	0,106	450



*if the machine tool or the equipment wouldn't allow to reach the requested rpm, please use the max. available rpm recalculating the Vf value (Vf=n available x fn)

Material Group ISO 513	N1			N2			N3 N4			N5		
	67-77*			49-59*			53-63*			67-77*		
	Vc (m/min)			49-59*			53-63*			67-77*		
	D (mm)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)
1.0	22920	0,026	600	17190	0,029	500	18460	0,030	550	22920	0,028	650
1.1	20840	0,029	600	15630	0,032	500	16790	0,030	500	20840	0,031	650
1.2	19100	0,031	600	14330	0,035	500	15390	0,032	500	19100	0,034	650
1.3	17630	0,034	600	13230	0,038	500	14200	0,035	500	17630	0,037	650
1.4	16370	0,037	600	12280	0,041	500	13190	0,042	550	16370	0,040	650
1.5	15280	0,039	600	11460	0,044	500	12310	0,045	550	15280	0,043	650
1.6	14330	0,050	720	10750	0,056	600	11540	0,059	680	14330	0,054	770
1.7	13480	0,053	720	10110	0,059	600	10860	0,063	680	13480	0,057	770
1.8	12740	0,057	720	9550	0,063	600	10260	0,066	680	12740	0,060	770
1.9	12070	0,060	720	9050	0,066	600	9720	0,070	680	12070	0,064	770
2.0	11460	0,063	720	8600	0,070	600	9230	0,074	680	11460	0,067	770
2.1	10920	0,083	910	8190	0,085	700	8800	0,097	850	10920	0,088	960
2.2	10420	0,087	910	7820	0,090	700	8400	0,101	850	10420	0,092	960
2.3	9970	0,091	910	7480	0,094	700	8030	0,106	850	9970	0,096	960
2.4	9550	0,095	910	7170	0,098	700	7700	0,110	850	9550	0,101	960
2.5	9170	0,099	910	6880	0,102	700	7390	0,115	850	9170	0,105	960
2.6	8820	0,125	1100	6620	0,121	800	7100	0,127	900	8820	0,130	1150
2.7	8490	0,130	1100	6370	0,126	800	6840	0,132	900	8490	0,135	1150
2.8	8190	0,134	1100	6140	0,130	800	6600	0,136	900	8190	0,140	1150
2.9	7910	0,139	1100	5930	0,135	800	6370	0,141	900	7910	0,145	1150
3.0	7640	0,144	1100	5730	0,140	800	6160	0,146	900	7640	0,151	1150



*if the machine tool or the equipment wouldn't allow to reach the requested rpm, please use the max. available rpm recalculating the Vf value (Vf=n available x fn)

3525SUH MINI

	Material Group ISO 513			S1 S2			S3			S4			S5		
	Hardness/Rm			< 35 HRC			35-45 HRC								
	Vc (m/min)			15-25*			13-23*			21-31*			19-29*		
D (mm)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)			
1.0	6370	0,013	80	5730	0,009	50	8280	0,018	150	7640	0,017	130			
1.1	5790	0,014	80	5210	0,010	50	7530	0,020	150	6950	0,019	130			
1.2	5310	0,015	80	4780	0,010	50	6900	0,022	150	6370	0,020	130			
1.3	4900	0,016	80	4410	0,011	50	6370	0,024	150	5880	0,022	130			
1.4	4550	0,018	80	4100	0,012	50	5920	0,025	150	5460	0,024	130			
1.5	4250	0,024	100	3820	0,018	70	5520	0,034	190	5100	0,031	160			
1.6	3980	0,025	100	3590	0,019	70	5180	0,037	190	4780	0,033	160			
1.7	3750	0,027	100	3370	0,021	70	4870	0,039	190	4500	0,036	160			
1.8	3540	0,028	100	3190	0,022	70	4600	0,041	190	4250	0,038	160			
1.9	3360	0,030	100	3020	0,023	70	4360	0,044	190	4030	0,040	160			
2.0	3190	0,034	110	2870	0,031	90	4140	0,051	210	3820	0,050	190			
2.1	3040	0,036	110	2730	0,033	90	3950	0,053	210	3640	0,052	190			
2.2	2900	0,038	110	2610	0,034	90	3770	0,056	210	3480	0,055	190			
2.3	2770	0,040	110	2500	0,036	90	3600	0,058	210	3330	0,057	190			
2.4	2660	0,041	110	2390	0,038	90	3450	0,061	210	3190	0,060	190			
2.5	2550	0,051	130	2300	0,043	100	3310	0,073	240	3060	0,072	220			
2.6	2450	0,053	130	2210	0,045	100	3190	0,075	240	2940	0,075	220			
2.7	2360	0,055	130	2130	0,047	100	3070	0,078	240	2830	0,078	220			
2.8	2280	0,057	130	2050	0,049	100	2960	0,081	240	2730	0,081	220			
2.9	2200	0,059	130	1980	0,051	100	2860	0,084	240	2640	0,083	220			
3.0	2130	0,070	150	1910	0,058	110	2760	0,094	260	2550	0,090	230			



*if the machine tool or the equipment wouldn't allow to reach the requested rpm, please use the max. available rpm recalculating the Vf value (Vf=n available x fn)

- INFO
- TYPHOON TA-HTA-4HTA
- TYPHOON PU-HPU
- TYPHOON SUH
- TYPHOON ALH
- TYPHOON HRC
- TYPHOON SUH MINI
- TYPHOON HL
- C-SD-TA
- LFTA
- SUTA
- HSS-HSS/CO DRILLS
- G2
- MDTA
- HF VH/UP
- MEF
- ALU
- MEX
- UH
- HSS/CO-HSSP END MILLS
- CARBIDE BURRS

3530SUH MINI

Material Group ISO 513	P1 P2			P3 P4			P5			P6		
	500-700 N/mm ²			600-1000 N/mm ²			900-1200 N/mm ²			1200-1400 N/mm ²		
	47-57*			42-52*			37-47*			32-42*		
Hardness/Rm	500-700 N/mm ²			600-1000 N/mm ²			900-1200 N/mm ²			1200-1400 N/mm ²		
Vc (m/min)	47-57*			42-52*			37-47*			32-42*		
D (mm)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)
1.0	16550	0,027	440	14960	0,028	420	13370	0,028	370	11780	0,029	340
1.1	15050	0,029	440	13600	0,031	420	12160	0,030	370	10710	0,032	340
1.2	13800	0,032	440	12470	0,034	420	11140	0,033	370	9820	0,035	340
1.3	12740	0,035	440	11510	0,036	420	10290	0,036	370	9060	0,038	340
1.4	11830	0,037	440	10690	0,039	420	9550	0,039	370	8420	0,040	340
1.5	11040	0,043	480	9980	0,045	450	8920	0,045	400	7860	0,048	380
1.6	10350	0,046	480	9350	0,048	450	8360	0,048	400	7360	0,052	380
1.7	9740	0,049	480	8800	0,051	450	7870	0,051	400	6930	0,055	380
1.8	9200	0,052	480	8320	0,054	450	7430	0,054	400	6550	0,058	380
1.9	8720	0,055	480	7880	0,057	450	7040	0,057	400	6200	0,061	380
2.0	8280	0,062	510	7480	0,064	480	6690	0,064	430	5890	0,071	420
2.1	7890	0,065	510	7130	0,067	480	6370	0,068	430	5610	0,075	420
2.2	7530	0,068	510	6800	0,071	480	6080	0,071	430	5360	0,078	420
2.3	7200	0,071	510	6510	0,074	480	5820	0,074	430	5120	0,082	420
2.4	6900	0,074	510	6240	0,077	480	5570	0,077	430	4910	0,086	420
2.5	6620	0,082	540	5990	0,085	510	5350	0,088	470	4720	0,097	460
2.6	6370	0,085	540	5760	0,089	510	5150	0,091	470	4530	0,102	460
2.7	6130	0,088	540	5550	0,092	510	4960	0,095	470	4370	0,105	460
2.8	5920	0,091	540	5350	0,095	510	4780	0,098	470	4210	0,109	460
2.9	5710	0,095	540	5160	0,099	510	4610	0,102	470	4070	0,113	460
3.0	5520	0,103	570	4990	0,108	540	4460	0,112	500	3930	0,125	490



*if the machine tool or the equipment wouldn't allow to reach the requested rpm, please use the max. available rpm recalculating the Vf value (Vf=n available x fn)

Material Group ISO 513	M1 M2			M3			M4			M5		
	< 750 N/mm ²			550-850 N/mm ²			650-950 N/mm ²			850-1200 N/mm ²		
	23-33*			20-30*			17-27*			13-23*		
Hardness/Rm	< 750 N/mm ²			550-850 N/mm ²			650-950 N/mm ²			850-1200 N/mm ²		
Vc (m/min)	23-33*			20-30*			17-27*			13-23*		
D (mm)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)
1.0	8920	0,028	250	7960	0,030	240	7010	0,029	200	5730	0,016	90
1.1	8110	0,031	250	7240	0,033	240	6370	0,031	200	5210	0,017	90
1.2	7430	0,034	250	6640	0,036	240	5840	0,034	200	4780	0,019	90
1.3	6860	0,036	250	6130	0,039	240	5390	0,037	200	4410	0,020	90
1.4	6370	0,039	250	5690	0,042	240	5010	0,040	200	4100	0,022	90
1.5	5950	0,047	280	5310	0,050	265	4670	0,047	220	3820	0,029	110
1.6	5570	0,050	280	4980	0,053	265	4380	0,050	220	3590	0,031	110
1.7	5250	0,053	280	4690	0,057	265	4120	0,053	220	3370	0,033	110
1.8	4960	0,056	280	4430	0,060	265	3890	0,057	220	3190	0,034	110
1.9	4700	0,060	280	4190	0,063	265	3690	0,060	220	3020	0,036	110
2.0	4460	0,070	310	3980	0,073	290	3510	0,071	250	2870	0,045	130
2.1	4250	0,073	310	3790	0,077	290	3340	0,075	250	2730	0,048	130
2.2	4060	0,076	310	3620	0,080	290	3190	0,078	250	2610	0,050	130
2.3	3880	0,080	310	3460	0,084	290	3050	0,082	250	2500	0,052	130
2.4	3720	0,083	310	3320	0,087	290	2920	0,086	250	2390	0,054	130
2.5	3570	0,095	340	3190	0,097	310	2810	0,096	270	2300	0,065	150
2.6	3430	0,099	340	3070	0,101	310	2700	0,100	270	2210	0,068	150
2.7	3310	0,103	340	2950	0,105	310	2600	0,104	270	2130	0,070	150
2.8	3190	0,107	340	2850	0,109	310	2510	0,108	270	2050	0,073	150
2.9	3080	0,110	340	2750	0,113	310	2420	0,112	270	1980	0,076	150
3.0	2980	0,124	370	2660	0,128	340	2340	0,124	290	1910	0,094	180



*if the machine tool or the equipment wouldn't allow to reach the requested rpm, please use the max. available rpm recalculating the Vf value (Vf=n available x fn)

- INFO
- TYPHOON TA-HTA-4HTA
- TYPHOON PU-HPU
- TYPHOON SUH
- TYPHOON ALH
- TYPHOON HRC
- TYPHOON SUH MINI
- TYPHOON HL
- C-SD-TA
- LFTA
- SUTA
- HSS-HSS/CO DRILLS
- G2
- MDTA
- HF VH/UP
- MEF
- ALU
- MEX
- UH
- HSS/CO-HSSP END MILLS
- CARBIDE BURRS

3530SUH MINI

Material Group ISO 513	K1			K2			K3			K4					
	Hardness/Rm			150-250 HB			150-350 HB			120-260 HB			250-500 HB		
	Vc (m/min)			52-62*			44-54*			40-50*			35-45*		
	D (mm)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)		
1.0	18150	0,021	380	15600	0,022	340	14330	0,022	310	12740	0,023	290			
1.1	16500	0,023	380	14180	0,024	340	13030	0,024	310	11580	0,025	290			
1.2	15120	0,025	380	13000	0,026	340	11940	0,026	310	10610	0,027	290			
1.3	13960	0,027	380	12000	0,028	340	11020	0,028	310	9800	0,030	290			
1.4	12960	0,029	380	11140	0,031	340	10240	0,030	310	9100	0,032	290			
1.5	12100	0,031	380	10400	0,033	340	9550	0,032	310	8490	0,034	290			
1.6	11340	0,041	460	9750	0,040	390	8960	0,041	370	7960	0,043	340			
1.7	10680	0,043	460	9180	0,042	390	8430	0,044	370	7490	0,045	340			
1.8	10080	0,046	460	8670	0,045	390	7960	0,046	370	7080	0,048	340			
1.9	9550	0,048	460	8210	0,048	390	7540	0,049	370	6710	0,051	340			
2.0	9080	0,051	460	7800	0,050	390	7170	0,052	370	6370	0,053	340			
2.1	8640	0,059	510	7430	0,063	470	6830	0,061	420	6070	0,066	400			
2.2	8250	0,062	510	7090	0,066	470	6520	0,064	420	5790	0,069	400			
2.3	7890	0,065	510	6790	0,069	470	6230	0,067	420	5540	0,072	400			
2.4	7560	0,067	510	6500	0,072	470	5970	0,070	420	5310	0,075	400			
2.5	7260	0,070	510	6240	0,075	470	5730	0,073	420	5100	0,078	400			
2.6	6980	0,083	580	6000	0,088	530	5510	0,087	480	4900	0,092	450			
2.7	6720	0,086	580	5780	0,092	530	5310	0,090	480	4720	0,095	450			
2.8	6480	0,090	580	5570	0,095	530	5120	0,094	480	4550	0,099	450			
2.9	6260	0,093	580	5380	0,099	530	4940	0,097	480	4390	0,103	450			
3.0	6050	0,096	580	5200	0,102	530	4780	0,100	480	4250	0,106	450			



*if the machine tool or the equipment wouldn't allow to reach the requested rpm, please use the max. available rpm recalculating the Vf value (Vf=n available x fn)

Material Group ISO 513	N1			N2			N3 N4			N5					
	Hardness/Rm														
	Vc (m/min)			67-77*			49-59*			53-63*			67-77*		
	D (mm)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)		
1.0	22920	0,026	600	17190	0,029	500	18460	0,030	550	22920	0,028	650			
1.1	20840	0,029	600	15630	0,032	500	16790	0,030	500	20840	0,031	650			
1.2	19100	0,031	600	14330	0,035	500	15390	0,032	500	19100	0,034	650			
1.3	17630	0,034	600	13230	0,038	500	14200	0,035	500	17630	0,037	650			
1.4	16370	0,037	600	12280	0,041	500	13190	0,042	550	16370	0,040	650			
1.5	15280	0,039	600	11460	0,044	500	12310	0,045	550	15280	0,043	650			
1.6	14330	0,050	720	10750	0,056	600	11540	0,059	680	14330	0,054	770			
1.7	13480	0,053	720	10110	0,059	600	10860	0,063	680	13480	0,057	770			
1.8	12740	0,057	720	9550	0,063	600	10260	0,066	680	12740	0,060	770			
1.9	12070	0,060	720	9050	0,066	600	9720	0,070	680	12070	0,064	770			
2.0	11460	0,063	720	8600	0,070	600	9230	0,074	680	11460	0,067	770			
2.1	10920	0,083	910	8190	0,085	700	8800	0,097	850	10920	0,088	960			
2.2	10420	0,087	910	7820	0,090	700	8400	0,101	850	10420	0,092	960			
2.3	9970	0,091	910	7480	0,094	700	8030	0,106	850	9970	0,096	960			
2.4	9550	0,095	910	7170	0,098	700	7700	0,110	850	9550	0,101	960			
2.5	9170	0,099	910	6880	0,102	700	7390	0,115	850	9170	0,105	960			
2.6	8820	0,125	1100	6620	0,121	800	7100	0,127	900	8820	0,130	1150			
2.7	8490	0,130	1100	6370	0,126	800	6840	0,132	900	8490	0,135	1150			
2.8	8190	0,134	1100	6140	0,130	800	6600	0,136	900	8190	0,140	1150			
2.9	7910	0,139	1100	5930	0,135	800	6370	0,141	900	7910	0,145	1150			
3.0	7640	0,144	1100	5730	0,140	800	6160	0,146	900	7640	0,151	1150			



*if the machine tool or the equipment wouldn't allow to reach the requested rpm, please use the max. available rpm recalculating the Vf value (Vf=n available x fn)

3530SUH MINI

Material Group ISO 513	S1 S2			S3			S4			S5				
	Hardness/Rm			< 35 HRC			35-45 HRC							
	Vc (m/min)			15-25*			13-23*			21-31*			19-29*	
D (mm)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)		
1.0	6370	0,013	80	5730	0,009	50	8280	0,018	150	7640	0,017	130		
1.1	5790	0,014	80	5210	0,010	50	7530	0,020	150	6950	0,019	130		
1.2	5310	0,015	80	4780	0,010	50	6900	0,022	150	6370	0,020	130		
1.3	4900	0,016	80	4410	0,011	50	6370	0,024	150	5880	0,022	130		
1.4	4550	0,018	80	4100	0,012	50	5920	0,025	150	5460	0,024	130		
1.5	4250	0,024	100	3820	0,018	70	5520	0,034	190	5100	0,031	160		
1.6	3980	0,025	100	3590	0,019	70	5180	0,037	190	4780	0,033	160		
1.7	3750	0,027	100	3370	0,021	70	4870	0,039	190	4500	0,036	160		
1.8	3540	0,028	100	3190	0,022	70	4600	0,041	190	4250	0,038	160		
1.9	3360	0,030	100	3020	0,023	70	4360	0,044	190	4030	0,040	160		
2.0	3190	0,034	110	2870	0,031	90	4140	0,051	210	3820	0,050	190		
2.1	3040	0,036	110	2730	0,033	90	3950	0,053	210	3640	0,052	190		
2.2	2900	0,038	110	2610	0,034	90	3770	0,056	210	3480	0,055	190		
2.3	2770	0,040	110	2500	0,036	90	3600	0,058	210	3330	0,057	190		
2.4	2660	0,041	110	2390	0,038	90	3450	0,061	210	3190	0,060	190		
2.5	2550	0,051	130	2300	0,043	100	3310	0,073	240	3060	0,072	220		
2.6	2450	0,053	130	2210	0,045	100	3190	0,075	240	2940	0,075	220		
2.7	2360	0,055	130	2130	0,047	100	3070	0,078	240	2830	0,078	220		
2.8	2280	0,057	130	2050	0,049	100	2960	0,081	240	2730	0,081	220		
2.9	2200	0,059	130	1980	0,051	100	2860	0,084	240	2640	0,083	220		
3.0	2130	0,070	150	1910	0,058	110	2760	0,094	260	2550	0,090	230		



*if the machine tool or the equipment wouldn't allow to reach the requested rpm, please use the max. available rpm recalculating the Vf value (Vf=n available x fn)

- INFO
- TYPHOON TA-HTA-4HTA
- TYPHOON PU-HPU
- TYPHOON SUH
- TYPHOON ALH
- TYPHOON HRC
- TYPHOON SUH MINI
- TYPHOON HL
- C-SD-TA
- LFTA
- SUTA
- HSS-HSS/CO DRILLS
- G2
- MDTA
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- UH
- HSS/CO-HSSP END MILLS
- CARBIDE BURRS



TYPHOON HL

HIGH PERFORMANCE - LONG AND EXTRA-LONG

🇬🇧 The Typhoon HL long and extra-long drills are the tool of choice for deep holes on ISO P, M, K, N, S.

🇮🇹 La gamma Typhoon HL di punte lunghe ed extra-lunghe è progettata per la foratura di materiali ISO P, M, K, N, S.

🇩🇪 Die Produktlinie Typhoon HL mit langen und extra-langen Bohrern wurde für das Bohren der Materialien ISO P, M, K, N, S entwickelt.

🇫🇷 La gamme Typhoon HL de forets longs et extra longs est conçue pour le perçage de matériaux ISO P, M, K, N, S.

🇪🇸 La gama Typhoon HL de brocas largas y extra-largas está diseñada para el taladro de materiales ISO P, M, K, N, S.

🇷🇺 Серия Typhoon HL длинных и супердлинных свёрл предназначена для сверления отверстий в материалах по ISO P, M, K, N, S.

INFO

TYPHOON
TA-HTA-4HTA

TYPHOON
PU-HPU

TYPHOON
SUH

TYPHOON
ALH

TYPHOON
HRC

TYPHOON
SUH MINI

TYPHOON
HL

C-SD-TA

LFTA

SUTA

HSS-HSS/CO
DRILLS

G2

MDTA

HF VH/UP

MEF

ALU

MEX

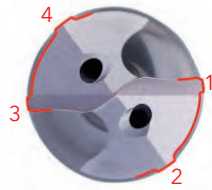
UH

HSS/CO-HSSP
END MILLS

CARBIDE
BURRS

TYPHOON HL
HIGH PERFORMANCE - LONG AND EXTRA-LONG

INFO
TYPHOON TA-HTA-4HTA
TYPHOON PU-HPU
TYPHOON SUH
TYPHOON ALH
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HF VH/UP
MEF
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UH
HSS/CO-HSSP END MILLS
CARBIDE BURRS



- Suitable for deep and extra-deep drilling on ISO P, M, K, N, S materials
- Drill geometry: 4 margin lands for accurate and straight deep holes. Very stable and reliable even in case of work-pieces with slant exit holes and cross holes
- Chip pocket: highly polished to prevent welding and to improve the chip ejection
- Substrate and coating: specifically selected for high wear resistance, long and reliable life
- Drilling process: no steps for reliable and faster process
- Addressable industries: automotive, hydraulic component, mould and die, energy, general engineering
- Available from $\varnothing 3.1$ mm to $\varnothing 10$ mm
- Different cutting length types, from long (12xD) to extra-long (30xD).



- Forets conçus pour le perçage profond de matériaux ISO P, M, K, N, S
- Géométrie de l'arête : « 4 listels » pour l'exécution de trous profonds précis et droits
- Elle garantit stabilité et fiabilité même en présence de trous avec sortie inclinée ou de trous croisés
- Finition des goujures : polie pour réduire le problème du collage et faciliter l'évacuation des copeaux
- Substrat et revêtement : spécifiques pour garantir durée et fiabilité
- Processus de perçage : le perçage sans step garantit un processus fiable et rapide
- Secteurs industriels : automotive, oléohydraulique, moules, énergie, mécanique générale
- Disponibles du $\varnothing 3.1$ mm au $\varnothing 10$ mm
- Différents types de longueur, de la longueur 12xD aux extra-longues 30xD

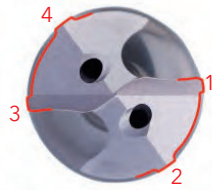


- Punta progettate per la foratura profonda di materiali ISO P, M, K, N, S
- Geometria del tagliente: 4 Margini per esecuzione di fori profondi precisi e rettilinei. Garantisce stabilità e affidabilità anche nel caso di fori con uscita inclinata o fori intersecanti
- Finitura gole: lappate per ridurre il problema dell'incollaggio e facilitare l'evacuazione dei trucioli
- Substrato e rivestimento: specifici per garantire durata e affidabilità
- Processo di foratura: la foratura senza step garantisce un processo affidabile e veloce
- Settori industriali: automotive, oleodinamica, stampi, energia, meccanica generale
- Disponibili dal $\varnothing 3.1$ mm fino a $\varnothing 10$ mm
- Differenti tipi di lunghezza, dalle lunghe (12xD) alle extra-lunghe (30xD)



- Brocas proyectadas para el taladro profundo de materiales ISO P, M, K, N, S
- Geometría del filo: 4 Márgenes para el mecanizado de agujeros profundos, precisos y rectilíneos. Garantiza estabilidad y fiabilidad incluso en caso de agujeros con salida inclinada o agujeros que se cruzan
- Acabado ranuras: lapeadas para reducir el problema del encolado y facilitar la evacuación de las virutas
- Sustrato y revestimiento: específicos para garantizar duración y fiabilidad
- Proceso de taladro: el taladro sin step garantiza un proceso fiable y rápido
- Sectores industriales: automoción, oleodinámico, moldes, energía, mecánica general
- Disponibles de $\varnothing 3.1$ mm hasta $\varnothing 10$ mm
- Diferentes tipos de longitud, desde las largas (12XD) hasta las extra-largas (30XD)

* $\varnothing 3.1$ = SUH MINI



- Für das tiefe Bohren der Materialien ISO P, M, K, N, S entwickelte Bohrer
- Schneidkantengeometrie: 4 Fasen für die Herstellung von präzisen und geraden Tiefbohrungen. Zur Gewährleistung von Stabilität und Zuverlässigkeit, auch bei Bohrungen mit geneigtem Ausgang oder sich kreuzenden Bohrungen
- Schlichtbearbeitung der Nuten: geläpft, um Probleme durch Verkleben zu reduzieren und um die Späneabführung zu erleichtern
- Trägermaterial und Beschichtung: speziell zur Gewährleistung von Standzeit und Zuverlässigkeit
- Bohrverfahren: das stufenlose Bohren gewährleistet ein zuverlässiges und rasches Verfahren
- Industriesektoren: Automobilindustrie, Ölhdraulik, Formpressen, Energie, allgemeine Mechanik
- Erhältlich von Ø3.1*mm bis Ø10 mm
- Verschiedene Längen, von lang (12XD) bis extra-lang (30XD)



- Свёрла предназначены для сверления глубоких отверстий в материалах по ISO P, M, K, N, S
- Геометрия с 4 режущими кромками для выполнения точных и прямолинейных отверстий. Гарантирует стабильность и надёжность, даже, в случае обработки отверстий с выходом в наклонную плоскость или взаимопересекающихся отверстий
- Отполированные стружечные канавки: уменьшают вероятность приваривания стружки и облегчают ее вывод
- Специальное покрытие для повышения стойкости инструмента
- Процесс сверления отверстий: сверление без ступенчатых отходов, гарантирующее производительность
- Промышленные отрасли: автомобилестроение, детали гидравлики, пресс-формы, энергетика, общее машиностроение
- Доступны диаметром от Ø3.1*мм до Ø10 мм
- Различные длины: от длинных (12XD) до супердлинных (30XD)

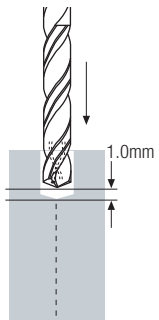
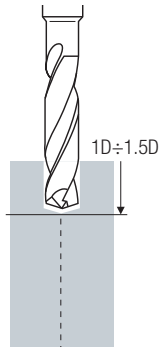
* < Ø3.1 = SUH MINI

INFO
TYPHOON TA-HTA-4HTA
TYPHOON PU-HPU
TYPHOON SUH
TYPHOON ALH
TYPHOON HRC
TYPHOON SUH MINI
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C-SD-TA
LFTA
SUTA
HSS-HSS/CO DRILLS
G2
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HF VH/UP
MEF
ALU
MEX
UH
HSS/CO-HSSP END MILLS
CARBIDE BURRS

TYPHOON HL

HIGH PERFORMANCE - LONG AND EXTRA-LONG

INFO
TYPHOON TA-HTA-4HTA
TYPHOON PU-HPU
TYPHOON SUH
TYPHOON ALH
TYPHOON HRC
TYPHOON SUH MINI
TYPHOON HL
C-SD-TA
LFTA
SUTA
HSS-HSS/CO DRILLS
G2
MDTA
HF VH/UP
MEF
ALU
MEX
UH
HSS/CO-HSSP END MILLS
CARBIDE BURRS


MACHINING OF DEEP HOLES PERPENDICULAR TO THE SURFACE
ESECUZIONE FORI PROFONDI ORTOGONALI ALLA SUPERFICIE
HERSTELLUNG TIEFER RECHTWINKLIGER BOHRUNGEN
EXÉCUTION DE TROUS PROFONDS ORTHOGONAUX À LA SURFACE
MECANIZADO DE AGUJEROS PROFUNDOS PERPENDICULARES A LA SUPERFICIE
СВЕРЛЕНИЕ ГЛУБОКИХ ОТВЕРСТИЙ ПЕРПЕНДИКУЛЯРНО ОБРАБАТЫВАЕМОЙ ПОВЕХНОСТИ
STEP 1

As pilot drill (1xD,1.5xD), please use 353HTA or 353HPU with head angle 140° (HL=135°) and m7 tolerance (HL=h7).

Utilizzare una punta 353HTA o 353HPU con angolo in testa di 140° (HL=135°) e tolleranza m7 (HL=h7), per eseguire un foro pilota (1xD÷1.5xD) molto preciso.

Einen Bohrer 353HTA oder 353HPU mit einem Spitzenwinkel von 140° (HL=135°) und Toleranz m7 (HL=h7) für die Herstellung einer äußerst präzisen Richtbohrung (1xD÷1.5xD) verwenden.

Utiliser un foret 353HTA ou 353HPU avec un angle en bout de 140° (HL=135°) et une tolérance m7 (HL=h7), pour effectuer un trou pilote (1xD÷1.5xD) très précis.

Utilice una broca 353HTA o 353HPU con ángulo punta de 140° (HL=135°) y tolerancia m7 (HL=h7), para realizar un agujero piloto (1xD÷1,5xD) muy preciso.

Для пилотного отверстия (1xD÷1.5xD) используйте сверло 353HTA или 353HPU с углом при вершине 140° (HL=135°) и допуском на диаметр m7 (HL=h7).

STEP 2

With coolant feed OFF, enter the pilot hole with HL drill at Vc=20 m/min and fn=0.3 mm/rev. Position the HL drill at 1 mm from the end of the pilot hole, then start supplying the coolant and start drilling.

Senza azionare il refrigerante interno, entrare con la punta lunga serie HL all'interno del foro. Vc=20 m/min, fn=0.3 mm/rev. Posizionare la punta HL sino a 1 mm dal fondo del foro pilota. Azionare il refrigerante interno ad alta pressione e cominciare la foratura.

Ohne Aktivierung der internen Kühlung, einen langen Bohrer der Serie HL in die Bohrung einführen. Vc=20 m/min, fn=0.3 mm/U den Bohrer HL bis 1 mm vom Ende der Richtbohrung ansetzen. Die interne Kühlung mit Hochdruck aktivieren und mit der Bohrung beginnen.

Sans actionner la lubrification interne, entrer avec le foret long série HL à l'intérieur du trou. Vc=20 m/min, fn=0.3 mm/rév. Placer le foret HL jusqu'à 1 mm du fond du trou pilote. Actionner la lubrification interne à haute pression et commencer le perçage.

Sin accionar el refrigerante interno, entre con la broca larga de la serie HL dentro del agujero. Vc=20 m/min, fn=0.3 mm/rev. Posicione la punta HL hasta 1 mm del fondo del agujero piloto. Accione el refrigerante interno a alta presión y comience el taladro.

Без включения СОЖ, введите длинное сверло серии HL внутрь пилотного отверстия с режимами Vc=20 м/мин и fn=0.3 мм/об. Спозиционируйте сверло HL на расстоянии 1 мм от дна отверстия. Включите подачу СОЖ и начните сверление.


STEP 3


Make continue drilling operation without steps for chip ejection.
In case of through holes, reduce the feed by 30% before the hole exit (approx. 1 mm).
Stop the coolant feed.



Furare senza step per scarico trucioli.
Nel caso di fori passanti, 1 mm prima di aver completato il foro, ridurre l'avanzamento del 30%.
Fermare il refrigerante.



Für die Späneabführung Stufenlos bohren.
Bei Durchgangsbohrungen 1 mm vor Fertigstellung der Bohrung den Vorschub um 30% reduzieren. Die Kühlung deaktivieren.



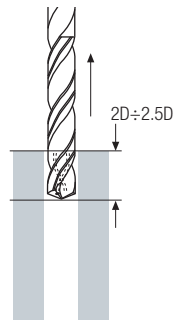
Perçer sans step pour l'évacuation des copeaux.
En présence de trous débouchants, 1 mm avant d'avoir terminé le trou, réduire l'avancement du 30%. Arrêter la lubrification.



Taladre sin step para la descarga de virutas.
En el caso de agujeros pasantes, 1 mm antes de haber completado el agujero, reduzca el avance un 30%. Pare el refrigerante.



Сверлите без остановок и выводов инструмента.
В случае обработки сквозного отверстия, снизьте подачу на 30%, за 1 мм до выхода. Отключите подачу СОЖ.


STEP 4


Withdraw the drill using max rpm and double fn, until 2xD from the hole entrance.



Ritirare la punta utilizzando il massimo dei giri disponibili e il doppio dell'avanzamento consigliato sino ad una profondità 2xD.



Den Bohrer zurückziehen, dabei die maximal verfügbare Drehzahl und den doppelten Wert des empfohlenen Vorschubs bis zu einer Tiefe 2xD einsetzen.



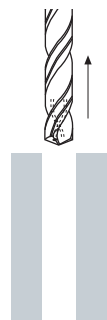
Retirer le foret en utilisant le maximum de tours disponibles et le double de l'avancement conseillé jusqu'à une profondeur 2xD.



Retire la broca utilizando el máximo de rpm disponibles y el doble del avance aconsejado hasta una profundidad 2xD.



Выньте сверло до уровня 2xD, используя максимальную частоту вращения и двойную подачу.


STEP 5


Completing the exit from the hole by using slow and constant speed.



Completare l'ultimo tratto di arretramento con velocità ridotta e costante.



Den letzten Abschnitt beim Zurückziehen mit reduzierter und konstanter Geschwindigkeit fertigstellen.



Terminer la dernière partie du perçage avec une vitesse réduite et constante.



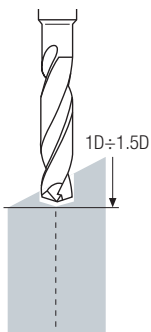
Complete el último tramo de retroceso con velocidad reducida y constante.



Полностью выньте сверло на заниженных режимах.

INFO
TYPHOON TA-HTA-4HTA
TYPHOON PU-HPU
TYPHOON SUH
TYPHOON ALH
TYPHOON HRC
TYPHOON SUH MINI
TYPHOON HL
C-SD-TA
LFTA
SUTA
HSS-HSS/CO DRILLS
G2
MDTA
HF VH/UP
MEF
ALU
MEX
UH
HSS/CO-HSSP END MILLS
CARBIDE BURRS

INFO
TYPHOON TA-HTA-4HTA
TYPHOON PU-HPU
TYPHOON SUH
TYPHOON ALH
TYPHOON HRC
TYPHOON SUH MINI
TYPHOON HL
C-SD-TA
LFTA
SUTA
HSS-HSS/CO DRILLS
G2
MDTA
HF VH/UP
MEF
ALU
MEX
UH
HSS/CO-HSSP END MILLS
CARBIDE BURRS



MACHINING OF DEEP HOLES ON SLANTED OR IRREGULAR SURFACES

ESECUZIONE FORI PROFONDI SU SUPERFICI IRREGOLARI O OBLIQUE

HERSTELLUNG TIEFER BOHRUNGEN AUF SCHRÄGEN ODER UNREGELMÄSSIGEN OBERFLÄCHEN

EXÉCUTION DE TROUS PROFONDS SUR DES SURFACES IRRÉGULIÈRES OU OBLIQUES

MECANIZADO DE AGUJEROS PROFUNDOS SOBRE SUPERFÍCIES IRREGULARES U OBLICUAS

ОБРАБОТКА ГЛУБОКИХ ОТВЕРСТИЙ НА НАКЛОННЫХ ИЛИ НЕРОВНЫХ ПЛОСКОСТЯХ

STEP 1

Prepare a flat surface of the same size as the drilling diameter.

Realizzare una superficie piana utilizzando una fresa con tagliente frontale. Il piano realizzato deve avere le stesse dimensioni del diametro di foratura profonda.

Eine ebene Oberfläche, durch einen Fräser mit stirnseitiger Schneidkante, herstellen. Die hergestellte Oberfläche muss dieselben Abmessungen des Durchmessers der tiefen Bohrung aufweisen.

Réaliser une surface plane en utilisant une fraise avec une arête frontale. Le plan réalisé doit avoir les mêmes dimensions que le diamètre de perçage profond.

Realizar una superficie plana usando una fresa con filo frontal. El plano realizado tiene que tener las mismas dimensiones que el diámetro de taladro profundo.

Подготовьте ровную поверхность с помощью концевой фрезы. Эта поверхность должна быть того же размера, что и диаметр будущего глубокого отверстия.

STEP 2

As pilot drill (1xD, 1.5xD), please use 353HTA or 353HPU with head angle 140° (HL=135°) and m7 tolerance (HL=h7).

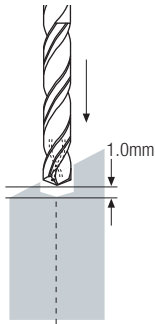
Utilizzare una punta 353HTA o 353HPU con angolo in testa di 140° (HL=135°) e tolleranza m7 (HL=h7), per eseguire un foro pilota (1xD÷1.5xD) molto preciso.

Einen Bohrer 353HTA oder 353HPU mit einem Spitzenwinkel von 140° (HL=135°) und Toleranz m7 (HL=h7) für die Herstellung einer äußerst präzisen Richtbohrung (1xD÷1.5xD) verwenden.

Utiliser un foret 353HTA ou 353HPU avec un angle en bout de 140° (HL=135°) et une tolérance m7 (HL=h7), pour effectuer un trou pilote (1xD÷1.5xD) très précis.

Utilice una broca 353HTA o 353HPU con ángulo punta de 140° (HL=135°) y tolerancia m7 (HL=h7), para realizar un agujero piloto (1xD÷1,5xD) muy preciso.

Для пилотного отверстия (1xD÷1.5xD) используйте сверло 353HTA или 353HPU с углом при вершине 140° (HL=135°) и допуском на диаметр m7 (HL=h7).



STEP 3

With coolant feed OFF, enter the pilot hole with HL drill at $V_c=20$ m/min and $f_n=0.3$ mm/rev. Position the HL drill at 1 mm from the end of the pilot hole, then start supplying the coolant and start drilling.

Senza azionare il refrigerante interno, entrare con la punta lunga serie HL all'interno del foro. $V_c=20$ m/min, $f_n=0.3$ mm/rev. Posizionare la punta HL sino a 1 mm dal fondo del foro pilota. Azionare il refrigerante interno ad alta pressione e cominciare la foratura.

Ohne Aktivierung der internen Kühlung, einen langen Bohrer der Serie HL in die Bohrung einführen. $V_c=20$ m/min, $f_n=0.3$ mm/Umdr. Den Bohrer HL bis 1 mm vom Ende der Richtbohrung ansetzen. Die interne Kühlung mit Hochdruck aktivieren und mit der Bohrung beginnen.

Sans actionner la lubrification interne, entrer avec le foret long série HL à l'intérieur du trou. $V_c=20$ m/min, $f_n=0.3$ mm/rév. Placer le foret HL jusqu'à 1 mm du fond du trou pilote. Actionner la lubrification interne à haute pression et commencer le perçage.

Sin accionar el refrigerante interno, entre con la broca larga de la serie HL dentro del agujero. $V_c=20$ m/min, $f_n=0.3$ mm/rev. Posicione la broca HL hasta 1 mm del fondo del agujero piloto. Accione el refrigerante interno a alta presión y comience el taladro.

Без включения СОЖ, введите длинное сверло серии HL внутрь пилотного отверстия с режимами $V_c=20$ м/мин и $f_n=0.3$ мм/об. Спозиционируйте сверло HL на расстоянии 1 мм от дна отверстия. Включите подачу СОЖ и начните сверление.



STEP 4

Make continue drilling operation without steps for chip ejection. In case of through holes, reduce the feed by 30% before the hole exit (approx 1 mm). Stop the coolant feed.

Forare senza step per scarico trucioli. Nel caso di fori passanti, 1 mm prima di aver completato il foro, ridurre l'avanzamento del 30%. Fermare il refrigerante.

Für die Späneabführung Stufenlos bohren. Bei Durchgangsbohrungen 1 mm vor Fertigstellung der Bohrung den Vorschub um 30% reduzieren. Die Kühlung deaktivieren.

Percer sans step pour l'évacuation des copeaux. En présence de trous débouchants, 1 mm avant d'avoir terminé le trou, réduire l'avancement du 30%. Arrêter la lubrification.

Taladre sin step para la descarga de virutas. En el caso de agujeros pasantes, 1 mm antes de haber completado el agujero, reduzca el avance un 30%. Pare el refrigerante.

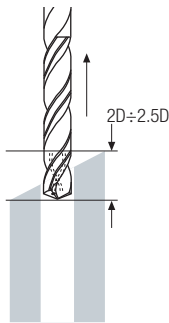
Сверлите без остановок и выводов инструмента. В случае обработки сквозного отверстия, снизьте подачу на 30%, за 1 мм до выхода. Отключите подачу СОЖ.

INFO
TYPHOON TA-HTA-4HTA
TYPHOON PU-HPU
TYPHOON SUH
TYPHOON ALH
TYPHOON HRC
TYPHOON SUH MINI
TYPHOON HL
C-SD-TA
LFTA
SUTA
HSS-HSS/CO DRILLS
G2
MDTA
HF VH/UP
MEF
ALU
MEX
UH
HSS/CO-HSSP END MILLS
CARBIDE BURRS

TYPHOON HL

HIGH PERFORMANCE - LONG AND EXTRA-LONG

INFO
TYPHOON TA-HTA-4HTA
TYPHOON PU-HPU
TYPHOON SUH
TYPHOON ALH
TYPHOON HRC
TYPHOON SUH MINI
TYPHOON HL
C-SD-TA
LFTA
SUTA
HSS-HSS/CO DRILLS
G2
MDTA
HF VH/UP
MEF
ALU
MEX
UH
HSS/CO-HSSP END MILLS
CARBIDE BURRS


STEP 5


Withdraw the drill using max rpm and double f_n , until $2xD \div 2.5xD$ from the hole entrance.



Ritirare la punta utilizzando il massimo dei giri disponibili e il doppio dell'avanzamento consigliato sino ad una profondità $2xD \div 2.5xD$.



Den Bohrer zurückziehen, dabei die maximal verfügbare Drehzahl und den doppelten Wert des empfohlenen Vorschubs bis zu einer Tiefe $2xD \div 2.5xD$ einsetzen.



Retirer le foret en utilisant le maximum de tours disponibles et le double de l'avancement conseillé jusqu'à une profondeur $2xD \div 2.5xD$.



Retire la broca utilizando el máximo de rpm disponibles y el doble del avance aconsejado hasta una profundidad de $2xD \div 2.5xD$.



Выньте сверло до уровня $2xD \div 2.5xD$, используя максимальную частоту вращения и двойную подачу.


STEP 6


Completing the exit from the hole by using slow and constant speed.



Completare l'ultimo tratto di arretramento con velocità ridotta e costante.



Den letzten Abschnitt beim Zurückziehen mit reduzierter und konstanter Geschwindigkeit fertigstellen.



Terminer la dernière partie du perçage avec une vitesse réduite et constante.



Complete el último tramo de retroceso con velocidad reducida y constante.



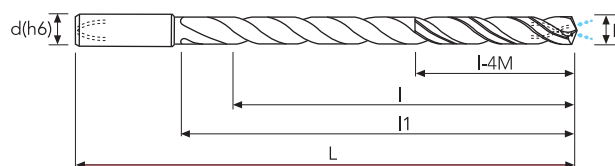
Полностью выньте сверло на заниженных режимах.

3512HL

4-margin lands, long (12xD), polished flutes, HL (through coolant)



★ 1st choice ☆ suitable



D(h7)	D Tol.	d(h6)	l	l1	L	l-4M	drilling length	EDP No.	Stock
3.10*	0/-0.012	4	45	50	85	15.5	12 x D	3512HL0310	●
3.20	0/-0.012	4	45	50	85	16	12 x D	3512HL0320	●
3.30	0/-0.012	4	45	50	85	16.5	12 x D	3512HL0330	●
3.40	0/-0.012	4	48	54	90	17	12 x D	3512HL0340	○
3.50	0/-0.012	4	48	54	90	17.5	12 x D	3512HL0350	●
3.60	0/-0.012	4	48	54	90	18	12 x D	3512HL0360	○
3.70	0/-0.012	4	48	54	90	18.5	12 x D	3512HL0370	●
3.80	0/-0.012	4	57	64	100	19	12 x D	3512HL0380	●
3.90	0/-0.012	4	57	64	100	19.5	12 x D	3512HL0390	○
4.00	0/-0.012	4	57	64	100	20	12 x D	3512HL0400	●
4.10	0/-0.012	5	57	64	100	20.5	12 x D	3512HL0410	●
4.20	0/-0.012	5	57	64	100	21	12 x D	3512HL0420	●
4.30	0/-0.012	5	57	64	100	21.5	12 x D	3512HL0430	●
4.40	0/-0.012	5	57	64	100	22	12 x D	3512HL0440	○
4.50	0/-0.012	5	57	64	100	22.5	12 x D	3512HL0450	●
4.60	0/-0.012	5	57	64	100	23	12 x D	3512HL0460	○
4.70	0/-0.012	5	57	64	100	23.5	12 x D	3512HL0470	○
4.80	0/-0.012	5	67	74	110	24	12 x D	3512HL0480	●
4.90	0/-0.012	5	72	81	120	24.5	12 x D	3512HL0490	○
5.00	0/-0.012	5	72	81	120	25	12 x D	3512HL0500	●
5.10	0/-0.012	6	72	81	120	25.5	12 x D	3512HL0510	●
5.20	0/-0.012	6	72	81	120	26	12 x D	3512HL0520	●
5.30	0/-0.012	6	72	81	120	26.5	12 x D	3512HL0530	●
5.40	0/-0.012	6	72	81	120	27	12 x D	3512HL0540	○
5.50	0/-0.012	6	72	81	120	27.5	12 x D	3512HL0550	●
5.60	0/-0.012	6	72	81	120	28	12 x D	3512HL0560	●
5.70	0/-0.012	6	72	81	120	28.5	12 x D	3512HL0570	○
5.80	0/-0.012	6	72	81	120	29	12 x D	3512HL0580	●
5.90	0/-0.012	6	72	81	120	29.5	12 x D	3512HL0590	○
6.00	0/-0.012	6	72	81	120	30	12 x D	3512HL0600	●
6.10	0/-0.015	8	88	97	135	30.5	12 x D	3512HL0610	●
6.20	0/-0.015	8	88	97	135	31	12 x D	3512HL0620	●
6.30	0/-0.015	8	88	97	135	31.5	12 x D	3512HL0630	●
6.40	0/-0.015	8	96	108	145	32	12 x D	3512HL0640	○
6.50	0/-0.015	8	96	108	145	32.5	12 x D	3512HL0650	●
6.60	0/-0.015	8	96	108	145	33	12 x D	3512HL0660	○
6.70	0/-0.015	8	96	108	145	33.5	12 x D	3512HL0670	●
6.80	0/-0.015	8	96	108	145	34	12 x D	3512HL0680	●
6.90	0/-0.015	8	96	108	145	34.5	12 x D	3512HL0690	●

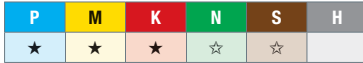
* Ø1+Ø3 = 3512 SUH MINI page 148

● stock standard ○ non-standard stock ▽ stock exhaustion

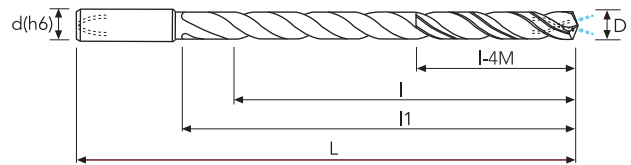


3512HL

4-margin lands, long (12xD), polished flutes, HL (through coolant)



★ 1st choice ☆ suitable



D(h7)	D Tol.	d(h6)	l	l1	L	l-4M	drilling length	EDP No.	Stock
7.00	0/-0.015	8	96	108	145	35	12 x D	3512HL0700	●
7.10	0/-0.015	8	96	108	145	35.5	12 x D	3512HL0710	●
7.20	0/-0.015	8	96	108	145	36	12 x D	3512HL0720	●
7.30	0/-0.015	8	96	108	145	36.5	12 x D	3512HL0730	○
7.40	0/-0.015	8	96	108	145	37	12 x D	3512HL0740	○
7.50	0/-0.015	8	96	108	145	37.5	12 x D	3512HL0750	●
7.60	0/-0.015	8	96	108	145	38	12 x D	3512HL0760	○
7.70	0/-0.015	8	96	108	145	38.5	12 x D	3512HL0770	○
7.80	0/-0.015	8	96	108	145	39	12 x D	3512HL0780	●
7.90	0/-0.015	8	96	108	145	39.5	12 x D	3512HL0790	○
8.00	0/-0.015	8	96	108	145	40	12 x D	3512HL0800	●
8.10	0/-0.015	10	115	127	170	40.5	12 x D	3512HL0810	●
8.20	0/-0.015	10	120	135	180	41	12 x D	3512HL0820	●
8.30	0/-0.015	10	120	135	180	41.5	12 x D	3512HL0830	●
8.40	0/-0.015	10	120	135	180	42	12 x D	3512HL0840	○
8.50	0/-0.015	10	120	135	180	42.5	12 x D	3512HL0850	●
8.60	0/-0.015	10	120	135	180	43	12 x D	3512HL0860	●
8.70	0/-0.015	10	120	135	180	43.5	12 x D	3512HL0870	●
8.80	0/-0.015	10	120	135	180	44	12 x D	3512HL0880	●
8.90	0/-0.015	10	120	135	180	44.5	12 x D	3512HL0890	○
9.00	0/-0.015	10	120	135	180	45	12 x D	3512HL0900	●
9.10	0/-0.015	10	120	135	180	45.5	12 x D	3512HL0910	●
9.20	0/-0.015	10	120	135	180	46	12 x D	3512HL0920	●
9.30	0/-0.015	10	120	135	180	46.5	12 x D	3512HL0930	●
9.40	0/-0.015	10	120	135	180	47	12 x D	3512HL0940	○
9.50	0/-0.015	10	120	135	180	47.5	12 x D	3512HL0950	●
9.60	0/-0.015	10	120	135	180	48	12 x D	3512HL0960	○
9.70	0/-0.015	10	120	135	180	48.5	12 x D	3512HL0970	○
9.80	0/-0.015	10	120	135	180	49	12 x D	3512HL0980	●
9.90	0/-0.015	10	120	135	180	49.5	12 x D	3512HL0990	○
10.00	0/-0.015	10	120	135	180	50	12 x D	3512HL1000	●

● stock standard ○ non-standard stock ▽ stock exhaustion

3512HL

	Material Group ISO 513	P1 P2			P3 P4			P5			P6		
	Hardness/Rm	500-700 N/mm ²			600-1000 N/mm ²			900-1200 N/mm ²			1200-1400 N/mm ²		
	Vc (m/min)	70-85			65-75			55-65			45-55		
	D (mm)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)
3.0	8500	0,077	650	7400	0,070	510	6400	0,062	400	5300	0,054	290	
3.5	7300	0,089	650	6400	0,080	510	5500	0,071	390	4500	0,062	280	
4.0	6400	0,107	680	5600	0,097	540	4800	0,086	410	4000	0,075	300	
4.5	5700	0,125	710	5000	0,113	560	4200	0,100	420	3500	0,088	310	
5.0	5100	0,143	730	4500	0,129	580	3800	0,114	430	3200	0,100	320	
5.5	4600	0,160	740	4100	0,144	590	3500	0,128	450	2900	0,112	320	
6.0	4200	0,178	750	3700	0,160	590	3200	0,142	450	2700	0,125	340	
6.5	3900	0,196	760	3400	0,177	600	2900	0,157	460	2400	0,137	330	
7.0	3600	0,214	770	3200	0,193	620	2700	0,171	460	2300	0,150	350	
7.5	3400	0,232	790	3000	0,209	630	2500	0,186	470	2100	0,162	340	
8.0	3200	0,250	800	2800	0,225	630	2400	0,200	480	2000	0,175	350	
8.5	3000	0,268	800	2600	0,241	630	2200	0,214	470	1900	0,188	360	
9.0	2800	0,285	800	2500	0,257	640	2100	0,228	480	1800	0,200	360	
9.5	2700	0,303	820	2300	0,273	630	2000	0,242	480	1700	0,212	360	
10.0	2500	0,321	800	2200	0,289	640	1900	0,257	490	1600	0,225	360	

	Material Group ISO 513	M1 M2			M3			M4			M5		
	Hardness/Rm	< 750 N/mm ²			550-850 N/mm ²			650-950 N/mm ²			850-1200 N/mm ²		
	Vc (m/min)	45-55			40-48			34-40			27-33		
	D (mm)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)
3.0	5300	0,058	310	4700	0,052	250	3900	0,039	150	3200	0,035	110	
3.5	4500	0,067	300	4000	0,060	240	3400	0,044	150	2700	0,040	110	
4.0	4000	0,080	320	3500	0,072	250	2900	0,053	150	2400	0,048	120	
4.5	3500	0,094	330	3100	0,085	260	2600	0,062	160	2100	0,056	120	
5.0	3200	0,107	340	2800	0,096	270	2400	0,070	170	1900	0,064	120	
5.5	2900	0,120	350	2500	0,108	270	2100	0,079	170	1700	0,072	120	
6.0	2700	0,134	360	2300	0,121	280	2000	0,088	180	1600	0,080	130	
6.5	2400	0,147	350	2200	0,132	290	1800	0,097	170	1500	0,088	130	
7.0	2300	0,161	370	2000	0,145	290	1700	0,106	180	1400	0,096	130	
7.5	2100	0,174	370	1900	0,157	300	1600	0,114	180	1300	0,104	140	
8.0	2000	0,188	380	1800	0,169	300	1500	0,124	190	1200	0,113	140	
8.5	1900	0,201	380	1600	0,181	290	1400	0,133	190	1100	0,121	130	
9.0	1800	0,214	390	1600	0,193	310	1300	0,141	180	1100	0,128	140	
9.5	1700	0,227	390	1500	0,204	310	1200	0,150	180	1000	0,136	140	
10.0	1600	0,241	390	1400	0,217	300	1200	0,158	190	1000	0,144	140	

- INFO
- TYPHOON TA-HTA-4HTA
- TYPHOON PU-HPU
- TYPHOON SUH
- TYPHOON ALH
- TYPHOON HRC
- TYPHOON SUH MINI
- TYPHOON HL
- C-SD-TA
- LFTA
- SUTA
- HSS-HSS/CO DRILLS
- G2
- MDTA
- HF VH/UP
- MEF
- ALU
- MEX
- UH
- HSS/CO-HSSP END MILLS
- CARBIDE BURRS

3512HL

	Material Group ISO 513	K1			K2			K3			K4		
	Hardness/Rm	150-250 HB			150-350 HB			120-260 HB			250-500 HB		
	Vc (m/min)	75-85			65-75			55-65			45-55		
	D (mm)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)
3.0	8500	0,077	650	7400	0,069	510	6400	0,059	380	5300	0,054	290	
3.5	7300	0,089	650	6400	0,080	510	5500	0,068	380	4500	0,062	280	
4.0	6400	0,107	680	5600	0,096	540	4800	0,083	400	4000	0,075	300	
4.5	5700	0,125	710	5000	0,113	560	4200	0,097	410	3500	0,088	310	
5.0	5100	0,143	730	4500	0,129	580	3800	0,110	420	3200	0,100	320	
5.5	4600	0,160	740	4100	0,144	590	3500	0,123	430	2900	0,112	320	
6.0	4200	0,178	750	3700	0,160	590	3200	0,138	440	2700	0,125	340	
6.5	3900	0,196	760	3400	0,176	600	2900	0,151	440	2400	0,137	330	
7.0	3600	0,214	770	3200	0,193	620	2700	0,165	450	2300	0,150	350	
7.5	3400	0,232	790	3000	0,209	630	2500	0,178	450	2100	0,162	340	
8.0	3200	0,250	800	2800	0,225	630	2400	0,193	460	2000	0,175	350	
8.5	3000	0,268	800	2600	0,241	630	2200	0,207	450	1900	0,188	360	
9.0	2800	0,285	800	2500	0,257	640	2100	0,220	460	1800	0,200	360	
9.5	2700	0,303	820	2300	0,273	630	2000	0,233	470	1700	0,212	360	
10.0	2500	0,321	800	2200	0,289	640	1900	0,248	470	1600	0,225	360	

	Material Group ISO 513	N1			N2			N3 N4					
	Hardness/Rm												
	Vc (m/min)	90-110			80-90			80-90					
	D (mm)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)			
3.0	10600	0,096	1020	9000	0,087	780	9000	0,077	690				
3.5	9100	0,111	1010	7700	0,100	770	7700	0,089	690				
4.0	8000	0,134	1070	6800	0,120	820	6800	0,107	730				
4.5	7100	0,156	1110	6000	0,141	850	6000	0,125	750				
5.0	6400	0,179	1150	5400	0,161	870	5400	0,143	770				
5.5	5800	0,200	1160	4900	0,180	880	4900	0,160	780				
6.0	5300	0,223	1180	4500	0,200	900	4500	0,178	800				
6.5	4900	0,245	1200	4200	0,221	930	4200	0,196	820				
7.0	4500	0,268	1210	3900	0,241	940	3900	0,214	830				
7.5	4200	0,290	1220	3600	0,261	940	3600	0,232	840				
8.0	4000	0,313	1250	3400	0,281	960	3400	0,250	850				
8.5	3700	0,335	1240	3200	0,302	970	3200	0,268	860				
9.0	3500	0,356	1250	3000	0,321	960	3000	0,285	860				
9.5	3400	0,379	1290	2800	0,341	950	2800	0,303	850				
10.0	3200	0,401	1280	2700	0,361	970	2700	0,321	870				

3512HL

	Material Group ISO 513	S1 S2			S3			S4			S5		
	Hardness/Rm	< 35 HRC			35-45 HRC								
	Vc (m/min)	22-28			18-22			32-38			27-33		
	D (mm)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)
	3.0	2700	0,038	100	2100	0,038	80	3700	0,051	190	3200	0,051	160
	3.5	2300	0,044	100	1800	0,044	80	3200	0,059	190	2700	0,059	160
	4.0	2000	0,052	100	1600	0,052	80	2800	0,071	200	2400	0,071	170
	4.5	1800	0,061	110	1400	0,061	90	2500	0,083	210	2100	0,083	170
	5.0	1600	0,070	110	1300	0,070	90	2200	0,095	210	1900	0,095	180
	5.5	1400	0,078	110	1200	0,078	90	2000	0,106	210	1700	0,106	180
	6.0	1300	0,087	110	1100	0,087	100	1900	0,118	220	1600	0,118	190
	6.5	1200	0,096	120	1000	0,096	100	1700	0,130	220	1500	0,130	200
	7.0	1100	0,105	120	900	0,105	90	1600	0,142	230	1400	0,142	200
	7.5	1100	0,114	130	800	0,114	90	1500	0,154	230	1300	0,154	200
	8.0	1000	0,123	120	800	0,123	100	1400	0,166	230	1200	0,166	200
	8.5	900	0,131	120	700	0,131	90	1300	0,178	230	1100	0,178	200
	9.0	900	0,140	130	700	0,140	100	1200	0,190	230	1100	0,190	210
	9.5	800	0,148	120	700	0,148	100	1200	0,201	240	1000	0,201	200
10.0	800	0,157	130	600	0,157	90	1100	0,213	230	1000	0,213	210	

- INFO
- TYPHOON TA-HTA-4HTA
- TYPHOON PU-HPU
- TYPHOON SUH
- TYPHOON ALH
- TYPHOON HRC
- TYPHOON SUH MINI
- TYPHOON HL**
- C-SD-TA
- LFTA
- SUTA
- HSS-HSS/CO DRILLS
- G2
- MDTA
- HF VH/UP
- MEF
- ALU
- MEX
- UH
- HSS/CO-HSSP END MILLS
- CARBIDE BURRS

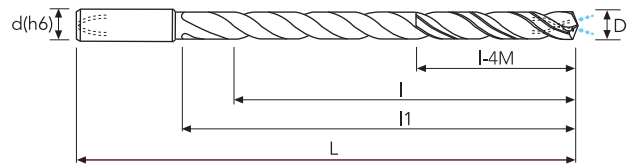
3515HL

4-margin lands, long (15xD), polished flutes, HL (through coolant)



P	M	K	N	S	H
★	★	★	☆	☆	

★ 1st choice ☆ suitable



D(h7)	D Tol.	d(h6)	l	l1	L	l-4M	drilling length	EDP No.	Stock
3.10	0/-0.012	4	50	55	90	15.5	15 x D	3515HL0310	○
3.20	0/-0.012	4	50	55	90	16	15 x D	3515HL0320	○
3.30	0/-0.012	4	52	56	90	16.5	15 x D	3515HL0330	○
3.40	0/-0.012	4	53	58	95	17	15 x D	3515HL0340	○
3.50	0/-0.012	4	55	60	95	17.5	15 x D	3515HL0350	●
3.60	0/-0.012	4	56	61	95	18	15 x D	3515HL0360	○
3.70	0/-0.012	4	58	63	100	18.5	15 x D	3515HL0370	○
3.80	0/-0.012	4	60	65	100	19	15 x D	3515HL0380	○
3.90	0/-0.012	4	60	66	100	19.5	15 x D	3515HL0390	○
4.00	0/-0.012	4	62	68	105	20	15 x D	3515HL0400	●
4.10	0/-0.012	5	64	70	105	20.5	15 x D	3515HL0410	○
4.20	0/-0.012	5	65	71	110	21	15 x D	3515HL0420	○
4.30	0/-0.012	5	67	73	110	21.5	15 x D	3515HL0430	○
4.40	0/-0.012	5	68	75	110	22	15 x D	3515HL0440	○
4.50	0/-0.012	5	70	76	115	22.5	15 x D	3515HL0450	●
4.60	0/-0.012	5	71	78	115	23	15 x D	3515HL0460	○
4.70	0/-0.012	5	73	80	115	23.5	15 x D	3515HL0470	○
4.80	0/-0.012	5	75	82	115	24	15 x D	3515HL0480	○
4.90	0/-0.012	5	76	83	120	24.5	15 x D	3515HL0490	○
5.00	0/-0.012	5	77	85	120	25	15 x D	3515HL0500	●
5.10	0/-0.012	6	79	86	125	25.5	15 x D	3515HL0510	○
5.20	0/-0.012	6	80	88	125	26	15 x D	3515HL0520	○
5.30	0/-0.012	6	82	89	130	26.5	15 x D	3515HL0530	○
5.40	0/-0.012	6	83	91	130	27	15 x D	3515HL0540	○
5.50	0/-0.012	6	85	93	130	27.5	15 x D	3515HL0550	●
5.60	0/-0.012	6	86	94	135	28	15 x D	3515HL0560	○
5.70	0/-0.012	6	88	96	135	28.5	15 x D	3515HL0570	○
5.80	0/-0.012	6	89	98	135	29	15 x D	3515HL0580	○
5.90	0/-0.012	6	91	99	140	29.5	15 x D	3515HL0590	○
6.00	0/-0.012	6	92	101	140	30	15 x D	3515HL0600	●
6.10	0/-0.015	8	94	103	140	30.5	15 x D	3515HL0610	○
6.20	0/-0.015	8	95	104	140	31	15 x D	3515HL0620	○
6.30	0/-0.015	8	98	108	145	31.5	15 x D	3515HL0630	○
6.40	0/-0.015	8	100	110	145	32	15 x D	3515HL0640	○
6.50	0/-0.015	8	100	110	150	32.5	15 x D	3515HL0650	●
6.60	0/-0.015	8	101	111	150	33	15 x D	3515HL0660	○
6.70	0/-0.015	8	103	113	150	33.5	15 x D	3515HL0670	○
6.80	0/-0.015	8	104	114	155	34	15 x D	3515HL0680	○
6.90	0/-0.015	8	106	116	155	34.5	15 x D	3515HL0690	○

● stock standard ○ non-standard stock ▽ stock exhaustion

3515HL

Material Group ISO 513	P1 P2			P3 P4			P5			P6					
	Hardness/Rm			500-700 N/mm ²			600-1000 N/mm ²			900-1200 N/mm ²			1200-1400 N/mm ²		
	Vc (m/min)			75-85			65-75			55-65			45-55		
	D (mm)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)		
3.0	8500	0,077	650	7400	0,070	510	6400	0,062	400	5300	0,054	290			
3.5	7300	0,089	650	6400	0,080	510	5500	0,071	390	4500	0,062	280			
4.0	6400	0,107	680	5600	0,097	540	4800	0,086	410	4000	0,075	300			
4.5	5700	0,125	710	5000	0,113	560	4200	0,100	420	3500	0,088	310			
5.0	5100	0,143	730	4500	0,129	580	3800	0,114	430	3200	0,100	320			
5.5	4600	0,160	740	4100	0,144	590	3500	0,128	450	2900	0,112	320			
6.0	4200	0,178	750	3700	0,160	590	3200	0,142	450	2700	0,125	340			
6.5	3900	0,196	760	3400	0,177	600	2900	0,157	460	2400	0,137	330			
7.0	3600	0,214	770	3200	0,193	620	2700	0,171	460	2300	0,150	350			
7.5	3400	0,232	790	3000	0,209	630	2500	0,186	470	2100	0,162	340			
8.0	3200	0,250	800	2800	0,225	630	2400	0,200	480	2000	0,175	350			
8.5	3000	0,268	800	2600	0,241	630	2200	0,214	470	1900	0,188	360			
9.0	2800	0,285	800	2500	0,257	640	2100	0,228	480	1800	0,200	360			
9.5	2700	0,303	820	2300	0,273	630	2000	0,242	480	1700	0,212	360			
10.0	2500	0,321	800	2200	0,289	640	1900	0,257	490	1600	0,225	360			



Material Group ISO 513	M1 M2			M3			M4			M5					
	Hardness/Rm			< 750 N/mm ²			550-850 N/mm ²			650-950 N/mm ²			850-1200 N/mm ²		
	Vc (m/min)			45-55			40-48			34-40			27-33		
	D (mm)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)		
3.0	5300	0,058	310	4700	0,052	250	3900	0,039	150	3200	0,035	110			
3.5	4500	0,067	300	4000	0,060	240	3400	0,044	150	2700	0,040	110			
4.0	4000	0,080	320	3500	0,072	250	2900	0,053	150	2400	0,048	120			
4.5	3500	0,094	330	3100	0,085	260	2600	0,062	160	2100	0,056	120			
5.0	3200	0,107	340	2800	0,096	270	2400	0,070	170	1900	0,064	120			
5.5	2900	0,120	350	2500	0,108	270	2100	0,079	170	1700	0,072	120			
6.0	2700	0,134	360	2300	0,121	280	2000	0,088	180	1600	0,080	130			
6.5	2400	0,147	350	2200	0,132	290	1800	0,097	170	1500	0,088	130			
7.0	2300	0,161	370	2000	0,145	290	1700	0,106	180	1400	0,096	130			
7.5	2100	0,174	370	1900	0,157	300	1600	0,114	180	1300	0,104	140			
8.0	2000	0,188	380	1800	0,169	300	1500	0,124	190	1200	0,113	140			
8.5	1900	0,201	380	1600	0,181	290	1400	0,133	190	1100	0,121	130			
9.0	1800	0,214	390	1600	0,193	310	1300	0,141	180	1100	0,128	140			
9.5	1700	0,227	390	1500	0,204	310	1200	0,150	180	1000	0,136	140			
10.0	1600	0,241	390	1400	0,217	300	1200	0,158	190	1000	0,144	140			



3515HL

	Material Group ISO 513	K1			K2			K3			K4		
	Hardness/Rm	150-250 HB			150-350 HB			120-260 HB			250-500 HB		
	Vc (m/min)	75-85			65-75			55-65			45-55		
	D (mm)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)
3.0	8500	0,077	650	7400	0,069	510	6400	0,059	380	5300	0,054	290	
3.5	7300	0,089	650	6400	0,080	510	5500	0,068	380	4500	0,062	280	
4.0	6400	0,107	680	5600	0,096	540	4800	0,083	400	4000	0,075	300	
4.5	5700	0,125	710	5000	0,113	560	4200	0,097	410	3500	0,088	310	
5.0	5100	0,143	730	4500	0,129	580	3800	0,110	420	3200	0,100	320	
5.5	4600	0,160	740	4100	0,144	590	3500	0,123	430	2900	0,112	320	
6.0	4200	0,178	750	3700	0,160	590	3200	0,138	440	2700	0,125	340	
6.5	3900	0,196	760	3400	0,176	600	2900	0,151	440	2400	0,137	330	
7.0	3600	0,214	770	3200	0,193	620	2700	0,165	450	2300	0,150	350	
7.5	3400	0,232	790	3000	0,209	630	2500	0,178	450	2100	0,162	340	
8.0	3200	0,250	800	2800	0,225	630	2400	0,193	460	2000	0,175	350	
8.5	3000	0,268	800	2600	0,241	630	2200	0,207	450	1900	0,188	360	
9.0	2800	0,285	800	2500	0,257	640	2100	0,220	460	1800	0,200	360	
9.5	2700	0,303	820	2300	0,273	630	2000	0,233	470	1700	0,212	360	
10.0	2500	0,321	800	2200	0,289	640	1900	0,248	470	1600	0,225	360	

	Material Group ISO 513	N1			N2			N3 N4					
	Hardness/Rm												
	Vc (m/min)	90-110			80-90			80-90					
	D (mm)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)			
3.0	10600	0,096	1020	9000	0,087	780	9000	0,077	690				
3.5	9100	0,111	1010	7700	0,100	770	7700	0,089	690				
4.0	8000	0,134	1070	6800	0,120	820	6800	0,107	730				
4.5	7100	0,156	1110	6000	0,141	850	6000	0,125	750				
5.0	6400	0,179	1150	5400	0,161	870	5400	0,143	770				
5.5	5800	0,200	1160	4900	0,180	880	4900	0,160	780				
6.0	5300	0,223	1180	4500	0,200	900	4500	0,178	800				
6.5	4900	0,245	1200	4200	0,221	930	4200	0,196	820				
7.0	4500	0,268	1210	3900	0,241	940	3900	0,214	830				
7.5	4200	0,290	1220	3600	0,261	940	3600	0,232	840				
8.0	4000	0,313	1250	3400	0,281	960	3400	0,250	850				
8.5	3700	0,335	1240	3200	0,302	970	3200	0,268	860				
9.0	3500	0,356	1250	3000	0,321	960	3000	0,285	860				
9.5	3400	0,379	1290	2800	0,341	950	2800	0,303	850				
10.0	3200	0,401	1280	2700	0,361	970	2700	0,321	870				

- INFO
- TYPHOON TA-HTA-4HTA
- TYPHOON PU-HPU
- TYPHOON SUH
- TYPHOON ALH
- TYPHOON HRC
- TYPHOON SUH MINI
- TYPHOON HL
- C-SD-TA
- LFTA
- SUTA
- HSS-HSS/CO DRILLS
- G2
- MDTA
- HF VH/UP
- MEF
- ALU
- MEX
- UH
- HSS/CO-HSSP END MILLS
- CARBIDE BURRS

3515HL

Material Group ISO 513	S1 S2			S3			S4			S5				
	Hardness/Rm			35-45 HRC										
	Vc (m/min)			22-28			18-22			32-38			27-33	
D (mm)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)		
3.0	2700	0,038	100	2100	0,038	80	3700	0,051	190	3200	0,051	160		
3.5	2300	0,044	100	1800	0,044	80	3200	0,059	190	2700	0,059	160		
4.0	2000	0,052	100	1600	0,052	80	2800	0,071	200	2400	0,071	170		
4.5	1800	0,061	110	1400	0,061	90	2500	0,083	210	2100	0,083	170		
5.0	1600	0,070	110	1300	0,070	90	2200	0,095	210	1900	0,095	180		
5.5	1400	0,078	110	1200	0,078	90	2000	0,106	210	1700	0,106	180		
6.0	1300	0,087	110	1100	0,087	100	1900	0,118	220	1600	0,118	190		
6.5	1200	0,096	120	1000	0,096	100	1700	0,130	220	1500	0,130	200		
7.0	1100	0,105	120	900	0,105	90	1600	0,142	230	1400	0,142	200		
7.5	1100	0,114	130	800	0,114	90	1500	0,154	230	1300	0,154	200		
8.0	1000	0,123	120	800	0,123	100	1400	0,166	230	1200	0,166	200		
8.5	900	0,131	120	700	0,131	90	1300	0,178	230	1100	0,178	200		
9.0	900	0,140	130	700	0,140	100	1200	0,190	230	1100	0,190	210		
9.5	800	0,148	120	700	0,148	100	1200	0,201	240	1000	0,201	200		
10.0	800	0,157	130	600	0,157	90	1100	0,213	230	1000	0,213	210		



- INFO
- TYPHOON TA-HTA-4HTA
- TYPHOON PU-HPU
- TYPHOON SUH
- TYPHOON ALH
- TYPHOON HRC
- TYPHOON SUH MINI
- TYPHOON HL
- C-SD-TA
- LFTA
- SUTA
- HSS-HSS/CO DRILLS
- G2
- MDTA
- HF VH/UP
- MEF
- ALU
- MEX
- UH
- HSS/CO-HSSP END MILLS
- CARBIDE BURRS

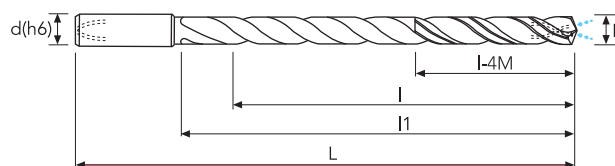
3520HL

4-margin lands, long (20xD), polished flutes, HL (through coolant)



P	M	K	N	S	H
★	★	★	☆	☆	

★ 1st choice ☆ suitable



D(h7)	D Tol.	d(h6)	l	l1	L	l-4M	drilling length	EDP No.	Stock
3.10*	0/-0.012	4	64	69	105	15.5	20 x D	3520HL0310	○
3.20	0/-0.012	4	66	71	105	16	20 x D	3520HL0320	●
3.30	0/-0.012	4	68	73	110	16.5	20 x D	3520HL0330	●
3.40	0/-0.012	4	70	75	110	17	20 x D	3520HL0340	○
3.50	0/-0.012	4	72	77	110	17.5	20 x D	3520HL0350	●
3.60	0/-0.012	4	74	79	115	18	20 x D	3520HL0360	○
3.70	0/-0.012	4	76	82	115	18.5	20 x D	3520HL0370	○
3.80	0/-0.012	4	78	84	120	19	20 x D	3520HL0380	●
3.90	0/-0.012	4	80	86	120	19.5	20 x D	3520HL0390	○
4.00	0/-0.012	4	82	88	125	20	20 x D	3520HL0400	●
4.10	0/-0.012	5	84	90	125	20.5	20 x D	3520HL0410	○
4.20	0/-0.012	5	86	92	130	21	20 x D	3520HL0420	●
4.30	0/-0.012	5	88	94	130	21.5	20 x D	3520HL0430	○
4.40	0/-0.012	5	90	97	135	22	20 x D	3520HL0440	○
4.50	0/-0.012	5	92	99	135	22.5	20 x D	3520HL0450	●
4.60	0/-0.012	5	94	101	140	23	20 x D	3520HL0460	○
4.70	0/-0.012	5	96	103	140	23.5	20 x D	3520HL0470	○
4.80	0/-0.012	5	98	105	140	24	20 x D	3520HL0480	●
4.90	0/-0.012	5	100	107	145	24.5	20 x D	3520HL0490	○
5.00	0/-0.012	5	102	110	145	25	20 x D	3520HL0500	●
5.10	0/-0.012	6	104	112	150	25.5	20 x D	3520HL0510	○
5.20	0/-0.012	6	106	114	155	26	20 x D	3520HL0520	○
5.30	0/-0.012	6	108	116	155	26.5	20 x D	3520HL0530	○
5.40	0/-0.012	6	110	118	155	27	20 x D	3520HL0540	○
5.50	0/-0.012	6	112	120	160	27.5	20 x D	3520HL0550	●
5.60	0/-0.012	6	114	122	160	28	20 x D	3520HL0560	○
5.70	0/-0.012	6	116	125	165	28.5	20 x D	3520HL0570	○
5.80	0/-0.012	6	118	127	165	29	20 x D	3520HL0580	●
5.90	0/-0.012	6	120	129	170	29.5	20 x D	3520HL0590	○
6.00	0/-0.012	6	122	131	170	30	20 x D	3520HL0600	●
6.10	0/-0.015	8	124	133	170	30.5	20 x D	3520HL0610	○
6.20	0/-0.015	8	126	135	175	31	20 x D	3520HL0620	○
6.30	0/-0.015	8	128	137	175	31.5	20 x D	3520HL0630	○
6.40	0/-0.015	8	130	140	180	32	20 x D	3520HL0640	○
6.50	0/-0.015	8	132	142	180	32.5	20 x D	3520HL0650	●
6.60	0/-0.015	8	134	144	185	33	20 x D	3520HL0660	○
6.70	0/-0.015	8	136	146	185	33.5	20 x D	3520HL0670	○
6.80	0/-0.015	8	138	148	185	34	20 x D	3520HL0680	●
6.90	0/-0.015	8	140	150	190	34.5	20 x D	3520HL0690	○

* Ø1+Ø3 = 3520 SUH MINI page 152

● stock standard ○ non-standard stock ▽ stock exhaustion

INFO
TYPHOON TA-HTA-4HTA
TYPHOON PU-HPU
TYPHOON SUH
TYPHOON ALH
TYPHOON HRC
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TYPHOON HL
C-SD-TA
LFTA
SUTA
HSS-HSS/CO DRILLS
G2
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HF VH/UP
MEF
ALU
MEX
UH
HSS/CO-HSSP END MILLS
CARBIDE BURRS

3520HL

4-margin lands, long (20xD), polished flutes, HL (through coolant)

20XD

OSAWA
NORM

HL

MG
PV250

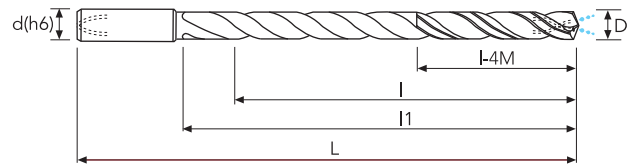
135°

30°



P	M	K	N	S	H
★	★	★	☆	☆	

★ 1st choice ☆ suitable



D(h7)	D Tol.	d(h6)	l	l1	L	l-4M	drilling length	EDP No.	Stock
7.00	0/-0.015	8	142	153	195	35	20 x D	3520HL0700	●
7.10	0/-0.015	8	144	155	195	35.5	20 x D	3520HL0710	○
7.20	0/-0.015	8	146	157	200	36	20 x D	3520HL0720	○
7.30	0/-0.015	8	148	159	200	36.5	20 x D	3520HL0730	○
7.40	0/-0.015	8	150	161	200	37	20 x D	3520HL0740	○
7.50	0/-0.015	8	152	163	205	37.5	20 x D	3520HL0750	●
7.60	0/-0.015	8	154	165	205	38	20 x D	3520HL0760	○
7.70	0/-0.015	8	156	168	210	38.5	20 x D	3520HL0770	○
7.80	0/-0.015	8	158	170	210	39	20 x D	3520HL0780	○
7.90	0/-0.015	8	160	172	215	39.5	20 x D	3520HL0790	○
8.00	0/-0.015	8	162	174	215	40	20 x D	3520HL0800	●
8.10	0/-0.015	10	164	176	220	40.5	20 x D	3520HL0810	○
8.20	0/-0.015	10	166	178	220	41	20 x D	3520HL0820	○
8.30	0/-0.015	10	168	180	225	41.5	20 x D	3520HL0830	○
8.40	0/-0.015	10	170	183	225	42	20 x D	3520HL0840	○
8.50	0/-0.015	10	172	185	230	42.5	20 x D	3520HL0850	●
8.60	0/-0.015	10	174	187	230	43	20 x D	3520HL0860	○
8.70	0/-0.015	10	176	189	230	43.5	20 x D	3520HL0870	○
8.80	0/-0.015	10	178	191	235	44	20 x D	3520HL0880	●
8.90	0/-0.015	10	180	193	235	44.5	20 x D	3520HL0890	○
9.00	0/-0.015	10	182	196	240	45	20 x D	3520HL0900	●
9.10	0/-0.015	10	184	198	240	45.5	20 x D	3520HL0910	○
9.20	0/-0.015	10	186	200	245	46	20 x D	3520HL0920	○
9.30	0/-0.015	10	188	202	245	46.5	20 x D	3520HL0930	○
9.40	0/-0.015	10	190	204	245	47	20 x D	3520HL0940	○
9.50	0/-0.015	10	192	206	250	47.5	20 x D	3520HL0950	●
9.60	0/-0.015	10	194	208	250	48	20 x D	3520HL0960	○
9.70	0/-0.015	10	196	211	255	48.5	20 x D	3520HL0970	○
9.80	0/-0.015	10	198	213	255	49	20 x D	3520HL0980	○
9.90	0/-0.015	10	200	215	260	49.5	20 x D	3520HL0990	○
10.00	0/-0.015	10	202	217	260	50	20 x D	3520HL1000	●

● stock standard ○ non-standard stock ▽ stock exhaustion

3520HL

	Material Group ISO 513	P1 P2			P3 P4			P5			P6		
	Hardness/Rm	500-700 N/mm ²			600-1000 N/mm ²			900-1200 N/mm ²			1200-1400 N/mm ²		
	Vc (m/min)	65-75			55-65			45-55			35-45		
	D (mm)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)
3.0	7400	0,077	570	6400	0,070	440	5300	0,062	330	4200	0,054	230	
3.5	6400	0,089	570	5500	0,080	440	4500	0,071	320	3600	0,062	220	
4.0	5600	0,107	600	4800	0,097	460	4000	0,086	340	3200	0,075	240	
4.5	5000	0,125	630	4200	0,113	470	3500	0,100	350	2800	0,088	250	
5.0	4500	0,143	640	3800	0,129	490	3200	0,114	360	2500	0,100	250	
5.5	4100	0,160	660	3500	0,144	500	2900	0,128	370	2300	0,112	260	
6.0	3700	0,178	660	3200	0,160	510	2700	0,142	380	2100	0,125	260	
6.5	3400	0,196	670	2900	0,177	510	2400	0,157	380	2000	0,137	270	
7.0	3200	0,214	680	2700	0,193	520	2300	0,171	390	1800	0,150	270	
7.5	3000	0,232	700	2500	0,209	520	2100	0,186	390	1700	0,162	280	
8.0	2800	0,250	700	2400	0,225	540	2000	0,200	400	1600	0,175	280	
8.5	2600	0,268	700	2200	0,241	530	1900	0,214	410	1500	0,188	280	
9.0	2500	0,285	710	2100	0,257	540	1800	0,228	410	1400	0,200	280	
9.5	2300	0,303	700	2000	0,273	550	1700	0,242	410	1300	0,212	280	
10.0	2200	0,321	710	1900	0,289	550	1600	0,257	410	1300	0,225	290	

	Material Group ISO 513	M1 M2			M3			M4			M5		
	Hardness/Rm	< 750 N/mm ²			550-850 N/mm ²			650-950 N/mm ²			850-1200 N/mm ²		
	Vc (m/min)	40-50			36-42			29-35			22-28		
	D (mm)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)
3.0	4800	0,058	280	4100	0,052	210	3400	0,039	130	2700	0,035	90	
3.5	4100	0,067	270	3500	0,060	210	2900	0,044	130	2300	0,040	90	
4.0	3600	0,080	290	3100	0,072	220	2500	0,053	130	2000	0,048	100	
4.5	3200	0,094	300	2800	0,085	240	2300	0,062	140	1800	0,056	100	
5.0	2900	0,107	310	2500	0,096	240	2000	0,070	140	1600	0,064	100	
5.5	2600	0,120	310	2300	0,108	250	1900	0,079	150	1400	0,072	100	
6.0	2400	0,134	320	2100	0,121	250	1700	0,088	150	1300	0,080	100	
6.5	2200	0,147	320	1900	0,132	250	1600	0,097	150	1200	0,088	110	
7.0	2000	0,161	320	1800	0,145	260	1500	0,106	160	1100	0,096	110	
7.5	1900	0,174	330	1700	0,157	270	1400	0,114	160	1100	0,104	110	
8.0	1800	0,188	340	1600	0,169	270	1300	0,124	160	1000	0,113	110	
8.5	1700	0,201	340	1500	0,181	270	1200	0,133	160	900	0,121	110	
9.0	1600	0,214	340	1400	0,193	270	1100	0,141	150	900	0,128	120	
9.5	1500	0,227	340	1300	0,204	270	1100	0,150	160	800	0,136	110	
10.0	1400	0,241	340	1200	0,217	260	1000	0,158	160	800	0,144	120	

- INFO
- TYPHOON TA-HTA-4HTA
- TYPHOON PU-HPU
- TYPHOON SUH
- TYPHOON ALH
- TYPHOON HRC
- TYPHOON SUH MINI
- TYPHOON HL
- C-SD-TA
- LFTA
- SUTA
- HSS-HSS/CO DRILLS
- G2
- MDTA
- HF VH/UP
- MEF
- ALU
- MEX
- UH
- HSS/CO-HSSP END MILLS
- CARBIDE BURRS

3520HL

Material Group ISO 513	K1			K2			K3			K4		
	150-250 HB			150-350 HB			120-260 HB			250-500 HB		
	65-75			55-65			45-55			35-45		
	D (mm)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)
3.0	7400	0,077	570	6400	0,069	440	5300	0,059	310	4200	0,054	230
3.5	6400	0,089	570	5500	0,080	440	4500	0,068	310	3600	0,062	220
4.0	5600	0,107	600	4800	0,096	460	4000	0,083	330	3200	0,075	240
4.5	5000	0,125	630	4200	0,113	470	3500	0,097	340	2800	0,088	250
5.0	4500	0,143	640	3800	0,129	490	3200	0,110	350	2500	0,100	250
5.5	4100	0,160	660	3500	0,144	500	2900	0,123	360	2300	0,112	260
6.0	3700	0,178	660	3200	0,160	510	2700	0,138	370	2100	0,125	260
6.5	3400	0,196	670	2900	0,176	510	2400	0,151	360	2000	0,137	270
7.0	3200	0,214	680	2700	0,193	520	2300	0,165	380	1800	0,150	270
7.5	3000	0,232	700	2500	0,209	520	2100	0,178	370	1700	0,162	280
8.0	2800	0,250	700	2400	0,225	540	2000	0,193	390	1600	0,175	280
8.5	2600	0,268	700	2200	0,241	530	1900	0,207	390	1500	0,188	280
9.0	2500	0,285	710	2100	0,257	540	1800	0,220	400	1400	0,200	280
9.5	2300	0,303	700	2000	0,273	550	1700	0,233	400	1300	0,212	280
10.0	2200	0,321	710	1900	0,289	550	1600	0,248	400	1300	0,225	290



Material Group ISO 513	N1			N2			N3 N4						
	85-95			70-80			70-80						
	D (mm)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)			
	3.0	9500	0,096	910	8000	0,087	700	8000	0,077	620			
3.5	8200	0,111	910	6800	0,100	680	6800	0,089	610				
4.0	7200	0,134	960	6000	0,120	720	6000	0,107	640				
4.5	6400	0,156	1000	5300	0,141	750	5300	0,125	660				
5.0	5700	0,179	1020	4800	0,161	770	4800	0,143	690				
5.5	5200	0,200	1040	4300	0,180	770	4300	0,160	690				
6.0	4800	0,223	1070	4000	0,200	800	4000	0,178	710				
6.5	4400	0,245	1080	3700	0,221	820	3700	0,196	730				
7.0	4100	0,268	1100	3400	0,241	820	3400	0,214	730				
7.5	3800	0,290	1100	3200	0,261	840	3200	0,232	740				
8.0	3600	0,313	1130	3000	0,281	840	3000	0,250	750				
8.5	3400	0,335	1140	2800	0,302	850	2800	0,268	750				
9.0	3200	0,356	1140	2700	0,321	870	2700	0,285	770				
9.5	3000	0,379	1140	2500	0,341	850	2500	0,303	760				
10.0	2900	0,401	1160	2400	0,361	870	2400	0,321	770				



3520HL

Material Group ISO 513	S1 S2			S3			S4			S5		
	< 35 HRC			35-45 HRC								
	18-22			13-17			27-33			22-28		
Vc (m/min)	n	fn	Vf	n	fn	Vf	n	fn	Vf	n	fn	Vf
D (mm)	(rpm)	(mm/rev)	(mm/min)	(rpm)	(mm/rev)	(mm/min)	(rpm)	(mm/rev)	(mm/min)	(rpm)	(mm/rev)	(mm/min)
3.0	2100	0,038	80	1600	0,038	60	3200	0,051	160	2700	0,051	140
3.5	1800	0,044	80	1400	0,044	60	2700	0,059	160	2300	0,059	140
4.0	1600	0,052	80	1200	0,052	60	2400	0,071	170	2000	0,071	140
4.5	1400	0,061	90	1100	0,061	70	2100	0,083	170	1800	0,083	150
5.0	1300	0,070	90	1000	0,070	70	1900	0,095	180	1600	0,095	150
5.5	1200	0,078	90	900	0,078	70	1700	0,106	180	1400	0,106	150
6.0	1100	0,087	100	800	0,087	70	1600	0,118	190	1300	0,118	150
6.5	1000	0,096	100	700	0,096	70	1500	0,130	200	1200	0,130	160
7.0	900	0,105	90	700	0,105	70	1400	0,142	200	1100	0,142	160
7.5	800	0,114	90	600	0,114	70	1300	0,154	200	1100	0,154	170
8.0	800	0,123	100	600	0,123	70	1200	0,166	200	1000	0,166	170
8.5	700	0,131	90	600	0,131	80	1100	0,178	200	900	0,178	160
9.0	700	0,140	100	500	0,140	70	1100	0,190	210	900	0,190	170
9.5	700	0,148	100	500	0,148	70	1000	0,201	200	800	0,201	160
10.0	600	0,157	90	500	0,157	80	1000	0,213	210	800	0,213	170



- INFO
- TYPHOON TA-HTA-4HTA
- TYPHOON PU-HPU
- TYPHOON SUH
- TYPHOON ALH
- TYPHOON HRC
- TYPHOON SUH MINI
- TYPHOON HL**
- C-SD-TA
- LFTA
- SUTA
- HSS-HSS/CO DRILLS
- G2
- MDTA
- HF VH/UP
- MEF
- ALU
- MEX
- UH
- HSS/CO-HSSP END MILLS
- CARBIDE BURRS

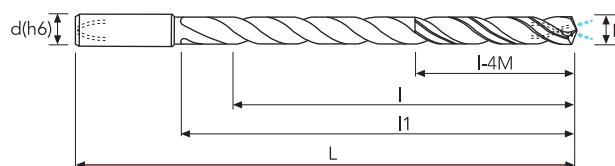
3525HL

4-margin lands, long (25xD), polished flutes, HL (through coolant)



P	M	K	N	S	H
★	★	★	☆	☆	

★ 1st choice ☆ suitable



D(h7)	D Tol.	d(h6)	l	l1	L	l-4M	drilling length	EDP No.	Stock
3.10*	0/-0.012	4	79	83	120	15.5	25 x D	3525HL0310	○
3.20	0/-0.012	4	81	86	120	16	25 x D	3525HL0320	○
3.30	0/-0.012	4	84	88	125	16.5	25 x D	3525HL0330	○
3.40	0/-0.012	4	86	91	125	17	25 x D	3525HL0340	○
3.50	0/-0.012	4	89	94	130	17.5	25 x D	3525HL0350	●
3.60	0/-0.012	4	91	96	130	18	25 x D	3525HL0360	○
3.70	0/-0.012	4	94	99	135	18.5	25 x D	3525HL0370	○
3.80	0/-0.012	4	96	102	135	19	25 x D	3525HL0380	○
3.90	0/-0.012	4	99	104	140	19.5	25 x D	3525HL0390	○
4.00	0/-0.012	4	101	107	140	20	25 x D	3525HL0400	●
4.10	0/-0.012	5	104	110	145	20.5	25 x D	3525HL0410	○
4.20	0/-0.012	5	106	112	150	21	25 x D	3525HL0420	○
4.30	0/-0.012	5	109	115	150	21.5	25 x D	3525HL0430	○
4.40	0/-0.012	5	111	118	155	22	25 x D	3525HL0440	○
4.50	0/-0.012	5	114	120	155	22.5	25 x D	3525HL0450	●
4.60	0/-0.012	5	116	123	160	23	25 x D	3525HL0460	○
4.70	0/-0.012	5	119	126	165	23.5	25 x D	3525HL0470	○
4.80	0/-0.012	5	121	128	165	24	25 x D	3525HL0480	○
4.90	0/-0.012	5	124	131	170	24.5	25 x D	3525HL0490	○
5.00	0/-0.012	5	126	134	170	25	25 x D	3525HL0500	●
5.10	0/-0.012	6	129	136	175	25.5	25 x D	3525HL0510	○
5.20	0/-0.012	6	131	139	180	26	25 x D	3525HL0520	○
5.30	0/-0.012	6	134	141	180	26.5	25 x D	3525HL0530	○
5.40	0/-0.012	6	136	144	185	27	25 x D	3525HL0540	○
5.50	0/-0.012	6	139	147	185	27.5	25 x D	3525HL0550	●
5.60	0/-0.012	6	141	149	190	28	25 x D	3525HL0560	○
5.70	0/-0.012	6	144	152	190	28.5	25 x D	3525HL0570	○
5.80	0/-0.012	6	146	155	195	29	25 x D	3525HL0580	○
5.90	0/-0.012	6	149	157	195	29.5	25 x D	3525HL0590	○
6.00	0/-0.012	6	151	160	200	30	25 x D	3525HL0600	●
6.10	0/-0.015	8	154	163	200	30.5	25 x D	3525HL0610	○
6.20	0/-0.015	8	156	165	205	31	25 x D	3525HL0620	○
6.30	0/-0.015	8	159	168	205	31.5	25 x D	3525HL0630	○
6.40	0/-0.015	8	161	171	210	32	25 x D	3525HL0640	○
6.50	0/-0.015	8	164	173	210	32.5	25 x D	3525HL0650	●
6.60	0/-0.015	8	166	176	215	33	25 x D	3525HL0660	○
6.70	0/-0.015	8	169	179	220	33.5	25 x D	3525HL0670	○
6.80	0/-0.015	8	171	181	220	34	25 x D	3525HL0680	○
6.90	0/-0.015	8	174	184	225	34.5	25 x D	3525HL0690	○

* Ø1+Ø3 = 3525 SUH MINI page 156

3525HL

	Material Group ISO 513	P1 P2			P3 P4			P5			P6		
	Hardness/Rm	500-700 N/mm ²			600-1000 N/mm ²			900-1200 N/mm ²			1200-1400 N/mm ²		
	Vc (m/min)	65-75			55-65			45-55			35-45		
	D (mm)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)
3.0	7400	0,077	570	6400	0,070	440	5300	0,062	330	4200	0,054	230	
3.5	6400	0,089	570	5500	0,080	440	4500	0,071	320	3600	0,062	220	
4.0	5600	0,107	600	4800	0,097	460	4000	0,086	340	3200	0,075	240	
4.5	5000	0,125	630	4200	0,113	470	3500	0,100	350	2800	0,088	250	
5.0	4500	0,143	640	3800	0,129	490	3200	0,114	360	2500	0,100	250	
5.5	4100	0,160	660	3500	0,144	500	2900	0,128	370	2300	0,112	260	
6.0	3700	0,178	660	3200	0,160	510	2700	0,142	380	2100	0,125	260	
6.5	3400	0,196	670	2900	0,177	510	2400	0,157	380	2000	0,137	270	
7.0	3200	0,214	680	2700	0,193	520	2300	0,171	390	1800	0,150	270	
7.5	3000	0,232	700	2500	0,209	520	2100	0,186	390	1700	0,162	280	
8.0	2800	0,250	700	2400	0,225	540	2000	0,200	400	1600	0,175	280	
8.5	2600	0,268	700	2200	0,241	530	1900	0,214	410	1500	0,188	280	
9.0	2500	0,285	710	2100	0,257	540	1800	0,228	410	1400	0,200	280	
9.5	2300	0,303	700	2000	0,273	550	1700	0,242	410	1300	0,212	280	

	Material Group ISO 513	M1 M2			M3			M4			M5		
	Hardness/Rm	< 750 N/mm ²			550-850 N/mm ²			650-950 N/mm ²			850-1200 N/mm ²		
	Vc (m/min)	40-50			36-42			29-35			22-28		
	D (mm)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)
3.0	4800	0,058	280	4100	0,052	210	3400	0,039	130	2700	0,035	90	
3.5	4100	0,067	270	3500	0,060	210	2900	0,044	130	2300	0,040	90	
4.0	3600	0,080	290	3100	0,072	220	2500	0,053	130	2000	0,048	100	
4.5	3200	0,094	300	2800	0,085	240	2300	0,062	140	1800	0,056	100	
5.0	2900	0,107	310	2500	0,096	240	2000	0,070	140	1600	0,064	100	
5.5	2600	0,120	310	2300	0,108	250	1900	0,079	150	1400	0,072	100	
6.0	2400	0,134	320	2100	0,121	250	1700	0,088	150	1300	0,080	100	
6.5	2200	0,147	320	1900	0,132	250	1600	0,097	150	1200	0,088	110	
7.0	2000	0,161	320	1800	0,145	260	1500	0,106	160	1100	0,096	110	
7.5	1900	0,174	330	1700	0,157	270	1400	0,114	160	1100	0,104	110	
8.0	1800	0,188	340	1600	0,169	270	1300	0,124	160	1000	0,113	110	
8.5	1700	0,201	340	1500	0,181	270	1200	0,133	160	900	0,121	110	
9.0	1600	0,214	340	1400	0,193	270	1100	0,141	150	900	0,128	120	
9.5	1500	0,227	340	1300	0,204	270	1100	0,150	160	800	0,136	110	

3525HL

	Material Group ISO 513	K1			K2			K3			K4		
	Hardness/Rm	150-250 HB			150-350 HB			120-260 HB			250-500 HB		
	Vc (m/min)	65-75			55-65			45-55			35-45		
	D (mm)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)
3.0	7400	0,077	570	6400	0,069	440	5300	0,059	310	4200	0,054	230	
3.5	6400	0,089	570	5500	0,080	440	4500	0,068	310	3600	0,062	220	
4.0	5600	0,107	600	4800	0,096	460	4000	0,083	330	3200	0,075	240	
4.5	5000	0,125	630	4200	0,113	470	3500	0,097	340	2800	0,088	250	
5.0	4500	0,143	640	3800	0,129	490	3200	0,110	350	2500	0,100	250	
5.5	4100	0,160	660	3500	0,144	500	2900	0,123	360	2300	0,112	260	
6.0	3700	0,178	660	3200	0,160	510	2700	0,138	370	2100	0,125	260	
6.5	3400	0,196	670	2900	0,176	510	2400	0,151	360	2000	0,137	270	
7.0	3200	0,214	680	2700	0,193	520	2300	0,165	380	1800	0,150	270	
7.5	3000	0,232	700	2500	0,209	520	2100	0,178	370	1700	0,162	280	
8.0	2800	0,250	700	2400	0,225	540	2000	0,193	390	1600	0,175	280	
8.5	2600	0,268	700	2200	0,241	530	1900	0,207	390	1500	0,188	280	
9.0	2500	0,285	710	2100	0,257	540	1800	0,220	400	1400	0,200	280	
9.5	2300	0,303	700	2000	0,273	550	1700	0,233	400	1300	0,212	280	

	Material Group ISO 513	N1			N2			N3 N4					
	Hardness/Rm												
	Vc (m/min)	85-95			70-80			70-80					
	D (mm)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)			
3.0	9500	0,096	910	8000	0,087	700	8000	0,077	620				
3.5	8200	0,111	910	6800	0,100	680	6800	0,089	610				
4.0	7200	0,134	960	6000	0,120	720	6000	0,107	640				
4.5	6400	0,156	1000	5300	0,141	750	5300	0,125	660				
5.0	5700	0,179	1020	4800	0,161	770	4800	0,143	690				
5.5	5200	0,200	1040	4300	0,180	770	4300	0,160	690				
6.0	4800	0,223	1070	4000	0,200	800	4000	0,178	710				
6.5	4400	0,245	1080	3700	0,221	820	3700	0,196	730				
7.0	4100	0,268	1100	3400	0,241	820	3400	0,214	730				
7.5	3800	0,290	1100	3200	0,261	840	3200	0,232	740				
8.0	3600	0,313	1130	3000	0,281	840	3000	0,250	750				
8.5	3400	0,335	1140	2800	0,302	850	2800	0,268	750				
9.0	3200	0,356	1140	2700	0,321	870	2700	0,285	770				
9.5	3000	0,379	1140	2500	0,341	850	2500	0,303	760				

- INFO
- TYPHOON TA-HTA-4HTA
- TYPHOON PU-HPU
- TYPHOON SUH
- TYPHOON ALH
- TYPHOON HRC
- TYPHOON SUH MINI
- TYPHOON HL
- C-SD-TA
- LFTA
- SUTA
- HSS-HSS/CO DRILLS
- G2
- MDTA
- HF VH/UP
- MEF
- ALU
- MEX
- UH
- HSS/CO-HSSP END MILLS
- CARBIDE BURRS

3525HL

Material Group ISO 513	S1 S2			S3			S4			S5				
	Hardness/Rm			35-45 HRC										
	Vc (m/min)			18-22			13-17			27-33			22-28	
D (mm)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)		
3.0	2100	0,038	80	1600	0,038	60	3200	0,051	160	2700	0,051	140		
3.5	1800	0,044	80	1400	0,044	60	2700	0,059	160	2300	0,059	140		
4.0	1600	0,052	80	1200	0,052	60	2400	0,071	170	2000	0,071	140		
4.5	1400	0,061	90	1100	0,061	70	2100	0,083	170	1800	0,083	150		
5.0	1300	0,070	90	1000	0,070	70	1900	0,095	180	1600	0,095	150		
5.5	1200	0,078	90	900	0,078	70	1700	0,106	180	1400	0,106	150		
6.0	1100	0,087	100	800	0,087	70	1600	0,118	190	1300	0,118	150		
6.5	1000	0,096	100	700	0,096	70	1500	0,130	200	1200	0,130	160		
7.0	900	0,105	90	700	0,105	70	1400	0,142	200	1100	0,142	160		
7.5	800	0,114	90	600	0,114	70	1300	0,154	200	1100	0,154	170		
8.0	800	0,123	100	600	0,123	70	1200	0,166	200	1000	0,166	170		
8.5	700	0,131	90	600	0,131	80	1100	0,178	200	900	0,178	160		
9.0	700	0,140	100	500	0,140	70	1100	0,190	210	900	0,190	170		
9.5	700	0,148	100	500	0,148	70	1000	0,201	200	800	0,201	160		



- INFO
- TYPHOON TA-HTA-4HTA
- TYPHOON PU-HPU
- TYPHOON SUH
- TYPHOON ALH
- TYPHOON HRC
- TYPHOON SUH MINI
- TYPHOON HL
- C-SD-TA
- LFTA
- SUTA
- HSS-HSS/CO DRILLS
- G2
- MDTA
- HF VH/UP
- MEF
- ALU
- MEX
- UH
- HSS/CO-HSSP END MILLS
- CARBIDE BURRS

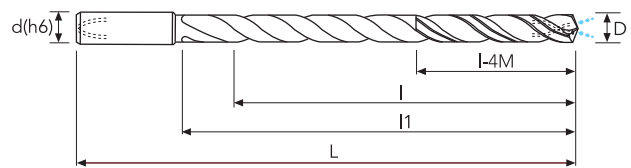
3530HL

4-margin lands, long (30xD), polished flutes, HL (through coolant)



P	M	K	N	S	H
★	★	★	☆	☆	

★ 1st choice ☆ suitable



D(h7)	D Tol.	d(h6)	l	l1	L	l-4M	drilling length	EDP No.	Stock
3.10*	0/-0.012	4	94	99	135	15.5	30 x D	3530HL0310	○
3.20	0/-0.012	4	97	102	135	16	30 x D	3530HL0320	○
3.30	0/-0.012	4	100	105	140	16.5	30 x D	3530HL0330	○
3.40	0/-0.012	4	103	108	145	17	30 x D	3530HL0340	○
3.50	0/-0.012	4	106	111	145	17.5	30 x D	3530HL0350	●
3.60	0/-0.012	4	109	114	150	18	30 x D	3530HL0360	○
3.70	0/-0.012	4	112	118	155	18.5	30 x D	3530HL0370	○
3.80	0/-0.012	4	115	121	155	19	30 x D	3530HL0380	○
3.90	0/-0.012	4	118	124	160	19.5	30 x D	3530HL0390	○
4.00	0/-0.012	4	121	127	160	20	30 x D	3530HL0400	●
4.10	0/-0.012	5	124	130	165	20.5	30 x D	3530HL0410	○
4.20	0/-0.012	5	127	133	170	21	30 x D	3530HL0420	○
4.30	0/-0.012	5	130	136	175	21.5	30 x D	3530HL0430	○
4.40	0/-0.012	5	133	140	175	22	30 x D	3530HL0440	○
4.50	0/-0.012	5	136	143	180	22.5	30 x D	3530HL0450	●
4.60	0/-0.012	5	139	146	185	23	30 x D	3530HL0460	○
4.70	0/-0.012	5	142	149	185	23.5	30 x D	3530HL0470	○
4.80	0/-0.012	5	145	152	190	24	30 x D	3530HL0480	○
4.90	0/-0.012	5	148	155	190	24.5	30 x D	3530HL0490	○
5.00	0/-0.012	5	151	159	195	25	30 x D	3530HL0500	●
5.10	0/-0.012	6	154	162	200	25.5	30 x D	3530HL0510	○
5.20	0/-0.012	6	157	165	205	26	30 x D	3530HL0520	○
5.30	0/-0.012	6	160	168	205	26.5	30 x D	3530HL0530	○
5.40	0/-0.012	6	163	171	210	27	30 x D	3530HL0540	○
5.50	0/-0.012	6	166	174	215	27.5	30 x D	3530HL0550	●
5.60	0/-0.012	6	169	177	215	28	30 x D	3530HL0560	○
5.70	0/-0.012	6	172	181	220	28.5	30 x D	3530HL0570	○
5.80	0/-0.012	6	175	184	225	29	30 x D	3530HL0580	○
5.90	0/-0.012	6	178	187	225	29.5	30 x D	3530HL0590	○
6.00	0/-0.012	6	181	190	230	30	30 x D	3530HL0600	●
6.10	0/-0.015	8	184	193	230	30.5	30 x D	3530HL0610	○
6.20	0/-0.015	8	187	196	135	31	30 x D	3530HL0620	○
6.30	0/-0.015	8	190	199	240	31.5	30 x D	3530HL0630	○
6.40	0/-0.015	8	193	203	240	32	30 x D	3530HL0640	○
6.50	0/-0.015	8	196	206	245	32.5	30 x D	3530HL0650	●
6.60	0/-0.015	8	199	209	250	33	30 x D	3530HL0660	○
6.70	0/-0.015	8	202	212	250	33.5	30 x D	3530HL0670	○
6.80	0/-0.015	8	205	215	255	34	30 x D	3530HL0680	○
6.90	0/-0.015	8	208	218	255	34.5	30 x D	3530HL0690	○

* Ø1+Ø3 = 3530 SUH MINI page 160

● stock standard ○ non-standard stock ▽ stock exhaustion

INFO
TYPHOON TA-HTA-4HTA
TYPHOON PU-HPU
TYPHOON SUH
TYPHOON ALH
TYPHOON HRC
TYPHOON SUH MINI
TYPHOON HL
C-SD-TA
LFTA
SUTA
HSS-HSS/CO DRILLS
G2
MDTA
HF VH/UP
MEF
ALU
MEX
UH
HSS/CO-HSSP END MILLS
CARBIDE BURRS

3530HL

	Material Group ISO 513	P1 P2			P3 P4			P5			P6		
	Hardness/Rm	500-700 N/mm ²			600-1000 N/mm ²			900-1200 N/mm ²			1200-1400 N/mm ²		
	Vc (m/min)	60-70			50-60			40-50			30-40		
	D (mm)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)
3.0	6900	0,077	530	5800	0,070	400	4800	0,062	300	3700	0,054	200	
3.5	5900	0,089	530	5000	0,080	400	4100	0,071	290	3200	0,062	200	
4.0	5200	0,107	560	4400	0,097	420	3600	0,086	310	2800	0,075	210	
4.5	4600	0,125	580	3900	0,113	440	3200	0,100	320	2500	0,088	220	
5.0	4100	0,143	590	3500	0,129	450	2900	0,114	330	2200	0,100	220	
5.5	3800	0,160	610	3200	0,144	460	2600	0,128	330	2000	0,112	220	
6.0	3400	0,178	610	2900	0,160	460	2400	0,142	340	1900	0,125	240	
6.5	3200	0,196	630	2700	0,177	480	2200	0,157	350	1700	0,137	230	
7.0	3000	0,214	640	2500	0,193	480	2000	0,171	340	1600	0,150	240	
7.5	2800	0,232	650	2300	0,209	480	1900	0,186	350	1500	0,162	240	
8.0	2600	0,250	650	2200	0,225	500	1800	0,200	360	1400	0,175	250	

	Material Group ISO 513	M1 M2			M3			M4			M5		
	Hardness/Rm	< 750 N/mm ²			550-850 N/mm ²			650-950 N/mm ²			850-1200 N/mm ²		
	Vc (m/min)	35-45			30-38			24-30			18-22		
	D (mm)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)
3.0	4200	0,058	240	3600	0,052	190	2900	0,039	110	2100	0,035	70	
3.5	3600	0,067	240	3100	0,060	190	2500	0,044	110	1800	0,040	70	
4.0	3200	0,080	260	2700	0,072	190	2100	0,053	110	1600	0,048	80	
4.5	2800	0,094	260	2400	0,085	200	1900	0,062	120	1400	0,056	80	
5.0	2500	0,107	270	2200	0,096	210	1700	0,070	120	1300	0,064	80	
5.5	2300	0,120	280	2000	0,108	220	1600	0,079	130	1200	0,072	90	
6.0	2100	0,134	280	1800	0,121	220	1400	0,088	120	1100	0,080	90	
6.5	2000	0,147	290	1700	0,132	220	1300	0,097	130	1000	0,088	90	
7.0	1800	0,161	290	1500	0,145	220	1200	0,106	130	900	0,096	90	
7.5	1700	0,174	300	1400	0,157	220	1100	0,114	130	800	0,104	80	
8.0	1600	0,188	300	1400	0,169	240	1100	0,124	140	800	0,113	90	

- INFO
- TYPHOON TA-HTA-4HTA
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- TYPHOON SUH
- TYPHOON ALH
- TYPHOON HRC
- TYPHOON SUH MINI
- TYPHOON HL
- C-SD-TA
- LFTA
- SUTA
- HSS-HSS/CO DRILLS
- G2
- MDTA
- HF VH/UP
- MEF
- ALU
- MEX
- UH
- HSS/CO-HSSP END MILLS
- CARBIDE BURRS

3530HL

	Material Group ISO 513	K1			K2			K3			K4		
	Hardness/Rm	150-250 HB			150-350 HB			120-260 HB			250-500 HB		
	Vc (m/min)	55-65			45-55			35-45			27-33		
	D (mm)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)
3.0	6400	0,077	490	5300	0,069	370	4200	0,059	250	3200	0,054	170	
3.5	5500	0,089	490	4500	0,080	360	3600	0,068	250	2700	0,062	170	
4.0	4800	0,107	510	4000	0,096	390	3200	0,083	260	2400	0,075	180	
4.5	4200	0,125	530	3500	0,113	390	2800	0,097	270	2100	0,088	180	
5.0	3800	0,143	540	3200	0,129	410	2500	0,110	280	1900	0,100	190	
5.5	3500	0,160	560	2900	0,144	420	2300	0,123	280	1700	0,112	190	
6.0	3200	0,178	570	2700	0,160	430	2100	0,138	290	1600	0,125	200	
6.5	2900	0,196	570	2400	0,176	420	2000	0,151	300	1500	0,137	210	
7.0	2700	0,214	580	2300	0,193	440	1800	0,165	300	1400	0,150	210	
7.5	2500	0,232	580	2100	0,209	440	1700	0,178	300	1300	0,162	210	
8.0	2400	0,250	600	2000	0,225	450	1600	0,193	310	1200	0,175	210	

	Material Group ISO 513	N1			N2			N3 N4					
	Hardness/Rm												
	Vc (m/min)	65-75			55-65			55-65					
	D (mm)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)			
3.0	7400	0,096	710	6400	0,087	560	6400	0,077	490				
3.5	6400	0,111	710	5500	0,100	550	5500	0,089	490				
4.0	5600	0,134	750	4800	0,120	580	4800	0,107	510				
4.5	5000	0,156	780	4200	0,141	590	4200	0,125	530				
5.0	4500	0,179	810	3800	0,161	610	3800	0,143	540				
5.5	4100	0,200	820	3500	0,180	630	3500	0,160	560				
6.0	3700	0,223	830	3200	0,200	640	3200	0,178	570				
6.5	3400	0,245	830	2900	0,221	640	2900	0,196	570				
7.0	3200	0,268	860	2700	0,241	650	2700	0,214	580				
7.5	3000	0,290	870	2500	0,261	650	2500	0,232	580				
8.0	2800	0,313	880	2400	0,281	670	2400	0,250	600				

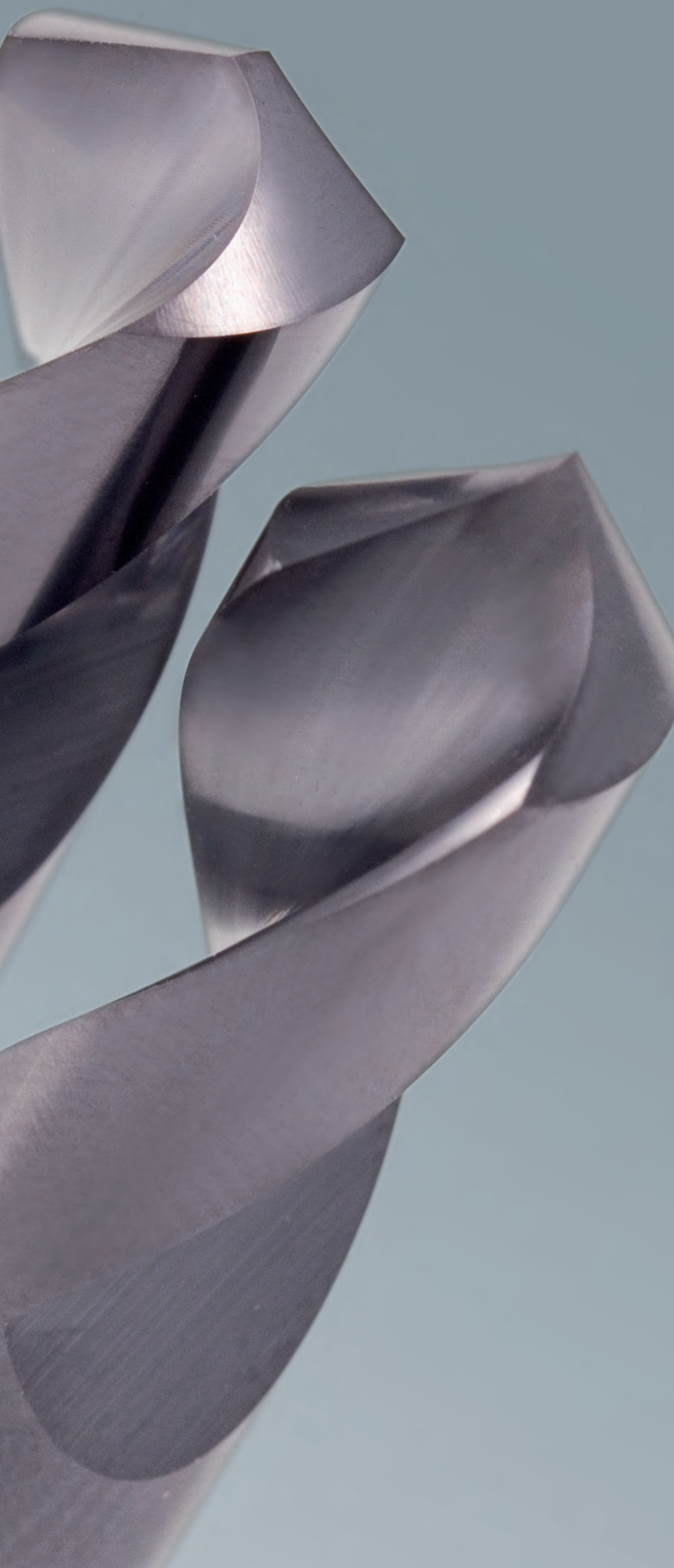
- INFO
- TYPHOON TA-HTA-4HTA
- TYPHOON PU-HPU
- TYPHOON SUH
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- TYPHOON HRC
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- CARBIDE BURRS



3530HL

	Material Group ISO 513	S1 S2			S3			S4			S5		
	Hardness/Rm	< 35 HRC			35-45 HRC								
	Vc (m/min)	16-20			11-15			22-28			18-22		
	D (mm)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)
3.0	1900	0,038	70	1400	0,038	50	2700	0,051	140	2100	0,051	110	
3.5	1600	0,044	70	1200	0,044	50	2300	0,059	140	1800	0,059	110	
4.0	1400	0,052	70	1000	0,052	50	2000	0,071	140	1600	0,071	110	
4.5	1300	0,061	80	900	0,061	50	1800	0,083	150	1400	0,083	120	
5.0	1100	0,070	80	800	0,070	60	1600	0,095	150	1300	0,095	120	
5.5	1000	0,078	80	800	0,078	60	1400	0,106	150	1200	0,106	130	
6.0	1000	0,087	90	700	0,087	60	1300	0,118	150	1100	0,118	130	
6.5	900	0,096	90	600	0,096	60	1200	0,130	160	1000	0,130	130	
7.0	800	0,105	80	600	0,105	60	1100	0,142	160	900	0,142	130	
7.5	800	0,114	90	600	0,114	70	1100	0,154	170	800	0,154	120	
8.0	700	0,123	90	500	0,123	60	1000	0,166	170	800	0,166	130	

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C-SD-TA

NC SPOTTING

🇬🇧 90° - 120° starting drills for NC centering and chamfering on a wide range of materials.

🇮🇹 Punte da centri a 90° e 120° per NC. Centratura e svasatura su una vasta gamma di materiali.

🇩🇪 Anbohrer mit Spitzenwinkel 90° und 120° für NC Maschinen. Zentrierung und Ansenkung auf einem sehr breiten Spektrum von Materialien.

🇫🇷 Forets à centrer et chanfreiner 90°-120°, pour une grande variété de matériaux.

🇪🇸 Brocas para puntear y escariar 90°-120° sobre una gran variedad de materiales.

🇷🇺 Центровочные свёрла с углами при вершине 90°-120° для сверления центровых отверстий и зенкования в широкой гамме материалов на станках с ЧПУ.

INFO
TYPHOON TA-HTA-4HTA
TYPHOON PU-HPU
TYPHOON SUH
TYPHOON ALH
TYPHOON HRC
TYPHOON SUH MINI
TYPHOON HL
C-SD-TA
LFTA
SUTA
HSS-HSS/CO DRILLS
G2
MDTA
HF VH/UP
MEF
ALU
MEX
UH
HSS/CO-HSSP END MILLS
CARBIDE BURRS

C-SD-TA

Material Group ISO 513	P1 P2			P3 P4			P5			P6		
	Hardness/Rm											
Vc (m/min)	90-110			70-90			60-80			50-70		
D (mm)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)
6	5310	0.140	740	4250	0.126	540	3720	0.112	420	3180	0.098	310
7	4550	0.160	730	3640	0.144	520	3180	0.128	410	2730	0.112	310
8	3980	0.180	720	3180	0.162	520	2790	0.144	400	2390	0.126	300
9	3540	0.200	710	2830	0.180	510	2480	0.160	400	2120	0.140	300
10	3180	0.220	700	2550	0.198	500	2230	0.176	390	1910	0.154	290
11	2900	0.240	700	2320	0.216	500	2030	0.192	390	1740	0.168	290
12	2650	0.260	690	2120	0.234	500	1860	0.208	390	1590	0.182	290
13	2450	0.280	690	1960	0.252	490	1710	0.224	380	1470	0.196	290
14	2270	0.300	680	1820	0.270	490	1590	0.240	380	1360	0.210	290
15	2120	0.320	680	1700	0.288	490	1490	0.256	380	1270	0.224	280
16	1990	0.340	680	1590	0.306	490	1390	0.272	380	1190	0.238	280

Material Group ISO 513	M1 M2			M3			M4			M5		
	Hardness/Rm											
Vc (m/min)	50-70			40-60			30-40			20-30		
D (mm)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)
6	3180	0.091	290	2650	0.073	190	1860	0.064	120	1330	0.055	70
7	2730	0.104	280	2270	0.083	190	1590	0.073	120	1140	0.062	70
8	2390	0.117	280	1990	0.094	190	1390	0.082	110	1000	0.070	70
9	2120	0.130	280	1770	0.104	180	1240	0.091	110	880	0.078	70
10	1910	0.143	270	1590	0.114	180	1110	0.100	110	800	0.086	70
11	1740	0.156	270	1450	0.125	180	1010	0.109	110	720	0.094	70
12	1590	0.169	270	1330	0.135	180	930	0.118	110	660	0.101	70
13	1470	0.182	270	1220	0.146	180	860	0.127	110	610	0.109	70
14	1360	0.195	270	1140	0.156	180	800	0.137	110	570	0.117	70
15	1270	0.208	260	1060	0.166	180	740	0.146	110	530	0.125	70
16	1190	0.221	260	1000	0.177	180	700	0.155	110	500	0.133	70

Material Group ISO 513	K1			K2			K3			K4		
	Hardness/Rm											
Vc (m/min)	90-110			70-90			60-80			50-70		
D (mm)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)
6	5310	0.140	740	4250	0.126	540	3720	0.112	420	3180	0.098	310
7	4550	0.160	730	3640	0.144	520	3180	0.128	410	2730	0.112	310
8	3980	0.180	720	3180	0.162	520	2790	0.144	400	2390	0.126	300
9	3540	0.200	710	2830	0.180	510	2480	0.160	400	2120	0.140	300
10	3180	0.220	700	2550	0.198	500	2230	0.176	390	1910	0.154	290
11	2900	0.240	700	2320	0.216	500	2030	0.192	390	1740	0.168	290
12	2650	0.260	690	2120	0.234	500	1860	0.208	390	1590	0.182	290
13	2450	0.280	690	1960	0.252	490	1710	0.224	380	1470	0.196	290
14	2270	0.300	680	1820	0.270	490	1590	0.240	380	1360	0.210	290
15	2120	0.320	680	1700	0.288	490	1490	0.256	380	1270	0.224	280
16	1990	0.340	680	1590	0.306	490	1390	0.272	380	1190	0.238	280

- INFO
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- CARBIDE BURRS

C-SD-TA

Material Group ISO 513	N1			N2			N3 N4			N5		
	Hardness/Rm											
Vc (m/min)	160-200			140-180			130-170			160-200		
D (mm)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)
6	9550	0.175	1670	8490	0.158	1340	7960	0.140	1110	9550	0.158	1500
7	8190	0.200	1640	7280	0.180	1310	6820	0.160	1090	8190	0.180	1470
8	7170	0.225	1610	6370	0.203	1290	5970	0.180	1070	7170	0.203	1450
9	6370	0.250	1590	5660	0.225	1270	5310	0.200	1060	6370	0.225	1430
10	5730	0.275	1580	5100	0.248	1260	4780	0.220	1050	5730	0.248	1420
11	5210	0.300	1560	4630	0.270	1250	4340	0.240	1040	5210	0.270	1410
12	4780	0.325	1550	4250	0.293	1240	3980	0.260	1030	4780	0.293	1400
13	4410	0.350	1540	3920	0.315	1230	3670	0.280	1030	4410	0.315	1390
14	4090	0.375	1530	3640	0.338	1230	3410	0.300	1020	4090	0.338	1380
15	3820	0.400	1530	3400	0.360	1220	3180	0.320	1020	3820	0.360	1380
16	3580	0.425	1520	3180	0.383	1220	2990	0.340	1020	3580	0.383	1370

Material Group ISO 513	S1 S2			S3			S4			S5		
	Hardness/Rm											
Vc (m/min)	30-50			20-40			45-65			35-55		
D (mm)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)
6	2120	0.063	130	1590	0.044	70	2920	0.060	170	2390	0.050	120
7	1820	0.072	130	1360	0.050	70	2500	0.068	170	2050	0.058	120
8	1590	0.081	130	1190	0.057	70	2190	0.077	170	1790	0.065	120
9	1420	0.090	130	1060	0.063	70	1950	0.086	170	1590	0.072	110
10	1270	0.099	130	960	0.069	70	1750	0.094	160	1430	0.079	110
11	1160	0.108	130	870	0.076	70	1590	0.103	160	1300	0.086	110
12	1060	0.117	120	800	0.082	70	1460	0.111	160	1190	0.094	110
13	980	0.126	120	730	0.088	60	1350	0.120	160	1100	0.101	110
14	910	0.135	120	680	0.095	60	1250	0.128	160	1020	0.108	110
15	850	0.144	120	640	0.101	60	1170	0.137	160	960	0.115	110
16	800	0.153	120	600	0.107	60	1090	0.145	160	900	0.122	110



HSS DRILLS
















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🇮🇹 Legenda 🇩🇪 Verzeichnis 🇫🇷 Légende 🇪🇸 Leyenda 🇷🇺 Условные обозначения













STOCK		
●	<ul style="list-style-type: none"> 🇩🇪 stock standard 🇮🇹 stock standard 🇪🇸 Standard Lager 	<ul style="list-style-type: none"> 🇫🇷 stock standard 🇪🇸 stock estándar 🇷🇺 складская позиция
○	<ul style="list-style-type: none"> 🇩🇪 non-standard stock 🇮🇹 stock non standard 🇪🇸 nicht Standard Lager 	<ul style="list-style-type: none"> 🇫🇷 stock non standard 🇪🇸 stock no estándar 🇷🇺 не складская позиция
▽	<ul style="list-style-type: none"> 🇩🇪 stock exhaustion 🇮🇹 esaurimento stock 🇪🇸 Vorraterschöpfung 	<ul style="list-style-type: none"> 🇫🇷 épuisement du stock 🇪🇸 agotamiento de stock 🇷🇺 складские остатки

🇩🇪 APPLICATION GUIDELINES 🇮🇹 INDICAZIONI PER L'APPLICAZIONE 🇪🇸 LEITFADEN ZUR ANWENDUNG 🇫🇷 INDICATIONS POUR L'APPLICATION 🇪🇸 INDICACIONES PARA SU APLICACIÓN 🇷🇺 УКАЗАНИЯ ПО ПРИМЕНЕНИЮ		
★	<ul style="list-style-type: none"> 🇩🇪 1st choice 🇮🇹 1a scelta 🇪🇸 1. Wahl 	<ul style="list-style-type: none"> 🇫🇷 1er choix 🇪🇸 1ª elección 🇷🇺 1-й выбор
☆	<ul style="list-style-type: none"> 🇩🇪 suitable 🇮🇹 adatto 🇪🇸 geeignet 	<ul style="list-style-type: none"> 🇫🇷 adapté 🇪🇸 adecuado 🇷🇺 пригоден

🇩🇪 SHANK 🇮🇹 ATTACCO 🇪🇸 SCHAFT 🇫🇷 QUEUE 🇪🇸 MANGO 🇷🇺 ХВОСТОВИК		
	<ul style="list-style-type: none"> 🇩🇪 cylindrical shank 🇮🇹 attacco cilindrico 🇪🇸 zylindrischer Schaft 	<ul style="list-style-type: none"> 🇫🇷 queue cylindrique 🇪🇸 mango cilíndrico 🇷🇺 цилиндрическое крепление
	<ul style="list-style-type: none"> 🇩🇪 Morse Taper shank 🇮🇹 attacco Cono Morse 🇪🇸 MK Schaft 	<ul style="list-style-type: none"> 🇫🇷 queue conique 🇪🇸 mango Cono Morse 🇷🇺 конус Морзе

🇩🇪 GEOMETRY 🇮🇹 GEOMETRIA 🇪🇸 GEOMETRIE 🇫🇷 GÉOMÉTRIE 🇪🇸 GEOMETRÍA 🇷🇺 ГЕОМЕТРИЯ		
  	<ul style="list-style-type: none"> 🇩🇪 high performance, selfcentering 🇮🇹 alto rendimento, autocentrante 🇪🇸 hochleistung, selbstzentrierende 	<ul style="list-style-type: none"> 🇫🇷 haute performance, auto centreur 🇪🇸 alto rendimiento, autocentrante 🇷🇺 высокопроизводительные, самоцентрирующиеся
  	<ul style="list-style-type: none"> 🇩🇪 for stainless steel and general application 🇮🇹 per acciaio inossidabile e applicazioni generiche 🇪🇸 für rostfreien Stahl und allgemeine Anwendung 	<ul style="list-style-type: none"> 🇫🇷 pour acier inoxydable et applications génériques 🇪🇸 para acero inoxidable y aplicaciones genéricas 🇷🇺 для нержавеющей сталей и общего назначения
  	<ul style="list-style-type: none"> 🇩🇪 HSS general purpose 🇮🇹 HSS uso generico 🇪🇸 HSS allgemeine Anwendung 	<ul style="list-style-type: none"> 🇫🇷 HSS applications génériques 🇪🇸 HSS uso genérico 🇷🇺 HSS общего назначения
  	HSS Tin Pointed	
  	HSS/Co Tin Pointed	







🇮🇹 Legenda 🇩🇪 Verzeichnis 🇫🇷 Légende 🇪🇸 Leyenda 🇷🇺 Условные обозначения

⚙️ GEOMETRY 🇮🇹 GEOMETRIA 🇩🇪 GEOMETRIE 🇫🇷 GÉOMÉTRIE 🇪🇸 GEOMETRÍA 🇷🇺 ГЕОМЕТРИЯ					
			<ul style="list-style-type: none"> ⚙️ for stainless steel and general application 🇮🇹 per acciaio inossidabile e applicazioni generiche 🇩🇪 für rostfreien Stahl und allgemeine Anwendung 	<ul style="list-style-type: none"> 🇫🇷 pour acier inoxydable et applications génériques 🇪🇸 para acero inoxidable y aplicaciones genéricas 🇷🇺 для нержавеющей сталей и общего назначения 	
			<ul style="list-style-type: none"> ⚙️ for deep holes 🇮🇹 per fori profondi 🇩🇪 für tiefe Löcher 	<ul style="list-style-type: none"> 🇫🇷 pour trous profonds 🇪🇸 para agujeros profundos 🇷🇺 для глубоких отверстий 	
			<ul style="list-style-type: none"> ⚙️ for brass 🇮🇹 per ottone 🇩🇪 für Messing 	<ul style="list-style-type: none"> 🇫🇷 pour laiton 🇪🇸 para latón 🇷🇺 для латуни 	
			<ul style="list-style-type: none"> ⚙️ for aluminium 🇮🇹 per alluminio 🇩🇪 für Aluminium 	<ul style="list-style-type: none"> 🇫🇷 pour aluminium 🇪🇸 para aluminio 🇷🇺 для алюминия 	

⚙️ MATERIAL 🇮🇹 MATERIALE 🇩🇪 WERKSTOFF 🇫🇷 MATIÈRE 🇪🇸 MATERIAL 🇷🇺 МАТЕРИАЛ		
HSS ...	<ul style="list-style-type: none"> ⚙️ high speed steel 🇮🇹 acciaio super rapido 🇩🇪 Hochleistungsschnellschnittstahl 	<ul style="list-style-type: none"> 🇫🇷 acier rapide 🇪🇸 acero súper rápido 🇷🇺 быстрорежущая сталь
HSS/Co ...	<ul style="list-style-type: none"> ⚙️ high speed steel - 5% ÷ 8% Co 🇮🇹 acciaio super rapido - 5% ÷ 8% Co 🇩🇪 Hochleistungsschnellschnittstahl - 5% ÷ 8% Co 	<ul style="list-style-type: none"> 🇫🇷 acier rapide - 5% ÷ 8% Co 🇪🇸 acero súper rápido - 5% ÷ 8% Co 🇷🇺 быстрорежущая сталь - 5% ÷ 8% Co
HSSE ...	HSS/Co + EV	

⚙️ SURFACE TREATMENT 🇮🇹 TRATTAMENTO SUPERFICIALE 🇩🇪 OBERFLÄCHENBEHANDLUNG 🇫🇷 TRAITEMENT DE SURFACE 🇪🇸 TRATAMIENTO SUPERFICIAL 🇷🇺 ОБРАБОТКА ПОВЕРХНОСТИ		
... BR	<ul style="list-style-type: none"> ⚙️ uncoated 🇮🇹 non rivestito 🇩🇪 unbeschichtet 	<ul style="list-style-type: none"> 🇫🇷 non revêtu 🇪🇸 no revestido 🇷🇺 без покрытия
... OX	<ul style="list-style-type: none"> ⚙️ vaporization 🇮🇹 vaporizzazione 🇩🇪 Dämpfung 	<ul style="list-style-type: none"> 🇫🇷 traitement vapeur 🇪🇸 vaporización 🇷🇺 окисление
... HT	<ul style="list-style-type: none"> ⚙️ heat treatment 🇮🇹 trattamento termico 🇩🇪 thermische Behandlung 	<ul style="list-style-type: none"> 🇫🇷 traitement thermique 🇪🇸 tratamiento térmico 🇷🇺 термическая обработка

 Legenda
  Verzeichnis
  Légende
  Leyenda
  Условные обозначения

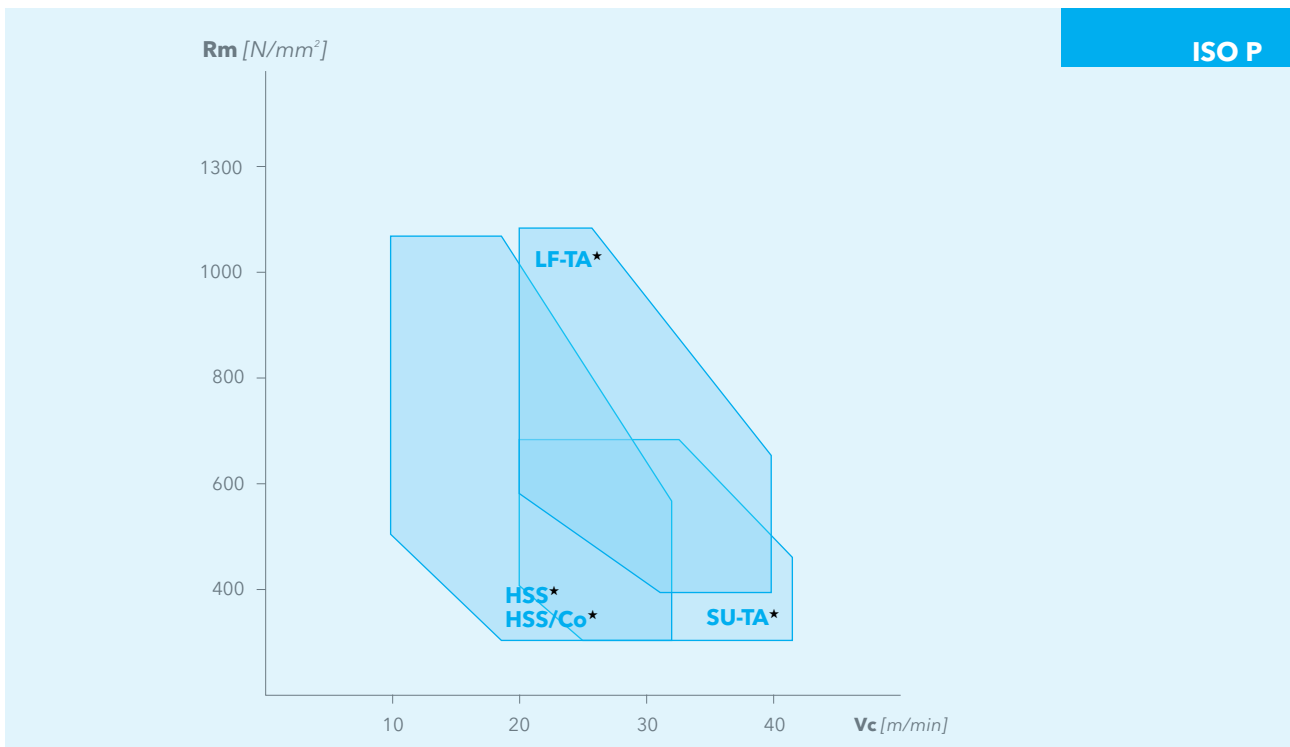
 COATINGS  RIVESTIMENTI  BESCHICHTUNGEN  REVÊTEMENTS  RECUBRIMIENTOS  ПОКРЫТИЕ		 ... TiN	 ... PV10	 ... PV15
 hardness (HV)  durezza (HV)  Härte (HV)	 dureté (HV)  dureza (HV)  твёрдость (HV)	2300	3300	TiAlN + WC/C
 friction coefficient  coefficiente d'attrito  Reibungskoeffizient	 coefficient de frottement  coeficiente de rozamiento  коэффициент трения	0.4	0.35	0.2
 thickness (μ)  spessore (μ)  dicke (μ)	 épaisseur (μ)  espesor (μ)  толщина (мкм)	1÷4	1÷5	2÷5
 max working temperature (°C)  temperatura max (°C)  höchste Temperatur (°C)	 température maximale (°C)  temperatura máx (°C)  макс. температура (°C)	600°	900°	1000°

	ITEM No.	PAGE	
LFTA high performance	218LFTA	214	
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SUTA high performance	980SUTA	224	
	990SUTA	228	
HSS-HSS/Co general purpose	118N	234	
	218NVA	239	
	1386STI	243	
	138N	248	
	138NTI	248	
	138HB	254	
	138WB	258	
	2386STI	262	
	238NVA	267	
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	234LSTH	276	
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RANGE	DRILLING DEPTH	NORM	TYPE	MATERIAL / COATING	HRC	POINT ANGLE	HELIX ANGLE	CHAMFER	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H
2-20	extra short	DIN1897	LF	HSS/Co PV10		130°	35°-40°		★	☆	★	☆		
2-20	short	DIN338	LF	HSS/Co PV10		130°	35°-40°		★	☆	★	☆		
2-13	extra short	OSAWA	SU	HSSE PV10		120°	38°		★	★		★	☆	
2-20	short	OSAWA	SU	HSSE PV10		120°	38°		★	★		★	☆	
1-16	extra short	DIN1897	N	HSS OX		118°	25°-30°		★		☆	☆		
1-20	extra short	DIN1897	NH	HSS/Co HT		130°	30°		★	★	☆	☆	☆	
1-13	short	DIN338	SPLIT POINT	HSS TiN		118°	30°		★	☆	★	☆	☆	
0.2-20	short	DIN338	N	HSS OX		118°	25°-30°		★		☆	☆		
1-16	short	DIN338	N	HSS TiN		118°	25°-30°		★		☆	☆		
1.5-10	short	DIN338	H	HSS BR		118°	12°-15°					★		
1.5-10	short	DIN338	W	HSS BR		130°	35°-40°					★		
1-13	short	DIN338	SPLIT POINT	HSS/Co TiN		135°	33°		★	★	★	☆	☆	
1-20	short	DIN338	NH	HSS/Co HT		130°	30°		★	★	☆	☆	☆	
0.5-12	long	DIN340	NH	HSS/Co HT		130°	30°		★	★	☆	☆	☆	
2-13	long	DIN340	LS	HSS/Co OX		130°	35°-40°		★	☆	★			
2-13	long	DIN340	LS	HSS/Co PV15		130°	35°-40°		★	☆	★			
2-13	extra long	DIN1869/1	LS	HSS/Co BR		130°	35°-40°		★	☆	★			
2-13	extra long	DIN1869/1	LS	HSS/Co PV15		130°	35°-40°		★	☆	★			
3-12	extra long	DIN1869/2	LS	HSS BR		130°	35°-40°		★		★			
3.5-12	extra long	DIN1869/3	LS	HSS BR		130°	35°-40°		★		★			
5-60	short	DIN345	N	HSS OX		118°	25°-30°		★		☆	☆		
13-30	short	DIN345	N	HSS TiN		118°	25°-30°		★		☆	☆		
13-30	short	DIN345	NH	HSS/Co OX		118°	30°		★	★	☆	☆	☆	
13-30	long	DIN341	LS	HSS/Co OX		130°	35°-40°		★	☆	★			
13-30	extra long	DIN1870/1	LS	HSS/Co OX		130°	35°-40°		★	☆	★			
13-30	extra long	DIN1870/2	LS	HSS/Co OX		130°	35°-40°		★	☆	★			

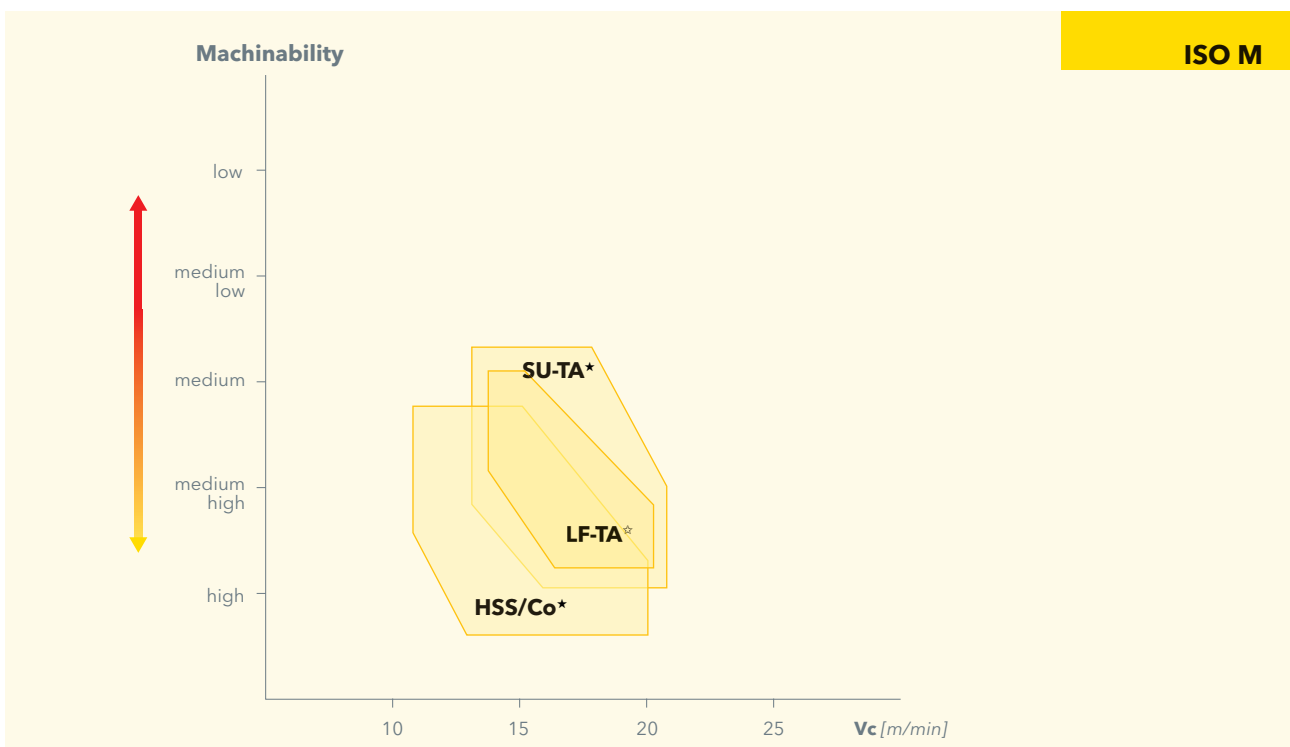
★ 1st choice ☆ suitable

STEEL APPLICATION



★ 1st choice ☆ suitable

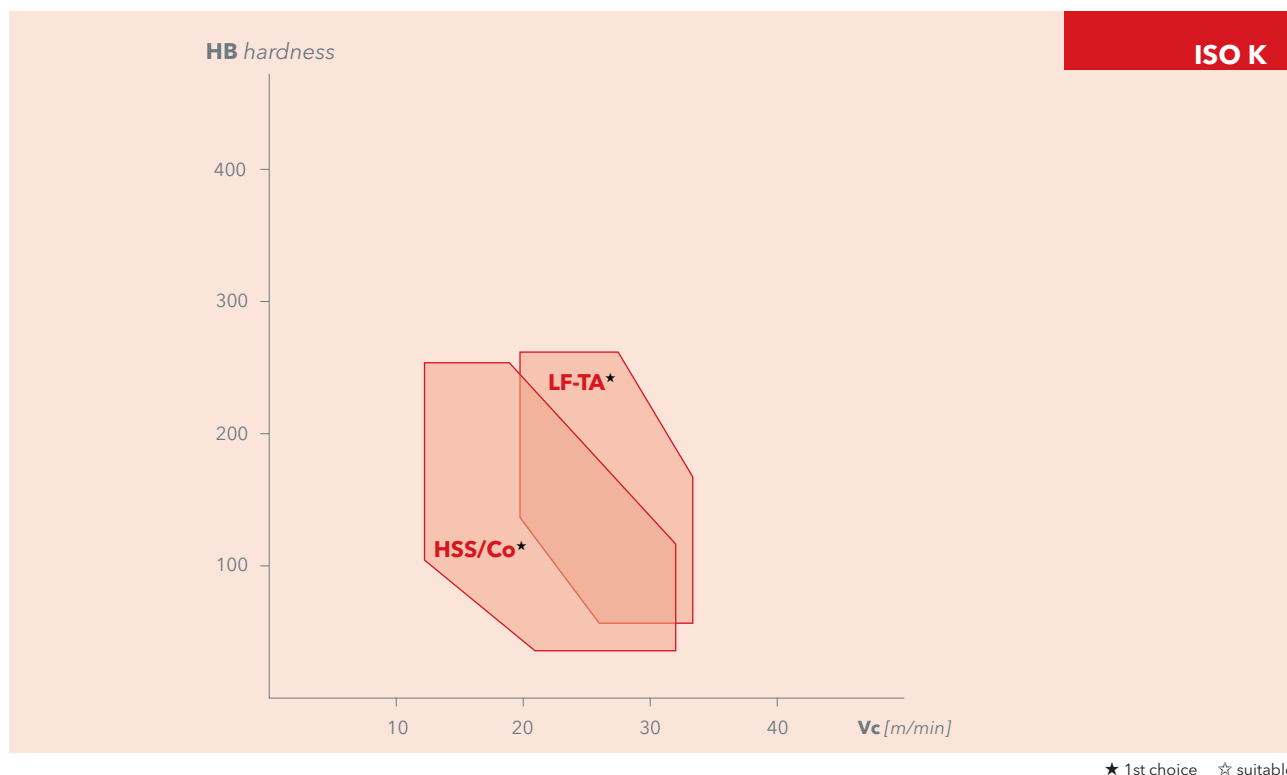
STAINLESS STEEL APPLICATION



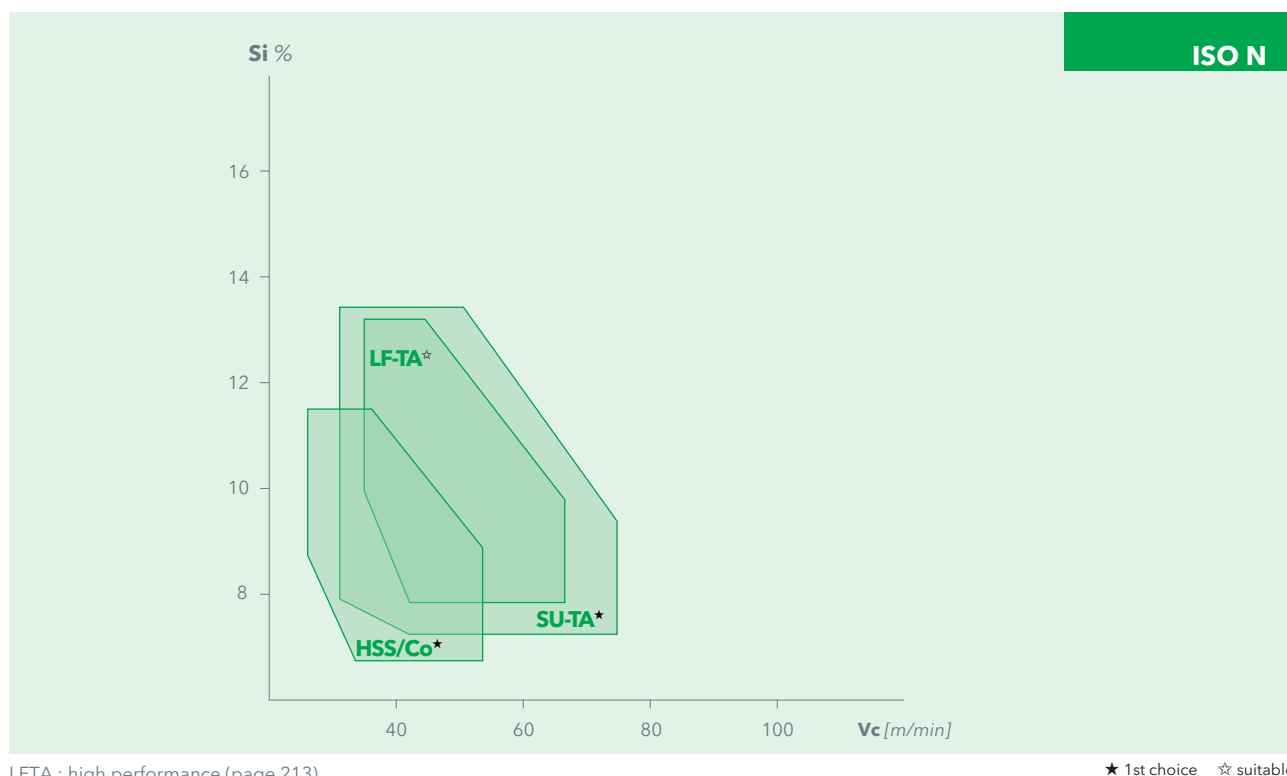
★ 1st choice ☆ suitable

LFTA : high performance (page 213)
 SUTA : high performance (page 223)
 HSS-HSS/Co : general purpose (page 233)

CAST IRON APPLICATION

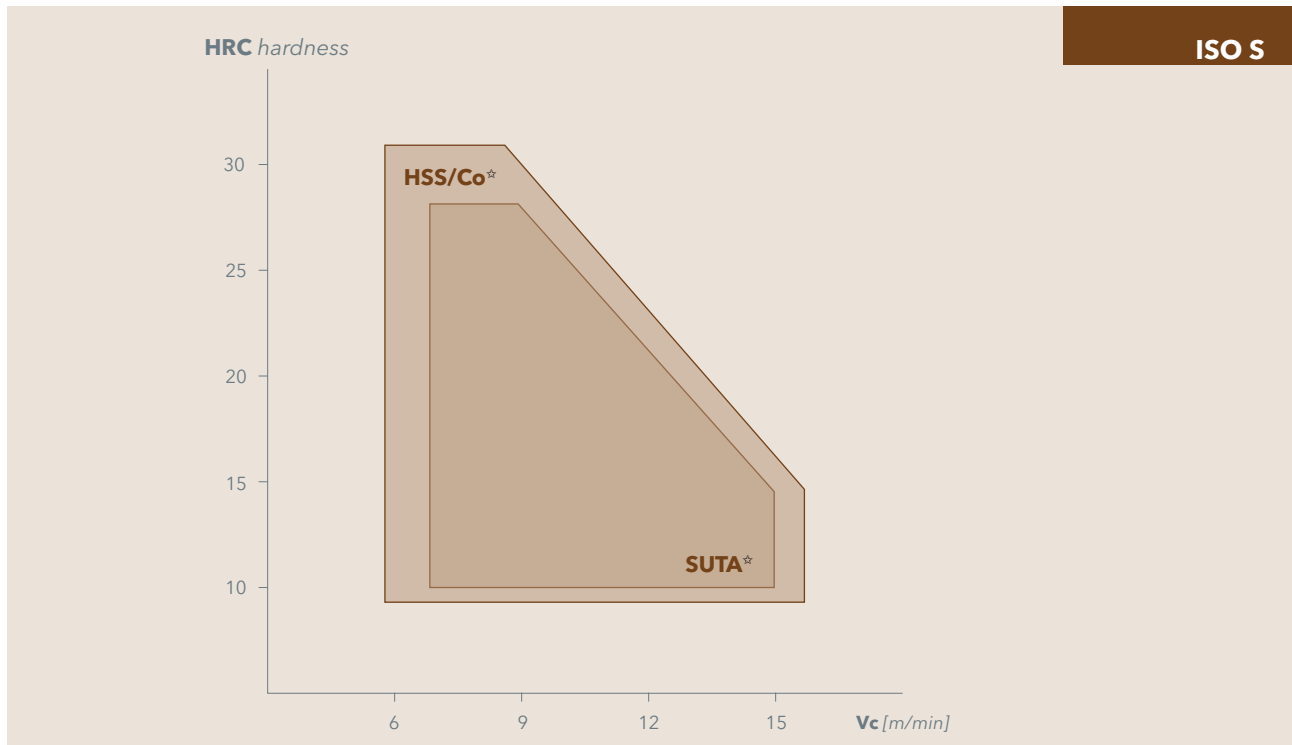


NON-FERROUS MATERIALS APPLICATION



LFTA : high performance (page 213)
 SUTA : high performance (page 223)
 HSS-HSS/Co : general purpose (page 233)

SUPER ALLOYS APPLICATION



SUTA : high performance (page 223)
 HSS-HSS/Co : general purpose (page 233)

★ 1st choice ☆ suitable



LFTA HIGH PERFORMANCE

🇺🇸 High performance and self-centering geometry. Featuring top quality HSS/Co+PV10 and very versatile cutting geometry, enables outstanding performance on a wide range of materials.

🇮🇹 Alto rendimento e affilatura autocentrante. Costruita con HSS/Co+PV10 di alta qualità e caratterizzata da una geometria di taglio molto versatile, garantisce elevate prestazioni su una vasta gamma di materiali.

🇩🇪 Hohe Leistungen und selbstzentrierende Schnittgeometrie. Aus hervorragendem HSS/Co mit PV10 Beschichtung. Dank der vielseitigen Geometrie, sind hohe Leistungen auf einem sehr breiten Spektrum von Materialien möglich.

🇫🇷 Haute performance et affûtage auto-centré. Fabriquée en HSS/Co+PV10 de la plus haute qualité et caractérisée par une géométrie de coupe très polyvalente, elle garantit des performances excellentes dans une grande variété de matériaux.

🇪🇸 Broca de alto rendimiento con afilado autocentrante. Fabricada en HSS/Co con recubrimiento PV10, gracias a su geometría de corte muy versátil, permite lograr un altísimo rendimiento en una gama muy amplia de materiales.

🇷🇺 Высокопроизводительная и самоцентрирующаяся геометрия. Использование HSS/Co высочайшего качества с покрытием PV10 и универсальная геометрия, позволяет получить повышенную производительность на широком спектре обрабатываемых материалов.

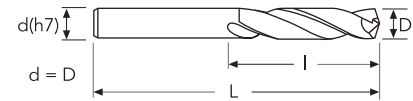
INFO
TYPHOON TA-HTA-4HTA
TYPHOON PU-HPU
TYPHOON SUH
TYPHOON ALH
TYPHOON HRC
TYPHOON SUH MINI
TYPHOON HL
C-SD-TA
LFTA
SUTA
HSS-HSS/CO DRILLS
G2
MDTA
HF VH/UP
MEF
ALU
MEX
UH
HSS/CO-HSSP END MILLS
CARBIDE BURRS

218LFTA

self-centering, general purpose, extra-short



★ 1st choice ☆ suitable



D(h8)	D Tol.	d(h7)	I	L	PACKAGING	EDP No.	Stock
2.00	0/-0.014	2	12	38	5	P218LFTA0200	●
2.10	0/-0.014	2.1	12	38	5	P218LFTA0210	●
2.20	0/-0.014	2.2	13	40	5	P218LFTA0220	●
2.30	0/-0.014	2.3	13	40	5	P218LFTA0230	●
2.40	0/-0.014	2.4	14	43	5	P218LFTA0240	●
2.50	0/-0.014	2.5	14	43	5	P218LFTA0250	●
2.60	0/-0.014	2.6	14	43	5	P218LFTA0260	●
2.70	0/-0.014	2.7	16	46	5	P218LFTA0270	●
2.80	0/-0.014	2.8	16	46	5	P218LFTA0280	●
2.90	0/-0.014	2.9	16	46	5	P218LFTA0290	●
3.00	0/-0.014	3	16	46	5	P218LFTA0300	●
3.10	0/-0.018	3.1	18	49	5	P218LFTA0310	●
3.20	0/-0.018	3.2	18	49	5	P218LFTA0320	●
3.30	0/-0.018	3.3	18	49	5	P218LFTA0330	●
3.40	0/-0.018	3.4	20	52	5	P218LFTA0340	●
3.50	0/-0.018	3.5	20	52	5	P218LFTA0350	●
3.60	0/-0.018	3.6	20	52	5	P218LFTA0360	●
3.70	0/-0.018	3.7	20	52	5	P218LFTA0370	●
3.80	0/-0.018	3.8	22	55	5	P218LFTA0380	●
3.90	0/-0.018	3.9	22	55	5	P218LFTA0390	●
4.00	0/-0.018	4	22	55	5	P218LFTA0400	●
4.10	0/-0.018	4.1	22	55	5	P218LFTA0410	●
4.20	0/-0.018	4.2	22	55	5	P218LFTA0420	●
4.30	0/-0.018	4.3	24	58	5	P218LFTA0430	●
4.40	0/-0.018	4.4	24	58	5	P218LFTA0440	●
4.50	0/-0.018	4.5	24	58	5	P218LFTA0450	●
4.60	0/-0.018	4.6	24	58	5	P218LFTA0460	●
4.70	0/-0.018	4.7	24	58	5	P218LFTA0470	●
4.80	0/-0.018	4.8	26	62	5	P218LFTA0480	●
4.90	0/-0.018	4.9	26	62	5	P218LFTA0490	●
5.00	0/-0.018	5	26	62	5	P218LFTA0500	●
5.10	0/-0.018	5.1	26	62	5	P218LFTA0510	●
5.20	0/-0.018	5.2	26	62	5	P218LFTA0520	●
5.30	0/-0.018	5.3	26	62	5	P218LFTA0530	●
5.40	0/-0.018	5.4	28	66	5	P218LFTA0540	●
5.50	0/-0.018	5.5	28	66	5	P218LFTA0550	●
5.60	0/-0.018	5.6	28	66	5	P218LFTA0560	●
5.70	0/-0.018	5.7	28	66	5	P218LFTA0570	●
5.80	0/-0.018	5.8	28	66	5	P218LFTA0580	●

● stock standard ○ non-standard stock ▽ stock exhaustion

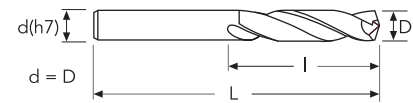
218LFTA

self-centering, general purpose, extra-short



P	M	K	N	S	H
★	☆	★	☆		

★ 1st choice ☆ suitable



D(h8)	D Tol.	d(h7)	I	L	PACKAGING	EDP No.	Stock
5.90	0/-0.018	5.9	28	66	5	P218LFTA0590	●
6.00	0/-0.018	6	28	66	5	P218LFTA0600	●
6.10	0/-0.022	6.1	31	70	5	P218LFTA0610	●
6.20	0/-0.022	6.2	31	70	5	P218LFTA0620	●
6.30	0/-0.022	6.3	31	70	5	P218LFTA0630	●
6.40	0/-0.022	6.4	31	70	5	P218LFTA0640	●
6.50	0/-0.022	6.5	31	70	5	P218LFTA0650	●
6.60	0/-0.022	6.6	31	70	5	P218LFTA0660	●
6.70	0/-0.022	6.7	31	70	5	P218LFTA0670	●
6.80	0/-0.022	6.8	34	74	5	P218LFTA0680	●
6.90	0/-0.022	6.9	34	74	5	P218LFTA0690	●
7.00	0/-0.022	7	34	74	5	P218LFTA0700	●
7.10	0/-0.022	7.1	34	74	5	P218LFTA0710	●
7.20	0/-0.022	7.2	34	74	5	P218LFTA0720	●
7.30	0/-0.022	7.3	34	74	5	P218LFTA0730	●
7.40	0/-0.022	7.4	34	74	5	P218LFTA0740	●
7.50	0/-0.022	7.5	34	74	5	P218LFTA0750	●
7.60	0/-0.022	7.6	37	79	5	P218LFTA0760	●
7.70	0/-0.022	7.7	37	79	5	P218LFTA0770	●
7.80	0/-0.022	7.8	37	79	5	P218LFTA0780	●
7.90	0/-0.022	7.9	37	79	5	P218LFTA0790	●
8.00	0/-0.022	8	37	79	5	P218LFTA0800	●
8.10	0/-0.022	8.1	37	79	5	P218LFTA0810	●
8.20	0/-0.022	8.2	37	79	5	P218LFTA0820	●
8.30	0/-0.022	8.3	37	79	5	P218LFTA0830	●
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9.00	0/-0.022	9	40	84	5	P218LFTA0900	●
9.10	0/-0.022	9.1	40	84	5	P218LFTA0910	●
9.20	0/-0.022	9.2	40	84	5	P218LFTA0920	●
9.30	0/-0.022	9.3	40	84	5	P218LFTA0930	●
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9.50	0/-0.022	9.5	40	84	5	P218LFTA0950	●
9.60	0/-0.022	9.6	43	89	5	P218LFTA0960	●
9.70	0/-0.022	9.7	43	89	5	P218LFTA0970	●

INFO
TYPHOON TA-HTA-4HTA
TYPHOON PU-HPU
TYPHOON SUH
TYPHOON ALH
TYPHOON HRC
TYPHOON SUH MINI
TYPHOON HL
C-SD-TA
LFTA
SUTA
HSS-HSS/CO DRILLS
G2
MDTA
HF VH/UP
MEF
ALU
MEX
UH
HSS/CO-HSSP END MILLS
CARBIDE BURRS

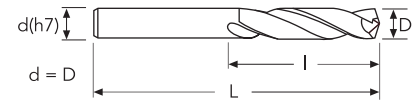
● stock standard ○ non-standard stock ▽ stock exhaustion

218LFTA

self-centering, general purpose, extra-short



★ 1st choice ☆ suitable



D(h8)	D Tol.	d(h7)	l	L	PACKAGING	EDP No.	Stock
9.80	0/-0.022	9.8	43	89	5	P218LFTA0980	●
9.90	0/-0.022	9.9	43	89	5	P218LFTA0990	●
10.00	0/-0.022	10	43	89	5	P218LFTA1000	●
10.20	0/-0.027	10.2	43	89	1	P218LFTA1020	●
10.30	0/-0.027	10.3	43	89	1	P218LFTA1030	●
10.50	0/-0.027	10.5	43	89	1	P218LFTA1050	●
10.80	0/-0.027	10.8	47	95	1	P218LFTA1080	●
11.00	0/-0.027	11	47	95	1	P218LFTA1100	●
11.20	0/-0.027	11.2	47	95	1	P218LFTA1120	●
11.30	0/-0.027	11.3	47	95	1	P218LFTA1130	●
11.50	0/-0.027	11.5	47	95	1	P218LFTA1150	●
11.80	0/-0.027	11.8	47	95	1	P218LFTA1180	●
12.00	0/-0.027	12	51	102	1	P218LFTA1200	●
12.20	0/-0.027	12.2	51	102	1	P218LFTA1220	●
12.50	0/-0.027	12.5	51	102	1	P218LFTA1250	●
12.80	0/-0.027	12.8	51	102	1	P218LFTA1280	●
13.00	0/-0.027	13	51	102	1	P218LFTA1300	●
13.30	0/-0.027	13.3	54	107	1	P218LFTA1330	●
13.50	0/-0.027	13.5	54	107	1	P218LFTA1350	●
13.80	0/-0.027	13.8	54	107	1	P218LFTA1380	●
14.00	0/-0.027	14	54	107	1	P218LFTA1400	●
14.50	0/-0.027	14.5	56	111	1	P218LFTA1450	●
14.80	0/-0.027	14.8	56	111	1	P218LFTA1480	●
15.00	0/-0.027	15	56	111	1	P218LFTA1500	●
15.30	0/-0.027	15.3	56	111	1	P218LFTA1530	●
15.50	0/-0.027	15.5	58	115	1	P218LFTA1550	●
15.80	0/-0.027	15.8	58	115	1	P218LFTA1580	●
16.00	0/-0.027	16	58	115	1	P218LFTA1600	●
16.50	0/-0.027	16.5	60	119	1	P218LFTA1650	●
17.00	0/-0.027	17	60	119	1	P218LFTA1700	●
17.50	0/-0.027	17.5	62	123	1	P218LFTA1750	●
18.00	0/-0.027	18	62	123	1	P218LFTA1800	●
18.50	0/-0.033	18.5	64	127	1	P218LFTA1850	●
19.00	0/-0.033	19	64	127	1	P218LFTA1900	●
19.50	0/-0.033	19.5	66	131	1	P218LFTA1950	●
20.00	0/-0.033	20	66	131	1	P218LFTA2000	●

● stock standard ○ non-standard stock ▽ stock exhaustion

218LFTA

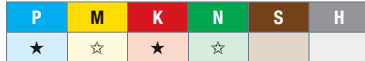
Material Group ISO 513	P1 P2			P3 P4			M1 M2					
Hardness/Rm	500-700 N/mm ²			600-1000 N/mm ²			< 750 N/mm ²					
Vc (m/min)	40-50			30-40			18-22					
D (mm)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)			
2	7170	0.060	430	5570	0.051	280	3180	0.042	130			
3	4780	0.084	400	3720	0.071	270	2120	0.059	120			
4	3580	0.108	390	2790	0.092	260	1590	0.076	120			
5	2870	0.132	380	2230	0.112	250	1270	0.092	120			
6	2390	0.156	370	1860	0.133	250	1060	0.109	120			
7	2050	0.180	370	1590	0.153	240	910	0.126	110			
8	1790	0.204	370	1390	0.173	240	800	0.143	110			
9	1590	0.228	360	1240	0.194	240	710	0.160	110			
10	1430	0.252	360	1110	0.214	240	640	0.176	110			
11	1300	0.276	360	1010	0.235	240	580	0.179	100			
12	1190	0.300	360	930	0.255	240	530	0.195	100			
13	1100	0.324	360	860	0.275	240	490	0.204	100			
14	1020	0.348	350	800	0.296	240	450	0.219	100			
15	960	0.372	360	740	0.316	230	420	0.223	90			
16	900	0.396	360	700	0.337	240	400	0.238	100			
17	840	0.420	350	660	0.357	240	370	0.252	90			
18	800	0.444	360	620	0.377	230	350	0.266	90			
19	750	0.468	350	590	0.398	230	340	0.281	100			
20	720	0.492	350	560	0.418	230	320	0.295	90			

Material Group ISO 513	K1 K2			N1 N2			N3 N4					
Hardness/Rm	150-350 HB											
Vc (m/min)	30-40			65-75			45-55					
D (mm)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)			
2	5570	0.057	320	11150	0.066	740	7960	0.060	480			
3	3720	0.080	300	7430	0.092	690	5310	0.084	450			
4	2790	0.103	290	5570	0.119	660	3980	0.108	430			
5	2230	0.125	280	4460	0.145	650	3180	0.132	420			
6	1860	0.148	280	3720	0.172	640	2650	0.156	410			
7	1590	0.171	270	3180	0.198	630	2270	0.180	410			
8	1390	0.194	270	2790	0.224	630	1990	0.204	410			
9	1240	0.217	270	2480	0.251	620	1770	0.228	400			
10	1110	0.239	270	2230	0.277	620	1590	0.252	400			
11	1010	0.262	260	2030	0.304	620	1450	0.276	400			
12	930	0.285	270	1860	0.330	610	1330	0.300	400			
13	860	0.308	260	1710	0.356	610	1220	0.324	400			
14	800	0.331	260	1590	0.383	610	1140	0.348	400			
15	740	0.353	260	1490	0.409	610	1060	0.372	390			
16	700	0.376	260	1390	0.436	610	1000	0.396	400			
17	660	0.399	260	1310	0.462	610	940	0.420	390			
18	620	0.422	260	1240	0.488	610	880	0.444	390			
19	590	0.445	260	1170	0.515	600	840	0.468	390			
20	560	0.467	260	1110	0.541	600	800	0.492	390			

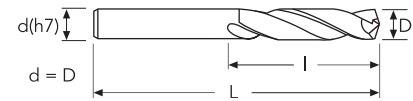
- INFO
- TYPHOON TA-HTA-4HTA
- TYPHOON PU-HPU
- TYPHOON SUH
- TYPHOON ALH
- TYPHOON HRC
- TYPHOON SUH MINI
- TYPHOON HL
- C-SD-TA
- LFTA
- SUTA
- HSS-HSS/CO DRILLS
- G2
- MDTA
- HF VH/UP
- MEF
- ALU
- MEX
- UH
- HSS/CO-HSSP END MILLS
- CARBIDE BURRS

238LFTA

self-centering, general purpose, short



★ 1st choice ☆ suitable



D(h8)	D Tol.	d(h7)	I	L	PACKAGING	EDP No.	Stock
2.00	0/-0.014	2	24	49	5	P238LFTA0200	●
2.10	0/-0.014	2.1	24	49	5	P238LFTA0210	●
2.20	0/-0.014	2.2	27	53	5	P238LFTA0220	●
2.30	0/-0.014	2.3	27	53	5	P238LFTA0230	●
2.40	0/-0.014	2.4	30	57	5	P238LFTA0240	●
2.50	0/-0.014	2.5	30	57	5	P238LFTA0250	●
2.60	0/-0.014	2.6	30	57	5	P238LFTA0260	●
2.70	0/-0.014	2.7	33	61	5	P238LFTA0270	●
2.80	0/-0.014	2.8	33	61	5	P238LFTA0280	●
2.90	0/-0.014	2.9	33	61	5	P238LFTA0290	●
3.00	0/-0.014	3	33	61	5	P238LFTA0300	●
3.10	0/-0.018	3.1	36	65	5	P238LFTA0310	●
3.20	0/-0.018	3.2	36	65	5	P238LFTA0320	●
3.30	0/-0.018	3.3	36	65	5	P238LFTA0330	●
3.40	0/-0.018	3.4	39	70	5	P238LFTA0340	●
3.50	0/-0.018	3.5	39	70	5	P238LFTA0350	●
3.60	0/-0.018	3.6	39	70	5	P238LFTA0360	●
3.70	0/-0.018	3.7	39	70	5	P238LFTA0370	●
3.80	0/-0.018	3.8	43	75	5	P238LFTA0380	●
3.90	0/-0.018	3.9	43	75	5	P238LFTA0390	●
4.00	0/-0.018	4	43	75	5	P238LFTA0400	●
4.10	0/-0.018	4.1	43	75	5	P238LFTA0410	●
4.20	0/-0.018	4.2	43	75	5	P238LFTA0420	●
4.30	0/-0.018	4.3	47	80	5	P238LFTA0430	●
4.40	0/-0.018	4.4	47	80	5	P238LFTA0440	●
4.50	0/-0.018	4.5	47	80	5	P238LFTA0450	●
4.60	0/-0.018	4.6	47	80	5	P238LFTA0460	●
4.70	0/-0.018	4.7	47	80	5	P238LFTA0470	●
4.80	0/-0.018	4.8	52	86	5	P238LFTA0480	●
4.90	0/-0.018	4.9	52	86	5	P238LFTA0490	●
5.00	0/-0.018	5	52	86	5	P238LFTA0500	●
5.10	0/-0.018	5.1	52	86	5	P238LFTA0510	●
5.20	0/-0.018	5.2	52	86	5	P238LFTA0520	●
5.30	0/-0.018	5.3	52	86	5	P238LFTA0530	●
5.40	0/-0.018	5.4	57	93	5	P238LFTA0540	●
5.50	0/-0.018	5.5	57	93	5	P238LFTA0550	●
5.60	0/-0.018	5.6	57	93	5	P238LFTA0560	●
5.70	0/-0.018	5.7	57	93	5	P238LFTA0570	●
5.80	0/-0.018	5.8	57	93	5	P238LFTA0580	●

● stock standard ○ non-standard stock ▽ stock exhaustion

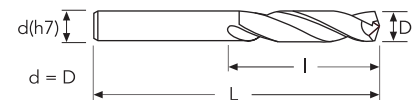
238LFTA

self-centering, general purpose, short



P	M	K	N	S	H
★	☆	★	☆		

★ 1st choice ☆ suitable



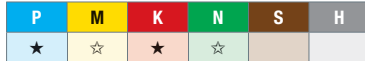
D(h8)	D Tol.	d(h7)	l	L	PACKAGING	EDP No.	Stock
5.90	0/-0.018	5.9	57	93	5	P238LFTA0590	●
6.00	0/-0.018	6	57	93	5	P238LFTA0600	●
6.10	0/-0.022	6.1	63	101	1	P238LFTA0610	●
6.20	0/-0.022	6.2	63	101	1	P238LFTA0620	●
6.30	0/-0.022	6.3	63	101	1	P238LFTA0630	●
6.40	0/-0.022	6.4	63	101	1	P238LFTA0640	●
6.50	0/-0.022	6.5	63	101	1	P238LFTA0650	●
6.60	0/-0.022	6.6	63	101	1	P238LFTA0660	●
6.70	0/-0.022	6.7	63	101	1	P238LFTA0670	●
6.80	0/-0.022	6.8	69	109	1	P238LFTA0680	●
6.90	0/-0.022	6.9	69	109	1	P238LFTA0690	●
7.00	0/-0.022	7	69	109	1	P238LFTA0700	●
7.10	0/-0.022	7.1	69	109	1	P238LFTA0710	●
7.20	0/-0.022	7.2	69	109	1	P238LFTA0720	●
7.30	0/-0.022	7.3	69	109	1	P238LFTA0730	●
7.40	0/-0.022	7.4	69	109	1	P238LFTA0740	●
7.50	0/-0.022	7.5	69	109	1	P238LFTA0750	●
7.60	0/-0.022	7.6	75	117	1	P238LFTA0760	●
7.70	0/-0.022	7.7	75	117	1	P238LFTA0770	●
7.80	0/-0.022	7.8	75	117	1	P238LFTA0780	●
7.90	0/-0.022	7.9	75	117	1	P238LFTA0790	●
8.00	0/-0.022	8	75	117	1	P238LFTA0800	●
8.10	0/-0.022	8.1	75	117	1	P238LFTA0810	●
8.20	0/-0.022	8.2	75	117	1	P238LFTA0820	●
8.30	0/-0.022	8.3	75	117	1	P238LFTA0830	●
8.40	0/-0.022	8.4	75	117	1	P238LFTA0840	●
8.50	0/-0.022	8.5	75	117	1	P238LFTA0850	●
8.60	0/-0.022	8.6	81	125	1	P238LFTA0860	●
8.70	0/-0.022	8.7	81	125	1	P238LFTA0870	●
8.80	0/-0.022	8.8	81	125	1	P238LFTA0880	●
8.90	0/-0.022	8.9	81	125	1	P238LFTA0890	●
9.00	0/-0.022	9	81	125	1	P238LFTA0900	●
9.10	0/-0.022	9.1	81	125	1	P238LFTA0910	●
9.20	0/-0.022	9.2	81	125	1	P238LFTA0920	●
9.30	0/-0.022	9.3	81	125	1	P238LFTA0930	●
9.40	0/-0.022	9.4	81	125	1	P238LFTA0940	●
9.50	0/-0.022	9.5	81	125	1	P238LFTA0950	●
9.60	0/-0.022	9.6	87	133	1	P238LFTA0960	●
9.70	0/-0.022	9.7	87	133	1	P238LFTA0970	●

INFO
TYPHOON TA-HTA-4HTA
TYPHOON PU-HPU
TYPHOON SUH
TYPHOON ALH
TYPHOON HRC
TYPHOON SUH MINI
TYPHOON HL
C-SD-TA
LFTA
SUTA
HSS-HSS/CO DRILLS
G2
MDTA
HF VH/UP
MEF
ALU
MEX
UH
HSS/CO-HSSP END MILLS
CARBIDE BURRS

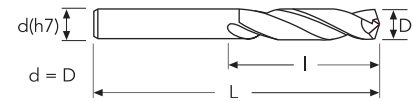
● stock standard ○ non-standard stock ▽ stock exhaustion

238LFTA

self-centering, general purpose, short



★ 1st choice ☆ suitable



D(h8)	D Tol.	d(h7)	l	L	PACKAGING	EDP No.	Stock
9.80	0/-0.022	9.8	87	133	1	P238LFTA0980	●
9.90	0/-0.022	9.9	87	133	1	P238LFTA0990	●
10.00	0/-0.022	10	87	133	1	P238LFTA1000	●
10.20	0/-0.027	10.2	87	133	1	P238LFTA1020	●
10.30	0/-0.027	10.3	87	133	1	P238LFTA1030	●
10.50	0/-0.027	10.5	87	133	1	P238LFTA1050	●
10.80	0/-0.027	10.8	94	142	1	P238LFTA1080	●
11.00	0/-0.027	11	94	142	1	P238LFTA1100	●
11.20	0/-0.027	11.2	94	142	1	P238LFTA1120	●
11.30	0/-0.027	11.3	94	142	1	P238LFTA1130	●
11.50	0/-0.027	11.5	94	142	1	P238LFTA1150	●
11.80	0/-0.027	11.8	94	142	1	P238LFTA1180	●
12.00	0/-0.027	12	101	151	1	P238LFTA1200	●
12.20	0/-0.027	12.2	101	151	1	P238LFTA1220	●
12.50	0/-0.027	12.5	101	151	1	P238LFTA1250	●
12.80	0/-0.027	12.8	101	151	1	P238LFTA1280	●
13.00	0/-0.027	13	101	151	1	P238LFTA1300	●
13.30	0/-0.027	13.3	108	160	1	P238LFTA1330	●
13.50	0/-0.027	13.5	108	160	1	P238LFTA1350	●
13.80	0/-0.027	13.8	108	160	1	P238LFTA1380	●
14.00	0/-0.027	14	108	160	1	P238LFTA1400	●
14.50	0/-0.027	14.5	114	169	1	P238LFTA1450	●
14.80	0/-0.027	14.8	114	169	1	P238LFTA1480	●
15.00	0/-0.027	15	114	169	1	P238LFTA1500	●
15.30	0/-0.027	15.3	120	178	1	P238LFTA1530	●
15.50	0/-0.027	15.5	120	178	1	P238LFTA1550	●
15.80	0/-0.027	15.8	120	178	1	P238LFTA1580	●
16.00	0/-0.027	16	120	178	1	P238LFTA1600	●
16.50	0/-0.027	16.5	125	184	1	P238LFTA1650	●
17.00	0/-0.027	17	125	184	1	P238LFTA1700	●
17.50	0/-0.027	17.5	130	191	1	P238LFTA1750	●
18.00	0/-0.027	18	130	191	1	P238LFTA1800	●
18.50	0/-0.033	18.5	135	198	1	P238LFTA1850	●
19.00	0/-0.033	19	135	198	1	P238LFTA1900	●
19.50	0/-0.033	19.5	140	205	1	P238LFTA1950	●
20.00	0/-0.033	20	140	205	1	P238LFTA2000	●

● stock standard ○ non-standard stock ▽ stock exhaustion

238LFTA

Material Group ISO 513		P1 P2			P3 P4			M1 M2					
Hardness/Rm		500-700 N/mm ²			600-1000 N/mm ²			< 750 N/mm ²					
Vc (m/min)		30-40			20-30			14-18					
D (mm)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)				
2	5570	0.054	300	3980	0.046	180	2550	0.038	100				
3	3720	0.076	280	2650	0.064	170	1700	0.053	90				
4	2790	0.097	270	1990	0.083	160	1270	0.068	90				
5	2230	0.119	260	1590	0.101	160	1020	0.083	80				
6	1860	0.140	260	1330	0.119	160	850	0.098	80				
7	1590	0.162	260	1140	0.138	160	730	0.113	80				
8	1390	0.184	260	1000	0.156	160	640	0.129	80				
9	1240	0.205	250	880	0.174	150	570	0.144	80				
10	1110	0.227	250	800	0.193	150	510	0.159	80				
11	1010	0.248	250	720	0.211	150	460	0.161	70				
12	930	0.270	250	660	0.230	150	420	0.176	70				
13	860	0.292	250	610	0.248	150	390	0.184	70				
14	800	0.313	250	570	0.266	150	360	0.197	70				
15	740	0.335	250	530	0.285	150	340	0.201	70				
16	700	0.356	250	500	0.303	150	320	0.214	70				
17	660	0.378	250	470	0.321	150	300	0.227	70				
18	620	0.400	250	440	0.340	150	280	0.240	70				
19	590	0.421	250	420	0.358	150	270	0.253	70				
20	560	0.443	250	400	0.376	150	250	0.266	70				

Material Group ISO 513		K1 K2			N1 N2			N3 N4					
Hardness/Rm		150-350 HB											
Vc (m/min)		25-35			50-60			35-45					
D (mm)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)				
2	4780	0.051	250	8760	0.059	520	6370	0.054	340				
3	3180	0.072	230	5840	0.083	490	4250	0.076	320				
4	2390	0.092	220	4380	0.107	470	3180	0.097	310				
5	1910	0.113	220	3500	0.131	460	2550	0.119	300				
6	1590	0.133	210	2920	0.154	450	2120	0.140	300				
7	1360	0.154	210	2500	0.178	450	1820	0.162	290				
8	1190	0.174	210	2190	0.202	440	1590	0.184	290				
9	1060	0.195	210	1950	0.226	440	1420	0.205	290				
10	960	0.215	210	1750	0.249	440	1270	0.227	290				
11	870	0.236	210	1590	0.273	430	1160	0.248	290				
12	800	0.257	210	1460	0.297	430	1060	0.270	290				
13	730	0.277	200	1350	0.321	430	980	0.292	290				
14	680	0.298	200	1250	0.345	430	910	0.313	290				
15	640	0.318	200	1170	0.368	430	850	0.335	280				
16	600	0.339	200	1090	0.392	430	800	0.356	290				
17	560	0.359	200	1030	0.416	430	750	0.378	280				
18	530	0.380	200	970	0.440	430	710	0.400	280				
19	500	0.400	200	920	0.463	430	670	0.421	280				
20	480	0.421	200	880	0.487	430	640	0.443	280				

- INFO
- TYPHOON TA-HTA-4HTA
- TYPHOON PU-HPU
- TYPHOON SUH
- TYPHOON ALH
- TYPHOON HRC
- TYPHOON SUH MINI
- TYPHOON HL
- C-SD-TA
- LFTA
- SUTA
- HSS-HSS/CO DRILLS
- G2
- MDTA
- HF VH/UP
- MEF
- ALU
- MEX
- UH
- HSS/CO-HSSP END MILLS
- CARBIDE BURRS



SUTA HIGH PERFORMANCE

🇬🇧 High performance and self-centering geometry. Featuring premium HSSE+PV10 coating and special edge design, enables very low cutting pressure and outstanding performance on stainless steel, steel and non-ferrous materials.

🇮🇹 Alto rendimento e affilatura autocentrante. Costruita con i migliori HSSE+PV10 e speciale geometria del tagliente, garantisce un bassissimo sforzo di taglio e prestazioni eccezionali nella foratura di acciaio inossidabile, acciaio e materiali non ferrosi.

🇩🇪 Hohe Leistungen und selbstzentrierende Schnittgeometrie. Aus hervorragendem HSSE mit PV10 Beschichtung. Dank des sehr geringen Schneiddrucks, sind unschlagbare Leistungen auf rostfreien Stählen, Stählen und NE-Metall-Werkstoffe möglich.

🇫🇷 Haute performance et affûtage autocentré. Fabriquée avec les meilleurs HSSE+PV10 et une géométrie spécifique de l'arête, elle permet de minimiser les efforts de coupe en garantissant des performances exceptionnelles dans le perçage des aciers inoxydables, des aciers et des matériaux non ferreux.

🇪🇸 Broca de alto rendimiento con afilado autocentrante. Fabricada en HSSE Premium con recubrimiento PV10 y geometría especial, minimiza el esfuerzo de corte y permite lograr un altísimo rendimiento en aceros inoxidable, aceros y materiales no ferrosos.

🇷🇺 Высокопроизводительная и самоцентрирующаяся геометрия. Высококачественная быстрорежущая сталь с покрытием PV10 и специальная геометрия режущих кромок обеспечивает низкие силы резания и непревзойденную производительность при работе по нержавеющей стали, конструкционной стали и цветным металлам.

INFO
TYPHOON TA-HTA-4HTA
TYPHOON PU-HPU
TYPHOON SUH
TYPHOON ALH
TYPHOON HRC
TYPHOON SUH MINI
TYPHOON HL
C-SD-TA
LFTA
SUTA
HSS-HSS/CO DRILLS
G2
MDTA
HF VH/UP
MEF
ALU
MEX
UH
HSS/CO-HSSP END MILLS
CARBIDE BURRS

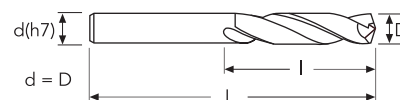
980SUTA

self centering, stainless steel, extra-short



P	M	K	N	S	H
★	★	★	★	☆	☆

★ 1st choice ☆ suitable



D(h8)	D Tol.	d(h7)	l	L	PACKAGING	EDP No.	Stock
2.00	0/-0.014	2	12	44	1	P980SUTA0200	●
2.10	0/-0.014	2.1	12	44	1	P980SUTA0210	●
2.20	0/-0.014	2.2	13	45	1	P980SUTA0220	●
2.30	0/-0.014	2.3	13	45	1	P980SUTA0230	●
2.40	0/-0.014	2.4	14	46	1	P980SUTA0240	●
2.50	0/-0.014	2.5	14	46	1	P980SUTA0250	●
2.60	0/-0.014	2.6	14	46	1	P980SUTA0260	●
2.70	0/-0.014	2.7	16	48	1	P980SUTA0270	●
2.80	0/-0.014	2.8	16	48	1	P980SUTA0280	●
2.90	0/-0.014	2.9	16	48	1	P980SUTA0290	●
3.00	0/-0.014	3	16	48	1	P980SUTA0300	●
3.10	0/-0.018	3.1	18	50	1	P980SUTA0310	●
3.20	0/-0.018	3.2	18	50	1	P980SUTA0320	●
3.30	0/-0.018	3.3	18	50	1	P980SUTA0330	●
3.40	0/-0.018	3.4	20	52	1	P980SUTA0340	●
3.50	0/-0.018	3.5	20	52	1	P980SUTA0350	●
3.60	0/-0.018	3.6	20	52	1	P980SUTA0360	●
3.70	0/-0.018	3.7	20	52	1	P980SUTA0370	●
3.80	0/-0.018	3.8	22	54	1	P980SUTA0380	●
3.90	0/-0.018	3.9	22	54	1	P980SUTA0390	●
4.00	0/-0.018	4	22	54	1	P980SUTA0400	●
4.10	0/-0.018	4.1	22	66	1	P980SUTA0410	●
4.20	0/-0.018	4.2	22	66	1	P980SUTA0420	●
4.30	0/-0.018	4.3	24	68	1	P980SUTA0430	●
4.40	0/-0.018	4.4	24	68	1	P980SUTA0440	●
4.50	0/-0.018	4.5	24	68	1	P980SUTA0450	●
4.60	0/-0.018	4.6	24	68	1	P980SUTA0460	●
4.70	0/-0.018	4.7	24	68	1	P980SUTA0470	●
4.80	0/-0.018	4.8	26	70	1	P980SUTA0480	●
4.90	0/-0.018	4.9	26	70	1	P980SUTA0490	●
5.00	0/-0.018	5	26	70	1	P980SUTA0500	●
5.10	0/-0.018	5.1	26	70	1	P980SUTA0510	●
5.20	0/-0.018	5.2	26	70	1	P980SUTA0520	●
5.30	0/-0.018	5.3	26	70	1	P980SUTA0530	●
5.40	0/-0.018	5.4	28	72	1	P980SUTA0540	●
5.50	0/-0.018	5.5	28	72	1	P980SUTA0550	●
5.60	0/-0.018	5.6	28	72	1	P980SUTA0560	●
5.70	0/-0.018	5.7	28	72	1	P980SUTA0570	●
5.80	0/-0.018	5.8	28	72	1	P980SUTA0580	●

● stock standard ○ non-standard stock ▽ stock exhaustion

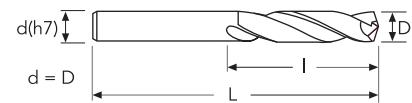
980SUTA

self centering, stainless steel, extra-short



P	M	K	N	S	H
★	★		★	☆	

★ 1st choice ☆ suitable



D(h8)	D Tol.	d(h7)	l	L	PACKAGING	EDP No.	Stock
5.90	0/-0.018	5.9	28	72	1	P980SUTA0590	●
6.00	0/-0.018	6	28	72	1	P980SUTA0600	●
6.10	0/-0.022	6.1	31	75	1	P980SUTA0610	●
6.20	0/-0.022	6.2	31	75	1	P980SUTA0620	●
6.30	0/-0.022	6.3	31	75	1	P980SUTA0630	●
6.40	0/-0.022	6.4	31	75	1	P980SUTA0640	●
6.50	0/-0.022	6.5	31	75	1	P980SUTA0650	●
6.60	0/-0.022	6.6	31	75	1	P980SUTA0660	●
6.70	0/-0.022	6.7	31	75	1	P980SUTA0670	●
6.80	0/-0.022	6.8	34	78	1	P980SUTA0680	●
6.90	0/-0.022	6.9	34	78	1	P980SUTA0690	●
7.00	0/-0.022	7	34	78	1	P980SUTA0700	●
7.10	0/-0.022	7.1	34	78	1	P980SUTA0710	●
7.20	0/-0.022	7.2	34	78	1	P980SUTA0720	●
7.30	0/-0.022	7.3	34	78	1	P980SUTA0730	●
7.40	0/-0.022	7.4	34	78	1	P980SUTA0740	●
7.50	0/-0.022	7.5	34	78	1	P980SUTA0750	●
7.60	0/-0.022	7.6	37	81	1	P980SUTA0760	●
7.70	0/-0.022	7.7	37	81	1	P980SUTA0770	●
7.80	0/-0.022	7.8	37	81	1	P980SUTA0780	●
7.90	0/-0.022	7.9	37	81	1	P980SUTA0790	●
8.00	0/-0.022	8	37	81	1	P980SUTA0800	●
8.10	0/-0.022	8.1	37	87	1	P980SUTA0810	●
8.20	0/-0.022	8.2	37	87	1	P980SUTA0820	●
8.30	0/-0.022	8.3	37	87	1	P980SUTA0830	●
8.40	0/-0.022	8.4	37	87	1	P980SUTA0840	●
8.50	0/-0.022	8.5	37	87	1	P980SUTA0850	●
8.60	0/-0.022	8.6	40	90	1	P980SUTA0860	●
8.70	0/-0.022	8.7	40	90	1	P980SUTA0870	●
8.80	0/-0.022	8.8	40	90	1	P980SUTA0880	●
8.90	0/-0.022	8.9	40	90	1	P980SUTA0890	●
9.00	0/-0.022	9	40	90	1	P980SUTA0900	●
9.10	0/-0.022	9.1	40	90	1	P980SUTA0910	●
9.20	0/-0.022	9.2	40	90	1	P980SUTA0920	●
9.30	0/-0.022	9.3	40	90	1	P980SUTA0930	●
9.40	0/-0.022	9.4	40	90	1	P980SUTA0940	●
9.50	0/-0.022	9.5	40	90	1	P980SUTA0950	●
9.60	0/-0.022	9.6	43	93	1	P980SUTA0960	●
9.70	0/-0.022	9.7	43	93	1	P980SUTA0970	●

INFO
TYPHOON TA-HTA-4HTA
TYPHOON PU-HPU
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C-SD-TA
LFTA
SUTA
HSS-HSS/CO DRILLS
G2
MDTA
HF VH/UP
MEF
ALU
MEX
UH
HSS/CO-HSSP END MILLS
CARBIDE BURRS

● stock standard ○ non-standard stock ▽ stock exhaustion

CUTTING PARAMETERS

980SUTA

Material Group ISO 513		P1 P2			M1 M2			M3					
Hardness/Rm		500-700 N/mm ²			< 750 N/mm ²			550-850 N/mm ²					
Vc (m/min)		35-45			18-22			12-16					
D (mm)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)				
2	6370	0.060	380	3180	0.060	190	2230	0.042	90				
3	4250	0.080	340	2120	0.080	170	1490	0.056	80				
4	3180	0.100	320	1590	0.100	160	1110	0.070	80				
5	2550	0.120	310	1270	0.120	150	890	0.084	70				
6	2120	0.140	300	1060	0.140	150	740	0.098	70				
7	1820	0.160	290	910	0.160	150	640	0.112	70				
8	1590	0.180	290	800	0.180	140	560	0.126	70				
9	1420	0.200	280	710	0.200	140	500	0.140	70				
10	1270	0.230	290	640	0.230	150	450	0.161	70				
11	1160	0.260	300	580	0.260	150	410	0.169	70				
12	1060	0.300	320	530	0.300	160	370	0.195	70				
13	980	0.340	330	490	0.340	170	340	0.221	80				
14	910	0.360	330	450	0.360	160	320	0.234	70				
15	850	0.380	320	420	0.380	160	300	0.247	70				
16	800	0.400	320	400	0.400	160	280	0.260	70				
17	750	0.425	320	370	0.425	160	260	0.276	70				
18	710	0.450	320	350	0.450	160	250	0.293	70				
19	670	0.460	310	340	0.460	160	230	0.299	70				
20	640	0.470	300	320	0.470	150	220	0.306	70				

Material Group ISO 513		N1 N2 N4			N3			S1 S2			S4		
Hardness/Rm								< 30 HRC					
Vc (m/min)		60-80			30-40			8-12			12-16		
D (mm)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)	
2	11150	0.066	740	5570	0.051	280	1590	0.024	38	2230	0.042	90	
3	7430	0.088	650	3720	0.068	250	1060	0.032	34	1490	0.056	80	
4	5570	0.120	670	2790	0.085	240	800	0.040	32	1110	0.070	80	
5	4460	0.144	640	2230	0.102	230	640	0.060	38	890	0.084	70	
6	3720	0.182	680	1860	0.119	220	530	0.070	37	740	0.098	70	
7	3180	0.208	660	1590	0.136	220	450	0.096	43	640	0.128	80	
8	2790	0.252	700	1390	0.153	210	400	0.108	43	560	0.144	80	
9	2480	0.280	690	1240	0.170	210	350	0.120	42	500	0.160	80	
10	2230	0.322	720	1110	0.196	220	320	0.138	44	450	0.184	80	
11	2030	0.364	740	1010	0.221	220	290	0.156	45	410	0.208	90	
12	1860	0.420	780	930	0.255	240	270	0.180	49	370	0.240	90	
13	1710	0.476	810	860	0.289	250	240	0.204	49	340	0.272	90	
14	1590	0.504	800	800	0.306	240	230	0.216	50	320	0.288	90	
15	1490	0.532	790	740	0.323	240	210	0.228	48	300	0.304	90	
16	1390	0.560	780	700	0.340	240	200	0.240	48	280	0.320	90	
17	1310	0.595	780	660	0.361	240	190	0.255	48	260	0.340	90	
18	1240	0.630	780	620	0.383	240	180	0.270	49	250	0.360	90	
19	1170	0.644	750	590	0.391	230	170	0.276	47	230	0.368	80	
20	1110	0.658	730	560	0.400	220	160	0.282	45	220	0.376	80	

- INFO
- TYPHOON TA-HTA-4HTA
- TYPHOON PU-HPU
- TYPHOON SUH
- TYPHOON ALH
- TYPHOON HRC
- TYPHOON SUH MINI
- TYPHOON HL
- C-SD-TA
- LFTA
- SUTA
- HSS-HSS/CO DRILLS
- G2
- MDTA
- HF VH/UP
- MEF
- ALU
- MEX
- UH
- HSS/CO-HSSP END MILLS
- CARBIDE BURRS

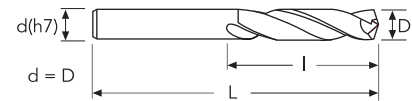
990SUTA

self centering, stainless steel, short



P	M	K	N	S	H
★	★	★	★	☆	☆

★ 1st choice ☆ suitable



D(h8)	D Tol.	d(h7)	l	L	PACKAGING	EDP No.	Stock
2.00	0/-0.014	2	24	56	1	P990SUTA0200	●
2.10	0/-0.014	2.1	24	56	1	P990SUTA0210	●
2.20	0/-0.014	2.2	27	59	1	P990SUTA0220	●
2.30	0/-0.014	2.3	27	59	1	P990SUTA0230	●
2.40	0/-0.014	2.4	30	62	1	P990SUTA0240	●
2.50	0/-0.014	2.5	30	62	1	P990SUTA0250	●
2.60	0/-0.014	2.6	30	62	1	P990SUTA0260	●
2.70	0/-0.014	2.7	33	65	1	P990SUTA0270	●
2.80	0/-0.014	2.8	33	65	1	P990SUTA0280	●
2.90	0/-0.014	2.9	33	65	1	P990SUTA0290	●
3.00	0/-0.014	3	33	65	1	P990SUTA0300	●
3.10	0/-0.018	3.1	36	68	1	P990SUTA0310	●
3.20	0/-0.018	3.2	36	68	1	P990SUTA0320	●
3.30	0/-0.018	3.3	36	68	1	P990SUTA0330	●
3.40	0/-0.018	3.4	39	71	1	P990SUTA0340	●
3.50	0/-0.018	3.5	39	71	1	P990SUTA0350	●
3.60	0/-0.018	3.6	39	71	1	P990SUTA0360	●
3.70	0/-0.018	3.7	39	71	1	P990SUTA0370	●
3.80	0/-0.018	3.8	43	75	1	P990SUTA0380	●
3.90	0/-0.018	3.9	43	75	1	P990SUTA0390	●
4.00	0/-0.018	4	43	75	1	P990SUTA0400	●
4.10	0/-0.018	4.1	43	87	1	P990SUTA0410	●
4.20	0/-0.018	4.2	43	87	1	P990SUTA0420	●
4.30	0/-0.018	4.3	47	91	1	P990SUTA0430	●
4.40	0/-0.018	4.4	47	91	1	P990SUTA0440	●
4.50	0/-0.018	4.5	47	91	1	P990SUTA0450	●
4.60	0/-0.018	4.6	47	91	1	P990SUTA0460	●
4.70	0/-0.018	4.7	47	91	1	P990SUTA0470	●
4.80	0/-0.018	4.8	52	96	1	P990SUTA0480	●
4.90	0/-0.018	4.9	52	96	1	P990SUTA0490	●
5.00	0/-0.018	5	52	96	1	P990SUTA0500	●
5.10	0/-0.018	5.1	52	96	1	P990SUTA0510	●
5.20	0/-0.018	5.2	52	96	1	P990SUTA0520	●
5.30	0/-0.018	5.3	52	96	1	P990SUTA0530	●
5.40	0/-0.018	5.4	57	101	1	P990SUTA0540	●
5.50	0/-0.018	5.5	57	101	1	P990SUTA0550	●
5.60	0/-0.018	5.6	57	101	1	P990SUTA0560	●
5.70	0/-0.018	5.7	57	101	1	P990SUTA0570	●
5.80	0/-0.018	5.8	57	101	1	P990SUTA0580	●

● stock standard ○ non-standard stock ▽ stock exhaustion

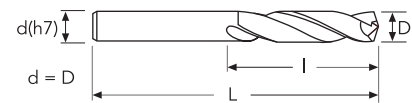
990SUTA

self centering, stainless steel, short



P	M	K	N	S	H
★	★		★	☆	

★ 1st choice ☆ suitable



D(h8)	D Tol.	d(h7)	l	L	PACKAGING	EDP No.	Stock
5.90	0/-0.018	5.9	57	101	1	P990SUTA0590	●
6.00	0/-0.018	6	57	101	1	P990SUTA0600	●
6.10	0/-0.022	6.1	63	107	1	P990SUTA0610	●
6.20	0/-0.022	6.2	63	107	1	P990SUTA0620	●
6.30	0/-0.022	6.3	63	107	1	P990SUTA0630	●
6.40	0/-0.022	6.4	63	107	1	P990SUTA0640	●
6.50	0/-0.022	6.5	63	107	1	P990SUTA0650	●
6.60	0/-0.022	6.6	63	107	1	P990SUTA0660	●
6.70	0/-0.022	6.7	63	107	1	P990SUTA0670	●
6.80	0/-0.022	6.8	69	113	1	P990SUTA0680	●
6.90	0/-0.022	6.9	69	113	1	P990SUTA0690	●
7.00	0/-0.022	7	69	113	1	P990SUTA0700	●
7.10	0/-0.022	7.1	69	113	1	P990SUTA0710	●
7.20	0/-0.022	7.2	69	113	1	P990SUTA0720	●
7.30	0/-0.022	7.3	69	113	1	P990SUTA0730	●
7.40	0/-0.022	7.4	69	113	1	P990SUTA0740	●
7.50	0/-0.022	7.5	69	113	1	P990SUTA0750	●
7.60	0/-0.022	7.6	75	119	1	P990SUTA0760	●
7.70	0/-0.022	7.7	75	119	1	P990SUTA0770	●
7.80	0/-0.022	7.8	75	119	1	P990SUTA0780	●
7.90	0/-0.022	7.9	75	119	1	P990SUTA0790	●
8.00	0/-0.022	8	75	119	1	P990SUTA0800	●
8.10	0/-0.022	8.1	75	125	1	P990SUTA0810	●
8.20	0/-0.022	8.2	75	125	1	P990SUTA0820	●
8.30	0/-0.022	8.3	75	125	1	P990SUTA0830	●
8.40	0/-0.022	8.4	75	125	1	P990SUTA0840	●
8.50	0/-0.022	8.5	75	125	1	P990SUTA0850	●
8.60	0/-0.022	8.6	81	131	1	P990SUTA0860	●
8.70	0/-0.022	8.7	81	131	1	P990SUTA0870	●
8.80	0/-0.022	8.8	81	131	1	P990SUTA0880	●
8.90	0/-0.022	8.9	81	131	1	P990SUTA0890	●
9.00	0/-0.022	9	81	131	1	P990SUTA0900	●
9.10	0/-0.022	9.1	81	131	1	P990SUTA0910	●
9.20	0/-0.022	9.2	81	131	1	P990SUTA0920	●
9.30	0/-0.022	9.3	81	131	1	P990SUTA0930	●
9.40	0/-0.022	9.4	81	131	1	P990SUTA0940	●
9.50	0/-0.022	9.5	81	131	1	P990SUTA0950	●
9.60	0/-0.022	9.6	87	137	1	P990SUTA0960	●
9.70	0/-0.022	9.7	87	137	1	P990SUTA0970	●

INFO
TYPHOON TA-HTA-4HTA
TYPHOON PU-HPU
TYPHOON SUH
TYPHOON ALH
TYPHOON HRC
TYPHOON SUH MINI
TYPHOON HL
C-SD-TA
LFTA
SUTA
HSS-HSS/CO DRILLS
G2
MDTA
HF VH/UP
MEF
ALU
MEX
UH
HSS/CO-HSSP END MILLS
CARBIDE BURRS

● stock standard ○ non-standard stock ▽ stock exhaustion

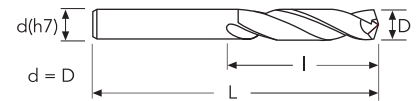
990SUTA

self centering, stainless steel, short



P	M	K	N	S	H
★	★		★	☆	

★ 1st choice ☆ suitable



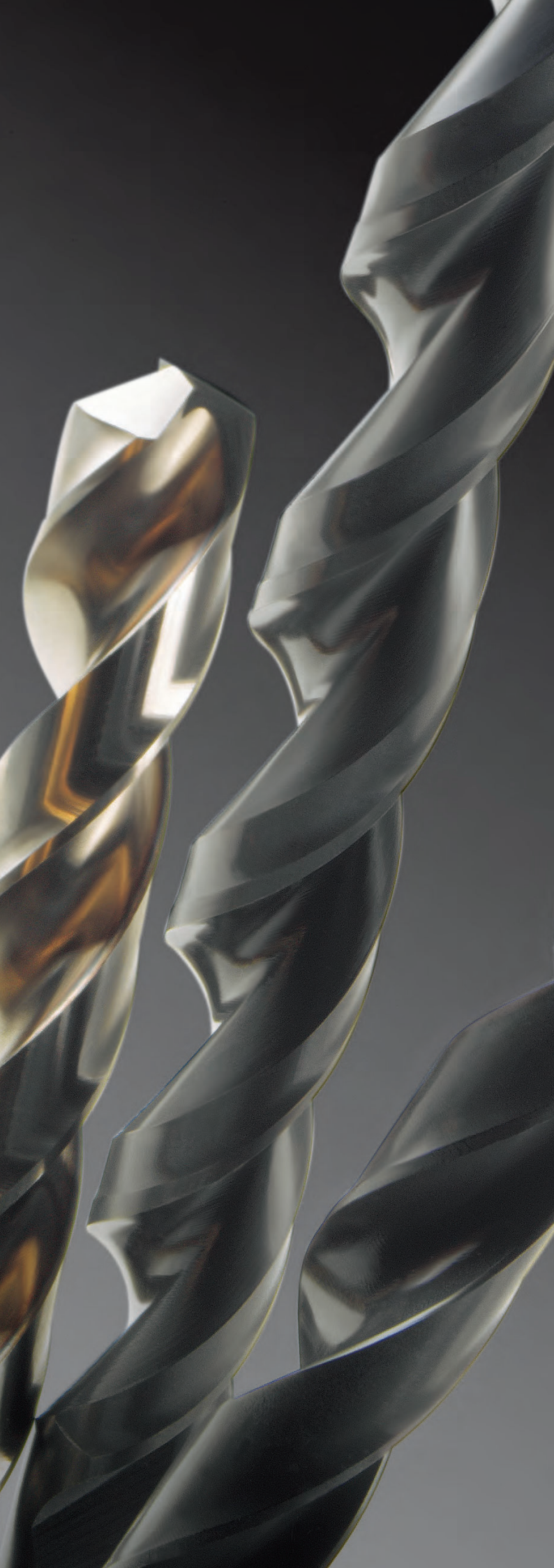
D(h8)	D Tol.	d(h7)	l	L	PACKAGING	EDP No.	Stock
9.80	0/-0.022	9.8	87	137	1	P990SUTA0980	●
9.90	0/-0.022	9.9	87	137	1	P990SUTA0990	●
10.00	0/-0.022	10	87	137	1	P990SUTA1000	●
10.10	0/-0.027	10.1	87	144	1	P990SUTA1010	●
10.20	0/-0.027	10.2	87	144	1	P990SUTA1020	●
10.30	0/-0.027	10.3	87	144	1	P990SUTA1030	●
10.40	0/-0.027	10.4	87	144	1	P990SUTA1040	●
10.50	0/-0.027	10.5	87	144	1	P990SUTA1050	●
10.60	0/-0.027	10.6	87	144	1	P990SUTA1060	●
10.70	0/-0.027	10.7	94	151	1	P990SUTA1070	●
10.80	0/-0.027	10.8	94	151	1	P990SUTA1080	●
10.90	0/-0.027	10.9	94	151	1	P990SUTA1090	●
11.00	0/-0.027	11	94	151	1	P990SUTA1100	●
11.10	0/-0.027	11.1	94	151	1	P990SUTA1110	●
11.20	0/-0.027	11.2	94	151	1	P990SUTA1120	●
11.30	0/-0.027	11.3	94	151	1	P990SUTA1130	●
11.40	0/-0.027	11.4	94	151	1	P990SUTA1140	●
11.50	0/-0.027	11.5	94	151	1	P990SUTA1150	●
11.60	0/-0.027	11.6	94	151	1	P990SUTA1160	●
11.70	0/-0.027	11.7	94	151	1	P990SUTA1170	●
11.80	0/-0.027	11.8	94	151	1	P990SUTA1180	●
11.90	0/-0.027	11.9	101	158	1	P990SUTA1190	●
12.00	0/-0.027	12	101	158	1	P990SUTA1200	●
12.10	0/-0.027	12.1	101	158	1	P990SUTA1210	●
12.20	0/-0.027	12.2	101	158	1	P990SUTA1220	●
12.30	0/-0.027	12.3	101	158	1	P990SUTA1230	●
12.40	0/-0.027	12.4	101	158	1	P990SUTA1240	●
12.50	0/-0.027	12.5	101	158	1	P990SUTA1250	●
12.60	0/-0.027	12.6	101	158	1	P990SUTA1260	●
12.70	0/-0.027	12.7	101	158	1	P990SUTA1270	●
12.80	0/-0.027	12.8	101	158	1	P990SUTA1280	●
12.90	0/-0.027	12.9	101	158	1	P990SUTA1290	●
13.00	0/-0.027	13	101	158	1	P990SUTA1300	●
13.50	0/-0.027	13.5	106	166	1	P990SUTA1350	●
14.00	0/-0.027	14	106	166	1	P990SUTA1400	●
14.10	0/-0.027	14.1	109	169	1	P990SUTA1410	●
14.50	0/-0.027	14.5	109	169	1	P990SUTA1450	●
15.00	0/-0.027	15	109	169	1	P990SUTA1500	●
15.50	0/-0.027	15.5	112	172	1	P990SUTA1550	●

● stock standard ○ non-standard stock ▽ stock exhaustion

990SUTA

	Material Group ISO 513		P1 P2			M1 M2			M3					
	Hardness/Rm		500-700 N/mm ²			< 750 N/mm ²			550-850 N/mm ²					
	Vc (m/min)		35-45			18-22			12-16					
D (mm)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)					
2	6370	0.057	360	3180	0.057	180	2230	0.040	90					
3	4250	0.076	320	2120	0.076	160	1490	0.053	80					
4	3180	0.095	300	1590	0.095	150	1110	0.067	70					
5	2550	0.114	290	1270	0.114	140	890	0.080	70					
6	2120	0.133	280	1060	0.133	140	740	0.093	70					
7	1820	0.152	280	910	0.152	140	640	0.106	70					
8	1590	0.171	270	800	0.171	140	560	0.120	70					
9	1420	0.190	270	710	0.190	130	500	0.133	70					
10	1270	0.219	280	640	0.219	140	450	0.153	70					
11	1160	0.247	290	580	0.247	140	410	0.161	70					
12	1060	0.285	300	530	0.285	150	370	0.185	70					
13	980	0.323	320	490	0.323	160	340	0.203	70					
14	910	0.342	310	450	0.342	150	320	0.215	70					
15	850	0.361	310	420	0.361	150	300	0.217	60					
16	800	0.380	300	400	0.380	150	280	0.228	60					
17	750	0.404	300	370	0.404	150	260	0.242	60					
18	710	0.428	300	350	0.428	150	250	0.257	60					
19	670	0.437	290	340	0.437	150	230	0.262	60					
20	640	0.447	290	320	0.447	140	220	0.268	60					

	Material Group ISO 513		N1 N2			N3 N4			S1 S2			S4		
	Hardness/Rm								< 30 HRC					
	Vc (m/min)		60-80			30-40			8-12			12-16		
D (mm)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)		
2	11150	0.063	700	5570	0.048	270	1590	0.023	36	2230	0.040	90		
3	7430	0.084	620	3720	0.065	240	1060	0.030	32	1490	0.053	80		
4	5570	0.105	580	2790	0.081	230	800	0.038	30	1110	0.067	70		
5	4460	0.125	560	2230	0.097	220	640	0.057	36	890	0.080	70		
6	3720	0.146	540	1860	0.113	210	530	0.067	35	740	0.093	70		
7	3180	0.167	530	1590	0.129	210	450	0.091	41	640	0.122	80		
8	2790	0.188	520	1390	0.145	200	400	0.103	41	560	0.137	80		
9	2480	0.209	520	1240	0.162	200	350	0.114	40	500	0.152	80		
10	2230	0.240	540	1110	0.186	210	320	0.131	42	450	0.175	80		
11	2030	0.272	550	1010	0.210	210	290	0.148	43	410	0.198	80		
12	1860	0.314	580	930	0.242	230	270	0.171	46	370	0.228	80		
13	1710	0.355	610	860	0.275	240	240	0.194	47	340	0.258	90		
14	1590	0.376	600	800	0.291	230	230	0.205	47	320	0.274	90		
15	1490	0.397	590	740	0.307	230	210	0.217	45	300	0.289	90		
16	1390	0.418	580	700	0.323	230	200	0.228	46	280	0.304	90		
17	1310	0.444	580	660	0.343	230	190	0.242	46	260	0.323	80		
18	1240	0.470	580	620	0.363	230	180	0.257	46	250	0.342	90		
19	1170	0.481	560	590	0.371	220	170	0.262	45	230	0.350	80		
20	1110	0.491	550	560	0.380	210	160	0.268	43	220	0.357	80		



HSS-HSS/CO GENERAL PURPOSE

🇬🇧 A wide variety of geometries and standards, as well as a profitable mix of performance and price.

🇮🇹 Un'ampia varietà di geometrie e standard costruttivi, con una vantaggiosa combinazione di rendimento e convenienza, sono i punti di forza delle punte in HSS e HSS/Co Osawa.

🇩🇪 Die breite Palette an Geometrien und genormten Baumaßen bieten eine außergewöhnlich vorteilhafte Verbindung von Preis und Leistung: unschlagbare Stärken der Osawa Bohrer aus HSS und HSS/Co.

🇫🇷 La gamme de forets HSS et HSS/Co Osawa offre une grande variété de géométries standards permettant une combinaison très rentable de performance et de prix.

🇪🇸 Una amplia variedad de geometrías y estándares de fabricación, y una ventajosa combinación de rendimiento y conveniencia, son los puntos de fuerza de las brocas HSS y HSS/Co Osawa.

🇷🇺 Исходный материал наивысшего качества в комбинации с современным покрытием и специальной геометрией. Отличное сочетание производительности и стоимости.

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HSS/CO-HSSP END MILLS
CARBIDE BURRS

118N

N type for general purpose, extra-short

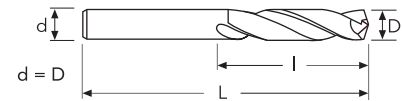


* < Ø2 mm = BR



P	M	K	N	S	H
★		☆	☆		

★ 1st choice ☆ suitable



D(h8)	D Tol.	d	l	L	PACKAGING	EDP No.	Stock
1.00	0/-0.014	1	6	26	10	P118NB0100	●
1.10	0/-0.014	1.1	7	28	10	P118NB0110	●
1.20	0/-0.014	1.2	8	30	10	P118NB0120	●
1.25	0/-0.014	1.25	8	30	10	P118NB0125	●
1.30	0/-0.014	1.3	8	30	10	P118NB0130	●
1.40	0/-0.014	1.4	9	32	10	P118NB0140	●
1.50	0/-0.014	1.5	9	32	10	P118NB0150	●
1.60	0/-0.014	1.6	10	34	10	P118NB0160	●
1.70	0/-0.014	1.7	10	34	10	P118NB0170	●
1.75	0/-0.014	1.75	11	36	10	P118NB0175	●
1.80	0/-0.014	1.8	11	36	10	P118NB0180	●
1.90	0/-0.014	1.9	11	36	10	P118NB0190	●
2.00	0/-0.014	2	12	38	10	P118N0200	●
2.10	0/-0.014	2.1	12	38	10	P118N0210	●
2.20	0/-0.014	2.2	13	40	10	P118N0220	●
2.25	0/-0.014	2.25	13	40	10	P118N0225	●
2.30	0/-0.014	2.3	13	40	10	P118N0230	●
2.40	0/-0.014	2.4	14	43	10	P118N0240	●
2.50	0/-0.014	2.5	14	43	10	P118N0250	●
2.60	0/-0.014	2.6	14	43	10	P118N0260	●
2.70	0/-0.014	2.7	16	46	10	P118N0270	●
2.75	0/-0.014	2.75	16	46	10	P118N0275	●
2.80	0/-0.014	2.8	16	46	10	P118N0280	●
2.90	0/-0.014	2.9	16	46	10	P118N0290	●
3.00	0/-0.014	3	16	46	10	P118N0300	●
3.10	0/-0.018	3.1	18	49	10	P118N0310	●
3.20	0/-0.018	3.2	18	49	10	P118N0320	●
3.25	0/-0.018	3.25	18	49	10	P118N0325	●
3.30	0/-0.018	3.3	18	49	10	P118N0330	●
3.40	0/-0.018	3.4	20	52	10	P118N0340	●
3.50	0/-0.018	3.5	20	52	10	P118N0350	●
3.60	0/-0.018	3.6	20	52	10	P118N0360	●
3.70	0/-0.018	3.7	20	52	10	P118N0370	●
3.75	0/-0.018	3.75	20	52	10	P118N0375	●
3.80	0/-0.018	3.8	22	55	10	P118N0380	●
3.90	0/-0.018	3.9	22	55	10	P118N0390	●
4.00	0/-0.018	4	22	55	10	P118N0400	●
4.10	0/-0.018	4.1	22	55	10	P118N0410	●
4.20	0/-0.018	4.2	22	55	10	P118N0420	●

● stock standard ○ non-standard stock ▽ stock exhaustion

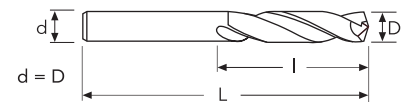
118N

N type for general purpose, extra-short



P	M	K	N	S	H
★		☆	☆		

★ 1st choice ☆ suitable



D(h8)	D Tol.	d	l	L	PACKAGING	EDP No.	Stock
4.25	0/-0.018	4.25	22	55	10	P118N0425	●
4.30	0/-0.018	4.3	24	58	10	P118N0430	●
4.40	0/-0.018	4.4	24	58	10	P118N0440	○
4.50	0/-0.018	4.5	24	58	10	P118N0450	●
4.60	0/-0.018	4.6	24	58	10	P118N0460	●
4.70	0/-0.018	4.7	24	58	10	P118N0470	●
4.75	0/-0.018	4.75	24	58	10	P118N0475	●
4.80	0/-0.018	4.8	26	62	10	P118N0480	●
4.90	0/-0.018	4.9	26	62	10	P118N0490	●
5.00	0/-0.018	5	26	62	10	P118N0500	●
5.10	0/-0.018	5.1	26	62	10	P118N0510	●
5.20	0/-0.018	5.2	26	62	10	P118N0520	●
5.25	0/-0.018	5.25	26	62	10	P118N0525	●
5.30	0/-0.018	5.3	26	62	10	P118N0530	●
5.40	0/-0.018	5.4	28	66	10	P118N0540	●
5.50	0/-0.018	5.5	28	66	10	P118N0550	●
5.60	0/-0.018	5.6	28	66	10	P118N0560	●
5.70	0/-0.018	5.7	28	66	10	P118N0570	●
5.75	0/-0.018	5.75	28	66	10	P118N0575	●
5.80	0/-0.018	5.8	28	66	10	P118N0580	●
5.90	0/-0.018	5.9	28	66	10	P118N0590	○
6.00	0/-0.018	6	28	66	10	P118N0600	●
6.10	0/-0.022	6.1	31	70	10	P118N0610	●
6.20	0/-0.022	6.2	31	70	10	P118N0620	●
6.25	0/-0.022	6.25	31	70	10	P118N0625	●
6.30	0/-0.022	6.3	31	70	10	P118N0630	●
6.40	0/-0.022	6.4	31	70	10	P118N0640	●
6.50	0/-0.022	6.5	31	70	10	P118N0650	●
6.60	0/-0.022	6.6	31	70	5	P118N0660	○
6.70	0/-0.022	6.7	31	70	5	P118N0670	●
6.75	0/-0.022	6.75	34	74	5	P118N0675	●
6.80	0/-0.022	6.8	34	74	5	P118N0680	●
6.90	0/-0.022	6.9	34	74	5	P118N0690	●
7.00	0/-0.022	7	34	74	5	P118N0700	●
7.10	0/-0.022	7.1	34	74	5	P118N0710	●
7.20	0/-0.022	7.2	34	74	5	P118N0720	●
7.25	0/-0.022	7.25	34	74	5	P118N0725	●
7.30	0/-0.022	7.3	34	74	5	P118N0730	●
7.40	0/-0.022	7.4	34	74	5	P118N0740	○

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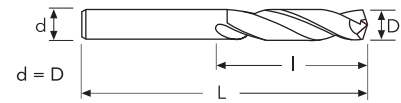
118N

N type for general purpose, extra-short



P	M	K	N	S	H
★		☆	☆		

★ 1st choice ☆ suitable



D(h8)	D Tol.	d	l	L	PACKAGING	EDP No.	Stock
7.50	0/-0.022	7.5	34	74	5	P118N0750	●
7.60	0/-0.022	7.6	37	79	5	P118N0760	●
7.70	0/-0.022	7.7	37	79	5	P118N0770	○
7.75	0/-0.022	7.75	37	79	5	P118N0775	●
7.80	0/-0.022	7.8	37	79	5	P118N0780	●
7.90	0/-0.022	7.9	37	79	5	P118N0790	○
8.00	0/-0.022	8	37	79	5	P118N0800	●
8.10	0/-0.022	8.1	37	79	5	P118N0810	●
8.20	0/-0.022	8.2	37	79	5	P118N0820	●
8.25	0/-0.022	8.25	37	79	5	P118N0825	●
8.30	0/-0.022	8.3	37	79	5	P118N0830	○
8.40	0/-0.022	8.4	37	79	5	P118N0840	○
8.50	0/-0.022	8.5	37	79	5	P118N0850	●
8.60	0/-0.022	8.6	40	84	5	P118N0860	●
8.70	0/-0.022	8.7	40	84	5	P118N0870	○
8.75	0/-0.022	8.75	40	84	5	P118N0875	●
8.80	0/-0.022	8.8	40	84	5	P118N0880	○
8.90	0/-0.022	8.9	40	84	5	P118N0890	●
9.00	0/-0.022	9	40	84	5	P118N0900	●
9.10	0/-0.022	9.1	40	84	5	P118N0910	●
9.20	0/-0.022	9.2	40	84	5	P118N0920	○
9.25	0/-0.022	9.25	40	84	5	P118N0925	○
9.30	0/-0.022	9.3	40	84	5	P118N0930	○
9.40	0/-0.022	9.4	40	84	5	P118N0940	○
9.50	0/-0.022	9.5	40	84	5	P118N0950	●
9.60	0/-0.022	9.6	43	89	5	P118N0960	○
9.70	0/-0.022	9.7	43	89	5	P118N0970	○
9.75	0/-0.022	9.75	43	89	5	P118N0975	○
9.80	0/-0.022	9.8	43	89	5	P118N0980	○
9.90	0/-0.022	9.9	43	89	5	P118N0990	○
10.00	0/-0.022	10	43	89	5	P118N1000	●
10.25	0/-0.027	10.25	43	89	5	P118N1025	●
10.50	0/-0.027	10.5	43	89	5	P118N1050	●
10.75	0/-0.027	10.75	47	95	5	P118N1075	●
11.00	0/-0.027	11	47	95	5	P118N1100	●
11.25	0/-0.027	11.25	47	95	5	P118N1125	●
11.50	0/-0.027	11.5	47	95	5	P118N1150	●
11.75	0/-0.027	11.75	47	95	5	P118N1175	●
12.00	0/-0.027	12	51	102	5	P118N1200	●

● stock standard ○ non-standard stock ▽ stock exhaustion

118N

Material Group ISO 513	P1 P2			P3 P4			K1 K2			N1 N5			N2 N3 N4		
	Hardness/Rm			500-700 N/mm ²			600-1000 N/mm ²			150-350 HB					
Vc (m/min)	25-35			20-30			25-35			50-70			40-60		
D (mm)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)
1	9550	0.017	160	7960	0.014	120	9550	0.019	180	19110	0.024	450	15920	0.017	270
1.5	6370	0.035	220	5310	0.030	160	6370	0.039	250	12740	0.049	620	10620	0.035	370
2	4780	0.050	240	3980	0.043	170	4780	0.055	260	9550	0.070	670	7960	0.050	400
2.5	3820	0.070	270	3180	0.060	190	3820	0.077	290	7640	0.098	750	6370	0.070	450
3	3180	0.080	250	2650	0.068	180	3180	0.088	280	6370	0.112	710	5310	0.080	420
3.5	2730	0.090	250	2270	0.077	170	2730	0.099	270	5460	0.126	690	4550	0.090	410
4	2390	0.100	240	1990	0.085	170	2390	0.110	260	4780	0.140	670	3980	0.100	400
5	1910	0.110	210	1590	0.094	150	1910	0.121	230	3820	0.154	590	3180	0.110	350
6	1590	0.120	190	1330	0.102	140	1590	0.132	210	3180	0.168	530	2650	0.120	320
7	1360	0.130	180	1140	0.111	130	1360	0.143	190	2730	0.182	500	2270	0.130	300
8	1190	0.140	170	1000	0.119	120	1190	0.154	180	2390	0.196	470	1990	0.140	280
9	1060	0.160	170	880	0.136	120	1060	0.176	190	2120	0.224	470	1770	0.160	280
10	960	0.170	160	800	0.145	120	960	0.187	180	1910	0.238	450	1590	0.170	270
11	870	0.180	160	720	0.153	110	870	0.198	170	1740	0.252	440	1450	0.180	260
12	800	0.190	150	660	0.162	110	800	0.209	170	1590	0.266	420	1330	0.190	250
13	730	0.200	150	610	0.170	100	730	0.220	160	1470	0.280	410	1220	0.200	240
14	680	0.210	140	570	0.179	100	680	0.231	160	1360	0.294	400	1140	0.210	240
15	640	0.220	140	530	0.187	100	640	0.242	150	1270	0.308	390	1060	0.220	230
16	600	0.240	140	500	0.204	100	600	0.264	160	1190	0.336	400	1000	0.240	240

- INFO
- TYPHOON TA-HTA-4HTA
- TYPHOON PU-HPU
- TYPHOON SUH
- TYPHOON ALH
- TYPHOON HRC
- TYPHOON SUH MINI
- TYPHOON HL
- C-SD-TA
- LFTA
- SUTA
- HSS-HSS/CO DRILLS
- G2
- MDTA
- HF VH/UP
- MEF
- ALU
- MEX
- UH
- HSS/CO-HSSP END MILLS
- CARBIDE BURRS

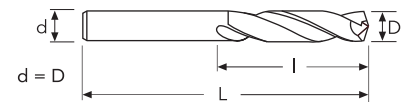
218NVA

NVA type for tough materials, extra-short



P	M	K	N	S	H
★	★	☆	☆	☆	☆

★ 1st choice ☆ suitable



D(h8)	D Tol.	d	l	L	PACKAGING	EDP No.	Stock
1.00	0/-0.014	1	6	26	10	P218NVA0100	●
1.10	0/-0.014	1.1	7	28	10	P218NVA0110	○
1.20	0/-0.014	1.2	8	30	10	P218NVA0120	●
1.30	0/-0.014	1.3	8	30	10	P218NVA0130	●
1.40	0/-0.014	1.4	9	32	10	P218NVA0140	○
1.50	0/-0.014	1.5	9	32	10	P218NVA0150	●
1.60	0/-0.014	1.6	10	34	10	P218NVA0160	●
1.70	0/-0.014	1.7	10	34	10	P218NVA0170	○
1.80	0/-0.014	1.8	11	36	10	P218NVA0180	○
1.90	0/-0.014	1.9	11	36	10	P218NVA0190	●
2.00	0/-0.014	2	12	38	10	P218NVA0200	●
2.10	0/-0.014	2.1	12	38	10	P218NVA0210	●
2.20	0/-0.014	2.2	13	40	10	P218NVA0220	○
2.30	0/-0.014	2.3	13	40	10	P218NVA0230	●
2.40	0/-0.014	2.4	14	43	10	P218NVA0240	●
2.50	0/-0.014	2.5	14	43	10	P218NVA0250	●
2.60	0/-0.014	2.6	14	43	10	P218NVA0260	●
2.70	0/-0.014	2.7	16	46	10	P218NVA0270	○
2.80	0/-0.014	2.8	16	46	10	P218NVA0280	●
2.90	0/-0.014	2.9	16	46	10	P218NVA0290	○
3.00	0/-0.014	3	16	46	10	P218NVA0300	●
3.10	0/-0.018	3.1	18	49	10	P218NVA0310	○
3.20	0/-0.018	3.2	18	49	10	P218NVA0320	●
3.30	0/-0.018	3.3	18	49	10	P218NVA0330	●
3.40	0/-0.018	3.4	20	52	10	P218NVA0340	●
3.50	0/-0.018	3.5	20	52	10	P218NVA0350	●
3.60	0/-0.018	3.6	20	52	10	P218NVA0360	○
3.70	0/-0.018	3.7	20	52	10	P218NVA0370	●
3.80	0/-0.018	3.8	22	55	10	P218NVA0380	●
3.90	0/-0.018	3.9	22	55	10	P218NVA0390	○
4.00	0/-0.018	4	22	55	10	P218NVA0400	●
4.10	0/-0.018	4.1	22	55	10	P218NVA0410	●
4.20	0/-0.018	4.2	22	55	10	P218NVA0420	●
4.30	0/-0.018	4.3	24	58	10	P218NVA0430	●
4.40	0/-0.018	4.4	24	58	10	P218NVA0440	○
4.50	0/-0.018	4.5	24	58	10	P218NVA0450	●
4.60	0/-0.018	4.6	24	58	10	P218NVA0460	●
4.70	0/-0.018	4.7	24	58	10	P218NVA0470	○
4.80	0/-0.018	4.8	26	62	10	P218NVA0480	●

- INFO
- TYPHOON TA-HTA-4HTA
- TYPHOON PU-HPU
- TYPHOON SUH
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- TYPHOON HL
- C-SD-TA
- LFTA
- SUTA
- HSS-HSS/CO DRILLS
- G2
- MDTA
- HF VH/UP
- MEF
- ALU
- MEX
- UH
- HSS/CO-HSSP END MILLS
- CARBIDE BURRS

● stock standard ○ non-standard stock ▽ stock exhaustion

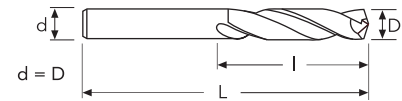
218NVA

NVA type for tough materials, extra-short



P	M	K	N	S	H
★	★	☆	☆	☆	

★ 1st choice ☆ suitable



D(h8)	D Tol.	d	l	L	PACKAGING	EDP No.	Stock
4.90	0/-0.018	4.9	26	62	10	P218NVA0490	○
5.00	0/-0.018	5	26	62	10	P218NVA0500	●
5.10	0/-0.018	5.1	26	62	10	P218NVA0510	●
5.20	0/-0.018	5.2	26	62	10	P218NVA0520	●
5.30	0/-0.018	5.3	26	62	10	P218NVA0530	○
5.40	0/-0.018	5.4	28	66	10	P218NVA0540	○
5.50	0/-0.018	5.5	28	66	10	P218NVA0550	●
5.60	0/-0.018	5.6	28	66	10	P218NVA0560	●
5.70	0/-0.018	5.7	28	66	10	P218NVA0570	○
5.80	0/-0.018	5.8	28	66	10	P218NVA0580	○
5.90	0/-0.018	5.9	28	66	10	P218NVA0590	○
6.00	0/-0.018	6	28	66	10	P218NVA0600	●
6.10	0/-0.022	6.1	31	70	10	P218NVA0610	○
6.20	0/-0.022	6.2	31	70	10	P218NVA0620	○
6.30	0/-0.022	6.3	31	70	10	P218NVA0630	○
6.40	0/-0.022	6.4	31	70	10	P218NVA0640	○
6.50	0/-0.022	6.5	31	70	10	P218NVA0650	●
6.60	0/-0.022	6.6	31	70	5	P218NVA0660	○
6.70	0/-0.022	6.7	31	70	5	P218NVA0670	●
6.80	0/-0.022	6.8	34	74	5	P218NVA0680	●
6.90	0/-0.022	6.9	34	74	5	P218NVA0690	●
7.00	0/-0.022	7	34	74	5	P218NVA0700	●
7.10	0/-0.022	7.1	34	74	5	P218NVA0710	○
7.20	0/-0.022	7.2	34	74	5	P218NVA0720	○
7.30	0/-0.022	7.3	34	74	5	P218NVA0730	○
7.40	0/-0.022	7.4	34	74	5	P218NVA0740	○
7.50	0/-0.022	7.5	34	74	5	P218NVA0750	●
7.60	0/-0.022	7.6	37	79	5	P218NVA0760	○
7.70	0/-0.022	7.7	37	79	5	P218NVA0770	○
7.80	0/-0.022	7.8	37	79	5	P218NVA0780	●
7.90	0/-0.022	7.9	37	79	5	P218NVA0790	○
8.00	0/-0.022	8	37	79	5	P218NVA0800	●
8.10	0/-0.022	8.1	37	79	5	P218NVA0810	○
8.20	0/-0.022	8.2	37	79	5	P218NVA0820	●
8.30	0/-0.022	8.3	37	79	5	P218NVA0830	●
8.40	0/-0.022	8.4	37	79	5	P218NVA0840	○
8.50	0/-0.022	8.5	37	79	5	P218NVA0850	●
8.60	0/-0.022	8.6	40	84	5	P218NVA0860	●
8.70	0/-0.022	8.7	40	84	5	P218NVA0870	●

● stock standard ○ non-standard stock ▽ stock exhaustion

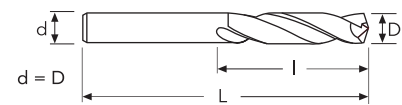
218NVA

NVA type for tough materials, extra-short



P	M	K	N	S	H
★	★	☆	☆	☆	

★ 1st choice ☆ suitable



D(h8)	D Tol.	d	l	L	PACKAGING	EDP No.	Stock
8.80	0/-0.022	8.8	40	84	5	P218NVA0880	○
8.90	0/-0.022	8.9	40	84	5	P218NVA0890	○
9.00	0/-0.022	9	40	84	5	P218NVA0900	●
9.10	0/-0.022	9.1	40	84	5	P218NVA0910	○
9.20	0/-0.022	9.2	40	84	5	P218NVA0920	●
9.30	0/-0.022	9.3	40	84	5	P218NVA0930	○
9.40	0/-0.022	9.4	40	84	5	P218NVA0940	●
9.50	0/-0.022	9.5	40	84	5	P218NVA0950	●
9.60	0/-0.022	9.6	43	89	5	P218NVA0960	○
9.70	0/-0.022	9.7	43	89	5	P218NVA0970	○
9.80	0/-0.022	9.8	43	89	5	P218NVA0980	●
9.90	0/-0.022	9.9	43	89	5	P218NVA0990	○
10.00	0/-0.022	10	43	89	5	P218NVA1000	●
10.20	0/-0.027	10.2	43	89	5	P218NVA1020	●
10.25	0/-0.027	10.25	43	89	5	P218NVA1025	●
10.50	0/-0.027	10.5	43	89	5	P218NVA1050	●
11.00	0/-0.027	11	47	95	5	P218NVA1100	●
11.50	0/-0.027	11.5	47	95	5	P218NVA1150	●
12.00	0/-0.027	12	51	102	5	P218NVA1200	●
12.50	0/-0.027	12.5	51	102	5	P218NVA1250	●
13.00	0/-0.027	13	51	102	5	P218NVA1300	●
13.50	0/-0.027	13.5	54	107	1	P218NVA1350	●
14.00	0/-0.027	14	54	107	1	P218NVA1400	●
14.50	0/-0.027	14.5	56	111	1	P218NVA1450	●
15.00	0/-0.027	15	56	111	1	P218NVA1500	●
15.50	0/-0.027	15.5	58	115	1	P218NVA1550	●
16.00	0/-0.027	16	58	115	1	P218NVA1600	●
16.50	0/-0.027	16.5	60	119	1	P218NVA1650	●
17.00	0/-0.027	17	60	119	1	P218NVA1700	●
17.50	0/-0.027	17.5	62	123	1	P218NVA1750	●
18.00	0/-0.027	18	62	123	1	P218NVA1800	●
18.50	0/-0.033	18.5	64	127	1	P218NVA1850	●
19.00	0/-0.033	19	64	127	1	P218NVA1900	●
19.50	0/-0.033	19.5	66	131	1	P218NVA1950	●
20.00	0/-0.033	20	66	131	1	P218NVA2000	●

INFO
TYPHOON TA-HTA-4HTA
TYPHOON PU-HPU
TYPHOON SUH
TYPHOON ALH
TYPHOON HRC
TYPHOON SUH MINI
TYPHOON HL
C-SD-TA
LFTA
SUTA
HSS-HSS/CO DRILLS
G2
MDTA
HF VH/UP
MEF
ALU
MEX
UH
HSS/CO-HSSP END MILLS
CARBIDE BURRS

● stock standard ○ non-standard stock ▽ stock exhaustion

CUTTING PARAMETERS

218NVA

Material Group ISO 513	P1 P2			P3 P4			M1 M2			M3 M4			K1 K2				
	Hardness/Rm			500-700 N/mm ²			600-1000 N/mm ²			< 750 N/mm ²			550-850 N/mm ²			150-350 HB	
Vc (m/min)	25-35			20-30			12-18			8-12			25-35				
D (mm)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)		
1	9550	0.017	160	7960	0.014	120	4780	0.012	57	3180	0.009	27	9550	0.019	180		
1.5	6370	0.035	220	5310	0.030	160	3180	0.025	80	2120	0.018	37	6370	0.039	250		
2	4780	0.050	240	3980	0.043	170	2390	0.035	80	1590	0.025	40	4780	0.055	260		
2.5	3820	0.070	270	3180	0.060	190	1910	0.049	90	1270	0.035	44	3820	0.077	290		
3	3180	0.080	250	2650	0.068	180	1590	0.056	90	1060	0.040	42	3180	0.088	280		
3.5	2730	0.090	250	2270	0.077	170	1360	0.063	90	910	0.045	41	2730	0.099	270		
4	2390	0.100	240	1990	0.085	170	1190	0.070	80	800	0.050	40	2390	0.110	260		
5	1910	0.110	210	1590	0.094	150	960	0.077	70	640	0.055	35	1910	0.121	230		
6	1590	0.120	190	1330	0.102	140	800	0.084	70	530	0.060	32	1590	0.132	210		
7	1360	0.130	180	1140	0.111	130	680	0.091	60	450	0.065	29	1360	0.143	190		
8	1190	0.140	170	1000	0.119	120	600	0.098	60	400	0.070	28	1190	0.154	180		
9	1060	0.160	170	880	0.136	120	530	0.112	60	350	0.080	28	1060	0.176	190		
10	960	0.170	160	800	0.145	120	480	0.119	60	320	0.085	27	960	0.187	180		
11	870	0.180	160	720	0.153	110	430	0.126	54	290	0.090	26	870	0.198	170		
12	800	0.190	150	660	0.162	110	400	0.133	53	270	0.095	26	800	0.209	170		
13	730	0.200	150	610	0.170	100	370	0.140	52	240	0.100	24	730	0.220	160		
14	680	0.210	140	570	0.179	100	340	0.147	50	230	0.105	24	680	0.231	160		
15	640	0.220	140	530	0.187	100	320	0.154	49	210	0.110	23	640	0.242	150		
16	600	0.240	140	500	0.204	100	300	0.168	50	200	0.120	24	600	0.264	160		
17	560	0.260	150	470	0.221	100	280	0.182	51	190	0.130	25	560	0.286	160		
18	530	0.280	150	440	0.238	100	270	0.196	53	180	0.140	25	530	0.308	160		
19	500	0.300	150	420	0.255	110	250	0.210	53	170	0.150	26	500	0.330	170		
20	480	0.320	150	400	0.272	110	240	0.224	54	160	0.160	26	480	0.352	170		

Material Group ISO 513	K3 K4			N1 N5			N2 N3 N4			S1 S2 S4		
	Hardness/Rm			< 350 HB			< 350 HB			< 35 HRC		
Vc (m/min)	20-30			50-70			40-60			8-12		
D (mm)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)
1	7960	0.013	100	19110	0.024	450	15920	0.017	270	3180	0.007	22
1.5	5310	0.026	140	12740	0.049	620	10620	0.035	370	2120	0.014	30
2	3980	0.038	150	9550	0.070	670	7960	0.050	400	1590	0.020	32
2.5	3180	0.053	170	7640	0.098	750	6370	0.070	450	1270	0.028	36
3	2650	0.060	160	6370	0.112	710	5310	0.080	420	1060	0.032	34
3.5	2270	0.068	150	5460	0.126	690	4550	0.090	410	910	0.036	33
4	1990	0.075	150	4780	0.140	670	3980	0.100	400	800	0.040	32
5	1590	0.083	130	3820	0.154	590	3180	0.110	350	640	0.044	28
6	1330	0.090	120	3180	0.168	530	2650	0.120	320	530	0.048	25
7	1140	0.098	110	2730	0.182	500	2270	0.130	300	450	0.052	23
8	1000	0.105	110	2390	0.196	470	1990	0.140	280	400	0.056	22
9	880	0.120	110	2120	0.224	470	1770	0.160	280	350	0.064	22
10	800	0.128	100	1910	0.238	450	1590	0.170	270	320	0.068	22
11	720	0.135	100	1740	0.252	440	1450	0.180	260	290	0.072	21
12	660	0.143	90	1590	0.266	420	1330	0.190	250	270	0.076	21
13	610	0.150	90	1470	0.280	410	1220	0.200	240	240	0.080	19
14	570	0.158	90	1360	0.294	400	1140	0.210	240	230	0.084	19
15	530	0.165	90	1270	0.308	390	1060	0.220	230	210	0.088	18
16	500	0.180	90	1190	0.336	400	1000	0.240	240	200	0.096	19
17	470	0.195	90	1120	0.364	410	940	0.260	240	190	0.104	20
18	440	0.210	90	1060	0.392	420	880	0.280	250	180	0.112	20
19	420	0.225	90	1010	0.420	420	840	0.300	250	170	0.120	20
20	400	0.240	100	960	0.448	430	800	0.320	260	160	0.128	20

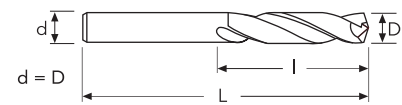
1386STI

STI type for general purpose, split point, TiN pointed, short



P	M	K	N	S	H
★	☆	★	☆	☆	

★ 1st choice ☆ suitable



D(h8)	D Tol.	d	l	L	PACKAGING	EDP No.	Stock
1.00	0/-0.014	1	12	34	10	P1385NTI0100	●
1.10	0/-0.014	1.1	14	36	10	P1385NTI0110	●
1.20	0/-0.014	1.2	16	38	10	P1385NTI0120	●
1.30	0/-0.014	1.3	16	38	10	P1385NTI0130	●
1.40	0/-0.014	1.4	18	40	10	P1385NTI0140	●
1.50	0/-0.014	1.5	18	40	10	P1385NTI0150	●
1.60	0/-0.014	1.6	20	43	10	P1386STI0160	●
1.70	0/-0.014	1.7	20	43	10	P1386STI0170	●
1.80	0/-0.014	1.8	22	46	10	P1386STI0180	●
1.90	0/-0.014	1.9	22	46	10	P1386STI0190	●
2.00	0/-0.014	2	24	49	10	P1386STI0200	●
2.10	0/-0.014	2.1	24	49	10	P1386STI0210	●
2.20	0/-0.014	2.2	27	53	10	P1386STI0220	●
2.30	0/-0.014	2.3	27	53	10	P1386STI0230	●
2.40	0/-0.014	2.4	30	57	10	P1386STI0240	●
2.50	0/-0.014	2.5	30	57	10	P1386STI0250	●
2.60	0/-0.014	2.6	30	57	10	P1386STI0260	●
2.70	0/-0.014	2.7	33	61	10	P1386STI0270	●
2.80	0/-0.014	2.8	33	61	10	P1386STI0280	●
2.90	0/-0.014	2.9	33	61	10	P1386STI0290	●
3.00	0/-0.014	3	33	61	10	P1386STI0300	●
3.10	0/-0.018	3.1	36	65	10	P1386STI0310	●
3.20	0/-0.018	3.2	36	65	10	P1386STI0320	●
3.30	0/-0.018	3.3	36	65	10	P1386STI0330	●
3.40	0/-0.018	3.4	39	70	10	P1386STI0340	●
3.50	0/-0.018	3.5	39	70	10	P1386STI0350	●
3.60	0/-0.018	3.6	39	70	10	P1386STI0360	●
3.70	0/-0.018	3.7	39	70	10	P1386STI0370	●
3.80	0/-0.018	3.8	43	75	10	P1386STI0380	●
3.90	0/-0.018	3.9	43	75	10	P1386STI0390	●
4.00	0/-0.018	4	43	75	10	P1386STI0400	●
4.10	0/-0.018	4.1	43	75	10	P1386STI0410	●
4.20	0/-0.018	4.2	43	75	10	P1386STI0420	●
4.30	0/-0.018	4.3	47	80	10	P1386STI0430	●
4.40	0/-0.018	4.4	47	80	10	P1386STI0440	●
4.50	0/-0.018	4.5	47	80	10	P1386STI0450	●
4.60	0/-0.018	4.6	47	80	10	P1386STI0460	●
4.70	0/-0.018	4.7	47	80	10	P1386STI0470	●
4.80	0/-0.018	4.8	52	86	10	P1386STI0480	●

INFO
TYPHOON TA-HTA-4HTA
TYPHOON PU-HPU
TYPHOON SUH
TYPHOON ALH
TYPHOON HRC
TYPHOON SUH MINI
TYPHOON HL
C-SD-TA
LFTA
SUTA
HSS-HSS/CO DRILLS
G2
MDTA
HF VH/UP
MEF
ALU
MEX
UH
HSS/CO-HSSP END MILLS
CARBIDE BURRS

● stock standard ○ non-standard stock ▽ stock exhaustion

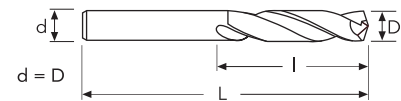
1386STI

STI type for general purpose, split point, TiN pointed, short



P	M	K	N	S	H
★	☆	★	☆	☆	

★ 1st choice ☆ suitable



D(h8)	D Tol.	d	l	L	PACKAGING	EDP No.	Stock
4.90	0/-0.018	4.9	52	86	10	P1386STI0490	●
5.00	0/-0.018	5	52	86	10	P1386STI0500	●
5.10	0/-0.018	5.1	52	86	10	P1386STI0510	●
5.20	0/-0.018	5.2	52	86	10	P1386STI0520	●
5.30	0/-0.018	5.3	52	86	10	P1386STI0530	●
5.40	0/-0.018	5.4	57	93	10	P1386STI0540	●
5.50	0/-0.018	5.5	57	93	10	P1386STI0550	●
5.60	0/-0.018	5.6	57	93	10	P1386STI0560	●
5.70	0/-0.018	5.7	57	93	10	P1386STI0570	●
5.80	0/-0.018	5.8	57	93	10	P1386STI0580	●
5.90	0/-0.018	5.9	57	93	10	P1386STI0590	●
6.00	0/-0.018	6	57	93	10	P1386STI0600	●
6.10	0/-0.022	6.1	63	101	10	P1386STI0610	●
6.20	0/-0.022	6.2	63	101	10	P1386STI0620	●
6.30	0/-0.022	6.3	63	101	10	P1386STI0630	●
6.40	0/-0.022	6.4	63	101	10	P1386STI0640	●
6.50	0/-0.022	6.5	63	101	10	P1386STI0650	●
6.60	0/-0.022	6.6	63	101	5	P1386STI0660	●
6.70	0/-0.022	6.7	63	101	5	P1386STI0670	●
6.80	0/-0.022	6.8	69	109	5	P1386STI0680	●
6.90	0/-0.022	6.9	69	109	5	P1386STI0690	●
7.00	0/-0.022	7	69	109	5	P1386STI0700	●
7.10	0/-0.022	7.1	69	109	5	P1386STI0710	●
7.20	0/-0.022	7.2	69	109	5	P1386STI0720	●
7.30	0/-0.022	7.3	69	109	5	P1386STI0730	●
7.40	0/-0.022	7.4	69	109	5	P1386STI0740	●
7.50	0/-0.022	7.5	69	109	5	P1386STI0750	●
7.60	0/-0.022	7.6	75	117	5	P1386STI0760	●
7.70	0/-0.022	7.7	75	117	5	P1386STI0770	●
7.80	0/-0.022	7.8	75	117	5	P1386STI0780	●
7.90	0/-0.022	7.9	75	117	5	P1386STI0790	●
8.00	0/-0.022	8	75	117	5	P1386STI0800	●
8.10	0/-0.022	8.1	75	117	5	P1386STI0810	●
8.20	0/-0.022	8.2	75	117	5	P1386STI0820	●
8.30	0/-0.022	8.3	75	117	5	P1386STI0830	●
8.40	0/-0.022	8.4	75	117	5	P1386STI0840	●
8.50	0/-0.022	8.5	75	117	5	P1386STI0850	●
8.60	0/-0.022	8.6	81	125	5	P1386STI0860	●
8.70	0/-0.022	8.7	81	125	5	P1386STI0870	●

● stock standard ○ non-standard stock ▽ stock exhaustion

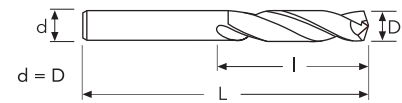
1386STI

STI type for general purpose, split point, TiN pointed, short



P	M	K	N	S	H
★	☆	★	☆	☆	

★ 1st choice ☆ suitable



D(h8)	D Tol.	d	l	L	PACKAGING	EDP No.	Stock
8.80	0/-0.022	8.8	81	125	5	P1386STI0880	●
8.90	0/-0.022	8.9	81	125	5	P1386STI0890	●
9.00	0/-0.022	9	81	125	5	P1386STI0900	●
9.10	0/-0.022	9.1	81	125	5	P1386STI0910	●
9.20	0/-0.022	9.2	81	125	5	P1386STI0920	●
9.30	0/-0.022	9.3	81	125	5	P1386STI0930	●
9.40	0/-0.022	9.4	81	125	5	P1386STI0940	●
9.50	0/-0.022	9.5	81	125	5	P1386STI0950	●
9.60	0/-0.022	9.6	87	133	5	P1386STI0960	●
9.70	0/-0.022	9.7	87	133	5	P1386STI0970	●
9.80	0/-0.022	9.8	87	133	5	P1386STI0980	●
9.90	0/-0.022	9.9	87	133	5	P1386STI0990	●
10.00	0/-0.022	10	87	133	5	P1386STI1000	●
10.10	0/-0.027	10.1	87	133	5	P1386STI1010	●
10.20	0/-0.027	10.2	87	133	5	P1386STI1020	●
10.30	0/-0.027	10.3	87	133	5	P1386STI1030	●
10.40	0/-0.027	10.4	87	133	5	P1386STI1040	●
10.50	0/-0.027	10.5	87	133	5	P1386STI1050	●
10.60	0/-0.027	10.6	87	133	5	P1386STI1060	●
10.70	0/-0.027	10.7	94	142	5	P1386STI1070	●
10.80	0/-0.027	10.8	94	142	5	P1386STI1080	●
10.90	0/-0.027	10.9	94	142	5	P1386STI1090	●
11.00	0/-0.027	11	94	142	5	P1386STI1100	●
11.10	0/-0.027	11.1	94	142	5	P1386STI1110	●
11.20	0/-0.027	11.2	94	142	5	P1386STI1120	●
11.30	0/-0.027	11.3	94	142	5	P1386STI1130	●
11.40	0/-0.027	11.4	94	142	5	P1386STI1140	●
11.50	0/-0.027	11.5	94	142	5	P1386STI1150	●
11.60	0/-0.027	11.6	94	142	5	P1386STI1160	●
11.70	0/-0.027	11.7	94	142	5	P1386STI1170	●
11.80	0/-0.027	11.8	94	142	5	P1386STI1180	●
11.90	0/-0.027	11.9	101	151	5	P1386STI1190	●
12.00	0/-0.027	12	101	151	5	P1386STI1200	●
12.10	0/-0.027	12.1	101	151	5	P1386STI1210	●
12.20	0/-0.027	12.2	101	151	5	P1386STI1220	●
12.30	0/-0.027	12.3	101	151	5	P1386STI1230	●
12.40	0/-0.027	12.4	101	151	5	P1386STI1240	●
12.50	0/-0.027	12.5	101	151	5	P1386STI1250	●
12.60	0/-0.027	12.6	101	151	5	P1386STI1260	●

INFO
TYPHOON TA-HTA-4HTA
TYPHOON PU-HPU
TYPHOON SUH
TYPHOON ALH
TYPHOON HRC
TYPHOON SUH MINI
TYPHOON HL
C-SD-TA
LFTA
SUTA
HSS-HSS/CO DRILLS
G2
MDTA
HF VH/UP
MEF
ALU
MEX
UH
HSS/CO-HSSP END MILLS
CARBIDE BURRS

● stock standard ○ non-standard stock ▽ stock exhaustion

CUTTING PARAMETERS

1386STI

Material Group ISO 513	P1 P2			P3 P4			M1 M2			K1 K2		
Hardness/Rm	500-700 N/mm ²			600-1000 N/mm ²			< 750 N/mm ²			150-350 HB		
Vc (m/min)	30-40			25-35			15-25			30-40		
D (mm)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)
1	11150	0.017	190	9550	0.014	140	6370	0.012	80	11150	0.019	210
1.5	7430	0.035	260	6370	0.030	190	4250	0.025	100	7430	0.039	290
2	5570	0.050	280	4780	0.043	200	3180	0.035	110	5570	0.055	310
2.5	4460	0.075	330	3820	0.064	240	2550	0.053	130	4460	0.083	370
3	3720	0.090	330	3180	0.077	240	2120	0.063	130	3720	0.099	370
3.5	3180	0.105	330	2730	0.089	240	1820	0.074	130	3180	0.116	370
4	2790	0.110	310	2390	0.094	220	1590	0.077	120	2790	0.121	340
5	2230	0.125	280	1910	0.106	200	1270	0.088	110	2230	0.138	310
6	1860	0.160	300	1590	0.136	220	1060	0.112	120	1860	0.176	330
7	1590	0.175	280	1360	0.149	200	910	0.123	110	1590	0.193	310
8	1390	0.200	280	1190	0.170	200	800	0.140	110	1390	0.220	310
9	1240	0.210	260	1060	0.179	190	710	0.147	100	1240	0.231	290
10	1110	0.220	240	960	0.187	180	640	0.154	100	1110	0.242	270
11	1010	0.235	240	870	0.200	170	580	0.165	100	1010	0.259	260
12	930	0.250	230	800	0.213	170	530	0.175	90	930	0.275	260
13	860	0.265	230	730	0.225	160	490	0.186	90	860	0.292	250

Material Group ISO 513	N1 N5			N2 N3 N4			S1 S2 S4					
Hardness/Rm							< 35 HRC					
Vc (m/min)	60-80			50-70			12-18					
D (mm)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)			
1	22290	0.024	530	19110	0.017	320	4780	0.007	35			
1.5	14860	0.049	730	12740	0.035	450	3180	0.014	45			
2	11150	0.070	780	9550	0.050	480	2390	0.020	50			
2.5	8920	0.105	940	7640	0.075	570	1910	0.030	55			
3	7430	0.126	940	6370	0.090	570	1590	0.036	55			
3.5	6370	0.147	940	5460	0.105	570	1360	0.042	55			
4	5570	0.154	860	4780	0.110	530	1190	0.044	50			
5	4460	0.175	780	3820	0.125	480	960	0.050	50			
6	3720	0.224	830	3180	0.160	510	800	0.064	50			
7	3180	0.245	780	2730	0.175	480	680	0.070	50			
8	2790	0.280	780	2390	0.200	480	600	0.080	50			
9	2480	0.294	730	2120	0.210	450	530	0.084	45			
10	2230	0.308	690	1910	0.220	420	480	0.088	40			
11	2030	0.329	670	1740	0.235	410	430	0.094	40			
12	1860	0.350	650	1590	0.250	400	400	0.100	40			
13	1710	0.371	630	1470	0.265	390	370	0.106	40			

- INFO
- TYPHOON TA-HTA-4HTA
- TYPHOON PU-HPU
- TYPHOON SUH
- TYPHOON ALH
- TYPHOON HRC
- TYPHOON SUH MINI
- TYPHOON HL
- C-SD-TA
- LFTA
- SUTA
- HSS-HSS/CO DRILLS
- G2
- MDTA
- HF VH/UP
- MEF
- ALU
- MEX
- UH
- HSS/CO-HSSP END MILLS
- CARBIDE BURRS

138N-138NTI

N type for general purpose, short (138N),
N type for general purpose, TiN coated, short (138NTI)

DIN
338

N

HSS
OX*

HSS
TIN

118°

25-30°

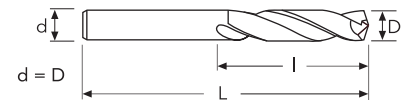
138N 138NTI

* < Ø2 mm = BR



P	M	K	N	S	H
★		☆	☆		

★ 1st choice ☆ suitable



						138N		138NTI	
D(h8)	D Tol.	d	I	L	PACKAGING	EDP No.	Stock	EDP No.	Stock
0.20	0/-0.014	0.2	2.5	19	10	P138NB0020	●		
0.30	0/-0.014	0.3	3	19	10	P138NB0030	●		
0.40	0/-0.014	0.4	5	20	10	P138NB0040	●		
0.50	0/-0.014	0.5	6	22	10	P138NB0050	●		
0.60	0/-0.014	0.6	7	24	10	P138NB0060	●		
0.70	0/-0.014	0.7	9	28	10	P138NB0070	●		
0.80	0/-0.014	0.8	10	30	10	P138NB0080	●		
0.90	0/-0.014	0.9	11	32	10	P138NB0090	●		
1.00	0/-0.014	1	12	34	10	P138NB0100	●	P138NTI0100	●
1.10	0/-0.014	1.1	14	36	10	P138NB0110	●	P138NTI0110	●
1.20	0/-0.014	1.2	16	38	10	P138NB0120	●	P138NTI0120	●
1.25	0/-0.014	1.25	16	38	10	P138NB0125	●		
1.30	0/-0.014	1.3	16	38	10	P138NB0130	●	P138NTI0130	●
1.40	0/-0.014	1.4	18	40	10	P138NB0140	●	P138NTI0140	●
1.50	0/-0.014	1.5	18	40	10	P138NB0150	●	P138NTI0150	●
1.60	0/-0.014	1.6	20	43	10	P138NB0160	●	P138NTI0160	●
1.70	0/-0.014	1.7	20	43	10	P138NB0170	●	P138NTI0170	●
1.75	0/-0.014	1.75	22	46	10	P138NB0175	●		
1.80	0/-0.014	1.8	22	46	10	P138NB0180	●	P138NTI0180	●
1.90	0/-0.014	1.9	22	46	10	P138NB0190	●	P138NTI0190	●
2.00	0/-0.014	2	24	49	10	P138N0200	●	P138NTI0200	●
2.10	0/-0.014	2.1	24	49	10	P138N0210	●	P138NTI0210	●
2.20	0/-0.014	2.2	27	53	10	P138N0220	●	P138NTI0220	●
2.25	0/-0.014	2.25	27	53	10	P138N0225	●		
2.30	0/-0.014	2.3	27	53	10	P138N0230	●	P138NTI0230	●
2.40	0/-0.014	2.4	30	57	10	P138N0240	●	P138NTI0240	●
2.50	0/-0.014	2.5	30	57	10	P138N0250	●	P138NTI0250	●
2.60	0/-0.014	2.6	30	57	10	P138N0260	●	P138NTI0260	●
2.70	0/-0.014	2.7	33	61	10	P138N0270	●	P138NTI0270	●
2.75	0/-0.014	2.75	33	61	10	P138N0275	●		
2.80	0/-0.014	2.8	33	61	10	P138N0280	●	P138NTI0280	●
2.90	0/-0.014	2.9	33	61	10	P138N0290	●	P138NTI0290	●
3.00	0/-0.014	3	33	61	10	P138N0300	●	P138NTI0300	●
3.10	0/-0.018	3.1	36	65	10	P138N0310	●	P138NTI0310	●
3.20	0/-0.018	3.2	36	65	10	P138N0320	●	P138NTI0320	●
3.25	0/-0.018	3.25	36	65	10	P138N0325	●		
3.30	0/-0.018	3.3	36	65	10	P138N0330	●	P138NTI0330	●
3.40	0/-0.018	3.4	39	70	10	P138N0340	●	P138NTI0340	●
3.50	0/-0.018	3.5	39	70	10	P138N0350	●	P138NTI0350	●

● stock standard ○ non-standard stock ▽ stock exhaustion

138N-138NTI

N type for general purpose, short (138N),
N type for general purpose, TiN coated, short (138NTI)

DIN
338

N

HSS
OX

HSS
TIN

118°

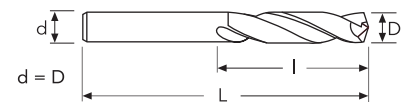
25-30°

138N 138NTI



P	M	K	N	S	H
★		☆	☆		

★ 1st choice ☆ suitable



D(h8)	D Tol.	d	I	L	PACKAGING	138N		138NTI	
						EDP No.	Stock	EDP No.	Stock
3.60	0/-0.018	3.6	39	70	10	P138N0360	●	P138NTI0360	●
3.70	0/-0.018	3.7	39	70	10	P138N0370	●	P138NTI0370	●
3.75	0/-0.018	3.75	39	70	10	P138N0375	●		
3.80	0/-0.018	3.8	43	75	10	P138N0380	●	P138NTI0380	●
3.90	0/-0.018	3.9	43	75	10	P138N0390	●	P138NTI0390	●
4.00	0/-0.018	4	43	75	10	P138N0400	●	P138NTI0400	●
4.10	0/-0.018	4.1	43	75	10	P138N0410	●	P138NTI0410	●
4.20	0/-0.018	4.2	43	75	10	P138N0420	●	P138NTI0420	●
4.25	0/-0.018	4.25	43	75	10	P138N0425	●		
4.30	0/-0.018	4.3	47	80	10	P138N0430	●	P138NTI0430	●
4.40	0/-0.018	4.4	47	80	10	P138N0440	●	P138NTI0440	●
4.50	0/-0.018	4.5	47	80	10	P138N0450	●	P138NTI0450	●
4.60	0/-0.018	4.6	47	80	10	P138N0460	●	P138NTI0460	●
4.70	0/-0.018	4.7	47	80	10	P138N0470	●	P138NTI0470	●
4.75	0/-0.018	4.75	47	80	10	P138N0475	●		
4.80	0/-0.018	4.8	52	86	10	P138N0480	●	P138NTI0480	●
4.90	0/-0.018	4.9	52	86	10	P138N0490	●	P138NTI0490	●
5.00	0/-0.018	5	52	86	10	P138N0500	●	P138NTI0500	●
5.10	0/-0.018	5.1	52	86	10	P138N0510	●	P138NTI0510	●
5.20	0/-0.018	5.2	52	86	10	P138N0520	●	P138NTI0520	●
5.25	0/-0.018	5.25	52	86	10	P138N0525	●		
5.30	0/-0.018	5.3	52	86	10	P138N0530	●	P138NTI0530	●
5.40	0/-0.018	5.4	57	93	10	P138N0540	●	P138NTI0540	●
5.50	0/-0.018	5.5	57	93	10	P138N0550	●	P138NTI0550	●
5.60	0/-0.018	5.6	57	93	10	P138N0560	●	P138NTI0560	●
5.70	0/-0.018	5.7	57	93	10	P138N0570	●	P138NTI0570	●
5.75	0/-0.018	5.75	57	93	10	P138N0575	●		
5.80	0/-0.018	5.8	57	93	10	P138N0580	●	P138NTI0580	●
5.90	0/-0.018	5.9	57	93	10	P138N0590	●	P138NTI0590	●
6.00	0/-0.018	6	57	93	10	P138N0600	●	P138NTI0600	●
6.10	0/-0.022	6.1	63	101	10	P138N0610	●	P138NTI0610	●
6.20	0/-0.022	6.2	63	101	10	P138N0620	●	P138NTI0620	●
6.25	0/-0.022	6.25	63	101	10	P138N0625	●		
6.30	0/-0.022	6.3	63	101	10	P138N0630	●	P138NTI0630	●
6.40	0/-0.022	6.4	63	101	10	P138N0640	●	P138NTI0640	●
6.50	0/-0.022	6.5	63	101	10	P138N0650	●	P138NTI0650	●
6.60	0/-0.022	6.6	63	101	5	P138N0660	●	P138NTI0660	●
6.70	0/-0.022	6.7	63	101	5	P138N0670	●	P138NTI0670	●
6.75	0/-0.022	6.75	69	109	5	P138N0675	●		

INFO
TYPHOON TA-HTA-4HTA
TYPHOON PU-HPU
TYPHOON SUH
TYPHOON ALH
TYPHOON HRC
TYPHOON SUH MINI
TYPHOON HL
C-SD-TA
LFTA
SUTA
HSS-HSS/CO DRILLS
G2
MDTA
HF VH/UP
MEF
ALU
MEX
UH
HSS/CO-HSSP END MILLS
CARBIDE BURRS

● stock standard ○ non-standard stock ▽ stock exhaustion

138N-138NTI

N type for general purpose, short (138N),
N type for general purpose, TiN coated, short (138NTI)

DIN
338

N

HSS
OX

HSS
TiN

118°

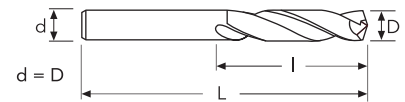
25-30°

138N 138NTI



P	M	K	N	S	H
★		☆	☆		

★ 1st choice ☆ suitable



						138N		138NTI	
D(h8)	D Tol.	d	I	L	PACKAGING	EDP No.	Stock	EDP No.	Stock
6.80	0/-0.022	6.8	69	109	5	P138N0680	●	P138NTI0680	●
6.90	0/-0.022	6.9	69	109	5	P138N0690	●	P138NTI0690	●
7.00	0/-0.022	7	69	109	5	P138N0700	●	P138NTI0700	●
7.10	0/-0.022	7.1	69	109	5	P138N0710	●	P138NTI0710	●
7.20	0/-0.022	7.2	69	109	5	P138N0720	●	P138NTI0720	●
7.25	0/-0.022	7.25	69	109	5	P138N0725	●		
7.30	0/-0.022	7.3	69	109	5	P138N0730	●	P138NTI0730	●
7.40	0/-0.022	7.4	69	109	5	P138N0740	●	P138NTI0740	●
7.50	0/-0.022	7.5	69	109	5	P138N0750	●	P138NTI0750	●
7.60	0/-0.022	7.6	75	117	5	P138N0760	●	P138NTI0760	●
7.70	0/-0.022	7.7	75	117	5	P138N0770	●	P138NTI0770	●
7.75	0/-0.022	7.75	75	117	5	P138N0775	●		
7.80	0/-0.022	7.8	75	117	5	P138N0780	●	P138NTI0780	●
7.90	0/-0.022	7.9	75	117	5	P138N0790	●	P138NTI0790	●
8.00	0/-0.022	8	75	117	5	P138N0800	●	P138NTI0800	●
8.10	0/-0.022	8.1	75	117	5	P138N0810	●	P138NTI0810	●
8.20	0/-0.022	8.2	75	117	5	P138N0820	●	P138NTI0820	●
8.25	0/-0.022	8.25	75	117	5	P138N0825	●		
8.30	0/-0.022	8.3	75	117	5	P138N0830	●	P138NTI0830	●
8.40	0/-0.022	8.4	75	117	5	P138N0840	●	P138NTI0840	●
8.50	0/-0.022	8.5	75	117	5	P138N0850	●	P138NTI0850	●
8.60	0/-0.022	8.6	81	125	5	P138N0860	●	P138NTI0860	●
8.70	0/-0.022	8.7	81	125	5	P138N0870	●	P138NTI0870	●
8.75	0/-0.022	8.75	81	125	5	P138N0875	●		
8.80	0/-0.022	8.8	81	125	5	P138N0880	●	P138NTI0880	●
8.90	0/-0.022	8.9	81	125	5	P138N0890	●	P138NTI0890	●
9.00	0/-0.022	9	81	125	5	P138N0900	●	P138NTI0900	●
9.10	0/-0.022	9.1	81	125	5	P138N0910	●	P138NTI0910	●
9.20	0/-0.022	9.2	81	125	5	P138N0920	●	P138NTI0920	●
9.25	0/-0.022	9.25	81	125	5	P138N0925	●		
9.30	0/-0.022	9.3	81	125	5	P138N0930	●	P138NTI0930	●
9.40	0/-0.022	9.4	81	125	5	P138N0940	●	P138NTI0940	●
9.50	0/-0.022	9.5	81	125	5	P138N0950	●	P138NTI0950	●
9.60	0/-0.022	9.6	87	133	5	P138N0960	●	P138NTI0960	●
9.70	0/-0.022	9.7	87	133	5	P138N0970	●	P138NTI0970	●
9.75	0/-0.022	9.75	87	133	5	P138N0975	●		
9.80	0/-0.022	9.8	87	133	5	P138N0980	●	P138NTI0980	●
9.90	0/-0.022	9.9	87	133	5	P138N0990	●	P138NTI0990	●
10.00	0/-0.022	10	87	133	5	P138N1000	●	P138NTI1000	●

● stock standard ○ non-standard stock ▽ stock exhaustion

138N-138NTI

N type for general purpose, short (138N),
N type for general purpose, TiN coated, short (138NTI)

DIN
338

N

HSS
OX

HSS
TIN

118°

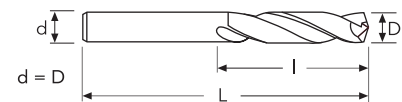
25-30°

138N 138NTI



P	M	K	N	S	H
★		☆	☆		

★ 1st choice ☆ suitable



D(h8)	D Tol.	d	I	L	PACKAGING	138N		138NTI	
						EDP No.	Stock	EDP No.	Stock
10.10	0/-0.027	10.1	87	133	5	P138N1010	●		
10.20	0/-0.027	10.2	87	133	5	P138N1020	●	P138NTI1020	●
10.25	0/-0.027	10.25	87	133	5	P138N1025	●		
10.30	0/-0.027	10.3	87	133	5	P138N1030	●		
10.40	0/-0.027	10.4	87	133	5	P138N1040	●		
10.50	0/-0.027	10.5	87	133	5	P138N1050	●	P138NTI1050	●
10.60	0/-0.027	10.6	87	133	5	P138N1060	●		
10.70	0/-0.027	10.7	94	142	5	P138N1070	●		
10.75	0/-0.027	10.75	94	142	5	P138N1075	●		
10.80	0/-0.027	10.8	94	142	5	P138N1080	●		
10.90	0/-0.027	10.9	94	142	5	P138N1090	●		
11.00	0/-0.027	11	94	142	5	P138N1100	●	P138NTI1100	●
11.10	0/-0.027	11.1	94	142	5	P138N1110	●		
11.20	0/-0.027	11.2	94	142	5	P138N1120	●		
11.25	0/-0.027	11.25	94	142	5	P138N1125	●		
11.30	0/-0.027	11.3	94	142	5	P138N1130	●		
11.40	0/-0.027	11.4	94	142	5	P138N1140	●		
11.50	0/-0.027	11.5	94	142	5	P138N1150	●	P138NTI1150	●
11.60	0/-0.027	11.6	94	142	5	P138N1160	●		
11.70	0/-0.027	11.7	94	142	5	P138N1170	●		
11.75	0/-0.027	11.75	94	142	5	P138N1175	●		
11.80	0/-0.027	11.8	94	142	5	P138N1180	●		
11.90	0/-0.027	11.9	101	151	5	P138N1190	●		
12.00	0/-0.027	12	101	151	5	P138N1200	●	P138NTI1200	●
12.10	0/-0.027	12.1	101	151	5	P138N1210	●		
12.20	0/-0.027	12.2	101	151	5	P138N1220	●		
12.25	0/-0.027	12.25	101	151	5	P138N1225	●		
12.30	0/-0.027	12.3	101	151	5	P138N1230	●		
12.40	0/-0.027	12.4	101	151	5	P138N1240	●		
12.50	0/-0.027	12.5	101	151	5	P138N1250	●	P138NTI1250	●
12.60	0/-0.027	12.6	101	151	5	P138N1260	●		
12.70	0/-0.027	12.7	101	151	5	P138N1270	●		
12.75	0/-0.027	12.75	101	151	5	P138N1275	●		
12.80	0/-0.027	12.8	101	151	5	P138N1280	●		
12.90	0/-0.027	12.9	101	151	5	P138N1290	●		
13.00	0/-0.027	13	101	151	5	P138N1300	●	P138NTI1300	●
13.25	0/-0.027	13.25	108	160	1	P138N1325	●		
13.50	0/-0.027	13.5	108	160	1	P138N1350	●	P138NTI1350	●
13.75	0/-0.027	13.75	108	160	1	P138N1375	●		

INFO
TYPHOON TA-HTA-4HTA
TYPHOON PU-HPU
TYPHOON SUH
TYPHOON ALH
TYPHOON HRC
TYPHOON SUH MINI
TYPHOON HL
C-SD-TA
LFTA
SUTA
HSS-HSS/CO DRILLS
G2
MDTA
HF VH/UP
MEF
ALU
MEX
UH
HSS/CO-HSSP END MILLS
CARBIDE BURRS

● stock standard ○ non-standard stock ▽ stock exhaustion

138N-138NTI

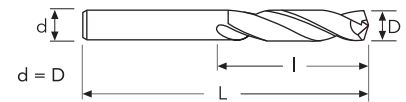
N type for general purpose, short (138N),
N type for general purpose, TiN coated, short (138NTI)

DIN 338	H	HSS OX	HSS TIN	118°	25-30°
		138N	138NTI		



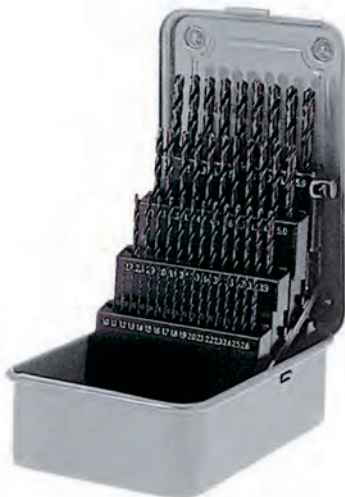
P	M	K	N	S	H
★		☆	☆		

★ 1st choice ☆ suitable



D(h8)	D Tol.	d	I	L	PACKAGING	138N		138NTI	
						EDP No.	Stock	EDP No.	Stock
14.00	0/-0.027	14	108	160	1	P138N1400	●	P138NTI1400	●
14.25	0/-0.027	14.25	114	169	1	P138N1425	●		
14.50	0/-0.027	14.5	114	169	1	P138N1450	●	P138NTI1450	●
14.75	0/-0.027	14.75	114	169	1	P138N1475	●		
15.00	0/-0.027	15	114	169	1	P138N1500	●	P138NTI1500	●
15.25	0/-0.027	15.25	120	178	1	P138N1525	●		
15.50	0/-0.027	15.5	120	178	1	P138N1550	●	P138NTI1550	●
15.75	0/-0.027	15.75	120	178	1	P138N1575	●		
16.00	0/-0.027	16	120	178	1	P138N1600	●	P138NTI1600	●
16.25	0/-0.027	16.25	125	184	1	P138N1625	●		
16.50	0/-0.027	16.5	125	184	1	P138N1650	●		
16.75	0/-0.027	16.75	125	184	1	P138N1675	●		
17.00	0/-0.027	17	125	184	1	P138N1700	●		
17.50	0/-0.027	17.5	130	191	1	P138N1750	●		
18.00	0/-0.027	18	130	191	1	P138N1800	●		
18.50	0/-0.033	18.5	135	198	1	P138N1850	●		
19.00	0/-0.033	19	135	198	1	P138N1900	●		
19.50	0/-0.033	19.5	140	205	1	P138N1950	●		
20.00	0/-0.033	20	140	205	1	P138N2000	●		

● stock standard ○ non-standard stock ▽ stock exhaustion



138NA01A

Set 50 pcs.
138N DIN338 HSS
Ø1 mm+Ø5.9 mm x 0.1 mm



138NA01B

Set 41 pcs.
138N DIN338 HSS
Ø6 mm+Ø10 mm x 0.1 mm



138NA05C

Set 25 pcs.
138N DIN338 HSS
Ø1 mm+Ø13 mm x 0.5 mm

CUTTING PARAMETERS

138N

Material Group ISO 513	P1 P2			P3 P4			K1 K2			N1 N5			N2 N3 N4		
Hardness/Rm															
Vc (m/min)	25-35			20-30			25-35			50-70			40-60		
D (mm)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)
0.2	47770	0.007	330	39810	0.006	240	47770	0.008	370	95540	0.010	940	79620	0.007	560
0.5	19110	0.011	210	15920	0.009	150	19110	0.012	230	38220	0.015	590	31850	0.011	350
0.8	11940	0.013	160	9950	0.011	110	11940	0.014	170	23890	0.018	430	19900	0.013	260
1	9550	0.017	160	7960	0.014	120	9550	0.019	180	19110	0.024	450	15920	0.017	270
1.5	6370	0.035	220	5310	0.030	160	6370	0.039	250	12740	0.049	620	10620	0.035	370
2	4780	0.050	240	3980	0.043	170	4780	0.055	260	9550	0.070	670	7960	0.050	400
2.5	3820	0.060	230	3180	0.051	160	3820	0.066	250	7640	0.084	640	6370	0.060	380
3	3180	0.070	220	2650	0.060	160	3180	0.077	240	6370	0.098	620	5310	0.070	370
3.5	2730	0.080	220	2270	0.068	150	2730	0.088	240	5460	0.112	610	4550	0.080	360
4	2390	0.090	220	1990	0.077	150	2390	0.099	240	4780	0.126	600	3980	0.090	360
5	1910	0.100	190	1590	0.085	140	1910	0.110	210	3820	0.140	530	3180	0.100	320
6	1590	0.110	170	1330	0.094	120	1590	0.121	190	3180	0.154	490	2650	0.110	290
7	1360	0.120	160	1140	0.102	120	1360	0.132	180	2730	0.168	460	2270	0.120	270
8	1190	0.130	150	1000	0.111	110	1190	0.143	170	2390	0.182	430	1990	0.130	260
9	1060	0.140	150	880	0.119	100	1060	0.154	160	2120	0.196	420	1770	0.140	250
10	960	0.160	150	800	0.136	110	960	0.176	170	1910	0.224	430	1590	0.160	250
11	870	0.170	150	720	0.145	100	870	0.187	160	1740	0.238	410	1450	0.170	250
12	800	0.180	140	660	0.153	100	800	0.198	160	1590	0.252	400	1330	0.180	240
13	730	0.190	140	610	0.162	100	730	0.209	150	1470	0.266	390	1220	0.190	230
14	680	0.200	140	570	0.170	100	680	0.220	150	1360	0.280	380	1140	0.200	230
15	640	0.210	130	530	0.179	90	640	0.231	150	1270	0.294	370	1060	0.210	220
16	600	0.220	130	500	0.187	90	600	0.242	150	1190	0.308	370	1000	0.220	220
17	560	0.230	130	470	0.196	90	560	0.253	140	1120	0.322	360	940	0.230	220
18	530	0.240	130	440	0.204	90	530	0.264	140	1060	0.336	360	880	0.240	210
19	500	0.250	130	420	0.213	90	500	0.275	140	1010	0.350	350	840	0.250	210
20	480	0.260	120	400	0.221	90	480	0.286	140	960	0.364	350	800	0.260	210

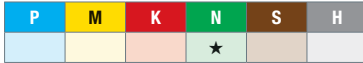
138NTI

Material Group ISO 513	P1 P2			P3 P4			K1 K2			N1 N5			N2 N3 N4		
Hardness/Rm	500-700 N/mm ²			600-1000 N/mm ²			150-350 HB								
Vc (m/min)	30-40			25-35			30-40			60-80			50-70		
D (mm)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)
1	11150	0.017	190	9550	0.014	140	11150	0.019	210	22290	0.024	530	19110	0.017	320
1.5	7430	0.035	260	6370	0.030	190	7430	0.039	290	14860	0.049	730	12740	0.035	450
2	5570	0.050	280	4780	0.043	200	5570	0.055	310	11150	0.070	780	9550	0.050	480
2.5	4460	0.060	270	3820	0.051	190	4460	0.066	290	8920	0.084	750	7640	0.060	460
3	3720	0.070	260	3180	0.060	190	3720	0.077	290	7430	0.098	730	6370	0.070	450
3.5	3180	0.080	250	2730	0.068	190	3180	0.088	280	6370	0.112	710	5460	0.080	440
4	2790	0.090	250	2390	0.077	180	2790	0.099	280	5570	0.126	700	4780	0.090	430
5	2230	0.100	220	1910	0.085	160	2230	0.110	250	4460	0.140	620	3820	0.100	380
6	1860	0.110	200	1590	0.094	150	1860	0.121	230	3720	0.154	570	3180	0.110	350
7	1590	0.120	190	1360	0.102	140	1590	0.132	210	3180	0.168	530	2730	0.120	330
8	1390	0.130	180	1190	0.111	130	1390	0.143	200	2790	0.182	510	2390	0.130	310
9	1240	0.140	170	1060	0.119	130	1240	0.154	190	2480	0.196	490	2120	0.140	300
10	1110	0.160	180	960	0.136	130	1110	0.176	200	2230	0.224	500	1910	0.160	310
11	1010	0.170	170	870	0.145	130	1010	0.187	190	2030	0.238	480	1740	0.170	300
12	930	0.180	170	800	0.153	120	930	0.198	180	1860	0.252	470	1590	0.180	290
13	860	0.190	160	730	0.162	120	860	0.209	180	1710	0.266	450	1470	0.190	280
14	800	0.200	160	680	0.170	120	800	0.220	180	1590	0.280	450	1360	0.200	270
15	740	0.210	160	640	0.179	110	740	0.231	170	1490	0.294	440	1270	0.210	270
16	700	0.220	150	600	0.187	110	700	0.242	170	1390	0.308	430	1190	0.220	260

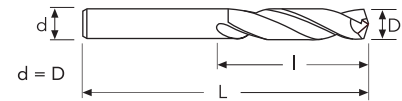
- INFO
- TYPHOON TA-HTA-4HTA
- TYPHOON PU-HPU
- TYPHOON SUH
- TYPHOON ALH
- TYPHOON HRC
- TYPHOON SUH MINI
- TYPHOON HL
- C-SD-TA
- LFTA
- SUTA
- HSS-HSS/CO DRILLS
- G2
- MDTA
- HF VH/UP
- MEF
- ALU
- MEX
- UH
- HSS/CO-HSSP END MILLS
- CARBIDE BURRS

138HB

HB type for brass, short



★ 1st choice ☆ suitable

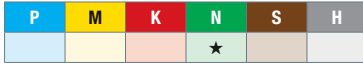


D(h8)	D Tol.	d	l	L	PACKAGING	EDP No.	Stock
1.50	0/-0.014	1.5	18	40	10	P138HB0150	●
1.60	0/-0.014	1.6	20	43	10	P138HB0160	●
1.70	0/-0.014	1.7	20	43	10	P138HB0170	●
1.80	0/-0.014	1.8	22	46	10	P138HB0180	●
1.90	0/-0.014	1.9	22	46	10	P138HB0190	●
2.00	0/-0.014	2	24	49	10	P138HB0200	●
2.10	0/-0.014	2.1	24	49	10	P138HB0210	●
2.20	0/-0.014	2.2	27	53	10	P138HB0220	●
2.30	0/-0.014	2.3	27	53	10	P138HB0230	●
2.40	0/-0.014	2.4	30	57	10	P138HB0240	●
2.50	0/-0.014	2.5	30	57	10	P138HB0250	●
2.60	0/-0.014	2.6	30	57	10	P138HB0260	●
2.70	0/-0.014	2.7	33	61	10	P138HB0270	●
2.80	0/-0.014	2.8	33	61	10	P138HB0280	●
2.90	0/-0.014	2.9	33	61	10	P138HB0290	●
3.00	0/-0.014	3	33	61	10	P138HB0300	●
3.10	0/-0.018	3.1	36	65	10	P138HB0310	●
3.20	0/-0.018	3.2	36	65	10	P138HB0320	●
3.30	0/-0.018	3.3	36	65	10	P138HB0330	●
3.40	0/-0.018	3.4	39	70	10	P138HB0340	●
3.50	0/-0.018	3.5	39	70	10	P138HB0350	●
3.60	0/-0.018	3.6	39	70	10	P138HB0360	●
3.70	0/-0.018	3.7	39	70	10	P138HB0370	●
3.80	0/-0.018	3.8	43	75	10	P138HB0380	●
3.90	0/-0.018	3.9	43	75	10	P138HB0390	●
4.00	0/-0.018	4	43	75	10	P138HB0400	●
4.10	0/-0.018	4.1	43	75	10	P138HB0410	●
4.20	0/-0.018	4.2	43	75	10	P138HB0420	●
4.30	0/-0.018	4.3	47	80	10	P138HB0430	●
4.40	0/-0.018	4.4	47	80	10	P138HB0440	○
4.50	0/-0.018	4.5	47	80	10	P138HB0450	●
4.60	0/-0.018	4.6	47	80	10	P138HB0460	●
4.70	0/-0.018	4.7	47	80	10	P138HB0470	●
4.80	0/-0.018	4.8	52	86	10	P138HB0480	●
4.90	0/-0.018	4.9	52	86	10	P138HB0490	○
5.00	0/-0.018	5	52	86	10	P138HB0500	●
5.10	0/-0.018	5.1	52	86	10	P138HB0510	○
5.20	0/-0.018	5.2	52	86	10	P138HB0520	○
5.30	0/-0.018	5.3	52	86	10	P138HB0530	○

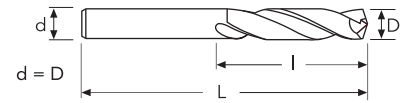
● stock standard ○ non-standard stock ▽ stock exhaustion

138HB

HB type for brass, short



★ 1st choice ☆ suitable



D(h8)	D Tol.	d	I	L	PACKAGING	EDP No.	Stock
5.40	0/-0.018	5.4	57	93	10	P138HB0540	○
5.50	0/-0.018	5.5	57	93	10	P138HB0550	●
5.60	0/-0.018	5.6	57	93	10	P138HB0560	○
5.70	0/-0.018	5.7	57	93	10	P138HB0570	○
5.80	0/-0.018	5.8	57	93	10	P138HB0580	○
5.90	0/-0.018	5.9	57	93	10	P138HB0590	○
6.00	0/-0.018	6	57	93	10	P138HB0600	●
6.10	0/-0.022	6.1	63	101	10	P138HB0610	○
6.20	0/-0.022	6.2	63	101	10	P138HB0620	○
6.30	0/-0.022	6.3	63	101	10	P138HB0630	○
6.40	0/-0.022	6.4	63	101	10	P138HB0640	○
6.50	0/-0.022	6.5	63	101	10	P138HB0650	●
6.60	0/-0.022	6.6	63	101	5	P138HB0660	○
6.70	0/-0.022	6.7	63	101	5	P138HB0670	○
6.80	0/-0.022	6.8	69	109	5	P138HB0680	○
6.90	0/-0.022	6.9	69	109	5	P138HB0690	○
7.00	0/-0.022	7	69	109	5	P138HB0700	●
7.10	0/-0.022	7.1	69	109	5	P138HB0710	○
7.20	0/-0.022	7.2	69	109	5	P138HB0720	○
7.30	0/-0.022	7.3	69	109	5	P138HB0730	○
7.40	0/-0.022	7.4	69	109	5	P138HB0740	○
7.50	0/-0.022	7.5	69	109	5	P138HB0750	●
7.60	0/-0.022	7.6	75	117	5	P138HB0760	○
7.70	0/-0.022	7.7	75	117	5	P138HB0770	○
7.80	0/-0.022	7.8	75	117	5	P138HB0780	●
7.90	0/-0.022	7.9	75	117	5	P138HB0790	○
8.00	0/-0.022	8	75	117	5	P138HB0800	●
8.10	0/-0.022	8.1	75	117	5	P138HB0810	○
8.20	0/-0.022	8.2	75	117	5	P138HB0820	○
8.30	0/-0.022	8.3	75	117	5	P138HB0830	○
8.40	0/-0.022	8.4	75	117	5	P138HB0840	○
8.50	0/-0.022	8.5	75	117	5	P138HB0850	●
8.60	0/-0.022	8.6	81	125	5	P138HB0860	○
8.70	0/-0.022	8.7	81	125	5	P138HB0870	○
8.80	0/-0.022	8.8	81	125	5	P138HB0880	○
8.90	0/-0.022	8.9	81	125	5	P138HB0890	○
9.00	0/-0.022	9	81	125	5	P138HB0900	●
9.10	0/-0.022	9.1	81	125	5	P138HB0910	○
9.20	0/-0.022	9.2	81	125	5	P138HB0920	○

INFO
TYPHOON TA-HTA-4HTA
TYPHOON PU-HPU
TYPHOON SUH
TYPHOON ALH
TYPHOON HRC
TYPHOON SUH MINI
TYPHOON HL
C-SD-TA
LFTA
SUTA
HSS-HSS/CO DRILLS
G2
MDTA
HF VH/UP
MEF
ALU
MEX
UH
HSS/CO-HSSP END MILLS
CARBIDE BURRS

● stock standard ○ non-standard stock ▽ stock exhaustion

CUTTING PARAMETERS

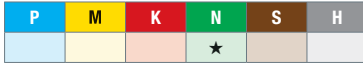
138HB

	Material Group ISO 513	N4											
	Hardness/Rm												
	Vc (m/min)	40-60											
	D (mm)	n (rpm)	fn (mm/rev)	Vf (mm/min)									
	1.5	10620	0.065	690									
	2	7960	0.080	640									
	2.5	6370	0.090	570									
	3	5310	0.100	530									
	3.5	4550	0.110	500									
	4	3980	0.120	480									
	4.5	3540	0.130	460									
	5	3180	0.140	450									
	6	2650	0.160	420									
7	2270	0.180	410										
8	1990	0.200	400										
9	1770	0.220	390										
10	1590	0.250	400										

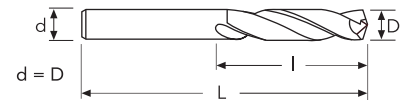
- INFO
- TYPHOON TA-HTA-4HTA
- TYPHOON PU-HPU
- TYPHOON SUH
- TYPHOON ALH
- TYPHOON HRC
- TYPHOON SUH MINI
- TYPHOON HL
- C-SD-TA
- LFTA
- SUTA
- HSS-HSS/CO DRILLS**
- G2
- MDTA
- HF VH/UP
- MEF
- ALU
- MEX
- UH
- HSS/CO-HSSP END MILLS
- CARBIDE BURRS

138WB

WB type for aluminium, short



★ 1st choice ☆ suitable



D(h8)	D Tol.	d	l	L	PACKAGING	EDP No.	Stock
1.50	0/-0.014	1.5	18	40	10	P138WB0150	●
1.60	0/-0.014	1.6	20	43	10	P138WB0160	○
1.70	0/-0.014	1.7	20	43	10	P138WB0170	○
1.80	0/-0.014	1.8	22	46	10	P138WB0180	○
1.90	0/-0.014	1.9	22	46	10	P138WB0190	○
2.00	0/-0.014	2	24	49	10	P138WB0200	●
2.10	0/-0.014	2.1	24	49	10	P138WB0210	○
2.20	0/-0.014	2.2	27	53	10	P138WB0220	●
2.30	0/-0.014	2.3	27	53	10	P138WB0230	○
2.40	0/-0.014	2.4	30	57	10	P138WB0240	●
2.50	0/-0.014	2.5	30	57	10	P138WB0250	●
2.60	0/-0.014	2.6	30	57	10	P138WB0260	●
2.70	0/-0.014	2.7	33	61	10	P138WB0270	○
2.80	0/-0.014	2.8	33	61	10	P138WB0280	●
2.90	0/-0.014	2.9	33	61	10	P138WB0290	○
3.00	0/-0.014	3	33	61	10	P138WB0300	●
3.10	0/-0.018	3.1	36	65	10	P138WB0310	●
3.20	0/-0.018	3.2	36	65	10	P138WB0320	●
3.30	0/-0.018	3.3	36	65	10	P138WB0330	●
3.40	0/-0.018	3.4	39	70	10	P138WB0340	●
3.50	0/-0.018	3.5	39	70	10	P138WB0350	●
3.60	0/-0.018	3.6	39	70	10	P138WB0360	●
3.70	0/-0.018	3.7	39	70	10	P138WB0370	●
3.80	0/-0.018	3.8	43	75	10	P138WB0380	●
3.90	0/-0.018	3.9	43	75	10	P138WB0390	●
4.00	0/-0.018	4	43	75	10	P138WB0400	●
4.10	0/-0.018	4.1	43	75	10	P138WB0410	●
4.20	0/-0.018	4.2	43	75	10	P138WB0420	●
4.30	0/-0.018	4.3	47	80	10	P138WB0430	○
4.40	0/-0.018	4.4	47	80	10	P138WB0440	○
4.50	0/-0.018	4.5	47	80	10	P138WB0450	●
4.60	0/-0.018	4.6	47	80	10	P138WB0460	●
4.70	0/-0.018	4.7	47	80	10	P138WB0470	○
4.80	0/-0.018	4.8	52	86	10	P138WB0480	●
4.90	0/-0.018	4.9	52	86	10	P138WB0490	●
5.00	0/-0.018	5	52	86	10	P138WB0500	●
5.10	0/-0.018	5.1	52	86	10	P138WB0510	○
5.20	0/-0.018	5.2	52	86	10	P138WB0520	●
5.30	0/-0.018	5.3	52	86	10	P138WB0530	○

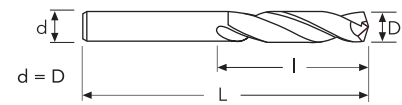
● stock standard ○ non-standard stock ▽ stock exhaustion

138WB

WB type for aluminium, short



★ 1st choice ☆ suitable



D(h8)	D Tol.	d	l	L	PACKAGING	EDP No.	Stock
5.40	0/-0.018	5.4	57	93	10	P138WB0540	○
5.50	0/-0.018	5.5	57	93	10	P138WB0550	●
5.60	0/-0.018	5.6	57	93	10	P138WB0560	●
5.70	0/-0.018	5.7	57	93	10	P138WB0570	○
5.80	0/-0.018	5.8	57	93	10	P138WB0580	○
5.90	0/-0.018	5.9	57	93	10	P138WB0590	○
6.00	0/-0.018	6	57	93	10	P138WB0600	●
6.10	0/-0.022	6.1	63	101	10	P138WB0610	○
6.20	0/-0.022	6.2	63	101	10	P138WB0620	○
6.30	0/-0.022	6.3	63	101	10	P138WB0630	○
6.40	0/-0.022	6.4	63	101	10	P138WB0640	○
6.50	0/-0.022	6.5	63	101	10	P138WB0650	●
6.60	0/-0.022	6.6	63	101	5	P138WB0660	○
6.70	0/-0.022	6.7	63	101	5	P138WB0670	○
6.80	0/-0.022	6.8	69	109	5	P138WB0680	●
6.90	0/-0.022	6.9	69	109	5	P138WB0690	○
7.00	0/-0.022	7	69	109	5	P138WB0700	●
7.10	0/-0.022	7.1	69	109	5	P138WB0710	○
7.20	0/-0.022	7.2	69	109	5	P138WB0720	○
7.30	0/-0.022	7.3	69	109	5	P138WB0730	○
7.40	0/-0.022	7.4	69	109	5	P138WB0740	○
7.50	0/-0.022	7.5	69	109	5	P138WB0750	●
7.60	0/-0.022	7.6	75	117	5	P138WB0760	○
7.70	0/-0.022	7.7	75	117	5	P138WB0770	○
7.80	0/-0.022	7.8	75	117	5	P138WB0780	○
7.90	0/-0.022	7.9	75	117	5	P138WB0790	○
8.00	0/-0.022	8	75	117	5	P138WB0800	●
8.10	0/-0.022	8.1	75	117	5	P138WB0810	○
8.20	0/-0.022	8.2	75	117	5	P138WB0820	●
8.30	0/-0.022	8.3	75	117	5	P138WB0830	○
8.40	0/-0.022	8.4	75	117	5	P138WB0840	○
8.50	0/-0.022	8.5	75	117	5	P138WB0850	●
8.60	0/-0.022	8.6	81	125	5	P138WB0860	○
8.70	0/-0.022	8.7	81	125	5	P138WB0870	○
8.80	0/-0.022	8.8	81	125	5	P138WB0880	○
8.90	0/-0.022	8.9	81	125	5	P138WB0890	○
9.00	0/-0.022	9	81	125	5	P138WB0900	●
9.10	0/-0.022	9.1	81	125	5	P138WB0910	○
9.20	0/-0.022	9.2	81	125	5	P138WB0920	○

INFO
TYPHOON TA-HTA-4HTA
TYPHOON PU-HPU
TYPHOON SUH
TYPHOON ALH
TYPHOON HRC
TYPHOON SUH MINI
TYPHOON HL
C-SD-TA
LFTA
SUTA
HSS-HSS/CO DRILLS
G2
MDTA
HF VH/UP
MEF
ALU
MEX
UH
HSS/CO-HSSP END MILLS
CARBIDE BURRS

● stock standard ○ non-standard stock ▽ stock exhaustion

CUTTING PARAMETERS

138WB

Material Group ISO 513	N1			N2			N3					
	Hardness/Rm											
	Vc (m/min)			40-60			30-50			25-45		
D (mm)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)			
1.5	10620	0.070	740	8490	0.063	530	7430	0.060	440			
2	7962	0.080	640	6369	0.072	460	5573	0.068	380			
2.5	6369	0.090	570	5096	0.081	410	4459	0.077	340			
3	5308	0.100	530	4246	0.090	380	3715	0.085	320			
3.5	4550	0.110	500	3640	0.099	360	3185	0.094	300			
4	3981	0.120	480	3185	0.108	340	2787	0.102	280			
4.5	3539	0.130	460	2831	0.117	330	2477	0.111	270			
5	3185	0.140	450	2548	0.126	320	2229	0.119	270			
6	2654	0.160	420	2123	0.144	310	1858	0.136	250			
7	2275	0.180	410	1820	0.162	290	1592	0.153	240			
8	1990	0.200	400	1592	0.180	290	1393	0.170	240			
9	1769	0.220	390	1415	0.198	280	1238	0.187	230			
10	1592	0.250	400	1274	0.225	290	1115	0.213	240			

- INFO
- TYPHOON TA-HTA-4HTA
- TYPHOON PU-HPU
- TYPHOON SUH
- TYPHOON ALH
- TYPHOON HRC
- TYPHOON SUH MINI
- TYPHOON HL
- C-SD-TA
- LFTA
- SUTA
- HSS-HSS/CO DRILLS
- G2
- MDTA
- HF VH/UP
- MEF
- ALU
- MEX
- UH
- HSS/CO-HSSP END MILLS
- CARBIDE BURRS

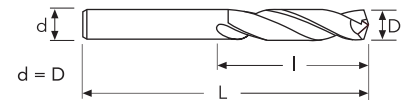
2386STI

STI type for tough materials, split point, TiN pointed, short



P	M	K	N	S	H
★	★	★	☆	☆	

★ 1st choice ☆ suitable



D(h8)	D Tol.	d	I	L	PACKAGING	EDP No.	Stock
1.00	0/-0.014	1	12	34	10	P2385NTI0100	●
1.10	0/-0.014	1.1	14	36	10	P2385NTI0110	●
1.20	0/-0.014	1.2	16	38	10	P2385NTI0120	●
1.30	0/-0.014	1.3	16	38	10	P2385NTI0130	●
1.40	0/-0.014	1.4	18	40	10	P2385NTI0140	●
1.50	0/-0.014	1.5	18	40	10	P2385NTI0150	●
1.60	0/-0.014	1.6	20	43	10	P2386STI0160	●
1.70	0/-0.014	1.7	20	43	10	P2386STI0170	●
1.80	0/-0.014	1.8	22	46	10	P2386STI0180	●
1.90	0/-0.014	1.9	22	46	10	P2386STI0190	●
2.00	0/-0.014	2	24	49	10	P2386STI0200	●
2.10	0/-0.014	2.1	24	49	10	P2386STI0210	●
2.20	0/-0.014	2.2	27	53	10	P2386STI0220	●
2.30	0/-0.014	2.3	27	53	10	P2386STI0230	●
2.40	0/-0.014	2.4	30	57	10	P2386STI0240	●
2.50	0/-0.014	2.5	30	57	10	P2386STI0250	●
2.60	0/-0.014	2.6	30	57	10	P2386STI0260	●
2.70	0/-0.014	2.7	33	61	10	P2386STI0270	●
2.80	0/-0.014	2.8	33	61	10	P2386STI0280	●
2.90	0/-0.014	2.9	33	61	10	P2386STI0290	●
3.00	0/-0.014	3	33	61	10	P2386STI0300	●
3.10	0/-0.018	3.1	36	65	10	P2386STI0310	●
3.20	0/-0.018	3.2	36	65	10	P2386STI0320	●
3.30	0/-0.018	3.3	36	65	10	P2386STI0330	●
3.40	0/-0.018	3.4	39	70	10	P2386STI0340	●
3.50	0/-0.018	3.5	39	70	10	P2386STI0350	●
3.60	0/-0.018	3.6	39	70	10	P2386STI0360	●
3.70	0/-0.018	3.7	39	70	10	P2386STI0370	●
3.80	0/-0.018	3.8	43	75	10	P2386STI0380	●
3.90	0/-0.018	3.9	43	75	10	P2386STI0390	●
4.00	0/-0.018	4	43	75	10	P2386STI0400	●
4.10	0/-0.018	4.1	43	75	10	P2386STI0410	●
4.20	0/-0.018	4.2	43	75	10	P2386STI0420	●
4.30	0/-0.018	4.3	47	80	10	P2386STI0430	●
4.40	0/-0.018	4.4	47	80	10	P2386STI0440	●
4.50	0/-0.018	4.5	47	80	10	P2386STI0450	●
4.60	0/-0.018	4.6	47	80	10	P2386STI0460	●
4.70	0/-0.018	4.7	47	80	10	P2386STI0470	●
4.80	0/-0.018	4.8	52	86	10	P2386STI0480	●

● stock standard ○ non-standard stock ▽ stock exhaustion

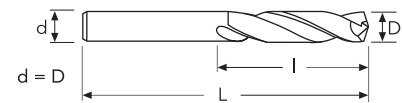
2386STI

STI type for tough materials, split point, TiN pointed, short



P	M	K	N	S	H
★	★	★	☆	☆	

★ 1st choice ☆ suitable



D(h8)	D Tol.	d	l	L	PACKAGING	EDP No.	Stock
4.90	0/-0.018	4.9	52	86	10	P2386STI0490	●
5.00	0/-0.018	5	52	86	10	P2386STI0500	●
5.10	0/-0.018	5.1	52	86	10	P2386STI0510	●
5.20	0/-0.018	5.2	52	86	10	P2386STI0520	●
5.30	0/-0.018	5.3	52	86	10	P2386STI0530	●
5.40	0/-0.018	5.4	57	93	10	P2386STI0540	●
5.50	0/-0.018	5.5	57	93	10	P2386STI0550	●
5.60	0/-0.018	5.6	57	93	10	P2386STI0560	●
5.70	0/-0.018	5.7	57	93	10	P2386STI0570	●
5.80	0/-0.018	5.8	57	93	10	P2386STI0580	●
5.90	0/-0.018	5.9	57	93	10	P2386STI0590	●
6.00	0/-0.018	6	57	93	10	P2386STI0600	●
6.10	0/-0.022	6.1	63	101	10	P2386STI0610	●
6.20	0/-0.022	6.2	63	101	10	P2386STI0620	●
6.30	0/-0.022	6.3	63	101	10	P2386STI0630	●
6.40	0/-0.022	6.4	63	101	10	P2386STI0640	●
6.50	0/-0.022	6.5	63	101	10	P2386STI0650	●
6.60	0/-0.022	6.6	63	101	5	P2386STI0660	●
6.70	0/-0.022	6.7	63	101	5	P2386STI0670	●
6.80	0/-0.022	6.8	69	109	5	P2386STI0680	●
6.90	0/-0.022	6.9	69	109	5	P2386STI0690	●
7.00	0/-0.022	7	69	109	5	P2386STI0700	●
7.10	0/-0.022	7.1	69	109	5	P2386STI0710	●
7.20	0/-0.022	7.2	69	109	5	P2386STI0720	●
7.30	0/-0.022	7.3	69	109	5	P2386STI0730	●
7.40	0/-0.022	7.4	69	109	5	P2386STI0740	●
7.50	0/-0.022	7.5	69	109	5	P2386STI0750	●
7.60	0/-0.022	7.6	75	117	5	P2386STI0760	●
7.70	0/-0.022	7.7	75	117	5	P2386STI0770	●
7.80	0/-0.022	7.8	75	117	5	P2386STI0780	●
7.90	0/-0.022	7.9	75	117	5	P2386STI0790	●
8.00	0/-0.022	8	75	117	5	P2386STI0800	●
8.10	0/-0.022	8.1	75	117	5	P2386STI0810	●
8.20	0/-0.022	8.2	75	117	5	P2386STI0820	●
8.30	0/-0.022	8.3	75	117	5	P2386STI0830	●
8.40	0/-0.022	8.4	75	117	5	P2386STI0840	●
8.50	0/-0.022	8.5	75	117	5	P2386STI0850	●
8.60	0/-0.022	8.6	81	125	5	P2386STI0860	●
8.70	0/-0.022	8.7	81	125	5	P2386STI0870	●

INFO
TYPHOON TA-HTA-4HTA
TYPHOON PU-HPU
TYPHOON SUH
TYPHOON ALH
TYPHOON HRC
TYPHOON SUH MINI
TYPHOON HL
C-SD-TA
LFTA
SUTA
HSS-HSS/CO DRILLS
G2
MDTA
HF VH/UP
MEF
ALU
MEX
UH
HSS/CO-HSSP END MILLS
CARBIDE BURRS

● stock standard ○ non-standard stock ▽ stock exhaustion

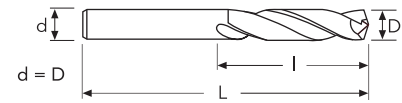
2386STI

STI type for tough materials, split point, TiN pointed, short



P	M	K	N	S	H
★	★	★	☆	☆	

★ 1st choice ☆ suitable



D(h8)	D Tol.	d	l	L	PACKAGING	EDP No.	Stock
8.80	0/-0.022	8.8	81	125	5	P2386STI0880	●
8.90	0/-0.022	8.9	81	125	5	P2386STI0890	●
9.00	0/-0.022	9	81	125	5	P2386STI0900	●
9.10	0/-0.022	9.1	81	125	5	P2386STI0910	●
9.20	0/-0.022	9.2	81	125	5	P2386STI0920	●
9.30	0/-0.022	9.3	81	125	5	P2386STI0930	●
9.40	0/-0.022	9.4	81	125	5	P2386STI0940	●
9.50	0/-0.022	9.5	81	125	5	P2386STI0950	●
9.60	0/-0.022	9.6	87	133	5	P2386STI0960	●
9.70	0/-0.022	9.7	87	133	5	P2386STI0970	●
9.80	0/-0.022	9.8	87	133	5	P2386STI0980	●
9.90	0/-0.022	9.9	87	133	5	P2386STI0990	●
10.00	0/-0.022	10	87	133	5	P2386STI1000	●
10.10	0/-0.027	10.1	87	133	5	P2386STI1010	●
10.20	0/-0.027	10.2	87	133	5	P2386STI1020	●
10.30	0/-0.027	10.3	87	133	5	P2386STI1030	●
10.40	0/-0.027	10.4	87	133	5	P2386STI1040	●
10.50	0/-0.027	10.5	87	133	5	P2386STI1050	●
10.60	0/-0.027	10.6	87	133	5	P2386STI1060	●
10.70	0/-0.027	10.7	94	142	5	P2386STI1070	●
10.80	0/-0.027	10.8	94	142	5	P2386STI1080	●
10.90	0/-0.027	10.9	94	142	5	P2386STI1090	●
11.00	0/-0.027	11	94	142	5	P2386STI1100	●
11.10	0/-0.027	11.1	94	142	5	P2386STI1110	●
11.20	0/-0.027	11.2	94	142	5	P2386STI1120	●
11.30	0/-0.027	11.3	94	142	5	P2386STI1130	●
11.40	0/-0.027	11.4	94	142	5	P2386STI1140	●
11.50	0/-0.027	11.5	94	142	5	P2386STI1150	●
11.60	0/-0.027	11.6	94	142	5	P2386STI1160	●
11.70	0/-0.027	11.7	94	142	5	P2386STI1170	●
11.80	0/-0.027	11.8	94	142	5	P2386STI1180	●
11.90	0/-0.027	11.9	101	151	5	P2386STI1190	●
12.00	0/-0.027	12	101	151	5	P2386STI1200	●
12.10	0/-0.027	12.1	101	151	5	P2386STI1210	●
12.20	0/-0.027	12.2	101	151	5	P2386STI1220	●
12.30	0/-0.027	12.3	101	151	5	P2386STI1230	●
12.40	0/-0.027	12.4	101	151	5	P2386STI1240	●
12.50	0/-0.027	12.5	101	151	5	P2386STI1250	●
12.60	0/-0.027	12.6	101	151	5	P2386STI1260	●

● stock standard ○ non-standard stock ▽ stock exhaustion

2386STI

Material Group ISO 513	P1 P2			P3 P4			M1 M2			M3			K1 K2		
	Hardness/Rm			Hardness/Rm			Hardness/Rm			Hardness/Rm			Hardness/Rm		
Vc (m/min)	30-40			25-35			15-25			12-18			30-40		
D (mm)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)
1	11150	0.017	190	9550	0.014	140	6370	0.012	80	4780	0.009	40	11150	0.019	210
1.5	7430	0.035	260	6370	0.030	190	4250	0.025	100	3180	0.018	55	7430	0.039	290
2	5570	0.050	280	4780	0.043	200	3180	0.035	110	2390	0.025	60	5570	0.055	310
2.5	4460	0.075	330	3820	0.064	240	2550	0.053	130	1910	0.038	70	4460	0.083	370
3	3720	0.090	330	3180	0.077	240	2120	0.063	130	1590	0.045	70	3720	0.099	370
3.5	3180	0.105	330	2730	0.089	240	1820	0.074	130	1360	0.053	70	3180	0.116	370
4	2790	0.110	310	2390	0.094	220	1590	0.077	120	1190	0.055	65	2790	0.121	340
5	2230	0.125	280	1910	0.106	200	1270	0.088	110	960	0.063	60	2230	0.138	310
6	1860	0.160	300	1590	0.136	220	1060	0.112	120	800	0.080	65	1860	0.176	330
7	1590	0.175	280	1360	0.149	200	910	0.123	110	680	0.088	60	1590	0.193	310
8	1390	0.200	280	1190	0.170	200	800	0.140	110	600	0.100	60	1390	0.220	310
9	1240	0.210	260	1060	0.179	190	710	0.147	100	530	0.105	55	1240	0.231	290
10	1110	0.220	240	960	0.187	180	640	0.154	100	480	0.110	55	1110	0.242	270
11	1010	0.235	240	870	0.200	170	580	0.165	100	430	0.118	50	1010	0.259	260
12	930	0.250	230	800	0.213	170	530	0.175	90	400	0.125	50	930	0.275	260
13	860	0.265	230	730	0.225	160	490	0.186	90	370	0.133	50	860	0.292	250

Material Group ISO 513	K3 K4			N1 N5			N2 N3 N4			S1 S2 S4		
	Hardness/Rm			Hardness/Rm			Hardness/Rm			Hardness/Rm		
Vc (m/min)	25-35			60-80			50-70			12-18		
D (mm)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)
1	9550	0.013	120	22290	0.024	530	19110	0.017	320	4780	0.007	35
1.5	6370	0.026	170	14860	0.049	730	12740	0.035	450	3180	0.014	45
2	4780	0.038	180	11150	0.070	780	9550	0.050	480	2390	0.020	50
2.5	3820	0.056	210	8920	0.105	940	7640	0.075	570	1910	0.030	55
3	3180	0.068	210	7430	0.126	940	6370	0.090	570	1590	0.036	55
3.5	2730	0.079	210	6370	0.147	940	5460	0.105	570	1360	0.042	55
4	2390	0.083	200	5570	0.154	860	4780	0.110	530	1190	0.044	50
5	1910	0.094	180	4460	0.175	780	3820	0.125	480	960	0.050	50
6	1590	0.120	190	3720	0.224	830	3180	0.160	510	800	0.064	50
7	1360	0.131	180	3180	0.245	780	2730	0.175	480	680	0.070	50
8	1190	0.150	180	2790	0.280	780	2390	0.200	480	600	0.080	50
9	1060	0.158	170	2480	0.294	730	2120	0.210	450	530	0.084	45
10	960	0.165	160	2230	0.308	690	1910	0.220	420	480	0.088	40
11	870	0.176	150	2030	0.329	670	1740	0.235	410	430	0.094	40
12	800	0.188	150	1860	0.350	650	1590	0.250	400	400	0.100	40
13	730	0.199	150	1710	0.371	630	1470	0.265	390	370	0.106	40

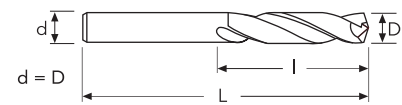
238NVA

NVA type for tough materials, short



P	M	K	N	S	H
★	★	☆	☆	☆	☆

★ 1st choice ☆ suitable



D(h8)	D Tol.	d	l	L	PACKAGING	EDP No.	Stock
1.00	0/-0.014	1	12	34	10	P238NVA0100	●
1.10	0/-0.014	1.1	14	36	10	P238NVA0110	●
1.20	0/-0.014	1.2	16	38	10	P238NVA0120	●
1.25	0/-0.014	1.25	16	38	10	P238NVA0125	●
1.30	0/-0.014	1.3	16	38	10	P238NVA0130	●
1.40	0/-0.014	1.4	18	40	10	P238NVA0140	●
1.50	0/-0.014	1.5	18	40	10	P238NVA0150	●
1.60	0/-0.014	1.6	20	43	10	P238NVA0160	●
1.70	0/-0.014	1.7	20	43	10	P238NVA0170	●
1.75	0/-0.014	1.75	22	46	10	P238NVA0175	●
1.80	0/-0.014	1.8	22	46	10	P238NVA0180	●
1.90	0/-0.014	1.9	22	46	10	P238NVA0190	●
2.00	0/-0.014	2	24	49	10	P238NVA0200	●
2.10	0/-0.014	2.1	24	49	10	P238NVA0210	●
2.20	0/-0.014	2.2	27	53	10	P238NVA0220	●
2.25	0/-0.014	2.25	27	53	10	P238NVA0225	●
2.30	0/-0.014	2.3	27	53	10	P238NVA0230	●
2.40	0/-0.014	2.4	30	57	10	P238NVA0240	●
2.50	0/-0.014	2.5	30	57	10	P238NVA0250	●
2.60	0/-0.014	2.6	30	57	10	P238NVA0260	●
2.70	0/-0.014	2.7	33	61	10	P238NVA0270	●
2.75	0/-0.014	2.75	33	61	10	P238NVA0275	●
2.80	0/-0.014	2.8	33	61	10	P238NVA0280	●
2.90	0/-0.014	2.9	33	61	10	P238NVA0290	●
3.00	0/-0.014	3	33	61	10	P238NVA0300	●
3.10	0/-0.018	3.1	36	65	10	P238NVA0310	●
3.20	0/-0.018	3.2	36	65	10	P238NVA0320	●
3.25	0/-0.018	3.25	36	65	10	P238NVA0325	●
3.30	0/-0.018	3.3	36	65	10	P238NVA0330	●
3.40	0/-0.018	3.4	39	70	10	P238NVA0340	●
3.50	0/-0.018	3.5	39	70	10	P238NVA0350	●
3.60	0/-0.018	3.6	39	70	10	P238NVA0360	●
3.70	0/-0.018	3.7	39	70	10	P238NVA0370	●
3.75	0/-0.018	3.75	39	70	10	P238NVA0375	●
3.80	0/-0.018	3.8	43	75	10	P238NVA0380	●
3.90	0/-0.018	3.9	43	75	10	P238NVA0390	●
4.00	0/-0.018	4	43	75	10	P238NVA0400	●
4.10	0/-0.018	4.1	43	75	10	P238NVA0410	●
4.20	0/-0.018	4.2	43	75	10	P238NVA0420	●

INFO
TYPHOON TA-HTA-4HTA
TYPHOON PU-HPU
TYPHOON SUH
TYPHOON ALH
TYPHOON HRC
TYPHOON SUH MINI
TYPHOON HL
C-SD-TA
LFTA
SUTA
HSS-HSS/CO DRILLS
G2
MDTA
HF VH/UP
MEF
ALU
MEX
UH
HSS/CO-HSSP END MILLS
CARBIDE BURRS

● stock standard ○ non-standard stock ▽ stock exhaustion

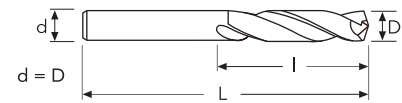
238NVA

NVA type for tough materials, short



P	M	K	N	S	H
★	★	☆	☆	☆	

★ 1st choice ☆ suitable



D(h8)	D Tol.	d	l	L	PACKAGING	EDP No.	Stock
4.25	0/-0.018	4.25	43	75	10	P238NVA0425	●
4.30	0/-0.018	4.3	47	80	10	P238NVA0430	●
4.40	0/-0.018	4.4	47	80	10	P238NVA0440	●
4.50	0/-0.018	4.5	47	80	10	P238NVA0450	●
4.60	0/-0.018	4.6	47	80	10	P238NVA0460	●
4.70	0/-0.018	4.7	47	80	10	P238NVA0470	●
4.75	0/-0.018	4.75	47	80	10	P238NVA0475	●
4.80	0/-0.018	4.8	52	86	10	P238NVA0480	●
4.90	0/-0.018	4.9	52	86	10	P238NVA0490	●
5.00	0/-0.018	5	52	86	10	P238NVA0500	●
5.10	0/-0.018	5.1	52	86	10	P238NVA0510	●
5.20	0/-0.018	5.2	52	86	10	P238NVA0520	●
5.25	0/-0.018	5.25	52	86	10	P238NVA0525	●
5.30	0/-0.018	5.3	52	86	10	P238NVA0530	●
5.40	0/-0.018	5.4	57	93	10	P238NVA0540	●
5.50	0/-0.018	5.5	57	93	10	P238NVA0550	●
5.60	0/-0.018	5.6	57	93	10	P238NVA0560	●
5.70	0/-0.018	5.7	57	93	10	P238NVA0570	●
5.75	0/-0.018	5.75	57	93	10	P238NVA0575	●
5.80	0/-0.018	5.8	57	93	10	P238NVA0580	●
5.90	0/-0.018	5.9	57	93	10	P238NVA0590	●
6.00	0/-0.018	6	57	93	10	P238NVA0600	●
6.10	0/-0.022	6.1	63	101	10	P238NVA0610	●
6.20	0/-0.022	6.2	63	101	10	P238NVA0620	●
6.25	0/-0.022	6.25	63	101	10	P238NVA0625	●
6.30	0/-0.022	6.3	63	101	10	P238NVA0630	●
6.40	0/-0.022	6.4	63	101	10	P238NVA0640	●
6.50	0/-0.022	6.5	63	101	10	P238NVA0650	●
6.60	0/-0.022	6.6	63	101	5	P238NVA0660	●
6.70	0/-0.022	6.7	63	101	5	P238NVA0670	●
6.75	0/-0.022	6.75	69	109	5	P238NVA0675	●
6.80	0/-0.022	6.8	69	109	5	P238NVA0680	●
6.90	0/-0.022	6.9	69	109	5	P238NVA0690	●
7.00	0/-0.022	7	69	109	5	P238NVA0700	●
7.10	0/-0.022	7.1	69	109	5	P238NVA0710	●
7.20	0/-0.022	7.2	69	109	5	P238NVA0720	●
7.25	0/-0.022	7.25	69	109	5	P238NVA0725	●
7.30	0/-0.022	7.3	69	109	5	P238NVA0730	●
7.40	0/-0.022	7.4	69	109	5	P238NVA0740	●

● stock standard ○ non-standard stock ▽ stock exhaustion

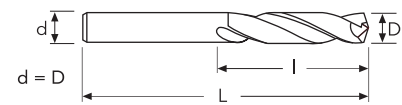
238NVA

NVA type for tough materials, short



P	M	K	N	S	H
★	★	☆	☆	☆	

★ 1st choice ☆ suitable



D(h8)	D Tol.	d	l	L	PACKAGING	EDP No.	Stock
7.50	0/-0.022	7.5	69	109	5	P238NVA0750	●
7.60	0/-0.022	7.6	75	117	5	P238NVA0760	●
7.70	0/-0.022	7.7	75	117	5	P238NVA0770	●
7.75	0/-0.022	7.75	75	117	5	P238NVA0775	●
7.80	0/-0.022	7.8	75	117	5	P238NVA0780	●
7.90	0/-0.022	7.9	75	117	5	P238NVA0790	●
8.00	0/-0.022	8	75	117	5	P238NVA0800	●
8.10	0/-0.022	8.1	75	117	5	P238NVA0810	●
8.20	0/-0.022	8.2	75	117	5	P238NVA0820	●
8.25	0/-0.022	8.25	75	117	5	P238NVA0825	●
8.30	0/-0.022	8.3	75	117	5	P238NVA0830	●
8.40	0/-0.022	8.4	75	117	5	P238NVA0840	●
8.50	0/-0.022	8.5	75	117	5	P238NVA0850	●
8.60	0/-0.022	8.6	81	125	5	P238NVA0860	●
8.70	0/-0.022	8.7	81	125	5	P238NVA0870	●
8.75	0/-0.022	8.75	81	125	5	P238NVA0875	●
8.80	0/-0.022	8.8	81	125	5	P238NVA0880	●
8.90	0/-0.022	8.9	81	125	5	P238NVA0890	●
9.00	0/-0.022	9	81	125	5	P238NVA0900	●
9.10	0/-0.022	9.1	81	125	5	P238NVA0910	●
9.20	0/-0.022	9.2	81	125	5	P238NVA0920	●
9.25	0/-0.022	9.25	81	125	5	P238NVA0925	●
9.30	0/-0.022	9.3	81	125	5	P238NVA0930	●
9.40	0/-0.022	9.4	81	125	5	P238NVA0940	●
9.50	0/-0.022	9.5	81	125	5	P238NVA0950	●
9.60	0/-0.022	9.6	87	133	5	P238NVA0960	●
9.70	0/-0.022	9.7	87	133	5	P238NVA0970	●
9.75	0/-0.022	9.75	87	133	5	P238NVA0975	●
9.80	0/-0.022	9.8	87	133	5	P238NVA0980	●
9.90	0/-0.022	9.9	87	133	5	P238NVA0990	●
10.00	0/-0.022	10	87	133	5	P238NVA1000	●
10.20	0/-0.027	10.2	87	133	5	P238NVA1020	●
10.50	0/-0.027	10.5	87	133	5	P238NVA1050	●
11.00	0/-0.027	11	94	142	5	P238NVA1100	●
11.50	0/-0.027	11.5	94	142	5	P238NVA1150	●
12.00	0/-0.027	12	101	151	5	P238NVA1200	●
12.50	0/-0.027	12.5	101	151	5	P238NVA1250	●
13.00	0/-0.027	13	101	151	5	P238NVA1300	●
13.50	0/-0.027	13.5	108	160	1	P238NVA1350	●

INFO
TYPHOON TA-HTA-4HTA
TYPHOON PU-HPU
TYPHOON SUH
TYPHOON ALH
TYPHOON HRC
TYPHOON SUH MINI
TYPHOON HL
C-SD-TA
LFTA
SUTA
HSS-HSS/CO DRILLS
G2
MDTA
HF VH/UP
MEF
ALU
MEX
UH
HSS/CO-HSSP END MILLS
CARBIDE BURRS

● stock standard ○ non-standard stock ▽ stock exhaustion

CUTTING PARAMETERS

238NVA

Material Group ISO 513	P1 P2			P3 P4			M1 M2			M3 M4			K1 K2		
Hardness/Rm	500-700 N/mm ²			600-1000 N/mm ²			< 750 N/mm ²			550-850 N/mm ²			150-350 HB		
Vc (m/min)	25-35			20-30			12-18			8-12			25-35		
D (mm)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)
1	9550	0.017	160	7960	0.014	120	4780	0.012	57	3180	0.009	27	9550	0.019	180
1.5	6370	0.035	220	5310	0.030	160	3180	0.025	80	2120	0.018	37	6370	0.039	250
2	4780	0.050	240	3980	0.043	170	2390	0.035	80	1590	0.025	40	4780	0.055	260
2.5	3820	0.060	230	3180	0.051	160	1910	0.042	80	1270	0.030	38	3820	0.066	250
3	3180	0.070	220	2650	0.060	160	1590	0.049	80	1060	0.035	37	3180	0.077	240
3.5	2730	0.080	220	2270	0.068	150	1360	0.056	80	910	0.040	36	2730	0.088	240
4	2390	0.090	220	1990	0.077	150	1190	0.063	70	800	0.045	36	2390	0.099	240
5	1910	0.100	190	1590	0.085	140	960	0.070	70	640	0.050	32	1910	0.110	210
6	1590	0.110	170	1330	0.094	120	800	0.077	60	530	0.055	29	1590	0.121	190
7	1360	0.120	160	1140	0.102	120	680	0.084	60	450	0.060	27	1360	0.132	180
8	1190	0.130	150	1000	0.111	110	600	0.091	55	400	0.065	26	1190	0.143	170
9	1060	0.140	150	880	0.119	100	530	0.098	52	350	0.070	25	1060	0.154	160
10	960	0.160	150	800	0.136	110	480	0.112	54	320	0.080	26	960	0.176	170
11	870	0.170	150	720	0.145	100	430	0.119	51	290	0.085	25	870	0.187	160
12	800	0.180	140	660	0.153	100	400	0.126	50	270	0.090	24	800	0.198	160
13	730	0.190	140	610	0.162	100	370	0.133	49	240	0.095	23	730	0.209	150
14	680	0.200	140	570	0.170	100	340	0.140	48	230	0.100	23	680	0.220	150
15	640	0.210	130	530	0.179	90	320	0.147	47	210	0.105	22	640	0.231	150
16	600	0.220	130	500	0.187	90	300	0.154	46	200	0.110	22	600	0.242	150
17	560	0.230	130	470	0.196	90	280	0.161	45	190	0.115	22	560	0.253	140
18	530	0.240	130	440	0.204	90	270	0.168	45	180	0.120	22	530	0.264	140
19	500	0.250	130	420	0.213	90	250	0.175	44	170	0.125	21	500	0.275	140
20	480	0.260	120	400	0.221	90	240	0.182	44	160	0.130	21	480	0.286	140

Material Group ISO 513	K3 K4			N1 N5			N2 N3 N4			S1 S2 S4		
Hardness/Rm	< 350 HB									< 35 HRC		
Vc (m/min)	20-30			50-70			40-60			8-12		
D (mm)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)
1	7960	0.013	100	19110	0.024	450	15920	0.017	270	3180	0.007	22
1.5	5310	0.026	140	12740	0.049	620	10620	0.035	370	2120	0.014	30
2	3980	0.038	150	9550	0.070	670	7960	0.050	400	1590	0.020	32
2.5	3180	0.045	140	7640	0.084	640	6370	0.060	380	1270	0.024	30
3	2650	0.053	140	6370	0.098	620	5310	0.070	370	1060	0.028	30
3.5	2270	0.060	140	5460	0.112	610	4550	0.080	360	910	0.032	29
4	1990	0.068	130	4780	0.126	600	3980	0.090	360	800	0.036	29
5	1590	0.075	120	3820	0.140	530	3180	0.100	320	640	0.040	26
6	1330	0.083	110	3180	0.154	490	2650	0.110	290	530	0.044	23
7	1140	0.090	100	2730	0.168	460	2270	0.120	270	450	0.048	22
8	1000	0.098	100	2390	0.182	430	1990	0.130	260	400	0.052	21
9	880	0.105	90	2120	0.196	420	1770	0.140	250	350	0.056	20
10	800	0.120	100	1910	0.224	430	1590	0.160	250	320	0.064	20
11	720	0.128	90	1740	0.238	410	1450	0.170	250	290	0.068	20
12	660	0.135	90	1590	0.252	400	1330	0.180	240	270	0.072	19
13	610	0.143	90	1470	0.266	390	1220	0.190	230	240	0.076	18
14	570	0.150	90	1360	0.280	380	1140	0.200	230	230	0.080	18
15	530	0.158	80	1270	0.294	370	1060	0.210	220	210	0.084	18
16	500	0.165	80	1190	0.308	370	1000	0.220	220	200	0.088	18
17	470	0.173	80	1120	0.322	360	940	0.230	220	190	0.092	17
18	440	0.180	80	1060	0.336	360	880	0.240	210	180	0.096	17
19	420	0.188	80	1010	0.350	350	840	0.250	210	170	0.100	17
20	400	0.195	80	960	0.364	350	800	0.260	210	160	0.104	17

- INFO
- TYPHOON TA-HTA-4HTA
- TYPHOON PU-HPU
- TYPHOON SUH
- TYPHOON ALH
- TYPHOON HRC
- TYPHOON SUH MINI
- TYPHOON HL
- C-SD-TA
- LFTA
- SUTA
- HSS-HSS/CO DRILLS
- G2
- MDTA
- HF VH/UP
- MEF
- ALU
- MEX
- UH
- HSS/CO-HSSP END MILLS
- CARBIDE BURRS

234NVA

NVA type for tough materials, long

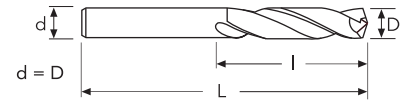


* $\varnothing 2\text{ mm}$ = HSS BR



P	M	K	N	S	H
★	★	☆	☆	☆	

★ 1st choice ☆ suitable



D(h8)	D Tol.	d	l	L	PACKAGING	EDP No.	Stock
0.50	0/-0.014	0.5	12	32	10	P134NB0050	●
0.60	0/-0.014	0.6	15	35	10	P134NB0060	●
0.70	0/-0.014	0.7	21	42	10	P134NB0070	●
0.80	0/-0.014	0.8	25	46	10	P134NB0080	●
0.90	0/-0.014	0.9	29	51	10	P134NB0090	●
1.00	0/-0.014	1	33	56	10	P134NB0100	●
1.10	0/-0.014	1.1	37	60	10	P134NB0110	●
1.20	0/-0.014	1.2	41	65	10	P134NB0120	●
1.30	0/-0.014	1.3	41	65	10	P134NB0130	●
1.40	0/-0.014	1.4	45	70	10	P134NB0140	●
1.50	0/-0.014	1.5	45	70	10	P134NB0150	●
1.60	0/-0.014	1.6	50	76	10	P134NB0160	●
1.70	0/-0.014	1.7	50	76	10	P134NB0170	●
1.80	0/-0.014	1.8	53	80	10	P134NB0180	●
1.90	0/-0.014	1.9	53	80	10	P134NB0190	●
2.00	0/-0.014	2	56	85	10	P234NVA0200	●
2.10	0/-0.014	2.1	56	85	10	P234NVA0210	●
2.20	0/-0.014	2.2	59	90	10	P234NVA0220	●
2.30	0/-0.014	2.3	59	90	10	P234NVA0230	●
2.40	0/-0.014	2.4	62	95	10	P234NVA0240	●
2.50	0/-0.014	2.5	62	95	10	P234NVA0250	●
2.60	0/-0.014	2.6	62	95	10	P234NVA0260	●
2.70	0/-0.014	2.7	66	100	10	P234NVA0270	●
2.80	0/-0.014	2.8	66	100	10	P234NVA0280	●
2.90	0/-0.014	2.9	66	100	10	P234NVA0290	●
3.00	0/-0.014	3	66	100	10	P234NVA0300	●
3.10	0/-0.018	3.1	69	106	10	P234NVA0310	●
3.20	0/-0.018	3.2	69	106	10	P234NVA0320	●
3.30	0/-0.018	3.3	69	106	10	P234NVA0330	●
3.40	0/-0.018	3.4	73	112	10	P234NVA0340	●
3.50	0/-0.018	3.5	73	112	10	P234NVA0350	●
3.60	0/-0.018	3.6	73	112	10	P234NVA0360	●
3.70	0/-0.018	3.7	73	112	10	P234NVA0370	●
3.80	0/-0.018	3.8	78	119	10	P234NVA0380	●
3.90	0/-0.018	3.9	78	119	10	P234NVA0390	●
4.00	0/-0.018	4	78	119	10	P234NVA0400	●
4.10	0/-0.018	4.1	78	119	10	P234NVA0410	●
4.20	0/-0.018	4.2	78	119	10	P234NVA0420	●
4.30	0/-0.018	4.3	82	126	10	P234NVA0430	●

● stock standard ○ non-standard stock ▽ stock exhaustion

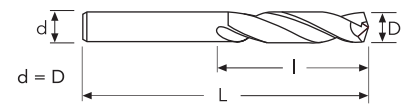
234NVA

NVA type for tough materials, long



P	M	K	N	S	H
★	★	☆	☆	☆	

★ 1st choice ☆ suitable



D(h8)	D Tol.	d	l	L	PACKAGING	EDP No.	Stock
4.40	0/-0.018	4.4	82	126	10	P234NVA0440	●
4.50	0/-0.018	4.5	82	126	10	P234NVA0450	●
4.60	0/-0.018	4.6	82	126	10	P234NVA0460	●
4.70	0/-0.018	4.7	82	126	10	P234NVA0470	●
4.80	0/-0.018	4.8	87	132	10	P234NVA0480	●
4.90	0/-0.018	4.9	87	132	10	P234NVA0490	●
5.00	0/-0.018	5	87	132	10	P234NVA0500	●
5.10	0/-0.018	5.1	87	132	10	P234NVA0510	●
5.20	0/-0.018	5.2	87	132	10	P234NVA0520	●
5.30	0/-0.018	5.3	87	132	10	P234NVA0530	●
5.40	0/-0.018	5.4	91	139	10	P234NVA0540	●
5.50	0/-0.018	5.5	91	139	10	P234NVA0550	●
5.60	0/-0.018	5.6	91	139	10	P234NVA0560	●
5.70	0/-0.018	5.7	91	139	10	P234NVA0570	●
5.80	0/-0.018	5.8	91	139	10	P234NVA0580	●
5.90	0/-0.018	5.9	91	139	10	P234NVA0590	●
6.00	0/-0.018	6	91	139	10	P234NVA0600	●
6.10	0/-0.022	6.1	97	148	5	P234NVA0610	●
6.20	0/-0.022	6.2	97	148	5	P234NVA0620	●
6.30	0/-0.022	6.3	97	148	5	P234NVA0630	●
6.40	0/-0.022	6.4	97	148	5	P234NVA0640	○
6.50	0/-0.022	6.5	97	148	5	P234NVA0650	●
6.60	0/-0.022	6.6	97	148	5	P234NVA0660	●
6.70	0/-0.022	6.7	97	148	5	P234NVA0670	●
6.80	0/-0.022	6.8	102	156	5	P234NVA0680	●
6.90	0/-0.022	6.9	102	156	5	P234NVA0690	●
7.00	0/-0.022	7	102	156	5	P234NVA0700	●
7.10	0/-0.022	7.1	102	156	5	P234NVA0710	●
7.20	0/-0.022	7.2	102	156	5	P234NVA0720	●
7.30	0/-0.022	7.3	102	156	5	P234NVA0730	○
7.40	0/-0.022	7.4	102	156	5	P234NVA0740	●
7.50	0/-0.022	7.5	102	156	5	P234NVA0750	●
7.60	0/-0.022	7.6	109	165	5	P234NVA0760	●
7.70	0/-0.022	7.7	109	165	5	P234NVA0770	●
7.80	0/-0.022	7.8	109	165	5	P234NVA0780	●
7.90	0/-0.022	7.9	109	165	5	P234NVA0790	●
8.00	0/-0.022	8	109	165	5	P234NVA0800	●
8.10	0/-0.022	8.1	109	165	5	P234NVA0810	●
8.20	0/-0.022	8.2	109	165	5	P234NVA0820	●

INFO
TYPHOON TA-HTA-4HTA
TYPHOON PU-HPU
TYPHOON SUH
TYPHOON ALH
TYPHOON HRC
TYPHOON SUH MINI
TYPHOON HL
C-SD-TA
LFTA
SUTA
HSS-HSS/CO DRILLS
G2
MDTA
HF VH/UP
MEF
ALU
MEX
UH
HSS/CO-HSSP END MILLS
CARBIDE BURRS

● stock standard ○ non-standard stock ▽ stock exhaustion

234NVA

Material Group ISO 513	P1 P2			P3 P4			M1 M2			M3 M4			K1 K2		
Hardness/Rm	500-700 N/mm ²			600-1000 N/mm ²			< 750 N/mm ²			550-850 N/mm ²			150-350 HB		
Vc (m/min)	20-30			15-25			12-16			8-12			20-30		
D (mm)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)
0.5	15920	0.008	130	12740	0.007	90	8920	0.006	50	6370	0.004	25	15920	0.009	140
0.8	9950	0.015	150	7960	0.013	100	5570	0.011	58	3980	0.008	30	9950	0.017	160
1	7960	0.020	160	6370	0.017	110	4460	0.014	62	3180	0.010	32	7960	0.022	180
1.5	5310	0.030	160	4250	0.026	110	2970	0.021	62	2120	0.015	32	5310	0.033	180
2	3980	0.040	160	3180	0.034	110	2230	0.028	62	1590	0.020	32	3980	0.044	180
2.5	3180	0.050	160	2550	0.043	110	1780	0.035	62	1270	0.025	32	3180	0.055	170
3	2650	0.060	160	2120	0.051	110	1490	0.042	63	1060	0.030	32	2650	0.066	170
3.5	2270	0.070	160	1820	0.060	110	1270	0.049	62	910	0.035	32	2270	0.077	170
4	1990	0.080	160	1590	0.068	110	1110	0.056	62	800	0.040	32	1990	0.088	180
5	1590	0.090	140	1270	0.077	100	890	0.063	56	640	0.045	29	1590	0.099	160
6	1330	0.100	130	1060	0.085	90	740	0.070	52	530	0.050	27	1330	0.110	150
7	1140	0.110	130	910	0.094	90	640	0.077	49	450	0.055	25	1140	0.121	140
8	1000	0.120	120	800	0.102	80	560	0.084	47	400	0.060	24	1000	0.132	130
9	880	0.130	110	710	0.111	80	500	0.091	46	350	0.065	23	880	0.143	130
10	800	0.140	110	640	0.119	80	450	0.098	44	320	0.070	22	800	0.154	120
11	720	0.150	110	580	0.128	70	410	0.105	43	290	0.075	22	720	0.165	120
12	660	0.160	110	530	0.136	70	370	0.112	41	270	0.080	22	660	0.176	120

Material Group ISO 513	K3 K4			N1 N5			N2 N3 N4			S1 S2 S4		
Hardness/Rm	< 350 HB									< 35 HRC		
Vc (m/min)	20-30			40-60			30-50			8-12		
D (mm)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)
0.5	15920	0.006	100	31850	0.011	360	25480	0.008	200	6370	0.003	20
0.8	9950	0.011	110	19900	0.021	420	15920	0.015	240	3980	0.006	24
1	7960	0.015	120	15920	0.028	450	12740	0.020	250	3180	0.008	25
1.5	5310	0.023	120	10620	0.042	450	8490	0.030	250	2120	0.012	25
2	3980	0.030	120	7960	0.056	450	6370	0.040	250	1590	0.016	25
2.5	3180	0.038	120	6370	0.070	450	5100	0.050	260	1270	0.020	25
3	2650	0.045	120	5310	0.084	450	4250	0.060	260	1060	0.024	25
3.5	2270	0.053	120	4550	0.098	450	3640	0.070	250	910	0.028	25
4	1990	0.060	120	3980	0.112	450	3180	0.080	250	800	0.032	26
5	1590	0.068	110	3180	0.126	400	2550	0.090	230	640	0.036	23
6	1330	0.075	100	2650	0.140	370	2120	0.100	210	530	0.040	21
7	1140	0.083	90	2270	0.154	350	1820	0.110	200	450	0.044	20
8	1000	0.090	90	1990	0.168	330	1590	0.120	190	400	0.048	19
9	880	0.098	90	1770	0.182	320	1420	0.130	180	350	0.052	18
10	800	0.105	80	1590	0.196	310	1270	0.140	180	320	0.056	18
11	720	0.113	80	1450	0.210	300	1160	0.150	170	290	0.060	17
12	660	0.120	80	1330	0.224	300	1060	0.160	170	270	0.064	17

- INFO
- TYPHOON TA-HTA-4HTA
- TYPHOON PU-HPU
- TYPHOON SUH
- TYPHOON ALH
- TYPHOON HRC
- TYPHOON SUH MINI
- TYPHOON HL
- C-SD-TA
- LFTA
- SUTA
- HSS-HSS/CO DRILLS
- G2
- MDTA
- HF VH/UP
- MEF
- ALU
- MEX
- UH
- HSS/CO-HSSP END MILLS
- CARBIDE BURRS

234LS-234LSTH

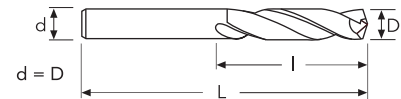
LS type for deep holes, long (234LS),
 LS type for deep holes, PV15 coated, long (234LSTH)

DIN 340	LS	HSS/CO OX	HSS/CO PV15	130°	35-40°
		234LS	234LSTH		



P	M	K	N	S	H
★	☆	★			

★ 1st choice ☆ suitable



D(h8)	D Tol.	d	l	L	PACKAGING	234LS		234LSTH	
						EDP No.	Stock	EDP No.	Stock
2.00	0/-0.014	2	56	85	10	P234LS0200	●	P234LSTH0200	●
2.10	0/-0.014	2.1	56	85	10	P234LS0210	●	P234LSTH0210	●
2.20	0/-0.014	2.2	59	90	10	P234LS0220	●	P234LSTH0220	●
2.30	0/-0.014	2.3	59	90	10	P234LS0230	●	P234LSTH0230	●
2.40	0/-0.014	2.4	62	95	10	P234LS0240	●	P234LSTH0240	●
2.50	0/-0.014	2.5	62	95	10	P234LS0250	●	P234LSTH0250	●
2.60	0/-0.014	2.6	62	95	10	P234LS0260	●	P234LSTH0260	●
2.70	0/-0.014	2.7	66	100	10	P234LS0270	●	P234LSTH0270	●
2.80	0/-0.014	2.8	66	100	10	P234LS0280	●	P234LSTH0280	●
2.90	0/-0.014	2.9	66	100	10	P234LS0290	●	P234LSTH0290	●
3.00	0/-0.014	3	66	100	10	P234LS0300	●	P234LSTH0300	●
3.10	0/-0.018	3.1	69	106	10	P234LS0310	●	P234LSTH0310	●
3.20	0/-0.018	3.2	69	106	10	P234LS0320	●	P234LSTH0320	●
3.30	0/-0.018	3.3	69	106	10	P234LS0330	●	P234LSTH0330	●
3.40	0/-0.018	3.4	73	112	10	P234LS0340	●	P234LSTH0340	●
3.50	0/-0.018	3.5	73	112	10	P234LS0350	●	P234LSTH0350	●
3.60	0/-0.018	3.6	73	112	10	P234LS0360	●	P234LSTH0360	●
3.70	0/-0.018	3.7	73	112	10	P234LS0370	●	P234LSTH0370	●
3.80	0/-0.018	3.8	78	119	10	P234LS0380	●	P234LSTH0380	●
3.90	0/-0.018	3.9	78	119	10	P234LS0390	●	P234LSTH0390	●
4.00	0/-0.018	4	78	119	10	P234LS0400	●	P234LSTH0400	●
4.20	0/-0.018	4.2	78	119	10	P234LS0420	●	P234LSTH0420	●
4.50	0/-0.018	4.5	82	126	10	P234LS0450	●	P234LSTH0450	●
4.80	0/-0.018	4.8	87	132	10	P234LS0480	●	P234LSTH0480	●
5.00	0/-0.018	5	87	132	10	P234LS0500	●	P234LSTH0500	●
5.20	0/-0.018	5.2	87	132	10	P234LS0520	●	P234LSTH0520	●
5.50	0/-0.018	5.5	91	139	10	P234LS0550	●	P234LSTH0550	●
5.80	0/-0.018	5.8	91	139	10	P234LS0580	●	P234LSTH0580	●
6.00	0/-0.018	6	91	139	10	P234LS0600	●	P234LSTH0600	●
6.20	0/-0.022	6.2	97	148	5	P234LS0620	●	P234LSTH0620	●
6.50	0/-0.022	6.5	97	148	5	P234LS0650	●	P234LSTH0650	●
6.80	0/-0.022	6.8	102	156	5	P234LS0680	●	P234LSTH0680	●
7.00	0/-0.022	7	102	156	5	P234LS0700	●	P234LSTH0700	●
7.20	0/-0.022	7.2	102	156	5	P234LS0720	●		
7.50	0/-0.022	7.5	102	156	5	P234LS0750	●	P234LSTH0750	●
7.80	0/-0.022	7.8	109	165	5	P234LS0780	●		
8.00	0/-0.022	8	109	165	5	P234LS0800	●	P234LSTH0800	●
8.20	0/-0.022	8.2	109	165	5	P234LS0820	●		
8.50	0/-0.022	8.5	109	165	5	P234LS0850	●	P234LSTH0850	●

● stock standard ○ non-standard stock ▽ stock exhaustion

234LS

Material Group ISO 513	P1 P2			P3 P4			M1 M2			K1 K2		
	500-700 N/mm ²			600-1000 N/mm ²			< 750 N/mm ²			150-350 HB		
Hardness/Rm	500-700 N/mm ²			600-1000 N/mm ²			< 750 N/mm ²			150-350 HB		
Vc (m/min)	20-30			15-25			10-14			20-30		
D (mm)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)
2	3980	0.040	160	3180	0.034	110	1910	0.028	53	3980	0.044	180
2.5	3180	0.050	160	2550	0.043	110	1530	0.035	54	3180	0.055	170
3	2650	0.060	160	2120	0.051	110	1270	0.042	53	2650	0.066	170
3.5	2270	0.070	160	1820	0.060	110	1090	0.049	53	2270	0.077	170
4	1990	0.080	160	1590	0.068	110	960	0.056	54	1990	0.088	180
5	1590	0.090	140	1270	0.077	100	760	0.063	48	1590	0.099	160
6	1330	0.100	130	1060	0.085	90	640	0.070	45	1330	0.110	150
7	1140	0.110	130	910	0.094	90	550	0.077	42	1140	0.121	140
8	1000	0.120	120	800	0.102	80	480	0.084	40	1000	0.132	130
9	880	0.130	110	710	0.111	80	420	0.091	38	880	0.143	130
10	800	0.140	110	640	0.119	80	380	0.098	37	800	0.154	120
11	720	0.150	110	580	0.128	70	350	0.105	37	720	0.165	120
12	660	0.160	110	530	0.136	70	320	0.112	36	660	0.176	120
13	610	0.170	100	490	0.145	70	290	0.119	35	610	0.187	110

234LSTH

Material Group ISO 513	P1 P2			P3 P4			M1 M2			K1 K2		
	500-700 N/mm ²			600-1000 N/mm ²			< 750 N/mm ²			150-350 HB		
Hardness/Rm	500-700 N/mm ²			600-1000 N/mm ²			< 750 N/mm ²			150-350 HB		
Vc (m/min)	25-35			20-30			16-20			25-35		
D (mm)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)
2	4780	0.040	190	3980	0.034	140	2870	0.028	80	4780	0.044	210
2.5	3820	0.050	190	3180	0.043	140	2290	0.035	80	3820	0.055	210
3	3180	0.060	190	2650	0.051	140	1910	0.042	80	3180	0.066	210
3.5	2730	0.070	190	2270	0.060	140	1640	0.049	80	2730	0.077	210
4	2390	0.080	190	1990	0.068	140	1430	0.056	80	2390	0.088	210
5	1910	0.090	170	1590	0.077	120	1150	0.063	72	1910	0.099	190
6	1590	0.100	160	1330	0.085	110	960	0.070	67	1590	0.110	170
7	1360	0.110	150	1140	0.094	110	820	0.077	63	1360	0.121	160
8	1190	0.120	140	1000	0.102	100	720	0.084	60	1190	0.132	160
9	1060	0.130	140	880	0.111	100	640	0.091	58	1060	0.143	150
10	960	0.140	130	800	0.119	100	570	0.098	56	960	0.154	150
11	870	0.150	130	720	0.128	90	520	0.105	55	870	0.165	140
12	800	0.160	130	660	0.136	90	480	0.112	54	800	0.176	140
13	730	0.170	120	610	0.145	90	440	0.119	52	730	0.187	140

2691LS-2691LSTH

LS type for deep holes, extra-long/1 (2691LS);
 LS type for deep holes, PV15 coated, extra-long/1 (2691LSTH)

DIN 1869/1	LS	HSS/Co BR	HSS/CO PV15	130°	35-40°
		2691LS	2691LSTH		



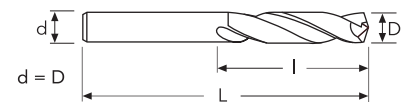
2691LS



2691LSTH

P	M	K	N	S	H
★	☆	★			

★ 1st choice ☆ suitable



D(h8)	D Tol.	d	l	L	PACKAGING	2691LS		2691LSTH	
						EDP No.	Stock	EDP No.	Stock
2.00	0/-0.014	2	85	125	10	P2691LS0200	●	P2691LSTH0200	●
2.50	0/-0.014	2.5	95	140	10	P2691LS0250	●	P2691LSTH0250	●
3.00	0/-0.014	3	100	150	10	P2691LS0300	●	P2691LSTH0300	●
3.50	0/-0.018	3.5	115	165	10	P2691LS0350	●	P2691LSTH0350	●
4.00	0/-0.018	4	120	175	10	P2691LS0400	●	P2691LSTH0400	●
4.50	0/-0.018	4.5	125	185	10	P2691LS0450	●	P2691LSTH0450	●
5.00	0/-0.018	5	135	195	10	P2691LS0500	●	P2691LSTH0500	●
5.50	0/-0.018	5.5	140	205	10	P2691LS0550	●	P2691LSTH0550	●
6.00	0/-0.018	6	140	205	10	P2691LS0600	●	P2691LSTH0600	●
6.50	0/-0.022	6.5	150	215	5	P2691LS0650	●	P2691LSTH0650	●
6.75	0/-0.022	6.75	155	225	5	P2691LS0675	●		
7.00	0/-0.022	7	155	225	5	P2691LS0700	●	P2691LSTH0700	●
7.50	0/-0.022	7.5	155	225	5	P2691LS0750	●	P2691LSTH0750	●
8.00	0/-0.022	8	165	240	5	P2691LS0800	●	P2691LSTH0800	●
8.50	0/-0.022	8.5	165	240	5	P2691LS0850	●	P2691LSTH0850	●
9.00	0/-0.022	9	175	250	5	P2691LS0900	●	P2691LSTH0900	●
9.50	0/-0.022	9.5	175	250	5	P2691LS0950	●	P2691LSTH0950	●
10.00	0/-0.022	10	185	265	5	P2691LS1000	●	P2691LSTH1000	●
10.50	0/-0.027	10.5	185	265	5	P2691LS1050	●	P2691LSTH1050	●
11.00	0/-0.027	11	195	280	5	P2691LS1100	●	P2691LSTH1100	●
11.50	0/-0.027	11.5	195	280	5	P2691LS1150	●	P2691LSTH1150	●
12.00	0/-0.027	12	205	295	5	P2691LS1200	●	P2691LSTH1200	●
12.50	0/-0.027	12.5	205	295	5	P2691LS1250	●	P2691LSTH1250	●
13.00	0/-0.027	13	205	295	5	P2691LS1300	●	P2691LSTH1300	●

- INFO
- TYPHOON TA-HTA-4HTA
- TYPHOON PU-HPU
- TYPHOON SUH
- TYPHOON ALH
- TYPHOON HRC
- TYPHOON SUH MINI
- TYPHOON HL
- C-SD-TA
- LFTA
- SUTA
- HSS-HSS/CO DRILLS
- G2
- MDTA
- HF VH/UP
- MEF
- ALU
- MEX
- UH
- HSS/CO-HSSP END MILLS
- CARBIDE BURRS

● stock standard ○ non-standard stock ▽ stock exhaustion

2691LS

Material Group ISO 513	P1 P2			P3 P4			M1 M2			K1 K2		
	500-700 N/mm ²			600-1000 N/mm ²			< 750 N/mm ²			150-350 HB		
Hardness/Rm	500-700 N/mm ²			600-1000 N/mm ²			< 750 N/mm ²			150-350 HB		
Vc (m/min)	20-24			16-20			8-12			20-24		
D (mm)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)
2	3500	0.032	110	2870	0.027	80	1590	0.022	36	3500	0.035	125
2.5	2800	0.040	110	2290	0.034	80	1270	0.028	36	2800	0.044	125
3	2340	0.048	110	1910	0.041	80	1060	0.034	36	2340	0.053	125
3.5	2000	0.056	110	1640	0.048	80	910	0.039	36	2000	0.062	125
4	1750	0.064	110	1430	0.054	80	800	0.045	36	1750	0.070	125
5	1400	0.072	100	1150	0.061	70	640	0.050	32	1400	0.079	110
6	1170	0.080	95	960	0.068	65	530	0.056	30	1170	0.088	105
7	1000	0.088	90	820	0.075	60	450	0.062	28	1000	0.097	95
8	880	0.096	85	720	0.082	60	400	0.067	27	880	0.106	95
9	780	0.104	80	640	0.088	55	350	0.073	25	780	0.114	90
10	700	0.112	80	570	0.095	55	320	0.078	25	700	0.123	85
11	640	0.120	75	520	0.102	55	290	0.084	24	640	0.132	85
12	580	0.128	75	480	0.109	50	270	0.090	24	580	0.141	80
13	540	0.136	75	440	0.116	50	240	0.095	23	540	0.150	80

2691LSTH

Material Group ISO 513	P1 P2			P3 P4			M1 M2			K1 K2		
	500-700 N/mm ²			600-1000 N/mm ²			< 750 N/mm ²			150-350 HB		
Hardness/Rm	500-700 N/mm ²			600-1000 N/mm ²			< 750 N/mm ²			150-350 HB		
Vc (m/min)	24-28			20-24			10-14			24-28		
D (mm)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)
2	4140	0.032	132	3503	0.027	95	1911	0.022	43	4140	0.035	146
2.5	3312	0.040	132	2803	0.034	95	1529	0.028	43	3312	0.044	146
3	2760	0.048	132	2335	0.041	95	1274	0.034	43	2760	0.053	146
3.5	2366	0.056	132	2002	0.048	95	1092	0.039	43	2366	0.062	146
4	2070	0.064	132	1752	0.054	95	955	0.045	43	2070	0.070	146
5	1656	0.072	119	1401	0.061	86	764	0.050	39	1656	0.079	131
6	1380	0.080	110	1168	0.068	79	637	0.056	36	1380	0.088	121
7	1183	0.088	104	1001	0.075	75	546	0.062	34	1183	0.097	115
8	1035	0.096	99	876	0.082	71	478	0.067	32	1035	0.106	109
9	920	0.104	96	778	0.088	69	425	0.073	31	920	0.114	105
10	828	0.112	93	701	0.095	67	382	0.078	30	828	0.123	102
11	753	0.120	90	637	0.102	65	347	0.084	29	753	0.132	99
12	690	0.128	88	584	0.109	64	318	0.090	29	690	0.141	97
13	637	0.136	87	539	0.116	62	294	0.095	28	637	0.150	95

1692LS

Material Group ISO 513	P1 P2			P3 P4			K1 K2								
	Hardness/Rm			600-1000 N/mm ²			150-350 HB								
Vc (m/min)	20-24			16-20			20-24								
D (mm)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)						
3	2340	0.040	95	1910	0.034	65	2340	0.044	105						
3.5	2000	0.048	95	1640	0.041	65	2000	0.053	105						
4	1750	0.056	100	1430	0.048	70	1750	0.062	110						
5	1400	0.064	90	1150	0.054	65	1400	0.070	100						
6	1170	0.072	85	960	0.061	60	1170	0.079	95						
7	1000	0.080	80	820	0.068	55	1000	0.088	90						
8	880	0.088	75	720	0.075	55	880	0.097	85						
9	780	0.096	75	640	0.082	50	780	0.106	80						
10	700	0.104	75	570	0.088	50	700	0.114	80						
11	640	0.112	70	520	0.095	50	640	0.123	80						
12	580	0.120	70	480	0.102	50	580	0.132	75						
13	540	0.128	70	440	0.109	50	540	0.141	75						

- INFO
- TYPHOON TA-HTA-4HTA
- TYPHOON PU-HPU
- TYPHOON SUH
- TYPHOON ALH
- TYPHOON HRC
- TYPHOON SUH MINI
- TYPHOON HL
- C-SD-TA
- LFTA
- SUTA
- HSS-HSS/CO DRILLS
- G2
- MDTA
- HF VH/UP
- MEF
- ALU
- MEX
- UH
- HSS/CO-HSSP END MILLS
- CARBIDE BURRS

1693LS

Material Group ISO 513	P1 P2			P3 P4			K1 K2					
	500-700 N/mm ²			600-1000 N/mm ²			150-350 HB					
Hardness/Rm	15-25			10-20			15-25					
Vc (m/min)	15-25			10-20			15-25					
D (mm)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)			
3.5	1820	0.045	80	1360	0.038	50	1820	0.050	90			
4	1590	0.053	85	1190	0.045	55	1590	0.058	90			
5	1270	0.060	75	960	0.051	50	1270	0.066	85			
6	1060	0.068	70	800	0.057	45	1060	0.074	80			
7	910	0.075	70	680	0.064	45	910	0.083	75			
8	800	0.083	65	600	0.070	40	800	0.091	75			
9	710	0.090	65	530	0.077	40	710	0.099	70			
10	640	0.098	60	480	0.083	40	640	0.107	70			
11	580	0.105	60	430	0.089	40	580	0.116	65			
12	530	0.113	60	400	0.096	40	530	0.124	65			
13	490	0.120	60	370	0.102	40	490	0.132	65			

- INFO
- TYPHOON TA-HTA-4HTA
- TYPHOON PU-HPU
- TYPHOON SUH
- TYPHOON ALH
- TYPHOON HRC
- TYPHOON SUH MINI
- TYPHOON HL
- C-SD-TA
- LFTA
- SUTA
- HSS-HSS/CO DRILLS
- G2
- MDTA
- HF VH/UP
- MEF
- ALU
- MEX
- UH
- HSS/CO-HSSP END MILLS
- CARBIDE BURRS

145N-145NTI

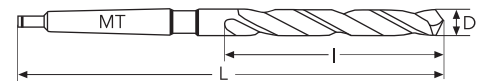
N type for general purpose, MT shank, short (145N),
 N type for general purpose, MT shank, TiN coated, short (145NTI)

DIN 345	H	HSS OX	HSS TIN	118°	25-30°
		145N	145NTI		



P	M	K	N	S	H
★		☆	☆		

★ 1st choice ☆ suitable



D(h8)	D Tol.	MT	I	L	PACKAGING	145N		145NTI	
						EDP No.	Stock	EDP No.	Stock
5.00	0/-0.018	1	52	133	1	P145N0500	●		
5.25	0/-0.018	1	52	133	1	P145N0525	○		
5.50	0/-0.018	1	57	138	1	P145N0550	●		
5.75	0/-0.018	1	57	138	1	P145N0575	○		
6.00	0/-0.018	1	57	138	1	P145N0600	●		
6.25	0/-0.022	1	63	144	1	P145N0625	○		
6.50	0/-0.022	1	63	144	1	P145N0650	●		
6.75	0/-0.022	1	69	150	1	P145N0675	●		
7.00	0/-0.022	1	69	150	1	P145N0700	●		
7.25	0/-0.022	1	69	150	1	P145N0725	○		
7.50	0/-0.022	1	69	150	1	P145N0750	●		
7.75	0/-0.022	1	75	156	1	P145N0775	○		
8.00	0/-0.022	1	75	156	1	P145N0800	●		
8.25	0/-0.022	1	75	156	1	P145N0825	○		
8.50	0/-0.022	1	75	156	1	P145N0850	●		
8.75	0/-0.022	1	81	162	1	P145N0875	○		
9.00	0/-0.022	1	81	162	1	P145N0900	●		
9.25	0/-0.022	1	81	162	1	P145N0925	○		
9.50	0/-0.022	1	81	162	1	P145N0950	●		
9.75	0/-0.022	1	87	168	1	P145N0975	○		
10.00	0/-0.022	1	87	168	1	P145N1000	●		
10.25	0/-0.027	1	87	168	1	P145N1025	●		
10.50	0/-0.027	1	87	168	1	P145N1050	●		
10.75	0/-0.027	1	94	175	1	P145N1075	○		
11.00	0/-0.027	1	94	175	1	P145N1100	●		
11.25	0/-0.027	1	94	175	1	P145N1125	○		
11.50	0/-0.027	1	94	175	1	P145N1150	●		
11.75	0/-0.027	1	94	175	1	P145N1175	○		
12.00	0/-0.027	1	101	182	1	P145N1200	●		
12.25	0/-0.027	1	101	182	1	P145N1225	○		
12.50	0/-0.027	1	101	182	1	P145N1250	●		
12.75	0/-0.027	1	101	182	1	P145N1275	○		
13.00	0/-0.027	1	101	182	1	P145N1300	●	P145NTI1300	●
13.25	0/-0.027	1	108	189	1	P145N1325	●		
13.50	0/-0.027	1	108	189	1	P145N1350	●	P145NTI1350	●
13.75	0/-0.027	1	108	189	1	P145N1375	●		
14.00	0/-0.027	1	108	189	1	P145N1400	●	P145NTI1400	●
14.25	0/-0.027	2	114	212	1	P145N1425	●		
14.50	0/-0.027	2	114	212	1	P145N1450	●	P145NTI1450	●

INFO
TYPHOON TA-HTA-4HTA
TYPHOON PU-HPU
TYPHOON SUH
TYPHOON ALH
TYPHOON HRC
TYPHOON SUH MINI
TYPHOON HL
C-SD-TA
LFTA
SUTA
HSS-HSS/CO DRILLS
G2
MDTA
HF VH/UP
MEF
ALU
MEX
UH
HSS/CO-HSSP END MILLS
CARBIDE BURRS

● stock standard ○ non-standard stock ▽ stock exhaustion

145N-145NTI

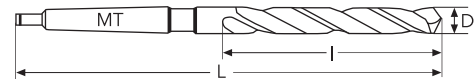
N type for general purpose, MT shank, short (145N),
 N type for general purpose, MT shank, TiN coated, short (145NTI)

DIN 345	H	HSS OX	HSS TIN	118°	25-30°
		145N	145NTI		



P	M	K	N	S	H
★		☆	☆		

★ 1st choice ☆ suitable



						145N		145NTI	
D(h8)	D Tol.	MT	I	L	PACKAGING	EDP No.	Stock	EDP No.	Stock
14.75	0/-0.027	2	114	212	1	P145N1475	●		
15.00	0/-0.027	2	114	212	1	P145N1500	●	P145NTI1500	●
15.25	0/-0.027	2	120	218	1	P145N1525	●		
15.50	0/-0.027	2	120	218	1	P145N1550	●	P145NTI1550	●
15.75	0/-0.027	2	120	218	1	P145N1575	●		
16.00	0/-0.027	2	120	218	1	P145N1600	●	P145NTI1600	●
16.25	0/-0.027	2	125	223	1	P145N1625	●		
16.50	0/-0.027	2	125	223	1	P145N1650	●	P145NTI1650	●
16.75	0/-0.027	2	125	223	1	P145N1675	●		
17.00	0/-0.027	2	125	223	1	P145N1700	●	P145NTI1700	●
17.25	0/-0.027	2	130	228	1	P145N1725	●		
17.50	0/-0.027	2	130	228	1	P145N1750	●	P145NTI1750	●
17.75	0/-0.027	2	130	228	1	P145N1775	●		
18.00	0/-0.027	2	130	228	1	P145N1800	●	P145NTI1800	●
18.25	0/-0.033	2	135	233	1	P145N1825	●		
18.50	0/-0.033	2	135	233	1	P145N1850	●	P145NTI1850	●
18.75	0/-0.033	2	135	233	1	P145N1875	●		
19.00	0/-0.033	2	135	233	1	P145N1900	●	P145NTI1900	●
19.25	0/-0.033	2	140	238	1	P145N1925	●		
19.50	0/-0.033	2	140	238	1	P145N1950	●	P145NTI1950	●
19.75	0/-0.033	2	140	238	1	P145N1975	●		
20.00	0/-0.033	2	140	238	1	P145N2000	●	P145NTI2000	●
20.25	0/-0.033	2	145	243	1	P145N2025	●		
20.50	0/-0.033	2	145	243	1	P145N2050	●	P145NTI2050	●
20.75	0/-0.033	2	145	243	1	P145N2075	●		
21.00	0/-0.033	2	145	243	1	P145N2100	●	P145NTI2100	●
21.25	0/-0.033	2	150	248	1	P145N2125	●		
21.50	0/-0.033	2	150	248	1	P145N2150	●	P145NTI2150	●
21.75	0/-0.033	2	150	248	1	P145N2175	●		
22.00	0/-0.033	2	150	248	1	P145N2200	●	P145NTI2200	●
22.25	0/-0.033	2	150	248	1	P145N2225	●		
22.50	0/-0.033	2	155	253	1	P145N2250	●	P145NTI2250	●
22.75	0/-0.033	2	155	253	1	P145N2275	●		
23.00	0/-0.033	2	155	253	1	P145N2300	●	P145NTI2300	●
23.25	0/-0.033	3	155	276	1	P145N2325	●		
23.50	0/-0.033	3	155	276	1	P145N2350	●	P145NTI2350	●
23.75	0/-0.033	3	160	281	1	P145N2375	●		
24.00	0/-0.033	3	160	281	1	P145N2400	●	P145NTI2400	●
24.25	0/-0.033	3	160	281	1	P145N2425	●		

● stock standard ○ non-standard stock ▽ stock exhaustion

145N-145NTI

N type for general purpose, MT shank, short (145N),
 N type for general purpose, MT shank, TiN coated, short (145NTI)

DIN 345	H	HSS OX	HSS TIN	118°	25-30°
		145N	145NTI		



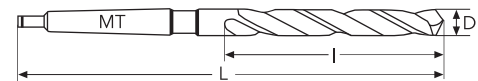
145N



145NTI

P	M	K	N	S	H
★		☆	☆		

★ 1st choice ☆ suitable



D(h8)	D Tol.	MT	I	L	PACKAGING	145N		145NTI	
						EDP No.	Stock	EDP No.	Stock
24.50	0/-0.033	3	160	281	1	P145N2450	●	P145NTI2450	●
24.75	0/-0.033	3	160	281	1	P145N2475	●		
25.00	0/-0.033	3	160	281	1	P145N2500	●	P145NTI2500	●
25.25	0/-0.033	3	165	286	1	P145N2525	○		
25.50	0/-0.033	3	165	286	1	P145N2550	●		
25.75	0/-0.033	3	165	286	1	P145N2575	○		
26.00	0/-0.033	3	165	286	1	P145N2600	●	P145NTI2600	●
26.25	0/-0.033	3	165	286	1	P145N2625	○		
26.50	0/-0.033	3	165	286	1	P145N2650	●		
26.75	0/-0.033	3	170	291	1	P145N2675	○		
27.00	0/-0.033	3	170	291	1	P145N2700	●	P145NTI2700	●
27.25	0/-0.033	3	170	291	1	P145N2725	○		
27.50	0/-0.033	3	170	291	1	P145N2750	●		
27.75	0/-0.033	3	170	291	1	P145N2775	○		
28.00	0/-0.033	3	170	291	1	P145N2800	●	P145NTI2800	●
28.25	0/-0.033	3	175	296	1	P145N2825	○		
28.50	0/-0.033	3	175	296	1	P145N2850	●		
28.75	0/-0.033	3	175	296	1	P145N2875	○		
29.00	0/-0.033	3	175	296	1	P145N2900	●	P145NTI2900	●
29.25	0/-0.033	3	175	296	1	P145N2925	○		
29.50	0/-0.033	3	175	296	1	P145N2950	●		
29.75	0/-0.033	3	175	296	1	P145N2975	○		
30.00	0/-0.033	3	175	296	1	P145N3000	●	P145NTI3000	●
30.25	0/-0.039	3	180	301	1	P145N3025	○		
30.50	0/-0.039	3	180	301	1	P145N3050	●		
30.75	0/-0.039	3	180	301	1	P145N3075	○		
31.00	0/-0.039	3	180	301	1	P145N3100	●		
31.25	0/-0.039	3	180	301	1	P145N3125	○		
31.50	0/-0.039	3	180	301	1	P145N3150	●		
31.75	0/-0.039	3	185	306	1	P145N3175	○		
32.00	0/-0.039	4	185	334	1	P145N3200	●		
32.50	0/-0.039	4	185	334	1	P145N3250	●		
33.00	0/-0.039	4	185	334	1	P145N3300	●		
33.50	0/-0.039	4	185	334	1	P145N3350	●		
34.00	0/-0.039	4	190	339	1	P145N3400	●		
34.50	0/-0.039	4	190	339	1	P145N3450	●		
35.00	0/-0.039	4	190	339	1	P145N3500	●		
35.50	0/-0.039	4	190	339	1	P145N3550	●		
36.00	0/-0.039	4	195	344	1	P145N3600	●		

INFO
TYPHOON TA-HTA-4HTA
TYPHOON PU-HPU
TYPHOON SUH
TYPHOON ALH
TYPHOON HRC
TYPHOON SUH MINI
TYPHOON HL
C-SD-TA
LFTA
SUTA
HSS-HSS/CO DRILLS
G2
MDTA
HF VH/UP
MEF
ALU
MEX
UH
HSS/CO-HSSP END MILLS
CARBIDE BURRS

● stock standard ○ non-standard stock ▽ stock exhaustion

145N-145NTI

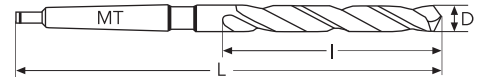
N type for general purpose, MT shank, short (145N),
 N type for general purpose, MT shank, TiN coated, short (145NTI)

DIN 345		HSS OX	HSS TIN		
		145N	145NTI		



P	M	K	N	S	H
★		☆	☆		

★ 1st choice ☆ suitable



D(h8)	D Tol.	MT	I	L	PACKAGING	145N		145NTI	
						EDP No.	Stock	EDP No.	Stock
36.50	0/-0.039	4	195	344	1	P145N3650	●		
37.00	0/-0.039	4	195	344	1	P145N3700	●		
37.50	0/-0.039	4	195	344	1	P145N3750	●		
38.00	0/-0.039	4	200	349	1	P145N3800	●		
38.50	0/-0.039	4	200	349	1	P145N3850	●		
39.00	0/-0.039	4	200	349	1	P145N3900	●		
39.50	0/-0.039	4	200	349	1	P145N3950	●		
40.00	0/-0.039	4	200	349	1	P145N4000	●		
40.50	0/-0.039	4	205	354	1	P145N4050	●		
41.00	0/-0.039	4	205	354	1	P145N4100	●		
42.00	0/-0.039	4	205	354	1	P145N4200	●		
43.00	0/-0.039	4	210	359	1	P145N4300	●		
44.00	0/-0.039	4	210	359	1	P145N4400	●		
45.00	0/-0.039	4	210	359	1	P145N4500	●		
46.00	0/-0.039	4	215	364	1	P145N4600	●		
47.00	0/-0.039	4	215	364	1	P145N4700	●		
48.00	0/-0.039	4	220	369	1	P145N4800	●		
49.00	0/-0.039	4	220	369	1	P145N4900	●		
50.00	0/-0.039	4	220	369	1	P145N5000	●		
55.00	0/-0.046	5	230	417	1	P145N5500	●		
60.00	0/-0.046	5	235	422	1	P145N6000	●		

● stock standard ○ non-standard stock ▽ stock exhaustion

CUTTING PARAMETERS

145N

Material Group ISO 513	P1 P2			P3 P4			K1 K2			N1 N5			N2 N3 N4		
Hardness/Rm	500-700 N/mm ²			600-1000 N/mm ²			150-350 HB								
Vc (m/min)	25-35			20-30			25-35			50-70			40-60		
D (mm)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)
5	1910	0.100	190	1590	0.085	140	1910	0.110	210	3820	0.140	530	3180	0.100	320
6	1590	0.120	190	1330	0.102	140	1590	0.132	210	3180	0.168	530	2650	0.120	320
7	1360	0.140	190	1140	0.119	140	1360	0.154	210	2730	0.196	540	2270	0.140	320
8	1190	0.160	190	1000	0.136	140	1190	0.176	210	2390	0.224	540	1990	0.160	320
9	1060	0.180	190	880	0.153	130	1060	0.198	210	2120	0.252	530	1770	0.180	320
10	960	0.200	190	800	0.170	140	960	0.220	210	1910	0.280	530	1590	0.200	320
11	870	0.208	180	720	0.177	130	870	0.229	200	1740	0.291	510	1450	0.208	300
12	800	0.216	170	660	0.184	120	800	0.238	190	1590	0.302	480	1330	0.216	290
13	730	0.224	160	610	0.190	120	730	0.246	180	1470	0.314	460	1220	0.224	270
14	680	0.232	160	570	0.197	110	680	0.255	170	1360	0.325	440	1140	0.232	260
15	640	0.240	150	530	0.204	110	640	0.264	170	1270	0.336	430	1060	0.240	250
16	600	0.250	150	500	0.213	110	600	0.275	170	1190	0.350	420	1000	0.250	250
17	560	0.265	150	470	0.225	110	560	0.292	160	1120	0.371	420	940	0.265	250
18	530	0.280	150	440	0.238	100	530	0.308	160	1060	0.392	420	880	0.280	250
19	500	0.295	150	420	0.251	110	500	0.325	160	1010	0.413	420	840	0.295	250
20	480	0.315	150	400	0.268	110	480	0.347	170	960	0.441	420	800	0.315	250
22	430	0.330	140	360	0.281	100	430	0.363	160	870	0.462	400	720	0.330	240
25	380	0.350	130	320	0.298	100	380	0.385	150	760	0.490	370	640	0.350	220
27	350	0.370	130	290	0.315	90	350	0.407	140	710	0.518	370	590	0.370	220
30	320	0.400	130	270	0.340	90	320	0.440	140	640	0.560	360	530	0.400	210
35	270	0.450	120	230	0.383	90	270	0.495	130	550	0.630	350	450	0.450	200
40	240	0.500	120	200	0.425	90	240	0.550	130	480	0.700	340	400	0.500	200
45	210	0.560	120	180	0.476	90	210	0.616	130	420	0.784	330	350	0.560	200
50	190	0.630	120	160	0.536	90	190	0.693	130	380	0.882	340	320	0.630	200
55	170	0.700	120	140	0.595	80	170	0.770	130	350	0.980	340	290	0.700	200
60	160	0.800	130	130	0.680	90	160	0.880	140	320	1.120	360	270	0.800	220

145NTI

Material Group ISO 513	P1 P2			P3 P4			K1 K2			N1 N5			N2 N3 N4		
Hardness/Rm	500-700 N/mm ²			600-1000 N/mm ²			150-350 HB								
Vc (m/min)	30-40			25-35			30-40			60-80			50-70		
D (mm)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)
13	860	0.224	190	730	0.190	139	860	0.246	210	1710	0.314	540	1470	0.224	330
14	800	0.232	190	680	0.197	134	800	0.255	200	1590	0.325	520	1360	0.232	320
15	740	0.240	180	640	0.204	131	740	0.264	200	1490	0.336	500	1270	0.240	300
16	700	0.250	180	600	0.213	128	700	0.275	190	1390	0.350	490	1190	0.250	300
17	660	0.265	170	560	0.225	126	660	0.292	190	1310	0.371	490	1120	0.265	300
18	620	0.280	170	530	0.238	126	620	0.308	190	1240	0.392	490	1060	0.280	300
19	590	0.295	170	500	0.251	125	590	0.325	190	1170	0.413	480	1010	0.295	300
20	560	0.315	180	480	0.268	129	560	0.347	190	1110	0.441	490	960	0.315	300
22	510	0.330	170	430	0.281	121	510	0.363	190	1010	0.462	470	870	0.330	290
25	450	0.350	160	380	0.298	113	450	0.385	170	890	0.490	440	760	0.350	270
27	410	0.370	150	350	0.315	110	410	0.407	170	830	0.518	430	710	0.370	260
30	370	0.400	150	320	0.340	109	370	0.440	160	740	0.560	410	640	0.400	260

- INFO
- TYPHOON TA-HTA-4HTA
- TYPHOON PU-HPU
- TYPHOON SUH
- TYPHOON ALH
- TYPHOON HRC
- TYPHOON SUH MINI
- TYPHOON HL
- C-SD-TA
- LFTA
- SUTA
- HSS-HSS/CO DRILLS
- G2
- MDTA
- HF VH/UP
- MEF
- ALU
- MEX
- UH
- HSS/CO-HSSP END MILLS
- CARBIDE BURRS

CUTTING PARAMETERS

245N

Material Group ISO 513	P1 P2			P3 P4			M1 M2			M3 M4			K1 K2		
Hardness/Rm	500-700 N/mm ²			600-1000 N/mm ²			< 750 N/mm ²			550-850 N/mm ²			150-350 HB		
Vc (m/min)	25-35			20-30			12-18			8-12			25-35		
D (mm)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)
13	730	0.224	160	610	0.190	120	370	0.157	60	240	0.112	27	730	0.246	180
14	680	0.232	160	570	0.197	110	340	0.162	55	230	0.116	27	680	0.255	170
15	640	0.240	150	530	0.204	110	320	0.168	55	210	0.120	25	640	0.264	170
16	600	0.250	150	500	0.213	110	300	0.175	55	200	0.125	25	600	0.275	170
17	560	0.265	150	470	0.225	110	280	0.186	50	190	0.133	25	560	0.292	160
18	530	0.280	150	440	0.238	100	270	0.196	55	180	0.140	25	530	0.308	160
19	500	0.295	150	420	0.251	110	250	0.207	50	170	0.148	25	500	0.325	160
20	480	0.315	150	400	0.268	110	240	0.221	55	160	0.158	25	480	0.347	170
22	430	0.330	140	360	0.281	100	220	0.231	50	140	0.165	23	430	0.363	160
25	380	0.350	130	320	0.298	100	190	0.245	47	130	0.175	23	380	0.385	150
27	350	0.370	130	290	0.315	90	180	0.259	47	120	0.185	22	350	0.407	140
30	320	0.400	130	270	0.340	90	160	0.280	45	110	0.200	22	320	0.440	140

Material Group ISO 513	K3 K4			N1 N5			N2 N3 N4			S1 S2 S4		
Hardness/Rm	< 350 HB									< 35 HRC		
Vc (m/min)	20-30			50-70			40-60			8-12		
D (mm)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)
13	610	0.168	100	1470	0.314	460	1220	0.224	270	240	0.090	22
14	570	0.174	100	1360	0.325	440	1140	0.232	260	230	0.093	21
15	530	0.180	100	1270	0.336	430	1060	0.240	250	210	0.096	20
16	500	0.188	90	1190	0.350	420	1000	0.250	250	200	0.100	20
17	470	0.199	90	1120	0.371	420	940	0.265	250	190	0.106	20
18	440	0.210	90	1060	0.392	420	880	0.280	250	180	0.112	20
19	420	0.221	90	1010	0.413	420	840	0.295	250	170	0.118	20
20	400	0.236	90	960	0.441	420	800	0.315	250	160	0.126	20
22	360	0.248	90	870	0.462	400	720	0.330	240	140	0.132	18
25	320	0.263	80	760	0.490	370	640	0.350	220	130	0.140	18
27	290	0.278	80	710	0.518	370	590	0.370	220	120	0.148	18
30	270	0.300	80	640	0.560	360	530	0.400	210	110	0.160	18

- INFO
- TYPHOON TA-HTA-4HTA
- TYPHOON PU-HPU
- TYPHOON SUH
- TYPHOON ALH
- TYPHOON HRC
- TYPHOON SUH MINI
- TYPHOON HL
- C-SD-TA
- LFTA
- SUTA
- HSS-HSS/CO DRILLS
- G2
- MDTA
- HF VH/UP
- MEF
- ALU
- MEX
- UH
- HSS/CO-HSSP END MILLS
- CARBIDE BURRS

241LS

Material Group ISO 513	P1 P2			P3 P4			M1 M2			K1 K2		
	500-700 N/mm ²			600-1000 N/mm ²			< 750 N/mm ²			150-350 HB		
Vc (m/min)	15-25			10-20			10-14			20-30		
D (mm)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)
13	490	0.160	80	370	0.136	50	290	0.112	32	610	0.176	110
14	450	0.170	75	340	0.145	49	270	0.119	32	570	0.187	110
15	420	0.180	75	320	0.153	49	250	0.126	32	530	0.198	100
16	400	0.200	80	300	0.170	51	240	0.140	34	500	0.220	110
17	370	0.190	70	280	0.162	45	220	0.133	29	470	0.209	100
18	350	0.205	70	270	0.174	47	210	0.144	30	440	0.226	100
19	340	0.220	75	250	0.187	47	200	0.154	31	420	0.242	100
20	320	0.235	75	240	0.200	48	190	0.165	31	400	0.259	100
21	300	0.250	75	230	0.213	49	180	0.175	32	380	0.275	100
22	290	0.265	75	220	0.225	50	170	0.186	32	360	0.292	100
23	280	0.280	80	210	0.238	50	170	0.196	33	350	0.308	110
24	270	0.295	80	200	0.251	50	160	0.207	33	330	0.325	110
25	250	0.310	80	190	0.264	50	150	0.217	33	320	0.341	110
26	240	0.325	80	180	0.276	50	150	0.228	34	310	0.358	110
27	240	0.340	80	180	0.289	52	140	0.238	33	290	0.374	110
28	230	0.355	80	170	0.302	51	140	0.249	35	280	0.391	110
29	220	0.370	80	160	0.315	50	130	0.259	34	270	0.407	110
30	210	0.385	80	160	0.327	52	130	0.270	35	270	0.424	110

- INFO
- TYPHOON TA-HTA-4HTA
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- G2
- MDTA
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- MEF
- ALU
- MEX
- UH
- HSS/CO-HSSP END MILLS
- CARBIDE BURRS

2701LS

Material Group ISO 513	P1 P2			P3 P4			M1 M2			K1 K2		
	500-700 N/mm ²			600-1000 N/mm ²			< 750 N/mm ²			150-350 HB		
Vc (m/min)	20-24			16-20			8-12			20-24		
D (mm)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)
13	540	0.140	75	440	0.119	50	240	0.098	24	540	0.154	83
14	500	0.150	75	410	0.128	50	230	0.105	24	500	0.165	83
15	470	0.160	75	380	0.136	50	210	0.112	24	470	0.176	83
16	440	0.180	80	360	0.153	55	200	0.126	25	440	0.198	87
17	410	0.190	80	340	0.162	55	190	0.133	25	410	0.209	86
18	390	0.200	80	320	0.170	55	180	0.140	25	390	0.220	86
19	370	0.210	80	300	0.179	55	170	0.147	25	370	0.231	85
20	350	0.220	75	290	0.187	55	160	0.154	25	350	0.242	85
21	330	0.220	75	270	0.187	50	150	0.154	23	330	0.242	80
22	320	0.230	75	260	0.196	50	140	0.161	23	320	0.253	81
23	300	0.250	75	250	0.213	55	140	0.175	25	300	0.275	83
24	290	0.260	75	240	0.221	55	130	0.182	24	290	0.286	83
25	280	0.280	80	230	0.238	55	130	0.196	25	280	0.308	86
26	270	0.290	80	220	0.247	55	120	0.203	24	270	0.319	86
27	260	0.300	80	210	0.255	55	120	0.210	25	260	0.330	86
28	250	0.310	80	200	0.264	55	110	0.217	24	250	0.341	85
29	240	0.325	80	200	0.276	55	110	0.228	25	240	0.358	86
30	230	0.340	80	190	0.289	55	110	0.238	26	230	0.374	86

- INFO
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- MEF
- ALU
- MEX
- UH
- HSS/CO-HSSP END MILLS
- CARBIDE BURRS

2702LS

Material Group ISO 513	P1 P2			P3 P4			M1 M2			K1 K2		
	500-700 N/mm ²			600-1000 N/mm ²			< 750 N/mm ²			150-350 HB		
Vc (m/min)	15-25			10-20			10-14			20-30		
D (mm)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)	n (rpm)	fn (mm/rev)	Vf (mm/min)
13	490	0.130	65	370	0.111	40	290	0.091	26	610	0.143	85
14	450	0.140	65	340	0.119	40	270	0.098	26	570	0.154	90
15	420	0.150	65	320	0.128	40	250	0.105	26	530	0.165	85
16	400	0.160	65	300	0.136	40	240	0.112	27	500	0.176	90
17	370	0.170	65	280	0.145	40	220	0.119	26	470	0.187	90
18	350	0.180	65	270	0.153	40	210	0.126	26	440	0.198	85
19	340	0.190	65	250	0.162	40	200	0.133	27	420	0.209	90
20	320	0.200	65	240	0.170	40	190	0.140	27	400	0.220	90
21	300	0.210	65	230	0.179	40	180	0.147	26	380	0.231	90
22	290	0.220	65	220	0.187	40	170	0.154	26	360	0.242	85
23	280	0.230	65	210	0.196	40	170	0.161	27	350	0.253	90
24	270	0.240	65	200	0.204	40	160	0.168	27	330	0.264	85
25	250	0.250	65	190	0.213	40	150	0.175	26	320	0.275	90
26	240	0.270	65	180	0.230	40	150	0.189	28	310	0.297	90
27	240	0.280	65	180	0.238	45	140	0.196	27	290	0.308	90
28	230	0.290	65	170	0.247	40	140	0.203	28	280	0.319	90
29	220	0.300	65	160	0.255	40	130	0.210	27	270	0.330	90
30	210	0.310	65	160	0.264	40	130	0.217	28	270	0.341	90

- INFO
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- CARBIDE BURRS

CARBIDE END MILLS





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🇮🇹 Legenda 🇩🇪 Verzeichnis 🇫🇷 Légende 🇪🇸 Leyenda 🇷🇺 Условные обозначения

STOCK		
●	<ul style="list-style-type: none"> 🇫🇷 stock standard 🇮🇹 stock standard 🇩🇪 Standard Lager 	<ul style="list-style-type: none"> 🇫🇷 stock standard 🇪🇸 stock estándar 🇷🇺 складская позиция
○	<ul style="list-style-type: none"> 🇫🇷 non-standard stock 🇮🇹 stock non standard 🇩🇪 nicht Standard Lager 	<ul style="list-style-type: none"> 🇫🇷 stock non standard 🇪🇸 stock no estándar 🇷🇺 не складская позиция
▽	<ul style="list-style-type: none"> 🇫🇷 stock exhaustion 🇮🇹 esaurimento stock 🇩🇪 Vorraterschöpfung 	<ul style="list-style-type: none"> 🇫🇷 épuisement du stock 🇪🇸 agotamiento de stock 🇷🇺 складские остатки









🇫🇷 APPLICATION GUIDELINES 🇮🇹 INDICAZIONI PER L'APPLICAZIONE 🇩🇪 LEITFADEN ZUR ANWENDUNG 🇫🇷 INDICATIONS POUR L'APPLICATION 🇪🇸 INDICACIONES PARA SU APLICACIÓN 🇷🇺 УКАЗАНИЯ ПО ПРИМЕНЕНИЮ		
★	<ul style="list-style-type: none"> 🇫🇷 1st choice 🇮🇹 1a scelta 🇩🇪 1. Wahl 	<ul style="list-style-type: none"> 🇫🇷 1er choix 🇪🇸 1ª elección 🇷🇺 1-й выбор
☆	<ul style="list-style-type: none"> 🇫🇷 suitable 🇮🇹 adatto 🇩🇪 geeignet 	<ul style="list-style-type: none"> 🇫🇷 adapté 🇪🇸 adecuado 🇷🇺 пригоден

🇫🇷 SHANK 🇮🇹 ATTACCO 🇩🇪 SCHAFT 🇫🇷 QUEUE 🇪🇸 MANGO 🇷🇺 ХВОСТОВИК		
	<ul style="list-style-type: none"> 🇫🇷 cylindrical shank 🇮🇹 attacco cilindrico 🇩🇪 zylindrischer Schaft 	<ul style="list-style-type: none"> 🇫🇷 queue cylindrique 🇪🇸 mango cilíndrico 🇷🇺 цилиндрическое крепление
	Weldon	

🇫🇷 MILLING STRATEGY 🇮🇹 STRATEGIA DI FRESATURA 🇩🇪 FRÄSSTRATEGIE 🇫🇷 STRATÉGIES DE FRAISAGE 🇪🇸 ESTRATEGIA DE FRESADO 🇷🇺 СТРАТЕГИЯ ФРЕЗЕРОВАНИЯ		
	<ul style="list-style-type: none"> 🇫🇷 slotting 🇮🇹 fresatura di cave 🇩🇪 Nutfräsen 	<ul style="list-style-type: none"> 🇫🇷 rainurage 🇪🇸 ranurado 🇷🇺 фрезерование канавок
	<ul style="list-style-type: none"> 🇫🇷 side milling 🇮🇹 contornatura 🇩🇪 Konturfräsen 	<ul style="list-style-type: none"> 🇫🇷 contournage 🇪🇸 perfiladura 🇷🇺 фрезерование по контуру
	<ul style="list-style-type: none"> 🇫🇷 square rib 🇮🇹 nervatura piana 🇩🇪 Flachrippen 	<ul style="list-style-type: none"> 🇫🇷 rainurage 🇪🇸 nervio plano 🇷🇺 прямоугольное оребрение
	<ul style="list-style-type: none"> 🇫🇷 copying 🇮🇹 copiatura 🇩🇪 Kopieren 	<ul style="list-style-type: none"> 🇫🇷 copiage 🇪🇸 copia 🇷🇺 копирование
	<ul style="list-style-type: none"> 🇫🇷 round rib 🇮🇹 nervatura raggiata 🇩🇪 Rundrippen 	<ul style="list-style-type: none"> 🇫🇷 rainurage rayonné 🇪🇸 nervio radiado 🇷🇺 радиальное оребрение

🇮🇹 Legenda 🇩🇪 Verzeichnis 🇫🇷 Légende 🇪🇸 Leyenda 🇷🇺 Условные обозначения

🇩🇪 MILLING STRATEGY 🇮🇹 STRATEGIA DI FRESATURA 🇪🇸 FRÄSSTRATEGIE 🇫🇷 STRATÉGIES DE FRAISAGE 🇪🇸 ESTRATEGIA DE FRESADO 🇷🇺 СТРАТЕГИЯ ФРЕЗЕРОВАНИЯ		
	🇩🇪 helical 🇮🇹 interpolazione elicoidale 🇪🇸 Helixinterpolation	🇫🇷 interpolation hélicoïdale 🇪🇸 interpolación helicoidal 🇷🇺 винтовая интерполяция
	🇩🇪 ramping 🇮🇹 entrata in rampa 🇪🇸 Rampen	🇫🇷 entrée en ramping 🇪🇸 entrada en rampa 🇷🇺 фрезерование под углом
	🇩🇪 vertical 🇮🇹 fresatura assiale 🇪🇸 Vertikalfräsen	🇫🇷 fraisage axial 🇪🇸 fresado axial 🇷🇺 осевое фрезерование
	🇩🇪 drilling 🇮🇹 foratura 🇪🇸 Bohren	🇫🇷 perçage 🇪🇸 taladro 🇷🇺 сверление
	🇩🇪 trochoidal 🇮🇹 fresatura trocoidale 🇪🇸 trochoidales Fräsen	🇫🇷 fraisage trochoïdal 🇪🇸 fresado trocoidal 🇷🇺 трохоидальное фрезерование

🇩🇪 APPLICATION RANGE 🇮🇹 GAMMA DI APPLICAZIONE 🇪🇸 ANWENDUNGSBEREICH 🇫🇷 GAMME D'APPLICATION 🇪🇸 RANGO DE APLICACIÓN 🇷🇺 ОБЛАСТЬ ПРИМЕНЕНИЯ		
	🇩🇪 general purpose 🇮🇹 uso generico 🇪🇸 allgemeine Anwendung	🇫🇷 applications génériques 🇪🇸 uso genérico 🇷🇺 общего назначения
	🇩🇪 < 40 HRC variable helix and unequal pitch 🇮🇹 < 40 HRC elica variabile e passo differenziato 🇪🇸 < 40 HRC ungleicher Teilung und Winkel	🇫🇷 < 40 HRC hélice et pas différencié 🇪🇸 < 40 HRC hélice variable y paso diferenciado 🇷🇺 < 40 HRC переменный завиток и дифференциальная кромка
	🇩🇪 30+55 HRC unequal pitch 🇮🇹 30+55 HRC passo differenziato 🇪🇸 30+55 HRC ungleicher Teilung	🇫🇷 30+55 HRC pas différencié 🇪🇸 30+55 HRC paso diferenciado 🇷🇺 30+55 HRC неодинаковый шаг режущих кромок
	🇩🇪 for stainless steel 🇮🇹 per acciaio inossidabile 🇪🇸 für rostfreien Stahl	🇫🇷 pour acier inoxydable 🇪🇸 para acero inoxidable 🇷🇺 для нержавеющей сталей
	🇩🇪 for aluminium 🇮🇹 per alluminio 🇪🇸 für Aluminium	🇫🇷 pour aluminium 🇪🇸 para aluminio 🇷🇺 для алюминия
	🇩🇪 unequal pitch (UP) for Aluminium 🇮🇹 passo differenziato (UP) per alluminio 🇪🇸 ungleiche Teilung (UP) für Aluminium	🇫🇷 pas différencié (UP) pour aluminium 🇪🇸 paso diferenciado (UP) para aluminio 🇷🇺 неравномерный шаг (UP) для алюминия
	🇩🇪 30+55 HRC general purpose and hardened steel 🇮🇹 30+55 HRC uso generico e acciaio temprato 🇪🇸 30+55 HRC allgemeine Anwendung und gehärtete Stähle	🇫🇷 30+55 HRC utilisation générale et aciers trempés 🇪🇸 30+55 HRC mecanizado genérico y acero templado 🇷🇺 30+55 HRC общее назначение и для закалённых сталей
	🇩🇪 < 70 HRC for hardened steel 🇮🇹 < 70 HRC per acciai temprati 🇪🇸 < 70 HRC für Hartstahl	🇫🇷 < 70 HRC pour acier trempé 🇪🇸 < 70 HRC para aceros templados 🇷🇺 < 70 HRC для закалённых сталей




🇮🇹 Legenda 🇩🇪 Verzeichnis 🇫🇷 Légende 🇪🇸 Leyenda 🇷🇺 Условные обозначения

	🇫🇷 TYPE	🇮🇹 TIPO	🇪🇸 TYP	🇫🇷 TYPE	🇪🇸 TIPO	🇷🇺 ТИП
 SQUARE	🇫🇷 sharp corner	🇮🇹 spigolo vivo	🇪🇸 scharfe Kante	🇫🇷 arête vive	🇪🇸 borde puntiagudo	🇷🇺 острая кромка
 C45°	🇫🇷 45° chamfer	🇮🇹 smusso a 45°	🇪🇸 45° abgescchrägt	🇫🇷 biseau à 45°	🇪🇸 chaflán a 45°	🇷🇺 фаска 45°
 C+R	🇫🇷 45° chamfer + radius	🇮🇹 smusso a 45° + raggio	🇪🇸 45° abgescchrägt + Radius	🇫🇷 biseau à 45° + rayon	🇪🇸 chaflán a 45° + radio	🇷🇺 фаска 45° + радиус
 RADIUS	🇫🇷 corner radius	🇮🇹 torica	🇪🇸 Eckradius	🇫🇷 torique	🇪🇸 tórica	🇷🇺 с радиусом при вершине
 BALL NOSE	🇫🇷 ball nose	🇮🇹 raggiaata	🇪🇸 runder Stirn	🇫🇷 bout hémisphérique	🇪🇸 fresa de bola	🇷🇺 сферическая
 HIGH FEED	🇫🇷 high feed	🇮🇹 alto avanzamento	🇪🇸 hoher Vorschub	🇫🇷 haute vitesse	🇪🇸 alto avance	🇷🇺 высокая подача





	🇫🇷 NR. OF FLUTES	🇮🇹 N. DI TAGLIANTI	🇪🇸 ANZAHL DER SCHNEIDEN	🇫🇷 NOMBRE DE DENTS	🇪🇸 N. DE LABIOS	🇷🇺 КОЛИЧЕСТВО РЕЖУЩИХ КРОМОК
 Z1	🇫🇷 single flute	🇮🇹 monotagliante	🇪🇸 Einzelschneide	🇫🇷 monocoupe	🇪🇸 monofilo	🇷🇺 1 зуб
 Z2	🇫🇷 2 flutes	🇮🇹 2 taglienti	🇪🇸 2 Schneiden	🇫🇷 2 arêtes de coupe	🇪🇸 2 fillos	🇷🇺 2 зуба
 Z3	🇫🇷 3 flutes	🇮🇹 3 taglienti	🇪🇸 3 Schneiden	🇫🇷 3 arêtes de coupe	🇪🇸 3 fillos	🇷🇺 3 зуба
 Z3 UP	🇫🇷 3 flutes unequal pitch	🇮🇹 3 taglienti passo differenziato	🇪🇸 3 Schneiden ungleiche Teilung	🇫🇷 3 arêtes de coupe pas différencié	🇪🇸 3 fillos paso diferenciado	🇷🇺 3 зуба с неравномерным шагом
 Z4	🇫🇷 4 flutes	🇮🇹 4 taglienti	🇪🇸 4 Schneiden	🇫🇷 4 arêtes de coupe	🇪🇸 4 fillos	🇷🇺 4 зуба
 Z4 UP	🇫🇷 4 flutes unequal pitch	🇮🇹 4 taglienti passo differenziato	🇪🇸 4 Schneiden ungleiche Teilung	🇫🇷 4 arêtes de coupe pas différencié	🇪🇸 4 fillos paso diferenciado	🇷🇺 4 зуба с неравномерным шагом
 Z5	🇫🇷 5 flutes	🇮🇹 5 taglienti	🇪🇸 5 Schneiden	🇫🇷 5 arêtes de coupe	🇪🇸 5 fillos	🇷🇺 5 зуба
 Z6	🇫🇷 6 flutes	🇮🇹 6 taglienti	🇪🇸 6 Schneiden	🇫🇷 6 arêtes de coupe	🇪🇸 6 fillos	🇷🇺 6 зуба

🇮🇹 Legenda 🇩🇪 Verzeichnis 🇫🇷 Légende 🇪🇸 Leyenda 🇷🇺 Условные обозначения

	🇬🇧 CHIPBREAKER STYLE	🇮🇹 TIPO DI ROMPIRUCIOLO	🇩🇪 SPÄNEBRECHER TYP	🇫🇷 TYPE DE BRISE-COPEAUX	🇪🇸 TIPO DE ROMPEVIRUTAS	🇷🇺 ТИП СТРУЖКОЛОМА
	🇬🇧 roughing coarse pitch	🇮🇹 sgrossare passo grosso	🇩🇪 Schruppfräser Regelgewinde	🇫🇷 ébauche pas gros	🇪🇸 desbaste paso grueso	🇷🇺 черновая с крупным шагом
	🇬🇧 roughing fine pitch	🇮🇹 sgrossare passo fine	🇩🇪 Schruppfräser Feingewinde	🇫🇷 ébauche pas fin	🇪🇸 desbaste paso fino	🇷🇺 черновая с мелким шагом

	🇬🇧 MATERIAL	🇮🇹 MATERIALE	🇩🇪 WERKSTOFF	🇫🇷 MATIÈRE	🇪🇸 MATERIAL	🇷🇺 МАТЕРИАЛ
	🇬🇧 nano micrograin	🇮🇹 nano micrograna	🇩🇪 nano Mikrokörnung	🇫🇷 nano micrograin	🇪🇸 nano micrograno	🇷🇺 нано микрозернистый твёрдый сплав
	🇬🇧 ultra fine micrograin	🇮🇹 micrograna ultra fine	🇩🇪 ultrafeine Mikrokörnung	🇫🇷 micrograin ultra-fin	🇪🇸 micrograno ultra fino	🇷🇺 ультра микрозернистый твёрдый сплав
	🇬🇧 micrograin	🇮🇹 micrograna	🇩🇪 Mikrokörnung	🇫🇷 micrograin	🇪🇸 micrograno	🇷🇺 микрозернистый твёрдый сплав

	🇬🇧 SURFACE TREATMENT	🇮🇹 TRATTAMENTO SUPERFICIALE	🇩🇪 OBERFLÄCHENBEHANDLUNG	🇫🇷 TREATMENT DE SURFACE	🇪🇸 TRATAMIENTO SUPERFICIAL	🇷🇺 ОБРАБОТКА ПОВЕРХНОСТИ
	🇬🇧 uncoated	🇮🇹 non rivestito	🇩🇪 unbeschichtet	🇫🇷 non revêtu	🇪🇸 no revestido	🇷🇺 без покрытия
	🇬🇧 polished	🇮🇹 lappato	🇩🇪 geläppt	🇫🇷 poli	🇪🇸 pulido	🇷🇺 полированный

	🇬🇧 COATINGS	🇮🇹 RIVESTIMENTI	🇩🇪 BESCHICHTUNGEN	🇫🇷 REVÊTEMENTS	🇪🇸 RECUBRIMIENTOS	🇷🇺 ПОКРЫТИЕ
						
🇬🇧 hardness (HV) 🇮🇹 durezza (HV) 🇩🇪 Härte (HV)	🇫🇷 dureté (HV) 🇪🇸 dureza (HV) 🇷🇺 твёрдость (HV)	3300	3300	3300	3300	3600
🇬🇧 friction coefficient 🇮🇹 coefficiente d'attrito 🇩🇪 Reibungskoeffizient	🇫🇷 coefficient de frottement 🇪🇸 coeficiente de rozamiento 🇷🇺 коэффициент трения	0.3	0.3	0.3	0.35	0.35
🇬🇧 thickness (μ) 🇮🇹 spessore (μ) 🇩🇪 dicke (μ)	🇫🇷 épaisseur (μ) 🇪🇸 espesor (μ) 🇷🇺 толщина (мкм)	3	2.5÷3.5	2.5÷3.5	2.5÷3.5	2.5÷3.5
🇬🇧 max working temperature (°C) 🇮🇹 temperatura max (°C) 🇩🇪 höchste Temperatur (°C)	🇫🇷 température maximale (°C) 🇪🇸 temperatura máx (°C) 🇷🇺 макс. температура (°C)	950°	1100°	900°	1000°	1200°

	ITEM No.	PAGE	
G2 general purpose, square	GB205	318	
	G2CS2	320	
	G2WS2	322	
	G2210	324	
	G2211	324	
	G2212	324	
	GB305	327	
	G2CSH3	329	
	G2WSH3	331	
	G2310	333	
	G2311	333	
	G2312	333	
	GB405	335	
	G2CS4	337	
	G2WS4	339	
	G2410	341	
	G2411	341	
	G2412	341	
	G2413	341	
	G2CSHM	343	
G2 general purpose, roughing	G2CSFR	345	
	G2WSFR	347	
G2 general purpose, corner radius	G2CS2R	349	
	G2CS4R	351	
	G2CL4R	353	
G2 general purpose, ball nose	GB255	355	
	G2CSB2	357	



RANGE	NORM	TYPE	MATERIAL / COATING	HRC	HELIX ANGLE	GEOMETRY	Z	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H
1-12	OSAWA	N	MG BR	<45	30°	SQUARE	2	★	☆	★	☆		
1-20	OSAWA	N	MG PV200	<45	30°	SQUARE	2	★	☆	★	☆		
3-20	OSAWA	N	MG PV200	<45	30°	SQUARE	2	★	☆	★	☆		
2-6	OSAWA	N	MG PV200	<45	30°	SQUARE	2	★	☆	★	☆		
5-12	OSAWA	N	MG PV200	<45	30°	SQUARE	2	★	☆	★	☆		
8-16	OSAWA	N	MG PV200	<45	30°	SQUARE	2	★	☆	★	☆		
1-12	OSAWA	N	MG BR	<45	45°	SQUARE	3	★	☆	★	☆		
1-20	OSAWA	N	MG PV200	<45	45°	SQUARE	3	★	☆	★	☆		
3-20	OSAWA	N	MG PV200	<45	45°	SQUARE	3	★	☆	★	☆		
2-6	OSAWA	N	MG PV200	<45	45°	SQUARE	3	★	☆	★	☆		
4-12	OSAWA	N	MG PV200	<45	45°	SQUARE	3	★	☆	★	☆		
8-20	OSAWA	N	MG PV200	<45	45°	SQUARE	3	★	☆	★	☆		
1-12	OSAWA	N	MG BR	<45	30°	SQUARE	4	★	☆	★	☆		
1-25	OSAWA	N	MG PV200	<45	30°	SQUARE	4	★	☆	★	☆		
3-20	OSAWA	N	MG PV200	<45	30°	SQUARE	4	★	☆	★	☆		
2-6	OSAWA	N	MG PV200	<45	30°	SQUARE	4	★	☆	★	☆		
3-12	OSAWA	N	MG PV200	<45	30°	SQUARE	4	★	☆	★	☆		
8-20	OSAWA	N	MG PV200	<45	30°	SQUARE	4	★	☆	★	☆		
16-20	OSAWA	N	MG PV200	<45	30°	SQUARE	4	★	☆	★	☆		
6-20	OSAWA	N	MG PV200	<45	45°	SQUARE	6	★	☆	★	☆		
4-20	OSAWA	N - HR	MG PV200	<45	30°	SQUARE	3-4	★	☆	★	☆		
6-20	OSAWA	N - HR	MG PV200	<45	30°	SQUARE	3-4	★	☆	★	☆		
1-12	OSAWA	N	MG PV200	<45	30°	CORNER RADIUS	2	★	☆	★	☆		
1-12	OSAWA	N	MG PV200	<45	30°	CORNER RADIUS	4	★	☆	★	☆		
2-12	OSAWA	N	MG PV200	<45	30°	CORNER RADIUS	4	★	☆	★	☆		
1-12	OSAWA	N	MG BR	<45	30°	BALL NOSE	2	★	☆	★	☆		
1-20	OSAWA	N	MG PV200	<45	30°	BALL NOSE	2	★	☆	★	☆		

★ 1st choice ☆ suitable



	ITEM No.	PAGE	
G2 general purpose, ball nose	G2250	359	
	G2251	359	
	G2CSB4	361	
MDTA general purpose, square	MDTACS2	364	
	MDTA210	366	
	MDCL2	368	
	MDTACS3	370	
	MDTAWSH3	372	
	MDTACS4	374	
	MDTA410	376	
	MDCL4	378	
MDTA general purpose, roughing	MDTAUPR	380	
MDTA general purpose, ball nose	MDTACSB2	382	
	MDTA250	384	
HF UNI < 40 HRC, 45° chamfer	HF840	390	
	HF440	394	
	HF441	399	
HF UNI < 40 HRC, roughing	HF844	405	
	HF444	409	
	HF445	413	
HF UNI < 40 HRC, corner radius	HF342	418	
	HF842	421	
	HF442	425	
	HF443	430	
	HF542	435	
	HF942	438	
	HF943	442	



RANGE	NORM	TYPE	MATERIAL / COATING	HRC	HELIX ANGLE	GEOMETRY	Z	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H
1-12	OSAWA	N	MG PV200	<45	30°	BALL NOSE	2	★	☆	★	☆		
6-20	OSAWA	N	MG PV200	<45	30°	BALL NOSE	2	★	☆	★	☆		
1-20	OSAWA	N	MG PV200	<45	30°	BALL NOSE	4	★	☆	★	☆		
1-20	OSAWA	N	MG PV200	<45	30°	SQUARE	2	★	☆	★	☆		
3-12	OSAWA	N	MG PV200	<45	30°	SQUARE	2	★	☆	★	☆		
3-12	OSAWA	N	MG BR	<45	30°	SQUARE	2	★	☆	★	☆		
1-20	OSAWA	N	MG PV200	<45	30°	SQUARE	3	★	☆	★	☆		
3-20	OSAWA	N	MG PV200	<45	45°	SQUARE	3	★	☆	★	☆		
1-20	OSAWA	N	MG PV200	<45	30°	SQUARE	4	★	☆	★	☆		
3-16	OSAWA	N	MG PV200	<45	30°	SQUARE	4	★	☆	★	☆		
3-20	OSAWA	N	MG BR	<45	30°	SQUARE	4	★	☆	★	☆		
6-20	OSAWA	N - UP - NR	MG PV200	<45	40°	C45°	3-4	★	☆	★			
1-12	OSAWA	N	MG PV200	<45	30°	BALL NOSE	2	★	☆	★	☆		
3-12	OSAWA	N	MG PV200	<45	30°	BALL NOSE	2	★	☆	★	☆		
3-20	OSAWA	VH/UP	MG PV300	<40	36°/39°	CHAMFER 45°	4	★	★	★		★	
3-20	OSAWA	VH/UP	MG PV300	<40	36°/39°	CHAMFER 45°	4	★	★	★		★	
3-20	OSAWA	VH/UP	MG PV300	<40	36°/39°	CHAMFER 45°	4	★	★	★		★	
6-20	OSAWA	VH/UP - HR	MG PV300	<40	36°/39°	CHAMFER 45°	4	★	★	★		★	
6-20	OSAWA	VH/UP - HR	MG PV300	<40	36°/39°	CHAMFER 45°	4	★	★	★		★	
6-20	OSAWA	VH/UP - HR	MG PV300	<40	36°/39°	CHAMFER 45°	4	★	★	★		★	
3-12	OSAWA	VH/UP	MG PV300	<40	36°/39°	CORNER RADIUS	4	★	★	★		★	
4-20	OSAWA	VH/UP	MG PV300	<40	36°/39°	CORNER RADIUS	4	★	★	★		★	
3-20	OSAWA	VH/UP	MG PV300	<40	36°/39°	CORNER RADIUS	4	★	★	★		★	
3-20	OSAWA	VH/UP	MG PV300	<40	36°/39°	CORNER RADIUS	4	★	★	★		★	
6-20	OSAWA	VH/UP	MG PV300	<40	36°/39°	CORNER RADIUS	4	★	★	★		★	
4-20	OSAWA	VH/UP	MG PV300	<40	36°/39°	CORNER RADIUS	4	★	★	★		★	
4-20	OSAWA	VH/UP	MG PV300	<40	36°/39°	CORNER RADIUS	4	★	★	★		★	

★ 1st choice ☆ suitable



	ITEM No.	PAGE	
HF UNI < 40 HRC, corner radius	HF642	446	
	HF643	449	
	HF742	452	
	HF743	455	
HF UNI SC < 40 HRC, 45° chamfer + corner radius	HF861	458	
HF HARD 30÷55 HRC, 45° chamfer	HF850	463	
	HF450	467	
	HF451	471	
HF HARD 30÷55 HRC, corner radius	HF852	475	
	HF452	479	
MEF stainless steel and super alloys, square	MEFCS2	484	
	MEFCSH3	486	
	MEFCS4	488	
	MEF600	490	
MEF stainless steel and super alloys, roughing	MEF901	492	
	MEF902	494	
ALU unequal pitch, square	HFAL4	498	
ALU unequal pitch, corner radius	HFAL3	501	
	HFA53	504	
ALU square	MDCSA1	507	
	MDCSA2	509	
	MDCSA3	512	
	MDA310	514	
	MDA311	514	
	MDA312	514	
	MDCSAM	517	
ALU corner radius	MCA212R	519	



RANGE	NORM	TYPE	MATERIAL / COATING	HRC	HELIX ANGLE	GEOMETRY	Z	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H
4-20	OSAWA	VH	MG PV300	<40	36°/37°/38°	CORNER RADIUS	5	★	★	★		★	
4-20	OSAWA	VH	MG PV300	<40	36°/37°/38°	CORNER RADIUS	5	★	★	★		★	
6-20	OSAWA	VH	MG PV300	<40	36°/37°/38°	CORNER RADIUS	5	★	★	★		★	
6-20	OSAWA	VH	MG PV300	<40	36°/37°/38°	CORNER RADIUS	5	★	★	★		★	
1-20	OSAWA	VH/UP	MG PV300	<40	36°/39°	CR+C45°	4	★	★	★		★	
3-20	OSAWA	UP	MG PV300	35÷55	40°	CHAMFER 45°	4	★	★	★		★	★
3-20	OSAWA	UP	MG PV300	35÷55	40°	CHAMFER 45°	4	★	★	★		★	★
3-20	OSAWA	UP	MG PV300	35÷55	40°	CHAMFER 45°	4	★	★	★		★	★
4-20	OSAWA	UP	MG PV300	35÷55	40°	CORNER RADIUS	4	★	★	★		★	★
3-20	OSAWA	UP	MG PV300	35÷55	40°	CORNER RADIUS	4	★	★	★		★	★
1-16	OSAWA	VA	UMG ENDLESS	<45	35°	SQUARE	2	★	★			★	
6-20	OSAWA	VA	UMG ENDLESS	<45	50°	SQUARE	3	★	★			★	
2-20	OSAWA	VA	UMG ENDLESS	<45	35°	SQUARE	4	★	★			★	
6-20	OSAWA	VA	UMG ENDLESS	<45	50°	SQUARE	6-8	★	★			★	
4-20	OSAWA	VA - HR	UMG ENDLESS	<45	45°	SQUARE	3-6	★	★			★	
6-20	OSAWA	VA - HR	UMG ENDLESS	<45	45°	SQUARE	4-6	★	★			★	
3-20	OSAWA	UP ALU	MG BR		40°	SQUARE	4					★	
2-20	OSAWA	UP ALU	MG POLISHED		30°	CORNER RADIUS	3					★	
3-20	OSAWA	UP ALU	MG BR		30°	CORNER RADIUS	3					★	
2-12	OSAWA	ALU	MG POLISHED		25°	SQUARE	1					★	
1-20	OSAWA	ALU	MG POLISHED		45°	SQUARE	2					★	
1-20	OSAWA	ALU	MG POLISHED		55°	SQUARE	3					★	
3-6	OSAWA	ALU	MG POLISHED		55°	SQUARE	3					★	
3-12	OSAWA	ALU	MG POLISHED		55°	SQUARE	3					★	
8-20	OSAWA	ALU	MG POLISHED		55°	SQUARE	3					★	
6-12	OSAWA	ALU	MG POLISHED		50°	SQUARE	6					★	
2-12	OSAWA	ALU	MG PV200		25°	CORNER RADIUS	2					★	

★ 1st choice ☆ suitable



	ITEM No.	PAGE	
ALU ball nose	MDCAB2	521	
MEX 30÷55 HRC, square	MEXM2	524	
	MEXM2SC	526	
	MEXLN2	528	
	MEXCS2	533	
	MEXCL2	535	
MEX 30÷55 HRC, square	MEXCS4	537	
	MEXCL4	539	
	MEXCSHM	541	
	MEXCLHM	543	
MEX 30÷55 HRC, roughing	MEXCSFR	545	
MEX 30÷55 HRC, corner radius	MEXLN2R	547	
	MEXLS2R	553	
	MEXCS4R	555	
	MEX410R	558	
	MEXLS4R	560	
	MEX610R	562	
	MEX611R	564	
MEX 30÷55 HRC, ball nose	MEXMB2	566	
	MEXMB2SC	568	
	MEXLNB2	570	
	MEXLNB206	575	
	MEXCSB2	577	
	MEXCLSB2	579	
	MEX253	581	
UH < 70 HRC, square	UHM204	584	
	UHLN2	586	



RANGE	NORM	TYPE	MATERIAL / COATING	HRC	HELIX ANGLE	GEOMETRY	Z	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H
1-12	OSAWA	ALU	MG POLISHED		40°	BALL NOSE	2				★		
0.3-2	OSAWA	MEX	UMG ENDLESS ORANGE	<55	40°	SQUARE	2	★		★			★
0.2-0.9	OSAWA	MEX	UMG ENDLESS ORANGE	<55	40°	SQUARE	2	★		★			★
0.2-4	OSAWA	MEX	UMG ENDLESS ORANGE	<55	40°	SQUARE	2	★		★			★
1-20	OSAWA	MEX	UMG ENDLESS ORANGE	<55	30°	SQUARE	2	★		★			★
1-12	OSAWA	MEX	UMG ENDLESS ORANGE	<55	30°	SQUARE	2	★		★			★
1-25	OSAWA	MEX	UMG ENDLESS ORANGE	<55	30°	SQUARE	4	★		★			★
2-25	OSAWA	MEX	UMG ENDLESS ORANGE	<55	30°-40°	SQUARE	4	★		★			★
3-20	OSAWA	MEX	UMG ENDLESS ORANGE	<55	50°	SQUARE	6-8	★		★			★
3-20	OSAWA	MEX	UMG ENDLESS ORANGE	<55	45°	SQUARE	6-8	★		★			★
6-20	OSAWA	MEX - HR	UMG ENDLESS ORANGE	<55	20°	SQUARE	3-4	★		★			★
0.3-4	OSAWA	MEX	UMG ENDLESS ORANGE	<55	40°	CORNER RADIUS	2	★		★			★
2-16	OSAWA	MEX	UMG ENDLESS ORANGE	<55	40°	CORNER RADIUS	2	★		★			★
1-20	OSAWA	MEX	UMG ENDLESS ORANGE	<55	40°	CORNER RADIUS	4	★		★			★
2-12	OSAWA	MEX	UMG ENDLESS ORANGE	<55	30°	CORNER RADIUS	4	★		★			★
2-16	OSAWA	MEX	UMG ENDLESS ORANGE	<55	40°	CORNER RADIUS	4	★		★			★
6-12	OSAWA	MEX	UMG ENDLESS ORANGE	<55	45°	CORNER RADIUS	6	★		★			★
6-12	OSAWA	MEX	UMG ENDLESS ORANGE	<55	45°	CORNER RADIUS	6	★		★			★
0.2-2	OSAWA	MEX	UMG ENDLESS ORANGE	<55	30°	BALL NOSE	2	★		★			★
0.2-0.8	OSAWA	MEX	UMG ENDLESS ORANGE	<55	30°	BALL NOSE	2	★		★			★
0.2-4	OSAWA	MEX	UMG ENDLESS ORANGE	<55	30°	BALL NOSE	2	★		★			★
0.5-2	OSAWA	MEX	UMG ENDLESS ORANGE	<55	30°	BALL NOSE	2	★		★			★
1-20	OSAWA	MEX	UMG ENDLESS ORANGE	<55	30°	BALL NOSE	2	★		★			★
1-20	OSAWA	MEX	UMG ENDLESS ORANGE	<55	30°	BALL NOSE	2	★		★			★
1-20	OSAWA	MEX	UMG ENDLESS ORANGE	<55	30°	BALL NOSE	2	★		★			★
0.1-0.9	OSAWA	UH	NMG UH RED	<70	40°	SQUARE	2	☆		☆			★
0.2-4	OSAWA	UH	NMG UH RED	<70	40°	SQUARE	2	☆		☆			★

★ 1st choice ☆ suitable

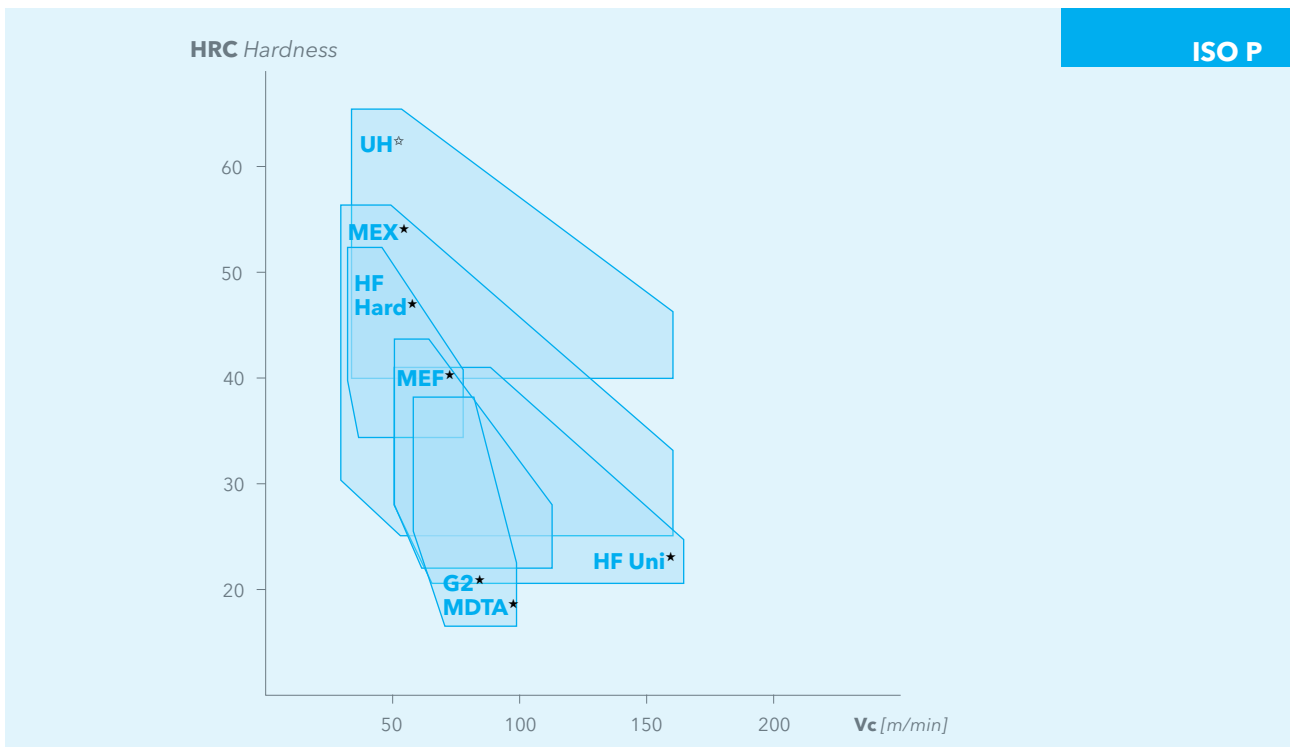


	ITEM No.	PAGE	
UH < 70 HRC, square	UH600	591	
	UH612	593	
UH < 70 HRC, corner radius	UHM206	595	
	UH211	597	
	UH212	599	
	UHCS2	604	
	UHF4LN	606	
	UHF4	610	
	UHCS4	612	
	UH410	614	
	UH411	617	
	UH412	619	
	UH413	621	
	UH610R	623	
	UH611R	625	
	UH < 70 HRC, ball nose	UHMB204	627
UHMB206		629	
UHLNB2		631	
UHCRB2		636	
UHCSB2		638	
UH250		640	
UH253		642	

RANGE	NORM	TYPE	MATERIAL / COATING	HRC	HELIX ANGLE	GEOMETRY	Z	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H
3-20	OSAWA	UH	NMG UH RED	<70	50°	SQUARE	6-8	☆		☆			★
3-20	OSAWA	UH	NMG UH RED	<70	50°	SQUARE	6-8	☆		☆			★
0.3-2	OSAWA	UH	NMG UH RED	<70	40°	CORNER RADIUS	2	☆		☆			★
1-6	OSAWA	UH	NMG UH RED	<70	30°	CORNER RADIUS	2	☆		☆			★
0.2-4	OSAWA	UH	NMG UH RED	<70	40°	CORNER RADIUS	2	☆		☆			★
1-12	OSAWA	UH	NMG UH RED	<70	30°	CORNER RADIUS	2	☆		☆			★
1-4	OSAWA	UP - UH	NMG UH RED	<70	25°	CORNER RADIUS	4	☆		☆			★
2-12	OSAWA	UH	NMG UH RED	<70	25°	CORNER RADIUS	4	☆		☆			★
1-12	OSAWA	UH	NMG UH RED	<70	30°	CORNER RADIUS	4	☆		☆			★
1-20	OSAWA	UH	NMG UH RED	<70	40°	CORNER RADIUS	4	☆		☆			★
3-12	OSAWA	UH	NMG UH RED	<70	30°	CORNER RADIUS	4	☆		☆			★
2-12	OSAWA	UH	NMG UH RED	<70	40°	CORNER RADIUS	4	☆		☆			★
6-16	OSAWA	UH	NMG UH RED	<70	40°	CORNER RADIUS	4	☆		☆			★
6-12	OSAWA	UH	NMG UH RED	<70	45°	CORNER RADIUS	6	☆		☆			★
6-20	OSAWA	UH	NMG UH RED	<70	45°	CORNER RADIUS	6	☆		☆			★
0.2-0.8	OSAWA	UH	NMG UH RED	<70	30°	BALL NOSE	2	☆		☆			★
0.4-0.8	OSAWA	UH	NMG UH RED	<70	30°	BALL NOSE	2	☆		☆			★
0.2-4	OSAWA	UH	NMG UH RED	<70	30°	BALL NOSE	2	☆		☆			★
0.5-2	OSAWA	UH	NMG UH RED	<70	30°	BALL NOSE	2	☆		☆			★
1-20	OSAWA	UH	NMG UH RED	<70	30°	BALL NOSE	2	☆		☆			★
1-20	OSAWA	UH	NMG UH RED	<70	30°	BALL NOSE	2	☆		☆			★
1-20	OSAWA	UH	NMG UH RED	<70	30°	BALL NOSE	2	☆		☆			★

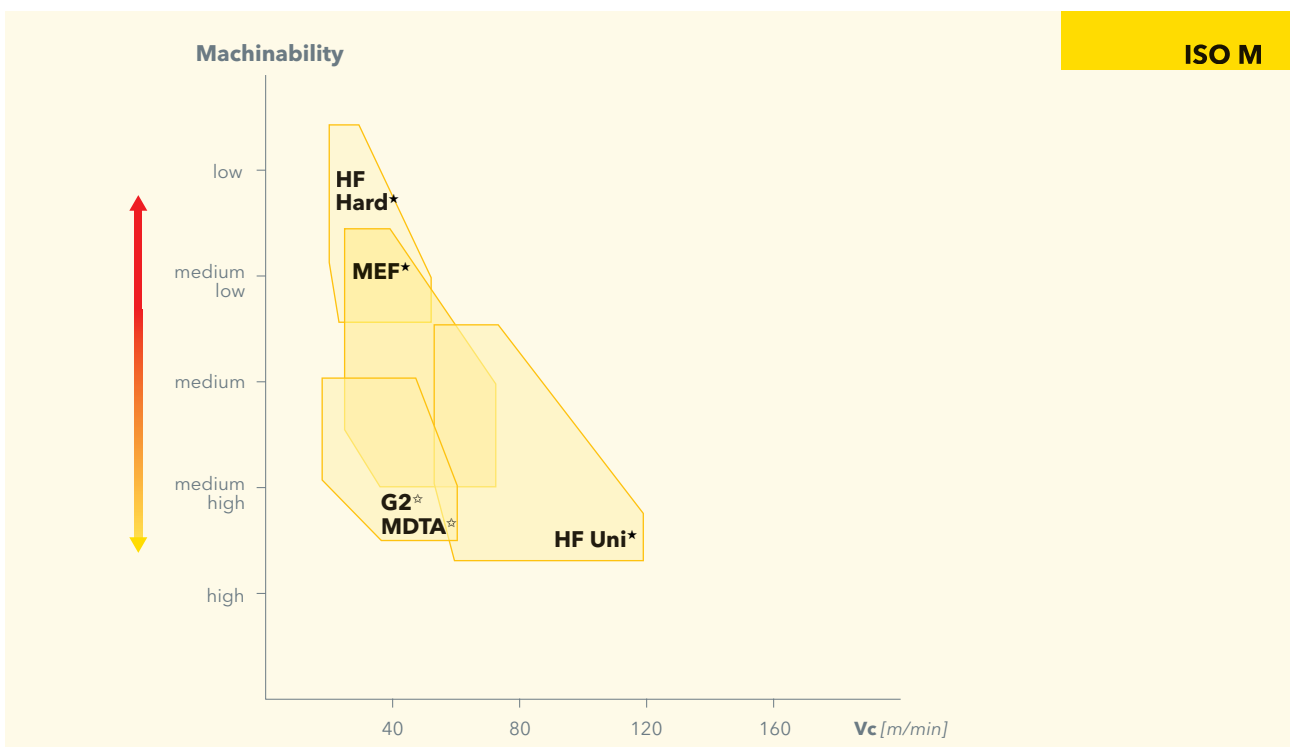
★ 1st choice ☆ suitable

STEEL APPLICATION



★ 1st choice ☆ suitable

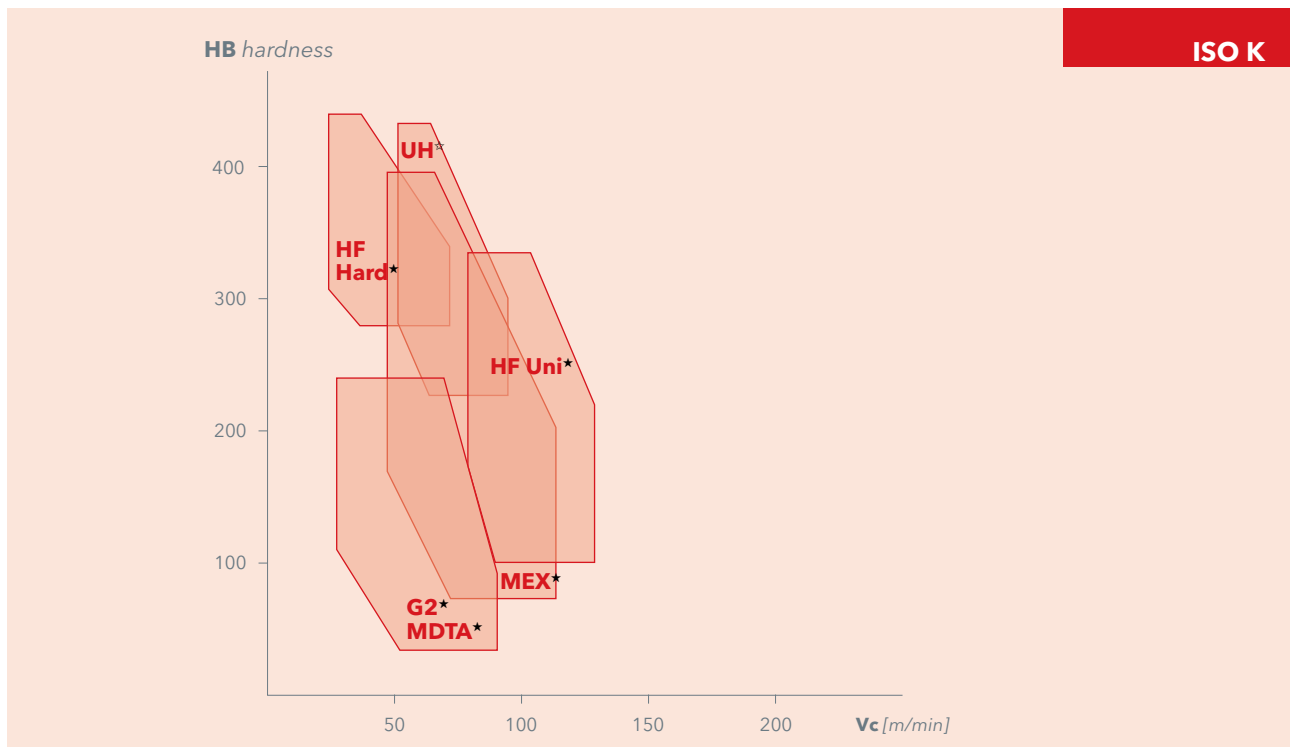
STAINLESS STEEL APPLICATION



★ 1st choice ☆ suitable

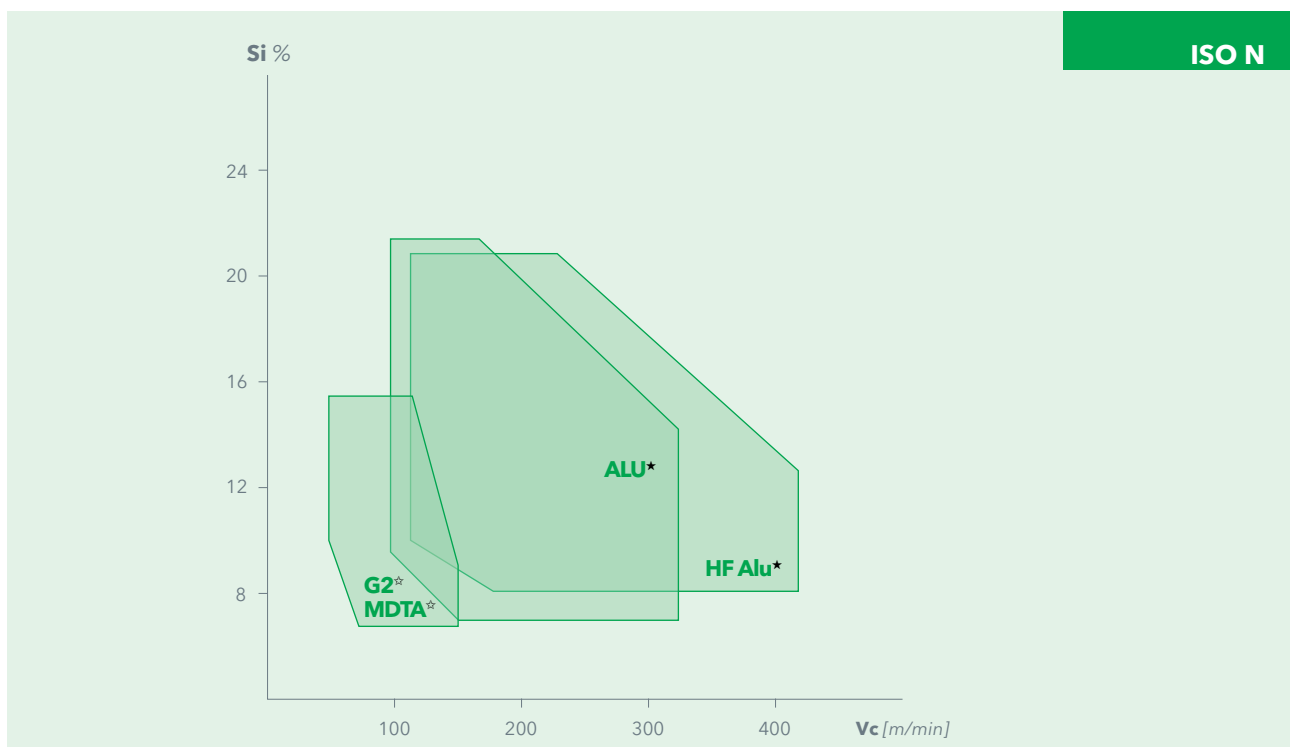
- G2 : general purpose (page 317)
- MDTA : general purpose (page 363)
- HF UNI : universal purpose (page 387)
- HF HARD : special purpose (page 463)
- MEF : special purpose (page 483)
- MEX : special purpose (page 523)
- UH : special purpose (page 583)

CAST IRON APPLICATION



★ 1st choice ☆ suitable

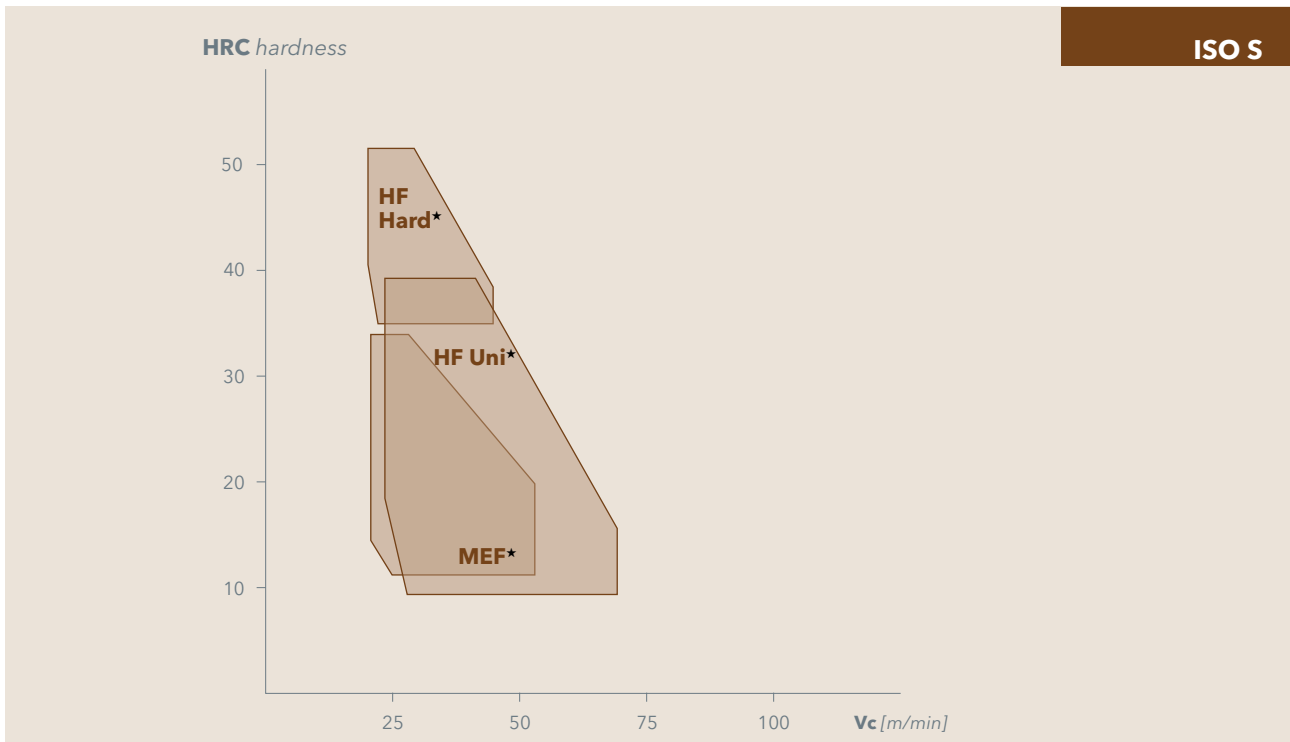
NON-FERROUS MATERIALS APPLICATION



★ 1st choice ☆ suitable

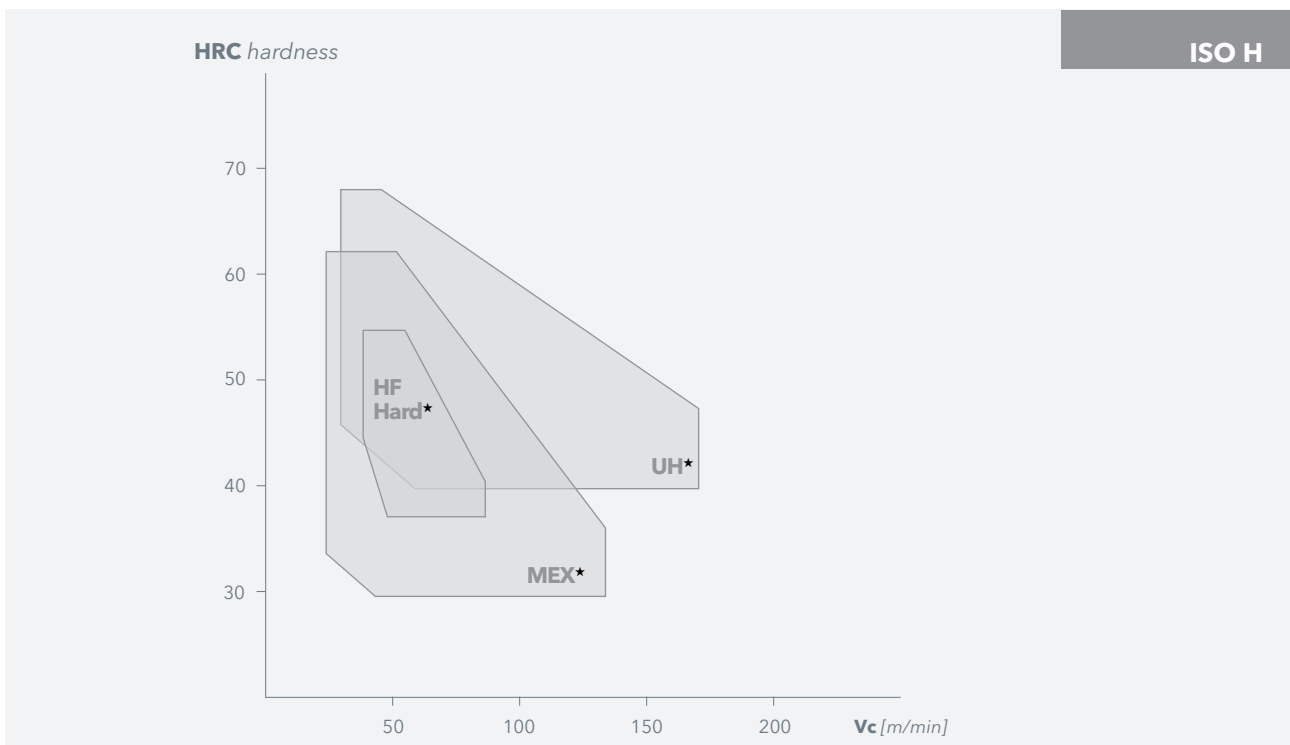
- G2 : general purpose (page 317)
- MDTA : general purpose (page 363)
- HF UNI : universal purpose (page 387)
- HF HARD : special purpose (page 463)
- ALU : special purpose (page 497)
- MEX : special purpose (page 523)
- UH : special purpose (page 583)

SUPER ALLOYS APPLICATION



★ 1st choice ☆ suitable

HARDENED STEEL APPLICATION



★ 1st choice ☆ suitable

HF UNI : universal purpose (page 387)
 HF HARD : special purpose (page 463)
 MEF : special purpose (page 483)
 MEX : special purpose (page 523)
 UH : special purpose (page 583)



G2

GENERAL PURPOSE

✚ Range of general-purpose endmills, featuring new cutting geometries and innovative coatings for enhanced performance. The answer given by Osawa to the market demand for higher performance tools. Thanks to a fully optimized manufacturing process and to large production batches the G2 range excels in the cost-performance ratio.

🇮🇹 Gamma di frese per uso generico, dotate di geometria di taglio e rivestimenti innovativi per garantire prestazioni ancora più elevate. La risposta di Osawa ad un mercato che chiede utensili sempre più performanti e competitivi. L'innovazione nei processi produttivi consente alla gamma G2 di eccellere nel rapporto qualità-prezzo.

🇩🇪 Produktpalette von Fräser für allgemeine Anwendungen, ausgestattet mit einer Schnittgeometrie und innovativen Beschichtungen zur Gewährleistung noch höheren Leistungen. Die Antwort von Osawa auf einen Markt, der immer leistungsstärkere und wettbewerbsfähigere Werkzeuge fordert. Dank der Innovation der Produktionsprozesse zeichnet sich die Produktreihe G2 durch ein außergewöhnliches Preis-Leistungsverhältnis aus.

🇫🇷 Gamme de fraises pour un usage général, dotées de géométrie de coupe et de revêtements innovants pour garantir des prestations encore plus élevées. C'est la réponse d'Osawa à un marché qui nécessite d'outils de plus en plus performants et compétitifs. L'innovation des processus de production permet à la gamme G2 d'avoir un rapport qualité-prix excellent.

🇪🇸 Gama de fresas para uso genérico, provistas de geometría de corte y revestimientos innovadores para garantizar prestaciones aún más elevadas. La respuesta de Osawa a un mercado que pide herramientas cada vez con mayor rendimiento y más competitivas. La innovación en los procesos de producción permite a la gama G2 sobresalir en la relación calidad-precio.

🇷🇺 Ассортимент фрез общего назначения, с новой геометрией и покрытиями, гарантирующими высокоэффективную работу. Это ответ компании Osawa на запросы рынка, который требует всё более конкурентоспособные инструменты с высокими эксплуатационными характеристиками. Инновации в производственных процессах и большие изготавливаемые партии позволяют серии G2 иметь превосходное соотношение цена-качество.

INFO
TYPHOON TA-HTA-4HTA
TYPHOON PU-HPU
TYPHOON SUH
TYPHOON ALH
TYPHOON HRC
TYPHOON SUH MINI
TYPHOON HL
C-SD-TA
LFTA
SUTA
HSS-HSS/CO DRILLS
G2
MDTA
HF VH/UP
MEF
ALU
MEX
UH
HSS/CO-HSSP END MILLS
CARBIDE BURRS

GB205

	Material Group ISO 513	P1 K1			P2 M1 K2			P3 M2			N1 N2 N3 N4		
	Hardness/Rm	< 700 N/mm ²			700-1000 N/mm ²			< 40 HRC					
	ap x ae	0.5D x D			0.5D x D			0.3D x D			0.5D x D		
	Vc (m/min)	50-60			30-50			20-40			70-90		
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)
	1	17520	0.004	120	12740	0.003	80	9550	0.003	50	25480	0.005	230
	2	8760	0.007	120	6370	0.006	80	4780	0.005	50	12740	0.009	230
	3	5840	0.010	120	4250	0.009	70	3180	0.008	50	8490	0.013	220
	4	4380	0.014	120	3180	0.012	80	2390	0.011	50	6370	0.018	230
	5	3500	0.018	130	2550	0.015	80	1910	0.014	50	5100	0.023	240
6	2920	0.023	130	2120	0.020	80	1590	0.017	50	4250	0.030	250	
8	2190	0.030	130	1590	0.026	80	1190	0.023	50	3180	0.039	250	
10	1750	0.038	130	1270	0.032	80	960	0.029	50	2550	0.049	250	
12	1460	0.045	130	1060	0.038	80	800	0.034	50	2120	0.059	250	

< D3 mm: ap = 0.2D

	Material Group ISO 513	P1 K1			P2 M1 K2			P3 M2			N1 N2 N3 N4		
	Hardness/Rm	< 700 N/mm ²			700-1000 N/mm ²			< 40 HRC					
	ap x ae	1.5D x 0.3D			1.5D x 0.3D			1.5D x 0.2D			1.5D x 0.3D		
	Vc (m/min)	50-60			30-50			20-40			70-90		
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)
	1	17520	0.004	150	12740	0.004	90	9550	0.003	60	25480	0.006	290
	2	8760	0.009	150	6370	0.007	90	4780	0.007	60	12740	0.011	290
	3	5840	0.013	150	4250	0.011	90	3180	0.009	60	8490	0.016	280
	4	4380	0.018	150	3180	0.015	90	2390	0.013	60	6370	0.023	290
	5	3500	0.023	160	2550	0.019	100	1910	0.017	60	5100	0.029	300
6	2920	0.029	170	2120	0.024	100	1590	0.022	70	4250	0.037	320	
8	2190	0.038	160	1590	0.032	100	1190	0.028	70	3180	0.049	310	
10	1750	0.048	170	1270	0.040	100	960	0.036	70	2550	0.062	310	
12	1460	0.056	160	1060	0.048	100	800	0.042	70	2120	0.073	310	

< D3 mm: ae = 0.2D

	Material Group ISO 513	P1 K1			P2 M1 K2			P3 M2			N1 N2 N3 N4		
	Hardness/Rm	< 700 N/mm ²			700-1000 N/mm ²			< 40 HRC					
	ap x ae	D x D			D x D			0.5D x D			D x D		
	Vc (m/min)	40-50			30-40			20-30			60-80		
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)
	1	14330	0.002	60	11150	0.002	40	7960	0.002	30	22290	0.003	130
	2	7170	0.004	60	5570	0.004	40	3980	0.003	30	11150	0.006	130
	3	4780	0.006	60	3720	0.005	40	2650	0.005	20	7430	0.008	120
	4	3580	0.009	60	2790	0.007	40	1990	0.007	30	5570	0.011	130
	5	2870	0.011	60	2230	0.010	40	1590	0.008	30	4460	0.015	130
6	2390	0.014	70	1860	0.012	50	1330	0.011	30	3720	0.019	140	
8	1790	0.019	70	1390	0.016	40	1000	0.014	30	2790	0.024	140	
10	1430	0.024	70	1110	0.020	40	800	0.018	30	2230	0.031	140	
12	1190	0.028	70	930	0.024	40	660	0.021	30	1860	0.037	140	

< D3 mm: ap = 0.5D

INFO

TYPHOON TA-HTA-4HTA

TYPHOON PU-HPU

TYPHOON SUH

TYPHOON ALH

TYPHOON HRC

TYPHOON SUH MINI

TYPHOON HL

C-SD-TA

LFTA

SUTA

HSS-HSS/CO DRILLS

G2

MDTA

HF VH/UP

MEF

ALU

MEX

UH

HSS/CO-HSSP END MILLS

CARBIDE BURRS

G2CS2

<p>SLOTTING</p>	Material Group ISO 513	P1 P2 K1			P3 P4 M1 M2 K2			P5 M3 K3			N1 N2 N3 N4		
	Hardness/Rm	< 700 N/mm ²			700-1000 N/mm ²			< 40 HRC					
	ap x ae	0.5D x D			0.5D x D			0.5D x D			0.5D x D		
	Vc (m/min)	80-100			50-70			30-50			100-120		
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)
	1	28660	0.004	230	19110	0.003	130	12740	0.003	80	35030	0.005	360
	2	14330	0.008	230	9550	0.007	130	6370	0.006	80	17520	0.010	360
	3	9550	0.012	230	6370	0.010	130	4250	0.009	80	11680	0.016	360
	4	7170	0.016	230	4780	0.014	130	3180	0.012	80	8760	0.021	360
	5	5730	0.020	230	3820	0.017	130	2550	0.015	80	7010	0.026	360
	6	4780	0.025	240	3180	0.021	140	2120	0.019	80	5840	0.033	380
	8	3580	0.032	230	2390	0.027	130	1590	0.024	80	4380	0.042	360
	10	2870	0.038	220	1910	0.032	120	1270	0.029	70	3500	0.049	350
	12	2390	0.045	220	1590	0.038	120	1060	0.034	70	2920	0.059	340
14	2050	0.052	210	1360	0.044	120	910	0.039	70	2500	0.068	340	
16	1790	0.060	210	1190	0.051	120	800	0.045	70	2190	0.078	340	
18	1590	0.070	220	1060	0.060	130	710	0.053	70	1950	0.091	350	
20	1430	0.080	230	960	0.068	130	640	0.060	80	1750	0.104	360	

< D3 mm: ap = 0.2D

<p>SIDE MILLING</p>	Material Group ISO 513	P1 P2 K1			P3 P4 M1 M2 K2			P5 M3 K3			N1 N2 N3 N4		
	Hardness/Rm	< 700 N/mm ²			700-1000 N/mm ²			< 40 HRC					
	ap x ae	1.5D x 0.5D			1.5D x 0.5D			1.5D x 0.5D			1.5D x 0.5D		
	Vc (m/min)	80-100			50-70			30-50			100-120		
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)
	1	28660	0.005	280	19110	0.004	160	12740	0.004	90	35030	0.006	440
	2	14330	0.010	280	9550	0.008	160	6370	0.007	90	17520	0.012	440
	3	9550	0.014	280	6370	0.012	160	4250	0.011	90	11680	0.019	440
	4	7170	0.019	280	4780	0.016	160	3180	0.014	90	8760	0.025	440
	5	5730	0.024	280	3820	0.020	160	2550	0.018	90	7010	0.031	440
	6	4780	0.030	290	3180	0.026	160	2120	0.023	100	5840	0.039	460
	8	3580	0.038	270	2390	0.033	160	1590	0.029	90	4380	0.050	440
	10	2870	0.046	260	1910	0.039	150	1270	0.034	90	3500	0.059	410
	12	2390	0.054	260	1590	0.046	150	1060	0.041	90	2920	0.070	410
14	2050	0.062	260	1360	0.053	140	910	0.047	90	2500	0.081	410	
16	1790	0.072	260	1190	0.061	150	800	0.054	90	2190	0.094	410	
18	1590	0.084	270	1060	0.071	150	710	0.063	90	1950	0.109	430	
20	1430	0.096	270	960	0.082	160	640	0.072	90	1750	0.125	440	

< D3 mm: ae = 0.2D

<p>DRILLING</p>	Material Group ISO 513	P1 P2 K1			P3 P4 M1 M2 K2			P5 M3 K3			N1 N2 N3 N4		
	Hardness/Rm	< 700 N/mm ²			700-1000 N/mm ²			< 40 HRC					
	ap x ae	0.5D x D			0.5D x D			0.5D x D			0.5D x D		
	Vc (m/min)	70-90			40-60			25-35			80-100		
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)
	1	25480	0.002	120	15920	0.002	60	9550	0.002	30	28660	0.003	180
	2	12740	0.005	120	7960	0.004	60	4780	0.004	30	14330	0.006	180
	3	8490	0.007	120	5310	0.006	60	3180	0.005	30	9550	0.009	180
	4	6370	0.010	120	3980	0.008	60	2390	0.007	30	7170	0.012	180
	5	5100	0.012	120	3180	0.010	60	1910	0.009	30	5730	0.016	180
	6	4250	0.015	130	2650	0.013	70	1590	0.011	40	4780	0.020	190
	8	3180	0.019	120	1990	0.016	60	1190	0.014	30	3580	0.025	180
	10	2550	0.023	120	1590	0.019	60	960	0.017	30	2870	0.030	170
	12	2120	0.027	110	1330	0.023	60	800	0.020	30	2390	0.035	170
14	1820	0.031	110	1140	0.027	60	680	0.023	30	2050	0.041	170	
16	1590	0.036	110	1000	0.031	60	600	0.027	30	1790	0.047	170	
18	1420	0.042	120	880	0.036	60	530	0.032	30	1590	0.055	170	
20	1270	0.048	120	800	0.041	70	480	0.036	30	1430	0.062	180	

< D3 mm: ap = 0.5D

- INFO
- TYPHOON TA-HTA-4HTA
- TYPHOON PU-HPU
- TYPHOON SUH
- TYPHOON ALH
- TYPHOON HRC
- TYPHOON SUH MINI
- TYPHOON HL
- C-SD-TA
- LFTA
- SUTA
- HSS-HSS/CO DRILLS
- G2
- MDTA
- HF VH/UP
- MEF
- ALU
- MEX
- UH
- HSS/CO-HSSP END MILLS
- CARBIDE BURRS

G2WS2

	Material Group ISO 513	P1 P2 K1			P3 P4 M1 M2 K2			P5 M3 K3			N1 N2 N3 N4		
	Hardness/Rm	< 700 N/mm ²			700-1000 N/mm ²			< 40 HRC					
	ap x ae	0.5D x D			0.5D x D			0.5D x D			0.5D x D		
	Vc (m/min)	80-100			50-70			30-50			100-120		
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)
	3	9550	0.012	230	6370	0.010	130	4250	0.009	80	11680	0.016	360
	4	7170	0.016	230	4780	0.014	130	3180	0.012	80	8760	0.021	360
	5	5730	0.020	230	3820	0.017	130	2550	0.015	80	7010	0.026	360
	6	4780	0.025	240	3180	0.021	140	2120	0.019	80	5840	0.033	380
	8	3580	0.032	230	2390	0.027	130	1590	0.024	80	4380	0.042	360
	10	2870	0.038	220	1910	0.032	120	1270	0.029	70	3500	0.049	350
	12	2390	0.045	220	1590	0.038	120	1060	0.034	70	2920	0.059	340
	14	2050	0.052	210	1360	0.044	120	910	0.039	70	2500	0.068	340
16	1790	0.060	210	1190	0.051	120	800	0.045	70	2190	0.078	340	
18	1590	0.070	220	1060	0.060	130	710	0.053	70	1950	0.091	350	
20	1430	0.080	230	960	0.068	130	640	0.060	80	1750	0.104	360	

< D3 mm: ap = 0.2D

	Material Group ISO 513	P1 P2 K1			P3 P4 M1 M2 K2			P5 M3 K3			N1 N2 N3 N4		
	Hardness/Rm	< 700 N/mm ²			700-1000 N/mm ²			< 40 HRC					
	ap x ae	1.5D x 0.3D			1.5D x 0.5D			1.5D x 0.5D			1.5D x 0.5D		
	Vc (m/min)	80-100			50-70			30-50			100-120		
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)
	3	9550	0.014	280	6370	0.012	160	4250	0.011	90	11680	0.019	440
	4	7170	0.019	280	4780	0.016	160	3180	0.014	90	8760	0.025	440
	5	5730	0.024	280	3820	0.020	160	2550	0.018	90	7010	0.031	440
	6	4780	0.030	290	3180	0.026	160	2120	0.023	100	5840	0.039	460
	8	3580	0.038	270	2390	0.033	160	1590	0.029	90	4380	0.050	440
	10	2870	0.046	260	1910	0.039	150	1270	0.034	90	3500	0.059	410
	12	2390	0.054	260	1590	0.046	150	1060	0.041	90	2920	0.070	410
	14	2050	0.062	260	1360	0.053	140	910	0.047	90	2500	0.081	410
16	1790	0.072	260	1190	0.061	150	800	0.054	90	2190	0.094	410	
18	1590	0.084	270	1060	0.071	150	710	0.063	90	1950	0.109	430	
20	1430	0.096	270	960	0.082	160	640	0.072	90	1750	0.125	440	

< D3 mm: ae = 0.2D

	Material Group ISO 513	P1 P2 K1			P3 P4 M1 M2 K2			P5 M3 K3			N1 N2 N3 N4		
	Hardness/Rm	< 700 N/mm ²			700-1000 N/mm ²			< 40 HRC					
	ap x ae	D x D			D x D			0.5D x D			D x D		
	Vc (m/min)	70-90			40-60			25-35			80-100		
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)
	3	8490	0.007	120	5310	0.006	60	3180	0.005	30	9550	0.009	180
	4	6370	0.010	120	3980	0.008	60	2390	0.007	30	7170	0.012	180
	5	5100	0.012	120	3180	0.010	60	1910	0.009	30	5730	0.016	180
	6	4250	0.015	130	2650	0.013	70	1590	0.011	40	4780	0.020	190
	8	3180	0.019	120	1990	0.016	60	1190	0.014	30	3580	0.025	180
	10	2550	0.023	120	1590	0.019	60	960	0.017	30	2870	0.030	170
	12	2120	0.027	110	1330	0.023	60	800	0.020	30	2390	0.035	170
	14	1820	0.031	110	1140	0.027	60	680	0.023	30	2050	0.041	170
16	1590	0.036	110	1000	0.031	60	600	0.027	30	1790	0.047	170	
18	1420	0.042	120	880	0.036	60	530	0.032	30	1590	0.055	170	
20	1270	0.048	120	800	0.041	70	480	0.036	30	1430	0.062	180	

< D3 mm: ap = 0.5D

- INFO
- TYPHOON TA-HTA-4HTA
- TYPHOON PU-HPU
- TYPHOON SUH
- TYPHOON ALH
- TYPHOON HRC
- TYPHOON SUH MINI
- TYPHOON HL
- C-SD-TA
- LFTA
- SUTA
- HSS-HSS/CO DRILLS
- G2**
- MDTA
- HF VH/UP
- MEF
- ALU
- MEX
- UH
- HSS/CO-HSSP END MILLS
- CARBIDE BURRS

G2210-G2211

	Material Group ISO 513	P1 P2 K1			P3 P4 M1 M2 K2			P5 M3 K3			N1 N2 N3 N4		
	Hardness/Rm	< 700 N/mm ²			700-1000 N/mm ²			< 40 HRC					
	ap x ae	0.5D x D			0.5D x D			0.5D x D			0.5D x D		
	Vc (m/min)	70-90			45-65			30-50			80-120		
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)
	2	12740	0.007	180	8760	0.006	100	6370	0.005	70	15920	0.009	290
	3	8490	0.010	170	5840	0.009	100	4250	0.008	60	10620	0.013	280
	4	6370	0.014	180	4380	0.012	100	3180	0.011	70	7960	0.018	290
	5	5100	0.018	180	3500	0.015	110	2550	0.014	70	6370	0.023	300
	6	4250	0.023	190	2920	0.019	110	2120	0.017	70	5310	0.029	310
8	3180	0.030	190	2190	0.026	110	1590	0.023	70	3980	0.039	310	
10	2550	0.035	180	1750	0.030	100	1270	0.026	70	3180	0.046	290	
12	2120	0.041	170	1460	0.035	100	1060	0.031	70	2650	0.053	280	

< D3 mm: ap = 0.2D

	Material Group ISO 513	P1 P2 K1			P3 P4 M1 M2 K2			P5 M3 K3			N1 N2 N3 N4		
	Hardness/Rm	< 700 N/mm ²			700-1000 N/mm ²			< 40 HRC					
	ap x ae	1.5D x 0.5D			1.5D x 0.5D			1.5D x 0.5D			1.5D x 0.5D		
	Vc (m/min)	70-90			45-65			30-50			80-120		
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)
	2	12740	0.008	210	8760	0.007	130	6370	0.006	80	15920	0.011	350
	3	8490	0.012	200	5840	0.010	120	4250	0.009	80	10620	0.016	330
	4	6370	0.017	210	4380	0.014	130	3180	0.013	80	7960	0.022	350
	5	5100	0.022	220	3500	0.018	130	2550	0.016	80	6370	0.028	360
	6	4250	0.027	230	2920	0.023	130	2120	0.020	90	5310	0.035	370
8	3180	0.036	230	2190	0.031	130	1590	0.027	90	3980	0.047	370	
10	2550	0.042	210	1750	0.036	120	1270	0.032	80	3180	0.055	350	
12	2120	0.049	210	1460	0.042	120	1060	0.037	80	2650	0.064	340	

< D3 mm: ae = 0.2D

	Material Group ISO 513	P1 P2 K1			P3 P4 M1 M2 K2			P5 M3 K3			N1 N2 N3 N4		
	Hardness/Rm	< 700 N/mm ²			700-1000 N/mm ²			< 40 HRC					
	ap x ae	D x D			D x D			0.5D x D			D x D		
	Vc (m/min)	60-80			40-60			25-45			70-110		
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)
	2	11150	0.004	90	7960	0.004	60	5570	0.003	40	14330	0.005	160
	3	7430	0.006	90	5310	0.005	50	3720	0.005	30	9550	0.008	150
	4	5570	0.008	90	3980	0.007	60	2790	0.006	40	7170	0.011	160
	5	4460	0.011	100	3180	0.009	60	2230	0.008	40	5730	0.014	160
	6	3720	0.014	100	2650	0.011	60	1860	0.010	40	4780	0.018	170
8	2790	0.018	100	1990	0.015	60	1390	0.014	40	3580	0.023	170	
10	2230	0.021	90	1590	0.018	60	1110	0.016	30	2870	0.027	160	
12	1860	0.025	90	1330	0.021	60	930	0.018	30	2390	0.032	150	

< D3 mm: ap = 0.5D

INFO
TYPHOON TA-HTA-4HTA
TYPHOON PU-HPU
TYPHOON SUH
TYPHOON ALH
TYPHOON HRC
TYPHOON SUH MINI
TYPHOON HL
C-SD-TA
LFTA
SUTA
HSS/HSS/CO DRILLS
G2
MDTA
HF VH/UP
MEF
ALU
MEX
UH
HSS/CO-HSSP END MILLS
CARBIDE BURRS

G2212

	Material Group ISO 513	P1 P2 K1			P3 P4 M1 M2 K2			P5 M3 K3			N1 N2 N3 N4		
	Hardness/Rm	< 700 N/mm ²			700-1000 N/mm ²			< 40 HRC					
	ap x ae	0.3D x D			0.3D x D			0.3D x D			0.3D x D		
	Vc (m/min)	55-75			40-60			20-40			70-90		
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)
	8	2590	0.026	130	1990	0.022	90	1190	0.020	50	3180	0.034	210
	10	2070	0.032	130	1590	0.027	90	960	0.024	50	2550	0.042	210
	12	1730	0.036	120	1330	0.031	80	800	0.027	40	2120	0.047	200
	14	1480	0.042	120	1140	0.036	80	680	0.032	40	1820	0.055	200
	16	1290	0.048	120	1000	0.041	80	600	0.036	40	1590	0.062	200

	Material Group ISO 513	P1 P2 K1			P3 P4 M1 M2 K2			P5 M3 K3			N1 N2 N3 N4		
	Hardness/Rm	< 700 N/mm ²			700-1000 N/mm ²			< 40 HRC					
	ap x ae	1.5D x 0.3D			1.5D x 0.3D			1.5D x 0.3D			1.5D x 0.3D		
	Vc (m/min)	55-75			40-60			20-40			70-90		
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)
	8	2590	0.031	160	1990	0.027	110	1190	0.023	60	3180	0.041	260
	10	2070	0.038	160	1590	0.033	100	960	0.029	60	2550	0.050	250
	12	1730	0.043	150	1330	0.037	100	800	0.032	50	2120	0.056	240
	14	1480	0.050	150	1140	0.043	100	680	0.038	50	1820	0.066	240
	16	1290	0.058	150	1000	0.049	100	600	0.043	50	1590	0.075	240

	Material Group ISO 513	P1 P2 K1			P3 P4 M1 M2 K2			P5 M3 K3			N1 N2 N3 N4		
	Hardness/Rm	< 700 N/mm ²			700-1000 N/mm ²			< 40 HRC					
	ap x ae	D x D			D x D			0.5D x D			D x D		
	Vc (m/min)	50-70			35-55			20-30			60-80		
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)
	8	2390	0.016	70	1790	0.013	50	1000	0.012	20	2790	0.020	110
	10	1910	0.019	70	1430	0.016	50	800	0.014	20	2230	0.025	110
	12	1590	0.022	70	1190	0.018	40	660	0.016	20	1860	0.028	100
	14	1360	0.025	70	1020	0.021	40	570	0.019	20	1590	0.033	100
	16	1190	0.029	70	900	0.024	40	500	0.022	20	1390	0.037	100

GB305

	Material Group ISO 513	P1 K1			P2 M1 K2			P3 M2			N1 N2 N3 N4		
	Hardness/Rm	< 700 N/mm ²			700-1000 N/mm ²			< 40 HRC					
	ap x ae	0.5D x D			0.5D x D			0.3D x D			0.5D x D		
	Vc (m/min)	50-60			30-50			20-40			70-90		
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)
	1	17520	0.003	160	12740	0.003	100	9550	0.002	60	25480	0.004	300
	2	8760	0.006	160	6370	0.005	100	4780	0.004	60	12740	0.008	300
	3	5840	0.009	150	4250	0.007	90	3180	0.006	60	8490	0.011	280
	4	4380	0.012	160	3180	0.010	100	2390	0.009	60	6370	0.016	300
	5	3500	0.015	160	2550	0.013	100	1910	0.012	70	5100	0.020	310
6	2920	0.020	170	2120	0.017	110	1590	0.015	70	4250	0.026	330	
8	2190	0.026	170	1590	0.022	100	1190	0.019	70	3180	0.033	320	
10	1750	0.032	170	1270	0.028	110	960	0.024	70	2550	0.042	320	
12	1460	0.038	170	1060	0.033	100	800	0.029	70	2120	0.050	320	

< D3 mm: ap = 0.2D

	Material Group ISO 513	P1 K1			P2 M1 K2			P3 M2			N1 N2 N3 N4		
	Hardness/Rm	< 700 N/mm ²			700-1000 N/mm ²			< 40 HRC					
	ap x ae	1.5D x 0.3D			1.5D x 0.3D			1.5D x 0.2D			1.5D x 0.3D		
	Vc (m/min)	50-70			40-50			20-40			80-100		
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)
	1	19110	0.004	210	14330	0.003	130	9550	0.003	80	28660	0.005	400
	2	9550	0.007	210	7170	0.006	130	4780	0.005	80	14330	0.009	400
	3	6370	0.010	200	4780	0.009	130	3180	0.008	70	9550	0.013	380
	4	4780	0.014	210	3580	0.012	130	2390	0.011	80	7170	0.019	400
	5	3820	0.018	210	2870	0.016	140	1910	0.014	80	5730	0.024	410
6	3180	0.024	230	2390	0.020	140	1590	0.018	80	4780	0.031	440	
8	2390	0.031	220	1790	0.026	140	1190	0.023	80	3580	0.040	430	
10	1910	0.039	220	1430	0.033	140	960	0.029	80	2870	0.051	440	
12	1590	0.046	220	1190	0.039	140	800	0.035	80	2390	0.060	430	

< D3 mm: ae = 0.1D

G2CSH3

	Material Group ISO 513	P1 P2 K1			P3 P4 M1 M2 K2			P5 M3 K3			N1 N2 N3 N4		
	Hardness/Rm	< 700 N/mm ²			700-1000 N/mm ²			< 40 HRC					
	ap x ae	0.5D x D			0.5D x D			0.5D x D			0.5D x D		
	Vc (m/min)	80-100			50-70			30-50			80-120		
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)
	1	28660	0.003	260	19110	0.003	150	12740	0.002	90	31850	0.004	370
	2	14330	0.006	270	9550	0.005	150	6370	0.005	90	15920	0.008	390
	3	9550	0.009	270	6370	0.008	150	4250	0.007	90	10620	0.012	390
	4	7170	0.013	270	4780	0.011	150	3180	0.009	90	7960	0.016	390
	5	5730	0.016	270	3820	0.013	150	2550	0.012	90	6370	0.020	390
	6	4780	0.019	270	3180	0.016	150	2120	0.014	90	5310	0.024	390
	8	3580	0.025	270	2390	0.021	150	1590	0.019	90	3980	0.033	390
	10	2870	0.031	270	1910	0.027	150	1270	0.023	90	3180	0.041	390
12	2390	0.040	290	1590	0.034	160	1060	0.030	100	2650	0.052	410	
14	2050	0.046	280	1360	0.039	160	910	0.035	90	2270	0.060	410	
16	1790	0.056	300	1190	0.048	170	800	0.042	100	1990	0.073	440	
18	1590	0.065	310	1060	0.055	180	710	0.049	100	1770	0.085	450	
20	1430	0.075	320	960	0.064	180	640	0.056	110	1590	0.098	470	

< D3 mm: ap = 0.2D

	Material Group ISO 513	P1 P2 K1			P3 P4 M1 M2 K2			P5 M3 K3			N1 N2 N3 N4		
	Hardness/Rm	< 700 N/mm ²			700-1000 N/mm ²			< 40 HRC					
	ap x ae	1.5D x 0.3D			1.5D x 0.3D			1.5D x 0.3D			1.5D x 0.3D		
	Vc (m/min)	90-110			60-80			40-60			110-120		
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)
	1	31850	0.004	340	22290	0.003	200	15920	0.003	130	38220	0.005	540
	2	15920	0.008	360	11150	0.006	210	7960	0.006	130	19110	0.010	560
	3	10620	0.011	360	7430	0.010	210	5310	0.008	130	12740	0.015	560
	4	7960	0.015	360	5570	0.013	210	3980	0.011	130	9550	0.020	560
	5	6370	0.019	360	4460	0.016	210	3180	0.014	130	7640	0.024	560
	6	5310	0.023	360	3720	0.019	210	2650	0.017	130	6370	0.029	560
	8	3980	0.030	360	2790	0.026	210	1990	0.023	130	4780	0.039	560
	10	3180	0.038	360	2230	0.032	210	1590	0.028	130	3820	0.049	560
12	2650	0.048	380	1860	0.041	230	1330	0.036	140	3180	0.062	600	
14	2270	0.056	380	1590	0.047	230	1140	0.042	140	2730	0.072	590	
16	1990	0.068	400	1390	0.057	240	1000	0.051	150	2390	0.088	630	
18	1770	0.078	410	1240	0.066	250	880	0.059	150	2120	0.101	640	
20	1590	0.090	430	1110	0.077	250	800	0.068	160	1910	0.117	670	

< D3 mm: ae = 0.1D

G2WSH3

	Material Group ISO 513	P1 P2 K1			P3 P4 M1 M2 K2			P5 M3 K3			N1 N2 N3 N4		
	Hardness/Rm	< 700 N/mm ²			700-1000 N/mm ²			< 40 HRC					
	ap x ae	0.5D x D			0.5D x D			0.5D x D			0.5D x D		
	Vc (m/min)	80-100			50-70			30-50			80-120		
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)
	3	9550	0.009	270	6370	0.008	150	4250	0.007	90	10620	0.012	390
	4	7170	0.013	270	4780	0.011	150	3180	0.009	90	7960	0.016	390
	5	5730	0.016	270	3820	0.013	150	2550	0.012	90	6370	0.020	390
	6	4780	0.019	270	3180	0.016	150	2120	0.014	90	5310	0.024	390
	8	3580	0.025	270	2390	0.021	150	1590	0.019	90	3980	0.033	390
	10	2870	0.031	270	1910	0.027	150	1270	0.023	90	3180	0.041	390
	12	2390	0.040	290	1590	0.034	160	1060	0.030	100	2650	0.052	410
	14	2050	0.046	280	1360	0.039	160	910	0.035	90	2270	0.060	410
16	1790	0.056	300	1190	0.048	170	800	0.042	100	1990	0.073	440	
18	1590	0.065	310	1060	0.055	180	710	0.049	100	1770	0.085	450	
20	1430	0.075	320	960	0.064	180	640	0.056	110	1590	0.098	470	

< D3 mm: ap = 0.2D

	Material Group ISO 513	P1 P2 K1			P3 P4 M1 M2 K2			P5 M3 K3			N1 N2 N3 N4		
	Hardness/Rm	< 700 N/mm ²			700-1000 N/mm ²			< 40 HRC					
	ap x ae	1.5D x 0.3D			1.5D x 0.3D			1.5D x 0.3D			1.5D x 0.3D		
	Vc (m/min)	90-110			60-80			40-60			110-120		
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)
	3	10620	0.011	360	7430	0.010	210	5310	0.008	130	12740	0.015	560
	4	7960	0.015	360	5570	0.013	210	3980	0.011	130	9550	0.020	560
	5	6370	0.019	360	4460	0.016	210	3180	0.014	130	7640	0.024	560
	6	5310	0.023	360	3720	0.019	210	2650	0.017	130	6370	0.029	560
	8	3980	0.030	360	2790	0.026	210	1990	0.023	130	4780	0.039	560
	10	3180	0.038	360	2230	0.032	210	1590	0.028	130	3820	0.049	560
	12	2650	0.048	380	1860	0.041	230	1330	0.036	140	3180	0.062	600
	14	2270	0.056	380	1590	0.047	230	1140	0.042	140	2730	0.072	590
16	1990	0.068	400	1390	0.057	240	1000	0.051	150	2390	0.088	630	
18	1770	0.078	410	1240	0.066	250	880	0.059	150	2120	0.101	640	
20	1590	0.090	430	1110	0.077	250	800	0.068	160	1910	0.117	670	

< D3 mm: ae = 0.1D

G2310-G2311

	Material Group ISO 513	P1 P2 K1			P3 P4 M1 M2 K2			P5 M3 K3			N1 N2 N3 N4		
	Hardness/Rm	< 700 N/mm ²			700-1000 N/mm ²			< 40 HRC					
	ap x ae	0.5D x D			0.5D x D			0.5D x D			0.5D x D		
	Vc (m/min)	60-80			35-55			25-35			80-100		
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)
	2	11150	0.006	190	7170	0.005	100	4780	0.004	60	14330	0.007	310
	3	7430	0.008	190	4780	0.007	100	3180	0.006	60	9550	0.011	310
	4	5570	0.011	190	3580	0.010	100	2390	0.008	60	7170	0.015	310
	5	4460	0.014	190	2870	0.012	100	1910	0.011	60	5730	0.018	310
	6	3720	0.017	190	2390	0.014	100	1590	0.013	60	4780	0.022	310
8	2790	0.023	190	1790	0.019	100	1190	0.017	60	3580	0.029	310	
10	2230	0.028	190	1430	0.024	100	960	0.021	60	2870	0.037	310	
12	1860	0.036	200	1190	0.031	110	800	0.027	60	2390	0.047	340	

< D3 mm: ap = 0.2D

	Material Group ISO 513	P1 P2 K1			P3 P4 M1 M2 K2			P5 M3 K3			N1 N2 N3 N4		
	Hardness/Rm	< 700 N/mm ²			700-1000 N/mm ²			< 40 HRC					
	ap x ae	1.5D x 0.3D			1.5D x 0.3D			1.5D x 0.3D			1.5D x 0.3D		
	Vc (m/min)	70-90			45-65			30-50			80-120		
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)
	2	12740	0.007	270	8760	0.006	160	6370	0.005	100	15920	0.009	440
	3	8490	0.011	270	5840	0.009	160	4250	0.008	100	10620	0.014	440
	4	6370	0.014	270	4380	0.012	160	3180	0.011	100	7960	0.018	440
	5	5100	0.018	270	3500	0.015	160	2550	0.013	100	6370	0.023	440
	6	4250	0.021	270	2920	0.018	160	2120	0.016	100	5310	0.027	440
8	3180	0.028	270	2190	0.024	160	1590	0.021	100	3980	0.037	440	
10	2550	0.035	270	1750	0.030	160	1270	0.026	100	3180	0.046	440	
12	2120	0.045	290	1460	0.038	170	1060	0.034	110	2650	0.059	470	

< D3 mm: ae = 0.1D

G2312

	Material Group ISO 513	P1 P2 K1			P3 P4 M1 M2 K2			P5 M3 K3			N1 N2 N3 N4		
	Hardness/Rm	< 700 N/mm ²			700-1000 N/mm ²			< 40 HRC					
	ap x ae	1.5D x 0.2D			1.5D x 0.2D			1.5D x 0.2D			1.5D x 0.2D		
	Vc (m/min)	55-75			40-60			20-40			70-90		
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)
	8	2590	0.020	160	1990	0.017	100	1190	0.015	50	3180	0.026	250
	10	2070	0.025	160	1590	0.021	100	960	0.019	50	2550	0.033	250
	12	1730	0.032	170	1330	0.027	110	800	0.024	60	2120	0.042	260
	14	1480	0.037	160	1140	0.031	110	680	0.028	60	1820	0.048	260
	16	1290	0.045	170	1000	0.038	110	600	0.034	60	1590	0.059	280

GB405

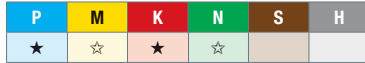
	Material Group ISO 513	P1 K1			P2 M1 K2			P3 M2			N1 N2 N3 N4			
	Hardness/Rm	< 700 N/mm ²			700-1000 N/mm ²			< 40 HRC						
	ap x ae	1.5D x 0.2D			1.5D x 0.2D			1.5D x 0.2D			1.5D x 0.2D			
	Vc (m/min)	50-70			40-50			20-40			80-100			
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	
	1	19110	0.003	250	14330	0.003	160	9550	0.002	90	28660	0.004	480	
	2	9550	0.006	250	7170	0.006	160	4780	0.005	90	14330	0.008	480	
	3	6370	0.010	250	4780	0.008	160	3180	0.007	90	9550	0.013	480	
	4	4780	0.013	250	3580	0.011	160	2390	0.010	90	7170	0.017	480	
	5	3820	0.016	250	2870	0.014	160	1910	0.012	90	5730	0.021	480	
	6	3180	0.020	260	2390	0.017	160	1590	0.015	100	4780	0.026	500	
	8	2390	0.026	250	1790	0.022	160	1190	0.019	90	3580	0.034	480	
	10	1910	0.031	240	1430	0.026	150	960	0.023	90	2870	0.040	460	
12	1590	0.036	230	1190	0.031	150	800	0.027	90	2390	0.047	450		

< D3 mm: ae = 0.1D

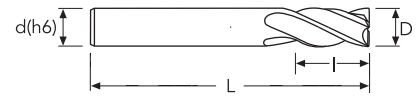
- INFO
- TYPHOON TA-HTA-4HTA
- TYPHOON PU-HPU
- TYPHOON SUH
- TYPHOON ALH
- TYPHOON HRC
- TYPHOON SUH MINI
- TYPHOON HL
- C-SD-TA
- LFTA
- SUTA
- HSS-HSS/CO DRILLS
- G2
- MDTA
- HF VH/UP
- MEF
- ALU
- MEX
- UH
- HSS/CO-HSSP END MILLS
- CARBIDE BURRS

G2CS4

cylindrical shank, 4 flutes



★ 1st choice ☆ suitable



D	D Tol.	C	C Tol.	d(h6)	l	l1	L	z	EDP No.	Stock
1	0/-0.020			4	3		50	4	G2CS4010	●
1.5	0/-0.020			4	4.5		50	4	G2CS4015	●
2	0/-0.020			4	6		50	4	G2CS4020	●
2.5	0/-0.020			4	7		50	4	G2CS4025	●
3	0/-0.020			4	8		50	4	G2CS4030	●
3.5	0/-0.020			4	10		50	4	G2CS4035	●
4	0/-0.020			4	11		50	4	G2CS4040	●
4.5	0/-0.020			6	13		50	4	G2CS4045	●
5	0/-0.020			6	13		50	4	G2CS4050	●
5.5	0/-0.020			6	13		50	4	G2CS4055	●
6	0/-0.020			6	15		50	4	G2CS4060	●
6.5	0/-0.025			8	17		60	4	G2CS4065	●
7	0/-0.025			8	17		60	4	G2CS4070	●
7.5	0/-0.025			8	17		60	4	G2CS4075	●
8	0/-0.025			8	20		60	4	G2CS4080	●
8.5	0/-0.025			10	23		75	4	G2CS4085	●
9	0/-0.025			10	23		75	4	G2CS4090	●
9.5	0/-0.025			10	25		75	4	G2CS4095	●
10	0/-0.025			10	30		75	4	G2CS4100	●
10.5	0/-0.025			12	25		75	4	G2CS4105	●
11	0/-0.025			12	30		75	4	G2CS4110	●
11.5	0/-0.025			12	28		75	4	G2CS4115	●
12	0/-0.025			12	30		75	4	G2CS4120	●
12.5	0/-0.030			14	26		83	4	G2CS4125	●
13	0/-0.030			14	26		83	4	G2CS4130	●
13.5	0/-0.030			14	26		83	4	G2CS4135	●
14	0/-0.030			14	26		83	4	G2CS4140	●
14.5	0/-0.030			16	32		92	4	G2CS4145	●
15	0/-0.030			16	32		92	4	G2CS4150	●
15.5	0/-0.030			16	32		92	4	G2CS4155	●
16	0/-0.030			16	32		92	4	G2CS4160	●
17	0/-0.030			20	40		100	4	G2CS4170	●
18	0/-0.030			20	40		100	4	G2CS4180	●
19	0/-0.030			20	40		100	4	G2CS4190	●
20	0/-0.030			20	40		100	4	G2CS4200	●
22	0/-0.030			25	40		100	4	G2CS4220	●
25	0/-0.030			25	40		100	4	G2CS4250	●

INFO
TYPHOON TA-HTA-4HTA
TYPHOON PU-HPU
TYPHOON SUH
TYPHOON ALH
TYPHOON HRC
TYPHOON SUH MINI
TYPHOON HL
C-SD-TA
LFTA
SUTA
HSS-HSS/CO DRILLS
G2
MDTA
HF VH/UP
MEF
ALU
MEX
UH
HSS/CO-HSSP END MILLS
CARBIDE BURRS

● stock standard ○ non-standard stock ▽ stock exhaustion


G2CS4

Material Group ISO 513	P1 P2 K1			P3 P4 M1 M2 K2			P5 M3 K3			N1 N2 N3 N4			
	< 700 N/mm ²			700-1000 N/mm ²			< 40 HRC						
	1.5D x 0.2D			1.5D x 0.2D			1.5D x 0.2D			1.5D x 0.2D			
ap x ae	80-100			50-70			30-50			100-120			
Vc (m/min)	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)
	1	28660	0.004	400	19110	0.003	230	12740	0.003	130	35030	0.005	640
	2	14330	0.007	400	9550	0.006	230	6370	0.005	130	17520	0.009	640
	3	9550	0.010	380	6370	0.009	220	4250	0.008	130	11680	0.013	610
	4	7170	0.013	370	4780	0.011	210	3180	0.010	120	8760	0.017	590
	5	5730	0.016	370	3820	0.014	210	2550	0.012	120	7010	0.021	580
	6	4780	0.019	360	3180	0.016	210	2120	0.014	120	5840	0.025	580
	8	3580	0.025	360	2390	0.021	200	1590	0.019	120	4380	0.033	570
	10	2870	0.032	370	1910	0.027	210	1270	0.024	120	3500	0.042	580
	12	2390	0.040	380	1590	0.034	220	1060	0.030	130	2920	0.052	610
	14	2050	0.047	390	1360	0.040	220	910	0.035	130	2500	0.061	610
	16	1790	0.054	390	1190	0.046	220	800	0.041	130	2190	0.070	610
	18	1590	0.060	380	1060	0.051	220	710	0.045	130	1950	0.078	610
	20	1430	0.065	370	960	0.055	210	640	0.049	120	1750	0.085	590
	22	1300	0.073	380	870	0.062	220	580	0.055	130	1590	0.095	600
	25	1150	0.083	380	760	0.071	210	510	0.062	130	1400	0.108	600

< D3 mm: ae = 0.1D

- INFO
- TYPHOON TA-HTA-4HTA
- TYPHOON PU-HPU
- TYPHOON SUH
- TYPHOON ALH
- TYPHOON HRC
- TYPHOON SUH MINI
- TYPHOON HL
- C-SD-TA
- LFTA
- SUTA
- HSS-HSS/CO DRILLS
- G2
- MDTA
- HF VH/UP
- MEF
- ALU
- MEX
- UH
- HSS/CO-HSSP END MILLS
- CARBIDE BURRS

G2WS4

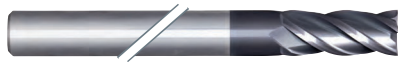
	Material Group ISO 513	P1 P2 K1			P3 P4 M1 M2 K2			P5 M3 K3			N1 N2 N3 N4		
	Hardness/Rm	< 700 N/mm ²			700-1000 N/mm ²			< 40 HRC					
	ap x ae	1.5D x 0.2D			1.5D x 0.2D			1.5D x 0.2D			1.5D x 0.2D		
	Vc (m/min)	80-100			50-70			30-50			100-120		
D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	
3	9550	0.01	380	6370	0.0085	220	4250	0.0075	130	11680	0.013	610	
4	7170	0.013	370	4780	0.011	210	3180	0.010	120	8760	0.017	590	
5	5730	0.016	370	3820	0.014	210	2550	0.012	120	7010	0.021	580	
6	4780	0.019	360	3180	0.016	210	2120	0.014	120	5840	0.025	580	
8	3580	0.025	360	2390	0.021	200	1590	0.019	120	4380	0.033	570	
10	2870	0.032	370	1910	0.027	210	1270	0.024	120	3500	0.042	580	
12	2390	0.040	380	1590	0.034	220	1060	0.030	130	2920	0.052	610	
14	2050	0.047	390	1360	0.040	220	910	0.035	130	2500	0.061	610	
16	1790	0.054	390	1190	0.046	220	800	0.041	130	2190	0.070	610	
18	1590	0.060	380	1060	0.051	220	710	0.045	130	1950	0.078	610	
20	1430	0.065	370	960	0.055	210	640	0.049	120	1750	0.085	590	

G2410-11-12-13

cylindrical shank, 4 flutes, long



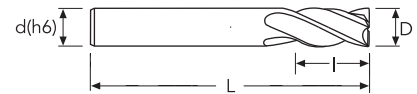
G2410



G2411-G2412-G2413



★ 1st choice ☆ suitable



D	D Tol.	C	C Tol.	d(h6)	l	l1	L	z	EDP No.	Stock
2	0/-0.030			4	9		75	4	G2410020	●
2.5	0/-0.030			4	10		75	4	G2410025	●
3	0/-0.030			4	15		75	4	G2410030	●
3.5	0/-0.030			4	15		75	4	G2410035	●
4	0/-0.030			4	20		75	4	G2410040	●
4.5	0/-0.030			6	20		75	4	G2410045	●
5	0/-0.030			6	25		75	4	G2410050	●
6	0/-0.030			6	25		75	4	G2410060	●
3	0/-0.030			6	15		100	4	G2411030	●
4	0/-0.030			6	25		100	4	G2411040	●
5	0/-0.030			6	30		100	4	G2411050	●
6	0/-0.030			6	30		100	4	G2411060	●
7	0/-0.030			8	35		100	4	G2411070	●
8	0/-0.035			8	35		100	4	G2411080	●
9	0/-0.035			10	40		100	4	G2411090	●
10	0/-0.035			10	40		100	4	G2411100	●
11	0/-0.035			12	45		100	4	G2411110	●
12	0/-0.035			12	45		100	4	G2411120	●
8	0/-0.035			8	40		150	4	G2412080	●
10	0/-0.035			10	50		150	4	G2412100	●
12	0/-0.035			12	50		150	4	G2412120	●
16	0/-0.040			16	70		150	4	G2412160	●
18	0/-0.040			20	80		150	4	G2412180	●
20	0/-0.040			20	80		150	4	G2412200	●
16	0/-0.040			16	40		200	4	G2413160	●
20	0/-0.040			20	40		200	4	G2413200	●

INFO
TYPHOON TA-HTA-4HTA
TYPHOON PU-HPU
TYPHOON SUH
TYPHOON ALH
TYPHOON HRC
TYPHOON SUH MINI
TYPHOON HL
C-SD-TA
LFTA
SUTA
HSS-HSS/CO DRILLS
G2
MDTA
HF VH/UP
MEF
ALU
MEX
UH
HSS/CO-HSSP END MILLS
CARBIDE BURRS

● stock standard ○ non-standard stock ▽ stock exhaustion

G2410-G2411

	Material Group ISO 513	P1 P2 K1			P3 P4 M1 M2 K2			P5 M3 K3			N1 N2 N3 N4		
	Hardness/Rm	< 700 N/mm ²			700-1000 N/mm ²			< 40 HRC					
	ap x ae	1.5D x 0.1D			1.5D x 0.1D			1.5D x 0.1D			1.5D x 0.1D		
	Vc (m/min)	70-90			45-65			30-50			80-120		
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)
	<i>mm</i>	<i>rpm</i>	<i>mm/rev</i>	<i>mm/min</i>	<i>rpm</i>	<i>mm/rev</i>	<i>mm/min</i>	<i>rpm</i>	<i>mm/rev</i>	<i>mm/min</i>	<i>rpm</i>	<i>mm/rev</i>	<i>mm/min</i>
	2	12740	0.006	320	8760	0.005	190	6370	0.005	120	15920	0.008	520
	3	8490	0.009	310	5840	0.008	180	4250	0.007	110	10620	0.012	500
	4	6370	0.012	300	4380	0.010	170	3180	0.009	110	7960	0.015	480
	5	5100	0.014	290	3500	0.012	170	2550	0.011	110	6370	0.019	480
6	4250	0.017	290	2920	0.015	170	2120	0.013	110	5310	0.022	470	
8	3180	0.023	290	2190	0.019	170	1590	0.017	110	3980	0.029	470	
10	2550	0.029	290	1750	0.024	170	1270	0.022	110	3180	0.037	480	
12	2120	0.036	310	1460	0.031	180	1060	0.027	110	2650	0.047	500	

G2412-G2413

	Material Group ISO 513	P1 P2 K1			P3 P4 M1 M2 K2			P5 M3 K3			N1 N2 N3 N4		
	Hardness/Rm	< 700 N/mm ²			700-1000 N/mm ²			< 40 HRC					
	ap x ae	1.5D x 0.1D			1.5D x 0.1D			1.5D x 0.1D			1.5D x 0.1D		
	Vc (m/min)	55-75			40-60			20-40			70-90		
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)
	<i>mm</i>	<i>rpm</i>	<i>mm/z</i>	<i>mm/min</i>	<i>rpm</i>	<i>mm/z</i>	<i>mm/min</i>	<i>rpm</i>	<i>mm/z</i>	<i>mm/min</i>	<i>rpm</i>	<i>mm/z</i>	<i>mm/min</i>
	8	2590	0.020	210	1990	0.017	140	1190	0.015	70	3180	0.026	330
	10	2070	0.026	210	1590	0.022	140	960	0.019	70	2550	0.033	340
	12	1730	0.032	220	1330	0.027	140	800	0.024	80	2120	0.042	350
	14	1480	0.038	220	1140	0.032	150	680	0.028	80	1820	0.049	360
16	1290	0.043	220	1000	0.037	150	600	0.032	80	1590	0.056	360	
20	1040	0.065	270	800	0.055	180	480	0.049	90	1270	0.085	430	

G2CSHM

	Material Group ISO 513	P1 P2 K1			P3 P4 M1 M2 K2			P5 M3 K3			
	Hardness/Rm	< 700 N/mm ²			700-1000 N/mm ²			< 40 HRC			
	ap x ae	1.5D x 0.1D			1.5D x 0.1D			1.5D x 0.1D			
	Vc (m/min)	100-120			70-90			50-70			
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	
	6	5840	0.016	560	4250	0.014	350	3180	0.012	230	
	8	4380	0.020	530	3180	0.017	320	2390	0.015	220	
	10	3500	0.025	530	2550	0.021	330	1910	0.019	210	
	12	2920	0.030	530	2120	0.026	320	1590	0.023	210	
	14	2500	0.035	530	1820	0.030	320	1360	0.026	210	
16	2190	0.040	530	1590	0.034	320	1190	0.030	210		
20	1750	0.050	530	1270	0.043	320	960	0.038	220		

- INFO
- TYPHOON TA-HTA-4HTA
- TYPHOON PU-HPU
- TYPHOON SUH
- TYPHOON ALH
- TYPHOON HRC
- TYPHOON SUH MINI
- TYPHOON HL
- C-SD-TA
- LFTA
- SUTA
- HSS-HSS/CO DRILLS
- G2**
- MDTA
- HF VH/UP
- MEF
- ALU
- MEX
- UH
- HSS/CO-HSSP END MILLS
- CARBIDE BURRS

G2CSFR

	Material Group ISO 513	P1 P2 K1			P3 P4 M1 M2 K2			P5 M3 K3					
	Hardness/Rm	< 700 N/mm ²			700-1000 N/mm ²			< 40 HRC					
	ap x ae	1.5D x 0.3D			1.5D x 0.3D			1.5D x 0.3D					
	Vc (m/min)	70-90			50-70			30-50					
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)			
	6	4250	0.030	380	3180	0.026	320	2120	0.023	190			
	8	3180	0.045	430	2390	0.038	370	1590	0.034	210			
	10	2550	0.060	610	1910	0.051	390	1270	0.045	230			
	12	2120	0.072	610	1590	0.061	390	1060	0.054	230			
	14	1820	0.085	620	1360	0.072	390	910	0.064	230			
16	1590	0.096	610	1190	0.082	390	800	0.072	230				
20	1270	0.120	610	960	0.102	390	640	0.090	230				

D6-9: Z3
D10-20: Z4

- INFO
- TYPHOON TA-HTA-4HTA
- TYPHOON PU-HPU
- TYPHOON SUH
- TYPHOON ALH
- TYPHOON HRC
- TYPHOON SUH MINI
- TYPHOON HL
- C-SD-TA
- LFTA
- SUTA
- HSS-HSS/CO DRILLS
- G2**
- MDTA
- HF VH/UP
- MEF
- ALU
- MEX
- UH
- HSS/CO-HSSP END MILLS
- CARBIDE BURRS

G2WSFR

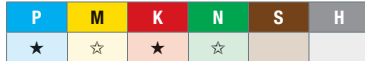
	Material Group ISO 513	P1 P2 K1			P3 P4 M1 M2 K2			P5 M3 K3			
	Hardness/Rm	< 700 N/mm ²			700-1000 N/mm ²			< 40 HRC			
	ap x ae	1.5D x 0.3D			1.5D x 0.3D			1.5D x 0.3D			
	Vc (m/min)	70-90			50-70			30-50			
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	
	6	4250	0.030	380	3180	0.026	320	2120	0.023	190	
	8	3180	0.045	430	2390	0.038	370	1590	0.034	210	
	10	2550	0.060	610	1910	0.051	390	1270	0.045	230	
	12	2120	0.072	610	1590	0.061	390	1060	0.054	230	
	14	1820	0.085	620	1360	0.072	390	910	0.064	230	
16	1590	0.096	610	1190	0.082	390	800	0.072	230		
20	1270	0.120	610	960	0.102	390	640	0.090	230		

D6-8: Z3
D10-20: Z4

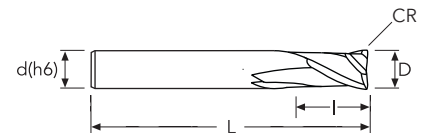
- INFO
- TYPHOON TA-HTA-4HTA
- TYPHOON PU-HPU
- TYPHOON SUH
- TYPHOON ALH
- TYPHOON HRC
- TYPHOON SUH MINI
- TYPHOON HL
- C-SD-TA
- LFTA
- SUTA
- HSS-HSS/CO DRILLS
- G2**
- MDTA
- HF VH/UP
- MEF
- ALU
- MEX
- UH
- HSS/CO-HSSP END MILLS
- CARBIDE BURRS

G2CS2R

cylindrical shank, 2 flutes, corner radius



★ 1st choice ☆ suitable



D	D Tol.	CR	CR Tol.	d(h6)	l	l1	L	z	EDP No.	Stock
1	0/-0.020	0.20	+/-0.010	4	2		50	2	G2CS2R02010	●
1.5	0/-0.020	0.20	+/-0.010	4	3		50	2	G2CS2R02015	●
1.5	0/-0.020	0.50	+/-0.010	4	3		50	2	G2CS2R05015	●
2	0/-0.020	0.20	+/-0.010	4	4		50	2	G2CS2R02020	●
2	0/-0.020	0.50	+/-0.010	4	4		50	2	G2CS2R05020	●
2.5	0/-0.020	0.20	+/-0.010	4	5		50	2	G2CS2R02025	●
2.5	0/-0.020	0.50	+/-0.010	4	5		50	2	G2CS2R05025	●
3	0/-0.020	0.20	+/-0.010	4	6		50	2	G2CS2R02030	●
3	0/-0.020	0.50	+/-0.010	4	6		50	2	G2CS2R05030	●
3	0/-0.020	1.00	+/-0.010	4	6		50	2	G2CS2R10030	●
4	0/-0.020	0.20	+/-0.010	4	8		50	2	G2CS2R02040	●
4	0/-0.020	0.50	+/-0.010	4	8		50	2	G2CS2R05040	●
4	0/-0.020	1.00	+/-0.010	4	8		50	2	G2CS2R10040	●
5	0/-0.020	0.50	+/-0.010	6	10		50	2	G2CS2R05050	●
5	0/-0.020	1.00	+/-0.010	6	10		50	2	G2CS2R10050	●
6	0/-0.020	0.20	+/-0.010	6	12		50	2	G2CS2R02060	●
6	0/-0.020	0.50	+/-0.010	6	12		50	2	G2CS2R05060	●
6	0/-0.020	1.00	+/-0.010	6	12		50	2	G2CS2R10060	●
6	0/-0.020	1.50	+/-0.010	6	12		50	2	G2CS2R15060	●
6	0/-0.020	2.00	+/-0.010	6	12		50	2	G2CS2R20060	●
8	0/-0.025	0.50	+/-0.010	8	16		60	2	G2CS2R05080	●
8	0/-0.025	1.00	+/-0.010	8	16		60	2	G2CS2R10080	●
8	0/-0.025	1.50	+/-0.010	8	16		60	2	G2CS2R15080	●
8	0/-0.025	2.00	+/-0.010	8	16		60	2	G2CS2R20080	●
10	0/-0.025	0.50	+/-0.010	10	20		75	2	G2CS2R05100	●
10	0/-0.025	1.00	+/-0.010	10	20		75	2	G2CS2R10100	●
10	0/-0.025	1.50	+/-0.010	10	20		75	2	G2CS2R15100	●
10	0/-0.025	2.00	+/-0.010	10	20		75	2	G2CS2R20100	●
12	0/-0.025	0.50	+/-0.010	12	24		75	2	G2CS2R05120	●
12	0/-0.025	1.00	+/-0.010	12	24		75	2	G2CS2R10120	●
12	0/-0.025	1.50	+/-0.010	12	24		75	2	G2CS2R15120	●
12	0/-0.025	2.00	+/-0.010	12	24		75	2	G2CS2R20120	●

INFO
TYPHOON TA-HTA-4HTA
TYPHOON PU-HPU
TYPHOON SUH
TYPHOON ALH
TYPHOON HRC
TYPHOON SUH MINI
TYPHOON HL
C-SD-TA
LFTA
SUTA
HSS-HSS/CO DRILLS
G2
MDTA
HF VH/UP
MEF
ALU
MEX
UH
HSS/CO-HSSP END MILLS
CARBIDE BURRS

● stock standard ○ non-standard stock ▽ stock exhaustion

G2CS2R

	Material Group ISO 513	P1 P2 K1			P3 P4 M1 M2 K2			P5 M3 K3			N1 N2 N3 N4		
	Hardness/Rm	< 700 N/mm ²			700-1000 N/mm ²			< 40 HRC					
	ap x ae	0.5D x D			0.5D x D			0.5D x D			0.5D x D		
	Vc (m/min)	80-100			50-70			30-50			100-120		
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)
	1	28660	0.004	230	19110	0.003	130	12740	0.003	80	35030	0.005	360
	2	14330	0.008	230	9550	0.007	130	6370	0.006	80	17520	0.010	360
	3	9550	0.012	230	6370	0.010	130	4250	0.009	80	11680	0.016	360
	4	7170	0.016	230	4780	0.014	130	3180	0.012	80	8760	0.021	360
	5	5730	0.020	230	3820	0.017	130	2550	0.015	80	7010	0.026	360
	6	4780	0.025	240	3180	0.021	140	2120	0.019	80	5840	0.033	380
	8	3580	0.032	230	2390	0.027	130	1590	0.024	80	4380	0.042	360
	10	2870	0.038	220	1910	0.032	120	1270	0.029	70	3500	0.049	350
12	2390	0.045	220	1590	0.038	120	1060	0.034	70	2920	0.059	340	

< D3 mm: ap = 0.2D

	Material Group ISO 513	P1 P2 K1			P3 P4 M1 M2 K2			P5 M3 K3			N1 N2 N3 N4		
	Hardness/Rm	< 700 N/mm ²			700-1000 N/mm ²			< 40 HRC					
	ap x ae	1.5D x 0.5D			1.5D x 0.5D			1.5D x 0.5D			1.5D x 0.5D		
	Vc (m/min)	80-100			50-70			30-50			100-120		
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)
	1	28660	0.005	280	19110	0.004	160	12740	0.004	90	35030	0.006	440
	2	14330	0.010	280	9550	0.008	160	6370	0.007	90	17520	0.012	440
	3	9550	0.014	280	6370	0.012	160	4250	0.011	90	11680	0.019	440
	4	7170	0.019	280	4780	0.016	160	3180	0.014	90	8760	0.025	440
	5	5730	0.024	280	3820	0.020	160	2550	0.018	90	7010	0.031	440
	6	4780	0.030	290	3180	0.026	160	2120	0.023	100	5840	0.039	460
	8	3580	0.038	270	2390	0.033	160	1590	0.029	90	4380	0.050	440
	10	2870	0.046	260	1910	0.039	150	1270	0.034	90	3500	0.059	410
12	2390	0.054	260	1590	0.046	150	1060	0.041	90	2920	0.070	410	

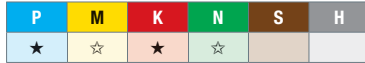
< D3 mm: ae = 0.2D

	Material Group ISO 513	P1 P2 K1			P3 P4 M1 M2 K2			P5 M3 K3			N1 N2 N3 N4		
	Hardness/Rm	< 700 N/mm ²			700-1000 N/mm ²			< 40 HRC					
	ap x ae	D x D			D x D			0.5D x D			D x D		
	Vc (m/min)	70-90			40-60			25-35			80-100		
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)
	1	25480	0.002	120	15920	0.002	60	9550	0.002	30	28660	0.003	180
	2	12740	0.005	120	7960	0.004	60	4780	0.004	30	14330	0.006	180
	3	8490	0.007	120	5310	0.006	60	3180	0.005	30	9550	0.009	180
	4	6370	0.010	120	3980	0.008	60	2390	0.007	30	7170	0.012	180
	5	5100	0.012	120	3180	0.010	60	1910	0.009	30	5730	0.016	180
	6	4250	0.015	130	2650	0.013	70	1590	0.011	40	4780	0.020	190
	8	3180	0.019	120	1990	0.016	60	1190	0.014	30	3580	0.025	180
	10	2550	0.023	120	1590	0.019	60	960	0.017	30	2870	0.030	170
12	2120	0.027	110	1330	0.023	60	800	0.020	30	2390	0.035	170	

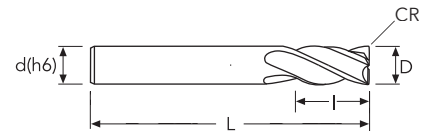
< D3 mm: ap = 0.5D

G2CS4R

cylindrical shank, 4 flutes, corner radius



★ 1st choice ☆ suitable




D	D Tol.	CR	CR Tol.	d(h6)	l	l1	L	z	EDP No.	Stock
1	0/-0.020	0.20	+/-0.010	4	2		50	4	G2CS4R02010	●
1.5	0/-0.020	0.20	+/-0.010	4	3		50	4	G2CS4R02015	●
1.5	0/-0.020	0.50	+/-0.010	4	3		50	4	G2CS4R05015	●
2	0/-0.020	0.20	+/-0.010	4	4		50	4	G2CS4R02020	●
2	0/-0.020	0.50	+/-0.010	4	4		50	4	G2CS4R05020	●
2.5	0/-0.020	0.20	+/-0.010	4	5		50	4	G2CS4R02025	●
2.5	0/-0.020	0.50	+/-0.010	4	5		50	4	G2CS4R05025	●
3	0/-0.020	0.20	+/-0.010	4	6		50	4	G2CS4R02030	●
3	0/-0.020	0.50	+/-0.010	4	6		50	4	G2CS4R05030	●
3	0/-0.020	1.00	+/-0.010	4	6		50	4	G2CS4R10030	●
4	0/-0.020	0.20	+/-0.010	4	8		50	4	G2CS4R02040	●
4	0/-0.020	0.50	+/-0.010	4	8		50	4	G2CS4R05040	●
4	0/-0.020	1.00	+/-0.010	4	8		50	4	G2CS4R10040	●
5	0/-0.020	0.50	+/-0.010	6	10		50	4	G2CS4R05050	●
5	0/-0.020	1.00	+/-0.010	6	10		50	4	G2CS4R10050	●
6	0/-0.020	0.20	+/-0.010	6	12		50	4	G2CS4R02060	●
6	0/-0.020	0.50	+/-0.010	6	12		50	4	G2CS4R05060	●
6	0/-0.020	1.00	+/-0.010	6	12		50	4	G2CS4R10060	●
6	0/-0.020	1.50	+/-0.010	6	12		50	4	G2CS4R15060	●
6	0/-0.020	2.00	+/-0.010	6	12		50	4	G2CS4R20060	●
8	0/-0.025	0.50	+/-0.010	8	16		60	4	G2CS4R05080	●
8	0/-0.025	1.00	+/-0.010	8	16		60	4	G2CS4R10080	●
8	0/-0.025	1.50	+/-0.010	8	16		60	4	G2CS4R15080	●
8	0/-0.025	2.00	+/-0.010	8	16		60	4	G2CS4R20080	●
10	0/-0.025	0.50	+/-0.010	10	20		75	4	G2CS4R05100	●
10	0/-0.025	1.00	+/-0.010	10	20		75	4	G2CS4R10100	●
10	0/-0.025	1.50	+/-0.010	10	20		75	4	G2CS4R15100	●
10	0/-0.025	2.00	+/-0.010	10	20		75	4	G2CS4R20100	●
10	0/-0.025	2.50	+/-0.010	10	20		75	4	G2CS4R25100	●
10	0/-0.025	3.00	+/-0.010	10	20		75	4	G2CS4R30100	●
12	0/-0.025	0.50	+/-0.010	12	24		75	4	G2CS4R05120	●
12	0/-0.025	1.00	+/-0.010	12	24		75	4	G2CS4R10120	●
12	0/-0.025	1.50	+/-0.010	12	24		75	4	G2CS4R15120	●
12	0/-0.025	2.00	+/-0.010	12	24		75	4	G2CS4R20120	●
12	0/-0.025	2.50	+/-0.010	12	24		75	4	G2CS4R25120	●
12	0/-0.025	3.00	+/-0.010	12	24		75	4	G2CS4R30120	●

INFO
TYPHOON TA-HTA-4HTA
TYPHOON PU-HPU
TYPHOON SUH
TYPHOON ALH
TYPHOON HRC
TYPHOON SUH MINI
TYPHOON HL
C-SD-TA
LFTA
SUTA
HSS-HSS/CO DRILLS
G2
MDTA
HF VH/UP
MEF
ALU
MEX
UH
HSS/CO-HSSP END MILLS
CARBIDE BURRS


● stock standard ○ non-standard stock ▽ stock exhaustion

G2CS4R

	Material Group ISO 513	P1 P2 K1			P3 P4 M1 M2 K2			P5 M3 K3			N1 N2 N3 N4			
	Hardness/Rm	< 700 N/mm ²			700-1000 N/mm ²			< 40 HRC						
	ap x ae	1.5D x 0.2D			1.5D x 0.2D			1.5D x 0.2D			1.5D x 0.2D			
	Vc (m/min)	80-100			50-70			30-50			100-120			
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	
1	28660	0.004	400	19110	0.003	230	12740	0.003	130	35030	0.005	640		
2	14330	0.007	400	9550	0.006	230	6370	0.005	130	17520	0.009	640		
3	9550	0.010	380	6370	0.009	220	4250	0.008	130	11680	0.013	610		
4	7170	0.013	370	4780	0.011	210	3180	0.010	120	8760	0.017	590		
5	5730	0.016	370	3820	0.014	210	2550	0.012	120	7010	0.021	580		
6	4780	0.019	360	3180	0.016	210	2120	0.014	120	5840	0.025	580		
8	3580	0.025	360	2390	0.021	200	1590	0.019	120	4380	0.033	570		
10	2870	0.032	370	1910	0.027	210	1270	0.024	120	3500	0.042	580		
12	2390	0.040	380	1590	0.034	220	1060	0.030	130	2920	0.052	610		


< D3 mm: ae = 0.1D

G2CL4R

	Material Group ISO 513	P1 P2 K1			P3 P4 M1 M2 K2			P5 M3 K3			N1 N2 N3 N4		
	Hardness/Rm	< 700 N/mm ²			700-1000 N/mm ²			< 40 HRC					
	ap x ae	1.5D x 0.2D			1.5D x 0.2D			1.5D x 0.2D			1.5D x 0.2D		
	Vc (m/min)	55-75			40-60			20-40			70-90		
D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	
2	10350	0.006	250	7960	0.005	160	4780	0.005	90	12740	0.007	340	
3	6900	0.009	250	5310	0.008	160	3180	0.007	90	8490	0.010	340	
4	5180	0.012	250	3980	0.010	160	2390	0.009	90	6370	0.013	340	
5	4140	0.015	250	3180	0.013	160	1910	0.011	90	5100	0.017	340	
6	3450	0.017	230	2650	0.014	150	1590	0.013	80	4250	0.019	320	
8	2590	0.023	240	1990	0.020	160	1190	0.017	80	3180	0.030	380	
10	2070	0.029	240	1590	0.025	160	960	0.022	80	2550	0.038	380	
12	1730	0.036	250	1330	0.031	160	800	0.027	90	2120	0.047	400	

< D3 mm: ae = 0.1D

GB255

	Material Group ISO 513		P1 K1			P2 M1 K2			P3 M2			N1 N2 N3 N4			
	Hardness/Rm		< 700 N/mm ²			700-1000 N/mm ²			< 40 HRC						
	ap x ae		0.1D x 0.1D			0.1D x 0.1D			0.1D x 0.1D			0.1D x 0.1D			
	Vc (m/min)		50-70			35-55			20-40			80-120			
D (mm)	D (eff.) (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)		
1	0.60	19110	0.030	1150	14330	0.023	640	9550	0.021	400	31850	0.036	2290		
2	1.20	9550	0.040	760	7170	0.030	430	4780	0.028	270	15920	0.048	1530		
3	1.80	6370	0.050	640	4780	0.038	360	3180	0.035	220	10620	0.060	1270		
4	2.40	4780	0.060	570	3580	0.045	320	2390	0.042	200	7960	0.072	1150		
5	3.00	3820	0.070	530	2870	0.053	300	1910	0.049	190	6370	0.084	1070		
6	3.60	3180	0.080	510	2390	0.060	290	1590	0.056	180	5310	0.096	1020		
8	4.80	2390	0.090	430	1790	0.068	240	1190	0.063	150	3980	0.108	860		
10	6.00	1910	0.105	400	1430	0.079	230	960	0.074	140	3180	0.126	800		
12	7.20	1590	0.120	380	1190	0.090	210	800	0.084	130	2650	0.144	760		

G2CSB2

	Material Group ISO 513		P1 P2 K1			P3 P4 M1 M2 K2			P5 M3 K3			N1 N2 N3 N4		
	Hardness/Rm		< 700 N/mm ²			700-1000 N/mm ²			< 40 HRC					
	ap x ae		0.1D x 0.1D			0.1D x 0.1D			0.1D x 0.1D			0.1D x 0.1D		
	Vc (m/min)		80-100			60-80			40-60			110-130		
D (mm)	D (eff.) (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	
1	0.60	28660	0.030	1720	22290	0.023	1000	15920	0.021	670	38220	0.036	2750	
2	1.20	14330	0.040	1150	11150	0.030	670	7960	0.028	450	19110	0.048	1830	
3	1.80	9550	0.050	960	7430	0.038	560	5310	0.035	370	12740	0.060	1530	
4	2.40	7170	0.060	860	5570	0.045	500	3980	0.042	330	9550	0.072	1380	
5	3.00	5730	0.070	800	4460	0.053	470	3180	0.049	310	7640	0.084	1280	
6	3.60	4780	0.080	760	3720	0.060	450	2650	0.056	300	6370	0.096	1220	
8	4.80	3580	0.090	640	2790	0.068	380	1990	0.063	250	4780	0.108	1030	
10	6.00	2870	0.105	600	2230	0.079	350	1590	0.074	230	3820	0.126	960	
12	7.20	2390	0.120	570	1860	0.090	330	1330	0.084	220	3180	0.144	920	
16	9.60	1790	0.150	540	1390	0.113	310	1000	0.105	210	2390	0.180	860	
20	12.00	1430	0.180	510	1110	0.135	300	800	0.126	200	1910	0.216	830	

- INFO
- TYPHOON TA-HTA-4HTA
- TYPHOON PU-HPU
- TYPHOON SUH
- TYPHOON ALH
- TYPHOON HRC
- TYPHOON SUH MINI
- TYPHOON HL
- C-SD-TA
- LFTA
- SUTA
- HSS-HSS/CO DRILLS
- G2**
- MDTA
- HF VH/UP
- MEF
- ALU
- MEX
- UH
- HSS/CO-HSSP END MILLS
- CARBIDE BURRS

G2250

	Material Group ISO 513	P1 P2 K1			P3 P4 M1 M2 K2			P5 M3 K3			N1 N2 N3 N4			
	Hardness/Rm	< 700 N/mm ²			700-1000 N/mm ²			< 40 HRC						
	ap x ae	0.1D x 0.1D			0.1D x 0.1D			0.1D x 0.1D			0.1D x 0.1D			
	Vc (m/min)	70-90			50-70			40-50			100-120			
	D (mm)	D (eff.) (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)
	1	0.60	25480	0.027	1380	19110	0.020	770	14330	0.019	540	35030	0.032	2270
	2	1.20	12740	0.036	920	9550	0.027	520	7170	0.025	360	17520	0.043	1510
	3	1.80	8490	0.045	760	6370	0.034	430	4780	0.032	300	11680	0.054	1260
	4	2.40	6370	0.054	690	4780	0.041	390	3580	0.038	270	8760	0.065	1140
	5	3.00	5100	0.063	640	3820	0.047	360	2870	0.044	250	7010	0.076	1060
6	3.60	4250	0.072	610	3180	0.054	340	2390	0.050	240	5840	0.086	1010	
8	4.80	3180	0.081	520	2390	0.061	290	1790	0.057	200	4380	0.097	850	
10	6.00	2550	0.095	480	1910	0.071	270	1430	0.066	190	3500	0.113	790	
12	7.20	2120	0.108	460	1590	0.081	260	1190	0.076	180	2920	0.130	760	

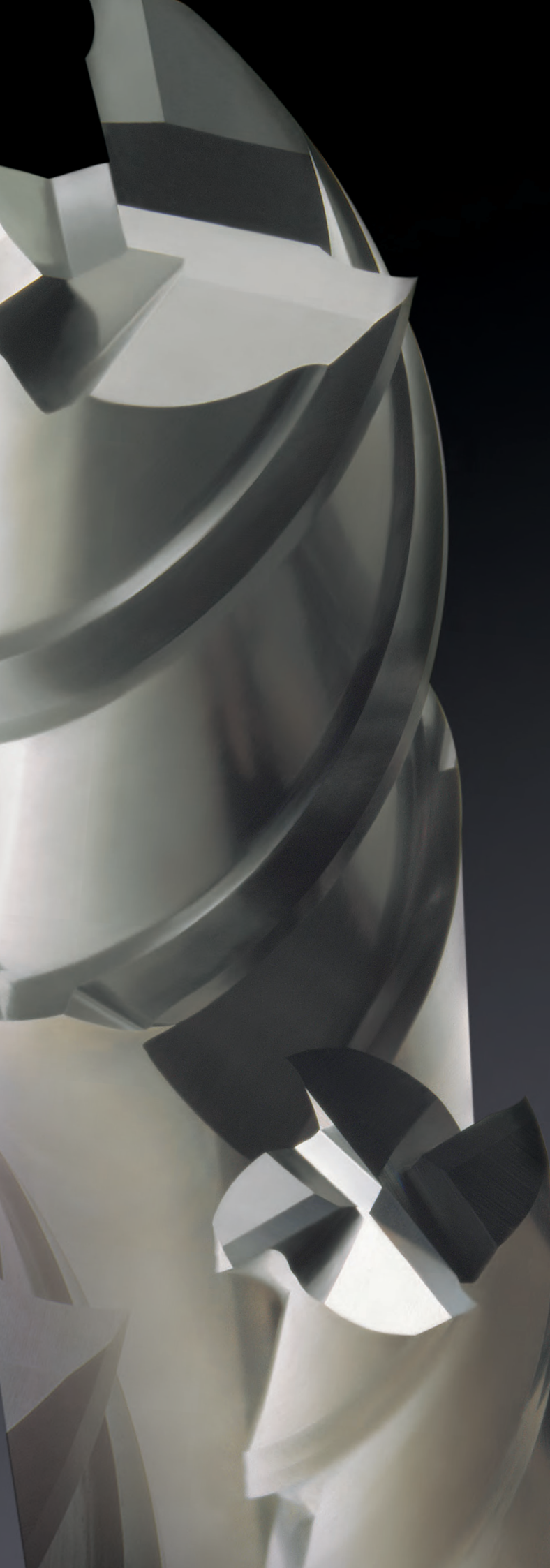
G2251

	Material Group ISO 513	P1 P2 K1			P3 P4 M1 M2 K2			P5 M3 K3			N1 N2 N3 N4			
	Hardness/Rm	< 700 N/mm ²			700-1000 N/mm ²			< 40 HRC						
	ap x ae	0.1D x 0.1D			0.1D x 0.1D			0.1D x 0.1D			0.1D x 0.1D			
	Vc (m/min)	60-80			40-60			35-45			90-110			
	D (mm)	D (eff.) (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)
	6	3.60	3720	0.058	430	2650	0.044	230	2120	0.041	170	5310	0.070	740
	8	4.80	2790	0.066	370	1990	0.049	200	1590	0.046	150	3980	0.079	630
	10	6.00	2230	0.077	340	1590	0.057	180	1270	0.054	140	3180	0.092	580
	12	7.20	1860	0.087	330	1330	0.066	170	1060	0.061	130	2650	0.105	560
	16	9.60	1390	0.122	340	1000	0.092	180	800	0.085	140	1990	0.146	580
20	12.00	1110	0.146	320	800	0.110	180	640	0.102	130	1590	0.175	560	

G2CSB4

	Material Group ISO 513		P1 P2 K1			P3 P4 M1 M2 K2			P5 M3 K3			N1 N2 N3 N4		
	Hardness/Rm		< 700 N/mm ²			700-1000 N/mm ²			< 40 HRC					
	ap x ae		0.1D x 0.3D			0.1D x 0.3D			0.1D x 0.3D			0.1D x 0.3D		
	Vc (m/min)		80-100			60-80			40-60			110-130		
D (mm)	D (eff.) (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	
1	0.60	28660	0.030	3440	22290	0.023	2010	15920	0.021	1340	38220	0.036	5500	
2	1.20	14330	0.040	2290	11150	0.030	1340	7960	0.028	890	19110	0.048	3670	
3	1.80	9550	0.050	1910	7430	0.038	1110	5310	0.035	740	12740	0.060	3060	
4	2.40	7170	0.060	1720	5570	0.045	1000	3980	0.042	670	9550	0.072	2750	
5	3.00	5730	0.070	1600	4460	0.053	940	3180	0.049	620	7640	0.084	2570	
6	3.60	4780	0.080	1530	3720	0.060	890	2650	0.056	590	6370	0.096	2450	
8	4.80	3580	0.090	1290	2790	0.068	750	1990	0.063	500	4780	0.108	2060	
10	6.00	2870	0.105	1210	2230	0.079	700	1590	0.074	470	3820	0.126	1930	
12	7.20	2390	0.120	1150	1860	0.090	670	1330	0.084	450	3180	0.144	1830	
16	9.60	1790	0.150	1070	1390	0.113	630	1000	0.105	420	2390	0.180	1720	
20	12.00	1430	0.180	1030	1110	0.135	600	800	0.126	400	1910	0.216	1650	

- INFO
- TYPHOON TA-HTA-4HTA
- TYPHOON PU-HPU
- TYPHOON SUH
- TYPHOON ALH
- TYPHOON HRC
- TYPHOON SUH MINI
- TYPHOON HL
- C-SD-TA
- LFTA
- SUTA
- HSS-HSS/CO DRILLS
- G2**
- MDTA
- HF VH/UP
- MEF
- ALU
- MEX
- UH
- HSS/CO-HSSP END MILLS
- CARBIDE BURRS



MDTA

GENERAL PURPOSE

✚ MDTA is the Osawa range of micrograin carbide end mills with PV200 coating. MDTA endmills have been developed for general purpose milling up to 45 HRC. The exclusive and innovative PV200 coating (3500HV) ensures the best performance, even in applications with air blow or MQL (Minimum Quantity Lubrication).

🇮🇹 MDTA sono le frese Osawa in metallo duro micrograna con rivestimento PV200 sviluppate per la fresatura di materiali generici sino a 45 HRC. L'esclusivo e innovativo rivestimento PV200 (3500HV) garantisce performance elevate anche in lavorazioni con impiego di refrigerazione con getto d'aria o MQL (Minimum Quantity Lubrication).

🇩🇪 MDTA sind Fräser von Osawa aus Mikrokörnungs-Hartmetall mit Beschichtung PV200, die für das Fräsen von allgemeinen Materialien bis zu 45 HRC entwickelt wurden. Die exklusive und innovative Beschichtung PV200 (3500HV) gewährleistet auch bei Bearbeitungen mit Kühlung durch Luftstrahl oder MQL (Minimum Quantity Lubrication) hohe Leistungen.

🇫🇷 MDTA sont les fraises Osawa en carbure micrograin avec revêtement PV200 développées pour le fraisage de matériaux génériques jusqu'à 45 HRC. Le revêtement PV200 (3500HV) exclusif et innovant garantit des performances élevées même pour les usinages employant un système de lubrification avec jet d'air ou MQL (Minimum Quantity Lubrication).

🇪🇸 MDTA son las fresas Osawa de metal duro micrograno con revestimiento PV200 desarrolladas para el fresado de materiales genéricos hasta 45 HRC. Su exclusivo e innovador revestimiento PV200 (3500HV) garantiza rendimientos elevados incluso en elaboraciones con el uso de refrigeración con chorro de aire o MQL (Minimum Quantity Lubrication).

🇷🇺 MDTA - это фрезы фирмы Osawa из твёрдого сплава с мелкозернистой структурой и покрытием PV200, предназначенные для стандартной обработки материалов с твёрдостью до 45 HRC. Эксклюзивное и инновационное покрытие PV200 (3500HV) гарантирует высокую производительность, даже, при обработке с обдувом воздухом или с масляным туманом.

INFO
TYPHOON TA-HTA-4HTA
TYPHOON PU-HPU
TYPHOON SUH
TYPHOON ALH
TYPHOON HRC
TYPHOON SUH MINI
TYPHOON HL
C-SD-TA
LFTA
SUTA
HSS-HSS/CO DRILLS
G2
MDTA
HF VH/UP
MEF
ALU
MEX
UH
HSS/CO-HSSP END MILLS
CARBIDE BURRS

MDTACS2

<p>SLOTTING</p>	Material Group ISO 513	P1 P2 K1			P3 P4 M1 M2 K2			P5 M3 K3			N1 N2 N3 N4		
	Hardness/Rm	< 700 N/mm ²			700-1000 N/mm ²			< 40 HRC					
	ap x ae	0.5D x D			0.5D x D			0.5D x D			0.5D x D		
	Vc (m/min)	80-100			50-70			30-50			100-120		
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)
	1	28660	0.004	230	19110	0.003	130	12740	0.003	80	35030	0.005	360
	2	14330	0.008	230	9550	0.007	130	6370	0.006	80	17520	0.010	360
	3	9550	0.012	230	6370	0.010	130	4250	0.009	80	11680	0.016	360
	4	7170	0.016	230	4780	0.014	130	3180	0.012	80	8760	0.021	360
	5	5730	0.020	230	3820	0.017	130	2550	0.015	80	7010	0.026	360
	6	4780	0.025	240	3180	0.021	140	2120	0.019	80	5840	0.033	380
	8	3580	0.032	230	2390	0.027	130	1590	0.024	80	4380	0.042	360
	10	2870	0.038	220	1910	0.032	120	1270	0.029	70	3500	0.049	350
	12	2390	0.045	220	1590	0.038	120	1060	0.034	70	2920	0.059	340
14	2050	0.052	210	1360	0.044	120	910	0.039	70	2500	0.068	340	
16	1790	0.060	210	1190	0.051	120	800	0.045	70	2190	0.078	340	
18	1590	0.070	220	1060	0.060	130	710	0.053	70	1950	0.091	350	
20	1430	0.080	230	960	0.068	130	640	0.060	80	1750	0.104	360	

< D3 mm: ap = 0.2D

<p>SIDE MILLING</p>	Material Group ISO 513	P1 P2 K1			P3 P4 M1 M2 K2			P5 M3 K3			N1 N2 N3 N4		
	Hardness/Rm	< 700 N/mm ²			700-1000 N/mm ²			< 40 HRC					
	ap x ae	1.5D x 0.5D			1.5D x 0.5D			1.5D x 0.5D			1.5D x 0.5D		
	Vc (m/min)	80-100			50-70			30-50			100-120		
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)
	1	28660	0.005	280	19110	0.004	160	12740	0.004	90	35030	0.006	440
	2	14330	0.010	280	9550	0.008	160	6370	0.007	90	17520	0.012	440
	3	9550	0.014	280	6370	0.012	160	4250	0.011	90	11680	0.019	440
	4	7170	0.019	280	4780	0.016	160	3180	0.014	90	8760	0.025	440
	5	5730	0.024	280	3820	0.020	160	2550	0.018	90	7010	0.031	440
	6	4780	0.030	290	3180	0.026	160	2120	0.023	100	5840	0.039	460
	8	3580	0.038	270	2390	0.033	160	1590	0.029	90	4380	0.050	440
	10	2870	0.046	260	1910	0.039	150	1270	0.034	90	3500	0.059	410
	12	2390	0.054	260	1590	0.046	150	1060	0.041	90	2920	0.070	410
14	2050	0.062	260	1360	0.053	140	910	0.047	90	2500	0.081	410	
16	1790	0.072	260	1190	0.061	150	800	0.054	90	2190	0.094	410	
18	1590	0.084	270	1060	0.071	150	710	0.063	90	1950	0.109	430	
20	1430	0.096	270	960	0.082	160	640	0.072	90	1750	0.125	440	

< D3 mm: ae = 0.2D

<p>DRILLING</p>	Material Group ISO 513	P1 P2 K1			P3 P4 M1 M2 K2			P5 M3 K3			N1 N2 N3 N4		
	Hardness/Rm	< 700 N/mm ²			700-1000 N/mm ²			< 40 HRC					
	ap x ae	D x D			D x D			0.5D x D			D x D		
	Vc (m/min)	70-90			40-60			25-35			80-100		
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)
	1	25480	0.002	120	15920	0.002	60	9550	0.002	30	28660	0.003	180
	2	12740	0.005	120	7960	0.004	60	4780	0.004	30	14330	0.006	180
	3	8490	0.007	120	5310	0.006	60	3180	0.005	30	9550	0.009	180
	4	6370	0.010	120	3980	0.008	60	2390	0.007	30	7170	0.012	180
	5	5100	0.012	120	3180	0.010	60	1910	0.009	30	5730	0.016	180
	6	4250	0.015	130	2650	0.013	70	1590	0.011	40	4780	0.020	190
	8	3180	0.019	120	1990	0.016	60	1190	0.014	30	3580	0.025	180
	10	2550	0.023	120	1590	0.019	60	960	0.017	30	2870	0.030	170
	12	2120	0.027	110	1330	0.023	60	800	0.020	30	2390	0.035	170
14	1820	0.031	110	1140	0.027	60	680	0.023	30	2050	0.041	170	
16	1590	0.036	110	1000	0.031	60	600	0.027	30	1790	0.047	170	
18	1420	0.042	120	880	0.036	60	530	0.032	30	1590	0.055	170	
20	1270	0.048	120	800	0.041	70	480	0.036	30	1430	0.062	180	

< D3 mm: ap = 0.5D

- INFO
- TYPHOON TA-HTA-4HTA
- TYPHOON PU-HPU
- TYPHOON SUH
- TYPHOON ALH
- TYPHOON HRC
- TYPHOON SUH MINI
- TYPHOON HL
- C-SD-TA
- LFTA
- SUTA
- HSS-HSS/CO DRILLS
- G2
- MDTA
- HF VH/UP
- MEF
- ALU
- MEX
- UH
- HSS/CO-HSSP END MILLS
- CARBIDE BURRS

CUTTING PARAMETERS

MDTA210

	Material Group ISO 513	P1 P2 K1			P3 P4 M1 M2 K2			P5 M3 K3			N1 N2 N3 N4		
	Hardness/Rm	< 700 N/mm ²			700-1000 N/mm ²			< 40 HRC					
	ap x ae	0.5D x D			0.5D x D			0.5D x D			0.5D x D		
	Vc (m/min)	60-80			40-60			30-40			70-80		
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)
	3	7430	0.011	160	5310	0.009	100	3720	0.008	60	8490	0.014	240
	4	5570	0.014	160	3980	0.012	100	2790	0.011	60	6370	0.019	240
	5	4460	0.018	160	3180	0.015	100	2230	0.014	60	5100	0.023	240
	6	3720	0.023	170	2650	0.019	100	1860	0.017	60	4250	0.029	250
	8	2790	0.029	160	1990	0.024	100	1390	0.022	60	3180	0.037	240
10	2230	0.034	150	1590	0.029	90	1110	0.026	60	2550	0.044	230	
12	1860	0.041	150	1330	0.034	90	930	0.030	60	2120	0.053	220	

	Material Group ISO 513	P1 P2 K1			P3 P4 M1 M2 K2			P5 M3 K3			N1 N2 N3 N4		
	Hardness/Rm	< 700 N/mm ²			700-1000 N/mm ²			< 40 HRC					
	ap x ae	1.5D x 0.5D			1.5D x 0.5D			1.5D x 0.5D			1.5D x 0.5D		
	Vc (m/min)	60-80			40-60			30-40			70-80		
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)
	3	7430	0.014	200	5310	0.011	120	3720	0.010	80	8490	0.018	300
	4	5570	0.018	200	3980	0.015	120	2790	0.014	80	6370	0.023	300
	5	4460	0.023	200	3180	0.019	120	2230	0.017	80	5100	0.029	300
	6	3720	0.028	210	2650	0.024	130	1860	0.021	80	4250	0.037	310
	8	2790	0.036	200	1990	0.031	120	1390	0.027	80	3180	0.047	300
10	2230	0.043	190	1590	0.036	120	1110	0.032	70	2550	0.056	280	
12	1860	0.051	190	1330	0.043	110	930	0.038	70	2120	0.066	280	

	Material Group ISO 513	P1 P2 K1			P3 P4 M1 M2 K2			P5 M3 K3			N1 N2 N3 N4		
	Hardness/Rm	< 700 N/mm ²			700-1000 N/mm ²			< 40 HRC					
	ap x ae	D x D			D x D			0.5D x D			D x D		
	Vc (m/min)	50-70			35-45			25-35			60-80		
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)
	3	6370	0.007	90	4250	0.006	50	3180	0.005	30	7430	0.009	130
	4	4780	0.009	90	3180	0.008	50	2390	0.007	30	5570	0.012	130
	5	3820	0.011	90	2550	0.010	50	1910	0.008	30	4460	0.015	130
	6	3180	0.014	90	2120	0.012	50	1590	0.011	30	3720	0.018	140
	8	2390	0.018	90	1590	0.015	50	1190	0.014	30	2790	0.023	130
10	1910	0.021	80	1270	0.018	50	960	0.016	30	2230	0.028	120	
12	1590	0.025	80	1060	0.022	50	800	0.019	30	1860	0.033	120	

- INFO
- TYPHOON TA-HTA-4HTA
- TYPHOON PU-HPU
- TYPHOON SUH
- TYPHOON ALH
- TYPHOON HRC
- TYPHOON SUH MINI
- TYPHOON HL
- C-SD-TA
- LFTA
- SUTA
- HSS-HSS/CO DRILLS
- G2
- MDTA
- HF VH/UP
- MEF
- ALU
- MEX
- UH
- HSS/CO-HSSP END MILLS
- CARBIDE BURRS

CUTTING PARAMETERS

MDCL2

	Material Group ISO 513	P1 P2 K1			P3 P4 M1 M2 K2			P5 M3 K3			N1 N2 N3 N4		
	Hardness/Rm	< 700 N/mm ²			700-1000 N/mm ²			< 40 HRC					
	ap x ae	0.3D x D			0.3D x D			0.3D x D			0.3D x D		
	Vc (m/min)	40-50			25-35			20-30			60-80		
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)
	3	4780	0.010	90	3180	0.008	50	2650	0.007	40	7430	0.011	160
	4	3580	0.013	90	2390	0.011	50	1990	0.010	40	5570	0.014	160
	5	2870	0.016	90	1910	0.014	50	1590	0.012	40	4460	0.018	160
	6	2390	0.020	100	1590	0.017	50	1330	0.015	40	3720	0.022	160
	8	1790	0.026	90	1190	0.022	50	1000	0.019	40	2790	0.033	190
10	1430	0.030	90	960	0.026	50	800	0.023	40	2230	0.040	180	
12	1190	0.036	90	800	0.031	50	660	0.027	40	1860	0.047	170	

	Material Group ISO 513	P1 P2 K1			P3 P4 M1 M2 K2			P5 M3 K3			N1 N2 N3 N4		
	Hardness/Rm	< 700 N/mm ²			700-1000 N/mm ²			< 40 HRC					
	ap x ae	1.5D x 0.3D			1.5D x 0.3D			1.5D x 0.3D			1.5D x 0.3D		
	Vc (m/min)	45-55			30-40			25-35			70-90		
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)
	3	5310	0.012	120	3720	0.010	70	3180	0.009	50	8490	0.013	220
	4	3980	0.015	120	2790	0.013	70	2390	0.012	60	6370	0.017	220
	5	3180	0.019	120	2230	0.016	70	1910	0.014	60	5100	0.021	220
	6	2650	0.024	130	1860	0.020	80	1590	0.018	60	4250	0.027	230
	8	1990	0.031	120	1390	0.026	70	1190	0.023	50	3180	0.040	250
10	1590	0.036	120	1110	0.031	70	960	0.027	50	2550	0.047	240	
12	1330	0.043	110	930	0.037	70	800	0.032	50	2120	0.056	240	

INFO

TYPHOON TA-HTA-4HTA

TYPHOON PU-HPU

TYPHOON SUH

TYPHOON ALH

TYPHOON HRC

TYPHOON SUH MINI

TYPHOON HL

C-SD-TA

LFTA

SUTA

HSS-HSS/CO DRILLS

G2

MDTA

HF VH/UP

MEF

ALU

MEX

UH

HSS/CO-HSSP END MILLS

CARBIDE BURRS

MDTACS3

	Material Group ISO 513	P1 P2 K1			P3 P4 M1 M2 K2			P5 M3 K3			N1 N2 N3 N4		
	Hardness/Rm	< 700 N/mm ²			700-1000 N/mm ²			< 40 HRC					
	ap x ae	0.5D x D			0.5D x D			0.5D x D			0.5D x D		
	Vc (m/min)	80-100			50-70			30-50			100-120		
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)
	1	28660	0.004	330	19110	0.003	190	12740	0.003	110	35030	0.005	530
	2	14330	0.008	330	9550	0.007	190	6370	0.006	110	17520	0.010	530
	3	9550	0.011	320	6370	0.009	180	4250	0.008	110	11680	0.014	500
	4	7170	0.014	310	4780	0.012	170	3180	0.011	100	8760	0.019	490
	5	5730	0.018	300	3820	0.015	170	2550	0.013	100	7010	0.023	480
	6	4780	0.021	300	3180	0.018	170	2120	0.016	100	5840	0.027	480
	8	3580	0.028	300	2390	0.023	170	1590	0.021	100	4380	0.036	470
	10	2870	0.035	300	1910	0.030	170	1270	0.026	100	3500	0.046	480
12	2390	0.044	320	1590	0.037	180	1060	0.033	100	2920	0.057	500	
14	2050	0.052	320	1360	0.044	180	910	0.039	110	2500	0.067	500	
16	1790	0.059	320	1190	0.050	180	800	0.045	110	2190	0.077	510	
18	1590	0.066	310	1060	0.056	180	710	0.050	110	1950	0.086	500	
20	1430	0.072	310	960	0.061	180	640	0.054	100	1750	0.093	490	

< D3 mm: ap = 0.2D

	Material Group ISO 513	P1 P2 K1			P3 P4 M1 M2 K2			P5 M3 K3			N1 N2 N3 N4		
	Hardness/Rm	< 700 N/mm ²			700-1000 N/mm ²			< 40 HRC					
	ap x ae	1.5D x 0.3D			1.5D x 0.3D			1.5D x 0.3D			1.5D x 0.3D		
	Vc (m/min)	80-100			50-70			30-50			100-120		
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)
	1	28660	0.005	400	19110	0.004	230	12740	0.003	130	35030	0.006	630
	2	14330	0.009	400	9550	0.008	230	6370	0.007	130	17520	0.012	630
	3	9550	0.013	380	6370	0.011	210	4250	0.010	130	11680	0.017	600
	4	7170	0.017	370	4780	0.015	210	3180	0.013	120	8760	0.022	590
	5	5730	0.021	360	3820	0.018	210	2550	0.016	120	7010	0.027	580
	6	4780	0.025	360	3180	0.021	200	2120	0.019	120	5840	0.033	570
	8	3580	0.033	350	2390	0.028	200	1590	0.025	120	4380	0.043	560
	10	2870	0.042	360	1910	0.036	210	1270	0.032	120	3500	0.055	580
12	2390	0.053	380	1590	0.045	210	1060	0.040	130	2920	0.069	600	
14	2050	0.062	380	1360	0.053	220	910	0.047	130	2500	0.081	600	
16	1790	0.071	380	1190	0.061	220	800	0.053	130	2190	0.093	610	
18	1590	0.079	380	1060	0.067	210	710	0.059	130	1950	0.103	600	
20	1430	0.086	370	960	0.073	210	640	0.064	120	1750	0.112	590	

< D3 mm: ae = 0.1D

- INFO
- TYPHOON TA-HTA-4HTA
- TYPHOON PU-HPU
- TYPHOON SUH
- TYPHOON ALH
- TYPHOON HRC
- TYPHOON SUH MINI
- TYPHOON HL
- C-SD-TA
- LFTA
- SUTA
- HSS/HSS/CO DRILLS
- G2
- MDTA
- HF VH/UP
- MEF
- ALU
- MEX
- UH
- HSS/CO-HSSP END MILLS
- CARBIDE BURRS

CUTTING PARAMETERS

MDTAWSH3

	Material Group ISO 513	P1 P2 K1			P3 P4 M1 M2 K2			P5 M3 K3			N1 N2 N3 N4		
	Hardness/Rm	< 700 N/mm ²			700-1000 N/mm ²			< 40 HRC					
	ap x ae	0.5D x D			0.5D x D			0.5D x D			0.5D x D		
	Vc (m/min)	80-100			50-70			30-50			80-120		
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)
	3	9550	0.011	320	6370	0.009	180	4250	0.008	110	10620	0.014	460
	4	7170	0.014	310	4780	0.012	170	3180	0.011	100	7960	0.019	440
	5	5730	0.018	300	3820	0.015	170	2550	0.013	100	6370	0.023	440
	6	4780	0.021	300	3180	0.018	170	2120	0.016	100	5310	0.027	430
	8	3580	0.028	300	2390	0.023	170	1590	0.021	100	3980	0.036	430
	10	2870	0.035	300	1910	0.030	170	1270	0.026	100	3180	0.046	440
	12	2390	0.044	320	1590	0.037	180	1060	0.033	100	2650	0.057	450
	14	2050	0.052	320	1360	0.044	180	910	0.039	110	2270	0.067	460
16	1790	0.059	320	1190	0.050	180	800	0.045	110	1990	0.077	460	
18	1590	0.066	310	1060	0.056	180	710	0.050	110	1770	0.086	460	
20	1430	0.072	310	960	0.061	180	640	0.054	100	1590	0.093	440	

	Material Group ISO 513	P1 P2 K1			P3 P4 M1 M2 K2			P5 M3 K3			N1 N2 N3 N4		
	Hardness/Rm	< 700 N/mm ²			700-1000 N/mm ²			< 40 HRC					
	ap x ae	1.5D x 0.3D			1.5D x 0.3D			1.5D x 0.3D			1.5D x 0.3D		
	Vc (m/min)	90-110			60-80			40-60			110-120		
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)
	3	10620	0.013	420	7430	0.011	250	5310	0.010	160	12740	0.017	660
	4	7960	0.017	410	5570	0.015	240	3980	0.013	150	9550	0.022	640
	5	6370	0.021	400	4460	0.018	240	3180	0.016	150	7640	0.027	630
	6	5310	0.025	400	3720	0.021	240	2650	0.019	150	6370	0.033	620
	8	3980	0.033	390	2790	0.028	230	1990	0.025	150	4780	0.043	620
	10	3180	0.042	400	2230	0.036	240	1590	0.032	150	3820	0.055	630
	12	2650	0.053	420	1860	0.045	250	1330	0.040	160	3180	0.069	650
	14	2270	0.062	420	1590	0.053	250	1140	0.047	160	2730	0.081	660
16	1990	0.071	430	1390	0.061	250	1000	0.053	160	2390	0.093	660	
18	1770	0.079	420	1240	0.067	250	880	0.059	160	2120	0.103	650	
20	1590	0.086	410	1110	0.073	240	800	0.064	150	1910	0.112	640	

INFO
TYPHOON TA-HTA-4HTA
TYPHOON PU-HPU
TYPHOON SUH
TYPHOON ALH
TYPHOON HRC
TYPHOON SUH MINI
TYPHOON HL
C-SD-TA
LFTA
SUTA
HSS-HSS/CO DRILLS
G2
MDTA
HF VH/UP
MEF
ALU
MEX
UH
HSS/CO-HSSP END MILLS
CARBIDE BURRS

CUTTING PARAMETERS

MDTACS4

	Material Group ISO 513	P1 P2 K1			P3 P4 M1 M2 K2			P5 M3 K3			N1 N2 N3 N4		
	Hardness/Rm	< 700 N/mm ²			700-1000 N/mm ²			< 40 HRC					
	ap x ae	1.5D x 0.2D			1.5D x 0.2D			1.5D x 0.2D			1.5D x 0.2D		
	Vc (m/min)	80-100			50-70			30-50			100-120		
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)
1	28660	0.004	400	19110	0.003	230	12740	0.003	130	35030	0.005	640	
2	14330	0.007	400	9550	0.006	230	6370	0.005	130	17520	0.009	640	
3	9550	0.010	380	6370	0.009	220	4250	0.008	130	11680	0.013	610	
4	7170	0.013	370	4780	0.011	210	3180	0.010	120	8760	0.017	590	
5	5730	0.016	370	3820	0.014	210	2550	0.012	120	7010	0.021	580	
6	4780	0.019	360	3180	0.016	210	2120	0.014	120	5840	0.025	580	
8	3580	0.025	360	2390	0.021	200	1590	0.019	120	4380	0.033	570	
10	2870	0.032	370	1910	0.027	210	1270	0.024	120	3500	0.042	580	
12	2390	0.040	380	1590	0.034	220	1060	0.030	130	2920	0.052	610	
14	2050	0.047	390	1360	0.040	220	910	0.035	130	2500	0.061	610	
16	1790	0.054	390	1190	0.046	220	800	0.041	130	2190	0.070	610	
18	1590	0.060	380	1060	0.051	220	710	0.045	130	1950	0.078	610	
20	1430	0.065	370	960	0.055	210	640	0.049	120	1750	0.085	590	

< D3 mm: ae = 0.1D

- INFO
- TYPHOON TA-HTA-4HTA
- TYPHOON PU-HPU
- TYPHOON SUH
- TYPHOON ALH
- TYPHOON HRC
- TYPHOON SUH MINI
- TYPHOON HL
- C-SD-TA
- LFTA
- SUTA
- HSS-HSS/CO DRILLS
- G2
- MDTA
- HF VH/UP
- MEF
- ALU
- MEX
- UH
- HSS/CO-HSSP END MILLS
- CARBIDE BURRS

CUTTING PARAMETERS

MDTA410

	Material Group ISO 513	P1 P2 K1			P3 P4 M1 M2 K2			P5 M3 K3			N1 N2 N3 N4		
	Hardness/Rm	< 700 N/mm ²			700-1000 N/mm ²			< 40 HRC					
	ap x ae	1.5D x 0.1D			1.5D x 0.1D			1.5D x 0.1D			1.5D x 0.1D		
	Vc (m/min)	70-90			45-65			30-50			80-120		
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)
	3	8490	0.009	310	5840	0.008	180	4250	0.007	110	10620	0.012	500
	4	6370	0.012	300	4380	0.010	170	3180	0.009	110	7960	0.015	480
	5	5100	0.014	290	3500	0.012	170	2550	0.011	110	6370	0.019	480
	6	4250	0.017	290	2920	0.015	170	2120	0.013	110	5310	0.022	470
	8	3180	0.023	290	2190	0.019	170	1590	0.017	110	3980	0.029	470
10	2550	0.029	290	1750	0.024	170	1270	0.022	110	3180	0.037	480	
12	2120	0.036	310	1460	0.031	180	1060	0.027	110	2650	0.047	500	
14	1820	0.042	310	1250	0.036	180	910	0.032	110	2270	0.055	500	
16	1590	0.048	310	1090	0.041	180	800	0.036	120	1990	0.062	500	

- INFO
- TYPHOON TA-HTA-4HTA
- TYPHOON PU-HPU
- TYPHOON SUH
- TYPHOON ALH
- TYPHOON HRC
- TYPHOON SUH MINI
- TYPHOON HL
- C-SD-TA
- LFTA
- SUTA
- HSS-HSS/CO DRILLS
- G2
- MDTA**
- HF VH/UP
- MEF
- ALU
- MEX
- UH
- HSS/CO-HSSP END MILLS
- CARBIDE BURRS

CUTTING PARAMETERS

MDCL4

	Material Group ISO 513	P1 P2 K1			P3 P4 M1 M2 K2			P5 M3 K3			N1 N2 N3 N4		
	Hardness/Rm	< 700 N/mm ²			700-1000 N/mm ²			< 40 HRC					
	ap x ae	1.5D x 0.1D			1.5D x 0.1D			1.5D x 0.1D			1.5D x 0.1D		
	Vc (m/min)	40-50			25-35			20-30			60-80		
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)
	3	4780	0.008	150	3180	0.007	90	2650	0.006	60	7430	0.009	260
	4	3580	0.010	150	2390	0.009	80	1990	0.008	60	5570	0.011	260
	5	2870	0.013	150	1910	0.011	80	1590	0.010	60	4460	0.014	250
	6	2390	0.015	150	1590	0.013	80	1330	0.011	60	3720	0.017	250
	8	1790	0.020	140	1190	0.017	80	1000	0.015	60	2790	0.026	290
	10	1430	0.026	150	960	0.022	80	800	0.019	60	2230	0.033	300
	12	1190	0.032	150	800	0.027	90	660	0.024	60	1860	0.042	310
	14	1020	0.038	150	680	0.032	90	570	0.028	60	1590	0.049	310
16	900	0.043	160	600	0.037	90	500	0.032	60	1390	0.056	310	
20	720	0.052	150	480	0.044	80	400	0.039	60	1110	0.068	300	

- INFO
- TYPHOON TA-HTA-4HTA
- TYPHOON PU-HPU
- TYPHOON SUH
- TYPHOON ALH
- TYPHOON HRC
- TYPHOON SUH MINI
- TYPHOON HL
- C-SD-TA
- LFTA
- SUTA
- HSS-HSS/CO DRILLS
- G2
- MDTA**
- HF VH/UP
- MEF
- ALU
- MEX
- UH
- HSS/CO-HSSP END MILLS
- CARBIDE BURRS

MDTAUPR

	Material Group ISO 513	P1 P2 K1			P3 P4 M1 M2 K2			P5 M3 K3					
	Hardness/Rm	< 700 N/mm ²			700-1000 N/mm ²			< 40 HRC					
	ap x ae	0.5D x D			0.5D x D			0.5D x D					
	Vc (m/min)	80-100			50-70			30-50					
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)			
	6	4780	0.030	430	3180	0.026	240	2120	0.023	140			
	8	3580	0.045	480	2390	0.038	270	1590	0.034	160			
	10	2870	0.055	630	1910	0.047	360	1270	0.041	210			
	12	2390	0.065	620	1590	0.055	350	1060	0.049	210			
	14	2050	0.075	620	1360	0.064	350	910	0.056	200			
16	1790	0.085	610	1190	0.072	340	800	0.064	200				
20	1430	0.100	570	960	0.085	330	640	0.075	190				

D6-8: Z3
D10-20: Z4

	Material Group ISO 513	P1 P2 K1			P3 P4 M1 M2 K2			P5 M3 K3					
	Hardness/Rm	< 700 N/mm ²			700-1000 N/mm ²			< 40 HRC					
	ap x ae	1.5D x 0.3D			1.5D x 0.3D			1.5D x 0.3D					
	Vc (m/min)	80-100			50-70			30-50					
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)			
	6	4780	0.040	570	3180	0.034	320	2120	0.030	190			
	8	3580	0.055	590	2390	0.047	340	1590	0.041	200			
	10	2870	0.065	750	1910	0.055	420	1270	0.049	250			
	12	2390	0.080	760	1590	0.068	430	1060	0.060	250			
	14	2050	0.090	740	1360	0.077	420	910	0.068	250			
16	1790	0.100	720	1190	0.085	400	800	0.075	240				
20	1430	0.120	690	960	0.102	390	640	0.090	230				

D6-8: Z3
D10-20: Z4

- INFO
- TYPHOON TA-HTA-4HTA
- TYPHOON PU-HPU
- TYPHOON SUH
- TYPHOON ALH
- TYPHOON HRC
- TYPHOON SUH MINI
- TYPHOON HL
- C-SD-TA
- LFTA
- SUTA
- HSS-HSS/CO DRILLS
- G2
- MDTA
- HF VH/UP
- MEF
- ALU
- MEX
- UH
- HSS/CO-HSSP END MILLS
- CARBIDE BURRS

CUTTING PARAMETERS

MDTACSB2

	Material Group ISO 513	P1 P2 K1			P3 P4 M1 M2 K2			P5 M3 K3			N1 N2 N3 N4			
	Hardness/Rm	< 700 N/mm ²			700-1000 N/mm ²			< 40 HRC						
	ap x ae	0.1D x 0.1D			0.1D x 0.1D			0.1D x 0.1D			0.1D x 0.1D			
	Vc (m/min)	80-100			60-80			40-60			110-130			
	D (mm)	D (eff.) (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)
	1	0.60	28660	0.030	1720	22290	0.023	1000	15920	0.021	670	38220	0.036	2750
	2	1.20	14330	0.040	1150	11150	0.030	670	7960	0.028	450	19110	0.048	1830
	3	1.80	9550	0.050	960	7430	0.038	560	5310	0.035	370	12740	0.060	1530
	4	2.40	7170	0.060	860	5570	0.045	500	3980	0.042	330	9550	0.072	1380
	5	3.00	5730	0.070	800	4460	0.053	470	3180	0.049	310	7640	0.084	1280
6	3.60	4780	0.080	760	3720	0.060	450	2650	0.056	300	6370	0.096	1220	
8	4.80	3580	0.090	640	2790	0.068	380	1990	0.063	250	4780	0.108	1030	
10	6.00	2870	0.105	600	2230	0.079	350	1590	0.074	230	3820	0.126	960	
12	7.20	2390	0.120	570	1860	0.090	330	1330	0.084	220	3180	0.144	920	

- INFO
- TYPHOON TA-HTA-4HTA
- TYPHOON PU-HPU
- TYPHOON SUH
- TYPHOON ALH
- TYPHOON HRC
- TYPHOON SUH MINI
- TYPHOON HL
- C-SD-TA
- LFTA
- SUTA
- HSS-HSS/CO DRILLS
- G2
- MDTA**
- HF VH/UP
- MEF
- ALU
- MEX
- UH
- HSS/CO-HSSP END MILLS
- CARBIDE BURRS

CUTTING PARAMETERS

MDTA250

	Material Group ISO 513		P1 P2 K1			P3 P4 M1 M2 K2			P5 M3 K3			N1 N2 N3 N4		
	Hardness/Rm		< 700 N/mm ²			700-1000 N/mm ²			< 40 HRC					
	ap x ae		0.1D x 0.1D			0.1D x 0.1D			0.1D x 0.1D			0.1D x 0.1D		
	Vc (m/min)		70-90			50-70			40-50			100-120		
	D (mm)	D (eff.) (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)
	3	1.80	8490	0.045	760	6370	0.034	430	4780	0.032	300	11680	0.054	1260
	4	2.40	6370	0.054	690	4780	0.041	390	3580	0.038	270	8760	0.065	1140
	5	3.00	5100	0.063	640	3820	0.047	360	2870	0.044	250	7010	0.076	1060
	6	3.60	4250	0.072	610	3180	0.054	340	2390	0.050	240	5840	0.086	1010
	8	4.80	3180	0.081	520	2390	0.061	290	1790	0.057	200	4380	0.097	850
10	6.00	2550	0.095	480	1910	0.071	270	1430	0.066	190	3500	0.113	790	
12	7.20	2120	0.108	460	1590	0.081	260	1190	0.076	180	2920	0.130	760	

- INFO
- TYPHOON TA-HTA-4HTA
- TYPHOON PU-HPU
- TYPHOON SUH
- TYPHOON ALH
- TYPHOON HRC
- TYPHOON SUH MINI
- TYPHOON HL
- C-SD-TA
- LFTA
- SUTA
- HSS-HSS/CO DRILLS
- G2
- MDTA**
- HF VH/UP
- MEF
- ALU
- MEX
- UH
- HSS/CO-HSSP END MILLS
- CARBIDE BURRS



HF VH/UP

UNIVERSAL PURPOSE

✚ HF EVOLution is the Osawa family of micrograin carbide endmills for universal application with coatings and cutting edges specifically designed for high performance machining of all ISO materials. The HF EVOLution endmills are available in a broad range of types, lengths and radii. They are the ideal tools for both mass production and small batch manufacturing, thanks to the outstanding performance delivered and the universal applicability.

🇮🇹 HF EVOLution è la linea Osawa di frese universali in metallo duro micrograna con spoglie e rivestimenti specifici per la lavorazione ad alto rendimento di tutti i materiali della scala ISO. Le frese HF EVOLution sono disponibili in un'ampia gamma di tipologie, lunghezze e raggi torici. Sono gli utensili ideali sia per le superproduzioni di serie che per la produzione di piccoli lotti, grazie all'eccellenza del rendimento e all'universalità d'impiego.

🇩🇪 HF EVOLution heißt die Linie der Universalfräser aus mikrokörnigem Hartmetall von Osawa, mit Schneidekanten und spezifischen Beschichtungen zur Hochleistungsbearbeitung von allen Materialien der ISO-Skala. Die Fräser HF EVOLution sind in einer reichen Auswahl an Typologien, Längen und Torusradien erhältlich. Mit ihren ausgezeichneten Leistungen und dem universellen Einsatz sind sie die idealen Werkzeuge, sowohl für die Serienproduktion großer Mengen als auch für die Herstellung kleiner Lose.

🇫🇷 HF EVOLution est la ligne Osawa de fraises universelles en carbure micrograin avec dépouilles et revêtements spécifiques pour l'usinage de haute performance de tous les matériaux de l'échelle ISO. Les fraises HF EVOLution sont disponibles dans une large gamme, longueurs et rayons. Ce sont des outils aussi bien pour les grandes séries que pour la production de prototypes, grâce à leur excellence de rendement et leur polyvalence.

🇪🇸 HF EVOLution es la línea de fresas universales de metal duro microgranulado con inclinación y revestimientos específicos para el mecanizado de alto rendimiento de todos los materiales de la escala ISO. Las fresas HF EVOLution están disponibles en una amplia gama de tipologías, longitudes y radios tóricos. Son las herramientas ideales tanto para las superproducciones en serie como para la producción de pequeños lotes, gracias a la excelencia del rendimiento y la universalidad de empleo.

🇷🇺 HF EVOLution - это линейка универсальных фрез Osawa из мелкозернистого твердого сплава со специальным покрытием для высокопроизводительной обработки всех материалов по ISO. Доступна широкая гамма фрез этой серии, имеющих различную длину и радиусы на уголках. Благодаря высокой эффективности и универсальности, это идеальные инструменты как для массового, так и для мелкосерийного производства.

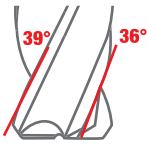
INFO
TYPHOON TA-HTA-4HTA
TYPHOON PU-HPU
TYPHOON SUH
TYPHOON ALH
TYPHOON HRC
TYPHOON SUH MINI
TYPHOON HL
C-SD-TA
LFTA
SUTA
HSS-HSS/CO DRILLS
G2
MDTA
HF VH/UP
MEF
ALU
MEX
UH
HSS/CO-HSSP END MILLS
CARBIDE BURRS

HF VH/UP

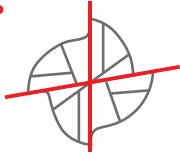
UNIVERSAL PURPOSE

INFO
TYPHOON TA-HTA-4HTA
TYPHOON PU-HPU
TYPHOON SUH
TYPHOON ALH
TYPHOON HRC
TYPHOON SUH MINI
TYPHOON HL
C-SD-TA
LFTA
SUTA
HSS-HSS/CO DRILLS
G2
MDTA
HF VH/UP
MEF
ALU
MEX
UH
HSS/CO-HSSP END MILLS
CARBIDE BURRS

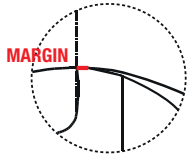
(1) VH



(2) UP



(3) MARGIN



ISO P
ISO M
ISO K
ISO S
ISO H



HIGH PERFORMANCE



Thanks to the variable helix geometry VH (1) with unequal pitch UP (2) and to the highly sophisticated cutting edge preparation (3), the HF EVOLution endmills enable the highest level of performances in terms of tool life, volume of chip removed, productivity and surface finishing.



Grazie alla geometria ad elica variabile VH (1) con passo differenziato UP (2) e alla sofisticata preparazione del tagliente (3), le frese HF EVOLution garantiscono performance di alto livello in termini di durata, volume truciolo asportato, produttività e finitura superficiale.



Dank der Geometrie mit variabler Helix VH (1) mit ungleicher Teilung UP (2) und der sorgfältigen Herstellung der Schneide (3) gewährleisten die Fräser HF EVOLution Höchstleistungen, was die Dauer, das Volumen des abgetragenen Spans, die Produktivität und das Oberflächenfinish betrifft.



Grâce à la géométrie à hélice variable VH (1) à pas décalé UP (2) et à la préparation technique de la partie coupante (3), les fraises HF EVOLution garantissent des performances de haut niveau en termes de durée, volume de débit copeau, productivité et finition superficielle.



Gracias a la geometría de hélice variable VH (1) con paso diferenciado UP (2) y a la sofisticada preparación del filo (3), las fresas HF EVOLution garantizan rendimientos de alto nivel en términos de duración, volumen de la viruta extraída, productividad y acabado de la superficie.



Благодаря геометрии с переменным углом наклона спирали VH (1) с неравномерным шагом UP (2) и сложной формой зубьев (3), фрезы HF EVOLution гарантируют высокую производительность, стойкость, объем удаляемого материала и низкую шероховатость обработанной поверхности.

UNIVERSAL



The HF EVOLution endmills are universal tools, both for the broad range of materials machineable, the type of applications and for the milling strategies applicable: slotting, side milling, helical interpolation, ramping, vertical milling, drilling and trochoidal milling. Just one single HF tool enables roughing, semi-finishing and finishing applications.



Le frese HF EVOLution sono utensili universali sia per la gamma dei materiali lavorabili che per il tipo di lavorazione e strategia di fresatura applicabile: fresatura dal pieno, contornatura, interpolazione elicoidale, entrata in rampa, fresatura assiale, foratura e fresatura trocoidale. Un unico utensile HF permette lavorazioni di sgrossatura, semi-sgrossatura e finitura.



Die Fräser HF EVOLution sind universelle Werkzeuge, sowohl aufgrund der breiten Palette bearbeitbarer Materialien als auch dank der anwendbaren Bearbeitungsarten und Frässtrategien: Nutfräsen, Konturfräsen, Helixinterpolation, Rampenfräsen, Vertikalfräsen, Bohren und trochoidales Fräsen. Ein einziges HF Werkzeug kann zum Schruppen, Vorschlichten und Schlichten eingesetzt werden.



Les fraises HF EVOLution sont des outils universels aussi bien pour tous types de matériaux que pour tous types d'usinages et de stratégies de fraisages applicables : fraisage de pièces taillées dans la masse, contournage, interpolation hélicoïdale, entrée sur rampe, fraisage axial, perçage et fraisage trochoidal. Un seul outil HF permet de réaliser des usinages d'ébauche, semi finition et finition.



Las fresas HF EVOLution son herramientas universales tanto por su gama de materiales trabajables como por el tipo de elaboración y estrategia de fresado aplicable: fresado de una sola pieza, contorneado, interpolación helicoidal, entrada en rampa, fresado axial, perforación y fresado trocoidal. Un sola herramienta HF permite elaboraciones de desbastado, semidesbastado y acabado.



Фрезы HF EVOLution являются универсальными инструментами как для широкой гаммы обрабатываемых материалов, так и для многих стратегий фрезерования: фрезерование пазов, уступов, по спирали, под углом, вдоль оси, сверление и трохойдальное фрезерование. С помощью одной фрезы серии HF можно выполнять черновую, получистовую и чистовую обработку.



COMPLETE RANGE



2 families of tools with application-specific geometries.

- HF UNI (VH+UP), designed for milling of materials with hardness up to 40 HRC: steel (ISO P), stainless steel (ISO M), cast iron (ISO K) and super alloys (ISO S), such as Inconel or Titanium. The HF UNI range is now extended with the new HF UNI SC "smooth cut" which reduces significantly the cutting forces thanks to the cutting edge geometry, becoming particularly suitable in case of machining with less powerful machines.

- HF HARD (UP) for steel (ISO P), stainless steel (ISO M), cast iron (ISO K), super alloys (ISO S), hardened steel (ISO H) milling, with hardness up to 55 HRC.



2 famiglie di utensili con geometrie specifiche.

- HF UNI (VH+UP), per fresatura di materiali con durezza sino a 40 HRC: acciaio (ISO P), acciaio inossidabile (ISO M), ghisa (ISO K) e super leghe (ISO S), quali Inconel o titanio. La gamma HF UNI si arricchisce della nuova HF UNI SC "smooth cut" che, grazie alla geometria del tagliente, riduce notevolmente gli sforzi di taglio, risultando particolarmente adatta all'utilizzo su macchine poco potenti.

- HF HARD (UP) per fresatura di acciaio (ISO P), acciaio inossidabile (ISO M), ghisa (ISO K), super leghe (ISO S), acciaio temprato (ISO H), con durezza sino a 55 HRC.



2 Werkzeugfamilien mit spezifischen Geometrien.

- HF UNI (VH+UP), zum Fräsen von Materialien mit einer Härte bis zu 40HRC: Stahl (ISO P), korrosionsbeständiger Stahl (ISO M), Gusseisen (ISO K) und Superlegierungen (ISO S) wie Inconel oder Titan. Die Serie HF UNI wird durch den neuen Fräser HF UNI SC „Smooth Cut“ erweitert, bei dem dank der Geometrie der Schneide die aufzubringende Schnittkraft wesentlich verringert werden konnte, so dass dieser Fräser besonders für den Einsatz auf weniger leistungsfähigen Maschinen geeignet ist.

- HF HARD (UP) für das Fräsen von Stahl (ISO P), korrosionsbeständigem Stahl (ISO M), Gusseisen (ISO K), Superlegierungen (ISO S), gehärtetem Stahl (ISO H) mit einer Härten bis zu 55HRC.



2 familles d'outils avec des géométries spécifiques.

- HF UNI (VH+UP), pour fraisage de matériaux dont la dureté peut atteindre 40HRC : acier (ISO P), acier inoxydable (ISO M), fonte (ISO K) et super alliages (ISO S), tels que l' inconel ou titane. La gamme HF UNI s'enrichit de la nouvelle HF UNI SC « smooth cut » qui, grâce à la géométrie de coupe, réduit considérablement les efforts de coupe, ce qui la rend particulièrement adaptée à l'utilisation sur des machines peu puissantes.

- HF HARD (UP), pour fraisage d'acier (ISO P), acier inoxydable (ISO M), fonte (ISO K) et super alliages (ISO S), acier trempé (ISO H), dont la dureté peut atteindre 55HRC.



2 familias de herramientas con geometrías específicas.

- HF UNI (VH+UP), para fresado de materiales con dureza hasta 40HRC: acero (ISO P), acero inoxidable (ISO M), fundición (ISO K) y súper aleaciones (ISO S), como Inconel o titanio. La gama HF UNI se enriquece con la nueva HF UNI SC «smooth cut», que, gracias a la geometría del filo cortante, reduce de forma importante los esfuerzos de corte, resultando especialmente adecuada para su uso en máquinas poco potentes.

- HF HARD (UP), para fresado de acero (ISO P), acero inoxidable (ISO M), fundición (ISO K) y súper aleaciones (ISO S), acero templado (ISO H), con duración de hasta 55 HRC.



2 семейства инструментов со специальной геометрией.

- HF UNI (VH+UP), для фрезерования материалов твердостью до 40HRC: сталь (ISO P), нержавеющей сталь (ISO M), чугуна (ISO K) и жаропрочные сплавы (ISO S), такие как инконель и титан. К этому семейству добавлена новая фреза HF UNI SC «smooth cut» (плавное резание), которая, благодаря форме зубьев, значительно сокращает усилия резания, что делает ее пригодной для использования на маломощных станках.

- HF HARD (UP) для фрезерования стали (ISO P), нержавеющей стали (ISO M), чугуна (ISO K), жаропрочных сплавов (ISO S), закаленной стали (ISO H) твердостью до 55 HRC.

INFO
TYPHOON TA-HTA-4HTA
TYPHOON PU-HPU
TYPHOON SUH
TYPHOON ALH
TYPHOON HRC
TYPHOON SUH MINI
TYPHOON HL
C-SD-TA
LFTA
SUTA
HSS-HSS/CO DRILLS
G2
MDTA
HF VH/UP
MEF
ALU
MEX
UH
HSS/CO-HSSP END MILLS
CARBIDE BURRS

CUTTING PARAMETERS

HF840

	Material Group ISO 513	P1 P2 M1 K1				P3 P4 M2 K2 K3			P5 M3 M4 K4 S1 S4				S2 S3 S5		
	Hardness/Rm	≤ 700 N/mm ²				700-1000 N/mm ²			≤ 35 HRC				≤ 40 HRC		
	ap x ae	D x D				D x D			0.5D x D				0.5D x D		
	Vc (m/min)	130-150				80-100			60-80				30-50		
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)		
	3	14860	0.014	830	9550	0.013	480	7430	0.011	310	4250	0.010	170		
	4	11150	0.019	830	7170	0.017	480	5570	0.014	310	3180	0.013	160		
	5	8920	0.023	820	5730	0.021	470	4460	0.017	310	2550	0.016	160		
	6	7430	0.027	800	4780	0.024	460	3720	0.020	300	2120	0.019	160		
	8	5570	0.035	780	3580	0.032	450	2790	0.026	290	1590	0.025	160		
	10	4460	0.042	750	2870	0.038	430	2230	0.032	280	1270	0.029	150		
	12	3720	0.048	710	2390	0.043	410	1860	0.036	270	1060	0.034	140		
	14	3180	0.054	690	2050	0.049	400	1590	0.041	260	910	0.038	140		
16	2790	0.060	670	1790	0.054	390	1390	0.045	250	800	0.042	130			
18	2480	0.066	650	1590	0.059	380	1240	0.050	250	710	0.046	130			
20	2230	0.073	650	1430	0.066	380	1110	0.055	240	640	0.051	130			
ap x ae	≤ D5	0.5D x D				0.5D x D			0.25D x D				0.25D x D		

	Material Group ISO 513	P1 P2 M1 K1				P3 P4 M2 K2 K3			P5 M3 M4 K4 S1 S4				S2 S3 S5		
	Hardness/Rm	≤ 700 N/mm ²				700-1000 N/mm ²			≤ 35 HRC				≤ 40 HRC		
	ap x ae	1.5D x 0.5D				1.5D x 0.5D			1.2D x 0.3D				1.2D x 0.3D		
	Vc (m/min)	160-180				100-120			70-90				40-60		
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)		
	3	18050	0.017	1210	11680	0.015	710	8490	0.013	460	5310	0.018	390		
	4	13540	0.022	1200	8760	0.020	700	6370	0.018	450	3980	0.024	390		
	5	10830	0.028	1200	7010	0.025	700	5100	0.022	450	3180	0.030	390		
	6	9020	0.032	1170	5840	0.029	680	4250	0.026	440	2650	0.036	380		
	8	6770	0.042	1140	4380	0.038	660	3180	0.034	430	1990	0.046	370		
	10	5410	0.050	1090	3500	0.045	640	2550	0.040	410	1590	0.055	350		
	12	4510	0.058	1040	2920	0.052	610	2120	0.046	390	1330	0.063	340		
	14	3870	0.065	1000	2500	0.058	580	1820	0.052	380	1140	0.071	330		
16	3380	0.072	970	2190	0.065	570	1590	0.058	370	1000	0.079	320			
18	3010	0.079	950	1950	0.071	560	1420	0.063	360	880	0.087	310			
20	2710	0.088	950	1750	0.079	550	1270	0.070	360	800	0.096	310			
ap x ae	≤ D5	1.5D x 0.25D				1.5D x 0.25D			1.2D x 0.1D				1.2D x 0.1D		

	Material Group ISO 513	P1 P2 M1 K1				P3 P4 M2 K2 K3			P5 M3 M4 K4 S1 S4				S2 S3 S5		
	Hardness/Rm	≤ 700 N/mm ²				700-1000 N/mm ²			≤ 35 HRC				≤ 40 HRC		
	α° x ae	5° x 0.4D				4° x 0.4D			3° x 0.4D				3° x 0.4D		
	Vc (m/min)	130-150				80-100			60-80				30-50		
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)		
	3	14860	0.010	605	9550	0.010	365	7430	0.008	250	4250	0.008	133		
	4	11150	0.013	600	7170	0.013	360	5570	0.011	247	3180	0.010	132		
	5	8920	0.017	600	5730	0.016	360	4460	0.014	246	2550	0.013	131		
	6	7430	0.020	585	4780	0.018	350	3720	0.016	241	2120	0.015	128		
	8	5570	0.025	570	3580	0.024	340	2790	0.021	235	1590	0.020	125		
	10	4460	0.031	545	2870	0.029	325	2230	0.025	225	1270	0.024	120		
	12	3720	0.035	520	2390	0.033	310	1860	0.029	214	1060	0.027	114		
	14	3180	0.039	500	2050	0.037	300	1590	0.032	206	910	0.030	110		
16	2790	0.044	490	1790	0.041	290	1390	0.036	200	800	0.034	108			
18	2480	0.048	475	1590	0.045	285	1240	0.040	197	710	0.037	105			
20	2230	0.053	475	1430	0.050	285	1110	0.044	195	640	0.041	105			
α° max	≤ D5	2°				2°			1°				1°		

PARAMETERS SUGGESTED WITH HIGH POWER MILLING CHUCK AND STABLE MACHINING CONDITION

- INFO
- TYPHOON TA-HTA-4HTA
- TYPHOON PU-HPU
- TYPHOON SUH
- TYPHOON ALH
- TYPHOON HRC
- TYPHOON SUH MINI
- TYPHOON HL
- C-SD-TA
- LFTA
- SUTA
- HSS-HSS/CO DRILLS
- G2
- MDTA
- HF-VH/UP
- MEF
- ALU
- MEX
- UH
- HSS/CO-HSSP END MILLS
- CARBIDE BURRS

HF840

	Material Group ISO 513	P1 P2 M1 K1				P3 P4 M2 K2 K3			P5 M3 M4 K4 S1 S4				S2 S3 S5		
	Hardness/Rm	≤ 700 N/mm ²				700-1000 N/mm ²			≤ 35 HRC				≤ 40 HRC		
	α° x ae	15° x D				10° x D			5° x D				5° x D		
	Vc (m/min)	130-150				80-100			60-80				30-50		
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)		
	6	7430	0.022	640	4780	0.020	380	3720	0.019	281	2120	0.026	220		
	8	5570	0.028	620	3580	0.026	370	2790	0.024	273	1590	0.034	214		
	10	4460	0.034	600	2870	0.031	355	2230	0.029	262	1270	0.040	205		
	12	3720	0.038	570	2390	0.035	335	1860	0.034	250	1060	0.046	196		
	14	3180	0.043	550	2050	0.040	325	1590	0.038	240	910	0.052	189		
16	2790	0.048	535	1790	0.044	315	1390	0.042	233	800	0.058	185			
18	2480	0.053	520	1590	0.048	310	1240	0.046	229	710	0.063	180			
20	2230	0.058	520	1430	0.054	305	1110	0.051	227	640	0.070	180			

	Material Group ISO 513	P1 P2 M1 K1				P3 P4 M2 K2 K3			P5 M3 M4 K4 S1 S4				S2 S3 S5		
	Hardness/Rm	≤ 700 N/mm ²				700-1000 N/mm ²			≤ 35 HRC				≤ 40 HRC		
	ap x ae	D x 0.4D				D x 0.4D			D x 0.25D				D x 0.25D		
	Vc (m/min)	130-150				80-100			60-80				30-50		
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)		
	6	7430	0.027	800	4780	0.024	460	3720	0.020	300	2120	0.019	160		
	8	5570	0.035	780	3580	0.032	450	2790	0.026	290	1590	0.025	160		
	10	4460	0.042	750	2870	0.038	430	2230	0.032	280	1270	0.029	150		
	12	3720	0.048	710	2390	0.043	410	1860	0.036	270	1060	0.034	140		
	14	3180	0.054	690	2050	0.049	400	1590	0.041	260	910	0.038	140		
16	2790	0.060	670	1790	0.054	390	1390	0.045	250	800	0.042	130			
18	2480	0.066	650	1590	0.059	380	1240	0.050	250	710	0.046	130			
20	2230	0.073	650	1430	0.066	380	1110	0.055	240	640	0.051	130			

	Material Group ISO 513	P1 P2 M1 K1				P3 P4 M2 K2 K3			P5 M3 M4 K4 S1 S4				S2 S3 S5		
	Hardness/Rm	≤ 700 N/mm ²				700-1000 N/mm ²			≤ 35 HRC				≤ 40 HRC		
	ap x ae	D x D				D x D			0.5D x D				0.5D x D		
	Vc (m/min)	100-120				60-80			45-65				20-40		
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)		
	3	11680	0.007	330	7430	0.006	190	5840	0.006	130	3180	0.008	100		
	4	8760	0.009	320	5570	0.008	190	4380	0.007	130	2390	0.010	100		
	5	7010	0.012	320	4460	0.010	180	3500	0.009	130	1910	0.013	100		
	6	5840	0.014	320	3720	0.012	180	2920	0.011	130	1590	0.015	90		
	8	4380	0.018	310	2790	0.016	180	2190	0.014	120	1190	0.019	90		
10	3500	0.021	290	2230	0.019	170	1750	0.017	120	960	0.023	90			
12	2920	0.024	280	1860	0.022	160	1460	0.019	110	800	0.026	80			
14	2500	0.027	270	1590	0.024	150	1250	0.022	110	680	0.030	80			
16	2190	0.030	260	1390	0.027	150	1090	0.024	100	600	0.033	80			
18	1950	0.033	260	1240	0.030	150	970	0.026	100	530	0.036	80			
20	1750	0.037	260	1110	0.033	150	880	0.029	100	480	0.040	80			
ap x ae	≤ D5		0.5D x D		0.5D x D		0.25D x D		0.25D x D		0.25D x D				

PARAMETERS SUGGESTED WITH HIGH POWER MILLING CHUCK AND STABLE MACHINING CONDITION

HF840

	Material Group ISO 513	P1 P2 M1 K1			P3 P4 M2 K2 K3			P5 M3 M4 K4 S1 S4			S2 S3 S5		
	Hardness/Rm	≤ 700 N/mm ²			700-1000 N/mm ²			≤ 35 HRC			≤ 40 HRC		
	ap x ae	2D x 0.2D			2D x 0.2D			1.5D x 0.1D			1.5D x 0.1D		
	Vc (m/min)	190-230			130-150			100-120			50-70		
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)
	3	22290	0.035	3120	14860	0.032	1870	11680	0.028	1310	6370	0.039	980
	4	16720	0.046	3090	11150	0.042	1860	8760	0.037	1300	4780	0.051	970
	5	13380	0.058	3080	8920	0.052	1850	7010	0.046	1290	3820	0.063	970
	6	11150	0.068	3010	7430	0.061	1810	5840	0.054	1260	3180	0.074	940
	8	8360	0.088	2930	5570	0.079	1750	4380	0.070	1230	2390	0.096	920
	10	6690	0.105	2810	4460	0.095	1690	3500	0.084	1180	1910	0.116	880
	12	5570	0.120	2670	3720	0.108	1610	2920	0.096	1120	1590	0.132	840
	14	4780	0.135	2580	3180	0.122	1550	2500	0.108	1080	1360	0.149	810
16	4180	0.150	2510	2790	0.135	1510	2190	0.120	1050	1190	0.165	790	
18	3720	0.165	2460	2480	0.149	1470	1950	0.132	1030	1060	0.182	770	
20	3340	0.183	2440	2230	0.164	1470	1750	0.146	1020	960	0.201	770	
ap x ae	≤ D5	1.5D x 0.1D			1.5D x 0.1D								

NOTES:

Down milling CNC programming is required.

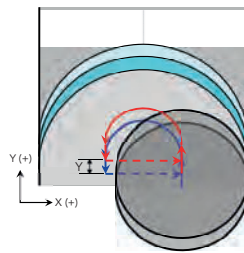
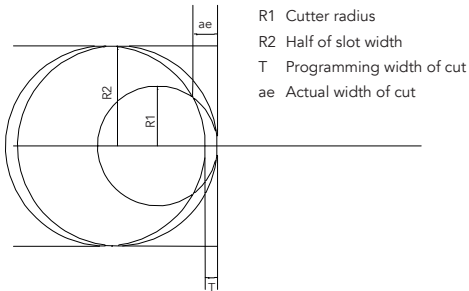
"ae" value max 0.2xD - "T" value max 0.1xD.

The use of end mill with diameter 30-40% smaller than the width of the slot is recommended.

The cutting conditions are based on CNC programming with medium dynamic speed.

With lower CNC dynamic speed, use the same cutting conditions or reduce the cutting speed Vc.

With higher CNC dynamic speed, reduce the "T" value by approximately -30 -50% and apply the maximum available cutting speed Vc.



- INFO
- TYPHOON TA-HTA-4HTA
- TYPHOON PU-HPU
- TYPHOON SUH
- TYPHOON ALH
- TYPHOON HRC
- TYPHOON SUH MINI
- TYPHOON HL
- C-SD-TA
- LFTA
- SUTA
- HSS-HSS/CO DRILLS
- G2
- MDTA
- HF-VH/UP
- MEF
- ALU
- MEX
- UH
- HSS/CO-HSSP END MILLS
- CARBIDE BURRS

CUTTING PARAMETERS

HF440

	Material Group ISO 513	P1 P2 M1 K1			P3 P4 M2 K2 K3			P5 M3 M4 K4 S1 S4			S2 S3 S5		
	Hardness/Rm	≤ 700 N/mm ²			700-1000 N/mm ²			≤ 35 HRC			≤ 40 HRC		
	ap x ae	D x D			D x D			0.5D x D			0.5D x D		
	Vc (m/min)	110-130			70-90			50-70			30-50		
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)
	3	12740	0.013	640	8490	0.011	390	6370	0.009	240	4250	0.009	150
	4	9550	0.017	640	6370	0.015	380	4780	0.012	240	3180	0.012	150
	5	7640	0.021	630	5100	0.019	380	3820	0.016	240	2550	0.014	150
	6	6370	0.024	620	4250	0.022	370	3180	0.018	230	2120	0.017	140
	8	4780	0.032	600	3180	0.028	360	2390	0.024	230	1590	0.022	140
10	3820	0.038	580	2550	0.034	350	1910	0.028	220	1270	0.026	130	
12	3180	0.043	550	2120	0.039	330	1590	0.032	210	1060	0.030	130	
14	2730	0.049	530	1820	0.044	320	1360	0.036	200	910	0.034	120	
16	2390	0.054	520	1590	0.049	310	1190	0.041	190	800	0.038	120	
20	1910	0.066	500	1270	0.059	300	960	0.049	190	640	0.046	120	
ap x ae	≤ D5	0.5D x D			0.5D x D			0.25D x D			0.25D x D		

	Material Group ISO 513	P1 P2 M1 K1			P3 P4 M2 K2 K3							
	Hardness/Rm	≤ 700 N/mm ²			700-1000 N/mm ²							
	ap x ae	1.5D x D			1.5D x D							
	Vc (m/min)	85-105			55-75							
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)					
	8	3780	0.025	380	2590	0.023	230					
	10	3030	0.030	370	2070	0.027	230					
12	2520	0.035	350	1730	0.031	220						
14	2160	0.039	340	1480	0.035	210						
16	1890	0.043	330	1290	0.039	200						
20	1510	0.053	320	1040	0.047	200						

	Material Group ISO 513	P1 P2 M1 K1			P3 P4 M2 K2 K3			P5 M3 M4 K4 S1 S4			S2 S3 S5		
	Hardness/Rm	≤ 700 N/mm ²			700-1000 N/mm ²			≤ 35 HRC			≤ 40 HRC		
	ap x ae	1.5D x 0.5D			1.5D x 0.5D			1.2D x 0.3D			1.2D x 0.3D		
	Vc (m/min)	130-150			90-110			60-80			40-60		
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)
	3	14860	0.015	900	10620	0.014	580	7430	0.012	360	5310	0.017	350
	4	11150	0.020	890	7960	0.018	570	5570	0.016	360	3980	0.022	350
	5	8920	0.025	890	6370	0.022	570	4460	0.020	350	3180	0.027	350
	6	7430	0.029	870	5310	0.026	560	3720	0.023	350	2650	0.032	340
	8	5570	0.038	840	3980	0.034	540	2790	0.030	340	1990	0.042	330
10	4460	0.045	810	3180	0.041	520	2230	0.036	320	1590	0.050	320	
12	3720	0.052	770	2650	0.047	490	1860	0.041	310	1330	0.057	300	
14	3180	0.058	740	2270	0.052	480	1590	0.047	300	1140	0.064	290	
16	2790	0.065	720	1990	0.058	460	1390	0.052	290	1000	0.071	290	
20	2230	0.079	700	1590	0.071	450	1110	0.063	280	800	0.087	280	
ap x ae	≤ D5	1.5D x 0.25D			1.5D x 0.25D			1.2D x 0.1D			1.2D x 0.1D		

PARAMETERS SUGGESTED WITH HIGH POWER MILLING CHUCK AND STABLE MACHINING CONDITION

- INFO
- TYPHOON TA-HTA-4HTA
- TYPHOON PU-HPU
- TYPHOON SUH
- TYPHOON ALH
- TYPHOON HRC
- TYPHOON SUH MINI
- TYPHOON HL
- C-SD-TA
- LFTA
- SUTA
- HSS-HSS/CO DRILLS
- G2
- MDTA
- HF VH/UP
- MEF
- ALU
- MEX
- UH
- HSS/CO-HSSP END MILLS
- CARBIDE BURRS

CUTTING PARAMETERS

HF440

	Material Group ISO 513	P1 P2 M1 K1			P3 P4 M2 K2 K3			P5 M3 M4 K4 S1 S4			S2 S3 S5				
	Hardness/Rm	≤ 700 N/mm ²			700-1000 N/mm ²			≤ 35 HRC			≤ 40 HRC				
	α° x ae	5° x 0.4D			4° x 0.4D			3° x 0.4D			3° x 0.4D				
	Vc (m/min)	110-130			70-90			50-70			30-50				
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)		
	3	12740	0.009	470	8490	0.009	290	6370	0.008	193	4250	0.007	120		
	4	9550	0.012	465	6370	0.011	290	4780	0.010	191	3180	0.009	119		
	5	7640	0.015	460	5100	0.014	285	3820	0.012	190	2550	0.012	118		
	6	6370	0.018	450	4250	0.016	280	3180	0.015	186	2120	0.014	115		
	8	4780	0.023	440	3180	0.021	270	2390	0.019	181	1590	0.018	112		
	10	3820	0.028	420	2550	0.026	260	1910	0.023	173	1270	0.021	108		
	12	3180	0.031	400	2120	0.029	250	1590	0.026	165	1060	0.024	103		
14	2730	0.035	385	1820	0.033	240	1360	0.029	159	910	0.027	99			
16	2390	0.039	375	1590	0.037	235	1190	0.032	154	800	0.030	97			
20	1910	0.048	365	1270	0.045	225	960	0.039	151	640	0.037	94			
α° max	≤ D5			2°			2°			1°			1°		

	Material Group ISO 513	P1 P2 M1 K1			P3 P4 M2 K2 K3			P5 M3 M4 K4 S1 S4			S2 S3 S5		
	Hardness/Rm	≤ 700 N/mm ²			700-1000 N/mm ²			≤ 35 HRC			≤ 40 HRC		
	α° x ae	15° x D			10° x D			5° x D			5° x D		
	Vc (m/min)	100-120			60-80			45-65			30-40		
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)
	6	5840	0.019	455	3720	0.018	265	2920	0.017	198	1860	0.023	174
	8	4380	0.025	440	2790	0.023	260	2190	0.022	193	1390	0.030	168
	10	3500	0.030	420	2230	0.028	250	1750	0.026	185	1110	0.036	161
	12	2920	0.034	405	1860	0.032	235	1460	0.030	176	930	0.042	154
	14	2500	0.039	390	1590	0.036	225	1250	0.034	170	800	0.047	149
	16	2190	0.043	375	1390	0.040	220	1090	0.038	165	700	0.052	145
	20	1750	0.052	365	1110	0.048	215	880	0.046	162	560	0.063	141

	Material Group ISO 513	P1 P2 M1 K1			P3 P4 M2 K2 K3								
	Hardness/Rm	≤ 700 N/mm ²			700-1000 N/mm ²								
	α° x ae	30° x D			15° x D								
	Vc (m/min)	80-100			45-65								
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)						
	10	2870	0.025	280	1750	0.023	160						
	12	2390	0.028	270	1460	0.026	150						
14	2050	0.032	260	1250	0.029	145							
16	1790	0.035	250	1090	0.032	140							
20	1430	0.043	245	880	0.039	140							

PARAMETERS SUGGESTED WITH HIGH POWER MILLING CHUCK AND STABLE MACHINING CONDITION

HF440

	Material Group ISO 513	P1 P2 M1 K1			P3 P4 M2 K2 K3			P5 M3 M4 K4 S1 S4			S2 S3 S5		
	Hardness/Rm	≤ 700 N/mm ²			700-1000 N/mm ²			≤ 35 HRC			≤ 40 HRC		
	ap x ae	D x 0.4D			D x 0.4D			D x 0.25D			D x 0.25D		
	Vc (m/min)	100-120			60-80			45-65			30-40		
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)
	6	5840	0.024	570	3720	0.022	330	2920	0.018	210	1860	0.017	130
	8	4380	0.032	550	2790	0.028	320	2190	0.024	210	1390	0.022	120
	10	3500	0.038	530	2230	0.034	300	1750	0.028	200	1110	0.026	120
	12	2920	0.043	500	1860	0.039	290	1460	0.032	190	930	0.030	110
	14	2500	0.049	490	1590	0.044	280	1250	0.036	180	800	0.034	110
16	2190	0.054	470	1390	0.049	270	1090	0.041	180	700	0.038	110	
20	1750	0.066	460	1110	0.059	260	880	0.049	170	560	0.046	100	

	Material Group ISO 513	P1 P2 M1 K1			P3 P4 M2 K2 K3			P5 M3 M4 K4 S1 S4			S2 S3 S5		
	Hardness/Rm	≤ 700 N/mm ²			700-1000 N/mm ²			≤ 35 HRC			≤ 40 HRC		
	ap x ae	D x D			D x D			0.5D x D			0.5D x D		
	Vc (m/min)	85-105			55-75			40-60			20-40		
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)
	3	10080	0.006	250	6900	0.006	160	5310	0.005	110	3180	0.007	90
	4	7560	0.008	250	5180	0.007	160	3980	0.007	110	2390	0.009	90
	5	6050	0.010	250	4140	0.009	150	3180	0.008	110	1910	0.011	90
	6	5040	0.012	240	3450	0.011	150	2650	0.010	100	1590	0.013	90
	8	3780	0.016	240	2590	0.014	150	1990	0.013	100	1190	0.017	80
10	3030	0.019	230	2070	0.017	140	1590	0.015	100	960	0.021	80	
12	2520	0.022	220	1730	0.019	130	1330	0.017	90	800	0.024	80	
14	2160	0.024	210	1480	0.022	130	1140	0.019	90	680	0.027	70	
16	1890	0.027	200	1290	0.024	130	1000	0.022	90	600	0.030	70	
20	1510	0.033	200	1040	0.030	120	800	0.026	80	480	0.036	70	
ap x ae	≤ D5	0.5D x D			0.5D x D			0.25D x D			0.25D x D		

- INFO
- TYPHOON TA-HTA-4HTA
- TYPHOON PU-HPU
- TYPHOON SUH
- TYPHOON ALH
- TYPHOON HRC
- TYPHOON SUH MINI
- TYPHOON HL
- C-SD-TA
- LFTA
- SUTA
- HSS-HSS/CO DRILLS
- G2
- MDTA
- HF VH/UP
- MEF
- ALU
- MEX
- UH
- HSS/CO-HSSP END MILLS
- CARBIDE BURRS

PARAMETERS SUGGESTED WITH HIGH POWER MILLING CHUCK AND STABLE MACHINING CONDITION

HF440

TROCHOIDAL	Material Group ISO 513	P1 P2 M1 K1			P3 P4 M2 K2 K3			P5 M3 M4 K4 S1 S4			S2 S3 S5		
	Hardness/Rm	≤ 700 N/mm ²			700-1000 N/mm ²			≤ 35 HRC			≤ 40 HRC		
	ap x ae	2D x 0.2D			2D x 0.1D			1.5D x 0.1D			1.5D x 0.1D		
	Vc (m/min)	160-200			110-130			80-100			50-70		
D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	
3	19110	0,032	2410	12740	0,028	1440	9550	0,025	960	6370	0,035	880	
4	14330	0,042	2390	9550	0,037	1430	7170	0,033	960	4780	0,046	880	
5	11460	0,052	2370	7640	0,047	1420	5730	0,041	950	3820	0,057	870	
6	9550	0,061	2320	6370	0,055	1390	4780	0,049	930	3180	0,067	850	
8	7170	0,079	2260	4780	0,071	1360	3580	0,063	900	2390	0,087	830	
10	5730	0,095	2170	3820	0,085	1300	2870	0,076	870	1910	0,104	790	
12	4780	0,108	2060	3180	0,097	1240	2390	0,086	830	1590	0,119	760	
14	4090	0,122	1990	2730	0,109	1190	2050	0,097	800	1360	0,134	730	
16	3580	0,135	1930	2390	0,122	1160	1790	0,108	770	1190	0,149	710	
20	2870	0,164	1890	1910	0,148	1130	1430	0,131	750	960	0,181	690	

ap x ae	≤ D5	1.5D x 0.1D	1.5D x 0.1D
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NOTES:

Down milling CNC programming is required.

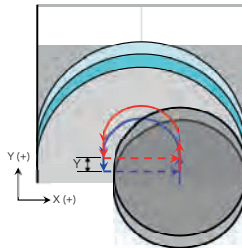
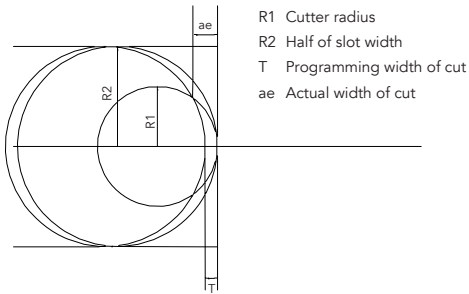
"ae" value max 0.2xD - "T" value max 0.1xD.

The use of end mill with diameter 30-40% smaller than the width of the slot is recommended.

The cutting conditions are based on CNC programming with medium dynamic speed.

With lower CNC dynamic speed, use the same cutting conditions or reduce the cutting speed Vc.

With higher CNC dynamic speed, reduce the "T" value by approximately -30 -50% and apply the maximum available cutting speed Vc.



HF441

	Material Group ISO 513	P1 P2 M1 K1			P3 P4 M2 K2 K3			P5 M3 M4 K4 S1 S4			S2 S3 S5		
	Hardness/Rm	≤ 700 N/mm ²			700-1000 N/mm ²			≤ 35 HRC			≤ 40 HRC		
	ap x ae	D x D			D x D			0.5D x D			0.5D x D		
	Vc (m/min)	110-130			70-90			50-70			30-50		
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)
	3	12740	0.013	640	8490	0.011	390	6370	0.009	240	4250	0.009	150
	4	9550	0.017	640	6370	0.015	380	4780	0.012	240	3180	0.012	150
	5	7640	0.021	630	5100	0.019	380	3820	0.016	240	2550	0.014	150
	6	6370	0.024	620	4250	0.022	370	3180	0.018	230	2120	0.017	140
	8	4780	0.032	600	3180	0.028	360	2390	0.024	230	1590	0.022	140
	10	3820	0.038	580	2550	0.034	350	1910	0.028	220	1270	0.026	130
	12	3180	0.043	550	2120	0.039	330	1590	0.032	210	1060	0.030	130
	14	2730	0.049	530	1820	0.044	320	1360	0.036	200	910	0.034	120
16	2390	0.054	520	1590	0.049	310	1190	0.041	190	800	0.038	120	
18	2120	0.059	500	1420	0.053	300	1060	0.045	190	710	0.042	120	
20	1910	0.066	500	1270	0.059	300	960	0.049	190	640	0.046	120	
ap x ae	≤ D5		0.5D x D		0.5D x D		0.25D x D		0.25D x D		0.25D x D		

	Material Group ISO 513	P1 P2 M1 K1			P3 P4 M2 K2 K3						
	Hardness/Rm	≤ 700 N/mm ²			700-1000 N/mm ²						
	ap x ae	1.5D x D			1.5D x D						
	Vc (m/min)	85-105			55-75						
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)				
	8	3780	0.025	380	2590	0.023	230				
	10	3030	0.030	370	2070	0.027	230				
	12	2520	0.035	350	1730	0.031	220				
14	2160	0.039	340	1480	0.035	210					
16	1890	0.043	330	1290	0.039	200					
18	1680	0.048	320	1150	0.043	200					
20	1510	0.053	320	1040	0.047	200					

	Material Group ISO 513	P1 P2 M1 K1									
	Hardness/Rm	≤ 700 N/mm ²									
	ap x ae	2D x D									
	Vc (m/min)	60-80									
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)							
	10	2230	0.023	200							
	12	1860	0.026	190							
	14	1590	0.029	190							
16	1390	0.032	180								
18	1240	0.036	180								
20	1110	0.039	180								

PARAMETERS SUGGESTED WITH HIGH PRECISION WELDON CHUCK AND STABLE MACHINING CONDITION.
FOR APPLICATION ON HIGH POWER MILLING CHUCK, PLEASE REFER TO HF440 PARAMETERS.

HF441

	Material Group ISO 513	P1 P2 M1 K1				P3 P4 M2 K2 K3			P5 M3 M4 K4 S1 S4				S2 S3 S5		
	Hardness/Rm	≤ 700 N/mm ²				700-1000 N/mm ²			≤ 35 HRC				≤ 40 HRC		
	ap x ae	1.5D x 0.5D				1.5D x 0.5D			1.2D x 0.3D				1.2D x 0.3D		
	Vc (m/min)	130-150				90-110			60-80				40-60		
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)		
	3	14860	0.015	900	10620	0.014	580	7430	0.012	360	5310	0.017	350		
	4	11150	0.020	890	7960	0.018	570	5570	0.016	360	3980	0.022	350		
	5	8920	0.025	890	6370	0.022	570	4460	0.020	350	3180	0.027	350		
	6	7430	0.029	870	5310	0.026	560	3720	0.023	350	2650	0.032	340		
	8	5570	0.038	840	3980	0.034	540	2790	0.030	340	1990	0.042	330		
	10	4460	0.045	810	3180	0.041	520	2230	0.036	320	1590	0.050	320		
	12	3720	0.052	770	2650	0.047	490	1860	0.041	310	1330	0.057	300		
	14	3180	0.058	740	2270	0.052	480	1590	0.047	300	1140	0.064	290		
16	2790	0.065	720	1990	0.058	460	1390	0.052	290	1000	0.071	290			
18	2480	0.071	710	1770	0.064	450	1240	0.057	280	880	0.078	280			
20	2230	0.079	700	1590	0.071	450	1110	0.063	280	800	0.087	280			
ap x ae	≤ D5	1.5D x 0.25D				1.5D x 0.25D			1.2D x 0.1D				1.2D x 0.1D		

	Material Group ISO 513	P1 P2 M1 K1				P3 P4 M2 K2 K3			P5 M3 M4 K4 S1 S4				S2 S3 S5		
	Hardness/Rm	≤ 700 N/mm ²				700-1000 N/mm ²			≤ 35 HRC				≤ 40 HRC		
	α° x ae	5° x 0.4D				4° x 0.4D			3° x 0.4D				3° x 0.4D		
	Vc (m/min)	110-130				70-90			50-70				30-50		
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)		
	3	12740	0.009	470	8490	0.009	290	6370	0.008	193	4250	0.007	120		
	4	9550	0.012	465	6370	0.011	290	4780	0.010	191	3180	0.009	119		
	5	7640	0.015	460	5100	0.014	285	3820	0.012	190	2550	0.012	118		
	6	6370	0.018	450	4250	0.016	280	3180	0.015	186	2120	0.014	115		
	8	4780	0.023	440	3180	0.021	270	2390	0.019	181	1590	0.018	112		
	10	3820	0.028	420	2550	0.026	260	1910	0.023	173	1270	0.021	108		
	12	3180	0.031	400	2120	0.029	250	1590	0.026	165	1060	0.024	103		
	14	2730	0.035	385	1820	0.033	240	1360	0.029	159	910	0.027	99		
16	2390	0.039	375	1590	0.037	235	1190	0.032	154	800	0.030	97			
18	2120	0.043	365	1420	0.040	230	1060	0.036	151	710	0.033	95			
20	1910	0.048	365	1270	0.045	225	960	0.039	151	640	0.037	94			
α° max	≤ D5	2°				2°			1°				1°		

PARAMETERS SUGGESTED WITH HIGH PRECISION WELDON CHUCK AND STABLE MACHINING CONDITION. FOR APPLICATION ON HIGH POWER MILLING CHUCK, PLEASE REFER TO HF440 PARAMETERS.

- INFO
- TYPHOON TA-HTA-4HTA
- TYPHOON PU-HPU
- TYPHOON SUH
- TYPHOON ALH
- TYPHOON HRC
- TYPHOON SUH MINI
- TYPHOON HL
- C-SD-TA
- LFTA
- SUTA
- HSS-HSS/CO DRILLS
- G2
- MDTA
- HF VH/UP
- MEF
- ALU
- MEX
- UH
- HSS/CO-HSSP END MILLS
- CARBIDE BURRS

HF441

	Material Group ISO 513	P1 P2 M1 K1				P3 P4 M2 K2 K3			P5 M3 M4 K4 S1 S4				S2 S3 S5		
	Hardness/Rm	≤ 700 N/mm ²				700-1000 N/mm ²			≤ 35 HRC				≤ 40 HRC		
	α° x ae	15° x D				10° x D			5° x D				5° x D		
	Vc (m/min)	100-120				60-80			45-65				30-40		
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)		
	6	5840	0.019	455	3720	0.018	265	2920	0.017	198	1860	0.023	174		
	8	4380	0.025	440	2790	0.023	260	2190	0.022	193	1390	0.030	168		
	10	3500	0.030	420	2230	0.028	250	1750	0.026	185	1110	0.036	161		
	12	2920	0.034	405	1860	0.032	235	1460	0.030	176	930	0.042	154		
	14	2500	0.039	390	1590	0.036	225	1250	0.034	170	800	0.047	149		
16	2190	0.043	375	1390	0.040	220	1090	0.038	165	700	0.052	145			
18	1950	0.047	370	1240	0.044	215	970	0.042	161	620	0.057	142			
20	1750	0.052	365	1110	0.048	215	880	0.046	162	560	0.063	141			

	Material Group ISO 513	P1 P2 M1 K1				P3 P4 M2 K2 K3							
	Hardness/Rm	≤ 700 N/mm ²				700-1000 N/mm ²							
	α° x ae	30° x D				15° x D							
	Vc (m/min)	85-105				55-75							
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)						
	10	3030	0.025	300	2070	0.023	185						
	12	2520	0.028	285	1730	0.026	180						
	14	2160	0.032	275	1480	0.029	170						
	16	1890	0.035	265	1290	0.032	165						
	18	1680	0.039	260	1150	0.036	165						
20	1510	0.043	260	1040	0.039	165							

	Material Group ISO 513	P1 P2 M1 K1											
	Hardness/Rm	≤ 700 N/mm ²											
	α° x ae	45° x D											
	Vc (m/min)	60-80											
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)									
	10	2230	0.024	220									
	12	1860	0.028	210									
	14	1590	0.031	200									
	16	1390	0.035	195									
	18	1240	0.038	190									
20	1110	0.042	190										

PARAMETERS SUGGESTED WITH HIGH PRECISION WELDON CHUCK AND STABLE MACHINING CONDITION.
FOR APPLICATION ON HIGH POWER MILLING CHUCK, PLEASE REFER TO HF440 PARAMETERS.

HF441

	Material Group ISO 513	P1 P2 M1 K1			P3 P4 M2 K2 K3			P5 M3 M4 K4 S1 S4			S2 S3 S5		
	Hardness/Rm	≤ 700 N/mm ²			700-1000 N/mm ²			≤ 35 HRC			≤ 40 HRC		
	ap x ae	D x 0.4D			D x 0.4D			D x 0.25D			D x 0.25D		
	Vc (m/min)	100-120			60-80			45-65			30-40		
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)
	6	5840	0.024	570	3720	0.022	330	2920	0.018	210	1860	0.017	130
	8	4380	0.032	550	2790	0.028	320	2190	0.024	210	1390	0.022	120
	10	3500	0.038	530	2230	0.034	300	1750	0.028	200	1110	0.026	120
	12	2920	0.043	500	1860	0.039	290	1460	0.032	190	930	0.030	110
	14	2500	0.049	490	1590	0.044	280	1250	0.036	180	800	0.034	110
16	2190	0.054	470	1390	0.049	270	1090	0.041	180	700	0.038	110	
18	1950	0.059	460	1240	0.053	270	970	0.045	170	620	0.042	100	
20	1750	0.066	460	1110	0.059	260	880	0.049	170	560	0.046	100	

	Material Group ISO 513	P1 P2 M1 K1			P3 P4 M2 K2 K3			P5 M3 M4 K4 S1 S4			S2 S3 S5		
	Hardness/Rm	≤ 700 N/mm ²			700-1000 N/mm ²			≤ 35 HRC			≤ 40 HRC		
	ap x ae	D x D			D x D			0.5D x D			0.5D x D		
	Vc (m/min)	85-105			55-75			40-60			20-40		
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)
	3	10080	0.006	250	6900	0.006	160	5310	0.005	110	3180	0.007	90
	4	7560	0.008	250	5180	0.007	160	3980	0.007	110	2390	0.009	90
	5	6050	0.010	250	4140	0.009	150	3180	0.008	110	1910	0.011	90
	6	5040	0.012	240	3450	0.011	150	2650	0.010	100	1590	0.013	90
	8	3780	0.016	240	2590	0.014	150	1990	0.013	100	1190	0.017	80
10	3030	0.019	230	2070	0.017	140	1590	0.015	100	960	0.021	80	
12	2520	0.022	220	1730	0.019	130	1330	0.017	90	800	0.024	80	
14	2160	0.024	210	1480	0.022	130	1140	0.019	90	680	0.027	70	
16	1890	0.027	200	1290	0.024	130	1000	0.022	90	600	0.030	70	
18	1680	0.030	200	1150	0.027	120	880	0.024	80	530	0.033	70	
20	1510	0.033	200	1040	0.030	120	800	0.026	80	480	0.036	70	

ap x ae	≤ D5	0.5D x D	0.5D x D	0.25D x D	0.25D x D
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PARAMETERS SUGGESTED WITH HIGH PRECISION WELDON CHUCK AND STABLE MACHINING CONDITION. FOR APPLICATION ON HIGH POWER MILLING CHUCK, PLEASE REFER TO HF440 PARAMETERS.

- INFO
- TYPHOON TA-HTA-4HTA
- TYPHOON PU-HPU
- TYPHOON SUH
- TYPHOON ALH
- TYPHOON HRC
- TYPHOON SUH MINI
- TYPHOON HL
- C-SD-TA
- LFTA
- SUTA
- HSS-HSS/CO DRILLS
- G2
- MDTA
- HF VH/UP
- MEF
- ALU
- MEX
- UH
- HSS/CO-HSSP END MILLS
- CARBIDE BURRS

HF441

	Material Group ISO 513	P1 P2 M1 K1			P3 P4 M2 K2 K3			P5 M3 M4 K4 S1 S4			S2 S3 S5		
	Hardness/Rm	≤ 700 N/mm ²			700-1000 N/mm ²			≤ 35 HRC			≤ 40 HRC		
	ap x ae	2D x 0.2D			2D x 0.1D			1.5D x 0.1D			1.5D x 0.1D		
	Vc (m/min)	160-200			110-130			80-100			50-70		
D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	
3	19110	0.032	2410	12740	0.028	1440	9550	0.025	960	6370	0.035	880	
4	14330	0.042	2390	9550	0.037	1430	7170	0.033	960	4780	0.046	880	
5	11460	0.052	2370	7640	0.047	1420	5730	0.041	950	3820	0.057	870	
6	9550	0.061	2320	6370	0.055	1390	4780	0.049	930	3180	0.067	850	
8	7170	0.079	2260	4780	0.071	1360	3580	0.063	900	2390	0.087	830	
10	5730	0.095	2170	3820	0.085	1300	2870	0.076	870	1910	0.104	790	
12	4780	0.108	2060	3180	0.097	1240	2390	0.086	830	1590	0.119	760	
14	4090	0.122	1990	2730	0.109	1190	2050	0.097	800	1360	0.134	730	
16	3580	0.135	1930	2390	0.122	1160	1790	0.108	770	1190	0.149	710	
18	3180	0.149	1890	2120	0.134	1130	1590	0.119	760	1060	0.163	690	
20	2870	0.164	1890	1910	0.148	1130	1430	0.131	750	960	0.181	690	

ap x ae	≤ D5	1.5D x 0.1D	1.5D x 0.1D
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NOTES:

Down milling CNC programming is required.

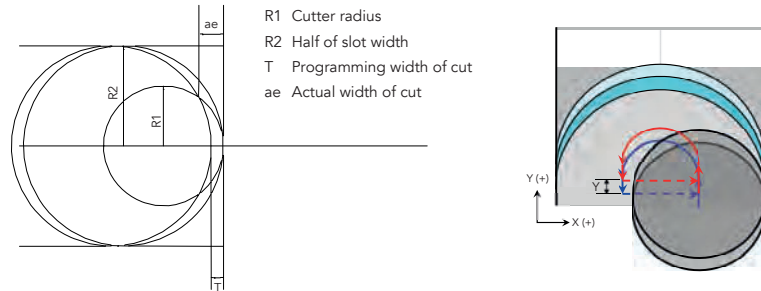
"ae" value max 0.2xD - "T" value max 0.1xD.

The use of end mill with diameter 30-40% smaller than the width of the slot is recommended.

The cutting conditions are based on CNC programming with medium dynamic speed.

With lower CNC dynamic speed, use the same cutting conditions or reduce the cutting speed Vc.

With higher CNC dynamic speed, reduce the "T" value by approximately -30 -50% and apply the maximum available cutting speed Vc.



PARAMETERS SUGGESTED WITH HIGH PRECISION WELDON CHUCK AND STABLE MACHINING CONDITION.
 FOR APPLICATION ON HIGH POWER MILLING CHUCK, PLEASE REFER TO HF440 PARAMETERS.

HF844

	Material Group ISO 513	P1 P2 M1 K1				P3 P4 M2 K2 K3			P5 M3 M4 K4 S1 S4				S2 S3 S5		
	Hardness/Rm	≤ 700 N/mm ²				700-1000 N/mm ²			≤ 35 HRC				≤ 40 HRC		
	ap x ae	D x D				D x D			0.5D x D				0.5D x D		
	Vc (m/min)	110-130				70-90			50-70				30-50		
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)		
	6	6370	0.029	740	4250	0.026	450	3180	0.022	280	2120	0.020	170		
	8	4780	0.038	720	3180	0.034	430	2390	0.028	270	1590	0.026	170		
	10	3820	0.045	690	2550	0.041	420	1910	0.034	260	1270	0.032	160		
	12	3180	0.052	660	2120	0.047	400	1590	0.039	250	1060	0.036	150		
	14	2730	0.058	640	1820	0.052	380	1360	0.044	240	910	0.041	150		
16	2390	0.065	620	1590	0.058	370	1190	0.049	230	800	0.045	150			
18	2120	0.071	600	1420	0.064	360	1060	0.053	230	710	0.050	140			
20	1910	0.079	600	1270	0.071	360	960	0.059	230	640	0.055	140			

	Material Group ISO 513	P1 P2 M1 K1				P3 P4 M2 K2 K3							
	Hardness/Rm	≤ 700 N/mm ²				700-1000 N/mm ²							
	ap x ae	1.5D x D				1.5D x D							
	Vc (m/min)	85-105				55-75							
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)						
	6	5040	0.023	470	3450	0.021	290						
	8	3780	0.030	460	2590	0.027	280						
	10	3030	0.036	440	2070	0.033	270						
	12	2520	0.041	420	1730	0.037	260						
	14	2160	0.047	400	1480	0.042	250						
16	1890	0.052	390	1290	0.047	240							
18	1680	0.057	380	1150	0.051	240							
20	1510	0.063	380	1040	0.057	240							

	Material Group ISO 513	P1 P2 M1 K1				P3 P4 M2 K2 K3			P5 M3 M4 K4 S1 S4				S2 S3 S5		
	Hardness/Rm	≤ 700 N/mm ²				700-1000 N/mm ²			≤ 35 HRC				≤ 40 HRC		
	ap x ae	1.5D x 0.5D				1.5D x 0.5D			1.2D x 0.3D				1.2D x 0.3D		
	Vc (m/min)	130-150				90-110			60-80				40-60		
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)		
	6	7430	0.035	1040	5310	0.031	670	3720	0.028	420	2650	0.038	410		
	8	5570	0.045	1010	3980	0.041	650	2790	0.036	400	1990	0.050	400		
	10	4460	0.054	970	3180	0.049	620	2230	0.044	390	1590	0.060	380		
	12	3720	0.062	930	2650	0.056	590	1860	0.050	370	1330	0.068	360		
	14	3180	0.070	890	2270	0.063	570	1590	0.056	360	1140	0.077	350		
16	2790	0.078	870	1990	0.070	560	1390	0.062	350	1000	0.086	340			
18	2480	0.086	850	1770	0.077	550	1240	0.068	340	880	0.094	330			
20	2230	0.095	840	1590	0.085	540	1110	0.076	340	800	0.104	330			

PARAMETERS SUGGESTED WITH HIGH POWER MILLING CHUCK AND STABLE MACHINING CONDITION

CUTTING PARAMETERS

HF844

	Material Group ISO 513	P1 P2 M1 K1			P3 P4 M2 K2 K3			P5 M3 M4 K4 S1 S4			S2 S3 S5		
	Hardness/Rm	≤ 700 N/mm ²			700-1000 N/mm ²			≤ 35 HRC			≤ 40 HRC		
	α° x ae	8° x 0.4D			6° x 0.4D			4° x 0.4D			3° x 0.4D		
	Vc (m/min)	110-130			70-90			50-70			30-50		
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)
	6	6370	0.020	515	4250	0.019	315	3180	0.016	210	2120	0.016	139
	8	4780	0.026	500	3180	0.024	310	2390	0.021	204	1590	0.021	135
	10	3820	0.031	480	2550	0.029	295	1910	0.026	196	1270	0.025	129
	12	3180	0.036	455	2120	0.033	280	1590	0.029	187	1060	0.029	123
	14	2730	0.040	440	1820	0.037	270	1360	0.033	179	910	0.033	119
16	2390	0.045	430	1590	0.041	265	1190	0.037	174	800	0.036	116	
18	2120	0.049	420	1420	0.046	260	1060	0.040	171	710	0.040	113	
20	1910	0.055	415	1270	0.050	255	960	0.045	171	640	0.044	113	

	Material Group ISO 513	P1 P2 M1 K1			P3 P4 M2 K2 K3			P5 M3 M4 K4 S1 S4			S2 S3 S5		
	Hardness/Rm	≤ 700 N/mm ²			700-1000 N/mm ²			≤ 35 HRC			≤ 40 HRC		
	α° x ae	15° x D			10° x D			5° x D			5° x D		
	Vc (m/min)	100-120			60-80			45-65			30-40		
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)
	6	5840	0.023	545	3720	0.021	320	2920	0.020	238	1860	0.028	209
	8	4380	0.030	530	2790	0.028	310	2190	0.026	231	1390	0.036	202
	10	3500	0.036	505	2230	0.033	295	1750	0.032	222	1110	0.044	194
	12	2920	0.041	485	1860	0.038	285	1460	0.036	212	930	0.050	185
	14	2500	0.047	465	1590	0.043	270	1250	0.041	204	800	0.056	179
16	2190	0.052	455	1390	0.048	265	1090	0.045	197	700	0.062	174	
18	1950	0.057	445	1240	0.052	260	970	0.050	193	620	0.069	170	
20	1750	0.063	440	1110	0.058	255	880	0.055	194	560	0.076	170	

	Material Group ISO 513	P1 P2 M1 K1			P3 P4 M2 K2 K3							
	Hardness/Rm	≤ 700 N/mm ²			700-1000 N/mm ²							
	α° x ae	30° x D			15° x D							
	Vc (m/min)	85-105			45-65							
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)					
	10	3030	0.030	360	1750	0.027	190					
	12	2520	0.034	340	1460	0.031	180					
14	2160	0.038	330	1250	0.035	175						
16	1890	0.042	320	1090	0.039	170						
18	1680	0.046	310	970	0.043	165						
20	1510	0.051	310	880	0.047	165						

PARAMETERS SUGGESTED WITH HIGH POWER MILLING CHUCK AND STABLE MACHINING CONDITION

- INFO
- TYPHOON TA-HTA-4HTA
- TYPHOON PU-HPU
- TYPHOON SUH
- TYPHOON ALH
- TYPHOON HRC
- TYPHOON SUH MINI
- TYPHOON HL
- C-SD-TA
- LFTA
- SUTA
- HSS-HSS/CO DRILLS
- G2
- MDTA
- HF VH/UP
- MEF
- ALU
- MEX
- UH
- HSS/CO-HSSP END MILLS
- CARBIDE BURRS

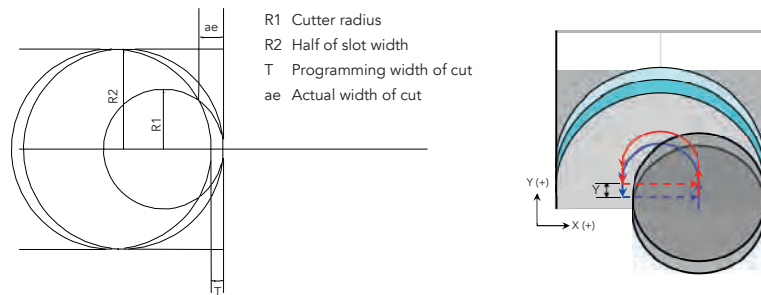
HF844

	Material Group ISO 513	P1 P2 M1 K1				P3 P4 M2 K2 K3			P5 M3 M4 K4 S1 S4				S2 S3 S5		
	Hardness/Rm	≤ 700 N/mm ²				700-1000 N/mm ²			≤ 35 HRC				≤ 40 HRC		
	ap x ae	D x 0.4D				D x 0.4D			D x 0.25D				D x 0.25D		
	Vc (m/min)	100-120				60-80			45-65				30-40		
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)		
	6	5840	0.029	680	3720	0.026	390	2920	0.022	260	1860	0.020	150		
	8	4380	0.038	660	2790	0.034	380	2190	0.028	250	1390	0.026	150		
	10	3500	0.045	640	2230	0.041	360	1750	0.034	240	1110	0.032	140		
	12	2920	0.052	610	1860	0.047	350	1460	0.039	230	930	0.036	130		
	14	2500	0.058	580	1590	0.052	330	1250	0.044	220	800	0.041	130		
16	2190	0.065	570	1390	0.058	320	1090	0.049	210	700	0.045	130			
18	1950	0.071	560	1240	0.064	320	970	0.053	210	620	0.050	120			
20	1750	0.079	550	1110	0.071	320	880	0.059	210	560	0.055	120			

	Material Group ISO 513	P1 P2 M1 K1				P3 P4 M2 K2 K3			P5 M3 M4 K4 S1 S4				S2 S3 S5		
	Hardness/Rm	≤ 700 N/mm ²				700-1000 N/mm ²			≤ 35 HRC				≤ 40 HRC		
	ap x ae	2D x 0.2D				2D x 0.1D			1.5D x 0.1D				1.5D x 0.1D		
	Vc (m/min)	160-200				110-130			80-100				50-70		
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)		
	6	9550	0.073	2780	6370	0.066	1670	4780	0.058	1120	3180	0.080	1020		
	8	7170	0.095	2710	4780	0.085	1630	3580	0.076	1080	2390	0.104	990		
	10	5730	0.113	2600	3820	0.102	1560	2870	0.091	1040	1910	0.125	950		
	12	4780	0.130	2480	3180	0.117	1480	2390	0.104	990	1590	0.143	910		
	14	4090	0.146	2390	2730	0.131	1430	2050	0.117	960	1360	0.160	870		
16	3580	0.162	2320	2390	0.146	1390	1790	0.130	930	1190	0.178	850			
18	3180	0.178	2270	2120	0.160	1360	1590	0.143	910	1060	0.196	830			
20	2870	0.197	2260	1910	0.177	1360	1430	0.158	900	960	0.217	830			

NOTES:

Down milling CNC programming is required.
 "ae" value max 0.2xD - "T" value max 0.1xD.
 The use of end mill with diameter 30-40% smaller than the width of the slot is recommended.
 The cutting conditions are based on CNC programming with medium dynamic speed.
 With lower CNC dynamic speed, use the same cutting conditions or reduce the cutting speed Vc.
 With higher CNC dynamic speed, reduce the "T" value by approximately -30 -50% and apply the maximum available cutting speed Vc.



HF444

	Material Group ISO 513	P1 P2 M1 K1			P3 P4 M2 K2 K3			P5 M3 M4 K4 S1 S4			S2 S3 S5		
	Hardness/Rm	≤ 700 N/mm ²			700-1000 N/mm ²			≤ 35 HRC			≤ 40 HRC		
	ap x ae	D x D			D x D			0.5D x D			0.5D x D		
	Vc (m/min)	110-130			70-90			50-70			30-50		
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)
	6	6370	0.026	670	4250	0.024	400	3180	0.020	250	2120	0.018	160
	8	4780	0.034	650	3180	0.031	390	2390	0.026	240	1590	0.024	150
	10	3820	0.041	620	2550	0.037	370	1910	0.031	230	1270	0.029	150
	12	3180	0.047	590	2120	0.042	360	1590	0.035	220	1060	0.033	140
	14	2730	0.052	570	1820	0.047	340	1360	0.039	210	910	0.037	130
16	2390	0.058	560	1590	0.052	330	1190	0.044	210	800	0.041	130	
20	1910	0.071	540	1270	0.064	320	960	0.053	200	640	0.050	130	

	Material Group ISO 513	P1 P2 M1 K1			P3 P4 M2 K2 K3								
	Hardness/Rm	≤ 700 N/mm ²			700-1000 N/mm ²								
	ap x ae	1.5D x D			1.5D x D								
	Vc (m/min)	85-105			55-75								
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)						
	6	5040	0.021	420	3450	0.019	260						
	8	3780	0.027	410	2590	0.024	250						
	10	3030	0.033	400	2070	0.029	240						
	12	2520	0.037	380	1730	0.034	230						
	14	2160	0.042	360	1480	0.038	220						
16	1890	0.047	350	1290	0.042	220							
20	1510	0.057	340	1040	0.051	210							

	Material Group ISO 513	P1 P2 M1 K1			P3 P4 M2 K2 K3			P5 M3 M4 K4 S1 S4			S2 S3 S5		
	Hardness/Rm	≤ 700 N/mm ²			700-1000 N/mm ²			≤ 35 HRC			≤ 40 HRC		
	ap x ae	1.5D x 0.5D			1.5D x 0.5D			1.2D x 0.3D			1.2D x 0.3D		
	Vc (m/min)	130-150			90-110			60-80			40-60		
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)
	6	7430	0.031	940	5310	0.028	600	3720	0.025	370	2650	0.035	370
	8	5570	0.041	910	3980	0.037	580	2790	0.033	360	1990	0.045	360
	10	4460	0.049	870	3180	0.044	560	2230	0.039	350	1590	0.054	340
	12	3720	0.056	830	2650	0.050	530	1860	0.045	330	1330	0.062	330
	14	3180	0.063	800	2270	0.057	510	1590	0.050	320	1140	0.069	320
16	2790	0.070	780	1990	0.063	500	1390	0.056	310	1000	0.077	310	
20	2230	0.085	760	1590	0.077	490	1110	0.068	300	800	0.094	300	

PARAMETERS SUGGESTED WITH HIGH POWER MILLING CHUCK AND STABLE MACHINING CONDITION

CUTTING PARAMETERS

HF444

	Material Group ISO 513	P1 P2 M1 K1				P3 P4 M2 K2 K3			P5 M3 M4 K4 S1 S4				S2 S3 S5		
	Hardness/Rm	≤ 700 N/mm ²				700-1000 N/mm ²			≤ 35 HRC				≤ 40 HRC		
	α° x ae	7° x 0.4D				5° x 0.4D			3° x 0.4D				3° x 0.4D		
	Vc (m/min)	110-130				70-90			50-70				30-50		
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)		
	6	6370	0.018	470	4250	0.017	290	3180	0.016	200	2120	0.015	125		
	8	4780	0.024	455	3180	0.022	285	2390	0.020	195	1590	0.019	121		
	10	3820	0.029	435	2550	0.027	275	1910	0.025	187	1270	0.023	116		
	12	3180	0.033	415	2120	0.031	260	1590	0.028	178	1060	0.026	111		
	14	2730	0.037	400	1820	0.034	250	1360	0.032	171	910	0.029	107		
16	2390	0.041	390	1590	0.038	245	1190	0.035	167	800	0.033	105			
20	1910	0.050	380	1270	0.046	235	960	0.043	164	640	0.040	102			

	Material Group ISO 513	P1 P2 M1 K1				P3 P4 M2 K2 K3			P5 M3 M4 K4 S1 S4				S2 S3 S5		
	Hardness/Rm	≤ 700 N/mm ²				700-1000 N/mm ²			≤ 35 HRC				≤ 40 HRC		
	α° x ae	15° x D				10° x D			5° x D				5° x D		
	Vc (m/min)	100-120				60-80			45-65				30-40		
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)		
	6	5840	0.021	490	3720	0.019	285	2920	0.018	214	1860	0.025	188		
	8	4380	0.027	475	2790	0.025	280	2190	0.024	208	1390	0.033	182		
	10	3500	0.033	455	2230	0.030	265	1750	0.029	200	1110	0.039	174		
	12	2920	0.037	435	1860	0.034	255	1460	0.033	190	930	0.045	167		
	14	2500	0.042	420	1590	0.039	245	1250	0.037	183	800	0.050	161		
16	2190	0.047	410	1390	0.043	240	1090	0.041	178	700	0.056	157			
20	1750	0.057	395	1110	0.052	230	880	0.050	175	560	0.068	153			

	Material Group ISO 513	P1 P2 M1 K1				P3 P4 M2 K2 K3							
	Hardness/Rm	≤ 700 N/mm ²				700-1000 N/mm ²							
	α° x ae	30° x D				15° x D							
	Vc (m/min)	85-105				45-65							
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)						
	10	3030	0.027	320	1750	0.024	170						
	12	2520	0.030	305	1460	0.028	165						
	14	2160	0.034	295	1250	0.031	155						
16	1890	0.038	285	1090	0.035	150							
20	1510	0.046	280	880	0.042	150							

PARAMETERS SUGGESTED WITH HIGH POWER MILLING CHUCK AND STABLE MACHINING CONDITION

- INFO
- TYPHOON TA-HTA-4HTA
- TYPHOON PU-HPU
- TYPHOON SUH
- TYPHOON ALH
- TYPHOON HRC
- TYPHOON SUH MINI
- TYPHOON HL
- C-SD-TA
- LFTA
- SUTA
- HSS-HSS/CO DRILLS
- G2
- MDTA
- HF-VH/UP
- MEF
- ALU
- MEX
- UH
- HSS/CO-HSSP END MILLS
- CARBIDE BURRS

CUTTING PARAMETERS

HF444

	Material Group ISO 513	P1 P2 M1 K1				P3 P4 M2 K2 K3			P5 M3 M4 K4 S1 S4				S2 S3 S5		
	Hardness/Rm	≤ 700 N/mm ²				700-1000 N/mm ²			≤ 35 HRC				≤ 40 HRC		
	ap x ae	D x 0.4D				D x 0.4D			D x 0.25D				D x 0.25D		
	Vc (m/min)	100-120				60-80			45-65				30-40		
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)		
	6	5840	0.026	610	3720	0.024	350	2920	0.020	230	1860	0.018	140		
	8	4380	0.034	600	2790	0.031	340	2190	0.026	220	1390	0.024	130		
	10	3500	0.041	570	2230	0.037	330	1750	0.031	210	1110	0.029	130		
	12	2920	0.047	540	1860	0.042	310	1460	0.035	200	930	0.033	120		
	14	2500	0.052	520	1590	0.047	300	1250	0.039	200	800	0.037	120		
16	2190	0.058	510	1390	0.052	290	1090	0.044	190	700	0.041	110			
20	1750	0.071	500	1110	0.064	280	880	0.053	190	560	0.050	110			

	Material Group ISO 513	P1 P2 M1 K1				P3 P4 M2 K2 K3			P5 M3 M4 K4 S1 S4				S2 S3 S5		
	Hardness/Rm	≤ 700 N/mm ²				700-1000 N/mm ²			≤ 35 HRC				≤ 40 HRC		
	ap x ae	2D x 0.2D				2D x 0.1D			1.5D x 0.1D				1.5D x 0.1D		
	Vc (m/min)	160-200				110-130			80-100				50-70		
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)		
	6	9550	0.066	2510	6370	0.059	1500	4780	0.052	1000	3180	0.072	920		
	8	7170	0.085	2440	4780	0.077	1460	3580	0.068	970	2390	0.094	890		
	10	5730	0.102	2340	3820	0.092	1400	2870	0.082	940	1910	0.112	860		
	12	4780	0.117	2230	3180	0.105	1340	2390	0.093	890	1590	0.128	820		
	14	4090	0.131	2150	2730	0.118	1290	2050	0.105	860	1360	0.144	790		
16	3580	0.146	2090	2390	0.131	1250	1790	0.117	840	1190	0.160	760			
20	2870	0.177	2040	1910	0.160	1220	1430	0.142	810	960	0.195	750			

NOTES:

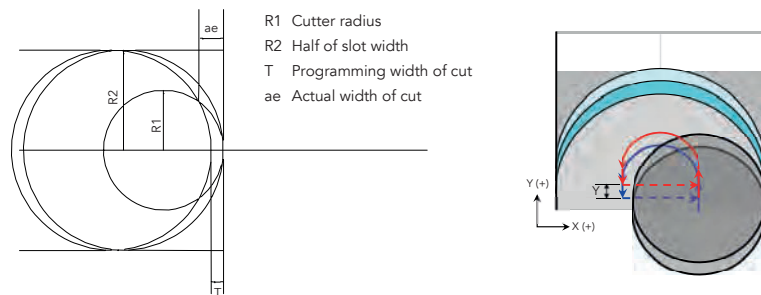
Down milling CNC programming is required.
 "ae" value max 0.2xD - "T" value max 0.1xD.

The use of end mill with diameter 30-40% smaller than the width of the slot is recommended.

The cutting conditions are based on CNC programming with medium dynamic speed.

With lower CNC dynamic speed, use the same cutting conditions or reduce the cutting speed Vc.

With higher CNC dynamic speed, reduce the "T" value by approximately -30 -50% and apply the maximum available cutting speed Vc.



PARAMETERS SUGGESTED WITH HIGH POWER MILLING CHUCK AND STABLE MACHINING CONDITION

HF445

	Material Group ISO 513	P1 P2 M1 K1			P3 P4 M2 K2 K3			P5 M3 M4 K4 S1 S4				S2 S3 S5		
	Hardness/Rm	≤ 700 N/mm ²			700-1000 N/mm ²			≤ 35 HRC				≤ 40 HRC		
	ap x ae	D x D			D x D			0.5D x D				0.5D x D		
	Vc (m/min)	110-130			70-90			50-70				30-50		
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	
	6	6370	0.026	670	4250	0.024	400	3180	0.020	250	2120	0.018	160	
	8	4780	0.034	650	3180	0.031	390	2390	0.026	240	1590	0.024	150	
	10	3820	0.041	620	2550	0.037	370	1910	0.031	230	1270	0.029	150	
	12	3180	0.047	590	2120	0.042	360	1590	0.035	220	1060	0.033	140	
	14	2730	0.052	570	1820	0.047	340	1360	0.039	210	910	0.037	130	
16	2390	0.058	560	1590	0.052	330	1190	0.044	210	800	0.041	130		
20	1910	0.071	540	1270	0.064	320	960	0.053	200	640	0.050	130		

	Material Group ISO 513	P1 P2 M1 K1			P3 P4 M2 K2 K3								
	Hardness/Rm	≤ 700 N/mm ²			700-1000 N/mm ²								
	ap x ae	1.5D x D			1.5D x D								
	Vc (m/min)	85-105			55-75								
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)						
	8	3780	0.027	410	2590	0.024	250						
	10	3030	0.033	400	2070	0.029	240						
	12	2520	0.037	380	1730	0.034	230						
	14	2160	0.042	360	1480	0.038	220						
	16	1890	0.047	350	1290	0.042	220						
20	1510	0.057	340	1040	0.051	210							

	Material Group ISO 513	P1 P2 M1 K1										
	Hardness/Rm	≤ 700 N/mm ²										
	ap x ae	2D x D										
	Vc (m/min)	60-80										
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)								
	6	3720	0.016	230								
	8	2790	0.020	230								
	10	2230	0.024	220								
	12	1860	0.028	210								
	14	1590	0.031	200								
16	1390	0.035	190									
20	1110	0.043	190									

PARAMETERS SUGGESTED WITH HIGH PRECISION WELDON CHUCK AND STABLE MACHINING CONDITION.
FOR APPLICATION ON HIGH POWER MILLING CHUCK, PLEASE REFER TO HF444 PARAMETERS.

CUTTING PARAMETERS

HF445

	Material Group ISO 513	P1 P2 M1 K1				P3 P4 M2 K2 K3			P5 M3 M4 K4 S1 S4				S2 S3 S5		
	Hardness/Rm	≤ 700 N/mm ²				700-1000 N/mm ²			≤ 35 HRC				≤ 40 HRC		
	ap x ae	1.5D x 0.5D				1.5D x 0.5D			1.2D x 0.3D				1.2D x 0.3D		
	Vc (m/min)	130-150				90-110			60-80				40-60		
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)		
	6	7430	0.031	940	5310	0.028	600	3720	0.025	370	2650	0.035	370		
	8	5570	0.041	910	3980	0.037	580	2790	0.033	360	1990	0.045	360		
	10	4460	0.049	870	3180	0.044	560	2230	0.039	350	1590	0.054	340		
	12	3720	0.056	830	2650	0.050	530	1860	0.045	330	1330	0.062	330		
	14	3180	0.063	800	2270	0.057	510	1590	0.050	320	1140	0.069	320		
16	2790	0.070	780	1990	0.063	500	1390	0.056	310	1000	0.077	310			
20	2230	0.085	760	1590	0.077	490	1110	0.068	300	800	0.094	300			

	Material Group ISO 513	P1 P2 M1 K1				P3 P4 M2 K2 K3			P5 M3 M4 K4 S1 S4				S2 S3 S5		
	Hardness/Rm	≤ 700 N/mm ²				700-1000 N/mm ²			≤ 35 HRC				≤ 40 HRC		
	α° x ae	7° x 0.4D				5° x 0.4D			3° x 0.4D				3° x 0.4D		
	Vc (m/min)	110-130				70-90			50-70				30-50		
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)		
	6	6370	0.018	470	4250	0.017	290	3180	0.016	200	2120	0.015	125		
	8	4780	0.024	455	3180	0.022	285	2390	0.020	195	1590	0.019	121		
	10	3820	0.029	435	2550	0.027	275	1910	0.025	187	1270	0.023	116		
	12	3180	0.033	415	2120	0.031	260	1590	0.028	178	1060	0.026	111		
	14	2730	0.037	400	1820	0.034	250	1360	0.032	171	910	0.029	107		
16	2390	0.041	390	1590	0.038	245	1190	0.035	167	800	0.033	105			
20	1910	0.050	380	1270	0.046	235	960	0.043	164	640	0.040	102			

	Material Group ISO 513	P1 P2 M1 K1				P3 P4 M2 K2 K3			P5 M3 M4 K4 S1 S4				S2 S3 S5		
	Hardness/Rm	≤ 700 N/mm ²				700-1000 N/mm ²			≤ 35 HRC				≤ 40 HRC		
	α° x ae	15° x D				10° x D			5° x D				5° x D		
	Vc (m/min)	100-120				60-80			45-65				30-40		
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)		
	8	4380	0.027	475	2790	0.025	280	2190	0.024	208	1390	0.033	182		
	10	3500	0.033	455	2230	0.030	265	1750	0.029	200	1110	0.039	174		
	12	2920	0.037	435	1860	0.034	255	1460	0.033	190	930	0.045	167		
	14	2500	0.042	420	1590	0.039	245	1250	0.037	183	800	0.050	161		
	16	2190	0.047	410	1390	0.043	240	1090	0.041	178	700	0.056	157		
20	1750	0.057	395	1110	0.052	230	880	0.050	175	560	0.068	153			

PARAMETERS SUGGESTED WITH HIGH PRECISION WELDON CHUCK AND STABLE MACHINING CONDITION. FOR APPLICATION ON HIGH POWER MILLING CHUCK, PLEASE REFER TO HF444 PARAMETERS.

- INFO
- TYPHOON TA-HTA-4HTA
- TYPHOON PU-HPU
- TYPHOON SUH
- TYPHOON ALH
- TYPHOON HRC
- TYPHOON SUH MINI
- TYPHOON HL
- C-SD-TA
- LFTA
- SUTA
- HSS-HSS/CO DRILLS
- G2
- MDTA
- HF-VH/UP
- MEF
- ALU
- MEX
- UH
- HSS/CO-HSSP END MILLS
- CARBIDE BURRS

HF445

	Material Group ISO 513	P1 P2 M1 K1			P3 P4 M2 K2 K3			P5 M3 M4 K4 S1 S4				S2 S3 S5		
	Hardness/Rm	≤ 700 N/mm ²			700-1000 N/mm ²			≤ 35 HRC				≤ 40 HRC		
	α° x ae	30° x D			15° x D									
	Vc (m/min)	85-105			45-65									
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)							
	10	3030	0.027	320	1750	0.024	170							
	12	2520	0.030	305	1460	0.028	165							
	14	2160	0.034	295	1250	0.031	155							
16	1890	0.038	285	1090	0.035	150								
20	1510	0.046	280	880	0.042	150								

	Material Group ISO 513	P1 P2 M1 K1										
	Hardness/Rm	≤ 700 N/mm ²										
	α° x ae	45° x D										
	Vc (m/min)	55-75										
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)								
	10	2070	0.026	220								
	12	1730	0.030	210								
	14	1480	0.034	200								
16	1290	0.038	195									
20	1040	0.046	190									

	Material Group ISO 513	P1 P2 M1 K1			P3 P4 M2 K2 K3			P5 M3 M4 K4 S1 S4				S2 S3 S5		
	Hardness/Rm	≤ 700 N/mm ²			700-1000 N/mm ²			≤ 35 HRC				≤ 40 HRC		
	ap x ae	D x 0.4D			D x 0.4D			D x 0.25D				D x 0.25D		
	Vc (m/min)	100-120			60-80			45-65				30-40		
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	
	6	9550	0.066	2510	6370	0.059	1500	4780	0.052	1000	3180	0.072	920	
	8	7170	0.085	2440	4780	0.077	1460	3580	0.068	970	2390	0.094	890	
	10	5730	0.102	2340	3820	0.092	1400	2870	0.082	940	1910	0.112	860	
	12	4780	0.117	2230	3180	0.105	1340	2390	0.093	890	1590	0.128	820	
	14	4090	0.131	2150	2730	0.118	1290	2050	0.105	860	1360	0.144	790	
16	3580	0.146	2090	2390	0.131	1250	1790	0.117	840	1190	0.160	760		
20	2870	0.177	2040	1910	0.160	1220	1430	0.142	810	960	0.195	750		

PARAMETERS SUGGESTED WITH HIGH PRECISION WELDON CHUCK AND STABLE MACHINING CONDITION.
FOR APPLICATION ON HIGH POWER MILLING CHUCK, PLEASE REFER TO HF444 PARAMETERS.

CUTTING PARAMETERS

HF445

	Material Group ISO 513	P1 P2 M1 K1			P3 P4 M2 K2 K3			P5 M3 M4 K4 S1 S4			S2 S3 S5		
	Hardness/Rm	≤ 700 N/mm ²			700-1000 N/mm ²			≤ 35 HRC			≤ 40 HRC		
	ap x ae	2D x 0.2D			2D x 0.1D			1.5D x 0.1D			1.5D x 0.1D		
	Vc (m/min)	160-200			110-130			80-100			50-70		
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)
	6	9550	0,066	2510	6370	0,059	1500	4780	0,052	1000	3180	0,072	920
	8	7170	0,085	2440	4780	0,077	1460	3580	0,068	970	2390	0,094	890
	10	5730	0,102	2340	3820	0,092	1400	2870	0,082	940	1910	0,112	860
	12	4780	0,117	2230	3180	0,105	1340	2390	0,093	890	1590	0,128	820
	14	4090	0,131	2150	2730	0,118	1290	2050	0,105	860	1360	0,144	790
16	3580	0,146	2090	2390	0,131	1250	1790	0,117	840	1190	0,160	760	
20	2870	0,177	2040	1910	0,160	1220	1430	0,142	810	960	0,195	750	

NOTES:

Down milling CNC programming is required.

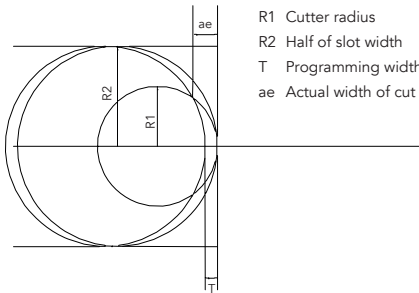
"ae" value max 0.2xD - "T" value max 0.1xD.

The use of end mill with diameter 30-40% smaller than the width of the slot is recommended.

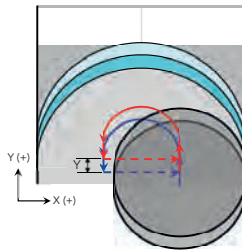
The cutting conditions are based on CNC programming with medium dynamic speed.

With lower CNC dynamic speed, use the same cutting conditions or reduce the cutting speed Vc.

With higher CNC dynamic speed, reduce the "T" value by approximately -30 -50% and apply the maximum available cutting speed Vc.



- R1 Cutter radius
- R2 Half of slot width
- T Programming width of cut
- ae Actual width of cut



PARAMETERS SUGGESTED WITH HIGH PRECISION WELDON CHUCK AND STABLE MACHINING CONDITION. FOR APPLICATION ON HIGH POWER MILLING CHUCK, PLEASE REFER TO HF444 PARAMETERS.

- INFO
- TYPHOON TA-HTA-4HTA
- TYPHOON PU-HPU
- TYPHOON SUH
- TYPHOON ALH
- TYPHOON HRC
- TYPHOON SUH MINI
- TYPHOON HL
- C-SD-TA
- LFTA
- SUTA
- HSS-HSS/CO DRILLS
- G2
- MDTA
- HF VH/UP**
- MEF
- ALU
- MEX
- UH
- HSS/CO-HSSP END MILLS
- CARBIDE BURRS

CUTTING PARAMETERS

HF342

	Material Group ISO 513	P1 P2 M1 K1			P3 P4 M2 K2 K3			P5 M3 M4 K4 S1 S4			S2 S3 S5		
	Hardness/Rm	≤ 700 N/mm ²			700-1000 N/mm ²			≤ 35 HRC			≤ 40 HRC		
	ap x ae	D x D			D x D			0.5D x D			0.5D x D		
	Vc (m/min)	110-130			70-90			50-70			30-50		
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)
	3	14860	0.014	830	9550	0.013	480	7430	0.011	310	4250	0.010	170
	4	11150	0.019	830	7170	0.017	480	5570	0.014	310	3180	0.013	160
	5	8920	0.023	820	5730	0.021	470	4460	0.017	310	2550	0.016	160
	6	7430	0.027	800	4780	0.024	460	3720	0.020	300	2120	0.019	160
	8	5570	0.035	780	3580	0.032	450	2790	0.026	290	1590	0.025	160
10	4460	0.042	750	2870	0.038	430	2230	0.032	280	1270	0.029	150	
12	3720	0.048	710	2390	0.043	410	1860	0.036	270	1060	0.034	140	
ap x ae	≤ D5	0.5D x D			0.5D x D			0.25D x D			0.25D x D		

	Material Group ISO 513	P1 P2 M1 K1			P3 P4 M2 K2 K3			P5 M3 M4 K4 S1 S4			S2 S3 S5		
	Hardness/Rm	≤ 700 N/mm ²			700-1000 N/mm ²			≤ 35 HRC			≤ 40 HRC		
	ap x ae	1.2D x 0.5D			1.2D x 0.5D			D x 0.3D			D x 0.3D		
	Vc (m/min)	160-180			100-120			70-90			40-60		
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)
	3	18050	0.017	1210	11680	0.015	710	8490	0.013	460	5310	0.018	390
	4	13540	0.022	1200	8760	0.020	700	6370	0.018	450	3980	0.024	390
	5	10830	0.028	1200	7010	0.025	700	5100	0.022	450	3180	0.030	390
	6	9020	0.032	1170	5840	0.029	680	4250	0.026	440	2650	0.036	380
	8	6770	0.042	1140	4380	0.038	660	3180	0.034	430	1990	0.046	370
10	5410	0.050	1090	3500	0.045	640	2550	0.040	410	1590	0.055	350	
12	4510	0.058	1040	2920	0.052	610	2120	0.046	390	1330	0.063	340	
ap x ae	≤ D5	1.2D x 0.3D			1.2D x 0.3D			D x 0.2D			D x 0.2D		

	Material Group ISO 513	P1 P2 M1 K1			P3 P4 M2 K2 K3			P5 M3 M4 K4 S1 S4			S2 S3 S5		
	Hardness/Rm	≤ 700 N/mm ²			700-1000 N/mm ²			≤ 35 HRC			≤ 40 HRC		
	α° x ae	5° x 0.4D			4° x 0.4D			3° x 0.4D			3° x 0.4D		
	Vc (m/min)	130-150			80-100			60-80			30-50		
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)
	3	14860	0.010	605	9550	0.010	365	7430	0.008	250	4250	0.008	133
	4	11150	0.013	600	7170	0.013	360	5570	0.011	247	3180	0.010	132
	5	8920	0.017	600	5730	0.016	360	4460	0.014	246	2550	0.013	131
	6	7430	0.020	585	4780	0.018	350	3720	0.016	241	2120	0.015	128
	8	5570	0.025	570	3580	0.024	340	2790	0.021	235	1590	0.020	125
10	4460	0.031	545	2870	0.029	325	2230	0.025	225	1270	0.024	120	
12	3720	0.035	520	2390	0.033	310	1860	0.029	214	1060	0.027	114	
α°	≤ D5	2°			2°			1°			1°		

PARAMETERS SUGGESTED WITH HIGH POWER MILLING CHUCK AND STABLE MACHINING CONDITION

- INFO
- TYPHOON TA-HTA-4HTA
- TYPHOON PU-HPU
- TYPHOON SUH
- TYPHOON ALH
- TYPHOON HRC
- TYPHOON SUH MINI
- TYPHOON HL
- C-SD-TA
- LFTA
- SUTA
- HSS-HSS/CO DRILLS
- G2
- MDTA
- HF VH/UP
- MEF
- ALU
- MEX
- UH
- HSS/CO-HSSP END MILLS
- CARBIDE BURRS

HF342

	Material Group ISO 513	P1 P2 M1 K1			P3 P4 M2 K2 K3			P5 M3 M4 K4 S1 S4			S2 S3 S5		
	Hardness/Rm	≤ 700 N/mm ²			700-1000 N/mm ²			≤ 35 HRC			≤ 40 HRC		
	α° x ae	15° x 0.4D			10° x 0.4D			5° x 0.4D			5° x 0.4D		
	Vc (m/min)	120-140			70-90			55-75			25-45		
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)
	6	6900	0.022	595	4250	0.020	335	3450	0.019	260	1860	0.026	193
	8	5180	0.028	580	3180	0.026	325	2590	0.024	253	1390	0.034	187
10	4140	0.034	555	2550	0.031	315	2070	0.029	243	1110	0.040	179	
12	3450	0.038	530	2120	0.035	300	1730	0.034	232	930	0.046	172	

	Material Group ISO 513	P1 P2 M1 K1			P3 P4 M2 K2 K3			P5 M3 M4 K4 S1 S4			S2 S3 S5		
	Hardness/Rm	≤ 700 N/mm ²			700-1000 N/mm ²			≤ 35 HRC			≤ 40 HRC		
	ap x ae	D x 0.4D			D x 0.4D			D x 0.25D			D x 0.25D		
	Vc (m/min)	120-140			70-90			55-75			25-45		
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)
	6	6900	0.027	750	4250	0.024	410	3450	0.020	280	1860	0.019	140
	8	5180	0.035	730	3180	0.032	400	2590	0.026	270	1390	0.025	140
10	4140	0.042	700	2550	0.038	390	2070	0.032	260	1110	0.029	130	
12	3450	0.048	660	2120	0.043	370	1730	0.036	250	930	0.034	120	

	Material Group ISO 513	P1 P2 M1 K1			P3 P4 M2 K2 K3			P5 M3 M4 K4 S1 S4			S2 S3 S5		
	Hardness/Rm	≤ 700 N/mm ²			700-1000 N/mm ²			≤ 35 HRC			≤ 40 HRC		
	ap x ae	D x D			D x D			0.5D x D			0.5D x D		
	Vc (m/min)	100-120			60-80			45-65			20-40		
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)
	3	11680	0.007	330	7430	0.006	190	5840	0.006	130	3180	0.008	100
	4	8760	0.009	320	5570	0.008	190	4380	0.007	130	2390	0.010	100
5	7010	0.012	320	4460	0.010	180	3500	0.009	130	1910	0.013	100	
6	5840	0.014	320	3720	0.012	180	2920	0.011	130	1590	0.015	90	
8	4380	0.018	310	2790	0.016	180	2190	0.014	120	1190	0.019	90	
10	3500	0.021	290	2230	0.019	170	1750	0.017	120	960	0.023	90	
12	2920	0.024	280	1860	0.022	160	1460	0.019	110	800	0.026	80	
ap x ae	≤ D5	0.5D x D			0.5D x D			0.25D x D			0.25D x D		

PARAMETERS SUGGESTED WITH HIGH POWER MILLING CHUCK AND STABLE MACHINING CONDITION

INFO
TYPHOON TA-HTA-4HTA
TYPHOON PU-HPU
TYPHOON SUH
TYPHOON ALH
TYPHOON HRC
TYPHOON SUH MINI
TYPHOON HL
C-SD-TA
LFTA
SUTA
HSS-HSS/CO DRILLS
G2
MDTA
HF VH/UP
MEF
ALU
MEX
UH
HSS/CO-HSSP END MILLS
CARBIDE BURRS

HF842

	Material Group ISO 513	P1 P2 M1 K1			P3 P4 M2 K2 K3			P5 M3 M4 K4 S1 S4			S2 S3 S5		
	Hardness/Rm	≤ 700 N/mm ²			700-1000 N/mm ²			≤ 35 HRC			≤ 40 HRC		
	ap x ae	D x D			D x D			0.5D x D			0.5D x D		
	Vc (m/min)	130-150			80-100			60-80			30-50		
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)
	4	11150	0.019	830	7170	0.017	480	5570	0.014	310	3180	0.013	160
	5	8920	0.023	820	5730	0.021	470	4460	0.017	310	2550	0.016	160
	6	7430	0.027	800	4780	0.024	460	3720	0.020	300	2120	0.019	160
	8	5570	0.035	780	3580	0.032	450	2790	0.026	290	1590	0.025	160
	10	4460	0.042	750	2870	0.038	430	2230	0.032	280	1270	0.029	150
	12	3720	0.048	710	2390	0.043	410	1860	0.036	270	1060	0.034	140
	14	3180	0.054	690	2050	0.049	400	1590	0.041	260	910	0.038	140
	16	2790	0.060	670	1790	0.054	390	1390	0.045	250	800	0.042	130
18	2480	0.066	650	1590	0.059	380	1240	0.050	250	710	0.046	130	
20	2230	0.073	650	1430	0.066	380	1110	0.055	240	640	0.051	130	
ap x ae	≤ D5	0.5D x D			0.5D x D			0.25D x D			0.25D x D		

	Material Group ISO 513	P1 P2 M1 K1			P3 P4 M2 K2 K3			P5 M3 M4 K4 S1 S4			S2 S3 S5		
	Hardness/Rm	≤ 700 N/mm ²			700-1000 N/mm ²			≤ 35 HRC			≤ 40 HRC		
	ap x ae	1.5D x 0.5D			1.5D x 0.5D			1.2D x 0.3D			1.2D x 0.3D		
	Vc (m/min)	160-180			100-120			70-90			40-60		
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)
	4	13540	0.022	1200	8760	0.020	700	6370	0.018	450	3980	0.024	390
	5	10830	0.028	1200	7010	0.025	700	5100	0.022	450	3180	0.030	390
	6	9020	0.032	1170	5840	0.029	680	4250	0.026	440	2650	0.036	380
	8	6770	0.042	1140	4380	0.038	660	3180	0.034	430	1990	0.046	370
	10	5410	0.050	1090	3500	0.045	640	2550	0.040	410	1590	0.055	350
	12	4510	0.058	1040	2920	0.052	610	2120	0.046	390	1330	0.063	340
	14	3870	0.065	1000	2500	0.058	580	1820	0.052	380	1140	0.071	330
	16	3380	0.072	970	2190	0.065	570	1590	0.058	370	1000	0.079	320
18	3010	0.079	950	1950	0.071	560	1420	0.063	360	880	0.087	310	
20	2710	0.088	950	1750	0.079	550	1270	0.070	360	800	0.096	310	
ap x ae	≤ D5	1.5D x 0.25D			1.5D x 0.25D			1.2D x 0.1D			1.2D x 0.1D		

	Material Group ISO 513	P1 P2 M1 K1			P3 P4 M2 K2 K3			P5 M3 M4 K4 S1 S4			S2 S3 S5		
	Hardness/Rm	≤ 700 N/mm ²			700-1000 N/mm ²			≤ 35 HRC			≤ 40 HRC		
	α° x ae	5° x 0.4D			4° x 0.4D			3° x 0.4D			3° x 0.4D		
	Vc (m/min)	130-150			80-100			60-80			30-50		
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)
	4	11150	0.013	600	7170	0.013	360	5570	0.011	247	3180	0.010	132
	5	8920	0.017	600	5730	0.016	360	4460	0.014	246	2550	0.013	131
	6	7430	0.020	585	4780	0.018	350	3720	0.016	241	2120	0.015	128
	8	5570	0.025	570	3580	0.024	340	2790	0.021	235	1590	0.020	125
	10	4460	0.031	545	2870	0.029	325	2230	0.025	225	1270	0.024	120
	12	3720	0.035	520	2390	0.033	310	1860	0.029	214	1060	0.027	114
	14	3180	0.039	500	2050	0.037	300	1590	0.032	206	910	0.030	110
	16	2790	0.044	490	1790	0.041	290	1390	0.036	200	800	0.034	108
18	2480	0.048	475	1590	0.045	285	1240	0.040	197	710	0.037	105	
20	2230	0.053	475	1430	0.050	285	1110	0.044	195	640	0.041	105	
α° max	≤ D5	2°			2°			1°			1°		

PARAMETERS SUGGESTED WITH HIGH POWER MILLING CHUCK AND STABLE MACHINING CONDITION

CUTTING PARAMETERS

HF842

	Material Group ISO 513	P1 P2 M1 K1			P3 P4 M2 K2 K3			P5 M3 M4 K4 S1 S4			S2 S3 S5		
	Hardness/Rm	≤ 700 N/mm ²			700-1000 N/mm ²			≤ 35 HRC			≤ 40 HRC		
	α° x ae	15° x 0.4D			10° x 0.4D			5° x 0.4D			5° x 0.4D		
	Vc (m/min)	130-150			80-100			60-80			30-50		
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)
	6	7430	0.022	640	4780	0.020	380	3720	0.019	281	2120	0.026	220
	8	5570	0.028	620	3580	0.026	370	2790	0.024	273	1590	0.034	214
	10	4460	0.034	600	2870	0.031	355	2230	0.029	262	1270	0.040	205
	12	3720	0.038	570	2390	0.035	335	1860	0.034	250	1060	0.046	196
	14	3180	0.043	550	2050	0.040	325	1590	0.038	240	910	0.052	189
16	2790	0.048	535	1790	0.044	315	1390	0.042	233	800	0.058	185	
18	2480	0.053	520	1590	0.048	310	1240	0.046	229	710	0.063	180	
20	2230	0.058	520	1430	0.054	305	1110	0.051	227	640	0.070	180	

	Material Group ISO 513	P1 P2 M1 K1			P3 P4 M2 K2 K3			P5 M3 M4 K4 S1 S4			S2 S3 S5		
	Hardness/Rm	≤ 700 N/mm ²			700-1000 N/mm ²			≤ 35 HRC			≤ 40 HRC		
	ap x ae	D x 0.4D			D x 0.4D			D x 0.25D			D x 0.25D		
	Vc (m/min)	130-150			80-100			60-80			30-50		
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)
	6	7430	0.027	800	4780	0.024	460	3720	0.020	300	2120	0.019	160
	8	5570	0.035	780	3580	0.032	450	2790	0.026	290	1590	0.025	160
	10	4460	0.042	750	2870	0.038	430	2230	0.032	280	1270	0.029	150
	12	3720	0.048	710	2390	0.043	410	1860	0.036	270	1060	0.034	140
	14	3180	0.054	690	2050	0.049	400	1590	0.041	260	910	0.038	140
16	2790	0.060	670	1790	0.054	390	1390	0.045	250	800	0.042	130	
18	2480	0.066	650	1590	0.059	380	1240	0.050	250	710	0.046	130	
20	2230	0.073	650	1430	0.066	380	1110	0.055	240	640	0.051	130	

	Material Group ISO 513	P1 P2 M1 K1			P3 P4 M2 K2 K3			P5 M3 M4 K4 S1 S4			S2 S3 S5		
	Hardness/Rm	≤ 700 N/mm ²			700-1000 N/mm ²			≤ 35 HRC			≤ 40 HRC		
	ap x ae	D x D			D x D			0.5D x D			0.5D x D		
	Vc (m/min)	100-120			60-80			45-65			20-40		
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)
	4	8760	0.009	320	5570	0.008	190	4380	0.007	130	2390	0.010	100
	5	7010	0.012	320	4460	0.010	180	3500	0.009	130	1910	0.013	100
	6	5840	0.014	320	3720	0.012	180	2920	0.011	130	1590	0.015	90
	8	4380	0.018	310	2790	0.016	180	2190	0.014	120	1190	0.019	90
	10	3500	0.021	290	2230	0.019	170	1750	0.017	120	960	0.023	90
12	2920	0.024	280	1860	0.022	160	1460	0.019	110	800	0.026	80	
14	2500	0.027	270	1590	0.024	150	1250	0.022	110	680	0.030	80	
16	2190	0.030	260	1390	0.027	150	1090	0.024	100	600	0.033	80	
18	1950	0.033	260	1240	0.030	150	970	0.026	100	530	0.036	80	
20	1750	0.037	260	1110	0.033	150	880	0.029	100	480	0.040	80	
ap x ae	≤ D5	0.5D x D			0.5D x D			0.25D x D			0.25D x D		

PARAMETERS SUGGESTED WITH HIGH POWER MILLING CHUCK AND STABLE MACHINING CONDITION

- INFO
- TYPHOON TA-HTA-4HTA
- TYPHOON PU-HPU
- TYPHOON SUH
- TYPHOON ALH
- TYPHOON HRC
- TYPHOON SUH MINI
- TYPHOON HL
- C-SD-TA
- LFTA
- SUTA
- HSS-HSS/CO DRILLS
- G2
- MDTA
- HF VH/UP
- MEF
- ALU
- MEX
- UH
- HSS/CO-HSSP END MILLS
- CARBIDE BURRS

HF842

	Material Group ISO 513	P1 P2 M1 K1			P3 P4 M2 K2 K3			P5 M3 M4 K4 S1 S4			S2 S3 S5		
	Hardness/Rm	≤ 700 N/mm ²			700-1000 N/mm ²			≤ 35 HRC			≤ 40 HRC		
	ap x ae	2D x 0.2D			2D x 0.1D			1.5D x 0.1D			1.5D x 0.1D		
	Vc (m/min)	190-230			130-150			100-120			50-70		
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)
	4	16720	0.046	3090	11150	0.042	1860	8760	0.037	1300	4780	0.051	970
	5	13380	0.058	3080	8920	0.052	1850	7010	0.046	1290	3820	0.063	970
	6	11150	0.068	3010	7430	0.061	1810	5840	0.054	1260	3180	0.074	940
	8	8360	0.088	2930	5570	0.079	1750	4380	0.070	1230	2390	0.096	920
	10	6690	0.105	2810	4460	0.095	1690	3500	0.084	1180	1910	0.116	880
	12	5570	0.120	2670	3720	0.108	1610	2920	0.096	1120	1590	0.132	840
	14	4780	0.135	2580	3180	0.122	1550	2500	0.108	1080	1360	0.149	810
	16	4180	0.150	2510	2790	0.135	1510	2190	0.120	1050	1190	0.165	790
18	3720	0.165	2460	2480	0.149	1470	1950	0.132	1030	1060	0.182	770	
20	3340	0.183	2440	2230	0.164	1470	1750	0.146	1020	960	0.201	770	
ap x ae	≤ D5	1.5D x 0.1D			1.5D x 0.1D								

NOTES:

Down milling CNC programming is required.

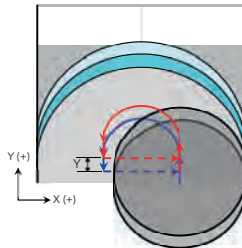
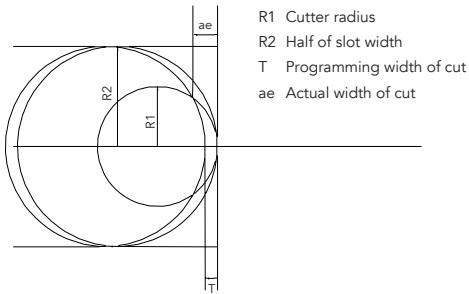
"ae" value max 0.2xD - "T" value max 0.1xD.

The use of end mill with diameter 30-40% smaller than the width of the slot is recommended.

The cutting conditions are based on CNC programming with medium dynamic speed.

With lower CNC dynamic speed, use the same cutting conditions or reduce the cutting speed Vc.

With higher CNC dynamic speed, reduce the "T" value by approximately -30 -50% and apply the maximum available cutting speed Vc.



CUTTING PARAMETERS

HF442

	Material Group ISO 513	P1 P2 M1 K1			P3 P4 M2 K2 K3			P5 M3 M4 K4 S1 S4			S2 S3 S5		
	Hardness/Rm	≤ 700 N/mm ²			700-1000 N/mm ²			≤ 35 HRC			≤ 40 HRC		
	ap x ae	D x D			D x D			0.5D x D			0.5D x D		
	Vc (m/min)	110-130			70-90			50-70			30-50		
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)
	3	12740	0.013	640	8490	0.011	390	6370	0.009	240	4250	0.009	150
	4	9550	0.017	640	6370	0.015	380	4780	0.012	240	3180	0.012	150
	5	7640	0.021	630	5100	0.019	380	3820	0.016	240	2550	0.014	150
	6	6370	0.024	620	4250	0.022	370	3180	0.018	230	2120	0.017	140
	8	4780	0.032	600	3180	0.028	360	2390	0.024	230	1590	0.022	140
	10	3820	0.038	580	2550	0.034	350	1910	0.028	220	1270	0.026	130
	12	3180	0.043	550	2120	0.039	330	1590	0.032	210	1060	0.030	130
14	2730	0.049	530	1820	0.044	320	1360	0.036	200	910	0.034	120	
16	2390	0.054	520	1590	0.049	310	1190	0.041	190	800	0.038	120	
20	1910	0.066	500	1270	0.059	300	960	0.049	190	640	0.046	120	
ap x ae	≤ D5	0.5D x D			0.5D x D			0.25D x D			0.25D x D		

	Material Group ISO 513	P1 P2 M1 K1			P3 P4 M2 K2 K3							
	Hardness/Rm	≤ 700 N/mm ²			700-1000 N/mm ²							
	ap x ae	1.5D x D			1.5D x D							
	Vc (m/min)	85-105			55-75							
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)					
	8	3780	0.025	380	2590	0.023	230					
	10	3030	0.030	370	2070	0.027	230					
12	2520	0.035	350	1730	0.031	220						
14	2160	0.039	340	1480	0.035	210						
16	1890	0.043	330	1290	0.039	200						
20	1510	0.053	320	1040	0.047	200						

	Material Group ISO 513	P1 P2 M1 K1			P3 P4 M2 K2 K3			P5 M3 M4 K4 S1 S4			S2 S3 S5		
	Hardness/Rm	≤ 700 N/mm ²			700-1000 N/mm ²			≤ 35 HRC			≤ 40 HRC		
	ap x ae	1.5D x 0.5D			1.5D x 0.5D			1.2D x 0.3D			1.2D x 0.3D		
	Vc (m/min)	130-150			90-110			60-80			40-60		
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)
	3	14860	0.015	900	10620	0.014	580	7430	0.012	360	5310	0.017	350
	4	11150	0.020	890	7960	0.018	570	5570	0.016	360	3980	0.022	350
	5	8920	0.025	890	6370	0.022	570	4460	0.020	350	3180	0.027	350
	6	7430	0.029	870	5310	0.026	560	3720	0.023	350	2650	0.032	340
	8	5570	0.038	840	3980	0.034	540	2790	0.030	340	1990	0.042	330
	10	4460	0.045	810	3180	0.041	520	2230	0.036	320	1590	0.050	320
	12	3720	0.052	770	2650	0.047	490	1860	0.041	310	1330	0.057	300
14	3180	0.058	740	2270	0.052	480	1590	0.047	300	1140	0.064	290	
16	2790	0.065	720	1990	0.058	460	1390	0.052	290	1000	0.071	290	
20	2230	0.079	700	1590	0.071	450	1110	0.063	280	800	0.087	280	
ap x ae	≤ D5	1.5D x 0.25D			1.5D x 0.25D			1.2D x 0.1D			1.2D x 0.1D		

PARAMETERS SUGGESTED WITH HIGH POWER MILLING CHUCK AND STABLE MACHINING CONDITION

CUTTING PARAMETERS

HF442

	Material Group ISO 513	P1 P2 M1 K1			P3 P4 M2 K2 K3			P5 M3 M4 K4 S1 S4			S2 S3 S5		
	Hardness/Rm	≤ 700 N/mm ²			700-1000 N/mm ²			≤ 35 HRC			≤ 40 HRC		
	α° x ae	5° x 0.4D			4° x 0.4D			3° x 0.4D			3° x 0.4D		
	Vc (m/min)	110-130			70-90			50-70			30-50		
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)
	3	12740	0.009	470	8490	0.009	290	6370	0.008	193	4250	0.007	120
	4	9550	0.012	465	6370	0.011	290	4780	0.010	191	3180	0.009	119
	5	7640	0.015	460	5100	0.014	285	3820	0.012	190	2550	0.012	118
	6	6370	0.018	450	4250	0.016	280	3180	0.015	186	2120	0.014	115
	8	4780	0.023	440	3180	0.021	270	2390	0.019	181	1590	0.018	112
10	3820	0.028	420	2550	0.026	260	1910	0.023	173	1270	0.021	108	
12	3180	0.031	400	2120	0.029	250	1590	0.026	165	1060	0.024	103	
14	2730	0.035	385	1820	0.033	240	1360	0.029	159	910	0.027	99	
16	2390	0.039	375	1590	0.037	235	1190	0.032	154	800	0.030	97	
20	1910	0.048	365	1270	0.045	225	960	0.039	151	640	0.037	94	
α° max	≤ D5	2°			2°			1°			1°		

	Material Group ISO 513	P1 P2 M1 K1			P3 P4 M2 K2 K3			P5 M3 M4 K4 S1 S4			S2 S3 S5		
	Hardness/Rm	≤ 700 N/mm ²			700-1000 N/mm ²			≤ 35 HRC			≤ 40 HRC		
	α° x ae	15° x D			10° x D			5° x D			5° x D		
	Vc (m/min)	100-120			60-80			45-65			30-40		
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)
	6	5840	0.019	455	3720	0.018	265	2920	0.017	198	1860	0.023	174
	8	4380	0.025	440	2790	0.023	260	2190	0.022	193	1390	0.030	168
	10	3500	0.030	420	2230	0.028	250	1750	0.026	185	1110	0.036	161
	12	2920	0.034	405	1860	0.032	235	1460	0.030	176	930	0.042	154
	14	2500	0.039	390	1590	0.036	225	1250	0.034	170	800	0.047	149
16	2190	0.043	375	1390	0.040	220	1090	0.038	165	700	0.052	145	
20	1750	0.052	365	1110	0.048	215	880	0.046	162	560	0.063	141	

	Material Group ISO 513	P1 P2 M1 K1			P3 P4 M2 K2 K3								
	Hardness/Rm	≤ 700 N/mm ²			700-1000 N/mm ²								
	α° x ae	30° x D			15° x D								
	Vc (m/min)	80-100			45-65								
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)						
	10	2870	0.025	280	1750	0.023	160						
12	2390	0.028	270	1460	0.026	150							
14	2050	0.032	260	1250	0.029	145							
16	1790	0.035	250	1090	0.032	140							
20	1430	0.043	245	880	0.039	140							

- INFO
- TYPHOON TA-HTA-4HTA
- TYPHOON PU-HPU
- TYPHOON SUH
- TYPHOON ALH
- TYPHOON HRC
- TYPHOON SUH MINI
- TYPHOON HL
- C-SD-TA
- LFTA
- SUTA
- HSS-HSS/CO DRILLS
- G2
- MDTA
- HF VH/UP
- MEF
- ALU
- MEX
- UH
- HSS/CO-HSSP END MILLS
- CARBIDE BURRS

PARAMETERS SUGGESTED WITH HIGH POWER MILLING CHUCK AND STABLE MACHINING CONDITION

HF442

	Material Group ISO 513	P1 P2 M1 K1			P3 P4 M2 K2 K3			P5 M3 M4 K4 S1 S4			S2 S3 S5		
	Hardness/Rm	≤ 700 N/mm ²			700-1000 N/mm ²			≤ 35 HRC			≤ 40 HRC		
	ap x ae	D x 0.4D			D x 0.4D			D x 0.25D			D x 0.25D		
	Vc (m/min)	100-120			60-80			45-65			30-40		
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)
	6	5840	0.024	570	3720	0.022	330	2920	0.018	210	1860	0.017	130
	8	4380	0.032	550	2790	0.028	320	2190	0.024	210	1390	0.022	120
	10	3500	0.038	530	2230	0.034	300	1750	0.028	200	1110	0.026	120
	12	2920	0.043	500	1860	0.039	290	1460	0.032	190	930	0.030	110
	14	2500	0.049	490	1590	0.044	280	1250	0.036	180	800	0.034	110
16	2190	0.054	470	1390	0.049	270	1090	0.041	180	700	0.038	110	
20	1750	0.066	460	1110	0.059	260	880	0.049	170	560	0.046	100	

	Material Group ISO 513	P1 P2 M1 K1			P3 P4 M2 K2 K3			P5 M3 M4 K4 S1 S4			S2 S3 S5		
	Hardness/Rm	≤ 700 N/mm ²			700-1000 N/mm ²			≤ 35 HRC			≤ 40 HRC		
	ap x ae	D x D			D x D			0.5D x D			0.5D x D		
	Vc (m/min)	85-105			55-75			40-60			20-40		
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)
	3	10080	0.006	250	6900	0.006	160	5310	0.005	110	3180	0.007	90
	4	7560	0.008	250	5180	0.007	160	3980	0.007	110	2390	0.009	90
	5	6050	0.010	250	4140	0.009	150	3180	0.008	110	1910	0.011	90
	6	5040	0.012	240	3450	0.011	150	2650	0.010	100	1590	0.013	90
	8	3780	0.016	240	2590	0.014	150	1990	0.013	100	1190	0.017	80
10	3030	0.019	230	2070	0.017	140	1590	0.015	100	960	0.021	80	
12	2520	0.022	220	1730	0.019	130	1330	0.017	90	800	0.024	80	
14	2160	0.024	210	1480	0.022	130	1140	0.019	90	680	0.027	70	
16	1890	0.027	200	1290	0.024	130	1000	0.022	90	600	0.030	70	
20	1510	0.033	200	1040	0.030	120	800	0.026	80	480	0.036	70	
ap x ae	≤ D5	0.5D x D			0.5D x D			0.25D x D			0.25D x D		

PARAMETERS SUGGESTED WITH HIGH POWER MILLING CHUCK AND STABLE MACHINING CONDITION

CUTTING PARAMETERS

HF442

	Material Group ISO 513	P1 P2 M1 K1			P3 P4 M2 K2 K3			P5 M3 M4 K4 S1 S4			S2 S3 S5		
	Hardness/Rm	≤ 700 N/mm ²			700-1000 N/mm ²			≤ 35 HRC			≤ 40 HRC		
	ap x ae	2D x 0.2D			2D x 0.1D			1.5D x 0.1D			1.5D x 0.1D		
	Vc (m/min)	160-200			110-130			80-100			50-70		
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)
	3	19110	0.032	2410	12740	0.028	1440	9550	0.025	960	6370	0.035	880
	4	14330	0.042	2390	9550	0.037	1430	7170	0.033	960	4780	0.046	880
	5	11460	0.052	2370	7640	0.047	1420	5730	0.041	950	3820	0.057	870
	6	9550	0.061	2320	6370	0.055	1390	4780	0.049	930	3180	0.067	850
	8	7170	0.079	2260	4780	0.071	1360	3580	0.063	900	2390	0.087	830
10	5730	0.095	2170	3820	0.085	1300	2870	0.076	870	1910	0.104	790	
12	4780	0.108	2060	3180	0.097	1240	2390	0.086	830	1590	0.119	760	
14	4090	0.122	1990	2730	0.109	1190	2050	0.097	800	1360	0.134	730	
16	3580	0.135	1930	2390	0.122	1160	1790	0.108	770	1190	0.149	710	
20	2870	0.164	1890	1910	0.148	1130	1430	0.131	750	960	0.181	690	
ap x ae	≤ D5	1.5D x 0.1D			1.5D x 0.1D								

NOTES:

Down milling CNC programming is required.

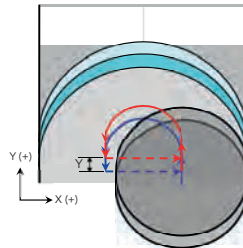
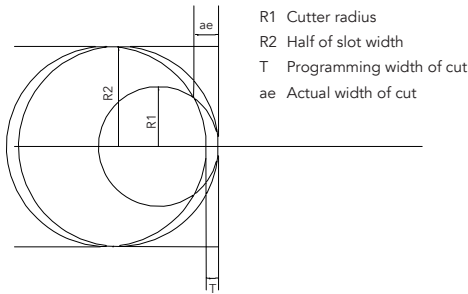
"ae" value max 0.2xD - "T" value max 0.1xD.

The use of end mill with diameter 30-40% smaller than the width of the slot is recommended.

The cutting conditions are based on CNC programming with medium dynamic speed.

With lower CNC dynamic speed, use the same cutting conditions or reduce the cutting speed Vc.

With higher CNC dynamic speed, reduce the "T" value by approximately -30 -50% and apply the maximum available cutting speed Vc.



INFO
TYPHOON TA-HTA-4HTA
TYPHOON PU-HPU
TYPHOON SUH
TYPHOON ALH
TYPHOON HRC
TYPHOON SUH MINI
TYPHOON HL
C-SD-TA
LFTA
SUTA
HSS-HSS/CO DRILLS
G2
MDTA
HF VH/UP
MEF
ALU
MEX
UH
HSS/CO-HSSP END MILLS
CARBIDE BURRS

PARAMETERS SUGGESTED WITH HIGH POWER MILLING CHUCK AND STABLE MACHINING CONDITION

CUTTING PARAMETERS

HF443

	Material Group ISO 513	P1 P2 M1 K1			P3 P4 M2 K2 K3			P5 M3 M4 K4 S1 S4			S2 S3 S5		
	Hardness/Rm	≤ 700 N/mm ²			700-1000 N/mm ²			≤ 35 HRC			≤ 40 HRC		
	ap x ae	D x D			D x D			0.5D x D			0.5D x D		
	Vc (m/min)	110-130			70-90			50-70			30-50		
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)
	3	12740	0.013	640	8490	0.011	390	6370	0.009	240	4250	0.009	150
	4	9550	0.017	640	6370	0.015	380	4780	0.012	240	3180	0.012	150
	5	7640	0.021	630	5100	0.019	380	3820	0.016	240	2550	0.014	150
	6	6370	0.024	620	4250	0.022	370	3180	0.018	230	2120	0.017	140
	8	4780	0.032	600	3180	0.028	360	2390	0.024	230	1590	0.022	140
10	3820	0.038	580	2550	0.034	350	1910	0.028	220	1270	0.026	130	
12	3180	0.043	550	2120	0.039	330	1590	0.032	210	1060	0.030	130	
14	2730	0.049	530	1820	0.044	320	1360	0.036	200	910	0.034	120	
16	2390	0.054	520	1590	0.049	310	1190	0.041	190	800	0.038	120	
20	1910	0.066	500	1270	0.059	300	960	0.049	190	640	0.046	120	
ap x ae	≤ D5	0.5D x D			0.5D x D			0.25D x D			0.25D x D		

	Material Group ISO 513	P1 P2 M1 K1			P3 P4 M2 K2 K3							
	Hardness/Rm	≤ 700 N/mm ²			700-1000 N/mm ²							
	ap x ae	1.5D x D			1.5D x D							
	Vc (m/min)	85-105			55-75							
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)					
	8	3780	0.025	380	2590	0.023	230					
	10	3030	0.030	370	2070	0.027	230					
	12	2520	0.035	350	1730	0.031	220					
	14	2160	0.039	340	1480	0.035	210					
	16	1890	0.043	330	1290	0.039	200					
20	1510	0.053	320	1040	0.047	200						

	Material Group ISO 513	P1 P2 M1 K1										
	Hardness/Rm	≤ 700 N/mm ²										
	ap x ae	2D x D										
	Vc (m/min)	60-80										
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)								
	10	2230	0.023	200								
	12	1860	0.026	190								
	14	1590	0.029	190								
	16	1390	0.032	180								
	20	1110	0.039	180								

PARAMETERS SUGGESTED WITH HIGH PRECISION WELDON CHUCK AND STABLE MACHINING CONDITION. FOR APPLICATION ON HIGH POWER MILLING CHUCK, PLEASE REFER TO HF442 PARAMETERS.

- INFO
- TYPHOON TA-HTA-4HTA
- TYPHOON PU-HPU
- TYPHOON SUH
- TYPHOON ALH
- TYPHOON HRC
- TYPHOON SUH MINI
- TYPHOON HL
- C-SD-TA
- LFTA
- SUTA
- HSS-HSS/CO DRILLS
- G2
- MDTA
- HF VH/UP
- MEF
- ALU
- MEX
- UH
- HSS/CO-HSSP END MILLS
- CARBIDE BURRS

CUTTING PARAMETERS

HF443

	Material Group ISO 513	P1 P2 M1 K1				P3 P4 M2 K2 K3			P5 M3 M4 K4 S1 S4				S2 S3 S5		
	Hardness/Rm	≤ 700 N/mm ²				700-1000 N/mm ²			≤ 35 HRC				≤ 40 HRC		
	ap x ae	1.5D x 0.5D				1.5D x 0.5D			1.2D x 0.3D				1.2D x 0.3D		
	Vc (m/min)	130-150				90-110			60-80				40-60		
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)		
	3	14860	0.015	900	10620	0.014	580	7430	0.012	360	5310	0.017	350		
	4	11150	0.020	890	7960	0.018	570	5570	0.016	360	3980	0.022	350		
	5	8920	0.025	890	6370	0.022	570	4460	0.020	350	3180	0.027	350		
	6	7430	0.029	870	5310	0.026	560	3720	0.023	350	2650	0.032	340		
	8	5570	0.038	840	3980	0.034	540	2790	0.030	340	1990	0.042	330		
	10	4460	0.045	810	3180	0.041	520	2230	0.036	320	1590	0.050	320		
	12	3720	0.052	770	2650	0.047	490	1860	0.041	310	1330	0.057	300		
	14	3180	0.058	740	2270	0.052	480	1590	0.047	300	1140	0.064	290		
16	2790	0.065	720	1990	0.058	460	1390	0.052	290	1000	0.071	290			
20	2230	0.079	700	1590	0.071	450	1110	0.063	280	800	0.087	280			
ap x ae	≤ D5		1.5D x 0.25D		1.5D x 0.25D		1.2D x 0.1D		1.2D x 0.1D		1.2D x 0.1D				

	Material Group ISO 513	P1 P2 M1 K1				P3 P4 M2 K2 K3			P5 M3 M4 K4 S1 S4				S2 S3 S5		
	Hardness/Rm	≤ 700 N/mm ²				700-1000 N/mm ²			≤ 35 HRC				≤ 40 HRC		
	α° x ae	5° x 0.4D				4° x 0.4D			3° x 0.4D				3° x 0.4D		
	Vc (m/min)	110-130				70-90			50-70				30-50		
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)		
	3	12740	0.009	470	8490	0.009	290	6370	0.008	193	4250	0.007	120		
	4	9550	0.012	465	6370	0.011	290	4780	0.010	191	3180	0.009	119		
	5	7640	0.015	460	5100	0.014	285	3820	0.012	190	2550	0.012	118		
	6	6370	0.018	450	4250	0.016	280	3180	0.015	186	2120	0.014	115		
	8	4780	0.023	440	3180	0.021	270	2390	0.019	181	1590	0.018	112		
	10	3820	0.028	420	2550	0.026	260	1910	0.023	173	1270	0.021	108		
	12	3180	0.031	400	2120	0.029	250	1590	0.026	165	1060	0.024	103		
	14	2730	0.035	385	1820	0.033	240	1360	0.029	159	910	0.027	99		
16	2390	0.039	375	1590	0.037	235	1190	0.032	154	800	0.030	97			
20	1910	0.048	365	1270	0.045	225	960	0.039	151	640	0.037	94			
α° max	≤ D5		2°		2°		1°		1°		1°				

	Material Group ISO 513	P1 P2 M1 K1				P3 P4 M2 K2 K3			P5 M3 M4 K4 S1 S4				S2 S3 S5		
	Hardness/Rm	≤ 700 N/mm ²				700-1000 N/mm ²			≤ 35 HRC				≤ 40 HRC		
	α° x ae	15° x D				10° x D			5° x D				5° x D		
	Vc (m/min)	100-120				60-80			45-65				30-40		
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)		
	6	5840	0.019	455	3720	0.018	265	2920	0.017	198	1860	0.023	174		
	8	4380	0.025	440	2790	0.023	260	2190	0.022	193	1390	0.030	168		
	10	3500	0.030	420	2230	0.028	250	1750	0.026	185	1110	0.036	161		
	12	2920	0.034	405	1860	0.032	235	1460	0.030	176	930	0.042	154		
	14	2500	0.039	390	1590	0.036	225	1250	0.034	170	800	0.047	149		
	16	2190	0.043	375	1390	0.040	220	1090	0.038	165	700	0.052	145		
	20	1750	0.052	365	1110	0.048	215	880	0.046	162	560	0.063	141		

PARAMETERS SUGGESTED WITH HIGH PRECISION WELDON CHUCK AND STABLE MACHINING CONDITION.
FOR APPLICATION ON HIGH POWER MILLING CHUCK, PLEASE REFER TO HF442 PARAMETERS.

CUTTING PARAMETERS

HF443

	Material Group ISO 513	P1 P2 M1 K1			P3 P4 M2 K2 K3			P5 M3 M4 K4 S1 S4				S2 S3 S5		
	Hardness/Rm	≤ 700 N/mm ²			700-1000 N/mm ²			≤ 35 HRC				≤ 40 HRC		
	α° x ae	30° x D			15° x D									
	Vc (m/min)	85-105			55-75									
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)							
	10	3030	0.025	300	2070	0.023	185							
	12	2520	0.028	285	1730	0.026	180							
14	2160	0.032	275	1480	0.029	170								
16	1890	0.035	265	1290	0.032	165								
20	1510	0.043	260	1040	0.039	165								

	Material Group ISO 513	P1 P2 M1 K1												
	Hardness/Rm	≤ 700 N/mm ²												
	α° x ae	45° x D												
	Vc (m/min)	60-80												
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)										
	10	2230	0.024	220										
	12	1860	0.028	210										
14	1590	0.031	200											
16	1390	0.035	195											
20	1110	0.042	190											

	Material Group ISO 513	P1 P2 M1 K1			P3 P4 M2 K2 K3			P5 M3 M4 K4 S1 S4				S2 S3 S5		
	Hardness/Rm	≤ 700 N/mm ²			700-1000 N/mm ²			≤ 35 HRC				≤ 40 HRC		
	ap x ae	D x 0.4D			D x 0.4D			D x 0.25D				D x 0.25D		
	Vc (m/min)	100-120			60-80			45-65				30-40		
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	
	6	5840	0.024	570	3720	0.022	330	2920	0.018	210	1860	0.017	130	
	8	4380	0.032	550	2790	0.028	320	2190	0.024	210	1390	0.022	120	
10	3500	0.038	530	2230	0.034	300	1750	0.028	200	1110	0.026	120		
12	2920	0.043	500	1860	0.039	290	1460	0.032	190	930	0.030	110		
14	2500	0.049	490	1590	0.044	280	1250	0.036	180	800	0.034	110		
16	2190	0.054	470	1390	0.049	270	1090	0.041	180	700	0.038	110		
20	1750	0.066	460	1110	0.059	260	880	0.049	170	560	0.046	100		

INFO
TYPHOON TA-HTA-4HTA
TYPHOON PU-HPU
TYPHOON SUH
TYPHOON ALH
TYPHOON HRC
TYPHOON SUH MINI
TYPHOON HL
C-SD-TA
LFTA
SUTA
HSS-HSS/CO DRILLS
G2
MDTA
HF-VH/UP
MEF
ALU
MEX
UH
HSS/CO-HSSP END MILLS
CARBIDE BURRS

PARAMETERS SUGGESTED WITH HIGH PRECISION WELDON CHUCK AND STABLE MACHINING CONDITION. FOR APPLICATION ON HIGH POWER MILLING CHUCK, PLEASE REFER TO HF442 PARAMETERS.

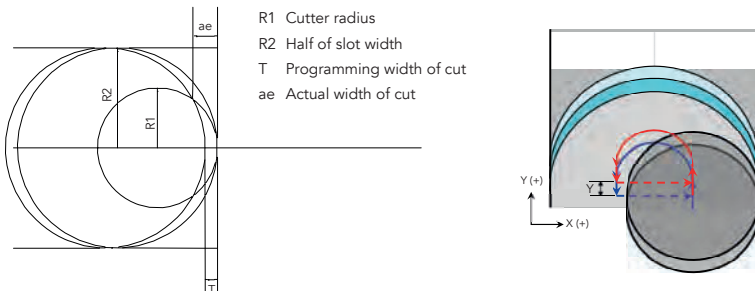
HF443

	Material Group ISO 513	P1 P2 M1 K1			P3 P4 M2 K2 K3			P5 M3 M4 K4 S1 S4			S2 S3 S5		
	Hardness/Rm	≤ 700 N/mm ²			700-1000 N/mm ²			≤ 35 HRC			≤ 40 HRC		
	ap x ae	D x D			D x D			0.5D x D			0.5D x D		
	Vc (m/min)	85-105			55-75			40-60			20-40		
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)
	3	10080	0.006	250	6900	0.006	160	5310	0.005	110	3180	0.007	90
	4	7560	0.008	250	5180	0.007	160	3980	0.007	110	2390	0.009	90
	5	6050	0.010	250	4140	0.009	150	3180	0.008	110	1910	0.011	90
	6	5040	0.012	240	3450	0.011	150	2650	0.010	100	1590	0.013	90
	8	3780	0.016	240	2590	0.014	150	1990	0.013	100	1190	0.017	80
	10	3030	0.019	230	2070	0.017	140	1590	0.015	100	960	0.021	80
	12	2520	0.022	220	1730	0.019	130	1330	0.017	90	800	0.024	80
	14	2160	0.024	210	1480	0.022	130	1140	0.019	90	680	0.027	70
16	1890	0.027	200	1290	0.024	130	1000	0.022	90	600	0.030	70	
20	1510	0.033	200	1040	0.030	120	800	0.026	80	480	0.036	70	
ap x ae	≤ D5	0.5D x D			0.5D x D			0.25D x D			0.25D x D		

	Material Group ISO 513	P1 P2 M1 K1			P3 P4 M2 K2 K3			P5 M3 M4 K4 S1 S4			S2 S3 S5		
	Hardness/Rm	≤ 700 N/mm ²			700-1000 N/mm ²			≤ 35 HRC			≤ 40 HRC		
	ap x ae	2D x 0.2D			2D x 0.1D			1.5D x 0.1D			1.5D x 0.1D		
	Vc (m/min)	160-200			110-130			80-100			50-70		
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)
	3	19110	0.032	2410	12740	0.028	1440	9550	0.025	960	6370	0.035	880
	4	14330	0.042	2390	9550	0.037	1430	7170	0.033	960	4780	0.046	880
	5	11460	0.052	2370	7640	0.047	1420	5730	0.041	950	3820	0.057	870
	6	9550	0.061	2320	6370	0.055	1390	4780	0.049	930	3180	0.067	850
	8	7170	0.079	2260	4780	0.071	1360	3580	0.063	900	2390	0.087	830
	10	5730	0.095	2170	3820	0.085	1300	2870	0.076	870	1910	0.104	790
	12	4780	0.108	2060	3180	0.097	1240	2390	0.086	830	1590	0.119	760
	14	4090	0.122	1990	2730	0.109	1190	2050	0.097	800	1360	0.134	730
16	3580	0.135	1930	2390	0.122	1160	1790	0.108	770	1190	0.149	710	
20	2870	0.164	1890	1910	0.148	1130	1430	0.131	750	960	0.181	690	
ap x ae	≤ D5	1.5D x 0.1D			1.5D x 0.1D								

NOTES:

- Down milling CNC programming is required.
- "ae" value max 0.2xD - "T" value max 0.1xD.
- The use of end mill with diameter 30-40% smaller than the width of the slot is recommended.
- The cutting conditions are based on CNC programming with medium dynamic speed.
- With lower CNC dynamic speed, use the same cutting conditions or reduce the cutting speed Vc.
- With higher CNC dynamic speed, reduce the "T" value by approximately -30 -50% and apply the maximum available cutting speed Vc.



PARAMETERS SUGGESTED WITH HIGH PRECISION WELDON CHUCK AND STABLE MACHINING CONDITION.
 FOR APPLICATION ON HIGH POWER MILLING CHUCK, PLEASE REFER TO HF442 PARAMETERS.

HF542

	Material Group ISO 513	P1 P2 M1 K1				P3 P4 M2 K2 K3			P5 M3 M4 K4 S1 S4				S2 S3 S5		
	Hardness/Rm	≤ 700 N/mm ²				700-1000 N/mm ²			≤ 35 HRC				≤ 40 HRC		
	ap x ae	0.5D x D				0.3D x D			0.2D x D				0.2D x D		
	Vc (m/min)	90-110				60-80			40-60				20-40		
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)		
	6	5310	0.019	410	3720	0.017	260	2650	0.015	150	1590	0.014	90		
	8	3980	0.025	400	2790	0.023	250	1990	0.019	150	1190	0.018	80		
	10	3180	0.030	380	2230	0.027	240	1590	0.023	140	960	0.021	80		
12	2650	0.035	370	1860	0.031	230	1330	0.026	140	800	0.024	80			
16	1990	0.043	340	1390	0.039	220	1000	0.032	130	600	0.030	70			
20	1590	0.053	330	1110	0.047	210	800	0.039	130	480	0.037	70			

	Material Group ISO 513	P1 P2 M1 K1				P3 P4 M2 K2 K3			P5 M3 M4 K4 S1 S4				S2 S3 S5		
	Hardness/Rm	≤ 700 N/mm ²				700-1000 N/mm ²			≤ 35 HRC				≤ 40 HRC		
	ap x ae	1.5D x 0.3D				1.5D x 0.3D			1.2D x 0.2D				1.2D x 0.2D		
	Vc (m/min)	110-130				70-90			50-70				30-50		
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)		
	6	6370	0.023	590	4250	0.021	360	3180	0.019	240	2120	0.026	220		
	8	4780	0.030	580	3180	0.027	350	2390	0.024	230	1590	0.033	210		
	10	3820	0.036	550	2550	0.033	330	1910	0.029	220	1270	0.040	200		
12	3180	0.041	530	2120	0.037	320	1590	0.033	210	1060	0.046	190			
16	2390	0.052	500	1590	0.047	300	1190	0.041	200	800	0.057	180			
20	1910	0.063	480	1270	0.057	290	960	0.050	190	640	0.069	180			

	Material Group ISO 513	P1 P2 M1 K1				P3 P4 M2 K2 K3			P5 M3 M4 K4 S1 S4				S2 S3 S5		
	Hardness/Rm	≤ 700 N/mm ²				700-1000 N/mm ²			≤ 35 HRC				≤ 40 HRC		
	α° x ae	4° x 0.4D				3° x 0.4D			3° x 0.4D				2° x 0.4D		
	Vc (m/min)	90-110				60-80			40-60				20-40		
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)		
	6	5310	0.015	310	3720	0.014	210	2650	0.012	124	1590	0.012	78		
	8	3980	0.019	305	2790	0.018	205	1990	0.015	120	1190	0.016	76		
	10	3180	0.023	290	2230	0.022	195	1590	0.018	115	960	0.019	73		
12	2650	0.026	275	1860	0.025	185	1330	0.021	110	800	0.022	70			
16	1990	0.033	260	1390	0.031	175	1000	0.026	104	600	0.027	66			
20	1590	0.040	250	1110	0.038	170	800	0.032	101	480	0.033	64			

	Material Group ISO 513	P1 P2 M1 K1				P3 P4 M2 K2 K3			P5 M3 M4 K4 S1 S4				S2 S3 S5		
	Hardness/Rm	≤ 700 N/mm ²				700-1000 N/mm ²			≤ 35 HRC				≤ 40 HRC		
	α° x ae	7° x 0.4D				5° x 0.4D			3° x 0.4D				3° x 0.4D		
	Vc (m/min)	80-100				50-70			35-55				20-30		
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)		
	6	4780	0.016	310	3180	0.015	195	2390	0.015	143	1330	0.021	109		
	8	3580	0.021	305	2390	0.020	190	1790	0.019	139	1000	0.027	107		
	10	2870	0.025	290	1910	0.024	180	1430	0.023	133	800	0.032	102		
12	2390	0.029	275	1590	0.027	175	1190	0.027	126	660	0.037	96			
16	1790	0.036	260	1190	0.034	160	900	0.033	120	500	0.046	91			
20	1430	0.044	250	960	0.041	160	720	0.040	116	400	0.056	89			

PARAMETERS SUGGESTED WITH HIGH POWER MILLING CHUCK AND STABLE MACHINING CONDITION

HF542

	Material Group ISO 513	P1 P2 M1 K1				P3 P4 M2 K2 K3			P5 M3 M4 K4 S1 S4				S2 S3 S5		
	Hardness/Rm	≤ 700 N/mm ²				700-1000 N/mm ²			≤ 35 HRC				≤ 40 HRC		
	ap x ae	D x 0.4D				D x 0.4D			D x 0.25D				D x 0.25D		
	Vc (m/min)	80-100				50-70			35-55				20-30		
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)		
	6	4780	0.019	370	3180	0.017	220	2390	0.015	140	1330	0.014	70		
	8	3580	0.025	360	2390	0.023	220	1790	0.019	140	1000	0.018	70		
10	2870	0.030	350	1910	0.027	210	1430	0.023	130	800	0.021	70			
12	2390	0.035	330	1590	0.031	200	1190	0.026	120	660	0.024	60			
16	1790	0.043	310	1190	0.039	190	900	0.032	120	500	0.030	60			
20	1430	0.053	300	960	0.047	180	720	0.039	110	400	0.037	60			

	Material Group ISO 513	P1 P2 M1 K1				P3 P4 M2 K2 K3			P5 M3 M4 K4 S1 S4				S2 S3 S5		
	Hardness/Rm	≤ 700 N/mm ²				700-1000 N/mm ²			≤ 35 HRC				≤ 40 HRC		
	ap x ae	D x D				D x D			0.5D x D				0.5D x D		
	Vc (m/min)	70-90				50-60			35-45				20-30		
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)		
	6	4250	0.010	170	2920	0.009	100	2120	0.008	70	1330	0.011	60		
	8	3180	0.013	160	2190	0.011	100	1590	0.010	60	1000	0.014	60		
10	2550	0.015	150	1750	0.014	100	1270	0.012	60	800	0.017	50			
12	2120	0.017	150	1460	0.016	90	1060	0.014	60	660	0.019	50			
16	1590	0.022	140	1090	0.019	80	800	0.017	60	500	0.024	50			
20	1270	0.026	130	880	0.024	80	640	0.021	50	400	0.029	50			

	Material Group ISO 513	P1 P2 M1 K1				P3 P4 M2 K2 K3			P5 M3 M4 K4 S1 S4				S2 S3 S5		
	Hardness/Rm	≤ 700 N/mm ²				700-1000 N/mm ²			≤ 35 HRC				≤ 40 HRC		
	ap x ae	2D x 0.1D				2D x 0.1D			1.5D x 0.1D				1.5D x 0.1D		
	Vc (m/min)	150-170				90-100			80-90				45-55		
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)		
	6	8490	0.049	1650	5040	0.044	880	3980	0.039	620	2650	0.053	570		
	8	6370	0.063	1610	3780	0.057	860	2990	0.050	600	1990	0.069	550		
10	5100	0.076	1540	3030	0.068	820	2390	0.060	580	1590	0.083	530			
12	4250	0.086	1470	2520	0.078	780	1990	0.069	550	1330	0.095	510			
16	3180	0.108	1370	1890	0.097	730	1490	0.086	510	1000	0.119	480			
20	2550	0.131	1340	1510	0.118	710	1190	0.105	500	800	0.145	460			

NOTES:

Down milling CNC programming is required.

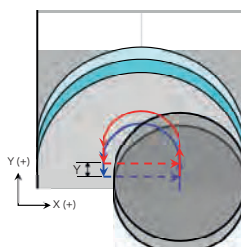
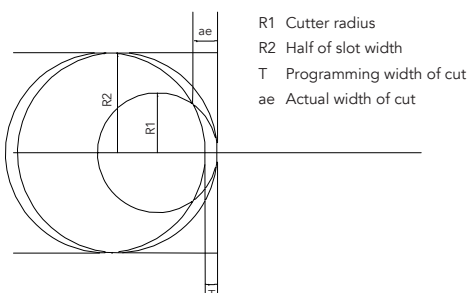
"ae" value max 0.2xD - "T" value max 0.1xD.

The use of end mill with diameter 30-40% smaller than the width of the slot is recommended.

The cutting conditions are based on CNC programming with medium dynamic speed.

With lower CNC dynamic speed, use the same cutting conditions or reduce the cutting speed Vc.

With higher CNC dynamic speed, reduce the "T" value by approximately -30 -50% and apply the maximum available cutting speed Vc.



- INFO
- TYPHOON TA-HTA-4HTA
- TYPHOON PU-HPU
- TYPHOON SUH
- TYPHOON ALH
- TYPHOON HRC
- TYPHOON SUH MINI
- TYPHOON HL
- C-SD-TA
- LFTA
- SUTA
- HSS-HSS/CO DRILLS
- G2
- MDTA
- HF-VH/UP
- MEF
- ALU
- MEX
- UH
- HSS/CO-HSSP END MILLS
- CARBIDE BURRS

HF942

	Material Group ISO 513	P1 P2 M1 K1			P3 P4 M2 K2 K3			P5 M3 M4 K4 S1 S4			S2 S3 S5		
	Hardness/Rm	≤ 700 N/mm ²			700-1000 N/mm ²			≤ 35 HRC			≤ 40 HRC		
	ap x ae	1.5D x 0.3D			1.5D x 0.3D			1.2D x 0.2D			1.2D x 0.2D		
	Vc (m/min)	110-130			70-90			50-70			30-50		
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)
	4	9550	0.016	620	6370	0.015	370	4780	0.013	250	3180	0.018	230
	5	7640	0.021	650	5100	0.019	390	3820	0.017	260	2550	0.023	240
	6	6370	0.026	660	4250	0.023	400	3180	0.021	260	2120	0.029	240
	8	4780	0.031	590	3180	0.028	350	2390	0.025	230	1590	0.034	210
	10	3820	0.036	560	2550	0.033	330	1910	0.029	220	1270	0.040	200
12	3180	0.041	530	2120	0.037	320	1590	0.033	210	1060	0.045	190	
16	2390	0.047	450	1590	0.042	270	1190	0.038	180	800	0.052	170	
20	1910	0.063	480	1270	0.057	290	960	0.051	190	640	0.070	180	
ap x ae	≤ D5	1.5D x 0.1D			1.5D x 0.1D			1.2D x 0.1D			1.2D x 0.1D		

	Material Group ISO 513	P1 P2 M1 K1			P3 P4 M2 K2 K3			P5 M3 M4 K4 S1 S4			S2 S3 S5		
	Hardness/Rm	≤ 700 N/mm ²			700-1000 N/mm ²			≤ 35 HRC			≤ 40 HRC		
	α° x ae	4° x 0.4D			3° x 0.4D			3° x 0.4D			2° x 0.4D		
	Vc (m/min)	90-110			60-80			40-60			20-40		
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)
	4	7960	0.010	325	5570	0.010	220	3980	0.008	130	2390	0.009	82
	5	6370	0.013	340	4460	0.013	225	3180	0.011	134	1910	0.011	85
	6	5310	0.016	345	3720	0.016	230	2650	0.013	137	1590	0.014	87
	8	3980	0.019	305	2790	0.018	205	1990	0.015	122	1190	0.016	77
	10	3180	0.023	290	2230	0.022	195	1590	0.018	116	960	0.019	74
12	2650	0.026	275	1860	0.025	185	1330	0.021	110	800	0.022	70	
16	1990	0.030	235	1390	0.028	155	1000	0.024	94	600	0.025	59	
20	1590	0.040	255	1110	0.038	170	800	0.032	101	480	0.033	64	
α° max	≤ D5	2°			2°			1°			1°		

PARAMETERS SUGGESTED WITH HIGH POWER MILLING CHUCK AND STABLE MACHINING CONDITION

- INFO
- TYPHOON TA-HTA-4HTA
- TYPHOON PU-HPU
- TYPHOON SUH
- TYPHOON ALH
- TYPHOON HRC
- TYPHOON SUH MINI
- TYPHOON HL
- C-SD-TA
- LFTA
- SUTA
- HSS-HSS/CO DRILLS
- G2
- MDTA
- HF-VH/UP
- MEF
- ALU
- MEX
- UH
- HSS/CO-HSSP END MILLS
- CARBIDE BURRS

HF942

	Material Group ISO 513	P1 P2 M1 K1			P3 P4 M2 K2 K3			P5 M3 M4 K4 S1 S4			S2 S3 S5		
	Hardness/Rm	≤ 700 N/mm ²			700-1000 N/mm ²			≤ 35 HRC			≤ 40 HRC		
	α° x ae	5° x 0.4D			5° x 0.4D			3° x 0.4D			3° x 0.4D		
	Vc (m/min)	80-100			50-70			35-55			20-30		
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)
	4	7170	0.012	340	4780	0.011	205	3580	0.010	150	1990	0.014	114
	5	5730	0.015	350	3820	0.014	210	2870	0.014	155	1590	0.019	118
	6	4780	0.019	360	3180	0.017	215	2390	0.017	159	1330	0.023	121
	8	3580	0.022	320	2390	0.020	190	1790	0.020	141	1000	0.027	108
	10	2870	0.027	305	1910	0.024	185	1430	0.023	134	800	0.032	103
12	2390	0.030	285	1590	0.027	170	1190	0.026	126	660	0.036	96	
16	1790	0.034	245	1190	0.031	145	900	0.030	108	500	0.041	83	
20	1430	0.046	265	960	0.042	160	720	0.041	117	400	0.056	89	

	Material Group ISO 513	P1 P2 M1 K1			P3 P4 M2 K2 K3			P5 M3 M4 K4 S1 S4			S2 S3 S5		
	Hardness/Rm	≤ 700 N/mm ²			700-1000 N/mm ²			≤ 35 HRC			≤ 40 HRC		
	ap x ae	D x 0.4D			D x 0.4D			D x 0.25D			D x 0.25D		
	Vc (m/min)	80-100			50-70			35-55			20-30		
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)
	4	7170	0.014	390	4780	0.012	230	3580	0.010	150	1990	0.010	80
	5	5730	0.018	400	3820	0.016	240	2870	0.013	150	1590	0.012	80
	6	4780	0.022	410	3180	0.019	250	2390	0.016	150	1330	0.015	80
	8	3580	0.026	370	2390	0.023	220	1790	0.019	140	1000	0.018	70
	10	2870	0.030	350	1910	0.027	210	1430	0.023	130	800	0.021	70
12	2390	0.034	330	1590	0.031	200	1190	0.026	120	660	0.024	60	
16	1790	0.039	280	1190	0.035	170	900	0.029	110	500	0.027	50	
20	1430	0.053	300	960	0.048	180	720	0.040	110	400	0.037	60	

	Material Group ISO 513	P1 P2 M1 K1			P3 P4 M2 K2 K3			P5 M3 M4 K4 S1 S4			S2 S3 S5		
	Hardness/Rm	≤ 700 N/mm ²			700-1000 N/mm ²			≤ 35 HRC			≤ 40 HRC		
	ap x ae	D x D			D x D			0.5D x D			0.5D x D		
	Vc (m/min)	70-90			50-60			35-45			20-30		
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)
	4	6370	0.007	170	4380	0.006	110	3180	0.005	70	1990	0.007	60
	5	5100	0.009	180	3500	0.008	110	2550	0.007	70	1590	0.010	60
	6	4250	0.011	180	2920	0.010	110	2120	0.009	70	1330	0.012	60
	8	3180	0.013	160	2190	0.012	100	1590	0.010	70	1000	0.014	60
	10	2550	0.015	160	1750	0.014	100	1270	0.012	60	800	0.017	50
12	2120	0.017	150	1460	0.015	90	1060	0.014	60	660	0.019	50	
16	1590	0.020	120	1090	0.018	80	800	0.016	50	500	0.022	40	
20	1270	0.026	130	880	0.024	80	640	0.021	50	400	0.029	50	

ap x ae	≤ D5	0.5D x D	0.5D x D	0.25D x D	0.25D x D
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PARAMETERS SUGGESTED WITH HIGH POWER MILLING CHUCK AND STABLE MACHINING CONDITION

HF942

	Material Group ISO 513	P1 P2 M1 K1			P3 P4 M2 K2 K3			P5 M3 M4 K4 S1 S4				S2 S3 S5		
	Hardness/Rm	≤ 700 N/mm ²			700-1000 N/mm ²			≤ 35 HRC				≤ 40 HRC		
	ap x ae	2D x 0.1D			2D x 0.1D			1.5D x 0.1D				1.5D x 0.1D		
	Vc (m/min)	140-160			100-120			70-90				40-60		
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	
	4	11940	0.034	1620	8760	0.031	1070	6370	0.027	690	3980	0.037	600	
	5	9550	0.044	1680	7010	0.040	1110	5100	0.035	720	3180	0.048	620	
	6	7960	0.054	1720	5840	0.049	1140	4250	0.043	730	2650	0.059	630	
	8	5970	0.064	1530	4380	0.058	1010	3180	0.051	650	1990	0.070	560	
	10	4780	0.076	1450	3500	0.068	960	2550	0.061	620	1590	0.084	530	
12	3980	0.086	1370	2920	0.077	900	2120	0.069	580	1330	0.095	500		
16	2990	0.098	1170	2190	0.088	770	1590	0.078	500	1000	0.108	430		
20	2390	0.132	1260	1750	0.119	830	1270	0.106	540	800	0.145	460		
ap x ae	≤ D5	1.5D x 0.1D			1.5D x 0.1D			1.2D x 0.05D				1.2D x 0.05D		

NOTES:

Down milling CNC programming is required.

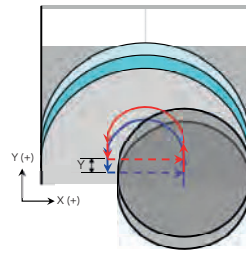
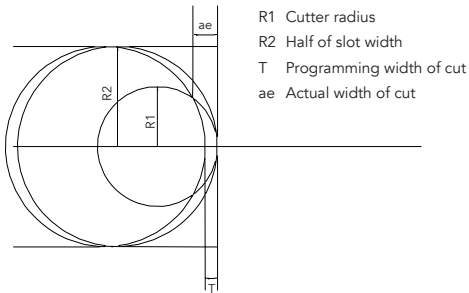
"ae" value max 0.2xD - "T" value max 0.1xD.

The use of end mill with diameter 30-40% smaller than the width of the slot is recommended.

The cutting conditions are based on CNC programming with medium dynamic speed.

With lower CNC dynamic speed, use the same cutting conditions or reduce the cutting speed Vc.

With higher CNC dynamic speed, reduce the "T" value by approximately -30 -50% and apply the maximum available cutting speed Vc.



- R1 Cutter radius
- R2 Half of slot width
- T Programming width of cut
- ae Actual width of cut

PARAMETERS SUGGESTED WITH HIGH POWER MILLING CHUCK AND STABLE MACHINING CONDITION

- INFO
- TYPHOON TA-HTA-4HTA
- TYPHOON PU-HPU
- TYPHOON SUH
- TYPHOON ALH
- TYPHOON HRC
- TYPHOON SUH MINI
- TYPHOON HL
- C-SD-TA
- LFTA
- SUTA
- HSS-HSS/CO DRILLS
- G2
- MDTA
- HF VH/UP
- MEF
- ALU
- MEX
- UH
- HSS/CO-HSSP END MILLS
- CARBIDE BURRS

HF943

	Material Group ISO 513	P1 P2 M1 K1			P3 P4 M2 K2 K3			P5 M3 M4 K4 S1 S4			S2 S3 S5		
	Hardness/Rm	≤ 700 N/mm ²			700-1000 N/mm ²			≤ 35 HRC			≤ 40 HRC		
	ap x ae	1.5D x 0.3D			1.5D x 0.3D			1.2D x 0.2D			1.2D x 0.2D		
	Vc (m/min)	110-130			70-90			50-70			30-50		
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)
	4	9550	0.016	620	6370	0.015	370	4780	0.013	250	3180	0.018	230
	5	7640	0.021	650	5100	0.019	390	3820	0.017	260	2550	0.023	240
	6	6370	0.026	660	4250	0.023	400	3180	0.021	260	2120	0.029	240
	8	4780	0.031	590	3180	0.028	350	2390	0.025	230	1590	0.034	210
	10	3820	0.036	560	2550	0.033	330	1910	0.029	220	1270	0.040	200
12	3180	0.041	530	2120	0.037	320	1590	0.033	210	1060	0.045	190	
16	2390	0.047	450	1590	0.042	270	1190	0.038	180	800	0.052	170	
20	1910	0.063	480	1270	0.057	290	960	0.051	190	640	0.070	180	
ap x ae	≤ D5	1.5D x 0.1D			1.5D x 0.1D			1.2D x 0.1D			1.2D x 0.1D		

	Material Group ISO 513	P1 P2 M1 K1			P3 P4 M2 K2 K3			P5 M3 M4 K4 S1 S4			S2 S3 S5		
	Hardness/Rm	≤ 700 N/mm ²			700-1000 N/mm ²			≤ 35 HRC			≤ 40 HRC		
	α° x ae	4° x 0.4D			3° x 0.4D			3° x 0.4D			2° x 0.4D		
	Vc (m/min)	90-110			60-80			40-60			20-40		
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)
	4	7960	0.010	325	5570	0.010	220	3980	0.008	130	2390	0.009	82
	5	6370	0.013	340	4460	0.013	225	3180	0.011	134	1910	0.011	85
	6	5310	0.016	345	3720	0.016	230	2650	0.013	137	1590	0.014	87
	8	3980	0.019	305	2790	0.018	205	1990	0.015	122	1190	0.016	77
	10	3180	0.023	290	2230	0.022	195	1590	0.018	116	960	0.019	74
12	2650	0.026	275	1860	0.025	185	1330	0.021	110	800	0.022	70	
16	1990	0.030	235	1390	0.028	155	1000	0.024	94	600	0.025	59	
20	1590	0.040	255	1110	0.038	170	800	0.032	101	480	0.033	64	
α° max	≤ D5	2°			2°			1°			1°		

PARAMETERS SUGGESTED WITH HIGH PRECISION WELDON CHUCK AND STABLE MACHINING CONDITION. FOR APPLICATION ON HIGH POWER MILLING CHUCK, PLEASE REFER TO HF942 PARAMETERS.

- INFO
- TYPHOON TA-HTA-4HTA
- TYPHOON PU-HPU
- TYPHOON SUH
- TYPHOON ALH
- TYPHOON HRC
- TYPHOON SUH MINI
- TYPHOON HL
- C-SD-TA
- LFTA
- SUTA
- HSS-HSS/CO DRILLS
- G2
- MDTA
- HF VH/UP
- MEF
- ALU
- MEX
- UH
- HSS/CO-HSSP END MILLS
- CARBIDE BURRS

HF943

	Material Group ISO 513	P1 P2 M1 K1			P3 P4 M2 K2 K3			P5 M3 M4 K4 S1 S4			S2 S3 S5		
	Hardness/Rm	≤ 700 N/mm ²			700-1000 N/mm ²			≤ 35 HRC			≤ 40 HRC		
	α° x ae	5° x 0.4D			5° x 0.4D			3° x 0.4D			3° x 0.4D		
	Vc (m/min)	80-100			50-70			35-55			20-30		
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)
	4	7170	0.012	340	4780	0.011	205	3580	0.010	150	1990	0.014	114
	5	5730	0.015	350	3820	0.014	210	2870	0.014	155	1590	0.019	118
	6	4780	0.019	360	3180	0.017	215	2390	0.017	159	1330	0.023	121
	8	3580	0.022	320	2390	0.020	190	1790	0.020	141	1000	0.027	108
	10	2870	0.027	305	1910	0.024	185	1430	0.023	134	800	0.032	103
12	2390	0.030	285	1590	0.027	170	1190	0.026	126	660	0.036	96	
16	1790	0.034	245	1190	0.031	145	900	0.030	108	500	0.041	83	
20	1430	0.046	265	960	0.042	160	720	0.041	117	400	0.056	89	

	Material Group ISO 513	P1 P2 M1 K1			P3 P4 M2 K2 K3			P5 M3 M4 K4 S1 S4			S2 S3 S5		
	Hardness/Rm	≤ 700 N/mm ²			700-1000 N/mm ²			≤ 35 HRC			≤ 40 HRC		
	ap x ae	D x 0.4D			D x 0.4D			D x 0.25D			D x 0.25D		
	Vc (m/min)	80-100			50-70			35-55			20-30		
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)
	4	7170	0.014	390	4780	0.012	230	3580	0.010	150	1990	0.010	80
	5	5730	0.018	400	3820	0.016	240	2870	0.013	150	1590	0.012	80
	6	4780	0.022	410	3180	0.019	250	2390	0.016	150	1330	0.015	80
	8	3580	0.026	370	2390	0.023	220	1790	0.019	140	1000	0.018	70
	10	2870	0.030	350	1910	0.027	210	1430	0.023	130	800	0.021	70
12	2390	0.034	330	1590	0.031	200	1190	0.026	120	660	0.024	60	
16	1790	0.039	280	1190	0.035	170	900	0.029	110	500	0.027	50	
20	1430	0.053	300	960	0.048	180	720	0.040	110	400	0.037	60	

	Material Group ISO 513	P1 P2 M1 K1			P3 P4 M2 K2 K3			P5 M3 M4 K4 S1 S4			S2 S3 S5		
	Hardness/Rm	≤ 700 N/mm ²			700-1000 N/mm ²			≤ 35 HRC			≤ 40 HRC		
	ap x ae	D x D			D x D			0.5D x D			0.5D x D		
	Vc (m/min)	70-90			50-60			35-45			20-30		
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)
	4	6370	0.007	170	4380	0.006	110	3180	0.005	70	1990	0.007	60
	5	5100	0.009	180	3500	0.008	110	2550	0.007	70	1590	0.010	60
	6	4250	0.011	180	2920	0.010	110	2120	0.009	70	1330	0.012	60
	8	3180	0.013	160	2190	0.012	100	1590	0.010	70	1000	0.014	60
	10	2550	0.015	160	1750	0.014	100	1270	0.012	60	800	0.017	50
12	2120	0.017	150	1460	0.015	90	1060	0.014	60	660	0.019	50	
16	1590	0.020	120	1090	0.018	80	800	0.016	50	500	0.022	40	
20	1270	0.026	130	880	0.024	80	640	0.021	50	400	0.029	50	

ap x ae	≤ D5	0.5D x D	0.5D x D	0.25D x D	0.25D x D
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PARAMETERS SUGGESTED WITH HIGH PRECISION WELDON CHUCK AND STABLE MACHINING CONDITION.
FOR APPLICATION ON HIGH POWER MILLING CHUCK, PLEASE REFER TO HF942 PARAMETERS.

CUTTING PARAMETERS

HF943

	Material Group ISO 513	P1 P2 M1 K1			P3 P4 M2 K2 K3			P5 M3 M4 K4 S1 S4				S2 S3 S5		
	Hardness/Rm	≤ 700 N/mm ²			700-1000 N/mm ²			≤ 35 HRC				≤ 40 HRC		
	ap x ae	2D x 0.1D			2D x 0.1D			1.5D x 0.1D				1.5D x 0.1D		
	Vc (m/min)	140-160			100-120			70-90				40-60		
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	
	4	11940	0.034	1620	8760	0.031	1070	6370	0.027	690	3980	0.037	600	
	5	9550	0.044	1680	7010	0.040	1110	5100	0.035	720	3180	0.048	620	
	6	7960	0.054	1720	5840	0.049	1140	4250	0.043	730	2650	0.059	630	
	8	5970	0.064	1530	4380	0.058	1010	3180	0.051	650	1990	0.070	560	
	10	4780	0.076	1450	3500	0.068	960	2550	0.061	620	1590	0.084	530	
12	3980	0.086	1370	2920	0.077	900	2120	0.069	580	1330	0.095	500		
16	2990	0.098	1170	2190	0.088	770	1590	0.078	500	1000	0.108	430		
20	2390	0.132	1260	1750	0.119	830	1270	0.106	540	800	0.145	460		
ap x ae	≤ D5	1.5D x 0.1D			1.5D x 0.1D			1.2D x 0.05D				1.2D x 0.05D		

NOTES:

Down milling CNC programming is required.

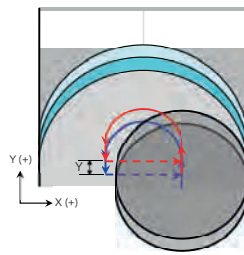
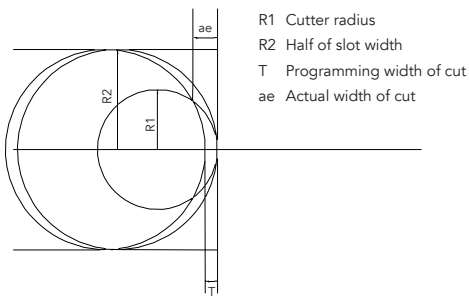
"ae" value max 0.2xD - "T" value max 0.1xD.

The use of end mill with diameter 30-40% smaller than the width of the slot is recommended.

The cutting conditions are based on CNC programming with medium dynamic speed.

With lower CNC dynamic speed, use the same cutting conditions or reduce the cutting speed Vc.

With higher CNC dynamic speed, reduce the "T" value by approximately -30 -50% and apply the maximum available cutting speed Vc.



INFO
TYPHOON TA-HTA-4HTA
TYPHOON PU-HPU
TYPHOON SUH
TYPHOON ALH
TYPHOON HRC
TYPHOON SUH MINI
TYPHOON HL
C-SD-TA
LFTA
SUTA
HSS-HSS/CO DRILLS
G2
MDTA
HF VH/UP
MEF
ALU
MEX
UH
HSS/CO-HSSP END MILLS
CARBIDE BURRS

PARAMETERS SUGGESTED WITH HIGH PRECISION WELDON CHUCK AND STABLE MACHINING CONDITION. FOR APPLICATION ON HIGH POWER MILLING CHUCK, PLEASE REFER TO HF942 PARAMETERS.

HF642

	Material Group ISO 513	P1 P2 M1 K1			P3 P4 M2 K2 K3			P5 M3 M4 K4 S1 S4			S2 S3 S5		
	Hardness/Rm	≤ 700 N/mm ²			700-1000 N/mm ²			≤ 35 HRC			≤ 40 HRC		
	ap x ae	1.5D x 0.5D			1.5D x 0.5D			1.2D x 0.3D			1.2D x 0.3D		
	Vc (m/min)	160-180			100-120			70-90			40-60		
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)
	4	13540	0.019	1280	8760	0.017	740	6370	0.015	480	3980	0.021	410
	5	10830	0.023	1270	7010	0.021	740	5100	0.019	480	3180	0.026	410
	6	9020	0.028	1240	5840	0.025	720	4250	0.022	470	2650	0.030	400
	8	6770	0.036	1210	4380	0.032	700	3180	0.029	450	1990	0.039	390
	10	5410	0.043	1160	3500	0.039	670	2550	0.034	440	1590	0.047	370
12	4510	0.049	1100	2920	0.044	640	2120	0.039	420	1330	0.054	360	
16	3380	0.061	1030	2190	0.055	600	1590	0.049	390	1000	0.067	340	
20	2710	0.074	1010	1750	0.067	590	1270	0.060	380	800	0.082	330	
ap x ae	≤ D5	1.5D x 0.3D			1.5D x 0.3D			1.2D x 0.2D			1.2D x 0.2D		

	Material Group ISO 513	P1 P2 M1 K1			P3 P4 M2 K2 K3			P5 M3 M4 K4 S1 S4			S2 S3 S5		
	Hardness/Rm	≤ 700 N/mm ²			700-1000 N/mm ²			≤ 35 HRC			≤ 40 HRC		
	α° x ae	5° x 0.4D			4° x 0.4D			3° x 0.4D			3° x 0.4D		
	Vc (m/min)	130-150			80-100			60-80			30-50		
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)
	4	11150	0.011	640	7170	0.011	385	5570	0.009	263	3180	0.009	140
	5	8920	0.014	635	5730	0.013	380	4460	0.012	262	2550	0.011	140
	6	7430	0.017	620	4780	0.016	370	3720	0.014	256	2120	0.013	136
	8	5570	0.022	605	3580	0.020	360	2790	0.018	249	1590	0.017	133
	10	4460	0.026	580	2870	0.024	350	2230	0.021	239	1270	0.020	127
12	3720	0.030	555	2390	0.028	330	1860	0.024	228	1060	0.023	121	
16	2790	0.037	520	1790	0.035	310	1390	0.031	213	800	0.029	114	
20	2230	0.045	505	1430	0.042	300	1110	0.037	207	640	0.035	111	
α° max	≤ D5	2°			2°			1°			1°		

- INFO
- TYPHOON TA-HTA-4HTA
- TYPHOON PU-HPU
- TYPHOON SUH
- TYPHOON ALH
- TYPHOON HRC
- TYPHOON SUH MINI
- TYPHOON HL
- C-SD-TA
- LFTA
- SUTA
- HSS-HSS/CO DRILLS
- G2
- MDTA
- HF VH/UP
- MEF
- ALU
- MEX
- UH
- HSS/CO-HSSP END MILLS
- CARBIDE BURRS

PARAMETERS SUGGESTED WITH HIGH POWER MILLING CHUCK AND STABLE MACHINING CONDITION

HF642

	Material Group ISO 513	P1 P2 M1 K1				P3 P4 M2 K2 K3			P5 M3 M4 K4 S1 S4				S2 S3 S5		
	Hardness/Rm	≤ 700 N/mm ²				700-1000 N/mm ²			≤ 35 HRC				≤ 40 HRC		
	α° x ae	15° x D				10° x D			5° x D				5° x D		
	Vc (m/min)	130-150				80-100			60-80				30-50		
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)		
	6	7430	0.018	680	4780	0.017	405	3720	0.016	298	2120	0.022	234		
	8	5570	0.024	660	3580	0.022	390	2790	0.021	290	1590	0.029	227		
	10	4460	0.028	635	2870	0.026	375	2230	0.025	278	1270	0.034	218		
	12	3720	0.033	605	2390	0.030	360	1860	0.029	265	1060	0.039	208		
	16	2790	0.041	570	1790	0.037	335	1390	0.036	248	800	0.049	196		
20	2230	0.050	550	1430	0.046	325	1110	0.043	241	640	0.060	191			

	Material Group ISO 513	P1 P2 M1 K1				P3 P4 M2 K2 K3			P5 M3 M4 K4 S1 S4				S2 S3 S5		
	Hardness/Rm	≤ 700 N/mm ²				700-1000 N/mm ²			≤ 35 HRC				≤ 40 HRC		
	ap x ae	D x 0.4D				D x 0.4D			D x 0.25D				D x 0.25D		
	Vc (m/min)	130-150				80-100			60-80				30-50		
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)		
	6	7430	0.023	850	4780	0.021	490	3720	0.017	320	2120	0.016	170		
	8	5570	0.030	830	3580	0.027	480	2790	0.022	310	1590	0.021	170		
	10	4460	0.036	800	2870	0.032	460	2230	0.027	300	1270	0.025	160		
	12	3720	0.041	760	2390	0.037	440	1860	0.031	280	1060	0.029	150		
	16	2790	0.051	710	1790	0.046	410	1390	0.038	270	800	0.036	140		
20	2230	0.062	690	1430	0.056	400	1110	0.047	260	640	0.043	140			

	Material Group ISO 513	P1 P2 M1 K1				P3 P4 M2 K2 K3			P5 M3 M4 K4 S1 S4				S2 S3 S5		
	Hardness/Rm	≤ 700 N/mm ²				700-1000 N/mm ²			≤ 35 HRC				≤ 40 HRC		
	ap x ae	2D x 0.2D				2D x 0.1D			1.5D x 0.1D				1.5D x 0.1D		
	Vc (m/min)	190-230				130-150			100-120				50-70		
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)		
	6	11150	0.057	3200	7430	0.052	1920	5840	0.046	1340	3180	0.063	1000		
	8	8360	0.074	3110	5570	0.067	1860	4380	0.060	1300	2390	0.082	980		
	10	6690	0.089	2990	4460	0.080	1790	3500	0.071	1250	1910	0.098	940		
	12	5570	0.102	2840	3720	0.092	1710	2920	0.082	1190	1590	0.112	890		
	16	4180	0.128	2660	2790	0.115	1600	2190	0.102	1120	1190	0.140	830		
20	3340	0.155	2590	2230	0.140	1560	1750	0.124	1090	960	0.171	820			
ap x ae	≤ D5	1.5D x 0.1D				1.5D x 0.1D			D x 0.1D				D x 0.1D		

NOTES:

Down milling CNC programming is required.

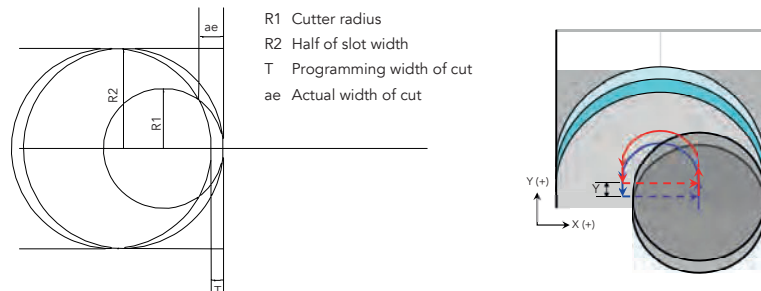
"ae" value max 0.2xD - "T" value max 0.1xD.

The use of end mill with diameter 30-40% smaller than the width of the slot is recommended.

The cutting conditions are based on CNC programming with medium dynamic speed.

With lower CNC dynamic speed, use the same cutting conditions or reduce the cutting speed Vc.

With higher CNC dynamic speed, reduce the "T" value by approximately -30 -50% and apply the maximum available cutting speed Vc.



HF643

	Material Group ISO 513	P1 P2 M1 K1			P3 P4 M2 K2 K3			P5 M3 M4 K4 S1 S4				S2 S3 S5		
	Hardness/Rm	≤ 700 N/mm ²			700-1000 N/mm ²			≤ 35 HRC				≤ 40 HRC		
	ap x ae	1.5D x 0.5D			1.5D x 0.5D			1.2D x 0.3D				1.2D x 0.3D		
	Vc (m/min)	160-180			100-120			70-90				40-60		
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	
	4	13540	0.019	1280	8760	0.017	740	6370	0.015	480	3980	0.021	410	
	5	10830	0.023	1270	7010	0.021	740	5100	0.019	480	3180	0.026	410	
	6	9020	0.028	1240	5840	0.025	720	4250	0.022	470	2650	0.030	400	
	8	6770	0.036	1210	4380	0.032	700	3180	0.029	450	1990	0.039	390	
	10	5410	0.043	1160	3500	0.039	670	2550	0.034	440	1590	0.047	370	
12	4510	0.049	1100	2920	0.044	640	2120	0.039	420	1330	0.054	360		
16	3380	0.061	1030	2190	0.055	600	1590	0.049	390	1000	0.067	340		
20	2710	0.074	1010	1750	0.067	590	1270	0.060	380	800	0.082	330		
ap x ae	≤ D5	1.5D x 0.3D			1.5D x 0.3D			1.2D x 0.2D				1.2D x 0.2D		

	Material Group ISO 513	P1 P2 M1 K1			P3 P4 M2 K2 K3			P5 M3 M4 K4 S1 S4				S2 S3 S5		
	Hardness/Rm	≤ 700 N/mm ²			700-1000 N/mm ²			≤ 35 HRC				≤ 40 HRC		
	α° x ae	5° x 0.4D			3° x 0.4D			3° x 0.4D				3° x 0.4D		
	Vc (m/min)	130-150			80-100			60-80				30-50		
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	
	4	11150	0.011	640	7170	0.011	385	5570	0.009	263	3180	0.009	140	
	5	8920	0.014	635	5730	0.013	380	4460	0.012	262	2550	0.011	140	
	6	7430	0.017	620	4780	0.016	370	3720	0.014	256	2120	0.013	136	
	8	5570	0.022	605	3580	0.020	360	2790	0.018	249	1590	0.017	133	
	10	4460	0.026	580	2870	0.024	350	2230	0.021	239	1270	0.020	127	
12	3720	0.030	555	2390	0.028	330	1860	0.024	228	1060	0.023	121		
16	2790	0.037	520	1790	0.035	310	1390	0.031	213	800	0.029	114		
20	2230	0.045	505	1430	0.042	300	1110	0.037	207	640	0.035	111		
α° max	≤ D5	2°			2°			1°				1°		

	Material Group ISO 513	P1 P2 M1 K1			P3 P4 M2 K2 K3			P5 M3 M4 K4 S1 S4				S2 S3 S5		
	Hardness/Rm	≤ 700 N/mm ²			700-1000 N/mm ²			≤ 35 HRC				≤ 40 HRC		
	α° x ae	15° x D			10° x D			5° x D				5° x D		
	Vc (m/min)	130-150			80-100			60-80				30-50		
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	
	4	11150	0.013	700	7170	0.012	415	5570	0.011	306	3180	0.015	240	
	5	8920	0.016	695	5730	0.014	410	4460	0.014	305	2550	0.019	240	
	6	7430	0.018	680	4780	0.017	405	3720	0.016	298	2120	0.022	234	
	8	5570	0.024	660	3580	0.022	390	2790	0.021	290	1590	0.029	227	
	10	4460	0.028	635	2870	0.026	375	2230	0.025	278	1270	0.034	218	
12	3720	0.033	605	2390	0.030	360	1860	0.029	265	1060	0.039	208		
16	2790	0.041	570	1790	0.037	335	1390	0.036	248	800	0.049	196		
20	2230	0.050	550	1430	0.046	325	1110	0.043	241	640	0.060	191		

PARAMETERS SUGGESTED WITH HIGH PRECISION WELDON CHUCK AND STABLE MACHINING CONDITION.
FOR APPLICATION ON HIGH POWER MILLING CHUCK, PLEASE REFER TO HF642 PARAMETERS.

HF643

	Material Group ISO 513	P1 P2 M1 K1			P3 P4 M2 K2 K3			P5 M3 M4 K4 S1 S4			S2 S3 S5		
	Hardness/Rm	≤ 700 N/mm ²			700-1000 N/mm ²			≤ 35 HRC			≤ 40 HRC		
	ap x ae	D x 0.4D			D x 0.4D			D x 0.25D			D x 0.25D		
	Vc (m/min)	130-150			80-100			60-80			30-50		
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)
	4	11150	0.016	880	7170	0.014	510	5570	0.012	330	3180	0.011	180
	5	8920	0.020	870	5730	0.018	500	4460	0.015	330	2550	0.014	170
	6	7430	0.023	850	4780	0.021	490	3720	0.017	320	2120	0.016	170
	8	5570	0.030	830	3580	0.027	480	2790	0.022	310	1590	0.021	170
	10	4460	0.036	800	2870	0.032	460	2230	0.027	300	1270	0.025	160
12	3720	0.041	760	2390	0.037	440	1860	0.031	280	1060	0.029	150	
16	2790	0.051	710	1790	0.046	410	1390	0.038	270	800	0.036	140	
20	2230	0.062	690	1430	0.056	400	1110	0.047	260	640	0.043	140	

	Material Group ISO 513	P1 P2 M1 K1			P3 P4 M2 K2 K3			P5 M3 M4 K4 S1 S4			S2 S3 S5		
	Hardness/Rm	≤ 700 N/mm ²			700-1000 N/mm ²			≤ 35 HRC			≤ 40 HRC		
	ap x ae	2D x 0.2D			2D x 0.1D			1.5D x 0.1D			1.5D x 0.1D		
	Vc (m/min)	190-230			130-150			100-120			50-70		
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)
	4	16720	0.039	3290	11150	0.035	1970	8760	0.031	1380	4780	0.043	1030
	5	13380	0.049	3270	8920	0.044	1960	7010	0.039	1370	3820	0.054	1030
	6	11150	0.057	3200	7430	0.052	1920	5840	0.046	1340	3180	0.063	1000
	8	8360	0.074	3110	5570	0.067	1860	4380	0.060	1300	2390	0.082	980
	10	6690	0.089	2990	4460	0.080	1790	3500	0.071	1250	1910	0.098	940
12	5570	0.102	2840	3720	0.092	1710	2920	0.082	1190	1590	0.112	890	
16	4180	0.128	2660	2790	0.115	1600	2190	0.102	1120	1190	0.140	830	
20	3340	0.155	2590	2230	0.140	1560	1750	0.124	1090	960	0.171	820	
ap x ae	≤ D5	1.5D x 0.1D			1.5D x 0.1D			D x 0.1D			D x 0.1D		

NOTES:

Down milling CNC programming is required.

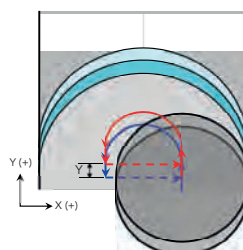
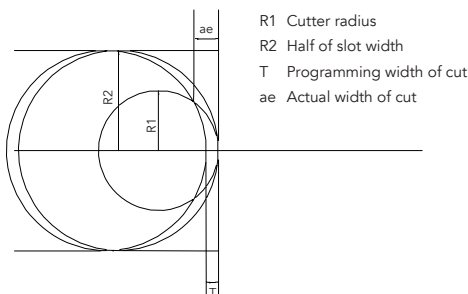
"ae" value max 0.2xD - "T" value max 0.1xD.

The use of end mill with diameter 30-40% smaller than the width of the slot is recommended.

The cutting conditions are based on CNC programming with medium dynamic speed.

With lower CNC dynamic speed, use the same cutting conditions or reduce the cutting speed Vc.

With higher CNC dynamic speed, reduce the "T" value by approximately -30 -50% and apply the maximum available cutting speed Vc.



PARAMETERS SUGGESTED WITH HIGH PRECISION WELDON CHUCK AND STABLE MACHINING CONDITION.
FOR APPLICATION ON HIGH POWER MILLING CHUCK, PLEASE REFER TO HF642 PARAMETERS.

INFO
TYPHOON TA-HTA-4HTA
TYPHOON PU-HPU
TYPHOON SUH
TYPHOON ALH
TYPHOON HRC
TYPHOON SUH MINI
TYPHOON HL
C-SD-TA
LFTA
SUTA
HSS-HSS/CO DRILLS
G2
MDTA
HF VH/UP
MEF
ALU
MEX
UH
HSS/CO-HSSP END MILLS
CARBIDE BURRS

HF742

	Material Group ISO 513	P1 P2 M1 K1				P3 P4 M2 K2 K3			P5 M3 M4 K4 S1 S4				S2 S3 S5		
	Hardness/Rm	≤ 700 N/mm ²				700-1000 N/mm ²			≤ 35 HRC				≤ 40 HRC		
	ap x ae	1.5D x 0.3D				1.5D x 0.3D			1.2D x 0.2D				1.2D x 0.2D		
	Vc (m/min)	110-130				70-90			50-70				30-50		
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)		
	6	6370	0.023	740	4250	0.021	450	3180	0.019	300	2120	0.026	270		
	8	4780	0.028	660	3180	0.025	400	2390	0.022	260	1590	0.030	240		
10	3820	0.033	630	2550	0.030	380	1910	0.026	250	1270	0.036	230			
12	3180	0.037	590	2120	0.033	350	1590	0.030	240	1060	0.041	220			
16	2390	0.042	510	1590	0.038	300	1190	0.034	200	800	0.047	190			
20	1910	0.057	540	1270	0.051	330	960	0.046	220	640	0.063	200			

	Material Group ISO 513	P1 P2 M1 K1				P3 P4 M2 K2 K3			P5 M3 M4 K4 S1 S4				S2 S3 S5		
	Hardness/Rm	≤ 700 N/mm ²				700-1000 N/mm ²			≤ 35 HRC				≤ 40 HRC		
	α° x ae	4° x 0.4D				3° x 0.4D			3° x 0.4D				2° x 0.4D		
	Vc (m/min)	90-110				60-80			40-60				20-40		
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)		
	6	5310	0.016	435	3720	0.016	290	2650	0.013	172	1590	0.014	109		
	8	3980	0.019	385	2790	0.018	255	1990	0.015	153	1190	0.016	96		
10	3180	0.023	365	2230	0.022	245	1590	0.018	145	960	0.019	92			
12	2650	0.026	345	1860	0.025	230	1330	0.021	137	800	0.022	87			
16	1990	0.030	295	1390	0.028	195	1000	0.024	118	600	0.025	74			
20	1590	0.040	315	1110	0.038	210	800	0.032	127	480	0.033	80			

	Material Group ISO 513	P1 P2 M1 K1				P3 P4 M2 K2 K3			P5 M3 M4 K4 S1 S4				S2 S3 S5		
	Hardness/Rm	≤ 700 N/mm ²				700-1000 N/mm ²			≤ 35 HRC				≤ 40 HRC		
	α° x ae	5° x D				4° x D			3° x D				3° x D		
	Vc (m/min)	80-100				50-70			35-55				20-30		
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)		
	6	4780	0.017	405	3180	0.016	250	2390	0.015	179	1330	0.021	137		
	8	3580	0.020	360	2390	0.019	225	1790	0.018	158	1000	0.024	122		
10	2870	0.024	345	1910	0.022	215	1430	0.021	150	800	0.029	116			
12	2390	0.027	325	1590	0.025	200	1190	0.024	142	660	0.033	108			
16	1790	0.031	275	1190	0.029	170	900	0.027	122	500	0.037	93			
20	1430	0.042	295	960	0.039	185	720	0.037	131	400	0.050	100			

- INFO
- TYPHOON TA-HTA-4HTA
- TYPHOON PU-HPU
- TYPHOON SUH
- TYPHOON ALH
- TYPHOON HRC
- TYPHOON SUH MINI
- TYPHOON HL
- C-SD-TA
- LFTA
- SUTA
- HSS-HSS/CO DRILLS
- G2
- MDTA
- HF VH/UP
- MEF
- ALU
- MEX
- UH
- HSS/CO-HSSP END MILLS
- CARBIDE BURRS

HF742

	Material Group ISO 513	P1 P2 M1 K1				P3 P4 M2 K2 K3			P5 M3 M4 K4 S1 S4				S2 S3 S5		
	Hardness/Rm	≤ 700 N/mm ²				700-1000 N/mm ²			≤ 35 HRC				≤ 40 HRC		
	ap x ae	D x 0.4D				D x 0.4D			D x 0.25D				D x 0.25D		
	Vc (m/min)	80-100				50-70			35-55				20-30		
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)		
	6	4780	0.022	520	3180	0.019	310	2390	0.016	190	1330	0.015	100		
	8	3580	0.026	460	2390	0.023	280	1790	0.019	170	1000	0.018	90		
	10	2870	0.030	440	1910	0.027	260	1430	0.023	160	800	0.021	90		
	12	2390	0.034	410	1590	0.031	250	1190	0.026	150	660	0.024	80		
	16	1790	0.039	350	1190	0.035	210	900	0.029	130	500	0.027	70		
20	1430	0.053	380	960	0.048	230	720	0.040	140	400	0.037	70			

	Material Group ISO 513	P1 P2 M1 K1				P3 P4 M2 K2 K3			P5 M3 M4 K4 S1 S4				S2 S3 S5		
	Hardness/Rm	≤ 700 N/mm ²				700-1000 N/mm ²			≤ 35 HRC				≤ 40 HRC		
	ap x ae	3D x 0.1D				3D x 0.1D			2D x 0.1D				2D x 0.1D		
	Vc (m/min)	130-170				100-120			70-90				40-60		
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)		
	6	7960	0.054	2150	5840	0.049	1420	4250	0.043	920	2650	0.059	790		
	8	5970	0.064	1910	4380	0.058	1260	3180	0.051	810	1990	0.070	700		
	10	4780	0.076	1820	3500	0.068	1200	2550	0.061	780	1590	0.084	660		
	12	3980	0.086	1710	2920	0.077	1130	2120	0.069	730	1330	0.095	630		
	16	2990	0.098	1470	2190	0.088	970	1590	0.078	620	1000	0.108	540		
20	2390	0.132	1580	1750	0.119	1040	1270	0.106	670	800	0.145	580			

NOTES:

Down milling CNC programming is required.

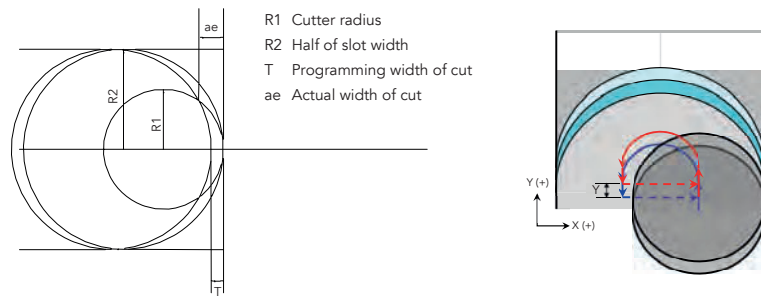
"ae" value max 0.2xD - "T" value max 0.1xD.

The use of end mill with diameter 30-40% smaller than the width of the slot is recommended.

The cutting conditions are based on CNC programming with medium dynamic speed.

With lower CNC dynamic speed, use the same cutting conditions or reduce the cutting speed Vc.

With higher CNC dynamic speed, reduce the "T" value by approximately -30 -50% and apply the maximum available cutting speed Vc.



HF743

	Material Group ISO 513	P1 P2 M1 K1				P3 P4 M2 K2 K3			P5 M3 M4 K4 S1 S4				S2 S3 S5		
	Hardness/Rm	≤ 700 N/mm ²				700-1000 N/mm ²			≤ 35 HRC				≤ 40 HRC		
	ap x ae	1.5D x 0.3D				1.5D x 0.3D			1.2D x 0.2D				1.2D x 0.2D		
	Vc (m/min)	110-130				70-90			50-70				30-50		
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)		
	6	6370	0.023	740	4250	0.021	450	3180	0.019	300	2120	0.026	270		
	8	4780	0.028	660	3180	0.025	400	2390	0.022	260	1590	0.030	240		
	10	3820	0.033	630	2550	0.030	380	1910	0.026	250	1270	0.036	230		
	12	3180	0.037	590	2120	0.033	350	1590	0.030	240	1060	0.041	220		
	16	2390	0.042	510	1590	0.038	300	1190	0.034	200	800	0.047	190		
20	1910	0.057	540	1270	0.051	330	960	0.046	220	640	0.063	200			

	Material Group ISO 513	P1 P2 M1 K1				P3 P4 M2 K2 K3			P5 M3 M4 K4 S1 S4				S2 S3 S5		
	Hardness/Rm	≤ 700 N/mm ²				700-1000 N/mm ²			≤ 35 HRC				≤ 40 HRC		
	α° x ae	4° x 0.4D				3° x 0.4D			3° x 0.4D				2° x 0.4D		
	Vc (m/min)	90-110				60-80			40-60				20-40		
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)		
	6	5310	0.016	435	3720	0.016	290	2650	0.013	172	1590	0.014	109		
	8	3980	0.019	385	2790	0.018	255	1990	0.015	153	1190	0.016	96		
	10	3180	0.023	365	2230	0.022	245	1590	0.018	145	960	0.019	92		
	12	2650	0.026	345	1860	0.025	230	1330	0.021	137	800	0.022	87		
	16	1990	0.030	295	1390	0.028	195	1000	0.024	118	600	0.025	74		
20	1590	0.040	315	1110	0.038	210	800	0.032	127	480	0.033	80			

	Material Group ISO 513	P1 P2 M1 K1				P3 P4 M2 K2 K3			P5 M3 M4 K4 S1 S4				S2 S3 S5		
	Hardness/Rm	≤ 700 N/mm ²				700-1000 N/mm ²			≤ 35 HRC				≤ 40 HRC		
	α° x ae	5° x D				4° x D			3° x D				3° x D		
	Vc (m/min)	80-100				50-70			35-55				20-30		
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)		
	6	4780	0.017	405	3180	0.016	250	2390	0.015	179	1330	0.021	137		
	8	3580	0.020	360	2390	0.019	225	1790	0.018	158	1000	0.024	122		
	10	2870	0.024	345	1910	0.022	215	1430	0.021	150	800	0.029	116		
	12	2390	0.027	325	1590	0.025	200	1190	0.024	142	660	0.033	108		
	16	1790	0.031	275	1190	0.029	170	900	0.027	122	500	0.037	93		
20	1430	0.042	295	960	0.039	185	720	0.037	131	400	0.050	100			

PARAMETERS SUGGESTED WITH HIGH PRECISION WELDON CHUCK AND STABLE MACHINING CONDITION.
FOR APPLICATION ON HIGH POWER MILLING CHUCK, PLEASE REFER TO HF742 PARAMETERS.

HF743

	Material Group ISO 513	P1 P2 M1 K1				P3 P4 M2 K2 K3			P5 M3 M4 K4 S1 S4				S2 S3 S5		
	Hardness/Rm	≤ 700 N/mm ²				700-1000 N/mm ²			≤ 35 HRC				≤ 40 HRC		
	ap x ae	D x 0.4D				D x 0.4D			D x 0.25D				D x 0.25D		
	Vc (m/min)	80-100				50-70			35-55				20-30		
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)		
	6	4780	0.022	520	3180	0.019	310	2390	0.016	190	1330	0.015	100		
	8	3580	0.026	460	2390	0.023	280	1790	0.019	170	1000	0.018	90		
10	2870	0.030	440	1910	0.027	260	1430	0.023	160	800	0.021	90			
12	2390	0.034	410	1590	0.031	250	1190	0.026	150	660	0.024	80			
16	1790	0.039	350	1190	0.035	210	900	0.029	130	500	0.027	70			
20	1430	0.053	380	960	0.048	230	720	0.040	140	400	0.037	70			

	Material Group ISO 513	P1 P2 M1 K1				P3 P4 M2 K2 K3			P5 M3 M4 K4 S1 S4				S2 S3 S5		
	Hardness/Rm	≤ 700 N/mm ²				700-1000 N/mm ²			≤ 35 HRC				≤ 40 HRC		
	ap x ae	3D x 0.1D				3D x 0.1D			2D x 0.1D				2D x 0.1D		
	Vc (m/min)	130-170				100-120			70-90				40-60		
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)		
	6	7960	0.054	2150	5840	0.049	1420	4250	0.043	920	2650	0.059	790		
	8	5970	0.064	1910	4380	0.058	1260	3180	0.051	810	1990	0.070	700		
10	4780	0.076	1820	3500	0.068	1200	2550	0.061	780	1590	0.084	660			
12	3980	0.086	1710	2920	0.077	1130	2120	0.069	730	1330	0.095	630			
16	2990	0.098	1470	2190	0.088	970	1590	0.078	620	1000	0.108	540			
20	2390	0.132	1580	1750	0.119	1040	1270	0.106	670	800	0.145	580			

NOTES:

Down milling CNC programming is required.

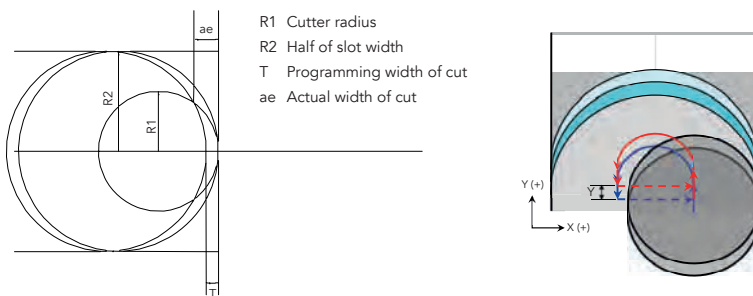
"ae" value max 0.2xD - "T" value max 0.1xD.

The use of end mill with diameter 30-40% smaller than the width of the slot is recommended.

The cutting conditions are based on CNC programming with medium dynamic speed.

With lower CNC dynamic speed, use the same cutting conditions or reduce the cutting speed Vc.

With higher CNC dynamic speed, reduce the "T" value by approximately -30 -50% and apply the maximum available cutting speed Vc.



PARAMETERS SUGGESTED WITH HIGH PRECISION WELDON CHUCK AND STABLE MACHINING CONDITION.
 FOR APPLICATION ON HIGH POWER MILLING CHUCK, PLEASE REFER TO HF742 PARAMETERS.

- INFO
- TYPHOON TA-HTA-4HTA
- TYPHOON PU-HPU
- TYPHOON SUH
- TYPHOON ALH
- TYPHOON HRC
- TYPHOON SUH MINI
- TYPHOON HL
- C-SD-TA
- LFTA
- SUTA
- HSS-HSS/CO DRILLS
- G2
- MDTA
- HF VH/UP
- MEF
- ALU
- MEX
- UH
- HSS/CO-HSSP END MILLS
- CARBIDE BURRS

CUTTING PARAMETERS

HF861

	Material Group ISO 513	P1 P2 M1 K1			P3 P4 M2 K2 K3			P5 M3 M4 K4 S1 S4			S2 S3 S5		
	Hardness/Rm	≤ 700 N/mm ²			700-1000 N/mm ²			≤ 35 HRC			≤ 40 HRC		
	ap x ae	D x D			D x D			0.5D x D			0.5D x D		
	Vc (m/min)	130-150			80-100			60-80			30-50		
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)
	1	30000	0.005	600	28660	0.005	520	22290	0.004	330	12740	0.004	180
	1.5	29720	0.008	890	19110	0.007	520	14860	0.006	330	8490	0.005	180
	2	22290	0.010	890	14330	0.009	520	11150	0.008	330	6370	0.007	180
	3	14860	0.014	830	9550	0.013	480	7430	0.011	310	4250	0.010	170
	4	11150	0.019	830	7170	0.017	480	5570	0.014	310	3180	0.013	160
	5	8920	0.023	820	5730	0.021	470	4460	0.017	310	2550	0.016	160
	6	7430	0.027	800	4780	0.024	460	3720	0.020	300	2120	0.019	160
	8	5570	0.035	780	3580	0.032	450	2790	0.026	290	1590	0.025	160
	10	4460	0.042	750	2870	0.038	430	2230	0.032	280	1270	0.029	150
12	3720	0.048	710	2390	0.043	410	1860	0.036	270	1060	0.034	140	
14	3180	0.054	690	2050	0.049	400	1590	0.041	260	910	0.038	140	
16	2790	0.060	670	1790	0.054	390	1390	0.045	250	800	0.042	130	
18	2480	0.066	650	1590	0.059	380	1240	0.050	250	710	0.046	130	
20	2230	0.073	650	1430	0.066	380	1110	0.055	240	640	0.051	130	
ap x ae	D1	0.25D x D											
ap x ae	≤ D3	0.5D x D											

	Material Group ISO 513	P1 P2 M1 K1			P3 P4 M2 K2 K3								
	Hardness/Rm	≤ 700 N/mm ²			700-1000 N/mm ²								
	ap x ae	1.5D x D			1.5D x D								
	Vc (m/min)	100-120			60-80								
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)						
	8	4380	0.028	490	2790	0.025	280						
	10	3500	0.034	470	2230	0.030	270						
	12	2920	0.038	450	1860	0.035	260						
	14	2500	0.043	430	1590	0.039	250						
	16	2190	0.048	420	1390	0.043	240						
18	1950	0.053	410	1240	0.048	240							
20	1750	0.058	410	1110	0.053	230							

	Material Group ISO 513	P1 P2 M1 K1										
	Hardness/Rm	≤ 700 N/mm ²										
	ap x ae	2D x D										
	Vc (m/min)	75-95										
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)								
	10	2710	0.025	270								
	12	2260	0.029	260								
	14	1930	0.032	250								
16	1690	0.036	240									
18	1500	0.040	240									
20	1350	0.044	240									

PARAMETERS SUGGESTED WITH HIGH PRECISION WELDON CHUCK AND STABLE MACHINING CONDITION. FOR APPLICATION ON HIGH POWER MILLING CHUCK, PLEASE REFER TO HF840 PARAMETERS.

- INFO
- TYPHOON TA-HTA-4HTA
- TYPHOON PU-HPU
- TYPHOON SUH
- TYPHOON ALH
- TYPHOON HRC
- TYPHOON SUH MINI
- TYPHOON HL
- C-SD-TA
- LFTA
- SUTA
- HSS-HSS/CO DRILLS
- G2
- MDTA
- HF VH/UP
- MEF
- ALU
- MEX
- UH
- HSS/CO-HSSP END MILLS
- CARBIDE BURRS

HF861

	Material Group ISO 513	P1 P2 M1 K1				P3 P4 M2 K2 K3			P5 M3 M4 K4 S1 S4				S2 S3 S5		
	Hardness/Rm	≤ 700 N/mm ²				700-1000 N/mm ²			≤ 35 HRC				≤ 40 HRC		
	ap x ae	1.5D x 0.5D				1.5D x 0.5D			1.2D x 0.3D				1.2D x 0.3D		
	Vc (m/min)	160-180				100-120			70-90				40-60		
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)		
	1	30000	0.006	720	30000	0.005	650	25480	0.005	490	15920	0.007	420		
	1.5	36090	0.009	1300	23350	0.008	760	16990	0.007	490	10620	0.010	420		
	2	27070	0.012	1300	17520	0.011	760	12740	0.010	490	7960	0.013	420		
	3	18050	0.017	1210	11680	0.015	710	8490	0.013	460	5310	0.018	390		
	4	13540	0.022	1200	8760	0.020	700	6370	0.018	450	3980	0.024	390		
	5	10830	0.028	1200	7010	0.025	700	5100	0.022	450	3180	0.030	390		
	6	9020	0.032	1170	5840	0.029	680	4250	0.026	440	2650	0.036	380		
	8	6770	0.042	1140	4380	0.038	660	3180	0.034	430	1990	0.046	370		
	10	5410	0.050	1090	3500	0.045	640	2550	0.040	410	1590	0.055	350		
12	4510	0.058	1040	2920	0.052	610	2120	0.046	390	1330	0.063	340			
14	3870	0.065	1000	2500	0.058	580	1820	0.052	380	1140	0.071	330			
16	3380	0.072	970	2190	0.065	570	1590	0.058	370	1000	0.079	320			
18	3010	0.079	950	1950	0.071	560	1420	0.063	360	880	0.087	310			
20	2710	0.088	950	1750	0.079	550	1270	0.070	360	800	0.096	310			
ap x ae	≤ D3				1.5D x 0.1D										

	Material Group ISO 513	P1 P2 M1 K1				P3 P4 M2 K2 K3			P5 M3 M4 K4 S1 S4				S2 S3 S5		
	Hardness/Rm	≤ 700 N/mm ²				700-1000 N/mm ²			≤ 35 HRC				≤ 40 HRC		
	α° x ae	5° x 0.4D				4° x 0.4D			3° x 0.4D				3° x 0.4D		
	Vc (m/min)	130-150				80-100			60-80				30-50		
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)		
	1	30000	0.004	435	28660	0.003	390	22290	0.003	268	12740	0.003	143		
	1.5	29720	0.005	650	19110	0.005	390	14860	0.005	268	8490	0.004	143		
	2	22290	0.007	650	14330	0.007	390	11150	0.006	268	6370	0.006	143		
	3	14860	0.010	605	9550	0.010	365	7430	0.008	250	4250	0.008	133		
	4	11150	0.013	600	7170	0.013	360	5570	0.011	247	3180	0.010	132		
	5	8920	0.017	600	5730	0.016	360	4460	0.014	246	2550	0.013	131		
	6	7430	0.020	585	4780	0.018	350	3720	0.016	241	2120	0.015	128		
	8	5570	0.025	570	3580	0.024	340	2790	0.021	235	1590	0.020	125		
	10	4460	0.031	545	2870	0.029	325	2230	0.025	225	1270	0.024	120		
12	3720	0.035	520	2390	0.033	310	1860	0.029	214	1060	0.027	114			
14	3180	0.039	500	2050	0.037	300	1590	0.032	206	910	0.030	110			
16	2790	0.044	490	1790	0.041	290	1390	0.036	200	800	0.034	108			
18	2480	0.048	475	1590	0.045	285	1240	0.040	197	710	0.037	105			
20	2230	0.053	475	1430	0.050	285	1110	0.044	195	640	0.041	105			
α° max	≤ D3				1°										

PARAMETERS SUGGESTED WITH HIGH PRECISION WELDON CHUCK AND STABLE MACHINING CONDITION.
FOR APPLICATION ON HIGH POWER MILLING CHUCK, PLEASE REFER TO HF840 PARAMETERS.

HF861

	Material Group ISO 513	P1 P2 M1 K1			P3 P4 M2 K2 K3			P5 M3 M4 K4 S1 S4			S2 S3 S5		
	Hardness/Rm	≤ 700 N/mm ²			700-1000 N/mm ²			≤ 35 HRC			≤ 40 HRC		
	α° x ae	15° x D			10° x D			5° x D			5° x D		
	Vc (m/min)	130-150			80-100			60-80			30-50		
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)
	6	7430	0.022	640	4780	0.020	380	3720	0.019	281	2120	0.026	220
	8	5570	0.028	620	3580	0.026	370	2790	0.024	273	1590	0.034	214
	10	4460	0.034	600	2870	0.031	355	2230	0.029	262	1270	0.040	205
	12	3720	0.038	570	2390	0.035	335	1860	0.034	250	1060	0.046	196
	14	3180	0.043	550	2050	0.040	325	1590	0.038	240	910	0.052	189
16	2790	0.048	535	1790	0.044	315	1390	0.042	233	800	0.058	185	
18	2480	0.053	520	1590	0.048	310	1240	0.046	229	710	0.063	180	
20	2230	0.058	520	1430	0.054	305	1110	0.051	227	640	0.070	180	

	Material Group ISO 513	P1 P2 M1 K1			P3 P4 M2 K2 K3			P5 M3 M4 K4 S1 S4			S2 S3 S5		
	Hardness/Rm	≤ 700 N/mm ²			700-1000 N/mm ²			≤ 35 HRC			≤ 40 HRC		
	ap x ae	D x 0.4D			D x 0.4D			D x 0.25D			D x 0.25D		
	Vc (m/min)	130-150			80-100			60-80			30-50		
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)
	6	7430	0.027	800	4780	0.024	460	3720	0.020	300	2120	0.019	160
	8	5570	0.035	780	3580	0.032	450	2790	0.026	290	1590	0.025	160
	10	4460	0.042	750	2870	0.038	430	2230	0.032	280	1270	0.029	150
	12	3720	0.048	710	2390	0.043	410	1860	0.036	270	1060	0.034	140
	14	3180	0.054	690	2050	0.049	400	1590	0.041	260	910	0.038	140
16	2790	0.060	670	1790	0.054	390	1390	0.045	250	800	0.042	130	
18	2480	0.066	650	1590	0.059	380	1240	0.050	250	710	0.046	130	
20	2230	0.073	650	1430	0.066	380	1110	0.055	240	640	0.051	130	

	Material Group ISO 513	P1 P2 M1 K1			P3 P4 M2 K2 K3			P5 M3 M4 K4 S1 S4			S2 S3 S5		
	Hardness/Rm	≤ 700 N/mm ²			700-1000 N/mm ²			≤ 35 HRC			≤ 40 HRC		
	ap x ae	D x D			D x D			0.5D x D			0.5D x D		
	Vc (m/min)	100-120			60-80			45-65			20-40		
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)
	1	30000	0.003	300	22290	0.002	200	17520	0.002	140	9550	0.003	110
	1.5	23350	0.004	350	14860	0.003	200	11680	0.003	140	6370	0.004	110
	2	17520	0.005	350	11150	0.005	200	8760	0.004	140	4780	0.006	110
	3	11680	0.007	330	7430	0.006	190	5840	0.006	130	3180	0.008	100
	4	8760	0.009	320	5570	0.008	190	4380	0.007	130	2390	0.010	100
5	7010	0.012	320	4460	0.010	180	3500	0.009	130	1910	0.013	100	
6	5840	0.014	320	3720	0.012	180	2920	0.011	130	1590	0.015	90	
8	4380	0.018	310	2790	0.016	180	2190	0.014	120	1190	0.019	90	
10	3500	0.021	290	2230	0.019	170	1750	0.017	120	960	0.023	90	
12	2920	0.024	280	1860	0.022	160	1460	0.019	110	800	0.026	80	
14	2500	0.027	270	1590	0.024	150	1250	0.022	110	680	0.030	80	
16	2190	0.030	260	1390	0.027	150	1090	0.024	100	600	0.033	80	
18	1950	0.033	260	1240	0.030	150	970	0.026	100	530	0.036	80	
20	1750	0.037	260	1110	0.033	150	880	0.029	100	480	0.040	80	
ap x ae	≤ D3	0.5D x D											

PARAMETERS SUGGESTED WITH HIGH PRECISION WELDON CHUCK AND STABLE MACHINING CONDITION.
 FOR APPLICATION ON HIGH POWER MILLING CHUCK, PLEASE REFER TO HF840 PARAMETERS.

- INFO
- TYPHOON TA-HTA-4HTA
- TYPHOON PU-HPU
- TYPHOON SUH
- TYPHOON ALH
- TYPHOON HRC
- TYPHOON SUH MINI
- TYPHOON HL
- C-SD-TA
- LFTA
- SUTA
- HSS-HSS/CO DRILLS
- G2
- MDTA
- HF VH/UP
- MEF
- ALU
- MEX
- UH
- HSS/CO-HSSP END MILLS
- CARBIDE BURRS

HF861

Material Group ISO 513	P1 P2 M1 K1			P3 P4 M2 K2 K3			P5 M3 M4 K4 S1 S4			S2 S3 S5		
	≤ 700 N/mm ²			700-1000 N/mm ²			≤ 35 HRC			≤ 40 HRC		
	2D x 0.2D			2D x 0.1D			1.5D x 0.1D			1.5D x 0.1D		
Hardness/Rm	2D x 0.2D			2D x 0.1D			1.5D x 0.1D			1.5D x 0.1D		
ap x ae	190-230			130-150			100-120			50-70		
Vc (m/min)	190-230			130-150			100-120			50-70		
D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)
1	30000	0.013	1500	30000	0.011	1350	30000	0.010	1200	19110	0.014	1050
1.5	23350	0.019	1750	29720	0.017	2010	23350	0.015	1400	12740	0.021	1050
2	30000	0.025	3000	22290	0.023	2010	17520	0.020	1400	9550	0.028	1050
3	22290	0.035	3120	14860	0.032	1870	11680	0.028	1310	6370	0.039	980
4	16720	0.046	3090	11150	0.042	1860	8760	0.037	1300	4780	0.051	970
5	13380	0.058	3080	8920	0.052	1850	7010	0.046	1290	3820	0.063	970
6	11150	0.068	3010	7430	0.061	1810	5840	0.054	1260	3180	0.074	940
8	8360	0.088	2930	5570	0.079	1750	4380	0.070	1230	2390	0.096	920
10	6690	0.105	2810	4460	0.095	1690	3500	0.084	1180	1910	0.116	880
12	5570	0.120	2670	3720	0.108	1610	2920	0.096	1120	1590	0.132	840
14	4780	0.135	2580	3180	0.122	1550	2500	0.108	1080	1360	0.149	810
16	4180	0.150	2510	2790	0.135	1510	2190	0.120	1050	1190	0.165	790
18	3720	0.165	2460	2480	0.149	1470	1950	0.132	1030	1060	0.182	770
20	3340	0.183	2440	2230	0.164	1470	1750	0.146	1020	960	0.201	770

ap x ae	D1	D x 0.1D	D x 0.1D	D x 0.1D	D x 0.1D
ap x ae	≤ D3	1.5D x 0.1D	1.5D x 0.1D	D x 0.1D	D x 0.1D



NOTES:

Down milling CNC programming is required.

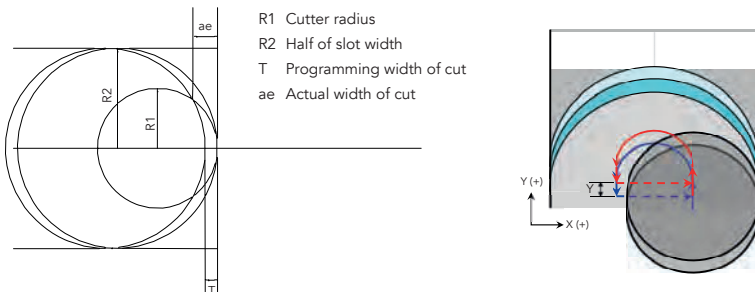
"ae" value max 0.2xD - "T" value max 0.1xD.

The use of end mill with diameter 30-40% smaller than the width of the slot is recommended.

The cutting conditions are based on CNC programming with medium dynamic speed.

With lower CNC dynamic speed, use the same cutting conditions or reduce the cutting speed Vc.

With higher CNC dynamic speed, reduce the "T" value by approximately -30 -50% and apply the maximum available cutting speed Vc.



R1 Cutter radius
 R2 Half of slot width
 T Programming width of cut
 ae Actual width of cut

PARAMETERS SUGGESTED WITH HIGH PRECISION WELDON CHUCK AND STABLE MACHINING CONDITION.
 FOR APPLICATION ON HIGH POWER MILLING CHUCK, PLEASE REFER TO HF840 PARAMETERS.

CUTTING PARAMETERS

HF850

	Material Group ISO 513	P4 M4 K4			P4 P5 M4 M5 K4 S1			P5 P6 M5 K4 S2 S3			H1 H4 H5		
	Hardness/Rm	800-1000 N/mm ²			900-1200 N/mm ²			35-45 HRC			≤ 55 HRC		
	ap x ae	0.5D x D			0.5D x D			0.3D x D			0.3D x D		
	Vc (m/min)	80-100			60-80			40-60			30-50		
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)
	3	9550	0.012	450	7430	0.011	320	5310	0.009	190	4250	0.008	140
	4	7170	0.016	450	5570	0.014	320	3980	0.012	190	3180	0.011	140
	5	5730	0.020	450	4460	0.018	310	3180	0.015	190	2550	0.014	140
	6	4780	0.023	440	3720	0.021	310	2650	0.017	180	2120	0.016	140
	8	3580	0.030	430	2790	0.027	300	1990	0.022	180	1590	0.021	130
	10	2870	0.036	410	2230	0.032	290	1590	0.027	170	1270	0.025	130
	12	2390	0.041	390	1860	0.037	270	1330	0.031	160	1060	0.029	120
14	2050	0.046	380	1590	0.041	260	1140	0.034	160	910	0.032	120	
16	1790	0.051	370	1390	0.046	260	1000	0.038	150	800	0.036	110	
20	1430	0.062	350	1110	0.056	250	800	0.047	150	640	0.043	110	
ap x ae	≤ D5		0.3D x D		0.3D x D		0.2D x D		0.1D x D				

	Material Group ISO 513	P4 M4 K4			P4 P5 M4 M5 K4 S1			P5 P6 M5 K4 S2 S3			H1 H4 H5		
	Hardness/Rm	800-1000 N/mm ²			900-1200 N/mm ²			35-45 HRC			≤ 55 HRC		
	ap x ae	1.5D x 0.3D			1.5D x 0.2D			1.2D x 0.2D			1.2D x 0.1D		
	Vc (m/min)	100-120			70-90			50-70			40-60		
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)
	3	11680	0.014	670	8490	0.013	440	6370	0.011	290	5310	0.016	330
	4	8760	0.019	660	6370	0.017	430	4780	0.015	290	3980	0.021	330
	5	7010	0.023	660	5100	0.021	430	3820	0.019	290	3180	0.026	330
	6	5840	0.028	640	4250	0.025	420	3180	0.022	280	2650	0.030	320
	8	4380	0.036	630	3180	0.032	410	2390	0.029	270	1990	0.039	310
	10	3500	0.043	600	2550	0.039	390	1910	0.034	260	1590	0.047	300
	12	2920	0.049	570	2120	0.044	370	1590	0.039	250	1330	0.054	290
14	2500	0.055	550	1820	0.050	360	1360	0.044	240	1140	0.061	280	
16	2190	0.061	540	1590	0.055	350	1190	0.049	230	1000	0.067	270	
20	1750	0.074	520	1270	0.067	340	960	0.060	230	800	0.082	260	
ap x ae	≤ D5		1.2D x 0.2D		1.2D x 0.1D		D x 0.2D		D x 0.1D				

	Material Group ISO 513	P4 M4 K4			P4 P5 M4 M5 K4 S1			P5 P6 M5 K4 S2 S3			H1 H4 H5		
	Hardness/Rm	800-1000 N/mm ²			900-1200 N/mm ²			35-45 HRC			≤ 55 HRC		
	α° x ae	5° x 0.4D			4° x 0.4D			3° x 0.4D			2° x 0.4D		
	Vc (m/min)	80-100			60-80			40-60			30-50		
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)
	3	9550	0.009	330	7430	0.008	240	5310	0.007	152	4250	0.008	128
	4	7170	0.011	330	5570	0.011	240	3980	0.009	150	3180	0.010	126
	5	5730	0.014	325	4460	0.013	235	3180	0.012	149	2550	0.012	126
	6	4780	0.017	320	3720	0.016	230	2650	0.014	146	2120	0.015	123
	8	3580	0.022	310	2790	0.020	225	1990	0.018	142	1590	0.019	120
	10	2870	0.026	300	2230	0.024	215	1590	0.021	136	1270	0.023	115
	12	2390	0.030	285	1860	0.028	205	1330	0.024	130	1060	0.026	109
14	2050	0.033	275	1590	0.031	200	1140	0.028	126	910	0.029	106	
16	1790	0.037	265	1390	0.035	190	1000	0.031	122	800	0.032	103	
20	1430	0.045	260	1110	0.042	185	800	0.037	119	640	0.039	100	
α°	≤ D5		2°		2°		1°		1°				

PARAMETERS SUGGESTED WITH HIGH POWER MILLING CHUCK AND STABLE MACHINING CONDITION

CUTTING PARAMETERS

HF850

	Material Group ISO 513	P4 M4 K4			P4 P5 M4 M5 K4 S1			P5 P6 M5 K4 S2 S3			H1 H4 H5		
	Hardness/Rm	800-1000 N/mm ²			900-1200 N/mm ²			35-45 HRC			≤ 55 HRC		
	α° x ae	5° x D			4° x D			3° x D			2° x D		
	Vc (m/min)	80-100			60-80			40-60			30-50		
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)
	6	4780	0.020	385	3720	0.019	280	2650	0.018	187	2120	0.027	232
	8	3580	0.026	370	2790	0.024	270	1990	0.023	182	1590	0.035	226
	10	2870	0.031	360	2230	0.029	260	1590	0.027	175	1270	0.043	216
	12	2390	0.036	340	1860	0.033	245	1330	0.031	167	1060	0.049	206
	14	2050	0.040	330	1590	0.037	240	1140	0.035	161	910	0.055	199
16	1790	0.045	320	1390	0.042	230	1000	0.039	157	800	0.061	195	
20	1430	0.054	310	1110	0.051	225	800	0.048	153	640	0.074	189	

	Material Group ISO 513	P4 M4 K4			P4 P5 M4 M5 K4 S1			P5 P6 M5 K4 S2 S3			H1 H4 H5		
	Hardness/Rm	800-1000 N/mm ²			900-1200 N/mm ²			35-45 HRC			≤ 55 HRC		
	ap x ae	D x 0.4D			D x 0.4D			D x 0.25D			D x 0.25D		
	Vc (m/min)	80-100			60-80			40-60			30-50		
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)
	6	4780	0.023	440	3720	0.021	310	2650	0.017	180	2120	0.016	140
	8	3580	0.030	430	2790	0.027	300	1990	0.022	180	1590	0.021	130
	10	2870	0.036	410	2230	0.032	290	1590	0.027	170	1270	0.025	130
	12	2390	0.041	390	1860	0.037	270	1330	0.031	160	1060	0.029	120
	14	2050	0.046	380	1590	0.041	260	1140	0.034	160	910	0.032	120
16	1790	0.051	370	1390	0.046	260	1000	0.038	150	800	0.036	110	
20	1430	0.062	350	1110	0.056	250	800	0.047	150	640	0.043	110	

- INFO
- TYPHOON TA-HTA-4HTA
- TYPHOON PU-HPU
- TYPHOON SUH
- TYPHOON ALH
- TYPHOON HRC
- TYPHOON SUH MINI
- TYPHOON HL
- C-SD-TA
- LFTA
- SUTA
- HSS-HSS/CO DRILLS
- G2
- MDTA
- HF VH/UP
- MEF
- ALU
- MEX
- UH
- HSS/CO-HSSP END MILLS
- CARBIDE BURRS

PARAMETERS SUGGESTED WITH HIGH POWER MILLING CHUCK AND STABLE MACHINING CONDITION

HF850

	Material Group ISO 513	P4 M4 K4			P4 P5 M4 M5 K4 S1			P5 P6 M5 K4 S2 S3			H1 H4 H5		
	Hardness/Rm	800-1000 N/mm ²			900-1200 N/mm ²			35-45 HRC			≤ 55 HRC		
	ap x ae	2D x 0.2D			2D x 0.1D			1.5D x 0.1D			1.5D x 0.1D		
	Vc (m/min)	130-150			100-120			70-90			50-70		
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)
	3	14860	0.030	1770	11680	0.027	1250	8490	0.024	810	6370	0.033	830
	4	11150	0.039	1750	8760	0.035	1240	6370	0.031	800	4780	0.043	830
	5	8920	0.049	1740	7010	0.044	1230	5100	0.039	800	3820	0.054	820
	6	7430	0.057	1710	5840	0.052	1210	4250	0.046	780	3180	0.063	800
	8	5570	0.074	1660	4380	0.067	1170	3180	0.060	760	2390	0.082	780
	10	4460	0.089	1590	3500	0.080	1120	2550	0.071	730	1910	0.098	750
	12	3720	0.102	1520	2920	0.092	1070	2120	0.082	690	1590	0.112	710
	14	3180	0.115	1460	2500	0.103	1030	1820	0.092	670	1360	0.126	690
16	2790	0.128	1420	2190	0.115	1010	1590	0.102	650	1190	0.140	670	
20	2230	0.155	1380	1750	0.140	980	1270	0.124	630	960	0.171	660	
ap x ae	≤ D5	1.5D x 0.1D			1.5D x 0.1D			D x 0.1D			D x 0.05D		

NOTES:

Down milling CNC programming is required.

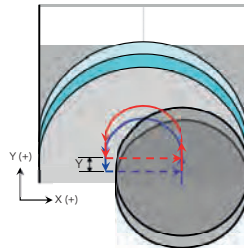
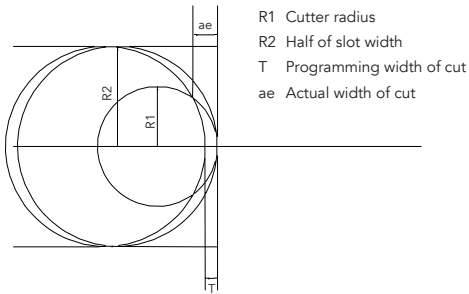
"ae" value max 0.2xD - "T" value max 0.1xD.

The use of end mill with diameter 30-40% smaller than the width of the slot is recommended.

The cutting conditions are based on CNC programming with medium dynamic speed.

With lower CNC dynamic speed, use the same cutting conditions or reduce the cutting speed Vc.

With higher CNC dynamic speed, reduce the "T" value by approximately -30 -50% and apply the maximum available cutting speed Vc.



- R1 Cutter radius
- R2 Half of slot width
- T Programming width of cut
- ae Actual width of cut

CUTTING PARAMETERS

HF450

	Material Group ISO 513	P4 M4 K4			P4 P5 M4 M5 K4 S1			P5 P6 M5 K4 S2 S3			H1 H4 H5		
	Hardness/Rm	800-1000 N/mm ²			900-1200 N/mm ²			35-45 HRC			≤ 55 HRC		
	ap x ae	0.5D x D			0.5D x D			0.3D x D			0.2D x D		
	Vc (m/min)	70-90			50-70			30-50			20-40		
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)
	3	8490	0.011	360	6370	0.010	250	4250	0.008	140	3180	0.007	100
	4	6370	0.014	360	4780	0.013	240	3180	0.011	140	2390	0.010	90
	5	5100	0.018	360	3820	0.016	240	2550	0.013	130	1910	0.012	90
	6	4250	0.021	350	3180	0.019	240	2120	0.015	130	1590	0.014	90
	8	3180	0.027	340	2390	0.024	230	1590	0.020	130	1190	0.019	90
10	2550	0.032	330	1910	0.029	220	1270	0.024	120	960	0.022	90	
12	2120	0.037	310	1590	0.033	210	1060	0.028	120	800	0.026	80	
14	1820	0.041	300	1360	0.037	200	910	0.031	110	680	0.029	80	
16	1590	0.046	290	1190	0.041	200	800	0.034	110	600	0.032	80	
20	1270	0.056	280	960	0.050	190	640	0.042	110	480	0.039	80	
ap x ae	≤ D5	0.3D x D			0.3D x D			0.2D x D			0.1D x D		

	Material Group ISO 513	P4 M4 K4			P4 P5 M4 M5 K4 S1			P5 P6 M5 K4 S2 S3			H1 H4 H5		
	Hardness/Rm	800-1000 N/mm ²			900-1200 N/mm ²			35-45 HRC			≤ 55 HRC		
	ap x ae	1.5D x 0.3D			1.5D x 0.2D			1.2D x 0.2D			D x 0.1D		
	Vc (m/min)	90-110			60-80			40-60			30-50		
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)
	3	10620	0.013	550	7430	0.012	340	5310	0.010	220	4250	0.014	240
	4	7960	0.017	540	5570	0.015	340	3980	0.014	220	3180	0.019	240
	5	6370	0.021	540	4460	0.019	340	3180	0.017	210	2550	0.023	240
	6	5310	0.025	530	3720	0.022	330	2650	0.020	210	2120	0.027	230
	8	3980	0.032	510	2790	0.029	320	1990	0.026	200	1590	0.035	220
10	3180	0.039	490	2230	0.035	310	1590	0.031	200	1270	0.042	220	
12	2650	0.044	470	1860	0.040	300	1330	0.035	190	1060	0.048	210	
14	2270	0.050	450	1590	0.045	280	1140	0.040	180	910	0.055	200	
16	1990	0.055	440	1390	0.050	280	1000	0.044	180	800	0.061	190	
20	1590	0.067	430	1110	0.060	270	800	0.054	170	640	0.074	190	
ap x ae	≤ D5	1.2D x 0.2D			1.2D x 0.1D			D x 0.1D			D x 0.05D		

	Material Group ISO 513	P4 M4 K4			P4 P5 M4 M5 K4 S1			P5 P6 M5 K4 S2 S3			H1 H4 H5		
	Hardness/Rm	800-1000 N/mm ²			900-1200 N/mm ²			35-45 HRC			≤ 55 HRC		
	α° x ae	5° x 0.4D			4° x 0.4D			3° x 0.4D			2° x 0.4D		
	Vc (m/min)	70-90			50-70			30-50			20-40		
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)
	3	8490	0.008	265	6370	0.007	185	4250	0.006	109	3180	0.007	86
	4	6370	0.010	265	4780	0.010	185	3180	0.008	108	2390	0.009	86
	5	5100	0.013	260	3820	0.012	185	2550	0.011	108	1910	0.011	85
	6	4250	0.015	255	3180	0.014	180	2120	0.012	105	1590	0.013	83
	8	3180	0.019	250	2390	0.018	175	1590	0.016	102	1190	0.017	81
10	2550	0.023	240	1910	0.022	165	1270	0.019	98	960	0.020	78	
12	2120	0.027	225	1590	0.025	160	1060	0.022	93	800	0.023	74	
14	1820	0.030	220	1360	0.028	155	910	0.025	90	680	0.026	71	
16	1590	0.033	215	1190	0.031	150	800	0.028	88	600	0.029	70	
20	1270	0.041	205	960	0.038	145	640	0.034	86	480	0.035	68	
α°	≤ D5	2°			2°			1°			1°		

PARAMETERS SUGGESTED WITH HIGH POWER MILLING CHUCK AND STABLE MACHINING CONDITION

CUTTING PARAMETERS

HF450

	Material Group ISO 513	P4 M4 K4			P4 P5 M4 M5 K4 S1			P5 P6 M5 K4 S2 S3			H1 H4 H5		
	Hardness/Rm	800-1000 N/mm ²			900-1200 N/mm ²			35-45 HRC			≤ 55 HRC		
	α° x ae	5° x D			4° x D			3° x D			2° x D		
	Vc (m/min)	60-80			50-60			30-40			20-30		
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)
	6	3720	0.018	270	2920	0.017	195	1860	0.016	118	1330	0.025	131
	8	2790	0.023	260	2190	0.022	190	1390	0.021	114	1000	0.032	128
	10	2230	0.028	250	1750	0.026	185	1110	0.025	110	800	0.038	123
	12	1860	0.032	240	1460	0.030	175	930	0.028	105	660	0.044	116
	14	1590	0.036	230	1250	0.034	170	800	0.032	102	570	0.049	112
16	1390	0.040	225	1090	0.037	165	700	0.035	99	500	0.055	109	
20	1110	0.049	215	880	0.045	160	560	0.043	96	400	0.067	107	

	Material Group ISO 513	P4 M4 K4			P4 P5 M4 M5 K4 S1			P5 P6 M5 K4 S2 S3			H1 H4 H5		
	Hardness/Rm	800-1000 N/mm ²			900-1200 N/mm ²			35-45 HRC			≤ 55 HRC		
	ap x ae	D x 0.4D			D x 0.4D			D x 0.25D			D x 0.25D		
	Vc (m/min)	60-80			50-60			30-40			20-30		
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)
	6	3720	0.021	310	2920	0.019	220	1860	0.015	120	1330	0.014	80
	8	2790	0.027	300	2190	0.024	210	1390	0.020	110	1000	0.019	70
	10	2230	0.032	290	1750	0.029	200	1110	0.024	110	800	0.022	70
	12	1860	0.037	270	1460	0.033	190	930	0.028	100	660	0.026	70
	14	1590	0.041	260	1250	0.037	190	800	0.031	100	570	0.029	70
16	1390	0.046	260	1090	0.041	180	700	0.034	100	500	0.032	60	
20	1110	0.056	250	880	0.050	180	560	0.042	90	400	0.039	60	

INFO

TYPHOON TA-HTA-4HTA

TYPHOON PU-HPU

TYPHOON SUH

TYPHOON ALH

TYPHOON HRC

TYPHOON SUH MINI

TYPHOON HL

C-SD-TA

LFTA

SUTA

HSS-HSS/CO DRILLS

G2

MDTA

HF VH/UP

MEF

ALU

MEX

UH

HSS/CO-HSSP END MILLS

CARBIDE BURRS

PARAMETERS SUGGESTED WITH HIGH POWER MILLING CHUCK AND STABLE MACHINING CONDITION

HF450

	Material Group ISO 513	P4 M4 K4			P4 P5 M4 M5 K4 S1			P5 P6 M5 K4 S2 S3			H1 H4 H5		
	Hardness/Rm	800-1000 N/mm ²			900-1200 N/mm ²			35-45 HRC			≤ 55 HRC		
	ap x ae	1.5D x 0.1D			1.5D x 0.1D			D x 0.1D			D x 0.1D		
	Vc (m/min)	110-130			80-100			50-70			40-60		
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)
	3	12740	0.027	1360	9550	0.024	920	6370	0.021	550	5310	0.029	630
	4	9550	0.035	1350	7170	0.032	910	4780	0.028	540	3980	0.039	620
	5	7640	0.044	1340	5730	0.040	910	3820	0.035	540	3180	0.048	620
	6	6370	0.052	1320	4780	0.046	890	3180	0.041	530	2650	0.057	600
	8	4780	0.067	1280	3580	0.060	860	2390	0.054	510	1990	0.074	590
	10	3820	0.080	1230	2870	0.072	830	1910	0.064	490	1590	0.088	560
	12	3180	0.092	1170	2390	0.083	790	1590	0.073	470	1330	0.101	540
	14	2730	0.103	1130	2050	0.093	760	1360	0.083	450	1140	0.114	520
16	2390	0.115	1100	1790	0.103	740	1190	0.092	440	1000	0.126	500	
20	1040	0.140	580	1430	0.126	720	960	0.112	430	800	0.154	490	
ap x ae	≤ D5	1.5D x 0.1D			1.5D x 0.1D			D x 0.1D			D x 0.05D		

NOTES:

Down milling CNC programming is required.

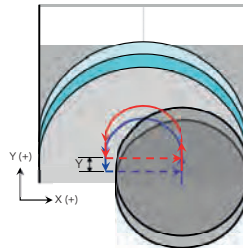
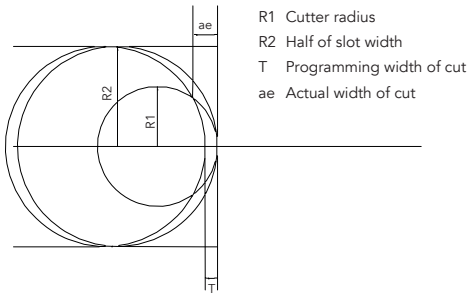
"ae" value max 0.2xD - "T" value max 0.1xD.

The use of end mill with diameter 30-40% smaller than the width of the slot is recommended.

The cutting conditions are based on CNC programming with medium dynamic speed.

With lower CNC dynamic speed, use the same cutting conditions or reduce the cutting speed Vc.

With higher CNC dynamic speed, reduce the "T" value by approximately -30 -50% and apply the maximum available cutting speed Vc.



CUTTING PARAMETERS

HF451

	Material Group ISO 513	P4 M4 K4			P4 P5 M4 M5 K4 S1			P5 P6 M5 K4 S2 S3			H1 H4 H5		
	Hardness/Rm	800-1000 N/mm ²			900-1200 N/mm ²			35-45 HRC			≤ 55 HRC		
	ap x ae	0.5D x D			0.5D x D			0.3D x D			0.2D x D		
	Vc (m/min)	70-90			50-70			30-50			20-40		
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)
	3	8490	0.011	360	6370	0.010	250	4250	0.008	140	3180	0.007	100
	4	6370	0.014	360	4780	0.013	240	3180	0.011	140	2390	0.010	90
	5	5100	0.018	360	3820	0.016	240	2550	0.013	130	1910	0.012	90
	6	4250	0.021	350	3180	0.019	240	2120	0.015	130	1590	0.014	90
	8	3180	0.027	340	2390	0.024	230	1590	0.020	130	1190	0.019	90
10	2550	0.032	330	1910	0.029	220	1270	0.024	120	960	0.022	90	
12	2120	0.037	310	1590	0.033	210	1060	0.028	120	800	0.026	80	
14	1820	0.041	300	1360	0.037	200	910	0.031	110	680	0.029	80	
16	1590	0.046	290	1190	0.041	200	800	0.034	110	600	0.032	80	
20	1270	0.056	280	960	0.050	190	640	0.042	110	480	0.039	80	
ap x ae	≤ D5	0.3D x D			0.3D x D			0.2D x D			0.1D x D		

	Material Group ISO 513	P4 M4 K4			P4 P5 M4 M5 K4 S1			P5 P6 M5 K4 S2 S3			H1 H4 H5		
	Hardness/Rm	800-1000 N/mm ²			900-1200 N/mm ²			35-45 HRC			≤ 55 HRC		
	ap x ae	1.5D x 0.3D			1.5D x 0.2D			1.2D x 0.2D			D x 0.1D		
	Vc (m/min)	90-110			60-80			40-60			30-50		
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)
	3	10620	0.013	550	7430	0.012	340	5310	0.010	220	4250	0.014	240
	4	7960	0.017	540	5570	0.015	340	3980	0.014	220	3180	0.019	240
	5	6370	0.021	540	4460	0.019	340	3180	0.017	210	2550	0.023	240
	6	5310	0.025	530	3720	0.022	330	2650	0.020	210	2120	0.027	230
	8	3980	0.032	510	2790	0.029	320	1990	0.026	200	1590	0.035	220
10	3180	0.039	490	2230	0.035	310	1590	0.031	200	1270	0.042	220	
12	2650	0.044	470	1860	0.040	300	1330	0.035	190	1060	0.048	210	
14	2270	0.050	450	1590	0.045	280	1140	0.040	180	910	0.055	200	
16	1990	0.055	440	1390	0.050	280	1000	0.044	180	800	0.061	190	
20	1590	0.067	430	1110	0.060	270	800	0.054	170	640	0.074	190	
ap x ae	≤ D5	1.2D x 0.2D			1.2D x 0.1D			D x 0.1D			D x 0.05D		

	Material Group ISO 513	P4 M4 K4			P4 P5 M4 M5 K4 S1			P5 P6 M5 K4 S2 S3			H1 H4 H5		
	Hardness/Rm	800-1000 N/mm ²			900-1200 N/mm ²			35-45 HRC			≤ 55 HRC		
	α° x ae	5° x 0.4D			4° x 0.4D			3° x 0.4D			2° x 0.4D		
	Vc (m/min)	70-90			50-70			30-50			20-40		
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)
	3	8490	0.008	265	6370	0.007	185	4250	0.006	109	3180	0.007	86
	4	6370	0.010	265	4780	0.010	185	3180	0.008	108	2390	0.009	86
	5	5100	0.013	260	3820	0.012	185	2550	0.011	108	1910	0.011	85
	6	4250	0.015	255	3180	0.014	180	2120	0.012	105	1590	0.013	83
	8	3180	0.019	250	2390	0.018	175	1590	0.016	102	1190	0.017	81
10	2550	0.023	240	1910	0.022	165	1270	0.019	98	960	0.020	78	
12	2120	0.027	225	1590	0.025	160	1060	0.022	93	800	0.023	74	
14	1820	0.030	220	1360	0.028	155	910	0.025	90	680	0.026	71	
16	1590	0.033	215	1190	0.031	150	800	0.028	88	600	0.029	70	
20	1270	0.041	205	960	0.038	145	640	0.034	86	480	0.035	68	
α°	≤ D5	2°			2°			1°			1°		

PARAMETERS SUGGESTED WITH HIGH PRECISION WELDON CHUCK AND STABLE MACHINING CONDITION.
FOR APPLICATION ON HIGH POWER MILLING CHUCK, PLEASE REFER TO HF450 PARAMETERS.

CUTTING PARAMETERS

HF451

	Material Group ISO 513	P4 M4 K4			P4 P5 M4 M5 K4 S1			P5 P6 M5 K4 S2 S3			H1 H4 H5		
	Hardness/Rm	800-1000 N/mm ²			900-1200 N/mm ²			35-45 HRC			≤ 55 HRC		
	α° x ae	5° x D			4° x D			3° x D			2° x D		
	Vc (m/min)	60-80			50-60			30-40			20-30		
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)
	6	3720	0.018	270	2920	0.017	195	1860	0.016	118	1330	0.025	131
	8	2790	0.023	260	2190	0.022	190	1390	0.021	114	1000	0.032	128
	10	2230	0.028	250	1750	0.026	185	1110	0.025	110	800	0.038	123
	12	1860	0.032	240	1460	0.030	175	930	0.028	105	660	0.044	116
	14	1590	0.036	230	1250	0.034	170	800	0.032	102	570	0.049	112
16	1390	0.040	225	1090	0.037	165	700	0.035	99	500	0.055	109	
20	1110	0.049	215	880	0.045	160	560	0.043	96	400	0.067	107	

	Material Group ISO 513	P4 M4 K4			P4 P5 M4 M5 K4 S1			P5 P6 M5 K4 S2 S3			H1 H4 H5		
	Hardness/Rm	800-1000 N/mm ²			900-1200 N/mm ²			35-45 HRC			≤ 55 HRC		
	ap x ae	D x 0.4D			D x 0.4D			D x 0.25D			D x 0.25D		
	Vc (m/min)	60-80			50-60			30-40			20-30		
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)
	6	3720	0.021	310	2920	0.019	220	1860	0.015	120	1330	0.014	80
	8	2790	0.027	300	2190	0.024	210	1390	0.020	110	1000	0.019	70
	10	2230	0.032	290	1750	0.029	200	1110	0.024	110	800	0.022	70
	12	1860	0.037	270	1460	0.033	190	930	0.028	100	660	0.026	70
	14	1590	0.041	260	1250	0.037	190	800	0.031	100	570	0.029	70
16	1390	0.046	260	1090	0.041	180	700	0.034	100	500	0.032	60	
20	1110	0.056	250	880	0.050	180	560	0.042	90	400	0.039	60	

INFO
TYPHOON TA-HTA-4HTA
TYPHOON PU-HPU
TYPHOON SUH
TYPHOON ALH
TYPHOON HRC
TYPHOON SUH MINI
TYPHOON HL
C-SD-TA
LFTA
SUTA
HSS-HSS/CO DRILLS
G2
MDTA
HF VH/UP
MEF
ALU
MEX
UH
HSS/CO-HSSP END MILLS
CARBIDE BURRS

PARAMETERS SUGGESTED WITH HIGH PRECISION WELDON CHUCK AND STABLE MACHINING CONDITION. FOR APPLICATION ON HIGH POWER MILLING CHUCK, PLEASE REFER TO HF450 PARAMETERS.

HF451

	Material Group ISO 513	P4 M4 K4			P4 P5 M4 M5 K4 S1			P5 P6 M5 K4 S2 S3			H1 H4 H5		
	Hardness/Rm	800-1000 N/mm ²			900-1200 N/mm ²			35-45 HRC			≤ 55 HRC		
	ap x ae	1.5D x 0.1D			1.5D x 0.1D			D x 0.1D			D x 0.1D		
	Vc (m/min)	110-130			80-100			50-70			40-60		
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)
	3	12740	0.027	1360	9550	0.024	920	6370	0.021	550	5310	0.029	630
	4	9550	0.035	1350	7170	0.032	910	4780	0.028	540	3980	0.039	620
	5	7640	0.044	1340	5730	0.040	910	3820	0.035	540	3180	0.048	620
	6	6370	0.052	1320	4780	0.046	890	3180	0.041	530	2650	0.057	600
	8	4780	0.067	1280	3580	0.060	860	2390	0.054	510	1990	0.074	590
	10	3820	0.080	1230	2870	0.072	830	1910	0.064	490	1590	0.088	560
	12	3180	0.092	1170	2390	0.083	790	1590	0.073	470	1330	0.101	540
	14	2730	0.103	1130	2050	0.093	760	1360	0.083	450	1140	0.114	520
16	2390	0.115	1100	1790	0.103	740	1190	0.092	440	1000	0.126	500	
20	1910	0.140	1070	1430	0.126	720	960	0.112	430	800	0.154	490	
ap x ae	≤ D5		1.5D x 0.1D		1.5D x 0.1D		D x 0.1D		D x 0.05D				

NOTES:

Down milling CNC programming is required.

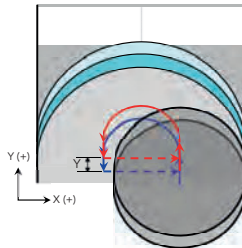
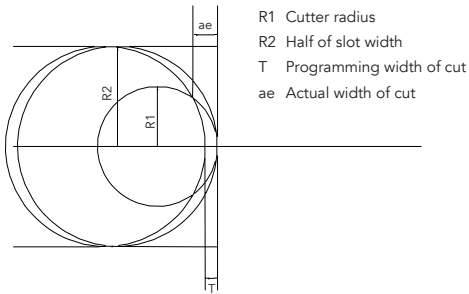
"ae" value max 0.2xD - "T" value max 0.1xD.

The use of end mill with diameter 30-40% smaller than the width of the slot is recommended.

The cutting conditions are based on CNC programming with medium dynamic speed.

With lower CNC dynamic speed, use the same cutting conditions or reduce the cutting speed Vc.

With higher CNC dynamic speed, reduce the "T" value by approximately -30 -50% and apply the maximum available cutting speed Vc.



PARAMETERS SUGGESTED WITH HIGH PRECISION WELDON CHUCK AND STABLE MACHINING CONDITION.
FOR APPLICATION ON HIGH POWER MILLING CHUCK, PLEASE REFER TO HF450 PARAMETERS.

CUTTING PARAMETERS

HF852

	Material Group ISO 513	P4 M4 K4			P4 P5 M4 M5 K4 S1			P5 P6 M5 K4 S2 S3			H1 H4 H5		
	Hardness/Rm	800-1000 N/mm ²			900-1200 N/mm ²			35-45 HRC			≤ 55 HRC		
	ap x ae	0.5D x D			0.5D x D			0.3D x D			0.2D x D		
	Vc (m/min)	80-100			60-80			40-60			30-50		
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)
	4	7170	0.016	450	5570	0.014	320	3980	0.012	190	3180	0.011	140
	5	5730	0.020	450	4460	0.018	310	3180	0.015	190	2550	0.014	140
	6	4780	0.023	440	3720	0.021	310	2650	0.017	180	2120	0.016	140
	8	3580	0.030	430	2790	0.027	300	1990	0.022	180	1590	0.021	130
	10	2870	0.036	410	2230	0.032	290	1590	0.027	170	1270	0.025	130
12	2390	0.041	390	1860	0.037	270	1330	0.031	160	1060	0.029	120	
14	2050	0.046	380	1590	0.041	260	1140	0.034	160	910	0.032	120	
16	1790	0.051	370	1390	0.046	260	1000	0.038	150	800	0.036	110	
20	1430	0.062	350	1110	0.056	250	800	0.047	150	640	0.043	110	
ap x ae	≤ D5	0.3D x D			0.3D x D			0.2D x D			0.1D x D		

	Material Group ISO 513	P4 M4 K4			P4 P5 M4 M5 K4 S1			P5 P6 M5 K4 S2 S3			H1 H4 H5		
	Hardness/Rm	800-1000 N/mm ²			900-1200 N/mm ²			35-45 HRC			≤ 55 HRC		
	ap x ae	1.5D x 0.3D			1.5D x 0.2D			1.2D x 0.2D			1.2D x 0.1D		
	Vc (m/min)	100-120			70-90			50-70			40-60		
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)
	4	8760	0.019	660	6370	0.017	430	4780	0.015	290	3980	0.021	330
	5	7010	0.023	660	5100	0.021	430	3820	0.019	290	3180	0.026	330
	6	5840	0.028	640	4250	0.025	420	3180	0.022	280	2650	0.030	320
	8	4380	0.036	630	3180	0.032	410	2390	0.029	270	1990	0.039	310
	10	3500	0.043	600	2550	0.039	390	1910	0.034	260	1590	0.047	300
12	2920	0.049	570	2120	0.044	370	1590	0.039	250	1330	0.054	290	
14	2500	0.055	550	1820	0.050	360	1360	0.044	240	1140	0.061	280	
16	2190	0.061	540	1590	0.055	350	1190	0.049	230	1000	0.067	270	
20	1750	0.074	520	1270	0.067	340	960	0.060	230	800	0.082	260	
ap x ae	≤ D5	1.2D x 0.2D			1.2D x 0.1D			D x 0.2D			D x 0.1D		

	Material Group ISO 513	P4 M4 K4			P4 P5 M4 M5 K4 S1			P5 P6 M5 K4 S2 S3			H1 H4 H5		
	Hardness/Rm	800-1000 N/mm ²			900-1200 N/mm ²			35-45 HRC			≤ 55 HRC		
	α° x ae	5° x 0.4D			4° x 0.4D			3° x 0.4D			2° x 0.4D		
	Vc (m/min)	80-100			60-80			40-60			30-50		
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)
	4	7170	0.011	330	5570	0.011	240	3980	0.009	150	3180	0.010	126
	5	5730	0.014	325	4460	0.013	235	3180	0.012	149	2550	0.012	126
	6	4780	0.017	320	3720	0.016	230	2650	0.014	146	2120	0.015	123
	8	3580	0.022	310	2790	0.020	225	1990	0.018	142	1590	0.019	120
	10	2870	0.026	300	2230	0.024	215	1590	0.021	136	1270	0.023	115
12	2390	0.030	285	1860	0.028	205	1330	0.024	130	1060	0.026	109	
14	2050	0.033	275	1590	0.031	200	1140	0.028	126	910	0.029	106	
16	1790	0.037	265	1390	0.035	190	1000	0.031	122	800	0.032	103	
20	1430	0.045	260	1110	0.042	185	800	0.037	119	640	0.039	100	
α°	≤ D5	2°			2°			1°			1°		

PARAMETERS SUGGESTED WITH HIGH POWER MILLING CHUCK AND STABLE MACHINING CONDITION

CUTTING PARAMETERS

HF852

	Material Group ISO 513	P4 M4 K4			P4 P5 M4 M5 K4 S1			P5 P6 M5 K4 S2 S3			H1 H4 H5		
	Hardness/Rm	800-1000 N/mm ²			900-1200 N/mm ²			35-45 HRC			≤ 55 HRC		
	α° x ae	5° x D			4° x D			3° x D			2° x D		
	Vc (m/min)	80-100			60-80			40-60			30-50		
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)
	6	4780	0.020	385	3720	0.019	280	2650	0.018	187	2120	0.027	232
	8	3580	0.026	370	2790	0.024	270	1990	0.023	182	1590	0.035	226
	10	2870	0.031	360	2230	0.029	260	1590	0.027	175	1270	0.043	216
	12	2390	0.036	340	1860	0.033	245	1330	0.031	167	1060	0.049	206
	14	2050	0.040	330	1590	0.037	240	1140	0.035	161	910	0.055	199
16	1790	0.045	320	1390	0.042	230	1000	0.039	157	800	0.061	195	
20	1430	0.054	310	1110	0.051	225	800	0.048	153	640	0.074	189	

	Material Group ISO 513	P4 M4 K4			P4 P5 M4 M5 K4 S1			P5 P6 M5 K4 S2 S3			H1 H4 H5		
	Hardness/Rm	800-1000 N/mm ²			900-1200 N/mm ²			35-45 HRC			≤ 55 HRC		
	ap x ae	D x 0.4D			D x 0.4D			D x 0.25D			D x 0.25D		
	Vc (m/min)	80-100			60-80			40-60			30-50		
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)
	6	4780	0.023	440	3720	0.021	310	2650	0.017	180	2120	0.016	140
	8	3580	0.030	430	2790	0.027	300	1990	0.022	180	1590	0.021	130
	10	2870	0.036	410	2230	0.032	290	1590	0.027	170	1270	0.025	130
	12	2390	0.041	390	1860	0.037	270	1330	0.031	160	1060	0.029	120
	14	2050	0.046	380	1590	0.041	260	1140	0.034	160	910	0.032	120
16	1790	0.051	370	1390	0.046	260	1000	0.038	150	800	0.036	110	
20	1430	0.062	350	1110	0.056	250	800	0.047	150	640	0.043	110	

INFO

TYPHOON TA-HTA-4HTA

TYPHOON PU-HPU

TYPHOON SUH

TYPHOON ALH

TYPHOON HRC

TYPHOON SUH MINI

TYPHOON HL

C-SD-TA

LFTA

SUTA

HSS-HSS/CO DRILLS

G2

MDTA

HF VH/UP

MEF

ALU

MEX

UH

HSS/CO-HSSP END MILLS

CARBIDE BURRS

PARAMETERS SUGGESTED WITH HIGH POWER MILLING CHUCK AND STABLE MACHINING CONDITION

HF852

 TROCHOIDAL	Material Group ISO 513	P4 M4 K4			P4 P5 M4 M5 K4 S1			P5 P6 M5 K4 S2 S3			H1 H4 H5		
	Hardness/Rm	800-1000 N/mm ²			900-1200 N/mm ²			35-45 HRC			≤ 55 HRC		
	ap x ae	2D x 0.2D			2D x 0.1D			1.5D x 0.1D			1.5D x 0.1D		
	Vc (m/min)	130-150			100-120			70-90			50-70		
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)
	4	11150	0.039	1750	8760	0.035	1240	6370	0.031	800	4780	0.043	830
	5	8920	0.049	1740	7010	0.044	1230	5100	0.039	800	3820	0.054	820
	6	7430	0.057	1710	5840	0.052	1210	4250	0.046	780	3180	0.063	800
	8	5570	0.074	1660	4380	0.067	1170	3180	0.060	760	2390	0.082	780
	10	4460	0.089	1590	3500	0.080	1120	2550	0.071	730	1910	0.098	750
	12	3720	0.102	1520	2920	0.092	1070	2120	0.082	690	1590	0.112	710
	14	3180	0.115	1460	2500	0.103	1030	1820	0.092	670	1360	0.126	690
	16	2790	0.128	1420	2190	0.115	1010	1590	0.102	650	1190	0.140	670
20	2230	0.155	1380	1750	0.140	980	1270	0.124	630	960	0.171	660	
ap x ae	≤ D5		1.5D x 0.1D		1.5D x 0.1D		D x 0.1D		D x 0.05D				

NOTES:

Down milling CNC programming is required.

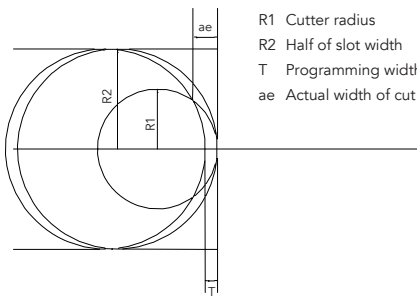
"ae" value max 0.2xD - "T" value max 0.1xD.

The use of end mill with diameter 30-40% smaller than the width of the slot is recommended.

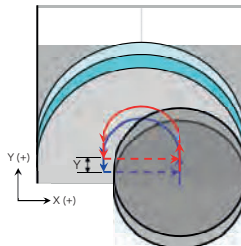
The cutting conditions are based on CNC programming with medium dynamic speed.

With lower CNC dynamic speed, use the same cutting conditions or reduce the cutting speed Vc.

With higher CNC dynamic speed, reduce the "T" value by approximately -30 -50% and apply the maximum available cutting speed Vc.



- R1 Cutter radius
- R2 Half of slot width
- T Programming width of cut
- ae Actual width of cut



CUTTING PARAMETERS

HF452

	Material Group ISO 513	P4 M4 K4			P4 P5 M4 M5 K4 S1			P5 P6 M5 K4 S2 S3			H1 H4 H5		
	Hardness/Rm	800-1000 N/mm ²			900-1200 N/mm ²			35-45 HRC			≤ 55 HRC		
	ap x ae	0.5D x D			0.5D x D			0.3D x D			0.2D x D		
	Vc (m/min)	70-90			50-70			30-50			20-40		
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)
	3	8490	0.011	360	6370	0.010	250	4250	0.008	140	3180	0.007	100
	4	6370	0.014	360	4780	0.013	240	3180	0.011	140	2390	0.010	90
	5	5100	0.018	360	3820	0.016	240	2550	0.013	130	1910	0.012	90
	6	4250	0.021	350	3180	0.019	240	2120	0.015	130	1590	0.014	90
	8	3180	0.027	340	2390	0.024	230	1590	0.020	130	1190	0.019	90
10	2550	0.032	330	1910	0.029	220	1270	0.024	120	960	0.022	90	
12	2120	0.037	310	1590	0.033	210	1060	0.028	120	800	0.026	80	
14	1820	0.041	300	1360	0.037	200	910	0.031	110	680	0.029	80	
16	1590	0.046	290	1190	0.041	200	800	0.034	110	600	0.032	80	
20	1270	0.056	280	960	0.050	190	640	0.042	110	480	0.039	80	
ap x ae	≤ D5	0.3D x D			0.3D x D			0.2D x D			0.1D x D		

	Material Group ISO 513	P4 M4 K4			P4 P5 M4 M5 K4 S1			P5 P6 M5 K4 S2 S3			H1 H4 H5		
	Hardness/Rm	800-1000 N/mm ²			900-1200 N/mm ²			35-45 HRC			≤ 55 HRC		
	ap x ae	1.5D x 0.3D			1.5D x 0.2D			1.2D x 0.2D			D x 0.1D		
	Vc (m/min)	90-110			60-80			40-60			30-50		
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)
	3	10620	0.013	550	7430	0.012	340	5310	0.010	220	4250	0.014	240
	4	7960	0.017	540	5570	0.015	340	3980	0.014	220	3180	0.019	240
	5	6370	0.021	540	4460	0.019	340	3180	0.017	210	2550	0.023	240
	6	5310	0.025	530	3720	0.022	330	2650	0.020	210	2120	0.027	230
	8	3980	0.032	510	2790	0.029	320	1990	0.026	200	1590	0.035	220
10	3180	0.039	490	2230	0.035	310	1590	0.031	200	1270	0.042	220	
12	2650	0.044	470	1860	0.040	300	1330	0.035	190	1060	0.048	210	
14	2270	0.050	450	1590	0.045	280	1140	0.040	180	910	0.055	200	
16	1990	0.055	440	1390	0.050	280	1000	0.044	180	800	0.061	190	
20	1590	0.067	430	1110	0.060	270	800	0.054	170	640	0.074	190	
ap x ae	≤ D5	1.2D x 0.2D			1.2D x 0.1D			D x 0.1D			D x 0.05D		

	Material Group ISO 513	P4 M4 K4			P4 P5 M4 M5 K4 S1			P5 P6 M5 K4 S2 S3			H1 H4 H5		
	Hardness/Rm	800-1000 N/mm ²			900-1200 N/mm ²			35-45 HRC			≤ 55 HRC		
	α° x ae	5° x 0.4D			4° x 0.4D			3° x 0.4D			2° x 0.4D		
	Vc (m/min)	70-90			50-70			30-50			20-40		
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)
	3	8490	0.008	265	6370	0.007	185	4250	0.006	109	3180	0.007	86
	4	6370	0.010	265	4780	0.010	185	3180	0.008	108	2390	0.009	86
	5	5100	0.013	260	3820	0.012	185	2550	0.011	108	1910	0.011	85
	6	4250	0.015	255	3180	0.014	180	2120	0.012	105	1590	0.013	83
	8	3180	0.019	250	2390	0.018	175	1590	0.016	102	1190	0.017	81
10	2550	0.023	240	1910	0.022	165	1270	0.019	98	960	0.020	78	
12	2120	0.027	225	1590	0.025	160	1060	0.022	93	800	0.023	74	
14	1820	0.030	220	1360	0.028	155	910	0.025	90	680	0.026	71	
16	1590	0.033	215	1190	0.031	150	800	0.028	88	600	0.029	70	
20	1270	0.041	205	960	0.038	145	640	0.034	86	480	0.035	68	
α°	≤ D5	2°			2°			1°			1°		

PARAMETERS SUGGESTED WITH HIGH POWER MILLING CHUCK AND STABLE MACHINING CONDITION

CUTTING PARAMETERS

HF452

	Material Group ISO 513	P4 M4 K4			P4 P5 M4 M5 K4 S1			P5 P6 M5 K4 S2 S3			H1 H4 H5		
	Hardness/Rm	800-1000 N/mm ²			900-1200 N/mm ²			35-45 HRC			≤ 55 HRC		
	α° x ae	5° x D			4° x D			3° x D			2° x D		
	Vc (m/min)	60-80			50-60			30-40			20-30		
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)
	6	3720	0.018	270	2920	0.017	195	1860	0.016	118	1330	0.025	131
	8	2790	0.023	260	2190	0.022	190	1390	0.021	114	1000	0.032	128
	10	2230	0.028	250	1750	0.026	185	1110	0.025	110	800	0.038	123
	12	1860	0.032	240	1460	0.030	175	930	0.028	105	660	0.044	116
	14	1590	0.036	230	1250	0.034	170	800	0.032	102	570	0.049	112
16	1390	0.040	225	1090	0.037	165	700	0.035	99	500	0.055	109	
20	1110	0.049	215	880	0.045	160	560	0.043	96	400	0.067	107	

	Material Group ISO 513	P4 M4 K4			P4 P5 M4 M5 K4 S1			P5 P6 M5 K4 S2 S3			H1 H4 H5		
	Hardness/Rm	800-1000 N/mm ²			900-1200 N/mm ²			35-45 HRC			≤ 55 HRC		
	ap x ae	D x 0.4D			D x 0.4D			D x 0.25D			D x 0.25D		
	Vc (m/min)	60-80			50-60			30-40			20-30		
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)
	6	3720	0.021	310	2920	0.019	220	1860	0.015	120	1330	0.014	80
	8	2790	0.027	300	2190	0.024	210	1390	0.020	110	1000	0.019	70
	10	2230	0.032	290	1750	0.029	200	1110	0.024	110	800	0.022	70
	12	1860	0.037	270	1460	0.033	190	930	0.028	100	660	0.026	70
	14	1590	0.041	260	1250	0.037	190	800	0.031	100	570	0.029	70
16	1390	0.046	260	1090	0.041	180	700	0.034	100	500	0.032	60	
20	1110	0.056	250	880	0.050	180	560	0.042	90	400	0.039	60	

- INFO
- TYPHOON TA-HTA-4HTA
- TYPHOON PU-HPU
- TYPHOON SUH
- TYPHOON ALH
- TYPHOON HRC
- TYPHOON SUH MINI
- TYPHOON HL
- C-SD-TA
- LFTA
- SUTA
- HSS-HSS/CO DRILLS
- G2
- MDTA
- HF VH/UP
- MEF
- ALU
- MEX
- UH
- HSS/CO-HSSP END MILLS
- CARBIDE BURRS

PARAMETERS SUGGESTED WITH HIGH POWER MILLING CHUCK AND STABLE MACHINING CONDITION

HF452

	Material Group ISO 513	P4 M4 K4			P4 P5 M4 M5 K4 S1			P5 P6 M5 K4 S2 S3			H1 H4 H5		
	Hardness/Rm	800-1000 N/mm ²			900-1200 N/mm ²			35-45 HRC			≤ 55 HRC		
	ap x ae	1.5D x 0.1D			1.5D x 0.1D			D x 0.1D			D x 0.1D		
	Vc (m/min)	110-130			80-100			50-70			40-60		
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)
	3	12740	0.027	1360	9550	0.024	920	6370	0.021	550	5310	0.029	630
	4	9550	0.035	1350	7170	0.032	910	4780	0.028	540	3980	0.039	620
	5	7640	0.044	1340	5730	0.040	910	3820	0.035	540	3180	0.048	620
	6	6370	0.052	1320	4780	0.046	890	3180	0.041	530	2650	0.057	600
	8	4780	0.067	1280	3580	0.060	860	2390	0.054	510	1990	0.074	590
	10	3820	0.080	1230	2870	0.072	830	1910	0.064	490	1590	0.088	560
	12	3180	0.092	1170	2390	0.083	790	1590	0.073	470	1330	0.101	540
	14	2730	0.103	1130	2050	0.093	760	1360	0.083	450	1140	0.114	520
16	2390	0.115	1100	1790	0.103	740	1190	0.092	440	1000	0.126	500	
20	1910	0.140	1070	1430	0.126	720	960	0.112	430	800	0.154	490	
ap x ae	≤ D5		1.5D x 0.1D		1.5D x 0.1D		D x 0.1D			D x 0.05D			

NOTES:

Down milling CNC programming is required.

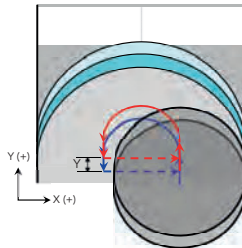
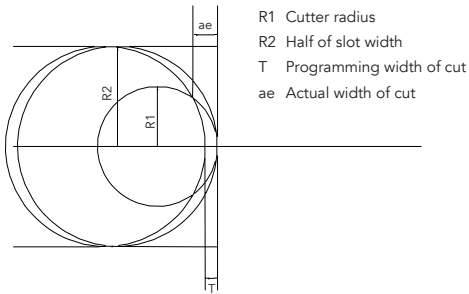
"ae" value max 0.2xD - "T" value max 0.1xD.

The use of end mill with diameter 30-40% smaller than the width of the slot is recommended.

The cutting conditions are based on CNC programming with medium dynamic speed.

With lower CNC dynamic speed, use the same cutting conditions or reduce the cutting speed Vc.

With higher CNC dynamic speed, reduce the "T" value by approximately -30 -50% and apply the maximum available cutting speed Vc.





MEF

STAINLESS STEEL AND SUPER ALLOYS

🇬🇧 Ultra-fine micrograin and Endless Black coating for high performance machining on stainless steel, HRSA and titanium alloy, carbon and low alloy steel. The unique design of the cutting geometry and the Endless Black coating are specifically developed to control the cutting friction delivering longer tool life through the reduction of the heat generation.

🇮🇹 Micrograna ultrafina e rivestimento Endless Black per la lavorazione ad alto rendimento di acciai al carbonio, acciai inossidabili, HRSA e leghe di titanio. La geometria e il rivestimento specifici consentono di generare bassi sforzi di taglio e l'abbassamento del coefficiente di attrito, garantendo una riduzione dello sviluppo del calore con conseguente rallentamento del processo di usura del tagliente.

🇩🇪 Besonders feine Mikrokörnung und Beschichtung Endless Black für Hochleistungsbearbeitungen von Kohlenstoffstahl, Edelstahl, HRSA und Titanlegierungen. Dank der speziellen Geometrie und der spezifischen Beschichtung wird ein niedriger Schneiddruck erzeugt und der Reibungsfaktor gesenkt, wodurch die Hitzeentwicklung reduziert und in Folge die Abnutzung der Schneidkante verzögert werden.

🇫🇷 Ultra Micrograin et revêtement Endless Black pour l'usage à haute performance pour les aciers au carbone, aciers inoxydables, HRSA et alliages de titane. La géométrie et le revêtement spécifiques permettent de générer peu d'efforts de coupe et de réduire le coefficient de frottement, en garantissant une diminution du développement de la chaleur et le ralentissement consécutif du processus d'usure de l'arête.

🇪🇸 Micrograno ultrafino y revestimiento Endless Black para el mecanizado a alto rendimiento de aceros al carbono, aceros inoxidables, HRSA y aleaciones de titanio. La geometría y revestimiento específicos permiten generar bajos esfuerzos de corte y reducción del coeficiente de rozamiento, garantizando una reducción del desarrollo de calor con la consiguiente ralentización del proceso de desgaste del filo.

🇷🇺 Микрозернистая супермелкая структура твердого сплава и покрытие Endless Black служат для высокоэффективной обработки нержавеющей стали, жаропрочных и титановых сплавов, низко- и высокоуглеродистых сталей. Специальные геометрия и покрытие позволяют снизить трение и тепловыделение при резании и, тем самым, увеличить стойкость инструмента.

INFO
TYPHOON TA-HTA-4HTA
TYPHOON PU-HPU
TYPHOON SUH
TYPHOON ALH
TYPHOON HRC
TYPHOON SUH MINI
TYPHOON HL
C-SD-TA
LFTA
SUTA
HSS-HSS/CO DRILLS
G2
MDTA
HF VH/UP
MEF
ALU
MEX
UH
HSS/CO-HSSP END MILLS
CARBIDE BURRS

MEFCS2

	Material Group ISO 513	P1 P2 P3			P4 M1 M2			P5 M3 M4 S1 S2 S4				M5 S3 S5		
	Hardness/Rm	< 700 N/mm ²			700-1000 N/mm ²			< 35 HRC				< 45 HRC		
	ap x ae	0.5D x D			0.5D x D			0.3D x D				0.2D x D		
	Vc (m/min)	90-110			50-70			30-50				20-40		
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	
	1	31850	0.005	290	19110	0.004	150	12740	0.004	90	9550	0.004	70	
	2	15920	0.009	290	9550	0.008	150	6370	0.007	90	4780	0.007	70	
	3	10620	0.012	240	6370	0.010	120	4250	0.009	80	3180	0.009	60	
	4	7960	0.017	270	4780	0.015	140	3180	0.014	90	2390	0.014	70	
	5	6370	0.023	290	3820	0.020	150	2550	0.018	90	1910	0.018	70	
	6	5310	0.029	310	3180	0.024	160	2120	0.023	100	1590	0.023	70	
	8	3980	0.035	270	2390	0.029	140	1590	0.028	90	1190	0.028	70	
	10	3180	0.040	260	1910	0.034	130	1270	0.032	80	960	0.032	60	
	12	2650	0.046	240	1590	0.039	120	1060	0.037	80	800	0.037	60	
14	2270	0.052	230	1360	0.044	120	910	0.041	80	680	0.041	60		
16	1990	0.058	230	1190	0.049	120	800	0.046	70	600	0.046	60		

< D3 mm: ap = 0.1D - 0.2D

	Material Group ISO 513	P1 P2 P3			P4 M1 M2			P5 M3 M4 S1 S2 S4				M5 S3 S5		
	Hardness/Rm	< 700 N/mm ²			700-1000 N/mm ²			< 35 HRC				< 45 HRC		
	ap x ae	1.5D x 0.5D			1.5D x 0.5D			D x 0.3D				D x 0.1D		
	Vc (m/min)	90-110			60-80			40-60				30-50		
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	
	1	31850	0.006	350	22290	0.005	210	15920	0.004	140	12740	0.004	110	
	2	15920	0.011	350	11150	0.009	210	7960	0.009	140	6370	0.009	110	
	3	10620	0.014	290	7430	0.012	170	5310	0.011	120	4250	0.011	90	
	4	7960	0.021	330	5570	0.018	200	3980	0.017	130	3180	0.017	110	
	5	6370	0.028	350	4460	0.023	210	3180	0.022	140	2550	0.022	110	
	6	5310	0.035	370	3720	0.029	220	2650	0.028	150	2120	0.028	120	
	8	3980	0.041	330	2790	0.035	200	1990	0.033	130	1590	0.033	110	
	10	3180	0.048	310	2230	0.041	180	1590	0.039	120	1270	0.039	100	
	12	2650	0.055	290	1860	0.047	170	1330	0.044	120	1060	0.044	90	
14	2270	0.062	280	1590	0.053	170	1140	0.050	110	910	0.050	90		
16	1990	0.069	270	1390	0.059	160	1000	0.055	110	800	0.055	90		

< D3 mm: ae = 0.05D - 0.2D

	Material Group ISO 513	P1 P2 P3			P4 M1 M2			P5 M3 M4 S1 S2 S4				M5 S3 S5		
	Hardness/Rm	< 700 N/mm ²			700-1000 N/mm ²			< 35 HRC				< 45 HRC		
	ap x ae	D x D			D x D			0.5D x D				0.2D x D		
	Vc (m/min)	90-110			50-70			30-50				20-40		
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	
	1	31850	0.003	180	19110	0.002	90	12740	0.002	60	9550	0.022	420	
	2	15920	0.006	180	9550	0.005	90	6370	0.004	60	4780	0.044	420	
	3	10620	0.007	150	6370	0.006	70	4250	0.006	50	3180	0.055	350	
	4	7960	0.010	160	4780	0.009	80	3180	0.008	50	2390	0.083	400	
	5	6370	0.014	180	3820	0.012	90	2550	0.011	60	1910	0.110	420	
	6	5310	0.017	180	3180	0.015	90	2120	0.014	60	1590	0.138	440	
	8	3980	0.021	160	2390	0.018	80	1590	0.017	50	1190	0.166	390	
	10	3180	0.024	150	1910	0.021	80	1270	0.019	50	960	0.193	370	
	12	2650	0.028	150	1590	0.023	70	1060	0.022	50	800	0.221	350	
14	2270	0.031	140	1360	0.026	70	910	0.025	50	680	0.248	340		
16	1990	0.035	140	1190	0.029	70	800	0.028	40	600	0.276	330		

< D3 mm: ap = 0.1D - 0.2D

- INFO
- TYPHOON TA-HTA-4HTA
- TYPHOON PU-HPU
- TYPHOON SUH
- TYPHOON ALH
- TYPHOON HRC
- TYPHOON SUH MINI
- TYPHOON HL
- C-SD-TA
- LFTA
- SUTA
- HSS-HSS/CO DRILLS
- G2
- MDTA
- HF VH/UP
- MEF
- ALU
- MEX
- UH
- HSS/CO-HSSP END MILLS
- CARBIDE BURRS

MEFCSH3

SLOTTING	Material Group ISO 513	P1 P2 P3			P4 M1 M2			P5 M3 M4 S1 S2 S4				M5 S3 S5		
	Hardness/Rm	< 700 N/mm ²			700-1000 N/mm ²			< 35 HRC				< 45 HRC		
	ap x ae	0.5D x D			0.5D x D			0.3D x D				0.2D x D		
	Vc (m/min)	80-100			60-80			40-60				30-50		
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	
6	4780	0.022	220	3720	0.013	140	2650	0.012	100	2120	0.012	80		
8	3580	0.029	210	2790	0.017	140	1990	0.015	90	1590	0.016	80		
10	2870	0.036	220	2230	0.021	140	1590	0.019	90	1270	0.020	80		
12	2390	0.046	230	1860	0.027	150	1330	0.024	100	1060	0.026	80		
14	2050	0.053	230	1590	0.031	150	1140	0.028	90	910	0.030	80		
16	1790	0.065	240	1390	0.038	160	1000	0.034	100	800	0.036	90		
18	1590	0.075	250	1240	0.044	160	880	0.039	100	710	0.042	90		
20	1430	0.086	260	1110	0.051	170	800	0.045	110	640	0.048	90		

SIDE MILLING	Material Group ISO 513	P1 P2 P3			P4 M1 M2			P5 M3 M4 S1 S2 S4				M5 S3 S5		
	Hardness/Rm	< 700 N/mm ²			700-1000 N/mm ²			< 35 HRC				< 45 HRC		
	ap x ae	1.5D x 0.3D			1.5D x 0.3D			1.5D x 0.2D				1.5D x 0.1D		
	Vc (m/min)	80-120			60-80			40-60				100-140		
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	
6	4780	0.026	260	3720	0.015	170	2650	0.014	110	2120	0.014	90		
8	3580	0.035	260	2790	0.020	170	1990	0.019	110	1590	0.019	90		
10	2870	0.043	260	2230	0.026	170	1590	0.024	110	1270	0.024	90		
12	2390	0.055	280	1860	0.033	180	1330	0.031	120	1060	0.031	100		
14	2050	0.064	270	1590	0.038	180	1140	0.036	120	910	0.036	100		
16	1790	0.078	290	1390	0.046	190	1000	0.043	130	800	0.043	100		
18	1590	0.090	300	1240	0.053	200	880	0.050	130	710	0.050	110		
20	1430	0.104	310	1110	0.061	200	800	0.058	140	640	0.058	110		

INFO

TYPHOON
TA-HTA-4HTATYPHOON
PU-HPUTYPHOON
SUHTYPHOON
ALHTYPHOON
HRCTYPHOON
SUH MINITYPHOON
HL

C-SD-TA

LFTA

SUTA

HSS/HSS/CO
DRILLS

G2

MDTA

HF VH/UP

MEF


ALU

MEX

UH

HSS/CO-HSSP
END MILLSCARBIDE
BURRS

MEFCS4

	Material Group ISO 513	P1 P2 P3			P4 M1 M2			P5 M3 M4 S1 S2 S4				M5 S3 S5		
	Hardness/Rm	< 700 N/mm ²			700-1000 N/mm ²			< 35 HRC				< 45 HRC		
	ap x ae	1.5D x 0.1D			1.5D x 0.1D			1.5D x 0.1D				1.5D x 0.1D		
	Vc (m/min)	90-110			60-80			40-60				30-50		
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	
3	10620	0.012	510	7430	0.010	300	5310	0.010	200	4250	0.010	160		
4	7960	0.015	480	5570	0.013	280	3980	0.012	190	3180	0.012	150		
5	6370	0.018	460	4460	0.015	270	3180	0.014	180	2550	0.014	150		
6	5310	0.023	490	3720	0.020	290	2650	0.018	200	2120	0.018	160		
8	3980	0.030	480	2790	0.026	280	1990	0.024	190	1590	0.024	150		
10	3180	0.038	480	2230	0.032	290	1590	0.030	190	1270	0.030	150		
12	2650	0.045	480	1860	0.038	280	1330	0.036	190	1060	0.036	150		
14	2270	0.052	470	1590	0.044	280	1140	0.042	190	910	0.042	150		
16	1990	0.058	460	1390	0.049	270	1000	0.046	190	800	0.046	150		
18	1770	0.066	470	1240	0.056	280	880	0.053	190	710	0.053	150		
20	1590	0.075	480	1110	0.064	280	800	0.060	190	640	0.060	150		

INFO

TYPHOON
TA-HTA-4HTATYPHOON
PU-HPUTYPHOON
SUHTYPHOON
ALHTYPHOON
HRCTYPHOON
SUH MINITYPHOON
HL

C-SD-TA

LFTA

SUTA

HSS-HSS/CO
DRILLS

G2

MDTA

HF VH/UP

MEF


ALU

MEX

UH

HSS/CO-HSSP
END MILLSCARBIDE
BURRS

MEF600

	Material Group ISO 513	P1 P2 P3			P4 M1 M2			P5 M3 M4 S1 S2 S4			M5 S3 S5		
	Hardness/Rm	< 700 N/mm ²			700-1000 N/mm ²			< 35 HRC			< 45 HRC		
	ap x ae	1.5D x 0.1D			1.5D x 0.1D			1.5D x 0.1D			1.5D x 0.05D		
	Vc (m/min)	100-140			70-110			50-90			50-70		
D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	
6	6370	0.015	570	4780	0.013	370	3720	0.012	270	3180	0.012	230	
8	4780	0.020	570	3580	0.017	370	2790	0.016	270	2390	0.016	230	
10	3820	0.025	570	2870	0.021	370	2230	0.020	270	1910	0.020	230	
12	3180	0.030	570	2390	0.026	370	1860	0.024	270	1590	0.024	230	
14	2730	0.035	570	2050	0.030	370	1590	0.028	270	1360	0.028	230	
16	2390	0.040	570	1790	0.034	370	1390	0.032	270	1190	0.032	230	
20	1910	0.050	760	1430	0.043	490	1110	0.040	360	960	0.040	310	

INFO

TYPHOON
TA-HTA-4HTATYPHOON
PU-HPUTYPHOON
SUHTYPHOON
ALHTYPHOON
HRCTYPHOON
SUH MINITYPHOON
HL

C-SD-TA

LFTA

SUTA

HSS-HSS/CO
DRILLS

G2

MDTA

HF VH/UP

MEF


ALU

MEX

UH

HSS/CO-HSSP
END MILLSCARBIDE
BURRS

MEF901

	Material Group ISO 513	P1 P2 P3			P4 M1 M2			P5 M3 M4 S1 S2 S4				M5 S3 S5		
	Hardness/Rm	< 700 N/mm ²			700-1000 N/mm ²			< 35 HRC				< 45 HRC		
	ap x ae	1.5D x 0.3D			1.5D x 0.3D			1.5D x 0.2D				D x 0.1D		
	Vc (m/min)	100-140			70-90			50-70				40-60		
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	
4	9550	0.018	520	6370	0.015	290	4780	0.014	210	3980	0.014	170		
5	7640	0.022	670	5100	0.019	380	3820	0.018	270	3180	0.018	220		
6	6370	0.028	710	4250	0.024	400	3180	0.022	280	2650	0.022	240		
8	4780	0.035	670	3180	0.030	380	2390	0.028	270	1990	0.028	220		
10	3820	0.040	610	2550	0.034	350	1910	0.032	240	1590	0.032	200		
12	3180	0.045	570	2120	0.038	320	1590	0.036	230	1330	0.036	190		
14	2730	0.050	680	1820	0.043	390	1360	0.040	270	1140	0.040	230		
16	2390	0.057	680	1590	0.048	390	1190	0.046	270	1000	0.046	230		
20	1910	0.073	840	1270	0.062	470	960	0.058	340	800	0.058	280		

INFO

TYPHOON
TA-HTA-4HTATYPHOON
PU-HPUTYPHOON
SUHTYPHOON
ALHTYPHOON
HRCTYPHOON
SUH MINITYPHOON
HL

C-SD-TA

LFTA

SUTA

HSS-HSS/CO
DRILLS

G2

MDTA

HF VH/UP

MEF

ALU


MEX

UH

HSS/CO-HSSP
END MILLSCARBIDE
BURRS

CUTTING PARAMETERS

MEF902

	Material Group ISO 513	P1 P2 P3			P4 M1 M2			P5 M3 M4 S1 S2 S4			M5 S3 S5		
	Hardness/Rm	< 700 N/mm ²			700-1000 N/mm ²			< 35 HRC			< 45 HRC		
	ap x ae	1.5D x 0.3D			1.5D x 0.3D			1.5D x 0.2D			D x 0.1D		
	Vc (m/min)	100-120			60-80			40-60			40-50		
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)
6	5840	0.027	620	3720	0.023	340	2650	0.021	230	2390	0.021	200	
8	4380	0.033	580	2790	0.028	320	1990	0.027	210	1790	0.027	190	
10	3500	0.038	530	2230	0.032	290	1590	0.030	190	1430	0.030	170	
12	2920	0.043	500	1860	0.036	270	1330	0.034	180	1190	0.034	160	
14	2500	0.048	590	1590	0.040	320	1140	0.038	220	1020	0.038	190	
16	2190	0.054	590	1390	0.046	320	1000	0.043	220	900	0.043	190	
20	1750	0.069	730	1110	0.059	390	800	0.055	270	720	0.055	240	

INFO

TYPHOON
TA-HTA-4HTATYPHOON
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ALHTYPHOON
HRCTYPHOON
SUH MINITYPHOON
HL

C-SD-TA

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SUTA

HSS-HSS/CO
DRILLS

G2

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MEF

ALU

MEX

UH

HSS/CO-HSSP
END MILLSCARBIDE
BURRS



ALU

NON-FERROUS MATERIALS

✚ Uncoated micrograin carbide and cutting geometry specifically developed for non-ferrous machining. Lapped cutting edges and ad-hoc profile of the chip pocket for low cutting forces and outstanding finishing quality. Also available in the HF ALU version with unequal pitch (UP) with a specific design allowing mirror finishing and DxD machining, even in the 4-flutes version.

🇮🇹 Micrograna non rivestita e geometria di taglio sviluppata specificamente per la lavorazione di materiali non-ferrosi. Taglienti lappati e particolare profilo del vano truciolo per bassi sforzi di taglio e un'eccellente finitura superficiale. Disponibile anche la versione HF Alu con passo differenziato (UP) con un particolare design che permette finiture a specchio e lavorazioni DxD, anche nella versione a 4 taglienti.

🇩🇪 Unbeschichtete Mikrokörnung und eigens für die Bearbeitung von NE-Metallen entwickelte Schnittgeometrie. Dank der geläpften Schneiden und der besonderen Form der Nuten ist die aufzubringende Schnittkraft gering, bei gleichzeitig ausgezeichnetem Oberflächenfinish. Auch in der Version HF Alu mit ungleicher Teilung (UP) und besonderer Form erhältlich, die auch in der Version mit 4 Schneiden ein spiegelblankes Oberflächenfinish und DxD-Bearbeitungen ermöglicht.

🇫🇷 Micrograin non revêtu et géométrie de coupe développée spécifiquement pour l'usinage de matériaux non ferreux. Arêtes de coupe polies et profil particulier de la goujure pour de faibles efforts de coupe et une excellente finition superficielle. Également disponible la version HF Alu à pas décalé(UP), avec un design particulier qui permet des finitions glacées et des usinages DxD, aussi dans la version à 4 arêtes de coupe.

🇪🇸 Micrograna no revestida y geometría de corte desarrollada específicamente para la elaboración de materiales no ferrosos. Filos de corte lapeados y perfil especial del compartimento de virutas, para bajos esfuerzos de corte y un excelente acabado de la superficie. También está disponible la versión HF Alu con paso diferenciado (UP) con un diseño especial que permite acabados a espejo y elaboraciones D x D, incluso en la versión de 4 filos.

🇷🇺 Мелкозернистый твердый сплав без покрытия со специально разработанной геометрией для обработки цветных металлов. Доведенные режущие кромки и специальный профиль стружечных канавок снижают силы резания и улучшают качество обработанной поверхности. Также доступна версия HF Alu с неравномерным шагом (UP) и специальной геометрией, позволяющая получать зеркальную поверхность и работать в режиме DxD, в том числе для версии с 4-мя зубьями.

INFO
TYPHOON TA-HTA-4HTA
TYPHOON PU-HPU
TYPHOON SUH
TYPHOON ALH
TYPHOON HRC
TYPHOON SUH MINI
TYPHOON HL
C-SD-TA
LFTA
SUTA
HSS-HSS/CO DRILLS
G2
MDTA
HF VH/UP
MEF
ALU
MEX
UH
HSS/CO-HSSP END MILLS
CARBIDE BURRS

CUTTING PARAMETERS

HFAL4

	Material Group ISO 513	N1			N2 N3			N4			N5		
	Material	Alluminium ≤ 12% Si - Copper Alloy			Alluminium > 12% Si - Copper Alloy			Brass and bronze			Plastics		
	ap x ae	D x D			D x D			D x D			D x D		
	Vc (m/min)	300-500			200-400			150-350			600-1000		
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)
	3	42460	0.030	5040	31850	0.025	3220	26540	0.021	2210	50000	0.033	6530
	4	31850	0.040	5050	23890	0.034	3220	19900	0.028	2210	50000	0.044	8710
	5	25480	0.050	5050	19110	0.042	3220	15920	0.035	2210	50000	0.054	10890
	6	21230	0.059	4970	15920	0.050	3170	13270	0.041	2170	42460	0.064	10930
	8	15920	0.077	4930	11940	0.066	3140	9950	0.054	2160	31850	0.085	10850
	10	12740	0.095	4820	9550	0.080	3070	7960	0.066	2110	25480	0.104	10590
	12	10620	0.108	4590	7960	0.092	2920	6630	0.076	2000	21230	0.119	10090
	14	9100	0.126	4590	6820	0.107	2920	5690	0.088	2010	18200	0.139	10090
16	7960	0.144	4580	5970	0.122	2920	4980	0.101	2010	15920	0.158	10090	
18	7080	0.158	4490	5310	0.135	2860	4420	0.111	1960	14150	0.174	9860	
20	6370	0.176	4470	4780	0.149	2850	3980	0.123	1960	12740	0.193	9840	

	Material Group ISO 513	N1			N2 N3			N4			N5		
	Material	Alluminium ≤ 12% Si - Copper Alloy			Alluminium > 12% Si - Copper Alloy			Brass and bronze			Plastics		
	ap x ae	1.5D x 0.5D			1.5D x 0.5D			1.5D x 0.5D			1.5D x 0.5D		
	Vc (m/min)	300-600			200-500			200-400			600-1000		
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)
	3	47770	0.036	6810	37150	0.032	4770	31850	0.029	3630	50000	0.039	7840
	4	35830	0.048	6810	27870	0.043	4770	23890	0.038	3630	50000	0.052	10450
	5	28660	0.059	6810	22290	0.053	4770	19110	0.048	3630	50000	0.065	13070
	6	23890	0.070	6710	18580	0.063	4700	15920	0.056	3580	42460	0.077	13120
	8	17910	0.093	6650	13930	0.084	4660	11940	0.074	3550	31850	0.102	13020
	10	14330	0.113	6500	11150	0.102	4550	9550	0.091	3470	25480	0.125	12710
	12	11940	0.130	6190	9290	0.117	4330	7960	0.104	3300	21230	0.143	12110
	14	10240	0.151	6190	7960	0.136	4330	6820	0.121	3300	18200	0.166	12110
16	8960	0.173	6190	6970	0.156	4340	5970	0.138	3300	15920	0.190	12100	
18	7960	0.190	6050	6190	0.171	4240	5310	0.152	3230	14150	0.209	11830	
20	7170	0.211	6040	5570	0.190	4220	4780	0.168	3220	12740	0.232	11810	

	Material Group ISO 513	N1			N2 N3			N4			N5		
	Material	Alluminium ≤ 12% Si - Copper Alloy			Alluminium > 12% Si - Copper Alloy			Brass and bronze			Plastics		
	α° x ae	8° x 0.5D			5° x 0.5D			5° x 0.5D			8° x 0.5D		
	Vc (m/min)	300-600			200-500			200-400			600-1000		
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)
	3	47770	0.021	3925	37150	0.018	2730	31850	0.015	1929	50000	0.023	4517
	4	35830	0.027	3925	27870	0.025	2730	23890	0.020	1929	50000	0.030	6023
	5	28660	0.034	3925	22290	0.031	2730	19110	0.025	1929	50000	0.038	7529
	6	23890	0.040	3865	18580	0.036	2690	15920	0.030	1899	42460	0.044	7556
	8	17910	0.054	3835	13930	0.048	2670	11940	0.039	1884	31850	0.059	7499
	10	14330	0.065	3745	11150	0.058	2610	9550	0.048	1840	25480	0.072	7325
	12	11940	0.075	3565	9290	0.067	2485	7960	0.055	1753	21230	0.082	6975
	14	10240	0.087	3570	7960	0.078	2485	6820	0.064	1752	18200	0.096	6976
16	8960	0.100	3570	6970	0.089	2485	5970	0.073	1753	15920	0.110	6974	
18	7960	0.110	3485	6190	0.098	2425	5310	0.081	1715	14150	0.120	6818	
20	7170	0.121	3480	5570	0.109	2420	4780	0.089	1710	12740	0.133	6801	

PARAMETERS SUGGESTED WITH HIGH POWER MILLING CHUCK AND STABLE MACHINING CONDITION

- INFO
- TYPHOON TA-HTA-4HTA
- TYPHOON PU-HPU
- TYPHOON SUH
- TYPHOON ALH
- TYPHOON HRC
- TYPHOON SUH MINI
- TYPHOON HL
- C-SD-TA
- LFTA
- SUTA
- HSS-HSS/CO DRILLS
- G2
- MDTA
- HF VH/UP
- MEF
- ALU
- MEX
- UH
- HSS/CO-HSSP END MILLS
- CARBIDE BURRS

CUTTING PARAMETERS

HFAL4


	Material Group ISO 513	N1			N2 N3			N4			N5		
	Material	Alluminium ≤ 12% Si - Copper Alloy			Alluminium > 12% Si - Copper Alloy			Brass and bronze			Plastics		
	α° x ae	15° x 0.5D			10° x 0.5D			7° x 0.5D			15° x 0.5D		
	Vc (m/min)	300-500			200-400			200-300			600-1000		
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)
3	42460	0.020	3355	31850	0.017	2185	26540	0.015	1545	50000	0.022	4344	
4	31850	0.026	3355	23890	0.023	2185	19900	0.019	1544	50000	0.029	5792	
5	25480	0.033	3355	19110	0.029	2185	15920	0.024	1544	50000	0.036	7240	
6	21230	0.039	3305	15920	0.034	2150	13270	0.029	1521	42460	0.043	7266	
8	15920	0.051	3275	11940	0.045	2135	9950	0.038	1509	31850	0.057	7211	
10	12740	0.063	3200	9550	0.055	2085	7960	0.046	1474	25480	0.069	7043	
12	10620	0.072	3050	7960	0.062	1985	6630	0.053	1403	21230	0.079	6707	
14	9100	0.084	3050	6820	0.073	1985	5690	0.062	1405	18200	0.092	6708	
16	7960	0.096	3050	5970	0.083	1985	4980	0.071	1405	15920	0.105	6706	
18	7080	0.105	2980	5310	0.092	1945	4420	0.078	1372	14150	0.116	6556	
20	6370	0.117	2975	4780	0.101	1940	3980	0.086	1369	12740	0.128	6540	

	Material Group ISO 513	N1			N2 N3			N4			N5		
	Material	Alluminium ≤ 12% Si - Copper Alloy			Alluminium > 12% Si - Copper Alloy			Brass and bronze			Plastics		
	ap x ae	D x 0.4D			D x 0.4D			D x 0.4D			D x 0.4D		
	Vc (m/min)	300-500			200-400			150-350			600-1000		
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)
3	42460	0.030	5040	31850	0.027	3410	26540	0.024	2520	50000	0.033	6530	
4	31850	0.040	5050	23890	0.036	3410	19900	0.032	2520	50000	0.044	8710	
5	25480	0.050	5050	19110	0.045	3410	15920	0.040	2520	50000	0.054	10890	
6	21230	0.059	4970	15920	0.053	3350	13270	0.047	2480	42460	0.064	10930	
8	15920	0.077	4930	11940	0.070	3330	9950	0.062	2460	31850	0.085	10850	
10	12740	0.095	4820	9550	0.085	3250	7960	0.076	2410	25480	0.104	10590	
12	10620	0.108	4590	7960	0.097	3090	6630	0.086	2290	21230	0.119	10090	
14	9100	0.126	4590	6820	0.113	3090	5690	0.101	2290	18200	0.139	10090	
16	7960	0.144	4580	5970	0.130	3090	4980	0.115	2290	15920	0.158	10090	
18	7080	0.158	4490	5310	0.143	3030	4420	0.127	2240	14150	0.174	9860	
20	6370	0.176	4470	4780	0.158	3020	3980	0.140	2240	12740	0.193	9840	


	Material Group ISO 513	N1			N2 N3			N4			N5		
	Material	Alluminium ≤ 12% Si - Copper Alloy			Alluminium > 12% Si - Copper Alloy			Brass and bronze			Plastics		
	ap x ae	D x D			D x D			0.5D x D			0.5D x D		
	Vc (m/min)	270-370			190-290			150-250			590-690		
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)
3	33970	0.015	2020	25480	0.013	1360	21230	0.012	1010	50000	0.016	3270	
4	25480	0.020	2020	19110	0.018	1360	15920	0.016	1010	50000	0.022	4360	
5	20380	0.025	2020	15290	0.022	1360	12740	0.020	1010	40760	0.027	4440	
6	16990	0.029	1990	12740	0.026	1340	10620	0.023	990	33970	0.032	4370	
8	12740	0.039	1970	9550	0.035	1330	7960	0.031	990	25480	0.043	4340	
10	10190	0.047	1930	7640	0.043	1300	6370	0.038	960	20380	0.052	4240	
12	8490	0.054	1830	6370	0.049	1240	5310	0.043	920	16990	0.059	4040	
14	7280	0.063	1830	5460	0.057	1240	4550	0.050	920	14560	0.069	4040	
16	6370	0.072	1830	4780	0.065	1240	3980	0.058	920	12740	0.079	4040	
18	5660	0.079	1790	4250	0.071	1210	3540	0.063	900	11320	0.087	3940	
20	5100	0.088	1790	3820	0.079	1210	3180	0.070	890	10190	0.097	3930	

PARAMETERS SUGGESTED WITH HIGH POWER MILLING CHUCK AND STABLE MACHINING CONDITION


HFAL3



Material Group ISO 513	N1			N2 N3			N4			N5		
Material	Alluminium ≤ 12% Si - Copper Alloy			Alluminium > 12% Si - Copper Alloy			Brass and bronze			Plastics		
ap x ae	D x D			D x D			D x D			D x D		
Vc (m/min)	300-500			200-400			150-350			600-900		
D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)
2	50000	0.022	3300	47770	0.019	2680	39810	0.015	1840	50000	0.024	3630
3	42460	0.033	4200	31850	0.028	2680	26540	0.023	1840	50000	0.036	5450
4	31850	0.044	4200	23890	0.037	2680	19900	0.031	1840	50000	0.048	7260
5	25480	0.055	4200	19110	0.047	2680	15920	0.039	1840	47770	0.061	8670
6	21230	0.065	4140	15920	0.055	2640	13270	0.046	1810	39810	0.072	8540
8	15920	0.086	4110	11940	0.073	2620	9950	0.060	1800	29860	0.095	8470
10	12740	0.105	4010	9550	0.089	2560	7960	0.074	1760	23890	0.116	8280
12	10620	0.120	3820	7960	0.102	2440	6630	0.084	1670	19900	0.132	7880
14	9100	0.140	3820	6820	0.119	2430	5690	0.098	1670	17060	0.154	7880
16	7960	0.160	3820	5970	0.136	2440	4980	0.112	1670	14930	0.176	7880
18	7080	0.176	3740	5310	0.150	2380	4420	0.123	1630	13270	0.194	7710
20	6370	0.195	3730	4780	0.166	2380	3980	0.137	1630	11940	0.215	7680



Material Group ISO 513	N1			N2 N3			N4			N5		
Material	Alluminium ≤ 12% Si - Copper Alloy			Alluminium > 12% Si - Copper Alloy			Brass and bronze			Plastics		
ap x ae	1.5D x 0.5D			1.5D x 0.5D			1.5D x 0.5D			1.5D x 0.5D		
Vc (m/min)	300-600			200-500			200-400			600-1000		
D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)
2	50000	0.026	3960	55730	0.024	3970	47770	0.021	3030	50000	0.029	4360
3	47770	0.040	5680	37150	0.036	3970	31850	0.032	3030	50000	0.044	6530
4	35830	0.053	5680	27870	0.048	3970	23890	0.042	3030	50000	0.058	8710
5	28660	0.066	5670	22290	0.059	3970	19110	0.053	3030	50000	0.073	10890
6	23890	0.078	5590	18580	0.070	3910	15920	0.062	2980	42460	0.086	10930
8	17910	0.103	5540	13930	0.093	3880	11940	0.083	2960	31850	0.114	10850
10	14330	0.126	5420	11150	0.113	3790	9550	0.101	2890	25480	0.139	10590
12	11940	0.144	5160	9290	0.130	3610	7960	0.115	2750	21230	0.158	10090
14	10240	0.168	5160	7960	0.151	3610	6820	0.134	2750	18200	0.185	10090
16	8960	0.192	5160	6970	0.173	3610	5970	0.154	2750	15920	0.211	10090
18	7960	0.211	5040	6190	0.190	3530	5310	0.169	2690	14150	0.232	9860
20	7170	0.234	5030	5570	0.211	3520	4780	0.187	2680	12740	0.257	9840



Material Group ISO 513	N1			N2 N3			N4			N5		
Material	Alluminium ≤ 12% Si - Copper Alloy			Alluminium > 12% Si - Copper Alloy			Brass and bronze			Plastics		
α° x ae	8° x 0.5D			5° x 0.5D			5° x 0.5D			8° x 0.5D		
Vc (m/min)	300-500			200-400			150-350			600-900		
D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)
2	50000	0.015	2280	47770	0.014	1950	39810	0.011	1339	50000	0.017	2510
3	42460	0.023	2905	31850	0.020	1950	26540	0.017	1339	50000	0.025	3764
4	31850	0.030	2905	23890	0.027	1950	19900	0.022	1339	50000	0.033	5019
5	25480	0.038	2905	19110	0.034	1950	15920	0.028	1339	47770	0.042	5994
6	21230	0.045	2860	15920	0.040	1920	13270	0.033	1319	39810	0.049	5904
8	15920	0.059	2840	11940	0.053	1905	9950	0.044	1308	29860	0.065	5859
10	12740	0.073	2775	9550	0.065	1860	7960	0.054	1278	23890	0.080	5723
12	10620	0.083	2645	7960	0.074	1775	6630	0.061	1217	19900	0.091	5448
14	9100	0.097	2640	6820	0.087	1775	5690	0.071	1218	17060	0.106	5449
16	7960	0.111	2640	5970	0.099	1775	4980	0.082	1218	14930	0.122	5450
18	7080	0.122	2585	5310	0.109	1735	4420	0.090	1189	13270	0.134	5328
20	6370	0.135	2575	4780	0.121	1730	3980	0.099	1187	11940	0.148	5312

PARAMETERS SUGGESTED WITH HIGH POWER MILLING CHUCK AND STABLE MACHINING CONDITION

CUTTING PARAMETERS

HFAL3

	Material Group ISO 513	N1			N2 N3			N4			N5		
	Material	Alluminium ≤ 12% Si - Copper Alloy			Alluminium > 12% Si - Copper Alloy			Brass and bronze			Plastics		
	α° x ae	15° x 0.5D			10° x 0.5D			7° x 0.5D			15° x 0.5D		
	Vc (m/min)	300-500			200-400			150-350			600-900		
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)
2	50000	0.015	2194	47770	0.013	1822	39810	0.011	1287	50000	0.016	2413	
3	42460	0.022	2794	31850	0.019	1822	26540	0.016	1287	50000	0.024	3620	
4	31850	0.029	2795	23890	0.025	1822	19900	0.022	1287	50000	0.032	4826	
5	25480	0.037	2795	19110	0.032	1822	15920	0.027	1287	47770	0.040	5764	
6	21230	0.043	2752	15920	0.038	1794	13270	0.032	1268	39810	0.048	5677	
8	15920	0.057	2731	11940	0.050	1780	9950	0.042	1258	29860	0.063	5634	
10	12740	0.070	2668	9550	0.061	1738	7960	0.051	1228	23890	0.077	5503	
12	10620	0.080	2542	7960	0.069	1656	6630	0.059	1169	19900	0.088	5239	
14	9100	0.093	2541	6820	0.081	1655	5690	0.069	1171	17060	0.102	5240	
16	7960	0.106	2540	5970	0.092	1656	4980	0.078	1171	14930	0.117	5241	
18	7080	0.117	2485	5310	0.102	1620	4420	0.086	1143	13270	0.129	5124	
20	6370	0.130	2477	4780	0.113	1616	3980	0.096	1141	11940	0.143	5108	

	Material Group ISO 513	N1			N2 N3			N4			N5		
	Material	Alluminium ≤ 12% Si - Copper Alloy			Alluminium > 12% Si - Copper Alloy			Brass and bronze			Plastics		
	ap x ae	D x 0.4D			D x 0.4D			D x 0.4D			D x 0.4D		
	Vc (m/min)	300-500			200-400			150-350			600-900		
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)
2	50000	0.022	3300	47770	0.020	2840	39810	0.018	2100	50000	0.024	3630	
3	42460	0.033	4200	31850	0.030	2840	26540	0.026	2100	50000	0.036	5450	
4	31850	0.044	4200	23890	0.040	2840	19900	0.035	2100	50000	0.048	7260	
5	25480	0.055	4200	19110	0.050	2840	15920	0.044	2100	47770	0.061	8670	
6	21230	0.065	4140	15920	0.059	2790	13270	0.052	2070	39810	0.072	8540	
8	15920	0.086	4110	11940	0.077	2770	9950	0.069	2050	29860	0.095	8470	
10	12740	0.105	4010	9550	0.095	2710	7960	0.084	2010	23890	0.116	8280	
12	10620	0.120	3820	7960	0.108	2580	6630	0.096	1910	19900	0.132	7880	
14	9100	0.140	3820	6820	0.126	2580	5690	0.112	1910	17060	0.154	7880	
16	7960	0.160	3820	5970	0.144	2580	4980	0.128	1910	14930	0.176	7880	
18	7080	0.176	3740	5310	0.158	2520	4420	0.141	1870	13270	0.194	7710	
20	6370	0.195	3730	4780	0.176	2520	3980	0.156	1860	11940	0.215	7680	


	Material Group ISO 513	N1			N2 N3			N4			N5		
	Material	Alluminium ≤ 12% Si - Copper Alloy			Alluminium > 12% Si - Copper Alloy			Brass and bronze			Plastics		
	ap x ae	D x D			D x D			0.5D x D			0.5D x D		
	Vc (m/min)	270-370			190-290			150-250			500-700		
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)
2	50000	0.011	1650	38220	0.010	1140	31850	0.009	840	50000	0.012	1820	
3	33970	0.017	1680	25480	0.015	1140	21230	0.013	840	50000	0.018	2720	
4	25480	0.022	1680	19110	0.020	1140	15920	0.018	840	47770	0.024	3470	
5	20380	0.028	1680	15290	0.025	1140	12740	0.022	840	38220	0.030	3470	
6	16990	0.033	1660	12740	0.029	1120	10620	0.026	830	31850	0.036	3420	
8	12740	0.043	1640	9550	0.039	1110	7960	0.034	820	23890	0.047	3390	
10	10190	0.053	1600	7640	0.047	1080	6370	0.042	800	19110	0.058	3310	
12	8490	0.060	1530	6370	0.054	1030	5310	0.048	760	15920	0.066	3150	
14	7280	0.070	1530	5460	0.063	1030	4550	0.056	760	13650	0.077	3150	
16	6370	0.080	1530	4780	0.072	1030	3980	0.064	760	11940	0.088	3150	
18	5660	0.088	1490	4250	0.079	1010	3540	0.070	750	10620	0.097	3080	
20	5100	0.098	1490	3820	0.088	1010	3180	0.078	740	9550	0.107	3070	


PARAMETERS SUGGESTED WITH HIGH POWER MILLING CHUCK AND STABLE MACHINING CONDITION


- INFO
- TYPHOON TA-HTA-4HTA
- TYPHOON PU-HPU
- TYPHOON SUH
- TYPHOON ALH
- TYPHOON HRC
- TYPHOON SUH MINI
- TYPHOON HL
- C-SD-TA
- LFTA
- SUTA
- HSS-HSS/CO DRILLS
- G2
- MDTA
- HF VH/UP
- MEF
- ALU
- MEX
- UH
- HSS/CO-HSSP END MILLS
- CARBIDE BURRS

CUTTING PARAMETERS

HFA53

	Material Group ISO 513	N1			N2 N3			N4			N5		
	Material	Alluminium ≤ 12% Si - Copper Alloy			Alluminium > 12% Si - Copper Alloy			Brass and bronze			Plastics		
	ap x ae	0.5D x D			0.5D x D			0.5D x D			0.5D x D		
	Vc (m/min)	200-500			150-350			150-250			500-900		
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)
	3	37150	0.026	2940	26540	0.022	1790	21230	0.018	1180	50000	0.029	4360
	4	27870	0.035	2940	19900	0.030	1790	15920	0.025	1180	50000	0.039	5810
	5	22290	0.044	2940	15920	0.037	1790	12740	0.031	1180	44590	0.048	6470
	6	18580	0.052	2900	13270	0.044	1760	10620	0.036	1160	37150	0.057	6370
	8	13930	0.069	2880	9950	0.058	1750	7960	0.048	1150	27870	0.076	6330
	10	11150	0.084	2810	7960	0.071	1710	6370	0.059	1120	22290	0.092	6180
	12	9290	0.096	2680	6630	0.082	1620	5310	0.067	1070	18580	0.106	5890
	14	7960	0.112	2670	5690	0.095	1630	4550	0.078	1070	15920	0.123	5880
16	6970	0.128	2680	4980	0.109	1630	3980	0.090	1070	13930	0.141	5880	
18	6190	0.141	2610	4420	0.120	1590	3540	0.099	1050	12380	0.155	5750	
20	5570	0.156	2610	3980	0.133	1580	3180	0.109	1040	11150	0.172	5740	

	Material Group ISO 513	N1			N2 N3			N4			N5		
	Material	Alluminium ≤ 12% Si - Copper Alloy			Alluminium > 12% Si - Copper Alloy			Brass and bronze			Plastics		
	ap x ae	1.5D x 0.5D			1.5D x 0.5D			1.5D x 0.5D			1.5D x 0.5D		
	Vc (m/min)	300-500			200-400			150-350			600-900		
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)
	3	42460	0.032	4040	31850	0.029	2720	26540	0.025	2020	50000	0.035	5230
	4	31850	0.042	4040	23890	0.038	2720	19900	0.034	2020	50000	0.046	6970
	5	25480	0.053	4040	19110	0.048	2720	15920	0.042	2020	47770	0.058	8320
	6	21230	0.062	3970	15920	0.056	2680	13270	0.050	1990	39810	0.069	8200
	8	15920	0.083	3940	11940	0.074	2660	9950	0.066	1970	29860	0.091	8140
	10	12740	0.101	3850	9550	0.091	2600	7960	0.081	1930	23890	0.111	7950
	12	10620	0.115	3670	7960	0.104	2480	6630	0.092	1830	19900	0.127	7570
	14	9100	0.134	3670	6820	0.121	2470	5690	0.108	1840	17060	0.148	7570
16	7960	0.154	3670	5970	0.138	2480	4980	0.123	1840	14930	0.169	7570	
18	7080	0.169	3590	5310	0.152	2420	4420	0.135	1790	13270	0.186	7400	
20	6370	0.187	3580	4780	0.168	2420	3980	0.150	1790	11940	0.206	7380	

	Material Group ISO 513	N1			N2 N3			N4			N5		
	Material	Alluminium ≤ 12% Si - Copper Alloy			Alluminium > 12% Si - Copper Alloy			Brass and bronze			Plastics		
	α° x ae	8° x 0.5D			5° x 0.5D			5° x 0.5D			8° x 0.5D		
	Vc (m/min)	200-500			150-350			200-400			500-900		
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)
	3	37150	0.018	2035	26540	0.016	1300	31850	0.013	1285	50000	0.020	3010
	4	27870	0.024	2035	19900	0.022	1300	23890	0.018	1285	50000	0.027	4015
	5	22290	0.030	2035	15920	0.027	1300	19110	0.022	1285	44590	0.033	4475
	6	18580	0.036	2005	13270	0.032	1280	15920	0.027	1265	37150	0.040	4405
	8	13930	0.048	1990	9950	0.043	1270	11940	0.035	1255	27870	0.052	4375
	10	11150	0.058	1945	7960	0.052	1240	9550	0.043	1225	22290	0.064	4270
	12	9290	0.066	1850	6630	0.059	1180	7960	0.049	1170	18580	0.073	4070
	14	7960	0.077	1850	5690	0.069	1185	6820	0.057	1170	15920	0.085	4070
16	6970	0.088	1850	4980	0.079	1185	5970	0.065	1170	13930	0.097	4070	
18	6190	0.097	1810	4420	0.087	1155	5310	0.072	1145	12380	0.107	3975	
20	5570	0.108	1800	3980	0.097	1155	4780	0.080	1140	11150	0.119	3970	

PARAMETERS SUGGESTED WITH HIGH POWER MILLING CHUCK AND STABLE MACHINING CONDITION

- INFO
- TYPHOON TA-HTA-4HTA
- TYPHOON PU-HPU
- TYPHOON SUH
- TYPHOON ALH
- TYPHOON HRC
- TYPHOON SUH MINI
- TYPHOON HL
- C-SD-TA
- LFTA
- SUTA
- HSS-HSS/CO DRILLS
- G2
- MDTA
- HF VH/UP
- MEF
- ALU
- MEX
- UH
- HSS/CO-HSSP END MILLS
- CARBIDE BURRS

CUTTING PARAMETERS

HFA53

	Material Group ISO 513	N1			N2 N3			N4			N5		
	Material	Alluminium ≤ 12% Si - Copper Alloy			Alluminium > 12% Si - Copper Alloy			Brass and bronze			Plastics		
	α° x ae	15° x D			10° x D			7° x D			15° x D		
	Vc (m/min)	200-500			150-350			200-400			500-900		
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)
3	37150	0.018	1955	26540	0.014	1095	21230	0.013	825	50000	0.019	2895	
4	27870	0.023	1955	19900	0.018	1095	15920	0.017	825	50000	0.026	3860	
5	22290	0.029	1955	15920	0.023	1095	12740	0.022	825	44590	0.032	4305	
6	18580	0.035	1925	13270	0.027	1075	10620	0.025	810	37150	0.038	4240	
8	13930	0.046	1910	9950	0.036	1070	7960	0.034	805	27870	0.050	4205	
10	11150	0.056	1870	7960	0.044	1045	6370	0.041	785	22290	0.061	4110	
12	9290	0.064	1780	6630	0.050	995	5310	0.047	750	18580	0.070	3915	
14	7960	0.074	1780	5690	0.058	995	4550	0.055	750	15920	0.082	3910	
16	6970	0.085	1780	4980	0.067	995	3980	0.063	750	13930	0.094	3910	
18	6190	0.094	1740	4420	0.073	970	3540	0.069	735	12380	0.103	3825	
20	5570	0.104	1735	3980	0.081	970	3180	0.076	730	11150	0.114	3815	

	Material Group ISO 513	N1			N2 N3			N4			N5		
	Material	Alluminium ≤ 12% Si - Copper Alloy			Alluminium > 12% Si - Copper Alloy			Brass and bronze			Plastics		
	ap x ae	D x 0.4D			D x 0.4D			D x 0.4D			D x 0.4D		
	Vc (m/min)	200-500			150-350			150-250			500-900		
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)
3	37150	0.026	2940	26540	0.024	1890	21230	0.021	1350	50000	0.029	4360	
4	27870	0.035	2940	19900	0.032	1890	15920	0.028	1340	50000	0.039	5810	
5	22290	0.044	2940	15920	0.040	1890	12740	0.035	1350	44590	0.048	6470	
6	18580	0.052	2900	13270	0.047	1860	10620	0.042	1330	37150	0.057	6370	
8	13930	0.069	2880	9950	0.062	1850	7960	0.055	1310	27870	0.076	6330	
10	11150	0.084	2810	7960	0.076	1810	6370	0.067	1280	22290	0.092	6180	
12	9290	0.096	2680	6630	0.086	1720	5310	0.077	1220	18580	0.106	5890	
14	7960	0.112	2670	5690	0.101	1720	4550	0.090	1220	15920	0.123	5880	
16	6970	0.128	2680	4980	0.115	1720	3980	0.102	1220	13930	0.141	5880	
18	6190	0.141	2610	4420	0.127	1680	3540	0.113	1200	12380	0.155	5750	
20	5570	0.156	2610	3980	0.140	1680	3180	0.125	1190	11150	0.172	5740	

	Material Group ISO 513	N1			N2 N3			N4			N5		
	Material	Alluminium ≤ 12% Si - Copper Alloy			Alluminium > 12% Si - Copper Alloy			Brass and bronze			Plastics		
	ap x ae	0.5D x D			0.5D x D			0.5D x D			0.5D x D		
	Vc (m/min)	230-330			150-250			110-210			510-610		
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)
3	29720	0.013	1180	21230	0.012	760	16990	0.011	540	50000	0.015	2180	
4	22290	0.018	1180	15920	0.016	760	12740	0.014	540	44590	0.019	2590	
5	17830	0.022	1180	12740	0.020	760	10190	0.018	540	35670	0.024	2590	
6	14860	0.026	1160	10620	0.023	750	8490	0.021	530	29720	0.029	2550	
8	11150	0.034	1150	7960	0.031	740	6370	0.028	530	22290	0.038	2530	
10	8920	0.042	1120	6370	0.038	720	5100	0.034	510	17830	0.046	2470	
12	7430	0.048	1070	5310	0.043	690	4250	0.038	490	14860	0.053	2350	
14	6370	0.056	1070	4550	0.050	690	3640	0.045	490	12740	0.062	2350	
16	5570	0.064	1070	3980	0.058	690	3180	0.051	490	11150	0.070	2350	
18	4950	0.070	1050	3540	0.063	670	2830	0.056	480	9910	0.077	2300	
20	4460	0.078	1040	3180	0.070	670	2550	0.062	480	8920	0.086	2300	

PARAMETERS SUGGESTED WITH HIGH POWER MILLING CHUCK AND STABLE MACHINING CONDITION

MDCSA1

	Material Group ISO 513	N1			N2 N3			N4			N5		
	Material	Alluminium ≤ 12% Si - Copper Alloy			Alluminium > 12% Si - Copper Alloy			Brass and bronze			Plastics		
	ap x ae	0.5D x D			0.5D x D			0.5D x D			0.5D x D		
	Vc (m/min)	300-500			200-400			150-350			400-600		
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)
	2	50000	0.023	1130	47770	0.019	910	39810	0.016	630	50000	0.023	1130
	3	42460	0.030	1270	31850	0.026	810	31850	0.021	670	50000	0.030	1500
	4	35830	0.039	1400	27870	0.033	920	23890	0.027	650	39810	0.039	1550
	5	28660	0.049	1400	22290	0.041	920	19110	0.034	650	38220	0.049	1860
	6	23890	0.058	1380	18580	0.049	910	15920	0.040	640	31850	0.058	1840
8	17910	0.079	1410	13930	0.067	930	11940	0.055	660	23890	0.079	1880	
10	14330	0.098	1400	11150	0.083	920	9550	0.068	650	19110	0.098	1860	
12	11940	0.116	1390	9290	0.099	920	7960	0.081	650	15920	0.116	1850	

< D3 ap x ae D x 0.25D

	Material Group ISO 513	N1			N2 N3			N4			N5		
	Material	Alluminium ≤ 12% Si - Copper Alloy			Alluminium > 12% Si - Copper Alloy			Brass and bronze			Plastics		
	ap x ae	D x 0.5D			D x 0.5D			D x 0.5D			D x 0.5D		
	Vc (m/min)	300-600			200-500			200-400			400-800		
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)
	2	50000	0.030	1500	50000	0.026	1280	47770	0.021	1000	50000	0.030	1500
	3	47770	0.040	1910	37150	0.034	1260	31850	0.028	890	50000	0.040	2000
	4	35830	0.052	1860	27870	0.044	1230	23890	0.036	870	47770	0.052	2480
	5	28660	0.065	1860	22290	0.055	1230	19110	0.046	870	38220	0.065	2480
	6	23890	0.077	1840	18580	0.065	1220	15920	0.054	860	31850	0.077	2450
8	17910	0.105	1880	13930	0.089	1240	11940	0.074	880	23890	0.105	2510	
10	14330	0.130	1860	11150	0.111	1230	9550	0.091	870	19110	0.130	2480	
12	11940	0.155	1850	9290	0.132	1220	7960	0.109	860	15920	0.155	2470	

< D3 ap x ae D x 0.25D

	Material Group ISO 513	N1			N2 N3			N4			N5		
	Material	Alluminium ≤ 12% Si - Copper Alloy			Alluminium > 12% Si - Copper Alloy			Brass and bronze			Plastics		
	ap x ae	D x D			D x D			D x D			0.5D x D		
	Vc (m/min)	200-400			150-350			100-300			300-500		
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)
	2	47770	0.011	540	39810	0.010	380	31850	0.008	250	50000	0.011	560
	3	31850	0.015	480	26540	0.013	340	21230	0.011	220	42460	0.015	640
	4	23890	0.020	470	19900	0.017	330	15920	0.014	220	31850	0.020	620
	5	19110	0.024	470	15920	0.021	330	12740	0.017	220	25480	0.024	620
	6	15920	0.029	460	13270	0.025	330	10620	0.020	210	21230	0.029	610
8	11940	0.039	470	9950	0.033	330	7960	0.028	220	15920	0.039	630	
10	9550	0.049	470	7960	0.041	330	6370	0.034	220	12740	0.049	620	
12	7960	0.058	460	6630	0.049	330	5310	0.041	220	10620	0.058	620	

< D3 ap x ae 0.5D x D

MDCSA2

	Material Group ISO 513	N1			N2 N3			N4			N5		
	Material	Alluminium ≤ 12% Si - Copper Alloy			Alluminium > 12% Si - Copper Alloy			Brass and bronze			Plastics		
	ap x ae	0.5D x D			0.5D x D			0.5D x D			0.5D x D		
	Vc (m/min)	200-600			150-350			150-250			500-900		
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)
1	50000	0.011	1120	50000	0.010	950	50000	0.008	780	50000	0.011	1120	
1.5	50000	0.017	1680	50000	0.014	1430	42460	0.012	1000	50000	0.017	1680	
2	50000	0.022	2240	39810	0.019	1520	31850	0.016	1000	50000	0.022	2240	
3	37150	0.028	2100	26540	0.024	1270	21230	0.020	840	50000	0.028	2820	
4	27870	0.038	2090	19900	0.032	1270	15920	0.026	840	50000	0.038	3750	
5	22290	0.047	2100	15920	0.040	1270	12740	0.033	840	44590	0.047	4200	
6	18580	0.056	2090	13270	0.048	1270	10620	0.039	840	37150	0.056	4190	
8	13930	0.075	2080	9950	0.064	1270	7960	0.052	830	27870	0.075	4170	
10	11150	0.094	2090	7960	0.080	1270	6370	0.066	840	22290	0.094	4170	
12	9290	0.112	2080	6630	0.095	1260	5310	0.078	830	18580	0.112	4160	
14	7960	0.130	2080	5690	0.111	1260	4550	0.091	830	15920	0.130	4150	
16	6970	0.148	2060	4980	0.126	1250	3980	0.103	820	13930	0.148	4120	
18	6190	0.166	2060	4420	0.141	1250	3540	0.116	820	12380	0.166	4120	
20	5570	0.185	2060	3980	0.157	1250	3180	0.129	820	11150	0.185	4120	

< D3 ap x ae 0.25D x D

	Material Group ISO 513	N1			N2 N3			N4			N5		
	Material	Alluminium ≤ 12% Si - Copper Alloy			Alluminium > 12% Si - Copper Alloy			Brass and bronze			Plastics		
	ap x ae	D x 0.5D			D x 0.5D			D x 0.5D			D x 0.5D		
	Vc (m/min)	300-500			200-400			150-350			600-1000		
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)
1	50000	0.013	1340	50000	0.011	1140	50000	0.009	940	50000	0.013	1340	
1.5	50000	0.020	2020	50000	0.017	1710	50000	0.014	1410	50000	0.020	2020	
2	50000	0.027	2690	50000	0.023	2280	39810	0.019	1500	50000	0.027	2690	
3	42460	0.034	2880	31850	0.029	1830	26540	0.024	1260	50000	0.034	3390	
4	31850	0.045	2870	23890	0.038	1830	19900	0.032	1250	50000	0.045	4500	
5	25480	0.056	2880	19110	0.048	1830	15920	0.040	1260	50000	0.056	5640	
6	21230	0.068	2870	15920	0.057	1830	13270	0.047	1260	42460	0.068	5740	
8	15920	0.090	2860	11940	0.076	1820	9950	0.063	1250	31850	0.090	5720	
10	12740	0.112	2860	9550	0.096	1820	7960	0.079	1250	25480	0.112	5730	
12	10620	0.134	2850	7960	0.114	1820	6630	0.094	1250	21230	0.134	5710	
14	9100	0.157	2850	6820	0.133	1820	5690	0.110	1250	18200	0.157	5700	
16	7960	0.177	2820	5970	0.151	1800	4980	0.124	1240	15920	0.177	5650	
18	7080	0.200	2830	5310	0.170	1800	4420	0.140	1240	14150	0.200	5650	
20	6370	0.222	2830	4780	0.188	1800	3980	0.155	1240	12740	0.222	5650	

< D3 ap x ae D x 0.5D

MDCSA2

	Material Group ISO 513	N1			N2 N3			N4			N5		
	Material	Alluminium ≤ 12% Si - Copper Alloy			Alluminium > 12% Si - Copper Alloy			Brass and bronze			Plastics		
	ap x ae	0.5D x D			0.5D x D			0.5D x D			0.5D x D		
	Vc (m/min)	200-400			150-350			150-350			500-900		
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)
1	50000	0.006	560	50000	0.005	480	50000	0.004	390	50000	0.006	560	
1.5	50000	0.008	840	50000	0.007	710	50000	0.006	590	50000	0.008	840	
2	47770	0.011	1070	39810	0.010	760	39810	0.008	620	50000	0.011	1120	
3	31850	0.014	900	26540	0.012	640	26540	0.010	520	50000	0.014	1410	
4	23890	0.019	900	19900	0.016	630	19900	0.013	520	50000	0.019	1880	
5	19110	0.024	900	15920	0.020	640	15920	0.016	520	44590	0.024	2100	
6	15920	0.028	900	13270	0.024	640	13270	0.020	520	37150	0.028	2090	
8	11940	0.037	890	9950	0.032	630	9950	0.026	520	27870	0.037	2090	
10	9550	0.047	890	7960	0.040	630	7960	0.033	520	22290	0.047	2090	
12	7960	0.056	890	6630	0.048	630	6630	0.039	520	18580	0.056	2080	
14	6820	0.065	890	5690	0.055	630	5690	0.046	520	15920	0.065	2080	
16	5970	0.074	880	4980	0.063	630	4980	0.052	520	13930	0.074	2060	
18	5310	0.083	880	4420	0.071	620	4420	0.058	510	12380	0.083	2060	
20	4780	0.092	880	3980	0.079	630	3980	0.065	510	11150	0.092	2060	

< D3 ap x ae 0.25D x D

- INFO
- TYPHOON TA-HTA-4HTA
- TYPHOON PU-HPU
- TYPHOON SUH
- TYPHOON ALH
- TYPHOON HRC
- TYPHOON SUH MINI
- TYPHOON HL
- C-SD-TA
- LFTA
- SUTA
- HSS-HSS/CO DRILLS
- G2
- MDTA
- HF VH/UP
- MEF
- ALU
- MEX
- UH
- HSS/CO-HSSP END MILLS
- CARBIDE BURRS

MDCSA3

	Material Group ISO 513	N1			N2 N3			N4			N5		
	Material	Alluminium ≤ 12% Si - Copper Alloy			Alluminium > 12% Si - Copper Alloy			Brass and bronze			Plastics		
	ap x ae	0.5D x D			0.5D x D			0.5D x D			0.5D x D		
	Vc (m/min)	200-600			150-350			150-250			500-900		
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)
1	50000	0.010	1510	50000	0.009	1290	50000	0.007	1060	50000	0.010	1510	
1.5	50000	0.015	2270	50000	0.013	1930	42460	0.011	1350	50000	0.015	2270	
2	50000	0.020	3020	39810	0.017	2050	31850	0.014	1350	50000	0.020	3020	
3	37150	0.025	2830	26540	0.022	1720	21230	0.018	1130	50000	0.025	3810	
4	27870	0.034	2820	19900	0.029	1710	15920	0.024	1130	50000	0.034	5070	
5	22290	0.042	2830	15920	0.036	1720	12740	0.030	1130	44590	0.042	5660	
6	18580	0.051	2830	13270	0.043	1720	10620	0.035	1130	37150	0.051	5650	
8	13930	0.067	2810	9950	0.057	1710	7960	0.047	1130	27870	0.067	5630	
10	11150	0.084	2820	7960	0.072	1710	6370	0.059	1130	22290	0.084	5640	
12	9290	0.101	2810	6630	0.086	1700	5310	0.071	1120	18580	0.101	5620	
14	7960	0.117	2800	5690	0.100	1700	4550	0.082	1120	15920	0.117	5610	
16	6970	0.133	2780	4980	0.113	1690	3980	0.093	1110	13930	0.133	5560	
18	6190	0.150	2780	4420	0.127	1690	3540	0.105	1110	12380	0.150	5560	
20	5570	0.166	2780	3980	0.141	1690	3180	0.116	1110	11150	0.166	5560	

< D3 ap x ae 0.25D x D

	Material Group ISO 513	N1			N2 N3			N4			N5		
	Material	Alluminium ≤ 12% Si - Copper Alloy			Alluminium > 12% Si - Copper Alloy			Brass and bronze			Plastics		
	ap x ae	1.5D x 0.3D			1.5D x 0.3D			1.5D x 0.3D			1.5D x 0.3D		
	Vc (m/min)	300-500			200-400			150-350			600-1000		
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)
1	50000	0.012	1810	50000	0.010	1540	50000	0.008	1270	50000	0.012	1810	
1.5	50000	0.018	2720	50000	0.015	2310	50000	0.013	1910	50000	0.018	2720	
2	50000	0.024	3630	50000	0.021	3080	39810	0.017	2020	50000	0.024	3630	
3	42460	0.030	3880	31850	0.026	2480	26540	0.021	1700	50000	0.030	4570	
4	31850	0.041	3870	23890	0.034	2470	19900	0.028	1690	50000	0.041	6080	
5	25480	0.051	3880	19110	0.043	2480	15920	0.036	1700	50000	0.051	7620	
6	21230	0.061	3880	15920	0.052	2470	13270	0.043	1700	42460	0.061	7750	
8	15920	0.081	3860	11940	0.069	2460	9950	0.057	1690	31850	0.081	7720	
10	12740	0.101	3860	9550	0.086	2460	7960	0.071	1690	25480	0.101	7730	
12	10620	0.121	3850	7960	0.103	2460	6630	0.085	1680	21230	0.121	7700	
14	9100	0.141	3850	6820	0.120	2450	5690	0.099	1680	18200	0.141	7690	
16	7960	0.160	3810	5970	0.136	2430	4980	0.112	1670	15920	0.160	7630	
18	7080	0.180	3820	5310	0.153	2430	4420	0.126	1670	14150	0.180	7630	
20	6370	0.200	3810	4780	0.170	2430	3980	0.140	1670	12740	0.200	7630	

< D3 ap x ae D x 0.1D

- INFO
- TYPHOON TA-HTA-4HTA
- TYPHOON PU-HPU
- TYPHOON SUH
- TYPHOON ALH
- TYPHOON HRC
- TYPHOON SUH MINI
- TYPHOON HL
- C-SD-TA
- LFTA
- SUTA
- HSS-HSS/CO DRILLS
- G2
- MDTA
- HF VH/UP
- MEF
- ALU
- MEX
- UH
- HSS/CO-HSSP END MILLS
- CARBIDE BURRS

MDA310-11-12

cylindrical shank, 3 flutes polished, long



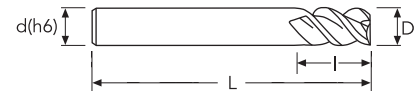
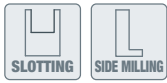
MDA310



MDA311 - MDA312



★ 1st choice ☆ suitable



D	D Tol.	C	C Tol.	d(h6)	l	l1	L	z	EDP No.	Stock
3	0/-0.030			6	12		75	3	MDA310030	●
4	0/-0.030			6	16		75	3	MDA310040	●
5	0/-0.030			6	20		75	3	MDA310050	●
6	0/-0.030			6	25		75	3	MDA310060	●
3	0/-0.030			6	15		100	3	MDA311030	●
4	0/-0.030			6	20		100	3	MDA311040	●
5	0/-0.030			6	25		100	3	MDA311050	●
6	0/-0.030			6	30		100	3	MDA311060	●
8	0/-0.035			8	35		100	3	MDA311080	●
10	0/-0.035			10	40		100	3	MDA311100	●
12	0/-0.035			12	45		100	3	MDA311120	●
8	0/-0.035			8	40		150	3	MDA312080	●
10	0/-0.035			10	50		150	3	MDA312100	●
12	0/-0.035			12	50		150	3	MDA312120	●
16	0/-0.040			16	70		150	3	MDA312160	●
20	0/-0.040			20	80		150	3	MDA312200	●

● stock standard ○ non-standard stock ▽ stock exhaustion

CUTTING PARAMETERS

MDA310

	Material Group ISO 513	N1			N2 N3			N4			N5		
	Material	Alluminium ≤ 12% Si - Copper Alloy			Alluminium > 12% Si - Copper Alloy			Brass and bronze			Plastics		
	ap x ae	0.3D x D			0.3D x D			0.3D x D			0.3D x D		
	Vc (m/min)	220-340			150-250			100-200			400-700		
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)
	3	29720	0.023	2040	21230	0.019	1240	15920	0.016	760	50000	0.023	3430
	4	22290	0.030	2030	15920	0.026	1230	11940	0.021	760	50000	0.030	4560
5	17830	0.038	2040	12740	0.032	1240	9550	0.027	760	35030	0.038	4000	
6	14860	0.046	2030	10620	0.039	1240	7960	0.032	760	29190	0.046	4000	

	Material Group ISO 513	N1			N2 N3			N4			N5		
	Material	Alluminium ≤ 12% Si - Copper Alloy			Alluminium > 12% Si - Copper Alloy			Brass and bronze			Plastics		
	ap x ae	1.5D x 0.1D			1.5D x 0.1D			1.5D x 0.1D			1.5D x 0.1D		
	Vc (m/min)	270-370			200-300			150-250			500-800		
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)
	3	33970	0.027	2800	26540	0.023	1860	21230	0.019	1220	50000	0.027	4120
	4	25480	0.036	2790	19900	0.031	1850	15920	0.026	1220	50000	0.036	5470
5	20380	0.046	2800	15920	0.039	1860	12740	0.032	1220	50000	0.046	6860	
6	16990	0.055	2790	13270	0.047	1850	10620	0.038	1220	34500	0.055	5670	

MDA311

	Material Group ISO 513	N1			N2 N3			N4			N5		
	Material	Alluminium ≤ 12% Si - Copper Alloy			Alluminium > 12% Si - Copper Alloy			Brass and bronze			Plastics		
	ap x ae	0.3D x D			0.3D x D			0.3D x D			0.3D x D		
	Vc (m/min)	180-280			110-210			100-160			350-550		
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)
	3	24420	0.019	1400	16990	0.016	830	13800	0.013	550	50000	0.019	2860
	4	18310	0.025	1390	12740	0.022	820	10350	0.018	550	50000	0.025	3800
5	14650	0.032	1400	10190	0.027	830	8280	0.022	550	28660	0.032	2730	
6	12210	0.038	1390	8490	0.032	820	6900	0.027	550	23890	0.038	2730	
8	9160	0.051	1390	6370	0.043	820	5180	0.035	550	17910	0.051	2710	
10	7320	0.063	1390	5100	0.054	820	4140	0.044	550	14330	0.063	2720	
12	6100	0.076	1380	4250	0.064	820	3450	0.053	550	11940	0.076	2710	

	Material Group ISO 513	N1			N2 N3			N4			N5		
	Material	Alluminium ≤ 12% Si - Copper Alloy			Alluminium > 12% Si - Copper Alloy			Brass and bronze			Plastics		
	ap x ae	2D x 0.05D			2D x 0.05D			2D x 0.05D			2D x 0.05D		
	Vc (m/min)	210-310			150-250			110-210			420-620		
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)
	3	27600	0.023	1890	21230	0.019	1240	16990	0.016	820	50000	0.023	3430
	4	20700	0.030	1890	15920	0.026	1230	12740	0.021	810	50000	0.030	4560
5	16560	0.038	1890	12740	0.032	1240	10190	0.027	820	50000	0.038	5720	
6	13800	0.046	1890	10620	0.039	1240	8490	0.032	810	27600	0.046	3780	
8	10350	0.061	1880	7960	0.052	1230	6370	0.042	810	20700	0.061	3760	
10	8280	0.076	1880	6370	0.064	1230	5100	0.053	810	16560	0.076	3770	
12	6900	0.091	1880	5310	0.077	1230	4250	0.064	810	13800	0.091	3760	

- INFO
- TYPHOON TA-HTA-4HTA
- TYPHOON PU-HPU
- TYPHOON SUH
- TYPHOON ALH
- TYPHOON HRC
- TYPHOON SUH MINI
- TYPHOON HL
- C-SD-TA
- LFTA
- SUTA
- HSS-HSS/CO DRILLS
- G2
- MDTA
- HF VH/UP
- MEF
- ALU
- MEX
- UH
- HSS/CO-HSSP END MILLS
- CARBIDE BURRS

MDA312

	Material Group ISO 513	N1			N2 N3			N4			N5		
	Material	Alluminium ≤ 12% Si - Copper Alloy			Alluminium > 12% Si - Copper Alloy			Brass and bronze			Plastics		
	ap x ae	0.1D x D			0.1D x D			0.1D x D			0.1D x D		
	Vc (m/min)	130-230			100-160			80-120			250-450		
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)
	8	7170	0.040	870	5180	0.034	530	3980	0.028	340	13930	0.040	1690
	10	5730	0.051	870	4140	0.043	530	3180	0.035	340	11150	0.051	1690
12	4780	0.060	870	3450	0.051	530	2650	0.042	340	9290	0.060	1690	
16	3580	0.080	860	2590	0.068	530	1990	0.056	330	6970	0.080	1670	
20	2870	0.100	860	2070	0.085	530	1590	0.070	330	5570	0.100	1670	

	Material Group ISO 513	N1			N2 N3			N4			N5		
	Material	Alluminium ≤ 12% Si - Copper Alloy			Alluminium > 12% Si - Copper Alloy			Brass and bronze			Plastics		
	ap x ae	2.5D x 0.05D			2.5D x 0.05D			2.5D x 0.05D			2.5D x 0.05D		
	Vc (m/min)	150-250			100-200			100-160			300-500		
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)
	8	7960	0.048	1160	5970	0.041	740	5180	0.034	530	15920	0.048	2320
	10	6370	0.061	1160	4780	0.052	740	4140	0.042	530	12740	0.061	2320
12	5310	0.073	1160	3980	0.062	740	3450	0.051	530	10620	0.073	2310	
16	3980	0.096	1140	2990	0.081	730	2590	0.067	520	7960	0.096	2290	
20	3180	0.120	1140	2390	0.102	730	2070	0.084	520	6370	0.120	2290	

- INFO
- TYPHOON TA-HTA-4HTA
- TYPHOON PU-HPU
- TYPHOON SUH
- TYPHOON ALH
- TYPHOON HRC
- TYPHOON SUH MINI
- TYPHOON HL
- C-SD-TA
- LFTA
- SUTA
- HSS-HSS/CO DRILLS
- G2
- MDTA
- HF VH/UP
- MEF
- ALU
- MEX
- UH
- HSS/CO-HSSP END MILLS
- CARBIDE BURRS

MDCSAM

	Material Group ISO 513	N1			N2 N3			N4			N5		
	Material	Alluminium ≤ 12% Si - Copper Alloy			Alluminium > 12% Si - Copper Alloy			Brass and bronze			Plastics		
	ap x ae	1.5D x 0.05D			1.5D x 0.05D			1.5D x 0.05D			1.5D x 0.05D		
	Vc (m/min)	600-1000			400-800			300-700			900-1300		
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)
6	42460	0.050	12810	31850	0.043	8170	26540	0.035	5610	50000	0.050	15090	
8	31850	0.067	12770	23890	0.057	8140	19900	0.047	5580	43790	0.067	17550	
10	25480	0.084	12780	19110	0.071	8150	15920	0.059	5590	35030	0.084	17570	
12	21230	0.100	12740	15920	0.085	8120	13270	0.070	5570	29190	0.100	17510	

- INFO
- TYPHOON TA-HTA-4HTA
- TYPHOON PU-HPU
- TYPHOON SUH
- TYPHOON ALH
- TYPHOON HRC
- TYPHOON SUH MINI
- TYPHOON HL
- C-SD-TA
- LFTA
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- MEF
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- UH
- HSS/CO-HSSP END MILLS
- CARBIDE BURRS

MCA212R

	Material Group ISO 513	N1			N2 N3			N4			N5		
	Material	Alluminium ≤ 12% Si - Copper Alloy			Alluminium > 12% Si - Copper Alloy			Brass and bronze			Plastics		
	ap x ae	0.5D x D			0.5D x D			0.5D x D			0.5D x D		
	Vc (m/min)	200-600			200-400			150-350			600-1000w		
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)
2	50000	0.022	2240	47770	0.019	1820	39810	0.016	1250	50000	0.022	2240	
3	42460	0.028	2400	31850	0.024	1530	26540	0.020	1050	50000	0.028	2820	
4	31850	0.038	2390	23890	0.032	1520	19900	0.026	1050	50000	0.038	3750	
5	25480	0.047	2400	19110	0.040	1530	15920	0.033	1050	50000	0.047	4700	
6	21230	0.056	2390	15920	0.048	1520	13270	0.039	1050	42460	0.056	4780	
8	15920	0.075	2380	11940	0.064	1520	9950	0.052	1040	31850	0.075	4770	
10	12740	0.094	2390	9550	0.080	1520	7960	0.066	1040	25480	0.094	4770	
12	10620	0.112	2380	7960	0.095	1520	6630	0.078	1040	21230	0.112	4760	

< D3 ap x ae 0.25D x D

	Material Group ISO 513	N1			N2 N3			N4			N5		
	Material	Alluminium ≤ 12% Si - Copper Alloy			Alluminium > 12% Si - Copper Alloy			Brass and bronze			Plastics		
	ap x ae	1.5D x 0.3D			1.5D x 0.3D			1.5D x 0.3D			1.5D x 0.3D		
	Vc (m/min)	300-600			250-450			200-400			600-1000		
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)
2	50000	0.027	2690	50000	0.023	2280	47770	0.019	1800	50000	0.027	2690	
3	47770	0.034	3240	37150	0.029	2140	31850	0.024	1510	50000	0.034	3390	
4	35830	0.045	3230	27870	0.038	2130	23890	0.032	1510	50000	0.045	4500	
5	28660	0.056	3240	22290	0.048	2140	19110	0.040	1510	50000	0.056	5640	
6	23890	0.068	3230	18580	0.057	2140	15920	0.047	1510	42460	0.068	5740	
8	17910	0.090	3220	13930	0.076	2130	11940	0.063	1500	31850	0.090	5720	
10	14330	0.112	3220	11150	0.096	2130	9550	0.079	1500	25480	0.112	5730	
12	11940	0.134	3210	9290	0.114	2120	7960	0.094	1500	21230	0.134	5710	

< D3 ap x ae D x 0.5D

MDCAB2

	Material Group ISO 513		N1			N2 N3			N4			N5		
	Material		Alluminium ≤ 12% Si - Copper Alloy			Alluminium > 12% Si - Copper Alloy			Brass and bronze			Plastics		
	ap x ae		0.2D x 0.4D			0.2D x 0.4D			0.2D x 0.4D			0.2D x 0.4D		
	Vc (m/min)		200-600			250-450			200-400			600-1000		
	D (mm)	D (eff.) (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)
1	0.80	40000	0.013	1010	111460	0.011	2530	95540	0.010	1930	254780	0.013	6420	
1.5	1.20	84930	0.017	2850	74310	0.015	2250	63690	0.013	1710	169850	0.017	5710	
2	1.60	63690	0.017	2140	55730	0.015	1690	47770	0.013	1280	127390	0.017	4280	
2.5	2.00	50960	0.021	2140	44590	0.019	1690	38220	0.017	1280	101910	0.021	4280	
3	2.40	42460	0.025	2140	37150	0.023	1690	31850	0.020	1280	84930	0.025	4280	
4	3.20	31850	0.035	2230	27870	0.032	1760	23890	0.028	1340	63690	0.035	4460	
5	4.00	25480	0.045	2280	22290	0.040	1800	19110	0.036	1370	50960	0.045	4570	
6	4.80	21230	0.053	2260	18580	0.048	1780	15920	0.043	1360	42460	0.053	4520	
8	6.40	15920	0.067	2140	13930	0.060	1680	11940	0.054	1280	31850	0.067	4280	
10	8.00	12740	0.080	2030	11150	0.072	1600	9550	0.064	1220	25480	0.080	4070	
12	9.60	10620	0.094	1990	9290	0.084	1570	7960	0.075	1190	21230	0.094	3980	

- INFO
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- C-SD-TA
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- HSS-HSS/CO DRILLS
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- CARBIDE BURRS



MEX

STEEL AND HARDENED STEEL 30÷55 HRC

✚ Ultra-fine micrograin and Endless Orange coating for high performance machining on 30÷55 HRC materials. Wide range of tools available for general milling, roughing, copying and super finishing.

🇮🇹 Micrograna ultrafine e rivestimento Endless Orange per lavorazione ad alto rendimento di materiali con durezza compresa tra 30÷55 HRC. Ampia gamma per soddisfare applicazioni di fresatura generale, sgrossatura, copiatura e super finitura.

🇩🇪 Besonders feine Mikrokörnung und Beschichtung Endless Orange für Hochleistungsbearbeitungen von Materialien mit einer Härte zwischen 30 und 55 HRC. Große Produktpalette für Anwendungen zum Fräsen im Allgemeinen, Schruppen, Kopierfräsen und Schlichtbearbeitung.

🇫🇷 Ultra Micrograin et revêtement Endless Orange pour un usinage à rendement élevé de matériaux ayant une dureté comprise entre 30÷55 HRC. Une large gamme pour satisfaire les applications de fraisage général, ébauche, copiage et super finition.

🇪🇸 Micrograno ultrafino y revestimiento Endless Orange para el mecanizado a alto rendimiento de materiales con una dureza comprendida entre 30 y 55 HRC. Amplia gama para satisfacer aplicaciones de fresado general, desbaste, copiado y súper acabado.

🇷🇺 Микрозернистая структура твердого сплава и покрытие Endless Orange служат для высокоэффективной обработки материалов с твердостью 30÷55 HRC. Представлен широкий ассортимент инструментов для стандартных операций фрезерования, черновой обработки, обработки криволинейных поверхностей и чистовой обработки.

INFO
TYPHOON TA-HTA-4HTA
TYPHOON PU-HPU
TYPHOON SUH
TYPHOON ALH
TYPHOON HRC
TYPHOON SUH MINI
TYPHOON HL
C-SD-TA
LFTA
SUTA
HSS-HSS/CO DRILLS
G2
MDTA
HF VH/UP
MEF
ALU
MEX
UH
HSS/CO-HSSP END MILLS
CARBIDE BURRS

MEXM2

	Material Group ISO 513	P2 P3 P4 K1 K2			P4 P5 K3			P6 K4			H1 H4 H5			
	Hardness/Rm	< 1000 N/mm ²			< 35 HRC			35 - 45 HRC			45 - 55 HRC			
	ap x ae	ap x D			ap x D			ap x D			ap x D			
	Vc (m/min)	70-110			50-90			30-70			20-40			
	D (mm)	ap (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)
	0.3	0.02	40000	0.004	320	40000	0.004	290	40000	0.003	255	31800	0.003	180
	0.4	0.02	40000	0.006	480	40000	0.005	430	39800	0.005	380	23900	0.004	200
	0.5	0.03	40000	0.007	560	40000	0.006	500	31800	0.006	355	19100	0.005	185
	0.6	0.03	40000	0.008	640	37200	0.007	540	26500	0.006	340	15900	0.006	180
	0.8	0.04	35800	0.010	720	27900	0.009	500	19900	0.008	320	11900	0.007	165
1	0.05	28700	0.012	690	22300	0.011	480	15900	0.010	305	9600	0.008	160	
1.2	0.06	23900	0.022	1050	18600	0.020	740	13300	0.018	470	8000	0.015	245	
1.4	0.07	20500	0.024	980	15900	0.022	690	11400	0.019	440	6800	0.017	230	
1.5	0.08	19100	0.025	960	14900	0.023	670	10600	0.020	425	6400	0.018	225	
1.6	0.08	17900	0.026	930	13900	0.023	650	10000	0.021	415	6000	0.018	220	
1.8	0.09	15900	0.028	890	12400	0.025	620	8800	0.022	395	5300	0.020	210	
2	0.10	14300	0.030	860	11100	0.027	600	8000	0.024	190	4800	0.021	200	

INFO
TYPHOON TA-HTA-4HTA
TYPHOON PU-HPU
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TYPHOON HRC
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CARBIDE BURRS

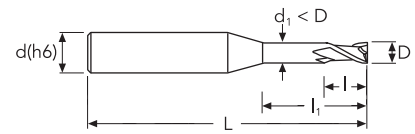
MEXM2SC

	Material Group ISO 513	P2 P3 P4 K1 K2			P4 P5 K3			P6 K4			H1 H4 H5			
	Hardness/Rm	< 1000 N/mm ²			< 35 HRC			35 - 45 HRC			45 - 55 HRC			
	ap x ae	ap x D			ap x D			ap x D			ap x D			
	Vc (m/min)	70-110			50-90			30-70			20-40			
	D (mm)	ap (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)
	0.2	0.01	40000	0.003	240	40000	0.003	220	40000	0.002	190	40000	0.002	170
	0.3	0.02	40000	0.004	320	40000	0.004	290	40000	0.003	255	31850	0.003	180
	0.4	0.02	40000	0.006	480	40000	0.005	430	39810	0.005	380	23890	0.004	200
	0.5	0.03	40000	0.007	560	40000	0.006	500	31850	0.006	355	19110	0.005	185
	0.6	0.03	40000	0.008	640	37150	0.007	530	26540	0.006	340	15920	0.006	180
0.8	0.04	35830	0.010	720	27870	0.009	500	19900	0.008	320	11940	0.007	165	
0.9	0.05	31850	0.012	760	24770	0.011	540	17690	0.010	340	10620	0.008	180	

- INFO
- TYPHOON TA-HTA-4HTA
- TYPHOON PU-HPU
- TYPHOON SUH
- TYPHOON ALH
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- CARBIDE BURRS

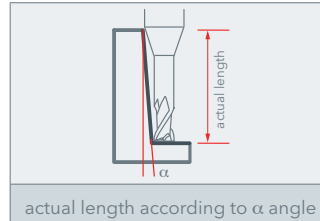
MEXLN2

cylindrical shank, 2 flutes, extended and reduced neck



P	M	K	N	S	H
★		★			★

★ 1st choice ☆ suitable

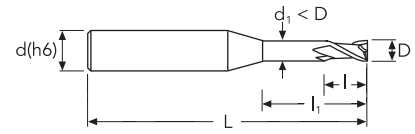


D	D Tol.	CR	CR Tol.	d(h6)	l	l1	d1	L	z	30'	1°	1°30'	2°	3°	EDP No.	Stock
0.2	0/-0.020			4	0.3	0.5	0.16	50	2	0.57	0.59	0.61	0.63	0.68	MEXLN2002005	●
0.2	0/-0.020			4	0.3	1	0.16	50	2	1.09	1.12	1.16	1.21	1.30	MEXLN200201	●
0.2	0/-0.020			4	0.3	1.5	0.16	50	2	1.60	1.66	1.72	1.78	1.91	MEXLN2002015	●
0.3	0/-0.020			4	0.4	1	0.26	50	2	1.09	1.12	1.16	1.21	1.30	MEXLN200301	●
0.3	0/-0.020			4	0.4	2	0.26	50	2	2.12	2.19	2.27	2.35	2.53	MEXLN200302	●
0.3	0/-0.020			4	0.4	3	0.26	50	2	3.15	3.26	3.38	3.50	3.76	MEXLN200303	●
0.4	0/-0.020			4	0.6	2	0.37	50	2	2.12	2.19	2.27	2.35	2.53	MEXLN200402	●
0.4	0/-0.020			4	0.6	3	0.37	50	2	3.15	3.26	3.38	3.50	3.76	MEXLN200403	●
0.4	0/-0.020			4	0.6	4	0.37	50	2	4.19	4.33	4.49	4.65	5.00	MEXLN200404	●
0.4	0/-0.020			4	0.6	5	0.37	50	2	5.22	5.40	5.59	5.79	6.23	MEXLN200405	●
0.5	0/-0.020			4	0.7	2	0.45	50	2	2.16	2.23	2.31	2.40	2.57	MEXLN200502	●
0.5	0/-0.020			4	0.7	4	0.45	50	2	4.23	4.37	4.53	4.69	5.04	MEXLN200504	●
0.5	0/-0.020			4	0.7	6	0.45	50	2	6.29	6.51	6.74	6.98	7.51	MEXLN200506	●
0.5	0/-0.020			4	0.7	8	0.45	50	2	8.36	8.65	8.96	9.28	9.98	MEXLN200508	●
0.6	0/-0.020			4	0.9	2	0.55	50	2	2.16	2.23	2.31	2.40	2.57	MEXLN200602	●
0.6	0/-0.020			4	0.9	4	0.55	50	2	4.23	4.37	4.53	4.69	5.04	MEXLN200604	●
0.6	0/-0.020			4	0.9	6	0.55	50	2	6.29	6.51	6.74	6.98	7.51	MEXLN200606	●
0.6	0/-0.020			4	0.9	8	0.55	50	2	8.36	8.65	8.96	9.28	9.98	MEXLN200608	●
0.6	0/-0.020			4	0.9	10	0.55	50	2	10.43	10.79	11.17	11.57	12.44	MEXLN200610	●
0.7	0/-0.020			4	1.0	2	0.65	50	2	2.16	2.23	2.31	2.40	2.57	MEXLN200702	●
0.7	0/-0.020			4	1.0	4	0.65	50	2	4.23	4.37	4.53	4.69	5.04	MEXLN200704	●
0.7	0/-0.020			4	1.0	6	0.65	50	2	6.29	6.51	6.74	6.98	7.51	MEXLN200706	●
0.7	0/-0.020			4	1.0	8	0.65	50	2	8.36	8.65	8.96	9.28	9.98	MEXLN200708	●
0.7	0/-0.020			4	1.0	10	0.65	50	2	10.43	10.79	11.17	11.57	12.44	MEXLN200710	●
0.8	0/-0.020			4	1.2	4	0.75	50	2	4.23	4.37	4.53	4.69	5.04	MEXLN200804	●
0.8	0/-0.020			4	1.2	6	0.75	50	2	6.29	6.51	6.74	6.98	7.51	MEXLN200806	●
0.8	0/-0.020			4	1.2	8	0.75	50	2	8.36	8.65	8.96	9.28	9.98	MEXLN200808	●
0.8	0/-0.020			4	1.2	10	0.75	50	2	10.43	10.79	11.17	11.57	12.44	MEXLN200810	●
0.8	0/-0.020			4	1.2	12	0.75	50	2	12.49	12.93	13.38	13.87	14.91	MEXLN200812	●
0.9	0/-0.020			4	1.4	6	0.85	50	2	6.29	6.51	6.74	6.98	7.51	MEXLN200906	●
0.9	0/-0.020			4	1.4	8	0.85	50	2	8.36	8.65	8.96	9.28	9.98	MEXLN200908	●
0.9	0/-0.020			4	1.4	10	0.85	50	2	10.43	10.79	11.17	11.57	12.44	MEXLN200910	●
1.0	0/-0.020			4	1.5	6	0.95	50	2	6.39	6.61	6.84	7.09	7.62	MEXLN201006	●
1.0	0/-0.020			4	1.5	8	0.95	50	2	8.46	8.75	9.06	9.38	10.09	MEXLN201008	●
1.0	0/-0.020			4	1.5	10	0.95	50	2	10.52	10.89	11.27	11.68	12.56	MEXLN201010	●
1.0	0/-0.020			4	1.5	12	0.95	50	2	12.59	13.03	13.49	13.97	15.02	MEXLN201012	●
1.0	0/-0.020			4	1.5	14	0.95	50	2	14.66	15.17	15.70	16.27	17.49	MEXLN201014	●
1.0	0/-0.020			4	1.5	16	0.95	50	2	16.73	17.3	17.92	18.56	19.96	MEXLN201016	●

● stock standard ○ non-stock standard ▽ stock exhaustion

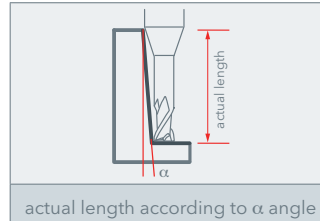
MEXLN2

cylindrical shank, 2 flutes, extended and reduced neck



P	M	K	N	S	H
★		★			★

★ 1st choice ☆ suitable



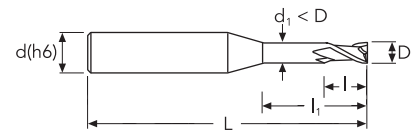
D	D Tol.	CR	CR Tol.	d(h6)	l	l1	d1	L	z	30'	1°	1°30'	2°	3°	EDP No.	Stock
1.2	0/-0.020			4	1.8	6	1.15	50	2	6.39	6.61	6.84	7.09	7.62	MEXLN201206	●
1.2	0/-0.020			4	1.8	8	1.15	50	2	8.46	8.75	9.06	9.38	10.09	MEXLN201208	●
1.2	0/-0.020			4	1.8	10	1.15	50	2	10.52	10.89	11.27	11.68	12.56	MEXLN201210	●
1.2	0/-0.020			4	1.8	12	1.15	50	2	12.59	13.03	13.49	13.97	15.02	MEXLN201212	●
1.4	0/-0.020			4	2.1	6	1.35	50	2	6.39	6.61	6.84	7.09	7.62	MEXLN201406	●
1.4	0/-0.020			4	2.1	8	1.35	50	2	8.46	8.75	9.06	9.38	10.09	MEXLN201408	●
1.4	0/-0.020			4	2.1	10	1.35	50	2	10.52	10.89	11.27	11.68	12.56	MEXLN201410	●
1.4	0/-0.020			4	2.1	12	1.35	50	2	12.59	13.03	13.49	13.97	15.02	MEXLN201412	●
1.4	0/-0.020			4	2.1	16	1.35	50	2	16.73	17.3	17.92	18.56	19.96	MEXLN201416	●
1.5	0/-0.020			4	2.3	6	1.45	50	2	6.39	6.61	6.84	7.09	7.62	MEXLN201506	●
1.5	0/-0.020			4	2.3	8	1.45	50	2	8.46	8.75	9.06	9.38	10.09	MEXLN201508	●
1.5	0/-0.020			4	2.3	10	1.45	50	2	10.52	10.89	11.27	11.68	12.56	MEXLN201510	●
1.5	0/-0.020			4	2.3	12	1.45	50	2	12.59	13.03	13.49	13.97	15.02	MEXLN201512	●
1.5	0/-0.020			4	2.3	14	1.45	50	2	14.66	15.17	15.70	16.27	17.49	MEXLN201514	●
1.5	0/-0.020			4	2.3	16	1.45	50	2	16.73	17.30	17.92	18.56	19.96	MEXLN201516	●
1.5	0/-0.020			4	2.3	18	1.45	60	2	18.79	19.44	20.13	20.86	22.43	MEXLN201518	●
1.5	0/-0.020			4	2.3	20	1.45	60	2	20.86	21.58	22.35	23.15	-	MEXLN201520	●
1.6	0/-0.020			4	2.4	6	1.55	50	2	6.39	6.61	6.84	7.09	7.62	MEXLN201606	●
1.6	0/-0.020			4	2.4	8	1.55	50	2	8.46	8.75	9.06	9.38	10.09	MEXLN201608	●
1.6	0/-0.020			4	2.4	10	1.55	50	2	10.52	10.89	11.27	11.68	12.56	MEXLN201610	●
1.6	0/-0.020			4	2.4	12	1.55	50	2	12.59	13.03	13.49	13.97	15.02	MEXLN201612	●
1.6	0/-0.020			4	2.4	14	1.55	50	2	14.66	15.17	15.70	16.27	17.49	MEXLN201614	●
1.6	0/-0.020			4	2.4	16	1.55	50	2	16.73	17.30	17.92	18.56	19.96	MEXLN201616	●
1.6	0/-0.020			4	2.4	18	1.55	60	2	18.79	19.44	20.13	20.86	22.43	MEXLN201618	●
1.6	0/-0.020			4	2.4	20	1.55	60	2	20.86	21.58	22.35	23.15	-	MEXLN201620	●
1.8	0/-0.020			4	2.7	6	1.75	50	2	6.39	6.61	6.84	7.09	7.62	MEXLN201806	●
1.8	0/-0.020			4	2.7	8	1.75	50	2	8.46	8.75	9.06	9.38	10.09	MEXLN201808	●
1.8	0/-0.020			4	2.7	10	1.75	50	2	10.52	10.89	11.27	11.68	12.56	MEXLN201810	●
1.8	0/-0.020			4	2.7	12	1.75	50	2	12.59	13.03	13.49	13.97	15.02	MEXLN201812	●
1.8	0/-0.020			4	2.7	16	1.75	50	2	16.73	17.30	17.92	18.56	19.96	MEXLN201816	●
1.8	0/-0.020			4	2.7	20	1.75	60	2	20.86	21.58	22.35	23.15	-	MEXLN201820	●
2	0/-0.020			4	3	6	1.95	50	2	6.39	6.61	6.84	7.09	7.62	MEXLN202006	●
2	0/-0.020			4	3	8	1.95	50	2	8.46	8.75	9.06	9.38	10.09	MEXLN202008	●
2	0/-0.020			4	3	10	1.95	50	2	10.52	10.89	11.27	11.68	12.56	MEXLN202010	●
2	0/-0.020			4	3	12	1.95	50	2	12.59	13.03	13.49	13.97	15.02	MEXLN202012	●
2	0/-0.020			4	3	14	1.95	50	2	14.66	15.17	15.70	16.27	17.49	MEXLN202014	●
2	0/-0.020			4	3	16	1.95	50	2	16.73	17.30	17.92	18.56	-	MEXLN202016	●
2	0/-0.020			4	3	18	1.95	60	2	18.79	19.44	20.13	20.86	-	MEXLN202018	●
2	0/-0.020			4	3	20	1.95	60	2	20.86	21.58	22.35	23.15	-	MEXLN202020	●

INFO
TYPHOON TA-HTA-4HTA
TYPHOON PU-HPU
TYPHOON SUH
TYPHOON ALH
TYPHOON HRC
TYPHOON SUH MINI
TYPHOON HL
C-SD-TA
LFTA
SUTA
HSS-HSS/CO DRILLS
G2
MDTA
HF VH/UP
MEF
ALU
MEX
UH
HSS/CO-HSSP END MILLS
CARBIDE BURRS

● stock standard ○ non-stock standard ▽ stock exhaustion

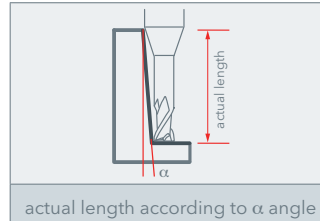
MEXLN2

cylindrical shank, 2 flutes, extended and reduced neck



P	M	K	N	S	H
★		★			★

★ 1st choice ☆ suitable



D	D Tol.	CR	CR Tol.	d(h6)	l	l1	d1	L	z	30'	1°	1°30'	2°	3°	EDP No.	Stock
2	0/-0.020			4	3	25	1.95	75	2	26.03	26.93	27.88	-	-	MEXLN202025	●
2	0/-0.020			4	3	30	1.95	75	2	31.20	32.28	33.42	-	-	MEXLN202030	●
2.5	0/-0.020			4	3.7	8	2.40	50	2	8.46	8.75	9.06	9.38	10.09	MEXLN202508	●
2.5	0/-0.020			4	3.7	10	2.40	50	2	10.52	10.89	11.27	11.68	12.56	MEXLN202510	●
2.5	0/-0.020			4	3.7	12	2.40	50	2	12.59	13.03	13.49	13.97	-	MEXLN202512	●
2.5	0/-0.020			4	3.7	16	2.40	50	2	16.73	17.3	17.92	18.56	-	MEXLN202516	●
2.5	0/-0.020			4	3.7	20	2.40	60	2	20.86	21.58	22.35	-	-	MEXLN202520	●
2.5	0/-0.020			4	3.7	25	2.40	60	2	26.03	26.93	27.88	-	-	MEXLN202525	●
2.5	0/-0.020			4	3.7	30	2.40	75	2	31.20	32.28	-	-	-	MEXLN202530	●
3	0/-0.025			6	4.5	8	2.85	50	2	8.65	8.95	9.26	9.60	10.31	MEXLN203008	●
3	0/-0.025			6	4.5	10	2.85	50	2	10.72	11.09	11.48	11.89	12.78	MEXLN203010	●
3	0/-0.025			6	4.5	12	2.85	50	2	12.78	13.23	13.69	14.18	15.25	MEXLN203012	●
3	0/-0.025			6	4.5	14	2.85	50	2	14.85	15.36	15.91	16.48	17.72	MEXLN203014	●
3	0/-0.025			6	4.5	16	2.85	60	2	16.92	17.50	18.12	18.77	20.18	MEXLN203016	●
3	0/-0.025			6	4.5	18	2.85	60	2	18.99	19.64	20.34	21.07	22.65	MEXLN203018	●
3	0/-0.025			6	4.5	20	2.85	60	2	21.05	21.78	22.55	23.36	25.12	MEXLN203020	●
3	0/-0.025			6	4.5	25	2.85	75	2	26.22	27.13	28.09	29.10	-	MEXLN203025	●
4	0/-0.025			6	4.5	10	3.85	60	2	10.91	11.29	11.68	12.10	13.00	MEXLN204010	●
4	0/-0.025			6	4.5	15	3.85	60	2	16.08	16.63	17.22	17.84	19.17	MEXLN204015	●
4	0/-0.025			6	4.5	20	3.85	60	2	21.25	21.98	22.76	23.57	-	MEXLN204020	●
4	0/-0.025			6	4.5	25	3.85	75	2	26.41	27.33	28.29	-	-	MEXLN204025	●
4	0/-0.025			6	4.5	30	3.85	75	2	31.58	32.67	33.83	-	-	MEXLN204030	●
4	0/-0.025			6	4.5	40	3.85	75	2	41.92	43.37	-	-	-	MEXLN204040	●

CUTTING PARAMETERS

MEXLN2

Material Group ISO 513		P2 P3 P4 K1 K2			P4 P5 K3			P6 K4			H1 H4 H5			
Hardness/Rm		< 1000 N/mm ²			< 35 HRC			35 - 45 HRC			45 - 55 HRC			
ap x ae		ap x D			ap x D			ap x D			ap x D			
Vc (m/min)		70-110			50-90			30-70			20-40			
D (mm)	l1 (mm)	ap (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)
0.2	≤ 6D	0.01	40000	0.003	240	40000	0.003	220	40000	0.002	190	40000	0.002	170
	≤ 8D	0.01	40000	0.003	200	40000	0.002	180	40000	0.002	165	40000	0.002	145
	≤ 10D	0.01	40000	0.002	170	40000	0.002	150	40000	0.002	135	38200	0.001	110
	≤ 12D	0.01	40000	0.002	130	40000	0.001	120	40000	0.001	105	33400	0.001	75
0.3	≤ 6D	0.02	40000	0.004	320	40000	0.004	290	40000	0.003	255	31800	0.003	180
	≤ 8D	0.01	40000	0.004	290	40000	0.003	260	40000	0.003	230	28700	0.003	145
	≤ 10D	0.01	40000	0.003	260	40000	0.003	230	40000	0.003	205	25500	0.002	115
	≤ 12D	0.01	40000	0.003	220	40000	0.003	200	37200	0.002	165	22300	0.002	85
0.4	≤ 6D	0.02	40000	0.006	480	40000	0.005	430	39800	0.005	380	23900	0.004	200
	≤ 8D	0.02	40000	0.005	430	40000	0.005	390	35800	0.004	310	21500	0.004	165
	≤ 10D	0.01	40000	0.005	380	40000	0.004	350	31800	0.004	245	19100	0.003	130
	≤ 12D	0.01	40000	0.004	340	40000	0.004	300	27900	0.003	185	16700	0.003	100
0.5	≤ 6D	0.03	40000	0.007	560	40000	0.006	500	31800	0.006	355	19100	0.005	185
	≤ 8D	0.02	40000	0.006	500	40000	0.006	450	28700	0.005	290	17200	0.004	150
	≤ 10D	0.02	40000	0.006	450	35700	0.005	360	25500	0.004	230	15300	0.004	120
	≤ 12D	0.01	40000	0.005	390	31200	0.004	280	22300	0.004	175	13400	0.003	90
0.6	≤ 6D	0.03	40000	0.008	640	37200	0.007	540	26500	0.006	340	15900	0.006	180
	≤ 8D	0.03	40000	0.007	580	33400	0.006	430	23900	0.006	275	14300	0.005	145
	≤ 10D	0.02	38200	0.006	490	29700	0.006	340	21200	0.005	215	12700	0.004	115
	≤ 12D	0.02	33400	0.006	370	26000	0.005	260	18600	0.004	165	11100	0.004	85
0.8	≤ 6D	0.04	35800	0.010	720	27900	0.009	500	19900	0.008	320	11900	0.007	165
	≤ 8D	0.03	32200	0.009	580	25100	0.008	410	17900	0.007	260	10700	0.006	135
	≤ 10D	0.03	28700	0.008	460	22300	0.007	320	15900	0.006	205	9600	0.006	110
	≤ 12D	0.02	25100	0.007	350	19500	0.006	250	13900	0.006	155	8400	0.005	80
1	≤ 6D	0.05	28700	0.012	690	22300	0.011	480	15900	0.010	305	9600	0.008	160
	≤ 8D	0.04	25800	0.011	560	20100	0.010	390	14300	0.009	245	8600	0.008	130
	≤ 10D	0.04	22900	0.010	440	17800	0.009	310	12700	0.008	195	7600	0.007	100
	≤ 12D	0.03	20100	0.008	340	15600	0.008	240	11100	0.007	150	6700	0.006	80
1.2	≤ 6D	0.06	23900	0.022	1050	18600	0.020	740	13300	0.018	470	8000	0.015	245
	≤ 8D	0.05	21500	0.020	850	16700	0.018	600	11900	0.016	375	7200	0.014	200
	≤ 10D	0.04	19100	0.018	670	14900	0.016	470	10600	0.014	300	6400	0.012	160
	≤ 12D	0.03	16700	0.015	510	13000	0.014	360	9300	0.012	230	5600	0.011	120
1.4	≤ 6D	0.07	20500	0.024	980	15900	0.022	690	11400	0.019	440	6800	0.017	230
	≤ 8D	0.06	18400	0.022	790	14300	0.019	560	10200	0.017	355	6100	0.015	185
	≤ 10D	0.05	16400	0.019	630	12700	0.017	440	9100	0.015	280	5500	0.013	150
	≤ 12D	0.04	14300	0.017	480	11100	0.015	340	8000	0.013	215	4800	0.012	115
	≤ 15D	0.03	12300	0.014	350	9600	0.013	250	6800	0.012	155	4100	0.010	85
> 15D	0.02	10200	0.012	240	8000	0.011	170	5700	0.010	110	3400	0.008	55	
1.5	≤ 6D	0.08	19100	0.025	960	14900	0.023	670	10600	0.020	425	6400	0.018	225
	≤ 8D	0.06	17200	0.023	770	13400	0.020	540	9600	0.018	345	5700	0.016	180
	≤ 10D	0.05	15300	0.020	610	11900	0.018	430	8500	0.016	270	5100	0.014	145
	≤ 12D	0.04	13400	0.018	470	10400	0.016	330	7400	0.014	205	4500	0.012	110
	≤ 15D	0.03	11500	0.015	350	8900	0.014	240	6400	0.012	155	3800	0.011	80
> 15D	0.02	9600	0.013	240	7400	0.011	170	5300	0.010	105	3200	0.009	55	
1.6	≤ 6D	0.08	17900	0.026	930	13900	0.023	650	10000	0.021	415	6000	0.018	220
	≤ 8D	0.07	16100	0.023	750	12500	0.021	530	9000	0.019	335	5400	0.016	175
	≤ 10D	0.06	14300	0.021	590	11100	0.019	420	8000	0.017	265	4800	0.015	140
	≤ 12D	0.04	12500	0.018	450	9800	0.016	320	7000	0.015	205	4200	0.013	105
	≤ 15D	0.04	10700	0.016	330	8400	0.014	240	6000	0.012	150	3600	0.011	80
> 15D	0.02	9000	0.013	230	7000	0.012	160	5000	0.010	105	3000	0.009	55	



INFO
TYPHOON TA-HTA-4HTA
TYPHOON PU-HPU
TYPHOON SUH
TYPHOON ALH
TYPHOON HRC
TYPHOON SUH MINI
TYPHOON HL
C-SD-TA
LFTA
SUTA
HSS-HSS/CO DRILLS
G2
MDTA
HF VH/UP
MEF
ALU
MEX
UH
HSS/CO-HSSP END MILLS
CARBIDE BURRS

MEXLN2

Material Group ISO 513		P2 P3 P4 K1 K2					P4 P5 K3			P6 K4			H1 H4 H5		
Hardness/Rm		< 1000 N/mm ²					< 35 HRC			35 - 45 HRC			45 - 55 HRC		
ap x ae		ap x D					ap x D			ap x D			ap x D		
Vc (m/min)		70-110					50-90			30-70			20-40		
D (mm)	l1 (mm)	ap (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	
1.8	≤ 6D	0.09	15900	0.028	890	12400	0.025	620	8800	0.022	395	5300	0.020	210	
	≤ 8D	0.08	14300	0.025	720	11100	0.023	500	8000	0.020	325	4800	0.018	170	
	≤ 10D	0.06	12700	0.022	570	9900	0.020	400	7100	0.018	255	4200	0.016	130	
	≤ 12D	0.05	11100	0.020	440	8700	0.018	310	6200	0.016	195	3700	0.014	100	
	≤ 15D	0.04	9600	0.017	320	7400	0.015	220	5300	0.013	140	3200	0.012	75	
> 15D	0.03	8000	0.014	220	6200	0.013	160	4400	0.011	100	2700	0.010	55		
2	≤ 6D	0.10	14300	0.030	860	11100	0.027	600	8000	0.024	385	4800	0.021	200	
	≤ 8D	0.09	12900	0.027	700	10000	0.024	490	7200	0.022	310	4300	0.019	165	
	≤ 10D	0.07	11500	0.024	550	8900	0.022	380	6400	0.019	245	3800	0.017	130	
	≤ 12D	0.06	10000	0.021	420	7800	0.019	290	5600	0.017	190	3300	0.015	95	
	≤ 15D	0.05	8600	0.018	310	6700	0.016	220	4800	0.014	140	2900	0.013	75	
> 15D	0.03	8600	0.018	310	6700	0.016	220	4800	0.014	140	2900	0.013	75		
2.5	≤ 6D	0.13	11500	0.035	810	8900	0.032	560	6400	0.028	360	3800	0.025	185	
	≤ 8D	0.11	10300	0.032	650	8000	0.028	450	5700	0.025	285	3400	0.022	150	
	≤ 10D	0.09	9200	0.028	520	7100	0.025	360	5100	0.022	230	3100	0.020	120	
	≤ 12D	0.07	8000	0.025	390	6200	0.022	270	4500	0.020	175	2700	0.017	95	
	≤ 15D	0.06	6900	0.021	290	5400	0.019	200	3800	0.017	130	2300	0.015	70	
> 15D	0.04	6900	0.021	290	5400	0.019	200	3800	0.017	130	2300	0.015	70		
3	≤ 6D	0.15	9600	0.040	770	7400	0.036	530	5300	0.032	340	3200	0.028	180	
	≤ 8D	0.13	8600	0.036	620	6700	0.032	430	4800	0.029	275	2900	0.025	145	
	≤ 10D	0.11	7600	0.032	490	5900	0.029	340	4200	0.026	215	2500	0.022	110	
	≤ 12D	0.08	6700	0.028	380	5200	0.025	260	3700	0.022	165	2200	0.020	85	
	≤ 15D	0.07	5700	0.024	270	4500	0.022	190	3200	0.019	125	1900	0.017	65	
> 15D	0.05	5700	0.024	270	4500	0.022	190	3200	0.019	125	1900	0.017	65		
4	≤ 6D	0.20	7200	0.050	720	5600	0.045	500	4000	0.040	320	2400	0.035	170	
	≤ 8D	0.17	6400	0.045	580	5000	0.041	410	3600	0.036	260	2100	0.032	130	
	≤ 10D	0.14	5700	0.040	460	4500	0.036	320	3200	0.032	205	1900	0.028	105	
	≤ 12D	0.11	5000	0.035	350	3900	0.032	250	2800	0.028	155	1700	0.025	85	
	≤ 15D	0.09	4300	0.030	260	3300	0.027	180	2400	0.024	115	1400	0.021	60	
> 15D	0.06	4300	0.030	260	3300	0.027	180	2400	0.024	115	1400	0.021	60		



MEXCS2

	Material Group ISO 513	P2 P3 P4 K1 K2	P4 P5 K3	P6 K4	H1 H4 H5							
	Hardness/Rm	< 1000 N/mm ²			< 35 HRC	35 - 45 HRC	45 - 55 HRC					
	ap x ae	0.5D x D			0.3D x D	0.2D x D	0.1D x D					
	Vc (m/min)	70-110			50-90	30-70	20-40					
D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)
1	28660	0.006	340	22290	0.005	240	15920	0.005	150	9550	0.004	80
2	14330	0.010	290	11150	0.009	200	7960	0.008	130	4780	0.007	70
3	9550	0.014	280	7430	0.013	190	5310	0.012	125	3180	0.010	65
4	7170	0.020	280	5570	0.018	200	3980	0.016	125	2390	0.014	65
5	5730	0.026	290	4460	0.023	200	3180	0.020	130	1910	0.018	70
6	4780	0.032	310	3720	0.029	220	2650	0.026	135	1590	0.023	70
8	3580	0.038	270	2790	0.034	190	1990	0.031	120	1190	0.027	65
10	2870	0.046	260	2230	0.041	180	1590	0.037	115	960	0.032	60
12	2390	0.055	260	1860	0.050	180	1330	0.044	120	800	0.039	60
14	2050	0.064	260	1590	0.057	180	1140	0.051	115	680	0.045	60
16	1790	0.072	260	1390	0.065	180	1000	0.058	115	600	0.051	60
18	1590	0.082	260	1240	0.074	180	880	0.066	115	530	0.058	60
20	1430	0.094	270	1110	0.084	190	800	0.075	120	480	0.065	65

- INFO
- TYPHOON TA-HTA-4HTA
- TYPHOON PU-HPU
- TYPHOON SUH
- TYPHOON ALH
- TYPHOON HRC
- TYPHOON SUH MINI
- TYPHOON HL
- C-SD-TA
- LFTA
- SUTA
- HSS-HSS/CO DRILLS
- G2
- MDTA
- HF VH/UP
- MEF
- ALU
- MEX
- UH
- HSS/CO-HSSP END MILLS
- CARBIDE BURRS

MEXCL2

	Material Group ISO 513	P2 P3 P4 K1 K2			P4 P5 K3			P6 K4			H1 H4 H5		
	Hardness/Rm	< 1000 N/mm ²			< 35 HRC			35 - 45 HRC			45 - 55 HRC		
	ap x ae	0.3D x D			0.3D x D			0.2D x D			0.05D x D		
	Vc (m/min)	70-110			50-90			30-70			20-40		
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)
	1	28700	0.005	290	22300	0.005	200	15900	0.004	125	9600	0.004	65
	1.5	19100	0.006	230	14900	0.005	160	10600	0.005	100	6400	0.004	55
	2	14300	0.009	260	11100	0.008	180	8000	0.007	115	4800	0.006	60
	3	9600	0.012	230	7400	0.011	160	5300	0.010	100	3200	0.008	55
	4	7200	0.018	260	5600	0.016	180	4000	0.014	115	2400	0.013	60
	5	5700	0.024	270	4500	0.022	190	3200	0.019	125	1900	0.017	65
	6	4800	0.029	280	3700	0.026	190	2700	0.023	125	1600	0.020	65
	8	3600	0.035	250	2800	0.032	180	2000	0.028	110	1200	0.025	60
10	2900	0.041	240	2200	0.037	160	1600	0.033	105	1000	0.029	55	
12	2400	0.050	240	1900	0.045	170	1300	0.040	105	800	0.035	55	

< D3: ap = 0.4 mm max

- INFO
- TYPHOON TA-HTA-4HTA
- TYPHOON PU-HPU
- TYPHOON SUH
- TYPHOON ALH
- TYPHOON HRC
- TYPHOON SUH MINI
- TYPHOON HL
- C-SD-TA
- LFTA
- SUTA
- HSS-HSS/CO DRILLS
- G2
- MDTA
- HF VH/UP
- MEF
- ALU
- MEX**
- UH
- HSS/CO-HSSP END MILLS
- CARBIDE BURRS

MEXCS4

	Material Group ISO 513	P2 P3 P4 K1 K2			P4 P5 K3			P6 K4			H1 H4 H5		
	Hardness/Rm	< 1000 N/mm ²			< 35 HRC			35 - 45 HRC			45 - 55 HRC		
	ap x ae	D x 0.01D			D x 0.01D			D x 0.05D			D x 0.05D		
	Vc (m/min)	80-120			50-90			40-60			20-40		
D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	
1	31850	0.009	1080	22290	0.008	680	15920	0.007	435	9550	0.006	225	
2	15920	0.017	1080	11150	0.015	680	7960	0.014	435	4780	0.012	230	
3	10620	0.026	1080	7430	0.023	680	5310	0.020	435	3180	0.018	225	
4	7960	0.034	1080	5570	0.031	680	3980	0.027	435	2390	0.024	230	
5	6370	0.038	970	4460	0.034	610	3180	0.031	390	1910	0.027	205	
6	5310	0.043	900	3720	0.038	570	2650	0.034	360	1590	0.030	190	
8	3980	0.055	880	2790	0.050	550	1990	0.044	350	1190	0.039	185	
10	3180	0.071	900	2230	0.064	570	1590	0.057	360	960	0.050	190	
12	2650	0.085	900	1860	0.077	570	1330	0.068	360	800	0.060	190	
14	2270	0.098	890	1590	0.088	560	1140	0.078	355	680	0.068	185	
16	1990	0.110	880	1390	0.099	550	1000	0.088	350	600	0.077	185	
18	1770	0.125	890	1240	0.113	560	880	0.100	350	530	0.088	185	
20	1590	0.140	890	1110	0.126	560	800	0.112	360	480	0.098	190	
22	1450	0.155	900	1010	0.140	560	720	0.124	355	430	0.109	185	
25	1270	0.177	900	890	0.159	570	640	0.142	360	380	0.124	190	



- INFO
- TYPHOON TA-HTA-4HTA
- TYPHOON PU-HPU
- TYPHOON SUH
- TYPHOON ALH
- TYPHOON HRC
- TYPHOON SUH MINI
- TYPHOON HL
- C-SD-TA
- LFTA
- SUTA
- HSS-HSS/CO DRILLS
- G2
- MDTA
- HF VH/UP
- MEF
- ALU
- MEX
- UH
- HSS/CO-HSSP END MILLS
- CARBIDE BURRS

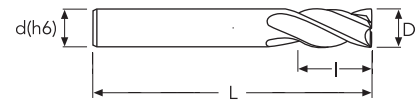
MEXCL4

cylindrical shank, 4 flutes, long



P	M	K	N	S	H
★		★			★

★ 1st choice ☆ suitable



D	D Tol.	CR	CR Tol.	d(h6)	l	l1	L	z	EDP No.	Stock
2	0/-0.020			6	8		60	4	MEXCL4020	●
3	0/-0.020			6	15		60	4	MEXCL4030	●
4	0/-0.020			6	20		60	4	MEXCL4040	●
5	0/-0.020			6	25		70	4	MEXCL4050	●
6	0/-0.020			6	25		70	4	MEXCL4060	●
8	0/-0.020			8	30		80	4	MEXCL4080	●
10	0/-0.020			10	35		90	4	MEXCL4100	●
12	0/-0.020			12	40		90	4	MEXCL4120	●
14	0/-0.020			16	50		110	4	MEXCL4140	●
16	0/-0.020			16	50		110	4	MEXCL4160	●
20	0/-0.020			20	50		110	4	MEXCL4200	●
25	0/-0.050			25	70		130	4	MEXCL4250	●
3	0/-0.025			6	25		100	4	MEXCL4030100 *	●
4	0/-0.025			6	31		100	4	MEXCL4040100 *	●
5	0/-0.025			6	31		100	4	MEXCL4050100 *	●
6	0/-0.025			6	38		100	4	MEXCL4060100 *	●
8	0/-0.030			8	41		100	4	MEXCL4080100 *	●
10	0/-0.030			10	57		125	4	MEXCL4100125 *	●
12	0/-0.030			12	75		150	4	MEXCL4120150 *	●
14	0/-0.030			14	75		150	4	MEXCL4140150 *	●
16	0/-0.030			16	75		150	4	MEXCL4160150 *	●
20	0/-0.030			20	75		150	4	MEXCL4200150 *	●

INFO
TYPHOON TA-HTA-4HTA
TYPHOON PU-HPU
TYPHOON SUH
TYPHOON ALH
TYPHOON HRC
TYPHOON SUH MINI
TYPHOON HL
C-SD-TA
LFTA
SUTA
HSS-HSS/CO DRILLS
G2
MDTA
HF VH/UP
MEF
ALU
MEX
UH
HSS/CO-HSSP END MILLS
CARBIDE BURRS

● stock standard ○ non-stock standard ▽ stock exhaustion

MEXCL4

	Material Group ISO 513	P2 P3 P4 K1 K2	P4 P5 K3	P6 K4	H1 H4 H5							
	Hardness/Rm	< 1000 N/mm ²		< 35 HRC	35 - 45 HRC	45 - 55 HRC						
	ap x ae	1.5D x 0.05D		1.5D x 0.05D	1.5D x 0.05D	1.5D x 0.05D						
	Vc (m/min)	60-100		40-80	20-60	20-40						
D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)
2	12740	0.014	740	9550	0.013	500	6370	0.012	295	4780	0.010	195
3	8490	0.022	740	6370	0.020	500	4250	0.017	295	3180	0.015	195
4	6370	0.029	740	4780	0.026	500	3180	0.023	295	2390	0.020	195
5	5100	0.033	660	3820	0.029	450	2550	0.026	265	1910	0.023	175
6	4250	0.036	610	3180	0.033	410	2120	0.029	245	1590	0.025	160
8	3180	0.047	600	2390	0.042	400	1590	0.038	240	1190	0.033	155
10	2550	0.060	620	1910	0.054	410	1270	0.048	245	960	0.042	160
12	2120	0.072	610	1590	0.065	410	1060	0.058	245	800	0.051	160
14	1820	0.083	600	1360	0.075	410	910	0.066	240	680	0.058	160
16	1590	0.094	590	1190	0.084	400	800	0.075	240	600	0.065	155
20	1270	0.119	600	960	0.107	410	640	0.095	245	480	0.083	160
25	1020	0.150	610	760	0.135	410	510	0.120	245	380	0.105	160

- INFO
- TYPHOON TA-HTA-4HTA
- TYPHOON PU-HPU
- TYPHOON SUH
- TYPHOON ALH
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- C-SD-TA
- LFTA
- SUTA
- HSS-HSS/CO DRILLS
- G2
- MDTA
- HF VH/UP
- MEF
- ALU
- MEX**
- UH
- HSS/CO-HSSP END MILLS
- CARBIDE BURRS

MEXCSHM

	Material Group ISO 513	P2 P3 P4 K1 K2			P4 P5 K3			P6 K4			H1 H4 H5		
	Hardness/Rm	< 1000 N/mm ²			< 35 HRC			35 - 45 HRC			45 - 55 HRC		
	ap x ae	1.5D x 0.1D			1.5D x 0.1D			1.5D x 0.05D			1.5D x 0.05D		
	Vc (m/min)	120-160			90-130			60-100			50-70		
D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	
3	14860	0.008	750	11680	0.008	530	8490	0.007	340	6370	0.006	220	
4	11150	0.012	800	8760	0.011	570	6370	0.010	370	4780	0.008	240	
5	8920	0.014	770	7010	0.013	550	5100	0.012	350	3820	0.010	230	
6	7430	0.018	800	5840	0.016	570	4250	0.014	370	3180	0.013	240	
8	5570	0.028	920	4380	0.025	650	3180	0.022	420	2390	0.019	280	
10	4460	0.034	900	3500	0.030	640	2550	0.027	410	1910	0.024	270	
12	3720	0.041	910	2920	0.037	640	2120	0.033	420	1590	0.029	270	
14	3180	0.048	920	2500	0.043	650	1820	0.038	420	1360	0.034	270	
16	2790	0.056	940	2190	0.051	670	1590	0.045	430	1190	0.039	280	
18	2480	0.065	970	1950	0.059	680	1420	0.052	440	1060	0.046	290	
20	2230	0.073	1300	1750	0.066	920	1270	0.058	590	960	0.051	390	


- INFO
- TYPHOON TA-HTA-4HTA
- TYPHOON PU-HPU
- TYPHOON SUH
- TYPHOON ALH
- TYPHOON HRC
- TYPHOON SUH MINI
- TYPHOON HL
- C-SD-TA
- LFTA
- SUTA
- HSS-HSS/CO DRILLS
- G2
- MDTA
- HF VH/UP
- MEF
- ALU
- MEX**
- UH
- HSS/CO-HSSP END MILLS
- CARBIDE BURRS

MEXCLHM


	Material Group ISO 513	P2 P3 P4 K1 K2			P4 P5 K3			P6 K4			H1 H4 H5		
	Hardness/Rm	< 1000 N/mm ²			< 35 HRC			35 - 45 HRC			45 - 55 HRC		
	ap x ae	1.5D x 0.05D			1.5D x 0.05D			1.5D x 0.05D			1.5D x 0.05D		
	Vc (m/min)	80-120			50-90			40-60			20-40		
D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	
3	10620	0.007	450	7430	0.006	290	5310	0.006	180	3180	0.005	100	
4	7960	0.010	490	5570	0.009	310	3980	0.008	190	2390	0.007	100	
5	6370	0.012	470	4460	0.011	290	3180	0.010	190	1910	0.009	100	
6	5310	0.015	490	3720	0.014	310	2650	0.012	190	1590	0.011	100	
8	3980	0.023	560	2790	0.021	350	1990	0.019	220	1190	0.016	120	
10	3180	0.029	540	2230	0.026	340	1590	0.023	220	960	0.020	120	
12	2650	0.035	550	1860	0.031	350	1330	0.028	220	800	0.024	120	
14	2270	0.041	560	1590	0.037	350	1140	0.033	220	680	0.029	120	
16	1990	0.048	570	1390	0.043	360	1000	0.038	230	600	0.034	120	
18	1770	0.055	580	1240	0.050	370	880	0.044	230	530	0.039	120	
20	1590	0.063	800	1110	0.057	500	800	0.050	320	480	0.044	170	

- INFO
- TYPHOON TA-HTA-4HTA
- TYPHOON PU-HPU
- TYPHOON SUH
- TYPHOON ALH
- TYPHOON HRC
- TYPHOON SUH MINI
- TYPHOON HL
- C-SD-TA
- LFTA
- SUTA
- HSS-HSS/CO DRILLS
- G2
- MDTA
- HF VH/UP
- MEF
- ALU
- MEX**
- UH
- HSS/CO-HSSP END MILLS
- CARBIDE BURRS

MEXCSFR

	Material Group ISO 513	P2 P3 P4 K1 K2			P4 P5 K3			P6 K4			H1 H4 H5		
	Hardness/Rm	< 1000 N/mm ²			< 35 HRC			35 - 45 HRC			45 - 55 HRC		
	ap x ae	0.5D x D			0.5D x D			0.3D x D			0.1D x D		
	Vc (m/min)	70-90			50-70			40-60			20-40		
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)
	6	4250	0.043	720	3180	0.038	490	2650	0.034	360	1590	0.030	190
	8	3180	0.055	700	2390	0.050	480	1990	0.044	350	1190	0.039	185
	10	2550	0.071	720	1910	0.064	490	1590	0.057	360	960	0.050	190
	12	2120	0.085	720	1590	0.077	490	1330	0.068	360	800	0.060	190
	14	1820	0.098	710	1360	0.088	480	1140	0.078	355	680	0.068	185
16	1590	0.110	700	1190	0.099	470	1000	0.088	350	600	0.077	185	
20	1270	0.140	710	960	0.126	480	800	0.112	360	480	0.098	190	

D6-8: Z=3

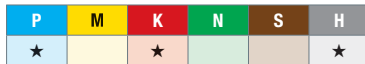
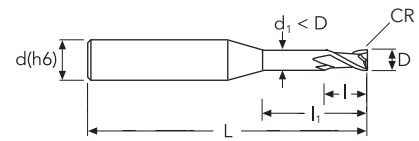
	Hardness/Rm	< 1000 N/mm ²			< 35 HRC			35 - 45 HRC			45 - 55 HRC		
	ap x ae	1.5D x 0.3D			1.5D x 0.3D			D x 0.1D			D x 0.05D		
	Vc (m/min)	80-100			60-80			50-70			30-50		
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)
	6	4250	0.047	790	3180	0.042	540	2650	0.037	395	1590	0.033	210
	8	3180	0.061	770	2390	0.055	520	1990	0.049	385	1190	0.043	205
	10	2550	0.078	800	1910	0.070	540	1590	0.062	395	960	0.055	210
	12	2120	0.094	790	1590	0.084	540	1330	0.075	400	800	0.065	210
	14	1820	0.108	780	1360	0.097	530	1140	0.086	390	680	0.075	205
	16	1590	0.121	770	1190	0.109	520	1000	0.097	385	600	0.085	205
20	1270	0.154	780	960	0.139	530	800	0.123	395	480	0.108	205	

D6-8: Z=3

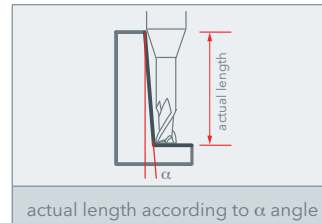
- INFO
- TYPHOON TA-HTA-4HTA
- TYPHOON PU-HPU
- TYPHOON SUH
- TYPHOON ALH
- TYPHOON HRC
- TYPHOON SUH MINI
- TYPHOON HL
- C-SD-TA
- LFTA
- SUTA
- HSS-HSS/CO DRILLS
- G2
- MDTA
- HF VH/UP
- MEF
- ALU
- MEX
- UH
- HSS/CO-HSSP END MILLS
- CARBIDE BURRS

MEXLN2R

cylindrical shank, 2 flutes, extended and reduced neck, corner radius



★ 1st choice ☆ suitable

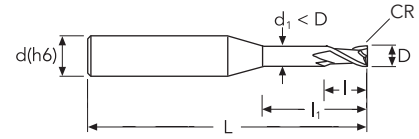


D	D Tol.	CR	CR Tol.	d(h6)	l	l1	d1	L	z	30'	1°	1°30'	2°	3°	EDP No.	Stock
0.3	0/-0.020	0.05	+/-0.010	4	0.4	1	0.26	50	2	1.08	1.12	1.15	1.19	1.25	MEXLN20030001	●
0.3	0/-0.020	0.05	+/-0.010	4	0.4	1.5	0.26	50	2	1.60	1.65	1.70	1.75	1.85	MEXLN20030065	●
0.3	0/-0.020	0.05	+/-0.010	4	0.4	2	0.26	50	2	2.12	2.19	2.25	2.32	2.46	MEXLN20030002	●
0.3	0/-0.020	0.05	+/-0.010	4	0.4	3	0.26	50	2	3.15	3.25	3.35	3.46	3.66	MEXLN20030003	●
0.3	0/-0.020	0.10	+/-0.010	4	0.4	1	0.26	50	2	1.08	1.12	1.15	1.18	1.24	MEXLN20030101	●
0.3	0/-0.020	0.10	+/-0.010	4	0.4	1.5	0.26	50	2	1.60	1.65	1.70	1.75	1.84	MEXLN20030165	●
0.3	0/-0.020	0.10	+/-0.010	4	0.4	2	0.26	50	2	2.12	2.18	2.25	2.31	2.45	MEXLN20030102	●
0.3	0/-0.020	0.10	+/-0.010	4	0.4	3	0.26	50	2	3.15	3.25	3.35	3.45	3.65	MEXLN20030103	●
0.4	0/-0.020	0.05	+/-0.010	4	0.6	1	0.37	50	2	1.08	1.12	1.15	1.19	1.25	MEXLN20040001	●
0.4	0/-0.020	0.05	+/-0.010	4	0.6	2	0.37	50	2	2.12	2.19	2.25	2.32	2.46	MEXLN20040002	●
0.4	0/-0.020	0.05	+/-0.010	4	0.6	3	0.37	50	2	3.15	3.25	3.35	3.46	3.66	MEXLN20040003	●
0.4	0/-0.020	0.05	+/-0.010	4	0.6	4	0.37	50	2	4.19	4.32	4.46	4.59	4.86	MEXLN20040004	●
0.4	0/-0.020	0.10	+/-0.010	4	0.6	1	0.37	50	2	1.08	1.12	1.15	1.18	1.24	MEXLN20040101	●
0.4	0/-0.020	0.10	+/-0.010	4	0.6	2	0.37	50	2	2.12	2.18	2.25	2.31	2.45	MEXLN20040102	●
0.4	0/-0.020	0.10	+/-0.010	4	0.6	3	0.37	50	2	3.15	3.25	3.35	3.45	3.65	MEXLN20040103	●
0.4	0/-0.020	0.10	+/-0.010	4	0.6	4	0.37	50	2	4.18	4.32	4.45	4.58	4.85	MEXLN20040104	●
0.5	0/-0.020	0.05	+/-0.010	4	0.7	2	0.45	50	2	2.16	2.23	2.29	2.36	2.50	MEXLN20050002	●
0.5	0/-0.020	0.05	+/-0.010	4	0.7	4	0.45	50	2	4.22	4.36	4.50	4.63	4.90	MEXLN20050004	●
0.5	0/-0.020	0.05	+/-0.010	4	0.7	6	0.45	50	2	6.29	6.49	6.70	6.90	7.31	MEXLN20050006	●
0.5	0/-0.020	0.10	+/-0.010	4	0.7	2	0.45	50	2	2.16	2.22	2.29	2.36	2.49	MEXLN20050102	●
0.5	0/-0.020	0.10	+/-0.010	4	0.7	4	0.45	50	2	4.22	4.36	4.49	4.63	4.89	MEXLN20050104	●
0.5	0/-0.020	0.10	+/-0.010	4	0.7	6	0.45	50	2	6.29	6.49	6.69	6.89	7.30	MEXLN20050106	●
0.6	0/-0.020	0.10	+/-0.010	4	0.9	2	0.55	50	2	2.16	2.22	2.29	2.36	2.49	MEXLN20060102	●
0.6	0/-0.020	0.10	+/-0.010	4	0.9	4	0.55	50	2	4.22	4.36	4.49	4.63	4.89	MEXLN20060104	●
0.6	0/-0.020	0.10	+/-0.010	4	0.9	6	0.55	50	2	6.29	6.49	6.69	6.89	7.30	MEXLN20060106	●
0.7	0/-0.020	0.10	+/-0.010	4	1.0	4	0.65	50	2	4.22	4.36	4.49	4.63	4.89	MEXLN20070104	●
0.7	0/-0.020	0.10	+/-0.010	4	1.0	6	0.65	50	2	6.29	6.49	6.69	6.89	7.30	MEXLN20070106	●
0.8	0/-0.020	0.05	+/-0.010	4	1.2	4	0.75	50	2	4.22	4.36	4.50	4.63	4.90	MEXLN20080004	●
0.8	0/-0.020	0.05	+/-0.010	4	1.2	6	0.75	50	2	6.29	6.49	6.70	6.90	7.31	MEXLN20080006	●
0.8	0/-0.020	0.05	+/-0.010	4	1.2	8	0.75	50	2	8.36	8.63	8.90	9.17	9.71	MEXLN20080008	●
0.8	0/-0.020	0.10	+/-0.010	4	1.2	4	0.75	50	2	4.22	4.36	4.49	4.63	4.89	MEXLN20080104	●
0.8	0/-0.020	0.10	+/-0.010	4	1.2	6	0.75	50	2	6.29	6.49	6.69	6.89	7.30	MEXLN20080106	●
0.8	0/-0.020	0.10	+/-0.010	4	1.2	8	0.75	50	2	8.36	8.63	8.89	9.16	9.70	MEXLN20080108	●
0.9	0/-0.020	0.10	+/-0.010	4	1.4	8	0.85	50	2	8.36	8.63	8.89	9.16	9.70	MEXLN20090108	●
0.9	0/-0.020	0.10	+/-0.010	4	1.4	15	0.85	50	2	15.59	16.10	16.60	17.11	18.12	MEXLN20090115	●
1	0/-0.020	0.10	+/-0.010	4	1.5	4	0.95	50	2	4.32	4.46	4.59	4.73	5.01	MEXLN20100104	●
1	0/-0.020	0.10	+/-0.010	4	1.5	6	0.95	50	2	6.39	6.59	6.80	7.00	7.41	MEXLN20100106	●
1	0/-0.020	0.10	+/-0.010	4	1.5	8	0.95	50	2	8.45	8.73	9.00	9.27	9.81	MEXLN20100108	●
1	0/-0.020	0.10	+/-0.010	4	1.5	10	0.95	50	2	10.52	10.86	11.20	11.54	12.22	MEXLN20100110	●

INFO
TYPHOON TA-HTA-4HTA
TYPHOON PU-HPU
TYPHOON SUH
TYPHOON ALH
TYPHOON HRC
TYPHOON SUH MINI
TYPHOON HL
C-SD-TA
LFTA
SUTA
HSS-HSS/CO DRILLS
G2
MDTA
HF VH/UP
MEF
ALU
MEX
UH
HSS/CO-HSSP END MILLS
CARBIDE BURRS

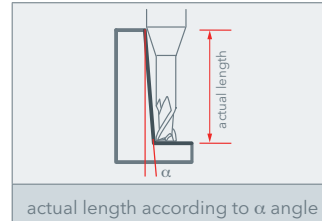
MEXLN2R

cylindrical shank, 2 flutes, extended and reduced neck, corner radius



P	M	K	N	S	H
★		★			★

★ 1st choice ☆ suitable

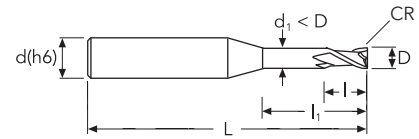


D	D Tol.	CR	CR Tol.	d(h6)	l	l1	d1	L	z	30'	1°	1°30'	2°	3°	EDP No.	Stock
1	0/-0.020	0.10	+/-0.010	4	1.5	12	0.95	50	2	12.59	12.99	13.40	13.81	14.62	MEXLN20100112	●
1	0/-0.020	0.10	+/-0.010	4	1.5	16	0.95	50	2	16.72	17.26	17.80	18.35	19.43	MEXLN20100116	●
1	0/-0.020	0.10	+/-0.010	4	1.5	20	0.95	50	2	20.86	21.53	22.21	22.88	24.24	MEXLN20100120	●
1	0/-0.020	0.20	+/-0.010	4	1.5	4	0.95	50	2	4.32	4.45	4.58	4.72	4.99	MEXLN20100204	●
1	0/-0.020	0.20	+/-0.010	4	1.5	6	0.95	50	2	6.38	6.58	6.79	6.99	7.39	MEXLN20100206	●
1	0/-0.020	0.20	+/-0.010	4	1.5	8	0.95	50	2	8.45	8.72	8.99	9.26	9.79	MEXLN20100208	●
1	0/-0.020	0.20	+/-0.010	4	1.5	10	0.95	50	2	10.52	10.85	11.19	11.52	12.20	MEXLN20100210	●
1	0/-0.020	0.20	+/-0.010	4	1.5	12	0.95	50	2	12.58	12.99	13.39	13.79	14.60	MEXLN20100212	●
1	0/-0.020	0.20	+/-0.010	4	1.5	16	0.95	50	2	16.72	17.26	17.79	18.33	19.41	MEXLN20100216	●
1	0/-0.020	0.20	+/-0.010	4	1.5	20	0.95	50	2	20.85	21.53	22.20	22.87	24.22	MEXLN20100220	●
1	0/-0.020	0.30	+/-0.010	4	1.5	6	0.95	50	2	6.38	6.58	6.78	6.97	7.37	MEXLN20100306	●
1	0/-0.020	0.30	+/-0.010	4	1.5	10	0.95	50	2	10.51	10.85	11.18	11.51	12.18	MEXLN20100310	●
1	0/-0.020	0.30	+/-0.010	4	1.5	16	0.95	50	2	16.72	17.25	17.78	18.32	19.39	MEXLN20100316	●
1	0/-0.020	0.30	+/-0.010	4	1.5	20	0.95	50	2	20.85	21.52	22.19	22.86	24.20	MEXLN20100320	●
1.2	0/-0.020	0.10	+/-0.010	4	1.8	6	1.15	50	2	6.39	6.59	6.80	7.00	7.41	MEXLN20120106	●
1.2	0/-0.020	0.10	+/-0.010	4	1.8	8	1.15	50	2	8.45	8.73	9.00	9.27	9.81	MEXLN20120108	●
1.2	0/-0.020	0.10	+/-0.010	4	1.8	10	1.15	50	2	10.52	10.86	11.20	11.54	12.22	MEXLN20120110	●
1.2	0/-0.020	0.10	+/-0.010	4	1.8	12	1.15	50	2	12.59	12.99	13.40	13.81	14.62	MEXLN20120112	●
1.4	0/-0.020	0.10	+/-0.010	4	2.1	6	1.35	50	2	6.39	6.59	6.80	7.00	7.41	MEXLN20140106	●
1.4	0/-0.020	0.10	+/-0.010	4	2.1	8	1.35	50	2	8.45	8.73	9.00	9.27	9.81	MEXLN20140108	●
1.4	0/-0.020	0.10	+/-0.010	4	2.1	10	1.35	50	2	10.52	10.86	11.20	11.54	12.22	MEXLN20140110	●
1.4	0/-0.020	0.10	+/-0.010	4	2.1	12	1.35	50	2	12.59	12.99	13.40	13.81	14.62	MEXLN20140112	●
1.4	0/-0.020	0.10	+/-0.010	4	2.1	16	1.35	50	2	16.72	17.26	17.80	18.35	19.43	MEXLN20140116	●
1.5	0/-0.020	0.10	+/-0.010	4	2.3	4	1.45	50	2	4.32	4.46	4.59	4.73	5.01	MEXLN20150104	●
1.5	0/-0.020	0.10	+/-0.010	4	2.3	8	1.45	50	2	8.45	8.73	9.00	9.27	9.81	MEXLN20150108	●
1.5	0/-0.020	0.10	+/-0.010	4	2.3	12	1.45	50	2	12.59	12.99	13.40	13.81	14.62	MEXLN20150112	●
1.5	0/-0.020	0.10	+/-0.010	4	2.3	16	1.45	50	2	16.72	17.26	17.80	18.35	19.43	MEXLN20150116	●
1.5	0/-0.020	0.10	+/-0.010	4	2.3	20	1.45	60	2	20.86	21.53	22.21	22.88	24.24	MEXLN20150120	●
1.5	0/-0.020	0.20	+/-0.010	4	2.3	8	1.45	50	2	8.45	8.72	8.99	9.26	9.79	MEXLN20150208	●
1.5	0/-0.020	0.20	+/-0.010	4	2.3	10	1.45	50	2	10.52	10.85	11.19	11.52	12.20	MEXLN20150210	●
1.5	0/-0.020	0.20	+/-0.010	4	2.3	12	1.45	50	2	12.58	12.99	13.39	13.79	14.60	MEXLN20150212	●
1.5	0/-0.020	0.20	+/-0.010	4	2.3	16	1.45	50	2	16.72	17.26	17.79	18.33	19.41	MEXLN20150216	●
1.5	0/-0.020	0.20	+/-0.010	4	2.3	20	1.45	60	2	20.85	21.53	22.20	22.87	24.22	MEXLN20150220	●
1.5	0/-0.020	0.30	+/-0.010	4	2.3	8	1.45	50	2	8.45	8.71	8.98	9.24	9.77	MEXLN20150308	●
1.5	0/-0.020	0.30	+/-0.010	4	2.3	16	1.45	50	2	16.72	17.25	17.78	18.32	19.39	MEXLN20150316	●
1.5	0/-0.020	0.30	+/-0.010	4	2.3	20	1.45	60	2	20.85	21.52	22.19	22.86	24.20	MEXLN20150320	●
1.6	0/-0.020	0.10	+/-0.010	4	2.4	8	1.55	50	2	8.45	8.73	9.00	9.27	9.81	MEXLN20160108	●
1.6	0/-0.020	0.10	+/-0.010	4	2.4	12	1.55	50	2	12.59	12.99	13.40	13.81	14.62	MEXLN20160112	●
1.6	0/-0.020	0.10	+/-0.010	4	2.4	16	1.55	50	2	16.72	17.26	17.80	18.35	19.43	MEXLN20160116	●

● stock standard ○ non-stock standard ▽ stock exhaustion

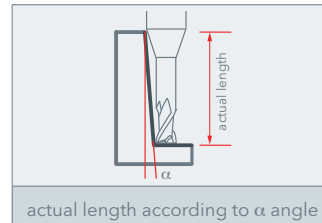
MEXLN2R

cylindrical shank, 2 flutes, extended and reduced neck, corner radius



P	M	K	N	S	H
★		★			★

★ 1st choice ☆ suitable



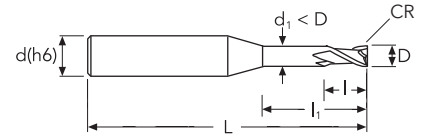
D	D Tol.	CR	CR Tol.	d(h6)	l	l1	d1	L	z	30'	1°	1°30'	2°	3°	EDP No.	Stock
1.8	0/-0.020	0.20	+/-0.010	4	2.7	8	1.75	50	2	8.45	8.72	8.99	9.26	9.79	MEXLN20180208	●
1.8	0/-0.020	0.20	+/-0.010	4	2.7	12	1.75	50	2	12.58	12.99	13.39	13.79	14.60	MEXLN20180212	●
1.8	0/-0.020	0.20	+/-0.010	4	2.7	16	1.75	50	2	16.72	17.26	17.79	18.33	19.41	MEXLN20180216	●
2	0/-0.020	0.20	+/-0.010	4	3	6	1.95	50	2	6.38	6.58	6.79	6.99	7.39	MEXLN20200206	●
2	0/-0.020	0.20	+/-0.010	4	3	8	1.95	50	2	8.45	8.72	8.99	9.26	9.79	MEXLN20200208	●
2	0/-0.020	0.20	+/-0.010	4	3	10	1.95	50	2	10.52	10.85	11.19	11.52	12.20	MEXLN20200210	●
2	0/-0.020	0.20	+/-0.010	4	3	12	1.95	50	2	12.58	12.99	13.39	13.79	14.60	MEXLN20200212	●
2	0/-0.020	0.20	+/-0.010	4	3	14	1.95	50	2	14.65	15.12	15.59	16.06	17.01	MEXLN20200214	●
2	0/-0.020	0.20	+/-0.010	4	3	16	1.95	50	2	16.72	17.26	17.79	18.33	19.41	MEXLN20200216	●
2	0/-0.020	0.20	+/-0.010	4	3	20	1.95	60	2	20.85	21.53	22.20	22.87	-	MEXLN20200220	●
2	0/-0.020	0.20	+/-0.010	4	3	25	1.95	75	2	26.02	26.86	27.70	28.54	-	MEXLN20200225	●
2	0/-0.020	0.20	+/-0.010	4	3	30	1.95	75	2	31.19	32.20	33.21	-	-	MEXLN20200230	●
2	0/-0.020	0.50	+/-0.010	4	3	6	1.95	50	2	6.37	6.56	6.75	6.95	7.33	MEXLN20200506	●
2	0/-0.020	0.50	+/-0.010	4	3	8	1.95	50	2	8.44	8.70	8.96	9.22	9.73	MEXLN20200508	●
2	0/-0.020	0.50	+/-0.010	4	3	12	1.95	50	2	12.57	12.97	13.36	13.75	14.54	MEXLN20200512	●
2	0/-0.020	0.50	+/-0.010	4	3	16	1.95	50	2	16.71	17.24	17.76	18.29	19.35	MEXLN20200516	●
2	0/-0.020	0.50	+/-0.010	4	3	20	1.95	60	2	20.84	21.51	22.17	22.83	-	MEXLN20200520	●
2	0/-0.020	0.50	+/-0.010	4	3	25	1.95	75	2	26.01	26.84	27.67	28.50	-	MEXLN20200525	●
2	0/-0.020	0.50	+/-0.010	4	3	30	1.95	75	2	31.18	32.18	33.18	-	-	MEXLN20200530	●
2.5	0/-0.020	0.30	+/-0.010	4	3.7	8	2.40	50	2	8.45	8.71	8.98	9.24	9.77	MEXLN20250308	●
2.5	0/-0.020	0.30	+/-0.010	4	3.7	12	2.40	50	2	12.58	12.98	13.38	13.78	14.58	MEXLN20250312	●
2.5	0/-0.020	0.30	+/-0.010	4	3.7	16	2.40	50	2	16.72	17.25	17.78	18.32	-	MEXLN20250316	●
2.5	0/-0.020	0.30	+/-0.010	4	3.7	20	2.40	60	2	20.85	21.52	22.19	-	-	MEXLN20250320	●
2.5	0/-0.020	0.30	+/-0.010	4	3.7	25	2.40	60	2	26.02	26.86	27.69	-	-	MEXLN20250325	●
2.5	0/-0.020	0.30	+/-0.010	4	3.7	30	2.40	75	2	31.19	32.19	-	-	-	MEXLN20250330	●
2.5	0/-0.020	0.50	+/-0.010	4	3.7	8	2.40	50	2	8.44	8.70	8.96	9.22	9.73	MEXLN20250508	●
2.5	0/-0.020	0.50	+/-0.010	4	3.7	12	2.40	50	2	12.57	12.97	13.36	13.75	14.54	MEXLN20250512	●
2.5	0/-0.020	0.50	+/-0.010	4	3.7	16	2.40	50	2	16.71	17.24	17.76	18.29	-	MEXLN20250516	●
2.5	0/-0.020	0.50	+/-0.010	4	3.7	20	2.40	60	2	20.84	21.51	22.17	-	-	MEXLN20250520	●
2.5	0/-0.020	0.50	+/-0.010	4	3.7	25	2.40	60	2	26.01	26.84	27.67	-	-	MEXLN20250525	●
2.5	0/-0.020	0.50	+/-0.010	4	3.7	30	2.40	75	2	31.18	32.18	-	-	-	MEXLN20250530	●
3	0/-0.025	0.20	+/-0.010	6	4.5	10	2.85	50	2	10.71	11.05	11.39	11.74	12.42	MEXLN20300210	●
3	0/-0.025	0.20	+/-0.010	6	4.5	12	2.85	50	2	12.78	13.19	13.60	14.00	14.82	MEXLN20300212	●
3	0/-0.025	0.20	+/-0.010	6	4.5	16	2.85	60	2	16.91	17.46	18.00	18.54	19.63	MEXLN20300216	●
3	0/-0.025	0.20	+/-0.010	6	4.5	20	2.85	60	2	21.05	21.72	22.40	23.08	24.44	MEXLN20300220	●
3	0/-0.025	0.20	+/-0.010	6	4.5	25	2.85	75	2	26.21	27.06	27.91	28.75	30.45	MEXLN20300225	●
3	0/-0.025	0.30	+/-0.010	6	4.5	10	2.85	50	2	10.71	11.04	11.38	11.72	12.40	MEXLN20300310	●
3	0/-0.025	0.30	+/-0.010	6	4.5	12	2.85	50	2	12.77	13.18	13.59	13.99	14.80	MEXLN20300312	●
3	0/-0.025	0.30	+/-0.010	6	4.5	16	2.85	60	2	16.91	17.45	17.99	18.53	19.61	MEXLN20300316	●

INFO
TYPHOON TA-HTA-4HTA
TYPHOON PU-HPU
TYPHOON SUH
TYPHOON ALH
TYPHOON HRC
TYPHOON SUH MINI
TYPHOON HL
C-SD-TA
LFTA
SUTA
HSS-HSS/CO DRILLS
G2
MDTA
HF VH/UP
MEF
ALU
MEX
UH
HSS/CO-HSSP END MILLS
CARBIDE BURRS

● stock standard ○ non-stock standard ▽ stock exhaustion

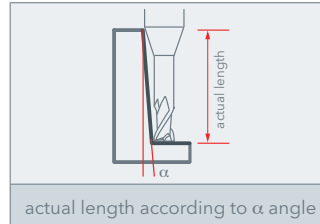
MEXLN2R

cylindrical shank, 2 flutes, extended and reduced neck, corner radius



P	M	K	N	S	H
★		★			★

★ 1st choice ☆ suitable



D	D Tol.	CR	CR Tol.	d(h6)	l	l1	d1	L	z	30°	1°	1°30'	2°	3°	EDP No.	Stock
3	0/-0.025	0.30	+/-0.010	6	4.5	20	2.85	60	2	21.04	21.72	22.39	23.07	24.42	MEXLN20300320	●
3	0/-0.025	0.30	+/-0.010	6	4.5	25	2.85	75	2	26.21	27.05	27.90	28.74	30.43	MEXLN20300325	●
3	0/-0.025	0.50	+/-0.010	6	4.5	10	2.85	50	2	10.70	11.03	11.36	11.70	12.36	MEXLN20300510	●
3	0/-0.025	0.50	+/-0.010	6	4.5	12	2.85	50	2	12.77	13.17	13.57	13.96	14.76	MEXLN20300512	●
3	0/-0.025	0.50	+/-0.010	6	4.5	16	2.85	60	2	16.90	17.44	17.97	18.50	19.57	MEXLN20300516	●
3	0/-0.025	0.50	+/-0.010	6	4.5	20	2.85	60	2	21.04	21.70	22.37	23.04	24.38	MEXLN20300520	●
3	0/-0.025	0.50	+/-0.010	6	4.5	25	2.85	75	2	26.20	27.04	27.88	28.71	30.39	MEXLN20300525	●
4	0/-0.025	0.30	+/-0.010	6	4.5	10	3.85	60	2	10.90	11.24	11.59	11.93	12.62	MEXLN20400310	●
4	0/-0.025	0.30	+/-0.010	6	4.5	15	3.85	60	2	16.07	16.58	17.09	17.61	18.63	MEXLN20400315	●
4	0/-0.025	0.30	+/-0.010	6	4.5	20	3.85	60	2	21.24	21.92	22.60	23.28	-	MEXLN20400320	●
4	0/-0.025	0.30	+/-0.010	6	4.5	25	3.85	75	2	26.40	27.25	28.10	28.95	-	MEXLN20400325	●
4	0/-0.025	0.30	+/-0.010	6	4.5	30	3.85	75	2	31.57	32.59	33.61	-	-	MEXLN20400330	●
4	0/-0.025	0.30	+/-0.010	6	4.5	40	3.85	75	2	41.91	43.26	-	-	-	MEXLN20400340	●
4	0/-0.025	0.50	+/-0.010	6	4.5	10	3.85	60	2	10.89	11.23	11.57	11.91	12.58	MEXLN20400510	●
4	0/-0.025	0.50	+/-0.010	6	4.5	15	3.85	60	2	16.06	16.57	17.07	17.58	18.59	MEXLN20400515	●
4	0/-0.025	0.50	+/-0.010	6	4.5	20	3.85	60	2	21.23	21.90	22.58	23.25	-	MEXLN20400520	●
4	0/-0.025	0.50	+/-0.010	6	4.5	25	3.85	75	2	26.40	27.24	28.08	28.92	-	MEXLN20400525	●
4	0/-0.025	0.50	+/-0.010	6	4.5	30	3.85	75	2	31.57	32.58	33.59	-	-	MEXLN20400530	●
4	0/-0.025	0.50	+/-0.010	6	4.5	40	3.85	75	2	41.90	43.25	-	-	-	MEXLN20400540	●

● stock standard ○ non-stock standard ▽ stock exhaustion

CUTTING PARAMETERS

MEXLN2R

Material Group ISO 513			P2 P3 P4 K1 K2			P4 P5 K3			P6 K4			H1 H4 H5		
Hardness/Rm			< 1000 N/mm ²			< 35 HRC			35 - 45 HRC			45 - 55 HRC		
ap x ae			ap x D			ap x D			ap x D			ap x D		
Vc (m/min)			70-110			50-90			30-70			20-40		
D (mm)	l1 (mm)	ap (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)
0.3	≤ 6D	0.02	40000	0.004	320	40000	0.004	290	40000	0.003	255	31800	0.003	180
	≤ 8D	0.01	40000	0.004	290	40000	0.003	260	40000	0.003	230	28700	0.003	145
	≤ 10D	0.01	40000	0.003	260	40000	0.003	230	40000	0.003	205	25500	0.002	115
	≤ 12D	0.01	40000	0.003	220	40000	0.003	200	37200	0.002	165	22300	0.002	85
0.4	≤ 6D	0.02	40000	0.006	480	40000	0.005	430	39800	0.005	380	23900	0.004	200
	≤ 8D	0.02	40000	0.005	430	40000	0.005	390	35800	0.004	310	21500	0.004	165
	≤ 10D	0.01	40000	0.005	380	40000	0.004	350	31800	0.004	245	19100	0.003	130
	≤ 12D	0.01	40000	0.004	340	39000	0.004	290	27900	0.003	185	16700	0.003	100
0.5	≤ 6D	0.03	40000	0.007	560	40000	0.006	500	31800	0.006	355	19100	0.005	185
	≤ 8D	0.02	40000	0.006	500	40000	0.006	450	28700	0.005	290	17200	0.004	150
	≤ 10D	0.02	40000	0.006	450	35700	0.005	360	25500	0.004	230	15300	0.004	120
	≤ 12D	0.01	40000	0.005	390	31200	0.004	280	22300	0.004	175	13400	0.003	90
0.6	≤ 6D	0.03	40000	0.008	640	37200	0.007	540	26500	0.006	340	15900	0.006	180
	≤ 8D	0.03	40000	0.007	580	33400	0.006	430	23900	0.006	275	14300	0.005	145
	≤ 10D	0.02	38200	0.006	490	29700	0.006	340	21200	0.005	215	12700	0.004	115
	≤ 12D	0.02	33400	0.006	370	26000	0.005	260	18600	0.004	165	11100	0.004	85
0.8	≤ 6D	0.04	35800	0.010	720	27900	0.009	500	19900	0.008	320	11900	0.007	165
	≤ 8D	0.03	32200	0.009	580	25100	0.008	410	17900	0.007	260	10700	0.006	135
	≤ 10D	0.03	28700	0.008	460	22300	0.007	320	15900	0.006	205	9600	0.006	110
	≤ 12D	0.02	25100	0.007	350	19500	0.006	250	13900	0.006	155	8400	0.005	80
1	≤ 6D	0.05	28700	0.012	690	22300	0.011	480	15900	0.010	305	9600	0.008	160
	≤ 8D	0.04	25800	0.011	560	20100	0.010	390	14300	0.009	245	8600	0.008	130
	≤ 10D	0.04	22900	0.010	440	17800	0.009	310	12700	0.008	195	7600	0.007	100
	≤ 12D	0.03	20100	0.008	340	15600	0.008	240	11100	0.007	150	6700	0.006	80
1.2	≤ 6D	0.06	23900	0.022	1050	18600	0.020	740	13300	0.018	470	8000	0.015	245
	≤ 8D	0.05	21500	0.020	850	16700	0.018	600	11900	0.016	375	7200	0.014	200
	≤ 10D	0.04	19100	0.018	670	14900	0.016	470	10600	0.014	300	6400	0.012	160
	≤ 12D	0.03	16700	0.015	510	13000	0.014	360	9300	0.012	230	5600	0.011	120
1.4	≤ 6D	0.07	20500	0.024	980	15900	0.022	690	11400	0.019	440	6800	0.017	230
	≤ 8D	0.06	18400	0.022	790	14300	0.019	560	10200	0.017	355	6100	0.015	185
	≤ 10D	0.05	16400	0.019	630	12700	0.017	440	9100	0.015	280	5500	0.013	150
	≤ 12D	0.04	14300	0.017	480	11100	0.015	340	8000	0.013	215	4800	0.012	115
1.5	≤ 15D	0.03	12300	0.014	350	9600	0.013	250	6800	0.012	155	4100	0.010	85
	> 15D	0.02	10200	0.012	240	8000	0.011	170	5700	0.010	110	3400	0.008	55
	≤ 6D	0.08	19100	0.025	960	14900	0.023	670	10600	0.020	425	6400	0.018	225
	≤ 8D	0.06	17200	0.023	770	13400	0.020	540	9600	0.018	345	5700	0.016	180
1.6	≤ 10D	0.05	15300	0.020	610	11900	0.018	430	8500	0.016	270	5100	0.014	145
	≤ 12D	0.04	13400	0.018	470	10400	0.016	330	7400	0.014	205	4500	0.012	110
	≤ 15D	0.03	11500	0.015	350	8900	0.014	240	6400	0.012	155	3800	0.011	80
	> 15D	0.02	9600	0.013	240	7400	0.011	170	5300	0.010	105	3200	0.009	55
1.6	≤ 6D	0.08	17900	0.026	930	13900	0.023	650	10000	0.021	415	6000	0.018	220
	≤ 8D	0.07	16100	0.023	750	12500	0.021	530	9000	0.019	335	5400	0.016	175
	≤ 10D	0.06	14300	0.021	590	11100	0.019	420	8000	0.017	265	4800	0.015	140
	≤ 12D	0.04	12500	0.018	450	9800	0.016	320	7000	0.015	205	4200	0.013	105
1.6	≤ 15D	0.04	10700	0.016	330	8400	0.014	240	6000	0.012	150	3600	0.011	80
1.6	> 15D	0.02	9000	0.013	230	7000	0.012	160	5000	0.010	105	3000	0.009	55



INFO
TYPHOON TA-HTA-4HTA
TYPHOON PU-HPU
TYPHOON SUH
TYPHOON ALH
TYPHOON HRC
TYPHOON SUH MINI
TYPHOON HL
C-SD-TA
LFTA
SUTA
HSS-HSS/CO DRILLS
G2
MDTA
HF VH/UP
MEF
ALU
MEX
UH
HSS/CO-HSSP END MILLS
CARBIDE BURRS

MEXLN2R

Material Group ISO 513		P2 P3 P4 K1 K2					P4 P5 K3			P6 K4			H1 H4 H5		
Hardness/Rm		< 1000 N/mm ²					< 35 HRC			35 - 45 HRC			45 - 55 HRC		
ap x ae		ap x D					ap x D			ap x D			ap x D		
Vc (m/min)		70-110					50-90			30-70			20-40		
D (mm)	l1 (mm)	ap (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	
1.8	≤ 6D	0.09	15900	0.028	890	12400	0.025	620	8800	0.022	395	5300	0.020	210	
	≤ 8D	0.08	14300	0.025	720	11100	0.023	500	8000	0.020	325	4800	0.018	170	
	≤ 10D	0.06	12700	0.022	570	9900	0.020	400	7100	0.018	255	4200	0.016	130	
	≤ 12D	0.05	11100	0.020	440	8700	0.018	310	6200	0.016	195	3700	0.014	100	
	≤ 15D	0.04	9600	0.017	320	7400	0.015	220	5300	0.013	140	3200	0.012	75	
> 15D	0.03	8000	0.014	220	6200	0.013	160	4400	0.011	100	2700	0.010	55		
2	≤ 6D	0.10	14300	0.030	860	11100	0.027	600	8000	0.024	385	4800	0.021	200	
	≤ 8D	0.09	12900	0.027	700	10000	0.024	490	7200	0.022	310	4300	0.019	165	
	≤ 10D	0.07	11500	0.024	550	8900	0.022	380	6400	0.019	245	3800	0.017	130	
	≤ 12D	0.06	10000	0.021	420	7800	0.019	290	5600	0.017	190	3300	0.015	95	
	≤ 15D	0.05	8600	0.018	310	6700	0.016	220	4800	0.014	140	2900	0.013	75	
> 15D	0.03	8600	0.018	310	6700	0.016	220	4800	0.014	140	2900	0.013	75		
2.5	≤ 6D	0.13	11500	0.035	810	8900	0.032	560	6400	0.028	360	3800	0.025	185	
	≤ 8D	0.11	10300	0.032	650	8000	0.028	450	5700	0.025	285	3400	0.022	150	
	≤ 10D	0.09	9200	0.028	520	7100	0.025	360	5100	0.022	230	3100	0.020	120	
	≤ 12D	0.07	8000	0.025	390	6200	0.022	270	4500	0.020	175	2700	0.017	95	
	≤ 15D	0.06	6900	0.021	290	5400	0.019	200	3800	0.017	130	2300	0.015	70	
> 15D	0.04	6900	0.021	290	5400	0.019	200	3800	0.017	130	2300	0.015	70		
3	≤ 6D	0.15	9600	0.040	770	7400	0.036	530	5300	0.032	340	3200	0.028	180	
	≤ 8D	0.13	8600	0.036	620	6700	0.032	430	4800	0.029	275	2900	0.025	145	
	≤ 10D	0.11	7600	0.032	490	5900	0.029	340	4200	0.026	215	2500	0.022	110	
	≤ 12D	0.08	6700	0.028	380	5200	0.025	260	3700	0.022	165	2200	0.020	85	
	≤ 15D	0.07	5700	0.024	270	4500	0.022	190	3200	0.019	125	1900	0.017	65	
> 15D	0.05	5700	0.024	270	4500	0.022	190	3200	0.019	125	1900	0.017	65		
4	≤ 6D	0.20	7200	0.050	720	5600	0.045	500	4000	0.040	320	2400	0.035	170	
	≤ 8D	0.17	6400	0.045	580	5000	0.041	410	3600	0.036	260	2100	0.032	130	
	≤ 10D	0.14	5700	0.040	460	4500	0.036	320	3200	0.032	205	1900	0.028	105	
	≤ 12D	0.11	5000	0.035	350	3900	0.032	250	2800	0.028	155	1700	0.025	85	
	≤ 15D	0.09	4300	0.030	260	3300	0.027	180	2400	0.024	115	1400	0.021	60	
> 15D	0.06	4300	0.030	260	3300	0.027	180	2400	0.024	115	1400	0.021	60		



- INFO
- TYPHOON TA-HTA-4HTA
- TYPHOON PU-HPU
- TYPHOON SUH
- TYPHOON ALH
- TYPHOON HRC
- TYPHOON SUH MINI
- TYPHOON HL
- C-SD-TA
- LFTA
- SUTA
- HSS-HSS/CO DRILLS
- G2
- MDTA
- HF VH/UP
- MEF
- ALU
- MEX
- UH
- HSS/CO-HSSP END MILLS
- CARBIDE BURRS

MEXLS2R

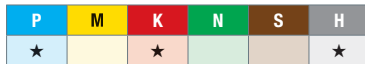
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	Hardness/Rm	< 1000 N/mm ²			< 35 HRC			35 - 45 HRC			45 - 55 HRC		
	ap x ae	0.3D x D			0.3D x D			0.2D x D			0.05D x D		
	Vc (m/min)	70-110			50-90			30-70			20-40		
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)
	2	14300	0.009	260	11440	0.008	190	8580	0.007	125	5150	0.006	65
	3	9600	0.012	230	7680	0.011	170	5760	0.010	110	3460	0.008	60
	4	7200	0.018	260	5760	0.016	190	4320	0.014	125	2590	0.013	65
	5	5700	0.024	270	4560	0.022	200	3420	0.019	130	2050	0.017	70
	6	4800	0.029	280	3840	0.026	200	2880	0.023	135	1730	0.020	70
8	3600	0.035	250	2880	0.032	180	2160	0.028	120	1300	0.025	65	
10	2900	0.041	240	2320	0.037	170	1740	0.033	115	1040	0.029	60	
12	2400	0.050	240	1920	0.045	170	1440	0.040	115	860	0.035	60	
16	1800	0.065	230	1400	0.059	160	1000	0.052	105	600	0.046	55	

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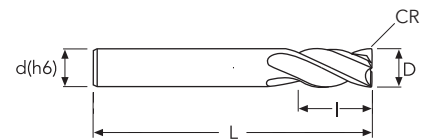
- INFO
- TYPHOON TA-HTA-4HTA
- TYPHOON PU-HPU
- TYPHOON SUH
- TYPHOON ALH
- TYPHOON HRC
- TYPHOON SUH MINI
- TYPHOON HL
- C-SD-TA
- LFTA
- SUTA
- HSS-HSS/CO DRILLS
- G2
- MDTA
- HF VH/UP
- MEF
- ALU
- MEX**
- UH
- HSS/CO-HSSP END MILLS
- CARBIDE BURRS

MEXCS4R

cylindrical shank, 4 flutes, corner radius



★ 1st choice ☆ suitable



D	D Tol.	CR	CR Tol.	d(h6)	l	l1	L	z	EDP No.	Stock
1	0/-0.020	0.20	+/-0.010	4	3		50	4	MEXCS4R01002	●
1.5	0/-0.020	0.20	+/-0.010	4	4.5		50	4	MEXCS4R01502	●
2	0/-0.020	0.20	+/-0.010	4	6.5		50	4	MEXCS4R02002	●
2	0/-0.020	0.30	+/-0.010	4	6.5		50	4	MEXCS4R02003	●
2.5	0/-0.020	0.20	+/-0.010	4	6.5		50	4	MEXCS4R02502	●
2.5	0/-0.020	0.50	+/-0.010	4	6.5		50	4	MEXCS4R02505	●
3	0/-0.025	0.20	+/-0.010	4	9		50	4	MEXCS4R03002	●
3	0/-0.025	0.30	+/-0.010	4	9		50	4	MEXCS4R03003	●
3	0/-0.025	0.50	+/-0.010	4	9		50	4	MEXCS4R03005	●
4	0/-0.025	0.30	+/-0.010	4	12		50	4	MEXCS4R04003	●
4	0/-0.025	0.50	+/-0.010	4	12		50	4	MEXCS4R04005	●
4	0/-0.025	1.00	+/-0.010	4	12		50	4	MEXCS4R04010	●
5	0/-0.025	0.30	+/-0.010	5	15		50	4	MEXCS4R05003	●
5	0/-0.025	0.50	+/-0.010	5	15		50	4	MEXCS4R05005	●
5	0/-0.025	1.00	+/-0.010	5	15		50	4	MEXCS4R05010	●
6	0/-0.025	0.30	+/-0.010	6	16		50	4	MEXCS4R06003	●
6	0/-0.025	0.50	+/-0.010	6	16		50	4	MEXCS4R06005	●
6	0/-0.025	1.00	+/-0.010	6	16		50	4	MEXCS4R06010	●
8	0/-0.030	0.30	+/-0.010	8	20		64	4	MEXCS4R08003	●
8	0/-0.030	0.50	+/-0.010	8	20		64	4	MEXCS4R08005	●
8	0/-0.030	1.00	+/-0.010	8	20		64	4	MEXCS4R08010	●
8	0/-0.030	1.50	+/-0.010	8	20		64	4	MEXCS4R08015	●
8	0/-0.030	2.00	+/-0.010	8	20		64	4	MEXCS4R08020	●
10	0/-0.030	0.30	+/-0.010	10	22		75	4	MEXCS4R10003	●
10	0/-0.030	0.50	+/-0.010	10	22		75	4	MEXCS4R10005	●
10	0/-0.030	1.00	+/-0.010	10	22		75	4	MEXCS4R10010	●
10	0/-0.030	1.50	+/-0.010	10	22		75	4	MEXCS4R10015	●
10	0/-0.030	2.00	+/-0.010	10	22		75	4	MEXCS4R10020	●
12	0/-0.030	0.30	+/-0.010	12	25		75	4	MEXCS4R12003	●
12	0/-0.030	0.50	+/-0.010	12	25		75	4	MEXCS4R12005	●
12	0/-0.030	1.00	+/-0.010	12	25		75	4	MEXCS4R12010	●
12	0/-0.030	1.50	+/-0.010	12	25		75	4	MEXCS4R12015	●
12	0/-0.030	2.00	+/-0.010	12	25		75	4	MEXCS4R12020	●
12	0/-0.030	3.00	+/-0.010	12	25		75	4	MEXCS4R12030	●
14	0/-0.030	0.50	+/-0.010	14	32		90	4	MEXCS4R14005	○
14	0/-0.030	1.00	+/-0.010	14	32		90	4	MEXCS4R14010	●
14	0/-0.030	2.00	+/-0.010	14	32		90	4	MEXCS4R14020	○
16	0/-0.030	0.50	+/-0.010	16	32		90	4	MEXCS4R16005	●
16	0/-0.030	1.00	+/-0.010	16	32		90	4	MEXCS4R16010	●

INFO
TYPHOON TA-HTA-4HTA
TYPHOON PU-HPU
TYPHOON SUH
TYPHOON ALH
TYPHOON HRC
TYPHOON SUH MINI
TYPHOON HL
C-SD-TA
LFTA
SUTA
HSS-HSS/CO DRILLS
G2
MDTA
HF VH/UP
MEF
ALU
MEX
UH
HSS/CO-HSSP END MILLS
CARBIDE BURRS

● stock standard ○ non-stock standard ▽ stock exhaustion

CUTTING PARAMETERS

MEXCS4R

	Material Group ISO 513	P2 P3 P4 K1 K2			P4 P5 K3			P6 K4			H1 H4 H5		
	Hardness/Rm	< 1000 N/mm ²			< 35 HRC			35 - 45 HRC			45 - 55 HRC		
	ap x ae	D x 0.1D			D x 0.1D			D x 0.05D			D x 0.05D		
	Vc (m/min)	80-120			50-90			40-60			20-40		
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)
	1	31850	0.009	1080	22290	0.008	680	15920	0.007	435	9550	0.006	225
	2	15920	0.017	1080	11150	0.015	680	7960	0.014	435	4780	0.012	230
	3	10620	0.026	1080	7430	0.023	680	5310	0.020	435	3180	0.018	225
	4	7960	0.034	1080	5570	0.031	680	3980	0.027	435	2390	0.024	230
	5	6370	0.038	970	4460	0.034	610	3180	0.031	390	1910	0.027	205
	6	5310	0.043	900	3720	0.038	570	2650	0.034	360	1590	0.030	190
	8	3980	0.055	880	2790	0.050	550	1990	0.044	350	1190	0.039	185
	10	3180	0.071	900	2230	0.064	570	1590	0.057	360	960	0.050	190
12	2650	0.085	900	1860	0.077	570	1330	0.068	360	800	0.060	190	
14	2270	0.098	890	1590	0.088	560	1140	0.078	355	680	0.068	185	
16	1990	0.110	880	1390	0.099	550	1000	0.088	350	600	0.077	185	
18	1770	0.125	890	1240	0.113	560	880	0.100	350	530	0.088	185	
20	1590	0.140	890	1110	0.126	560	800	0.112	360	480	0.098	190	

- INFO
- TYPHOON TA-HTA-4HTA
- TYPHOON PU-HPU
- TYPHOON SUH
- TYPHOON ALH
- TYPHOON HRC
- TYPHOON SUH MINI
- TYPHOON HL
- C-SD-TA
- LFTA
- SUTA
- HSS-HSS/CO DRILLS
- G2
- MDTA
- HF VH/UP
- MEF
- ALU
- MEX**
- UH
- HSS/CO-HSSP END MILLS
- CARBIDE BURRS

MEX410R

	Material Group ISO 513	P2 P3 P4 K1 K2			P4 P5 K3			P6 K4			H1 H4 H5		
	Hardness/Rm	< 1000 N/mm ²			< 35 HRC			35 - 45 HRC			45 - 55 HRC		
	ap x ae	D x 0.1D			D x 0.1D			D x 0.05D			D x 0.05D		
	Vc (m/min)	80-120			50-90			40-60			20-40		
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)
	2	15920	0.015	970	11150	0.014	610	7960	0.012	390	4780	0.011	205
	3	10620	0.023	970	7430	0.021	610	5310	0.018	390	3180	0.016	205
	4	7960	0.031	970	5570	0.028	610	3980	0.024	390	2390	0.021	205
	5	6370	0.034	880	4460	0.031	550	3180	0.028	350	1910	0.024	185
	6	5310	0.038	810	3720	0.034	510	2650	0.031	325	1590	0.027	170
8	3980	0.050	790	2790	0.045	500	1990	0.040	315	1190	0.035	165	
10	3180	0.065	830	2230	0.059	520	1590	0.052	330	960	0.046	175	
12	2650	0.077	810	1860	0.069	510	1330	0.061	325	800	0.054	170	

- INFO
- TYPHOON TA-HTA-4HTA
- TYPHOON PU-HPU
- TYPHOON SUH
- TYPHOON ALH
- TYPHOON HRC
- TYPHOON SUH MINI
- TYPHOON HL
- C-SD-TA
- LFTA
- SUTA
- HSS-HSS/CO DRILLS
- G2
- MDTA
- HF VH/UP
- MEF
- ALU
- MEX**
- UH
- HSS/CO-HSSP END MILLS
- CARBIDE BURRS

MEXLS4R

	Material Group ISO 513	P2 P3 P4 K1 K2			P4 P5 K3			P6 K4			H1 H4 H5		
	Hardness/Rm	< 1000 N/mm ²			< 35 HRC			35 - 45 HRC			45 - 55 HRC		
	ap x ae	D x 0.05D			D x 0.05D			D x 0.05D			D x 0.05D		
	Vc (m/min)	70-110			50-90			40-60			20-40		
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)
	2	14330	0.014	830	11150	0.013	580	7960	0.012	370	4780	0.010	195
	3	9550	0.022	830	7430	0.020	580	5310	0.017	370	3180	0.015	195
	4	7170	0.029	830	5570	0.026	580	3980	0.023	370	2390	0.020	195
	5	5730	0.033	750	4460	0.029	520	3180	0.026	330	1910	0.023	175
	6	4780	0.036	690	3720	0.033	480	2650	0.029	305	1590	0.025	160
8	3580	0.047	670	2790	0.042	470	1990	0.038	300	1190	0.033	155	
10	2870	0.060	690	2230	0.054	480	1590	0.048	305	960	0.042	160	
12	2390	0.072	690	1860	0.065	480	1330	0.058	305	800	0.051	160	
16	1790	0.094	670	1390	0.084	470	1000	0.075	300	600	0.065	155	

- INFO
- TYPHOON TA-HTA-4HTA
- TYPHOON PU-HPU
- TYPHOON SUH
- TYPHOON ALH
- TYPHOON HRC
- TYPHOON SUH MINI
- TYPHOON HL
- C-SD-TA
- LFTA
- SUTA
- HSS-HSS/CO DRILLS
- G2
- MDTA
- HF VH/UP
- MEF
- ALU
- MEX**
- UH
- HSS/CO-HSSP END MILLS
- CARBIDE BURRS

MEX610R

	Material Group ISO 513	P2 P3 P4 K1 K2			P4 P5 K3			P6 K4			H1 H4 H5		
	Hardness/Rm	< 1000 N/mm ²			< 35 HRC			35 - 45 HRC			45 - 55 HRC		
	ap x ae	D x 0.1D			D x 0.1D			D x 0.05D			D x 0.05D		
	Vc (m/min)	120-160			90-130			60-100			50-70		
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)
	6	7430	0.018	800	5840	0.016	570	4250	0.014	370	3180	0.013	240
8	5570	0.028	920	4380	0.025	650	3180	0.022	420	2390	0.019	280	
10	4460	0.034	900	3500	0.030	640	2550	0.027	410	1910	0.024	270	
12	3720	0.041	910	2920	0.037	640	2120	0.033	420	1590	0.029	270	

- INFO
- TYPHOON TA-HTA-4HTA
- TYPHOON PU-HPU
- TYPHOON SUH
- TYPHOON ALH
- TYPHOON HRC
- TYPHOON SUH MINI
- TYPHOON HL
- C-SD-TA
- LFTA
- SUTA
- HSS-HSS/CO DRILLS
- G2
- MDTA
- HF VH/UP
- MEF
- ALU
- MEX**
- UH
- HSS/CO-HSSP END MILLS
- CARBIDE BURRS

CUTTING PARAMETERS

MEX611R

	Material Group ISO 513	P2 P3 P4 K1 K2			P4 P5 K3			P6 K4			H1 H4 H5		
	Hardness/Rm	< 1000 N/mm ²			< 35 HRC			35 - 45 HRC			45 - 55 HRC		
	ap x ae	1.5D x 0.05D			1.5D x 0.05D			1.5D x 0.05D			1.5D x 0.05D		
	Vc (m/min)	100-140			80-120			40-80			20-60		
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)
	6	6370	0.015	580	5310	0.014	440	3180	0.012	230	2120	0.011	140
8	4780	0.023	670	3980	0.021	500	2390	0.019	270	1590	0.016	160	
10	3820	0.029	650	3180	0.026	490	1910	0.023	260	1270	0.020	150	
12	3180	0.035	660	2650	0.031	500	1590	0.028	260	1060	0.024	150	

- INFO
- TYPHOON TA-HTA-4HTA
- TYPHOON PU-HPU
- TYPHOON SUH
- TYPHOON ALH
- TYPHOON HRC
- TYPHOON SUH MINI
- TYPHOON HL
- C-SD-TA
- LFTA
- SUTA
- HSS-HSS/CO DRILLS
- G2
- MDTA
- HF VH/UP
- MEF
- ALU
- MEX**
- UH
- HSS/CO-HSSP END MILLS
- CARBIDE BURRS

CUTTING PARAMETERS

MEXMB2

	Material Group ISO 513	P2 P3 P4 K1 K2			P4 P5 K3			P6 K4			H1 H4 H5			
	Hardness/Rm	< 1000 N/mm ²			< 35 HRC			35 - 45 HRC			45 - 55 HRC			
	ap x ae	0.05D x 0.2D			0.05D x 0.1D			0.05D x 0.1D			0.05D x 0.1D			
	Vc (m/min)	110-130			90-110			50-70			45-55			
	D (mm)	D (eff.) (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)
	0.2	0.09	40000	0.006	480	40000	0.005	430	40000	0.005	360	40000	0.004	310
	0.3	0.13	40000	0.007	580	40000	0.006	520	40000	0.006	460	40000	0.005	405
	0.4	0.17	40000	0.009	720	40000	0.008	650	40000	0.007	575	40000	0.006	505
	0.5	0.22	40000	0.011	860	40000	0.010	780	38220	0.009	660	31850	0.008	480
	0.6	0.26	40000	0.014	1080	40000	0.012	970	31850	0.011	690	26540	0.009	500
	0.7	0.31	40000	0.016	1300	40000	0.015	1170	27300	0.013	710	22750	0.011	515
	0.8	0.35	40000	0.018	1440	40000	0.016	1300	23890	0.014	690	19900	0.013	500
	0.9	0.39	40000	0.021	1660	35390	0.019	1320	21230	0.017	705	17690	0.014	515
1	0.44	38220	0.023	1790	40000	0.021	1680	19110	0.019	715	15920	0.016	520	
1.5	0.65	25480	0.036	1830	21230	0.032	1380	12740	0.029	735	10620	0.025	535	
2	0.87	19110	0.050	1890	15920	0.045	1420	9550	0.040	755	7960	0.035	550	

	α	n (rpm)	Vf (mm/min)
	15°	x 1.1	x 1.1

- INFO
- TYPHOON TA-HTA-4HTA
- TYPHOON PU-HPU
- TYPHOON SUH
- TYPHOON ALH
- TYPHOON HRC
- TYPHOON SUH MINI
- TYPHOON HL
- C-SD-TA
- LFTA
- SUTA
- HSS-HSS/CO DRILLS
- G2
- MDTA
- HF VH/UP
- MEF
- ALU
- MEX**
- UH
- HSS/CO-HSSP END MILLS
- CARBIDE BURRS

CUTTING PARAMETERS

MEXMB2SC

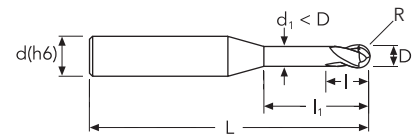
	Material Group ISO 513	P2 P3 P4 K1 K2			P4 P5 K3			P6 K4			H1 H4 H5			
	Hardness/Rm	< 1000 N/mm ²			< 35 HRC			35 - 45 HRC			45 - 55 HRC			
	ap x ae	0.05D x 0.1D			0.05D x 0.1D			0.05D x 0.1D			0.05D x 0.1D			
	Vc (m/min)	110-130			90-110			50-70			45-55			
	D (mm)	D (eff.) (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)
	0.2	0.09	40000	0.006	480	40000	0.005	430	40000	0.005	385	40000	0.004	335
	0.3	0.13	40000	0.008	640	40000	0.007	580	40000	0.006	510	40000	0.006	450
0.4	0.17	40000	0.010	800	40000	0.009	720	40000	0.008	640	40000	0.007	560	
0.5	0.22	40000	0.012	960	40000	0.011	860	38220	0.010	735	31850	0.008	535	
0.6	0.26	40000	0.015	1200	40000	0.014	1080	31850	0.012	765	26540	0.011	555	
0.8	0.35	40000	0.018	1440	40000	0.016	1300	27300	0.014	785	22750	0.013	575	

	α	n (rpm)	Vf (mm/min)
	15°	x 1.1	x 1.1

- INFO
- TYPHOON TA-HTA-4HTA
- TYPHOON PU-HPU
- TYPHOON SUH
- TYPHOON ALH
- TYPHOON HRC
- TYPHOON SUH MINI
- TYPHOON HL
- C-SD-TA
- LFTA
- SUTA
- HSS-HSS/CO DRILLS
- G2
- MDTA
- HF VH/UP
- MEF
- ALU
- MEX**
- UH
- HSS/CO-HSSP END MILLS
- CARBIDE BURRS

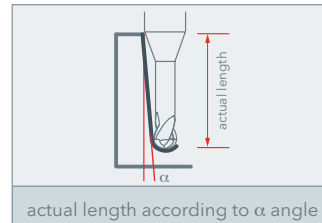
MEXLNB2

cylindrical shank, 2 flutes ball nose, extended and reduced neck



P	M	K	N	S	H
★		★			★

★ 1st choice ☆ suitable

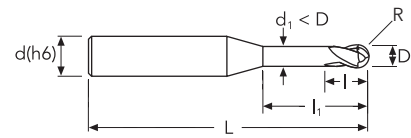


D	D Tol.	R	R Tol.	d(h6)	l	l1	d1	L	z	30'	1°	1°30'	2°	3°	EDP No.	Stock
0.2	0/-0.020	0.10	0/-0.020	4	0.2	0.5	0.15	50	2	0.57	0.58	0.6	0.62	0.66	www002005	●
0.2	0/-0.020	0.10	0/-0.020	4	0.2	1	0.15	50	2	1.08	1.12	1.15	1.19	1.27	MEXLNB200201	●
0.2	0/-0.020	0.10	0/-0.020	4	0.2	1.5	0.15	50	2	1.60	1.65	1.71	1.76	1.89	MEXLNB2002015	●
0.3	0/-0.020	0.15	0/-0.020	4	0.3	1	0.25	50	2	1.08	1.11	1.15	1.18	1.26	MEXLNB200301	●
0.3	0/-0.020	0.15	0/-0.020	4	0.3	2	0.25	50	2	2.12	2.18	2.25	2.33	2.49	MEXLNB200302	●
0.3	0/-0.020	0.15	0/-0.020	4	0.3	3	0.25	50	2	3.15	3.25	3.36	3.48	3.73	MEXLNB200303	●
0.4	0/-0.020	0.20	0/-0.020	4	0.4	1	0.35	50	2	1.08	1.11	1.14	1.18	1.25	MEXLNB200401	●
0.4	0/-0.020	0.20	0/-0.020	4	0.4	2	0.35	50	2	2.11	2.18	2.25	2.32	2.48	MEXLNB200402	●
0.4	0/-0.020	0.20	0/-0.020	4	0.4	3	0.35	50	2	3.15	3.25	3.36	3.47	3.72	MEXLNB200403	●
0.4	0/-0.020	0.20	0/-0.020	4	0.4	4	0.35	50	2	4.18	4.32	4.46	4.62	4.95	MEXLNB200404	●
0.4	0/-0.020	0.20	0/-0.020	4	0.4	5	0.35	50	2	5.21	5.39	5.57	5.77	6.18	MEXLNB200405	●
0.5	0/-0.020	0.25	0/-0.020	4	0.4	2	0.45	50	2	2.15	2.22	2.29	2.36	2.52	MEXLNB200502	●
0.5	0/-0.020	0.25	0/-0.020	4	0.4	3	0.45	50	2	3.18	3.29	3.39	3.51	3.75	MEXLNB200503	●
0.5	0/-0.020	0.25	0/-0.020	4	0.4	4	0.45	50	2	4.22	4.35	4.5	4.65	4.98	MEXLNB200504	●
0.5	0/-0.020	0.25	0/-0.020	4	0.4	5	0.45	50	2	5.25	5.42	5.61	5.8	6.22	MEXLNB200505	●
0.5	0/-0.020	0.25	0/-0.020	4	0.4	6	0.45	50	2	6.28	6.49	6.71	6.95	7.45	MEXLNB200506	●
0.5	0/-0.020	0.25	0/-0.020	4	0.4	8	0.45	50	2	8.35	8.63	8.93	9.24	9.92	MEXLNB200508	●
0.6	0/-0.020	0.30	0/-0.020	4	0.5	2	0.55	50	2	2.15	2.21	2.28	2.35	2.50	MEXLNB200602	●
0.6	0/-0.020	0.30	0/-0.020	4	0.5	3	0.55	50	2	3.18	3.28	3.39	3.50	3.74	MEXLNB200603	●
0.6	0/-0.020	0.30	0/-0.020	4	0.5	4	0.55	50	2	4.22	4.35	4.49	4.65	4.97	MEXLNB200604	●
0.6	0/-0.020	0.30	0/-0.020	4	0.5	5	0.55	50	2	5.25	5.42	5.60	5.79	6.21	MEXLNB200605	●
0.6	0/-0.020	0.30	0/-0.020	4	0.5	6	0.55	50	2	6.28	6.49	6.71	6.94	7.44	MEXLNB200606	●
0.6	0/-0.020	0.30	0/-0.020	4	0.5	8	0.55	50	2	8.35	8.63	8.92	9.23	9.91	MEXLNB200608	●
0.8	0/-0.020	0.40	0/-0.020	4	0.6	2	0.75	50	2	2.15	2.21	2.27	2.34	2.48	MEXLNB200802	●
0.8	0/-0.020	0.40	0/-0.020	4	0.6	4	0.75	50	2	4.21	4.34	4.48	4.63	4.95	MEXLNB200804	●
0.8	0/-0.020	0.40	0/-0.020	4	0.6	5	0.75	50	2	5.25	5.41	5.59	5.78	6.18	MEXLNB200805	●
0.8	0/-0.020	0.40	0/-0.020	4	0.6	6	0.75	50	2	6.28	6.48	6.70	6.93	7.42	MEXLNB200806	●
0.8	0/-0.020	0.40	0/-0.020	4	0.6	7	0.75	50	2	7.31	7.55	7.81	8.07	8.65	MEXLNB200807	●
0.8	0/-0.020	0.40	0/-0.020	4	0.6	8	0.75	50	2	8.35	8.62	8.91	9.22	9.88	MEXLNB200808	●
0.8	0/-0.020	0.40	0/-0.020	4	0.6	10	0.75	50	2	10.41	10.76	11.13	11.51	12.35	MEXLNB200810	●
1	0/-0.020	0.50	0/-0.020	4	0.8	3	0.95	50	2	3.27	3.37	3.47	3.57	3.80	MEXLNB201003	●
1	0/-0.020	0.50	0/-0.020	4	0.8	4	0.95	50	2	4.31	4.44	4.58	4.72	5.04	MEXLNB201004	●
1	0/-0.020	0.50	0/-0.020	4	0.8	5	0.95	50	2	5.34	5.51	5.68	5.87	6.27	MEXLNB201005	●
1	0/-0.020	0.50	0/-0.020	4	0.8	6	0.95	50	2	6.37	6.58	6.79	7.02	7.50	MEXLNB201006	●
1	0/-0.020	0.50	0/-0.020	4	0.8	7	0.95	50	2	7.41	7.64	7.90	8.16	8.74	MEXLNB201007	●
1	0/-0.020	0.50	0/-0.020	4	0.8	8	0.95	50	2	8.44	8.71	9.00	9.31	9.97	MEXLNB201008	●
1	0/-0.020	0.50	0/-0.020	4	0.8	9	0.95	50	2	9.47	9.78	10.11	10.46	11.21	MEXLNB201009	●
1	0/-0.020	0.50	0/-0.020	4	0.8	10	0.95	50	2	10.51	10.85	11.22	11.61	12.44	MEXLNB201010	●
1	0/-0.020	0.50	0/-0.020	4	0.8	12	0.95	50	2	12.57	12.99	13.43	13.9	14.91	MEXLNB201012	●

● stock standard ○ non-stock standard ▽ stock exhaustion

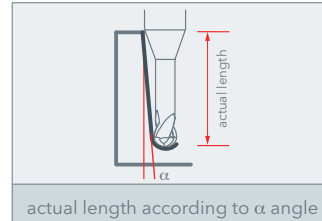
MEXLNB2

cylindrical shank, 2 flutes ball nose, extended and reduced neck



P	M	K	N	S	H
★		★			★

★ 1st choice ☆ suitable



D	D Tol.	R	R Tol.	d(h6)	l	l1	d1	L	z	30°	1°	1°30'	2°	3°	EDP No.	Stock
1	0/-0.020	0.50	0/-0.020	4	0.8	14	0.95	50	2	14.64	15.13	15.65	16.19	17.37	MEXLNB201014	●
1	0/-0.020	0.50	0/-0.020	4	0.8	16	0.95	50	2	16.71	15.13	15.65	16.19	17.37	MEXLNB201016	●
1	0/-0.020	0.50	0/-0.020	4	0.8	20	0.95	60	2	20.84	21.55	22.29	23.08	24.78	MEXLNB201020	●
1.2	0/-0.020	0.60	0/-0.020	4	1	6	1.15	50	2	6.37	6.57	6.78	7.00	7.48	MEXLNB201206	●
1.2	0/-0.020	0.60	0/-0.020	4	1	8	1.15	50	2	8.44	8.71	8.99	9.30	9.95	MEXLNB201208	●
1.2	0/-0.020	0.60	0/-0.020	4	1	10	1.15	50	2	10.50	10.85	11.21	11.59	12.42	MEXLNB201210	●
1.2	0/-0.020	0.60	0/-0.020	4	1	12	1.15	50	2	12.57	12.98	13.42	13.89	14.88	MEXLNB201212	●
1.4	0/-0.020	0.70	0/-0.020	4	1.1	8	1.35	50	2	8.43	8.70	8.98	9.28	9.93	MEXLNB201408	●
1.4	0/-0.020	0.70	0/-0.020	4	1.1	12	1.35	50	2	12.57	12.98	13.41	13.87	14.86	MEXLNB201412	●
1.4	0/-0.020	0.70	0/-0.020	4	1.1	16	1.35	50	2	16.70	17.26	17.84	18.46	19.8	MEXLNB201416	●
1.5	0/-0.020	0.75	0/-0.020	4	1.2	8	1.45	50	2	8.43	8.70	8.98	9.27	9.91	MEXLNB201508	●
1.5	0/-0.020	0.75	0/-0.020	4	1.2	12	1.45	50	2	12.57	12.97	13.41	13.86	14.85	MEXLNB201512	●
1.5	0/-0.020	0.75	0/-0.020	4	1.2	16	1.45	50	2	16.7	17.25	17.84	18.45	19.78	MEXLNB201516	●
1.5	0/-0.020	0.75	0/-0.020	4	1.2	18	1.45	60	2	18.77	19.39	20.05	20.75	22.25	MEXLNB201518	●
1.6	0/-0.020	0.80	0/-0.020	4	1.3	8	1.55	50	2	8.43	8.69	8.97	9.27	9.90	MEXLNB201608	●
1.6	0/-0.020	0.80	0/-0.020	4	1.3	12	1.55	50	2	12.56	12.97	13.40	13.86	14.84	MEXLNB201612	●
1.6	0/-0.020	0.80	0/-0.020	4	1.3	16	1.55	50	2	16.7	17.25	17.83	18.45	19.77	MEXLNB201616	●
1.6	0/-0.020	0.80	0/-0.020	4	1.3	20	1.55	60	2	20.83	21.53	22.26	23.03	-	MEXLNB201620	●
1.8	0/-0.020	0.90	0/-0.020	4	1.4	8	1.75	50	2	8.43	8.69	8.96	9.25	9.88	MEXLNB201808	●
1.8	0/-0.020	0.90	0/-0.020	4	1.4	12	1.75	50	2	12.56	12.96	13.39	13.84	14.81	MEXLNB201812	●
1.8	0/-0.020	0.90	0/-0.020	4	1.4	16	1.75	50	2	16.7	17.24	17.82	18.43	19.75	MEXLNB201816	●
1.8	0/-0.020	0.90	0/-0.020	4	1.4	20	1.75	60	2	20.83	21.52	22.25	23.02	-	MEXLNB201820	●
2	0/-0.020	1.00	0/-0.020	4	1.6	4	1.95	50	2	4.29	4.40	4.52	4.65	4.92	MEXLNB202004	●
2	0/-0.020	1.00	0/-0.020	4	1.6	6	1.95	50	2	6.36	6.54	6.74	6.94	7.39	MEXLNB202006	●
2	0/-0.020	1.00	0/-0.020	4	1.6	8	1.95	50	2	8.42	8.68	8.95	9.24	9.86	MEXLNB202008	●
2	0/-0.020	1.00	0/-0.020	4	1.6	10	1.95	50	2	10.49	10.82	11.17	11.53	12.32	MEXLNB202010	●
2	0/-0.020	1.00	0/-0.020	4	1.6	12	1.95	50	2	12.56	12.96	13.38	13.83	14.79	MEXLNB202012	●
2	0/-0.020	1.00	0/-0.020	4	1.6	14	1.95	50	2	14.62	15.10	15.59	16.12	17.26	MEXLNB202014	●
2	0/-0.020	1.00	0/-0.020	4	1.6	16	1.95	50	2	16.69	17.23	17.81	18.42	19.73	MEXLNB202016	●
2	0/-0.020	1.00	0/-0.020	4	1.6	18	1.95	60	2	18.76	19.37	20.02	20.71	-	MEXLNB202018	●
2	0/-0.020	1.00	0/-0.020	4	1.6	20	1.95	60	2	20.83	21.51	22.24	23.00	-	MEXLNB202020	●
2	0/-0.020	1.00	0/-0.020	4	1.6	25	1.95	75	2	25.99	26.86	27.77	28.74	-	MEXLNB202025	●
2	0/-0.020	1.00	0/-0.020	4	1.6	30	1.95	75	2	31.16	32.21	33.31	-	-	MEXLNB202030	●
3	0/-0.025	1.50	0/-0.020	6	2.4	8	2.85	50	2	8.60	8.84	9.10	9.37	9.96	MEXLNB203008	●
3	0/-0.025	1.50	0/-0.020	6	2.4	10	2.85	50	2	10.67	10.98	11.32	11.67	12.43	MEXLNB203010	●
3	0/-0.025	1.50	0/-0.020	6	2.4	16	2.85	60	2	16.87	17.4	17.96	18.55	19.83	MEXLNB203016	●
3	0/-0.025	1.50	0/-0.020	6	2.4	20	2.85	60	2	21.00	21.68	22.39	23.14	24.77	MEXLNB203020	●
3	0/-0.025	1.50	0/-0.020	6	2.4	25	2.85	75	2	26.17	27.02	27.93	28.88	-	MEXLNB203025	●
3	0/-0.025	1.50	0/-0.020	6	2.4	30	2.85	75	2	31.34	32.37	33.46	34.62	-	MEXLNB203030	●

INFO
TYPHOON TA-HTA-4HTA
TYPHOON PU-HPU
TYPHOON SUH
TYPHOON ALH
TYPHOON HRC
TYPHOON SUH MINI
TYPHOON HL
C-SD-TA
LFTA
SUTA
HSS-HSS/CO DRILLS
G2
MDTA
HF VH/UP
MEF
ALU
MEX
UH
HSS/CO-HSSP END MILLS
CARBIDE BURRS

CUTTING PARAMETERS

MEXLNB2


Material Group ISO 513				P2 P3 P4 K1 K2			P4 P5 K3			P6 K4			H1 H4 H5		
Hardness/Rm				< 1000 N/mm ²			< 35 HRC			35 - 45 HRC			45 - 55 HRC		
ap x ae				ap x 0.2D			ap x 0.1D			ap x 0.1D			ap x 0.1D		
Vc (m/min)				110-130			90-110			50-70			45-55		
D (mm)	l1 (mm)	ap (mm)	D (eff.) (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)
0.2	≤ 6D	0.01	0.09	40000	0.007	580	40000	0.006	520	40000	0.006	460	40000	0.005	405
	≤ 8D	0.01	0.08	40000	0.006	520	40000	0.005	420	40000	0.005	375	40000	0.004	325
	≤ 10D	0.01	0.07	40000	0.006	460	40000	0.004	330	40000	0.004	295	40000	0.003	260
0.3	≤ 6D	0.02	0.13	40000	0.009	720	40000	0.008	650	40000	0.007	575	40000	0.006	505
	≤ 8D	0.01	0.12	40000	0.008	650	40000	0.007	520	40000	0.006	465	40000	0.005	410
	≤ 10D	0.01	0.11	40000	0.007	580	40000	0.005	410	40000	0.005	370	40000	0.004	325
0.4	≤ 6D	0.02	0.17	40000	0.012	940	40000	0.011	840	40000	0.009	750	40000	0.008	655
	≤ 8D	0.02	0.16	40000	0.011	840	40000	0.009	680	40000	0.008	605	35830	0.007	475
	≤ 10D	0.01	0.15	40000	0.009	750	40000	0.007	540	38220	0.006	460	31850	0.005	335
0.5	≤ 6D	0.03	0.22	40000	0.015	1220	40000	0.014	1100	38220	0.012	935	31850	0.011	680
	≤ 8D	0.02	0.20	40000	0.014	1100	40000	0.011	890	34390	0.010	680	28660	0.009	495
	≤ 10D	0.02	0.18	40000	0.012	980	40000	0.009	710	30570	0.008	480	25480	0.007	350
0.6	≤ 6D	0.03	0.26	40000	0.019	1510	40000	0.017	1360	31850	0.015	965	26540	0.013	700
	≤ 8D	0.03	0.24	40000	0.017	1360	40000	0.014	1100	28660	0.012	700	23890	0.011	510
	≤ 10D	0.02	0.22	40000	0.015	1210	40000	0.011	870	25480	0.010	495	21230	0.008	360
0.8	≤ 6D	0.04	0.35	40000	0.023	1800	39810	0.020	1610	23890	0.018	860	19900	0.016	625
	≤ 8D	0.03	0.32	40000	0.020	1620	35830	0.016	1180	21500	0.015	625	17910	0.013	455
	≤ 10D	0.03	0.29	38220	0.018	1380	31850	0.013	830	19110	0.012	440	15920	0.010	320
1	≤ 6D	0.05	0.44	38220	0.027	2060	31850	0.024	1550	19110	0.022	825	15920	0.019	600
	≤ 8D	0.04	0.40	34390	0.024	1670	28660	0.020	1130	17200	0.017	600	14330	0.015	440
	≤ 10D	0.04	0.37	30570	0.022	1320	25480	0.016	790	15290	0.014	425	12740	0.012	310
1.2	≤ 6D	0.06	0.52	22930	0.016	740	19110	0.009	330	13380	0.011	285	11150	0.009	205
	≤ 8D	0.05	0.48	22930	0.016	740	19110	0.009	330	11460	0.008	180	9550	0.007	130
	≤ 10D	0.04	0.44	22930	0.016	740	19110	0.009	330	11460	0.008	180	9550	0.007	130
1.5	≤ 6D	0.08	0.65	22930	0.032	2010	21230	0.028	1200	15920	0.025	800	13270	0.022	585
	≤ 8D	0.05	0.48	28660	0.028	1630	19110	0.023	880	14330	0.020	585	11940	0.018	425
	≤ 10D	0.04	0.44	25480	0.025	1280	16990	0.018	620	12740	0.016	410	10620	0.014	300
2	≤ 6D	0.03	0.39	22290	0.022	980	14860	0.014	410	11150	0.012	275	9290	0.011	200
	≤ 8D	0.03	0.36	19110	0.019	720	12740	0.010	260	9550	0.009	175	7960	0.008	125
	≤ 10D	0.03	0.36	19110	0.019	720	12740	0.010	260	9550	0.009	175	7960	0.008	125
2.5	≤ 6D	0.08	0.65	25480	0.041	2060	21230	0.036	1550	12740	0.032	825	10620	0.028	600
	≤ 8D	0.06	0.61	22930	0.036	1670	19110	0.030	1130	11460	0.026	600	9550	0.023	440
	≤ 10D	0.05	0.55	20380	0.032	1320	16990	0.023	790	10190	0.021	425	8490	0.018	310
2	≤ 6D	0.04	0.49	17830	0.028	1010	14860	0.018	530	8920	0.016	285	7430	0.014	205
	≤ 8D	0.03	0.44	15290	0.024	740	12740	0.013	330	7640	0.012	180	6370	0.010	130
	≤ 10D	0.03	0.44	15290	0.024	740	12740	0.013	330	7640	0.012	180	6370	0.010	130
2	≤ 6D	0.10	0.87	19110	0.054	2060	15920	0.049	1550	9550	0.043	825	7960	0.038	600
	≤ 8D	0.09	0.81	17200	0.049	1670	14330	0.039	1130	8600	0.035	600	7170	0.031	440
	≤ 10D	0.07	0.74	15290	0.043	1320	12740	0.031	790	7640	0.028	420	6370	0.024	310
2.5	≤ 6D	0.06	0.65	13380	0.038	1010	11150	0.024	530	6690	0.021	285	5570	0.019	205
	≤ 8D	0.05	0.59	11460	0.032	740	9550	0.017	330	5730	0.016	180	4780	0.014	130
	≤ 10D	0.05	0.59	11460	0.032	740	9550	0.017	330	5730	0.016	180	4780	0.014	130
2.5	≤ 6D	0.13	1.09	15290	0.054	1650	12740	0.049	1240	7640	0.043	660	6370	0.038	480
	≤ 8D	0.11	1.01	13760	0.049	1340	11460	0.039	900	6880	0.035	480	5730	0.031	350
	≤ 10D	0.09	0.92	12230	0.043	1060	10190	0.031	630	6110	0.028	340	5100	0.024	245
2.5	≤ 12D	0.07	0.82	10700	0.038	810	8920	0.024	420	5350	0.021	225	4460	0.019	165
	> 12D	0.06	0.74	9170	0.032	590	7640	0.017	270	4590	0.016	145	3820	0.014	105




	α	n (rpm)	Vf (mm/min)
45°	x 1.65	x 1.65	x 1.65
30°	x 1.30	x 1.30	x 1.30
15°	x 1.15	x 1.15	x 1.15

- INFO
- TYPHOON TA-HTA-4HTA
- TYPHOON PU-HPU
- TYPHOON SUH
- TYPHOON ALH
- TYPHOON HRC
- TYPHOON SUH MINI
- TYPHOON HL
- C-SD-TA
- LFTA
- SUTA
- HSS-HSS/CO DRILLS
- G2
- MDTA
- HF VH/UP
- MEF
- ALU
- MEX
- UH
- HSS/CO-HSSP END MILLS
- CARBIDE BURRS

MEXLNB2

 ROUND RIB	Material Group ISO 513			P2 P3 P4 K1 K2			P4 P5 K3			P6 K4		H1 H4 H5			
	Hardness/Rm			< 1000 N/mm ²			< 35 HRC			35 - 45 HRC		45 - 55 HRC			
	ap x ae			ap x 0.2D			ap x 0.1D			ap x 0.1D		ap x 0.1D			
	Vc (m/min)			110-130			90-110			50-70		45-55			
D (mm)	l1 (mm)	ap (mm)	D (eff.) (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)
3	≤ 6D	0.15	1.31	12740	0.068	1720	10620	0.061	1290	6370	0.054	690	5310	0.047	500
	≤ 8D	0.13	1.21	11460	0.061	1390	9550	0.049	940	5730	0.044	500	4780	0.038	365
	≤ 10D	0.11	1.10	10190	0.054	1100	8490	0.039	660	5100	0.035	355	4250	0.030	255
	≤ 12D	0.08	0.98	8920	0.047	840	7430	0.030	440	4460	0.026	235	3720	0.023	170
	> 12D	0.07	0.89	7640	0.041	620	6370	0.022	280	3820	0.019	150	3180	0.017	110
4	≤ 6D	0.20	1.74	9550	0.086	1630	7960	0.077	1230	4780	0.068	655	3980	0.060	475
	≤ 8D	0.17	1.61	8600	0.077	1320	7170	0.062	890	4300	0.055	475	3580	0.048	345
	≤ 10D	0.14	1.47	7640	0.068	1050	6370	0.049	630	3820	0.044	335	3180	0.038	245
	≤ 12D	0.11	1.31	6690	0.060	800	5570	0.038	420	3340	0.034	225	2790	0.029	165
	> 12D	0.09	1.19	5730	0.051	590	4780	0.028	260	2870	0.025	140	2390	0.022	105

	α	n (rpm)	Vf (mm/min)
45°	x 1.65	x 1.65	x 1.65
30°	x 1.30	x 1.30	x 1.30
15°	x 1.15	x 1.15	x 1.15

MEXLNB206

D (mm)	Material Group ISO 513			P2 P3 P4 K1 K2			P4 P5 K3			P6 K4			H1 H4 H5		
	Hardness/Rm			< 1000 N/mm ²			< 35 HRC			35 - 45 HRC			45 - 55 HRC		
	ap x ae			ap x 0.2D			ap x 0.1D			ap x 0.1D			ap x 0.1D		
	Vc (m/min)			110-130			90-110			50-70			45-55		
l1 (mm)	ap (mm)	D (eff.) (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	
0.5	≤ 6D	0.03	0.22	40000	0.015	1220	40000	0.014	1100	38220	0.012	935	31850	0.011	680
	≤ 10D	0.02	0.22	40000	0.015	1210	40000	0.011	870	25480	0.010	495	21230	0.008	360
0.8	≤ 6D	0.04	0.35	40000	0.023	1800	39810	0.020	1610	23890	0.018	860	19900	0.016	625
	≤ 10D	0.03	0.29	38220	0.018	1380	31850	0.013	830	19110	0.012	440	15920	0.010	320
1	≤ 6D	0.05	0.44	38220	0.027	2060	31850	0.024	1550	19110	0.022	825	15920	0.019	600
	≤ 8D	0.04	0.40	34390	0.024	1670	28660	0.020	1130	17200	0.017	600	14330	0.015	440
1.2	≤ 12D	0.03	0.33	26750	0.019	1010	22290	0.012	530	13380	0.011	285	11150	0.009	205
	≤ 6D	0.06	0.52	31850	0.032	2010	21230	0.028	1200	15920	0.025	800	13270	0.022	585
1.5	≤ 6D	0.08	0.65	25480	0.041	2060	21230	0.036	1550	12740	0.032	825	10620	0.028	600
	≤ 8D	0.06	0.61	22930	0.036	1670	19110	0.030	1130	11460	0.026	600	9550	0.023	440
1.6	≤ 12D	0.04	0.49	17830	0.028	1010	14860	0.018	530	8920	0.016	285	7430	0.014	205
	≤ 10D	0.06	0.59	19110	0.030	1130	15920	0.021	680	9550	0.019	360	7960	0.017	265
1.8	≤ 6D	0.06	0.66	16990	0.032	1100	14150	0.023	660	8490	0.021	350	7080	0.018	255
	≤ 8D	0.10	0.87	19110	0.054	2060	15920	0.049	1550	9550	0.043	825	7960	0.038	600
2	≤ 8D	0.09	0.81	17200	0.049	1670	14330	0.039	1130	8600	0.035	600	7170	0.031	440
	≤ 10D	0.07	0.74	15290	0.043	1320	12740	0.031	790	7640	0.028	420	6370	0.024	310



	α	n (rpm)	Vf (mm/min)
	45°	x 1.65	x 1.65
	30°	x 1.30	x 1.30
	15°	x 1.15	x 1.15

MEXCSB2

	Material Group ISO 513		P2 P3 P4 K1 K2			P4 P5 K3			P6 K4			H1 H4 H5		
	Hardness/Rm		< 1000 N/mm ²			< 35 HRC			35 - 45 HRC			45 - 55 HRC		
	ap x ae		0.05D x 0.2D			0.05D x 0.1D			0.05D x 0.1D			0.05D x 0.1D		
	Vc (m/min)		120-160			80-120			60-100			50-70		
D (mm)	D (eff.) (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	
1	0.44	40000	0.009	720	31850	0.008	520	25480	0.007	370	19110	0.006	240	
1.5	0.79	29720	0.012	710	21230	0.011	460	16990	0.010	330	12740	0.008	210	
2	1.20	22290	0.012	530	15920	0.011	340	12740	0.010	240	9550	0.008	160	
2.5	1.65	17830	0.015	530	12740	0.014	340	10190	0.012	240	7640	0.011	160	
3	2.14	14860	0.018	530	10620	0.016	340	8490	0.014	240	6370	0.013	160	
4	3.20	11150	0.025	560	7960	0.023	360	6370	0.020	250	4780	0.018	170	
5	4.33	8920	0.032	570	6370	0.029	370	5100	0.026	260	3820	0.022	170	
6	5.50	7430	0.038	560	5310	0.034	360	4250	0.030	260	3180	0.027	170	
8	7.84	5570	0.048	530	3980	0.043	340	3180	0.038	240	2390	0.034	160	
10	10.00	4460	0.057	510	3180	0.051	330	2550	0.046	230	1910	0.040	150	
12	11.76	3720	0.067	500	2650	0.060	320	2120	0.054	230	1590	0.047	150	
14	12.83	3180	0.08	510	2270	0.072	330	1820	0.064	230	1360	0.056	150	
16	12.80	2790	0.095	530	1990	0.086	340	1590	0.076	240	1190	0.067	160	
18	10.80	2480	0.108	540	1770	0.097	340	1420	0.086	250	1060	0.076	160	
20	12.00	2230	0.108	480	1590	0.097	310	1270	0.086	220	960	0.076	150	



	α	n (rpm)	Vf (mm/min)
	15°	x 1.1	x 1.1

MEXCLSB2

	Material Group ISO 513		P2 P3 P4 K1 K2			P4 P5 K3			P6 K4			H1 H4 H5		
	Hardness/Rm		< 1000 N/mm ²			< 35 HRC			35 - 45 HRC			45 - 55 HRC		
	ap x ae		0.05D x 0.2D			0.05D x 0.2D			0.05D x 0.2D			0.05D x 0.2D		
	Vc (m/min)		100-140			80-120			60-80			40-60		
D (mm)	D (eff.) (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	
1	0.44	38220	0.015	1150	31850	0.014	860	22290	0.012	530	15920	0.011	330	
2	0.87	19110	0.021	810	15920	0.019	610	11150	0.017	380	7960	0.015	240	
3	1.31	12740	0.027	690	10620	0.024	520	7430	0.022	320	5310	0.019	200	
4	1.74	9550	0.037	700	7960	0.033	520	5570	0.029	330	3980	0.026	200	
5	2.18	7640	0.045	690	6370	0.041	520	4460	0.036	320	3180	0.032	200	
6	2.62	6370	0.051	650	5310	0.046	490	3720	0.041	300	2650	0.036	190	
8	3.49	4780	0.060	570	3980	0.054	430	2790	0.048	270	1990	0.042	170	
10	4.36	3820	0.068	520	3180	0.061	390	2230	0.054	240	1590	0.048	150	
12	5.23	3180	0.077	490	2650	0.069	360	1860	0.061	230	1330	0.054	140	
14	6.10	2730	0.089	490	2270	0.080	360	1590	0.071	230	1140	0.062	140	
16	6.97	2390	0.102	490	1990	0.092	370	1390	0.082	230	1000	0.071	140	
18	7.85	2120	0.115	490	1770	0.103	370	1240	0.092	230	880	0.080	140	
20	8.72	1910	0.132	500	1590	0.119	380	1110	0.106	230	800	0.092	150	



α	n (rpm)	Vf (mm/min)
30°	x 0.8	x 0.8
15°	x 0.7	x 0.7
0°	x 0.6	x 0.6



- INFO
- TYPHOON TA-HTA-4HTA
- TYPHOON PU-HPU
- TYPHOON SUH
- TYPHOON ALH
- TYPHOON HRC
- TYPHOON SUH MINI
- TYPHOON HL
- C-SD-TA
- LFTA
- SUTA
- HSS-HSS/CO DRILLS
- G2
- MDTA
- HF VH/UP
- MEF
- ALU
- MEX
- UH
- HSS/CO-HSSP END MILLS
- CARBIDE BURRS

MEX253

	Material Group ISO 513		P2 P3 P4 K1 K2			P4 P5 K3			P6 K4			H1 H4 H5		
	Hardness/Rm		< 1000 N/mm ²			< 35 HRC			35 - 45 HRC			45 - 55 HRC		
	ap x ae		0.05D x 0.2D			0.05D x 0.2D			0.05D x 0.2D			0.05D x 0.2D		
	Vc (m/min)		90-130			60-100			50-70			30-50		
D (mm)	D (eff.) (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	
1	0.44	35030	0.015	1050	25480	0.014	690	19110	0.012	460	12740	0.011	270	
2	0.87	17520	0.021	740	12740	0.019	490	9550	0.017	320	6370	0.015	190	
3	1.31	11680	0.027	640	8490	0.024	420	6370	0.022	280	4250	0.019	160	
4	1.74	8760	0.037	640	6370	0.033	420	4780	0.029	280	3180	0.026	160	
5	2.18	7010	0.045	630	5100	0.041	410	3820	0.036	280	2550	0.032	160	
6	2.62	5840	0.051	600	4250	0.046	390	3180	0.041	260	2120	0.036	150	
8	3.49	4380	0.060	520	3180	0.054	340	2390	0.048	230	1590	0.042	130	
10	4.36	3500	0.068	480	2550	0.061	310	1910	0.054	210	1270	0.048	120	
12	5.23	2920	0.077	450	2120	0.069	290	1590	0.061	190	1060	0.054	110	
14	6.10	2500	0.089	450	1820	0.080	290	1360	0.071	190	910	0.062	110	
16	6.97	2190	0.102	450	1590	0.092	290	1190	0.082	190	800	0.071	110	
18	7.85	1950	0.115	450	1420	0.103	290	1060	0.092	190	710	0.080	110	
20	8.72	1750	0.132	460	1270	0.119	300	960	0.106	200	640	0.092	120	



	α	n (rpm)	Vf (mm/min)
	30°	x 0.8	x 0.8
	15°	x 0.7	x 0.7
	0°	x 0.6	x 0.6



UH

STEEL AND HARDENED STEEL < 70 HRC

✚ Nano micrograin and UH RED TiSi base coating for high performance milling on hardened steel up to 70 HRC. High reliability and long life in dry milling operation adopting high speed or high feed strategy. The cutting geometry has been specifically designed to obtain high precision and high quality surface finishing.

🇮🇹 Nano micrograna e rivestimento UH RED a base TiSi per la fresatura di materiali temprati sino a 70 HRC. Grande affidabilità e durata nell'utilizzo di strategie di lavorazione ad alta velocità o alto avanzamento e con la possibilità di evitare l'utilizzo del refrigerante. Le geometrie di taglio specifiche garantiscono elevata precisione ed eccellente finitura della superficie lavorata.

🇩🇪 Nano-Mikrokörnung und Beschichtung UH RED auf TiSi-Basis für das Fräsen von gehärteten Materialien bis zu 70 HRC. Hohe Zuverlässigkeit und lange Standzeit auch bei Bearbeitungsverfahren mit hoher Geschwindigkeit und großem Vorschub und mit der Möglichkeit, ohne Kühlmittel zu arbeiten. Die spezifischen Schnittgeometrien gewährleisten eine hohe Präzision und eine hervorragende Endbearbeitung der bearbeiteten Fläche.

🇫🇷 Nano micrograin et revêtement UH RED à base TiSi pour le fraisage de matériaux trempés jusqu'à 70 HRC. Grande fiabilité et durée dans l'utilisation stratégique d'usinage à haute vitesse ou avancement élevé et avec la possibilité d'éviter l'utilisation de lubrifiant. Les géométries de coupe spécifiques garantissent une précision élevée et une excellente finition de la surface usinée.

🇪🇸 Nano micrograno y revestimiento UH RED a base de TiSi para el fresado de materiales templados hasta 70 HRC. Gran fiabilidad y duración en la utilización de estrategias de elaboración a alta velocidad o alto avance con la posibilidad de evitar la utilización del refrigerante. Las geometrías de corte específicas garantizan una elevada precisión y excelente acabado de la superficie trabajada.

🇷🇺 Микрозернистая наноструктура твердого сплава и покрытие UH RED на основе TiSi служат для фрезерования закалённых сталей с твёрдостью до 70 HRC. Высокая надёжность и стойкость при работе с высокой скоростью резания и подачей без использования СОЖ. Режущая геометрия специально создана для достижения высокой точности и низкой шероховатости обработанной поверхности.

INFO
TYPHOON TA-HTA-4HTA
TYPHOON PU-HPU
TYPHOON SUH
TYPHOON ALH
TYPHOON HRC
TYPHOON SUH MINI
TYPHOON HL
C-SD-TA
LFTA
SUTA
HSS-HSS/CO DRILLS
G2
MDTA
HF VH/UP
MEF
ALU
MEX
UH
HSS/CO-HSSP END MILLS
CARBIDE BURRS

CUTTING PARAMETERS

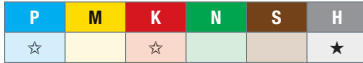
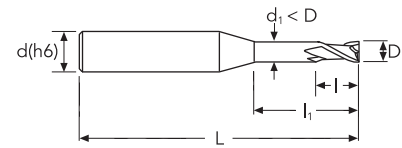
UHM204

	Material Group ISO 513	P3 P4 P5 K2 K3			P6 K4 H1 H4 H5			H2			H3			
	Hardness/Rm	< 45 HRC			45 - 55 HRC			55 - 60 HRC			60 - 65 HRC			
	ap x ae	ap x D			ap x D			ap x D			ap x D			
	Vc (m/min)	80-120			60-100			50-70			30-50			
	D (mm)	ap (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)
	0.1	0.01	40000	0.002	160	40000	0.002	140	40000	0.002	130	40000	0.001	110
	0.2	0.01	40000	0.003	240	40000	0.003	220	40000	0.002	190	40000	0.002	170
	0.3	0.02	40000	0.004	320	40000	0.004	290	40000	0.003	255	40000	0.003	225
	0.4	0.02	40000	0.006	480	40000	0.005	430	40000	0.005	385	31850	0.004	270
	0.5	0.03	40000	0.007	560	40000	0.006	500	38220	0.006	430	25480	0.005	250
0.6	0.03	40000	0.008	640	40000	0.007	580	31850	0.006	410	21230	0.006	240	
0.8	0.04	39810	0.010	800	31850	0.009	570	23890	0.008	380	15920	0.007	225	
0.9	0.05	35390	0.012	850	28310	0.011	610	21230	0.010	410	14150	0.008	240	

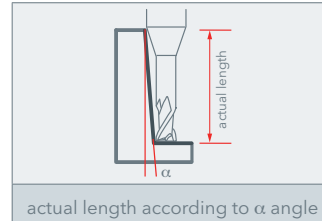
- INFO
- TYPHOON TA-HTA-4HTA
- TYPHOON PU-HPU
- TYPHOON SUH
- TYPHOON ALH
- TYPHOON HRC
- TYPHOON SUH MINI
- TYPHOON HL
- C-SD-TA
- LFTA
- SUTA
- HSS-HSS/CO DRILLS
- G2
- MDTA
- HF VH/UP
- MEF
- ALU
- MEX
- UH
- HSS/CO-HSSP END MILLS
- CARBIDE BURRS

UHLN2

cylindrical shank, 2F, extended and reduced neck



★ 1st choice ☆ suitable

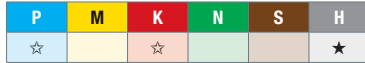
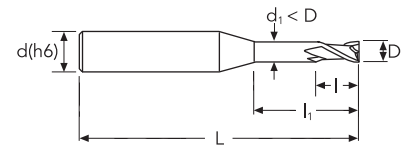


D	D Tol.	CR	CR Tol.	d(h6)	l	l1	d1	L	z	30°	1°	1°30'	2°	3°	EDP No.	Stock
0.2	0/-0.020			4	0.3	0.5	0.16	50	2	0.57	0.59	0.61	0.63	0.68	UHLN2002005	●
0.2	0/-0.020			4	0.3	1	0.16	50	2	1.09	1.12	1.16	1.21	1.30	UHLN200201	●
0.2	0/-0.020			4	0.3	1.5	0.16	50	2	1.60	1.66	1.72	1.78	1.91	UHLN2002015	●
0.3	0/-0.020			4	0.4	1	0.26	50	2	1.09	1.12	1.16	1.21	1.30	UHLN200301	●
0.3	0/-0.020			4	0.4	2	0.26	50	2	2.12	2.19	2.27	2.35	2.53	UHLN200302	●
0.3	0/-0.020			4	0.4	3	0.26	50	2	3.15	3.26	3.38	3.50	3.76	UHLN200303	●
0.4	0/-0.020			4	0.6	2	0.37	50	2	2.12	2.19	2.27	2.35	2.53	UHLN200402	●
0.4	0/-0.020			4	0.6	3	0.37	50	2	3.15	3.26	3.38	3.50	3.76	UHLN200403	●
0.4	0/-0.020			4	0.6	4	0.37	50	2	4.19	4.33	4.49	4.65	5.00	UHLN200404	●
0.4	0/-0.020			4	0.6	5	0.37	50	2	5.22	5.40	5.59	5.79	6.23	UHLN200405	●
0.5	0/-0.020			4	0.7	2	0.45	50	2	2.16	2.23	2.31	2.40	2.57	UHLN200502	●
0.5	0/-0.020			4	0.7	4	0.45	50	2	4.23	4.37	4.53	4.69	5.04	UHLN200504	●
0.5	0/-0.020			4	0.7	6	0.45	50	2	6.29	6.51	6.74	6.98	7.51	UHLN200506	●
0.5	0/-0.020			4	0.7	8	0.45	50	2	8.36	8.65	8.96	9.28	9.98	UHLN200508	●
0.6	0/-0.020			4	0.9	2	0.55	50	2	2.16	2.23	2.31	2.40	2.57	UHLN200602	●
0.6	0/-0.020			4	0.9	4	0.55	50	2	4.23	4.37	4.53	4.69	5.04	UHLN200604	●
0.6	0/-0.020			4	0.9	6	0.55	50	2	6.29	6.51	6.74	6.98	7.51	UHLN200606	●
0.6	0/-0.020			4	0.9	8	0.55	50	2	8.36	8.65	8.96	9.28	9.98	UHLN200608	●
0.6	0/-0.020			4	0.9	10	0.55	50	2	10.43	10.79	11.17	11.57	12.44	UHLN200610	●
0.7	0/-0.020			4	1.0	2	0.65	50	2	2.16	2.23	2.31	2.40	2.57	UHLN200702	●
0.7	0/-0.020			4	1.0	4	0.65	50	2	4.23	4.37	4.53	4.69	5.04	UHLN200704	●
0.7	0/-0.020			4	1.0	6	0.65	50	2	6.29	6.51	6.74	6.98	7.51	UHLN200706	●
0.7	0/-0.020			4	1.0	8	0.65	50	2	8.36	8.65	8.96	9.28	9.98	UHLN200708	●
0.7	0/-0.020			4	1.0	10	0.65	50	2	10.43	10.79	11.17	11.57	12.44	UHLN200710	●
0.8	0/-0.020			4	1.2	4	0.75	50	2	4.23	4.37	4.53	4.69	5.04	UHLN200804	●
0.8	0/-0.020			4	1.2	6	0.75	50	2	6.29	6.51	6.74	6.98	7.51	UHLN200806	●
0.8	0/-0.020			4	1.2	8	0.75	50	2	8.36	8.65	8.96	9.28	9.98	UHLN200808	●
0.8	0/-0.020			4	1.2	10	0.75	50	2	10.43	10.79	11.17	11.57	12.44	UHLN200810	●
0.8	0/-0.020			4	1.2	12	0.75	50	2	12.49	12.93	13.38	13.87	14.91	UHLN200812	●
0.9	0/-0.020			4	1.4	6	0.85	50	2	6.29	6.51	6.74	6.98	7.51	UHLN200906	●
0.9	0/-0.020			4	1.4	8	0.85	50	2	8.36	8.65	8.96	9.28	9.98	UHLN200908	●
0.9	0/-0.020			4	1.4	10	0.85	50	2	10.43	10.79	11.17	11.57	12.44	UHLN200910	●
0.9	0/-0.020			4	1.4	15	0.85	50	2	15.6	16.14	16.71	17.31	18.61	UHLN200915	●
1	0/-0.020			4	1.5	6	0.95	50	2	6.39	6.61	6.84	7.09	7.62	UHLN201006	●
1	0/-0.020			4	1.5	8	0.95	50	2	8.46	8.75	9.06	9.38	10.09	UHLN201008	●
1	0/-0.020			4	1.5	10	0.95	50	2	10.52	10.89	11.27	11.68	12.56	UHLN201010	●
1	0/-0.020			4	1.5	12	0.95	50	2	12.59	13.03	13.49	13.97	15.02	UHLN201012	●
1	0/-0.020			4	1.5	14	0.95	50	2	14.66	15.17	15.70	16.27	17.49	UHLN201014	●
1	0/-0.020			4	1.5	16	0.95	50	2	16.73	17.30	17.92	18.56	19.96	UHLN201016	●

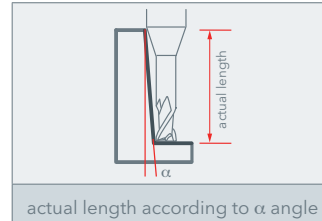
● stock standard ○ non-standard stock ▽ stock exhaustion

UHLN2

cylindrical shank, 2F, extended and reduced neck



★ 1st choice ☆ suitable

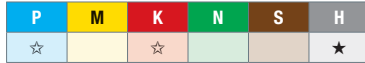
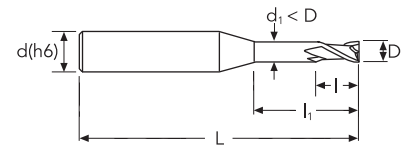


D	D Tol.	CR	CR Tol.	d(h6)	I	I1	d1	L	z	30'	1°	1°30'	2°	3°	EDP No.	Stock
1.2	0/-0.020			4	1.8	6	1.15	50	2	6.39	6.61	6.84	7.09	7.62	UHLN201206	●
1.2	0/-0.020			4	1.8	8	1.15	50	2	8.46	8.75	9.06	9.38	10.09	UHLN201208	●
1.2	0/-0.020			4	1.8	10	1.15	50	2	10.52	10.89	11.27	11.68	12.56	UHLN201210	●
1.2	0/-0.020			4	1.8	12	1.15	50	2	12.59	13.03	13.49	13.97	15.02	UHLN201212	●
1.4	0/-0.020			4	2.1	6	1.35	50	2	6.39	6.61	6.84	7.09	7.62	UHLN201406	●
1.4	0/-0.020			4	2.1	8	1.35	50	2	8.46	8.75	9.06	9.38	10.09	UHLN201408	●
1.4	0/-0.020			4	2.1	10	1.35	50	2	10.52	10.89	11.27	11.68	12.56	UHLN201410	●
1.4	0/-0.020			4	2.1	12	1.35	50	2	12.59	13.03	13.49	13.97	15.02	UHLN201412	●
1.4	0/-0.020			4	2.1	14	1.35	50	2	14.66	15.17	15.70	16.27	17.49	UHLN201414	●
1.4	0/-0.020			4	2.1	16	1.35	50	2	16.73	17.30	17.92	18.56	19.96	UHLN201416	●
1.5	0/-0.020			4	2.3	6	1.45	50	2	6.39	6.61	6.84	7.09	7.62	UHLN201506	●
1.5	0/-0.020			4	2.3	8	1.45	50	2	8.46	8.75	9.06	9.38	10.09	UHLN201508	●
1.5	0/-0.020			4	2.3	10	1.45	50	2	10.52	10.89	11.27	11.68	12.56	UHLN201510	●
1.5	0/-0.020			4	2.3	12	1.45	50	2	12.59	13.03	13.49	13.97	15.02	UHLN201512	●
1.5	0/-0.020			4	2.3	14	1.45	50	2	14.66	15.17	15.7	16.27	17.49	UHLN201514	●
1.5	0/-0.020			4	2.3	16	1.45	50	2	16.73	17.30	17.92	18.56	19.96	UHLN201516	●
1.5	0/-0.020			4	2.3	18	1.45	60	2	18.79	19.44	20.13	20.86	22.43	UHLN201518	●
1.5	0/-0.020			4	2.3	20	1.45	60	2	20.86	21.58	22.35	23.15	-	UHLN201520	●
1.6	0/-0.020			4	2.4	6	1.55	50	2	6.39	6.61	6.84	7.09	7.62	UHLN201606	●
1.6	0/-0.020			4	2.4	8	1.55	50	2	8.46	8.75	9.06	9.38	10.09	UHLN201608	●
1.6	0/-0.020			4	2.4	10	1.55	50	2	10.52	10.89	11.27	11.68	12.56	UHLN201610	●
1.6	0/-0.020			4	2.4	12	1.55	50	2	12.59	13.03	13.49	13.97	15.02	UHLN201612	●
1.6	0/-0.020			4	2.4	14	1.55	50	2	14.66	15.17	15.70	16.27	17.49	UHLN201614	●
1.6	0/-0.020			4	2.4	16	1.55	50	2	16.73	17.30	17.92	18.56	19.96	UHLN201616	●
1.6	0/-0.020			4	2.4	18	1.55	60	2	18.79	19.44	20.13	20.86	22.43	UHLN201618	●
1.6	0/-0.020			4	2.4	20	1.55	60	2	20.86	21.58	22.35	23.15	-	UHLN201620	●
1.8	0/-0.020			4	2.7	6	1.75	50	2	6.39	6.61	6.84	7.09	7.62	UHLN201806	●
1.8	0/-0.020			4	2.7	8	1.75	50	2	8.46	8.75	9.06	9.38	10.09	UHLN201808	●
1.8	0/-0.020			4	2.7	10	1.75	50	2	10.52	10.89	11.27	11.68	12.56	UHLN201810	●
1.8	0/-0.020			4	2.7	12	1.75	50	2	12.59	13.03	13.49	13.97	15.02	UHLN201812	●
1.8	0/-0.020			4	2.7	14	1.75	50	2	14.66	15.17	15.70	16.27	17.49	UHLN201814	●
1.8	0/-0.020			4	2.7	16	1.75	50	2	16.73	17.30	17.92	18.56	19.96	UHLN201816	●
1.8	0/-0.020			4	2.7	18	1.75	60	2	18.79	19.44	20.13	20.86	-	UHLN201818	●
1.8	0/-0.020			4	2.7	20	1.75	60	2	20.86	21.58	22.35	23.15	-	UHLN201820	●
2	0/-0.020			4	3	6	1.95	50	2	6.39	6.61	6.84	7.09	7.62	UHLN202006	●
2	0/-0.020			4	3	8	1.95	50	2	8.46	8.75	9.06	9.38	10.09	UHLN202008	●
2	0/-0.020			4	3	10	1.95	50	2	10.52	10.89	11.27	11.68	12.56	UHLN202010	●
2	0/-0.020			4	3	12	1.95	50	2	12.59	13.03	13.49	13.97	15.02	UHLN202012	●
2	0/-0.020			4	3	14	1.95	50	2	14.66	15.17	15.70	16.27	17.49	UHLN202014	●

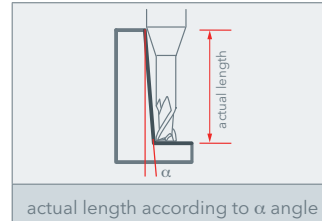
INFO
TYPHOON TA-HTA-4HTA
TYPHOON PU-HPU
TYPHOON SUH
TYPHOON ALH
TYPHOON HRC
TYPHOON SUH MINI
TYPHOON HL
C-SD-TA
LFTA
SUTA
HSS-HSS/CO DRILLS
G2
MDTA
HF VH/UP
MEF
ALU
MEX
UH
HSS/CO-HSSP END MILLS
CARBIDE BURRS

UHLN2

cylindrical shank, 2F, extended and reduced neck



★ 1st choice ☆ suitable



D	D Tol.	CR	CR Tol.	d(h6)	l	l1	d1	L	z	30'	1°	1°30'	2°	3°	EDP No.	Stock
2	0/-0.020			4	3	16	1.95	50	2	16.73	17.30	17.92	18.56	-	UHLN202016	●
2	0/-0.020			4	3	18	1.95	60	2	18.79	19.44	20.13	20.86	-	UHLN202018	●
2	0/-0.020			4	3	20	1.95	60	2	20.86	21.58	22.35	23.15	-	UHLN202020	●
2	0/-0.020			4	3	25	1.95	75	2	26.03	26.93	27.88	-	-	UHLN202025	●
2	0/-0.020			4	3	30	1.95	75	2	31.2	32.28	33.42	-	-	UHLN202030	●
2.5	0/-0.020			4	3.7	8	2.4	50	2	8.46	8.75	9.06	9.38	10.09	UHLN202508	●
2.5	0/-0.020			4	3.7	10	2.4	50	2	10.52	10.89	11.27	11.68	12.56	UHLN202510	●
2.5	0/-0.020			4	3.7	12	2.4	50	2	12.59	13.03	13.49	13.97	-	UHLN202512	●
2.5	0/-0.020			4	3.7	14	2.4	50	2	14.66	15.17	15.70	16.27	-	UHLN202514	●
2.5	0/-0.020			4	3.7	16	2.4	50	2	16.73	17.30	17.92	18.56	-	UHLN202516	●
2.5	0/-0.020			4	3.7	18	2.4	60	2	18.79	19.44	20.13	20.86	-	UHLN202518	●
2.5	0/-0.020			4	3.7	20	2.4	60	2	20.86	21.58	22.35	-	-	UHLN202520	●
2.5	0/-0.020			4	3.7	25	2.4	75	2	24.1	24.94	25.83	-	-	UHLN202525	●
2.5	0/-0.020			4	3.7	30	2.4	75	2	31.2	32.28	-	-	-	UHLN202530	●
3	0/-0.025			6	4.5	8	2.85	50	2	8.65	8.95	9.26	9.60	10.31	UHLN203008	●
3	0/-0.025			6	4.5	10	2.85	50	2	10.72	11.09	11.48	11.89	12.78	UHLN203010	●
3	0/-0.025			6	4.5	12	2.85	50	2	12.78	13.23	13.69	14.18	15.25	UHLN203012	●
3	0/-0.025			6	4.5	14	2.85	50	2	14.85	15.36	15.91	16.48	17.72	UHLN203014	●
3	0/-0.025			6	4.5	16	2.85	60	2	16.92	17.50	18.12	18.77	20.18	UHLN203016	●
3	0/-0.025			6	4.5	18	2.85	60	2	18.99	19.64	20.34	21.07	22.65	UHLN203018	●
3	0/-0.025			6	4.5	20	2.85	60	2	21.05	21.78	22.55	23.36	25.12	UHLN203020	●
3	0/-0.025			6	4.5	25	2.85	75	2	26.22	27.13	28.09	29.10	-	UHLN203025	●
4	0/-0.025			6	4.5	10	3.85	60	2	10.91	11.29	11.68	12.10	13.00	UHLN204010	●
4	0/-0.025			6	4.5	15	3.85	60	2	16.08	16.63	17.22	17.84	19.17	UHLN204015	●
4	0/-0.025			6	4.5	20	3.85	60	2	21.25	21.98	22.76	23.57	-	UHLN204020	●
4	0/-0.025			6	4.5	25	3.85	75	2	26.41	27.33	28.29	-	-	UHLN204025	●
4	0/-0.025			6	4.5	30	3.85	75	2	31.58	32.67	33.83	-	-	UHLN204030	●
4	0/-0.025			6	4.5	40	3.85	75	2	41.92	43.37	-	-	-	UHLN204040	●

● stock standard ○ non-standard stock ▽ stock exhaustion

CUTTING PARAMETERS

UHLN2

Material Group ISO 513		P3 P4 P5 K2 K3					P6 K4 H1 H4 H5					H2			H3		
Hardness/Rm		< 45 HRC					45 - 55 HRC					55 - 60 HRC			60 - 65 HRC		
ap x ae		ap x D					ap x D					ap x D			ap x D		
Vc (m/min)		80-120					60-100					50-70			30-50		
D (mm)	l1 (mm)	ap (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)			
0.2	≤ 6D	0.01	40000	0.003	240	40000	0.003	220	40000	0.002	190	40000	0.002	170			
	≤ 8D	0.01	40000	0.003	200	40000	0.002	180	40000	0.002	165	40000	0.002	145			
	≤ 10D	0.01	40000	0.002	170	40000	0.002	150	40000	0.002	135	40000	0.001	120			
	≤ 12D	0.01	40000	0.002	130	40000	0.001	120	40000	0.001	105	40000	0.001	90			
0.3	≤ 6D	0.02	40000	0.004	320	40000	0.004	290	40000	0.003	255	40000	0.003	225			
	≤ 8D	0.01	40000	0.003	270	40000	0.003	240	40000	0.003	220	38200	0.002	180			
	≤ 10D	0.01	40000	0.003	220	40000	0.003	200	40000	0.002	180	34000	0.002	135			
	≤ 12D	0.01	40000	0.002	180	40000	0.002	160	40000	0.002	140	29700	0.002	90			
0.4	≤ 6D	0.02	40000	0.006	480	40000	0.005	430	40000	0.005	385	31800	0.004	265			
	≤ 8D	0.01	40000	0.005	410	40000	0.005	370	40000	0.004	325	28700	0.004	205			
	≤ 10D	0.01	40000	0.004	340	40000	0.004	300	38200	0.003	255	25500	0.003	150			
	≤ 12D	0.01	40000	0.003	260	40000	0.003	240	33400	0.003	175	22300	0.002	105			
0.5	≤ 6D	0.03	40000	0.007	560	40000	0.006	500	38200	0.006	430	25500	0.005	250			
	≤ 8D	0.02	40000	0.006	480	40000	0.005	430	34400	0.005	325	22900	0.004	190			
	≤ 10D	0.02	40000	0.005	390	40000	0.004	350	30600	0.004	240	20400	0.003	140			
	≤ 12D	0.01	35000	0.004	270	35700	0.003	250	26800	0.003	165	17800	0.003	95			
0.6	≤ 6D	0.03	40000	0.008	640	40000	0.007	580	31800	0.006	405	21200	0.006	235			
	≤ 8D	0.03	40000	0.007	540	38200	0.006	470	28700	0.005	310	19100	0.005	180			
	≤ 10D	0.02	40000	0.006	450	34000	0.005	340	25500	0.004	230	17000	0.004	135			
	≤ 12D	0.02	37200	0.004	330	29700	0.004	240	22300	0.004	155	14900	0.003	90			
0.8	≤ 6D	0.04	39800	0.010	800	31800	0.009	570	23900	0.008	380	15900	0.007	225			
	≤ 8D	0.03	35800	0.009	610	28700	0.008	440	21500	0.007	290	14300	0.006	170			
	≤ 10D	0.03	31800	0.007	450	25500	0.006	320	19100	0.006	215	12700	0.005	125			
	≤ 12D	0.02	27900	0.006	310	22300	0.005	220	16700	0.004	145	11100	0.004	85			
1	≤ 6D	0.05	31800	0.012	760	25500	0.011	550	19100	0.010	365	12700	0.008	215			
	≤ 8D	0.04	28700	0.010	590	22900	0.009	420	17200	0.008	280	11500	0.007	165			
	≤ 10D	0.04	25500	0.008	430	20400	0.008	310	15300	0.007	205	10200	0.006	120			
	≤ 12D	0.03	22300	0.007	290	17800	0.006	210	13400	0.005	140	8900	0.005	80			
1.2	≤ 6D	0.06	26500	0.022	1170	21200	0.020	840	15900	0.018	560	10600	0.015	325			
	≤ 8D	0.05	23900	0.019	890	19120	0.017	640	14340	0.015	430	9560	0.013	250			
	≤ 10D	0.04	21200	0.015	650	16960	0.014	470	12720	0.012	315	8480	0.011	185			
	≤ 12D	0.03	18600	0.012	450	14880	0.011	320	11160	0.010	215	7440	0.008	125			
1.4	≤ 6D	0.07	22700	0.024	1090	18160	0.022	780	13620	0.019	525	9080	0.017	305			
	≤ 8D	0.06	20500	0.020	840	16400	0.018	600	12300	0.016	400	8200	0.014	235			
	≤ 10D	0.05	18200	0.017	610	14560	0.015	440	10920	0.013	295	7280	0.012	170			
	≤ 12D	0.04	15900	0.013	420	12720	0.012	300	9540	0.011	200	6360	0.009	120			
	≤ 15D	0.03	13600	0.011	290	10880	0.010	210	8160	0.009	140	5440	0.008	80			
> 15D	0.02	11400	0.007	160	9120	0.006	120	6840	0.006	80	4560	0.005	45				
1.5	≤ 6D	0.08	21200	0.025	1060	16960	0.023	760	12720	0.020	510	8480	0.018	295			
	≤ 8D	0.06	19100	0.021	810	15280	0.019	580	11460	0.017	390	7640	0.015	225			
	≤ 10D	0.05	17000	0.018	590	13600	0.016	430	10200	0.014	285	6800	0.012	165			
	≤ 12D	0.04	14900	0.014	410	11920	0.012	300	8940	0.011	195	5960	0.010	115			
	≤ 15D	0.03	12700	0.011	290	10160	0.010	210	7620	0.009	135	5080	0.008	80			
> 15D	0.02	10600	0.008	160	8480	0.007	110	6360	0.006	75	4240	0.005	45				
1.6	≤ 6D	0.08	19900	0.026	1030	15920	0.023	750	11940	0.021	495	7960	0.018	290			
	≤ 8D	0.07	17900	0.022	790	14320	0.020	570	10740	0.018	380	7160	0.015	220			
	≤ 10D	0.06	15900	0.018	580	12720	0.016	420	9540	0.015	280	6360	0.013	160			
	≤ 12D	0.04	13900	0.014	400	11120	0.013	290	8340	0.011	190	5560	0.010	110			
	≤ 15D	0.04	11900	0.012	280	9520	0.011	200	7140	0.009	135	4760	0.008	80			
> 15D	0.02	10000	0.008	160	8000	0.007	110	6000	0.006	75	4000	0.005	45				



- INFO
- TYPHOON TA-HTA-4HTA
- TYPHOON PU-HPU
- TYPHOON SUH
- TYPHOON ALH
- TYPHOON HRC
- TYPHOON SUH MINI
- TYPHOON HL
- C-SD-TA
- LFTA
- SUTA
- HSS-HSS/CO DRILLS
- G2
- MDTA
- HF VH/UP
- MEF
- ALU
- MEX
- UH
- HSS/CO-HSSP END MILLS
- CARBIDE BURRS

UHLN2

D (mm)	l1 (mm)	ap (mm)	P3 P4 P5 K2 K3					P6 K4 H1 H4 H5					H2			H3		
			Material Group ISO 513					Material Group ISO 513					Material Group ISO 513			Material Group ISO 513		
			Hardness/Rm					Hardness/Rm					Hardness/Rm			Hardness/Rm		
			ap x ae					ap x D					ap x D			ap x D		
Vc (m/min)					80-120					60-100			50-70			30-50		
n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)				
1.8	≤ 6D	0.09	17700	0.028	990	14160	0.025	710	10620	0.022	475	7080	0.020	280				
	≤ 8D	0.08	15900	0.024	760	12720	0.021	540	9540	0.019	365	6360	0.017	210				
	≤ 10D	0.06	14200	0.020	560	11360	0.018	400	8520	0.016	265	5680	0.014	155				
	≤ 12D	0.05	12400	0.015	380	9920	0.014	270	7440	0.012	185	4960	0.011	105				
	≤ 15D	0.04	10600	0.013	270	8480	0.011	190	6360	0.010	130	4240	0.009	75				
2	> 15D	0.03	8800	0.008	150	7040	0.008	110	5280	0.007	70	3520	0.006	40				
	≤ 6D	0.10	15900	0.030	950	12720	0.027	690	9540	0.024	460	6360	0.021	265				
	≤ 8D	0.09	14300	0.026	730	11440	0.023	530	8580	0.020	350	5720	0.018	205				
	≤ 10D	0.07	12700	0.021	530	10160	0.019	380	7620	0.017	255	5080	0.015	150				
	≤ 12D	0.06	11100	0.017	370	8880	0.015	260	6660	0.013	175	4440	0.012	105				
2.5	≤ 15D	0.05	9600	0.014	260	7680	0.012	190	5760	0.011	125	3840	0.009	75				
	> 15D	0.03	9600	0.009	170	7680	0.008	120	5760	0.007	85	3840	0.006	50				
	≤ 6D	0.13	12700	0.035	890	10160	0.032	640	7620	0.028	425	5080	0.025	250				
	≤ 8D	0.11	11500	0.030	680	9200	0.027	490	6900	0.024	330	4600	0.021	190				
	≤ 10D	0.09	10200	0.025	500	8160	0.022	360	6120	0.020	240	4080	0.017	140				
3	≤ 12D	0.07	8900	0.019	340	7120	0.017	250	5340	0.015	165	3560	0.013	95				
	≤ 15D	0.06	7600	0.016	240	6080	0.014	170	4560	0.013	115	3040	0.011	65				
	> 15D	0.04	7600	0.011	160	6080	0.009	110	4560	0.008	75	3040	0.007	45				
	≤ 6D	0.15	10600	0.040	850	8480	0.036	610	6360	0.032	405	4240	0.028	235				
	≤ 8D	0.13	9600	0.034	650	7680	0.031	470	5760	0.027	315	3840	0.024	185				
4	≤ 10D	0.11	8500	0.028	480	6800	0.025	340	5100	0.022	230	3400	0.020	135				
	≤ 12D	0.08	7400	0.022	330	5920	0.020	230	4440	0.018	155	2960	0.015	90				
	≤ 15D	0.07	6400	0.018	230	5120	0.016	170	3840	0.014	110	2560	0.013	65				
	> 15D	0.05	6400	0.012	150	5120	0.011	110	3840	0.010	75	2560	0.008	45				
	≤ 6D	0.20	8000	0.050	800	6400	0.045	580	4800	0.040	385	3200	0.035	225				
4	≤ 8D	0.17	7200	0.043	610	5760	0.038	440	4320	0.034	295	2880	0.030	170				
	≤ 10D	0.14	6400	0.035	450	5120	0.032	320	3840	0.028	215	2560	0.025	125				
	≤ 12D	0.11	5600	0.028	310	4480	0.025	220	3360	0.022	150	2240	0.019	85				
	≤ 15D	0.09	4800	0.023	220	3840	0.020	160	2880	0.018	105	1920	0.016	60				
	> 15D	0.06	4800	0.015	140	3840	0.014	100	2880	0.012	70	1920	0.011	40				




- INFO
- TYPHOON TA-HTA-4HTA
- TYPHOON PU-HPU
- TYPHOON SUH
- TYPHOON ALH
- TYPHOON HRC
- TYPHOON SUH MINI
- TYPHOON HL
- C-SD-TA
- LFTA
- SUTA
- HSS-HSS/CO DRILLS
- G2
- MDTA
- HF VH/UP
- MEF
- ALU
- MEX
- UH
- HSS/CO-HSSP END MILLS
- CARBIDE BURRS

UH600

	Material Group ISO 513	P3 P4 P5 K2 K3			P6 K4 H1 H4 H5			H2			H3		
	Hardness/Rm	< 45 HRC			45 - 55 HRC			55 - 60 HRC			60 - 65 HRC		
	ap x ae	1.5D x 0.1D			1.5D x 0.05D			1.5D x 0.05D			1.5D x 0.05D		
	Vc (m/min)	140-180			100-140			80-100			60-80		
D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	
3	16990	0.008	860	12740	0.008	580	9550	0.007	390	7430	0.006	260	
4	12740	0.012	920	9550	0.011	620	7170	0.010	410	5570	0.008	280	
5	10190	0.014	880	7640	0.013	590	5730	0.012	400	4460	0.010	270	
6	8490	0.018	920	6370	0.016	620	4780	0.014	410	3720	0.013	280	
8	6370	0.028	1050	4780	0.025	710	3580	0.022	470	2790	0.019	320	
10	5100	0.034	1030	3820	0.030	690	2870	0.027	460	2230	0.024	310	
12	4250	0.041	1040	3180	0.037	700	2390	0.033	470	1860	0.029	320	
14	3640	0.048	1050	2730	0.043	710	2050	0.038	470	1590	0.034	320	
16	3180	0.056	1080	2390	0.051	730	1790	0.045	480	1390	0.039	330	
18	2830	0.066	1120	2120	0.059	760	1590	0.053	500	1240	0.046	340	
20	2550	0.078	1190	1910	0.070	800	1430	0.062	540	1110	0.055	360	

- INFO
- TYPHOON TA-HTA-4HTA
- TYPHOON PU-HPU
- TYPHOON SUH
- TYPHOON ALH
- TYPHOON HRC
- TYPHOON SUH MINI
- TYPHOON HL
- C-SD-TA
- LFTA
- SUTA
- HSS-HSS/CO DRILLS
- G2
- MDTA
- HF VH/UP
- MEF
- ALU
- MEX
- UH
- HSS/CO-HSSP END MILLS
- CARBIDE BURRS

UH612

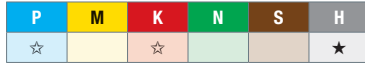
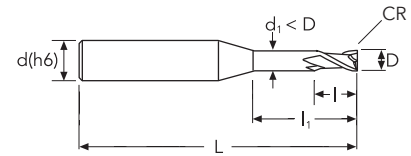
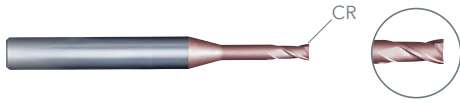
	Material Group ISO 513	P3 P4 P5 K2 K3			P6 K4 H1 H4 H5			H2			H3		
	Hardness/Rm	< 45 HRC			45 - 55 HRC			55 - 60 HRC			60 - 65 HRC		
	ap x ae	1.5D x 0.05D			1.5D x 0.05D			1.5D x 0.05D			1.5D x 0.05D		
	Vc (m/min)	90-130			70-110			50-70			20-40		
D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	
3	11680	0.007	500	9550	0.006	370	6370	0.006	220	3180	0.005	100	
4	8760	0.010	540	7170	0.009	390	4780	0.008	230	2390	0.007	100	
5	7010	0.012	510	5730	0.011	380	3820	0.010	220	1910	0.009	100	
6	5840	0.015	540	4780	0.014	390	3180	0.012	230	1590	0.011	100	
8	4380	0.023	620	3580	0.021	450	2390	0.019	270	1190	0.016	120	
10	3500	0.029	600	2870	0.026	440	1910	0.023	260	960	0.020	120	
12	2920	0.035	610	2390	0.031	450	1590	0.028	260	800	0.024	120	
14	2500	0.041	610	2050	0.037	450	1360	0.033	270	680	0.029	120	
16	2190	0.048	630	1790	0.043	460	1190	0.038	270	600	0.034	120	
18	1950	0.056	660	1590	0.050	480	1060	0.045	290	530	0.039	120	
20	1750	0.066	700	1430	0.060	510	960	0.053	310	480	0.046	130	

UHM206

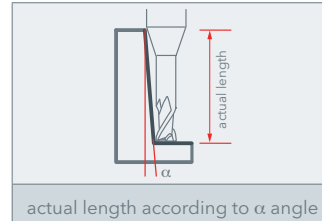
SLOTING	Material Group ISO 513		P3 P4 P5 K2 K3					P6 K4 H1 H4 H5					H2			H3		
	Hardness/Rm		< 45 HRC					45 - 55 HRC					55 - 60 HRC			60 - 65 HRC		
	ap x ae		ap x D					ap x D					ap x D			ap x D		
	Vc (m/min)		80-120					60-100					50-70			30-50		
D (mm)	ap (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)					
0.3	0.02	40000	0.004	320	40000	0.004	290	40000	0.003	255	40000	0.003	225					
0.4	0.02	40000	0.006	480	40000	0.005	430	40000	0.005	385	31850	0.004	270					
0.5	0.03	40000	0.007	560	40000	0.006	500	38220	0.006	430	25480	0.005	250					
0.6	0.03	40000	0.008	640	40000	0.007	580	31850	0.006	410	21230	0.006	240					
0.8	0.04	39810	0.010	800	31850	0.009	570	23890	0.008	380	15920	0.007	225					
1	0.05	31850	0.012	760	25480	0.011	550	19110	0.010	365	12740	0.008	215					
1.5	0.08	21230	0.025	1060	16990	0.023	760	12740	0.020	510	8490	0.018	295					
2	0.10	15920	0.030	960	12740	0.027	690	9550	0.024	460	6370	0.021	270					

UH211

cylindrical shank, 2F, extended and reduced neck, corner radius



★ 1st choice ☆ suitable



D	D Tol.	CR	CR Tol.	d(h6)	l	l1	d1	L	z	30°	1°	1°30'	2°	3°	EDP No.	Stock
1	0/-0.012	0.10	+/-0.010	4	2	4	0.95	50	2	4.36	4.60	4.86	5.16	5.89	UH2110100104	●
1	0/-0.012	0.10	+/-0.010	4	2	6	0.95	50	2	6.46	6.82	7.21	7.66	8.74	UH2110100106	●
1	0/-0.012	0.10	+/-0.010	4	2	8	0.90	50	2	8.45	8.73	9.00	9.27	9.81	UH2110100108	●
1	0/-0.012	0.20	+/-0.010	4	2	4	0.95	50	2	4.36	4.60	4.86	5.16	5.89	UH2110100204	●
1	0/-0.012	0.20	+/-0.010	4	2	8	0.95	50	2	8.57	9.04	9.56	10.15	11.18	UH2110100208	●
1	0/-0.012	0.30	+/-0.010	4	2	4	0.90	50	2	4.31	4.44	4.57	4.70	4.97	UH2110100304	●
1	0/-0.012	0.30	+/-0.010	4	2	8	0.95	50	2	8.57	9.04	9.56	10.15	11.18	UH2110100308	●
1.5	0/-0.012	0.10	+/-0.010	4	2.5	6	1.45	50	2	6.30	6.52	6.75	7.01	7.57	UH2110150106	●
1.5	0/-0.012	0.10	+/-0.010	4	2.5	10	1.45	50	2	10.43	10.8	11.19	11.61	12.55	UH2110150110	●
1.5	0/-0.012	0.20	+/-0.010	4	2.5	8	1.45	50	2	8.37	8.66	8.97	9.31	10.06	UH2110150208	●
1.5	0/-0.012	0.20	+/-0.010	4	2.5	12	1.45	50	2	12.50	12.94	13.40	13.91	15.03	UH2110150212	●
2	0/-0.012	0.10	+/-0.010	4	3	6	1.95	50	2	6.30	6.52	6.75	7.01	7.57	UH2110200106	●
2	0/-0.012	0.10	+/-0.010	4	3	12	1.95	50	2	12.50	12.94	13.40	13.91	15.03	UH2110200112	●
2	0/-0.012	0.20	+/-0.010	4	3	6	1.95	50	2	6.30	6.52	6.75	7.01	7.57	UH2110200206	●
2	0/-0.012	0.20	+/-0.010	4	3	12	1.95	50	2	12.50	12.94	13.40	13.91	15.03	UH2110200212	●
2	0/-0.012	0.30	+/-0.010	4	3	8	1.95	50	2	8.37	8.66	8.97	9.31	10.06	UH2110200308	●
2	0/-0.012	0.30	+/-0.010	4	3	12	1.95	50	2	12.50	12.94	13.40	13.91	15.03	UH2110200312	●
2	0/-0.012	0.30	+/-0.010	4	3	16	1.95	50	2	16.64	17.21	17.84	18.50	-	UH2110200316	●
2	0/-0.012	0.50	+/-0.010	4	3	6	1.95	50	2	6.30	6.52	6.75	7.01	7.57	UH2110200506	●
2	0/-0.012	0.50	+/-0.010	4	3	12	1.95	50	2	12.50	12.94	13.40	13.91	15.03	UH2110200512	●
3	0/-0.012	0.30	+/-0.010	6	4.5	10	2.80	55	2	10.71	11.04	11.38	11.72	12.40	UH2110300310	●
3	0/-0.012	0.30	+/-0.010	6	4.5	16	2.85	55	2	16.83	17.41	18.04	18.72	20.24	UH2110300316	●
3	0/-0.012	0.50	+/-0.010	6	4.5	10	2.85	55	2	10.63	11.00	11.39	11.82	12.78	UH2110300510	●
3	0/-0.012	0.50	+/-0.010	6	4.5	16	2.85	55	2	16.83	17.41	18.04	18.72	20.24	UH2110300516	●
4	0/-0.012	0.20	+/-0.010	6	6	20	3.85	60	2	20.96	21.69	22.48	23.32	-	UH2110400220	●
4	0/-0.012	0.30	+/-0.010	6	6	12	3.85	55	2	12.69	13.14	13.61	14.12	15.27	UH2110400312	●
4	0/-0.012	0.30	+/-0.010	6	6	20	3.85	60	2	20.96	21.69	22.48	23.32	-	UH2110400320	●
4	0/-0.012	0.50	+/-0.010	6	6	12	3.85	55	2	12.69	13.14	13.61	14.12	15.27	UH2110400512	●
4	0/-0.012	0.50	+/-0.010	6	6	20	3.85	60	2	20.96	21.69	22.48	23.32	-	UH2110400520	●
4	0/-0.012	1.00	+/-0.010	6	6	16	3.85	55	2	16.83	17.41	18.04	18.72	-	UH2110401016	●
6	0/-0.015	0.50	+/-0.015	6	9	15	5.85	60	2	-	-	-	-	-	UH2110600520	●
6	0/-0.015	1.00	+/-0.015	6	9	15	5.85	60	2	-	-	-	-	-	UH2110601020	●
6	0/-0.015	2.00	+/-0.015	6	9	15	5.85	60	2	-	-	-	-	-	UH2110602020	●

INFO
TYPHOON TA-HTA-4HTA
TYPHOON PU-HPU
TYPHOON SUH
TYPHOON ALH
TYPHOON HRC
TYPHOON SUH MINI
TYPHOON HL
C-SD-TA
LFTA
SUTA
HSS-HSS/CO DRILLS
G2
MDTA
HF VH/UP
MEF
ALU
MEX
UH
HSS/CO-HSSP END MILLS
CARBIDE BURRS

UH211

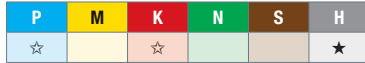
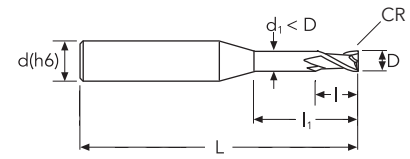
	Material Group ISO 513			P3 P4 P5 K2 K3					P6 K4 H1 H4 H5					H2			H3		
	Hardness/Rm			< 45 HRC					45 - 55 HRC					55 - 60 HRC			60 - 65 HRC		
	ap x ae			ap x D					ap x D					ap x D			ap x D		
	Vc (m/min)			80-120					60-100					50-70			30-50		
D (mm)	l1 (mm)	ap (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)					
1	≤ 6D	0.05	30000	0.012	720	24000	0.011	520	18000	0.010	345	12000	0.008	200					
	≤ 8D	0.04	28700	0.010	590	22960	0.009	420	17220	0.008	280	11480	0.007	165					
	≤ 10D	0.04	25500	0.008	430	20400	0.008	310	15300	0.007	205	10200	0.006	120					
	≤ 12D	0.03	22300	0.007	290	17840	0.006	210	13380	0.005	140	8920	0.005	80					
1.5	≤ 6D	0.08	21200	0.025	1060	16960	0.023	760	12720	0.020	510	8480	0.018	295					
	≤ 8D	0.06	19100	0.021	810	15280	0.019	580	11460	0.017	390	7640	0.015	225					
	≤ 10D	0.05	17000	0.018	590	13600	0.016	430	10200	0.014	285	6800	0.012	165					
	≤ 12D	0.04	14900	0.014	410	11920	0.012	300	8940	0.011	195	5960	0.010	115					
2	≤ 15D	0.03	12700	0.011	290	10160	0.010	210	7620	0.009	135	5080	0.008	80					
	> 15D	0.02	10600	0.008	160	8480	0.007	110	6360	0.006	75	4240	0.005	45					
	≤ 6D	0.10	15900	0.030	950	12720	0.027	690	9540	0.024	460	6360	0.021	265					
	≤ 8D	0.09	14300	0.026	730	11440	0.023	530	8580	0.020	350	5720	0.018	205					
2.5	≤ 10D	0.07	12700	0.021	530	10160	0.019	380	7620	0.017	255	5080	0.015	150					
	≤ 12D	0.06	11100	0.017	370	8880	0.015	260	6660	0.013	175	4440	0.012	105					
	≤ 15D	0.05	9600	0.014	260	7680	0.012	190	5760	0.011	125	3840	0.009	75					
	> 15D	0.03	9600	0.009	170	7680	0.008	120	5760	0.007	85	3840	0.006	50					
3	≤ 6D	0.13	12700	0.035	890	10160	0.032	640	7620	0.028	425	5080	0.025	250					
	≤ 8D	0.11	11500	0.030	680	9200	0.027	490	6900	0.024	330	4600	0.021	190					
	≤ 10D	0.09	10200	0.025	500	8160	0.022	360	6120	0.020	240	4080	0.017	140					
	≤ 12D	0.07	8900	0.019	340	7120	0.017	250	5340	0.015	165	3560	0.013	95					
4	≤ 15D	0.06	7600	0.016	240	6080	0.014	170	4560	0.013	115	3040	0.011	65					
	> 15D	0.04	7600	0.011	160	6080	0.009	110	4560	0.008	75	3040	0.007	45					
	≤ 6D	0.15	10600	0.040	850	8480	0.036	610	6360	0.032	405	4240	0.028	235					
	≤ 8D	0.13	9600	0.034	650	7680	0.031	470	5760	0.027	315	3840	0.024	185					
5	≤ 10D	0.11	8500	0.028	480	6800	0.025	340	5100	0.022	230	3400	0.020	135					
	≤ 12D	0.08	7400	0.022	330	5920	0.020	230	4440	0.018	155	2960	0.015	90					
	≤ 15D	0.07	6400	0.018	230	5120	0.016	170	3840	0.014	110	2560	0.013	65					
	> 15D	0.05	6400	0.012	150	5120	0.011	110	3840	0.010	75	2560	0.008	45					
6	≤ 6D	0.20	8000	0.050	800	6400	0.045	580	4800	0.040	385	3200	0.035	225					
	≤ 8D	0.17	7200	0.043	610	5760	0.038	440	4320	0.034	295	2880	0.030	170					
	≤ 10D	0.14	6400	0.035	450	5120	0.032	320	3840	0.028	215	2560	0.025	125					
	≤ 12D	0.11	5600	0.028	310	4480	0.025	220	3360	0.022	150	2240	0.019	85					
7	≤ 15D	0.09	4800	0.023	220	3840	0.020	160	2880	0.018	105	1920	0.016	60					
	> 15D	0.06	4800	0.015	140	3840	0.014	100	2880	0.012	70	1920	0.011	40					
	≤ 6D	0.30	5300	0.070	740	4240	0.063	530	3180	0.056	355	2120	0.049	210					
	≤ 8D	0.26	4800	0.060	570	3840	0.054	410	2880	0.048	275	1920	0.042	160					
8	≤ 10D	0.21	4200	0.049	410	3360	0.044	300	2520	0.039	200	1680	0.034	115					
	≤ 12D	0.17	3700	0.039	280	2960	0.035	210	2220	0.031	135	1480	0.027	80					
	> 12D	0.14	3200	0.032	200	2560	0.028	150	1920	0.025	95	1280	0.022	55					



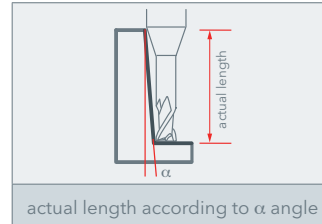
- INFO
- TYPHOON TA-HTA-4HTA
- TYPHOON PU-HPU
- TYPHOON SUH
- TYPHOON ALH
- TYPHOON HRC
- TYPHOON SUH MINI
- TYPHOON HL
- C-SD-TA
- LFTA
- SUTA
- HSS-HSS/CO DRILLS
- G2
- MDTA
- HF VH/UP
- MEF
- ALU
- MEX
- UH
- HSS/CO-HSSP END MILLS
- CARBIDE BURRS

UH212

cylindrical shank, 2F, extended and reduced neck, corner radius



★ 1st choice ☆ suitable

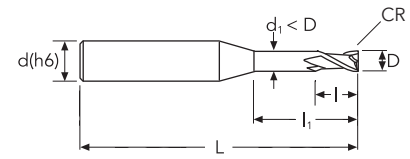


D	D Tol.	CR	CR Tol.	d(h6)	l	l1	d1	L	z	30'	1°	1°30'	2°	3°	EDP No.	Stock
0.2	0/-0.020	0.02	+/-0.010	4	0.3	0.5	0.16	50	2	0.57	0.59	0.6	0.62	0.66	UH21200202005	●
0.2	0/-0.020	0.02	+/-0.010	4	0.3	1	0.16	50	2	1.09	1.12	1.16	1.19	1.26	UH2120020201	●
0.2	0/-0.020	0.02	+/-0.010	4	0.3	1.5	0.16	50	2	1.60	1.65	1.71	1.76	1.86	UH21200202015	●
0.3	0/-0.020	0.03	+/-0.010	4	0.4	1	0.26	50	2	1.09	1.12	1.15	1.19	1.26	UH21200300301	●
0.3	0/-0.020	0.03	+/-0.010	4	0.4	2	0.26	50	2	2.12	2.19	2.26	2.32	2.46	UH21200300302	●
0.3	0/-0.020	0.03	+/-0.010	4	0.4	3	0.26	50	2	3.15	3.25	3.36	3.46	3.66	UH21200300303	●
0.4	0/-0.020	0.03	+/-0.010	4	0.6	2	0.37	50	2	2.12	2.19	2.26	2.32	2.46	UH21200400302	●
0.4	0/-0.020	0.03	+/-0.010	4	0.6	3	0.37	50	2	3.15	3.25	3.36	3.46	3.66	UH21200400303	●
0.4	0/-0.020	0.03	+/-0.010	4	0.6	4	0.37	50	2	4.19	4.32	4.46	4.59	4.86	UH21200400304	●
0.4	0/-0.020	0.03	+/-0.010	4	0.6	5	0.37	50	2	5.22	5.39	5.56	5.73	6.07	UH21200400305	●
0.5	0/-0.020	0.05	+/-0.010	4	0.7	2	0.45	50	2	2.16	2.23	2.29	2.36	2.50	UH21200500502	●
0.5	0/-0.020	0.05	+/-0.010	4	0.7	4	0.45	50	2	4.22	4.36	4.50	4.63	4.90	UH21200500504	●
0.5	0/-0.020	0.05	+/-0.010	4	0.7	6	0.45	50	2	6.29	6.49	6.70	6.90	7.31	UH21200500506	●
0.5	0/-0.020	0.05	+/-0.010	4	0.7	8	0.45	50	2	8.36	8.63	8.90	9.17	9.71	UH21200500508	●
0.6	0/-0.020	0.05	+/-0.010	4	0.9	2	0.55	50	2	2.16	2.23	2.29	2.36	2.50	UH21200600502	●
0.6	0/-0.020	0.05	+/-0.010	4	0.9	4	0.55	50	2	4.22	4.36	4.50	4.63	4.90	UH21200600504	●
0.6	0/-0.020	0.05	+/-0.010	4	0.9	6	0.55	50	2	6.29	6.49	6.70	6.90	7.31	UH21200600506	●
0.6	0/-0.020	0.05	+/-0.010	4	0.9	8	0.55	50	2	8.36	8.63	8.90	9.17	9.71	UH21200600508	●
0.6	0/-0.020	0.05	+/-0.010	4	0.9	10	0.55	50	2	10.43	10.76	11.10	11.44	12.12	UH21200600510	●
0.7	0/-0.020	0.08	+/-0.010	4	1.0	2	0.65	50	2	2.16	2.22	2.29	2.36	2.49	UH21200700802	●
0.7	0/-0.020	0.08	+/-0.010	4	1.0	4	0.65	50	2	4.22	4.36	4.49	4.63	4.90	UH21200700804	●
0.7	0/-0.020	0.08	+/-0.010	4	1.0	6	0.65	50	2	6.29	6.49	6.69	6.90	7.30	UH21200700806	●
0.7	0/-0.020	0.08	+/-0.010	4	1.0	8	0.65	50	2	8.36	8.63	8.90	9.17	9.71	UH21200700808	●
0.7	0/-0.020	0.08	+/-0.010	4	1.0	10	0.65	50	2	10.42	10.76	11.10	11.44	12.11	UH21200700810	●
0.8	0/-0.020	0.08	+/-0.010	4	1.2	4	0.75	50	2	4.22	4.36	4.49	4.63	4.90	UH21200800804	●
0.8	0/-0.020	0.08	+/-0.010	4	1.2	6	0.75	50	2	6.29	6.49	6.69	6.90	7.30	UH21200800806	●
0.8	0/-0.020	0.08	+/-0.010	4	1.2	8	0.75	50	2	8.36	8.63	8.90	9.17	9.71	UH21200800808	●
0.8	0/-0.020	0.08	+/-0.010	4	1.2	10	0.75	50	2	10.42	10.76	11.10	11.44	12.11	UH21200800810	●
0.8	0/-0.020	0.08	+/-0.010	4	1.2	12	0.75	50	2	12.49	12.90	13.30	13.7	14.51	UH21200800812	●
0.9	0/-0.020	0.08	+/-0.010	4	1.4	6	0.85	50	2	6.29	6.49	6.69	6.90	7.30	UH21200900806	●
0.9	0/-0.020	0.08	+/-0.010	4	1.4	8	0.85	50	2	8.36	8.63	8.90	9.17	9.71	UH21200900808	●
0.9	0/-0.020	0.08	+/-0.010	4	1.4	10	0.85	50	2	10.42	10.76	11.10	11.44	12.11	UH21200900810	●
0.9	0/-0.020	0.08	+/-0.010	4	1.4	15	0.85	50	2	15.59	16.1	16.60	17.11	18.12	UH21200900815	●
1.0	0/-0.020	0.10	+/-0.010	4	1.5	6	0.95	50	2	6.39	6.59	6.80	7.00	7.41	UH2120100106	●
1.0	0/-0.020	0.10	+/-0.010	4	1.5	8	0.95	50	2	8.45	8.73	9.00	9.27	9.81	UH2120100108	●
1.0	0/-0.020	0.10	+/-0.010	4	1.5	10	0.95	50	2	10.52	10.86	11.20	11.54	12.22	UH2120100110	●
1.0	0/-0.020	0.10	+/-0.010	4	1.5	12	0.95	50	2	12.59	12.99	13.40	13.81	14.62	UH2120100112	●
1.0	0/-0.020	0.10	+/-0.010	4	1.5	14	0.95	50	2	14.66	15.13	15.60	16.08	17.03	UH2120100114	●
1.0	0/-0.020	0.10	+/-0.010	4	1.5	16	0.95	50	2	16.72	17.26	17.80	18.35	19.43	UH2120100116	●

INFO
TYPHOON TA-HTA-4HTA
TYPHOON PU-HPU
TYPHOON SUH
TYPHOON ALH
TYPHOON HRC
TYPHOON SUH MINI
TYPHOON HL
C-SD-TA
LFTA
SUTA
HSS-HSS/CO DRILLS
G2
MDTA
HF VH/UP
MEF
ALU
MEX
UH
HSS/CO-HSSP END MILLS
CARBIDE BURRS

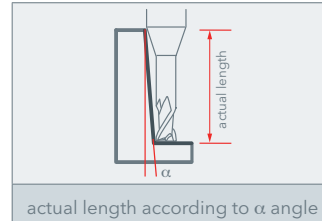
UH212

cylindrical shank, 2F, extended and reduced neck, corner radius



P	M	K	N	S	H
☆		☆			★

★ 1st choice ☆ suitable

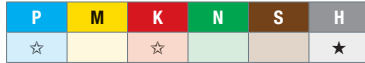
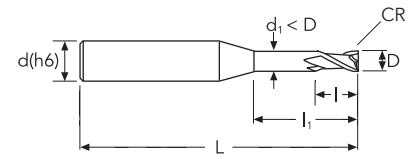


D	D Tol.	CR	CR Tol.	d(h6)	l	l1	d1	L	z	30'	1°	1°30'	2°	3°	EDP No.	Stock
1.2	0/-0.020	0.10	+/-0.010	4	1.8	6	1.15	50	2	6.39	6.59	6.80	7.00	7.41	UH2120120106	●
1.2	0/-0.020	0.10	+/-0.010	4	1.8	8	1.15	50	2	8.45	8.73	9.00	9.27	9.81	UH2120120108	●
1.2	0/-0.020	0.10	+/-0.010	4	1.8	10	1.15	50	2	10.52	10.86	11.20	11.54	12.22	UH2120120110	●
1.2	0/-0.020	0.10	+/-0.010	4	1.8	12	1.15	50	2	12.59	12.99	13.40	13.81	14.62	UH2120120112	●
1.4	0/-0.020	0.15	+/-0.010	4	2.1	6	1.35	50	2	6.38	6.59	6.79	6.99	7.40	UH21201401506	●
1.4	0/-0.020	0.15	+/-0.010	4	2.1	8	1.35	50	2	8.45	8.72	8.99	9.26	9.80	UH21201401508	●
1.4	0/-0.020	0.15	+/-0.010	4	2.1	10	1.35	50	2	10.52	10.86	11.19	11.53	12.21	UH21201401510	●
1.4	0/-0.020	0.15	+/-0.010	4	2.1	12	1.35	50	2	12.59	12.99	13.40	13.80	14.61	UH21201401512	●
1.4	0/-0.020	0.15	+/-0.010	4	2.1	14	1.35	50	2	14.65	15.13	15.60	16.07	17.02	UH21201401514	●
1.4	0/-0.020	0.15	+/-0.010	4	2.1	16	1.35	50	2	16.72	17.26	17.80	18.34	19.42	UH21201401516	●
1.5	0/-0.020	0.15	+/-0.010	4	2.3	6	1.45	50	2	6.38	6.59	6.79	6.99	7.40	UH21201501506	●
1.5	0/-0.020	0.15	+/-0.010	4	2.3	8	1.45	50	2	8.45	8.72	8.99	9.26	9.80	UH21201501508	●
1.5	0/-0.020	0.15	+/-0.010	4	2.3	10	1.45	50	2	10.52	10.86	11.19	11.53	12.21	UH21201501510	●
1.5	0/-0.020	0.15	+/-0.010	4	2.3	12	1.45	50	2	12.59	12.99	13.40	13.80	14.61	UH21201501512	●
1.5	0/-0.020	0.15	+/-0.010	4	2.3	14	1.45	50	2	14.65	15.13	15.60	16.07	17.02	UH21201501514	●
1.5	0/-0.020	0.15	+/-0.010	4	2.3	16	1.45	50	2	16.72	17.26	17.80	18.34	19.42	UH21201501516	●
1.5	0/-0.020	0.15	+/-0.010	4	2.3	18	1.45	60	2	18.79	19.39	20.00	20.61	21.82	UH21201501518	●
1.5	0/-0.020	0.15	+/-0.010	4	2.3	20	1.45	60	2	20.86	21.53	22.20	22.88	24.23	UH21201501520	●
1.6	0/-0.020	0.15	+/-0.010	4	2.4	6	1.55	50	2	6.38	6.59	6.79	6.99	7.40	UH21201601506	●
1.6	0/-0.020	0.15	+/-0.010	4	2.4	8	1.55	50	2	8.45	8.72	8.99	9.26	9.80	UH21201601508	●
1.6	0/-0.020	0.15	+/-0.010	4	2.4	10	1.55	50	2	10.52	10.86	11.19	11.53	12.21	UH21201601510	●
1.6	0/-0.020	0.15	+/-0.010	4	2.4	12	1.55	50	2	12.59	12.99	13.40	13.80	14.61	UH21201601512	●
1.6	0/-0.020	0.15	+/-0.010	4	2.4	14	1.55	50	2	14.65	15.13	15.60	16.07	17.02	UH21201601514	●
1.6	0/-0.020	0.15	+/-0.010	4	2.4	16	1.55	50	2	16.72	17.26	17.80	18.34	19.42	UH21201601516	●
1.6	0/-0.020	0.15	+/-0.010	4	2.4	18	1.55	60	2	18.79	19.39	20.00	20.61	21.82	UH21201601518	●
1.6	0/-0.020	0.15	+/-0.010	4	2.4	20	1.55	60	2	20.86	21.53	22.20	22.88	24.23	UH21201601520	●
1.8	0/-0.020	0.20	+/-0.010	4	2.7	6	1.75	50	2	6.38	6.58	6.79	6.99	7.39	UH2120180206	●
1.8	0/-0.020	0.20	+/-0.010	4	2.7	8	1.75	50	2	8.45	8.72	8.99	9.26	9.79	UH2120180208	●
1.8	0/-0.020	0.20	+/-0.010	4	2.7	10	1.75	50	2	10.52	10.85	11.19	11.52	12.20	UH2120180210	●
1.8	0/-0.020	0.20	+/-0.010	4	2.7	12	1.75	50	2	12.58	12.99	13.39	13.79	14.60	UH2120180212	●
1.8	0/-0.020	0.20	+/-0.010	4	2.7	14	1.75	50	2	14.65	15.12	15.59	16.06	17.01	UH2120180214	●
1.8	0/-0.020	0.20	+/-0.010	4	2.7	16	1.75	50	2	16.72	17.26	17.79	18.33	19.41	UH2120180216	●
1.8	0/-0.020	0.20	+/-0.010	4	2.7	18	1.75	60	2	18.79	19.39	20.00	20.6	21.81	UH2120180218	●
1.8	0/-0.020	0.20	+/-0.010	4	2.7	20	1.75	60	2	20.85	21.53	22.20	22.87	24.22	UH2120180220	●
2	0/-0.020	0.20	+/-0.010	4	3	6	1.95	50	2	6.38	6.58	6.79	6.99	7.39	UH2120200206	●
2	0/-0.020	0.20	+/-0.010	4	3	8	1.95	50	2	8.45	8.72	8.99	9.26	9.79	UH2120200208	●
2	0/-0.020	0.20	+/-0.010	4	3	10	1.95	50	2	10.52	10.85	11.19	11.52	12.20	UH2120200210	●
2	0/-0.020	0.20	+/-0.010	4	3	12	1.95	50	2	12.58	12.99	13.39	13.79	14.60	UH2120200212	●
2	0/-0.020	0.20	+/-0.010	4	3	14	1.95	50	2	14.65	15.12	15.59	16.06	17.01	UH2120200214	●

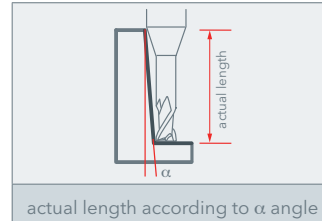
● stock standard ○ non-standard stock ▽ stock exhaustion

UH212

cylindrical shank, 2F, extended and reduced neck, corner radius



★ 1st choice ☆ suitable



D	D Tol.	CR	CR Tol.	d(h6)	l	l1	d1	L	z	30°	1°	1°30'	2°	3°	EDP No.	Stock
2	0/-0.020	0.20	+/-0.010	4	3	16	1.95	50	2	16.72	17.26	17.79	18.33	19.41	UH2120200216	●
2	0/-0.020	0.20	+/-0.010	4	3	18	1.95	60	2	18.79	19.39	20.00	20.60	21.81	UH2120200218	●
2	0/-0.020	0.20	+/-0.010	4	3	20	1.95	60	2	20.85	21.53	22.20	22.87	-	UH2120200220	●
2	0/-0.020	0.20	+/-0.010	4	3	25	1.95	75	2	26.02	26.86	27.70	28.54	-	UH2120200225	●
2	0/-0.020	0.20	+/-0.010	4	3	30	1.95	75	2	31.19	32.20	33.21	-	-	UH2120200230	●
2.5	0/-0.020	0.30	+/-0.010	4	3.7	8	2.40	50	2	8.45	8.71	8.98	9.24	9.77	UH2120250308	●
2.5	0/-0.020	0.30	+/-0.010	4	3.7	10	2.40	50	2	10.51	10.85	11.18	11.51	12.18	UH2120250310	●
2.5	0/-0.020	0.30	+/-0.010	4	3.7	12	2.40	50	2	12.58	12.98	13.38	13.78	14.58	UH2120250312	●
2.5	0/-0.020	0.30	+/-0.010	4	3.7	14	2.40	50	2	14.65	15.12	15.58	16.05	-	UH2120250314	●
2.5	0/-0.020	0.30	+/-0.010	4	3.7	16	2.40	50	2	16.72	17.25	17.78	18.32	-	UH2120250316	●
2.5	0/-0.020	0.30	+/-0.010	4	3.7	18	2.40	60	2	18.78	19.38	19.99	20.59	-	UH2120250318	●
2.5	0/-0.020	0.30	+/-0.010	4	3.7	20	2.40	60	2	20.85	21.52	22.19	22.86	-	UH2120250320	●
2.5	0/-0.020	0.30	+/-0.010	4	3.7	25	2.40	60	2	26.02	26.86	27.69	-	-	UH2120250325	●
2.5	0/-0.020	0.30	+/-0.010	4	3.7	30	2.40	75	2	31.19	32.19	-	-	-	UH2120250330	●
3	0/-0.025	0.30	+/-0.010	6	4.5	8	2.85	50	2	8.64	8.91	9.18	9.45	10.00	UH2120300308	●
3	0/-0.025	0.30	+/-0.010	6	4.5	10	2.85	50	2	10.71	11.04	11.38	11.72	12.40	UH2120300310	●
3	0/-0.025	0.30	+/-0.010	6	4.5	12	2.85	50	2	12.77	13.18	13.59	13.99	14.80	UH2120300312	●
3	0/-0.025	0.30	+/-0.010	6	4.5	14	2.85	50	2	14.84	15.31	15.79	16.26	17.21	UH2120300314	●
3	0/-0.025	0.30	+/-0.010	6	4.5	16	2.85	60	2	16.91	17.45	17.99	18.53	19.61	UH2120300316	●
3	0/-0.025	0.30	+/-0.010	6	4.5	18	2.85	60	2	18.98	19.58	20.19	20.80	22.02	UH2120300318	●
3	0/-0.025	0.30	+/-0.010	6	4.5	20	2.85	60	2	21.04	21.72	22.39	23.07	24.42	UH2120300320	●
3	0/-0.025	0.30	+/-0.010	6	4.5	25	2.85	75	2	26.21	27.05	27.90	28.74	30.43	UH2120300325	●
4	0/-0.025	0.40	+/-0.010	6	4.5	10	3.85	60	2	10.90	11.24	11.58	11.92	12.60	UH2120400410	●
4	0/-0.025	0.40	+/-0.010	6	4.5	15	3.85	60	2	16.06	16.57	17.08	17.59	18.61	UH2120400415	●
4	0/-0.025	0.40	+/-0.010	6	4.5	20	3.85	60	2	21.23	21.91	22.59	23.27	-	UH2120400420	●
4	0/-0.025	0.40	+/-0.010	6	4.5	25	3.85	75	2	26.40	27.25	28.09	28.94	-	UH2120400425	●
4	0/-0.025	0.40	+/-0.010	6	4.5	30	3.85	75	2	31.57	32.58	33.60	-	-	UH2120400430	●
4	0/-0.025	0.40	+/-0.010	6	4.5	40	3.85	75	2	41.90	43.25	-	-	-	UH2120400440	●

- INFO
- TYPHOON TA-HTA-4HTA
- TYPHOON PU-HPU
- TYPHOON SUH
- TYPHOON ALH
- TYPHOON HRC
- TYPHOON SUH MINI
- TYPHOON HL
- C-SD-TA
- LFTA
- SUTA
- HSS-HSS/CO DRILLS
- G2
- MDTA
- HF VH/UP
- MEF
- ALU
- MEX
- UH
- HSS/CO-HSSP END MILLS
- CARBIDE BURRS

● stock standard ○ non-standard stock ▽ stock exhaustion

CUTTING PARAMETERS

UH212

Material Group ISO 513		P3 P4 P5 K2 K3					P6 K4 H1 H4 H5					H2			H3		
Hardness/Rm		< 45 HRC					45 - 55 HRC					55 - 60 HRC			60 - 65 HRC		
ap x ae		ap x D					ap x D					ap x D			ap x D		
Vc (m/min)		80-120					60-100					50-70			30-50		
D (mm)	l1 (mm)	ap (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)			
0.2	≤ 6D	0.01	40000	0.003	240	40000	0.003	220	40000	0.002	190	40000	0.002	170			
	≤ 8D	0.01	40000	0.003	200	40000	0.002	180	40000	0.002	165	40000	0.002	145			
	≤ 10D	0.01	40000	0.002	170	40000	0.002	150	40000	0.002	135	40000	0.001	120			
	≤ 12D	0.01	40000	0.002	130	40000	0.001	120	40000	0.001	105	40000	0.001	90			
0.3	≤ 6D	0.02	40000	0.004	320	40000	0.004	290	40000	0.003	255	40000	0.003	225			
	≤ 8D	0.01	40000	0.003	270	40000	0.003	240	40000	0.003	220	38200	0.002	180			
	≤ 10D	0.01	40000	0.003	220	40000	0.003	200	40000	0.002	180	34000	0.002	135			
	≤ 12D	0.01	40000	0.002	180	40000	0.002	160	40000	0.002	140	29700	0.002	90			
0.4	≤ 6D	0.02	40000	0.006	480	40000	0.005	430	40000	0.005	385	31800	0.004	265			
	≤ 8D	0.01	40000	0.005	410	40000	0.005	370	40000	0.004	325	28700	0.004	205			
	≤ 10D	0.01	40000	0.004	340	40000	0.004	300	38200	0.003	255	25500	0.003	150			
	≤ 12D	0.01	40000	0.003	260	40000	0.003	240	33400	0.003	175	22300	0.002	105			
0.5	≤ 6D	0.03	40000	0.007	560	40000	0.006	500	38200	0.006	430	25500	0.005	250			
	≤ 8D	0.02	40000	0.006	480	40000	0.005	430	34400	0.005	325	22900	0.004	190			
	≤ 10D	0.02	40000	0.005	390	40000	0.004	350	30600	0.004	240	20400	0.003	140			
	≤ 12D	0.01	35000	0.004	270	35700	0.003	250	26800	0.003	165	17800	0.003	95			
0.6	≤ 6D	0.03	40000	0.008	640	40000	0.007	580	31800	0.006	405	21200	0.006	235			
	≤ 8D	0.03	40000	0.007	540	38200	0.006	470	28700	0.005	310	19100	0.005	180			
	≤ 10D	0.02	40000	0.006	450	34000	0.005	340	25500	0.004	230	17000	0.004	135			
	≤ 12D	0.02	37200	0.004	330	29700	0.004	240	22300	0.004	155	14900	0.003	90			
0.8	≤ 6D	0.04	39800	0.010	800	31840	0.009	570	23880	0.008	380	15920	0.007	225			
	≤ 8D	0.03	35800	0.009	610	28640	0.008	440	21480	0.007	290	14320	0.006	170			
	≤ 10D	0.03	31800	0.007	450	25440	0.006	320	19080	0.006	215	12720	0.005	125			
	≤ 12D	0.02	27900	0.006	310	22320	0.005	220	16740	0.004	145	11160	0.004	85			
1	≤ 6D	0.05	31800	0.012	760	25440	0.011	550	19080	0.010	365	12720	0.008	215			
	≤ 8D	0.04	28700	0.010	590	22960	0.009	420	17220	0.008	280	11480	0.007	165			
	≤ 10D	0.04	25500	0.008	430	20400	0.008	310	15300	0.007	205	10200	0.006	120			
	≤ 12D	0.03	22300	0.007	290	17840	0.006	210	13380	0.005	140	8920	0.005	80			
1.2	≤ 6D	0.06	26500	0.022	1170	21200	0.020	840	15900	0.018	560	10600	0.015	325			
	≤ 8D	0.05	23900	0.019	890	19120	0.017	640	14340	0.015	430	9560	0.013	250			
	≤ 10D	0.04	21200	0.015	650	16960	0.014	470	12720	0.012	315	8480	0.011	185			
	≤ 12D	0.03	18600	0.012	450	14880	0.011	320	11160	0.010	215	7440	0.008	125			
1.4	≤ 6D	0.07	22700	0.024	1090	18160	0.022	780	13620	0.019	525	9080	0.017	305			
	≤ 8D	0.06	20500	0.020	840	16400	0.018	600	12300	0.016	400	8200	0.014	235			
	≤ 10D	0.05	18200	0.017	610	14560	0.015	440	10920	0.013	295	7280	0.012	170			
	≤ 12D	0.04	15900	0.013	420	12720	0.012	300	9540	0.011	200	6360	0.009	120			
	≤ 15D	0.03	13600	0.011	290	10880	0.010	210	8160	0.009	140	5440	0.008	80			
	> 15D	0.02	11400	0.007	160	9120	0.006	120	6840	0.006	80	4560	0.005	45			
1.5	≤ 6D	0.08	21200	0.025	1060	16960	0.023	760	12720	0.020	510	8480	0.018	295			
	≤ 8D	0.06	19100	0.021	810	15280	0.019	580	11460	0.017	390	7640	0.015	225			
	≤ 10D	0.05	17000	0.018	590	13600	0.016	430	10200	0.014	285	6800	0.012	165			
	≤ 12D	0.04	14900	0.014	410	11920	0.012	300	8940	0.011	195	5960	0.010	115			
	≤ 15D	0.03	12700	0.011	290	10160	0.010	210	7620	0.009	135	5080	0.008	80			
	> 15D	0.02	10600	0.008	160	8480	0.007	110	6360	0.006	75	4240	0.005	45			
1.6	≤ 6D	0.08	19900	0.026	1030	15920	0.023	750	11940	0.021	495	7960	0.018	290			
	≤ 8D	0.07	17900	0.022	790	14320	0.020	570	10740	0.018	380	7160	0.015	220			
	≤ 10D	0.06	15900	0.018	580	12720	0.016	420	9540	0.015	280	6360	0.013	160			
	≤ 12D	0.04	13900	0.014	400	11120	0.013	290	8340	0.011	190	5560	0.010	110			
	≤ 15D	0.04	11900	0.012	280	9520	0.011	200	7140	0.009	135	4760	0.008	80			
> 15D	0.02	10000	0.008	160	8000	0.007	110	6000	0.006	75	4000	0.005	45				



- INFO
- TYPHOON TA-HTA-4HTA
- TYPHOON PU-HPU
- TYPHOON SUH
- TYPHOON ALH
- TYPHOON HRC
- TYPHOON SUH MINI
- TYPHOON HL
- C-SD-TA
- LFTA
- SUTA
- HSS-HSS/CO DRILLS
- G2
- MDTA
- HF VH/UP
- MEF
- ALU
- MEX
- UH
- HSS/CO-HSSP END MILLS
- CARBIDE BURRS


UH212

Material Group ISO 513		P3 P4 P5 K2 K3					P6 K4 H1 H4 H5					H2			H3		
Hardness/Rm		< 45 HRC					45 - 55 HRC					55 - 60 HRC			60 - 65 HRC		
ap x ae		ap x D					ap x D					ap x D			ap x D		
Vc (m/min)		80-120					60-100					50-70			30-50		
D (mm)	l1 (mm)	ap (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)			
1.8	≤ 6D	0.09	17700	0.028	990	14160	0.025	710	10620	0.022	475	7080	0.020	280			
	≤ 8D	0.08	15900	0.024	760	12720	0.021	540	9540	0.019	365	6360	0.017	210			
	≤ 10D	0.06	14200	0.020	560	11360	0.018	400	8520	0.016	265	5680	0.014	155			
	≤ 12D	0.05	12400	0.015	380	9920	0.014	270	7440	0.012	185	4960	0.011	105			
	> 15D	0.04	10600	0.013	270	8480	0.011	190	6360	0.010	130	4240	0.009	75			
2	≤ 6D	0.10	15900	0.030	950	12720	0.027	690	9540	0.024	460	6360	0.021	265			
	≤ 8D	0.09	14300	0.026	730	11440	0.023	530	8580	0.020	350	5720	0.018	205			
	≤ 10D	0.07	12700	0.021	530	10160	0.019	380	7620	0.017	255	5080	0.015	150			
	≤ 12D	0.06	11100	0.017	370	8880	0.015	260	6660	0.013	175	4440	0.012	105			
	> 15D	0.05	9600	0.014	260	7680	0.012	190	5760	0.011	125	3840	0.009	75			
2.5	≤ 6D	0.13	12700	0.035	890	10160	0.032	640	7620	0.028	425	5080	0.025	250			
	≤ 8D	0.11	11500	0.030	680	9200	0.027	490	6900	0.024	330	4600	0.021	190			
	≤ 10D	0.09	10200	0.025	500	8160	0.022	360	6120	0.020	240	4080	0.017	140			
	≤ 12D	0.07	8900	0.019	340	7120	0.017	250	5340	0.015	165	3560	0.013	95			
	> 15D	0.06	7600	0.016	240	6080	0.014	170	4560	0.013	115	3040	0.011	65			
3	≤ 6D	0.15	10600	0.040	850	8480	0.036	610	6360	0.032	405	4240	0.028	235			
	≤ 8D	0.13	9600	0.034	650	7680	0.031	470	5760	0.027	315	3840	0.024	185			
	≤ 10D	0.11	8500	0.028	480	6800	0.025	340	5100	0.022	230	3400	0.020	135			
	≤ 12D	0.08	7400	0.022	330	5920	0.020	230	4440	0.018	155	2960	0.015	90			
	> 15D	0.07	6400	0.018	230	5120	0.016	170	3840	0.014	110	2560	0.013	65			
4	≤ 6D	0.20	8000	0.050	800	6400	0.045	580	4800	0.040	385	3200	0.035	225			
	≤ 8D	0.17	7200	0.043	610	5760	0.038	440	4320	0.034	295	2880	0.030	170			
	≤ 10D	0.14	6400	0.035	450	5120	0.032	320	3840	0.028	215	2560	0.025	125			
	≤ 12D	0.11	5600	0.028	310	4480	0.025	220	3360	0.022	150	2240	0.019	85			
	> 15D	0.09	4800	0.023	220	3840	0.020	160	2880	0.018	105	1920	0.016	60			
> 15D	0.06	4800	0.015	140	3840	0.014	100	2880	0.012	70	1920	0.011	40				



INFO
TYPHOON TA-HTA-4HTA
TYPHOON PU-HPU
TYPHOON SUH
TYPHOON ALH
TYPHOON HRC
TYPHOON SUH MINI
TYPHOON HL
C-SD-TA
LFTA
SUTA
HSS-HSS/CO DRILLS
G2
MDTA
HF VH/UP
MEF
ALU
MEX
UH
HSS/CO-HSSP END MILLS
CARBIDE BURRS

UHCS2

	Material Group ISO 513	P3 P4 P5 K2 K3			P6 K4 H1 H4 H5			H2			H3		
	Hardness/Rm	< 45 HRC			45 - 55 HRC			55 - 60 HRC			60 - 65 HRC		
	ap x ae	0.3D x D			0.2D x D			0.2D x D			0.1D x D		
	Vc (m/min)	80-120			60-100			50-70			30-50		
D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	
1	30000	0.007	420	25480	0.006	320	19110	0.006	215	12740	0.005	125	
2	15920	0.012	380	12740	0.011	280	9550	0.010	185	6370	0.008	105	
3	10620	0.017	360	8490	0.015	260	6370	0.014	175	4250	0.012	100	
4	7960	0.023	370	6370	0.021	260	4780	0.018	175	3180	0.016	100	
5	6370	0.030	380	5100	0.027	280	3820	0.024	185	2550	0.021	105	
6	5310	0.038	400	4250	0.034	290	3180	0.030	195	2120	0.027	115	
8	3980	0.050	400	3180	0.045	290	2390	0.040	190	1590	0.035	110	
10	3180	0.065	410	2550	0.059	300	1910	0.052	200	1270	0.046	115	
12	2650	0.080	420	2120	0.072	310	1590	0.064	205	1060	0.056	120	

INFO

TYPHOON
TA-HTA-4HTATYPHOON
PU-HPUTYPHOON
SUHTYPHOON
ALHTYPHOON
HRCTYPHOON
SUH MINITYPHOON
HL

C-SD-TA

LFTA

SUTA

HSS-HSS/CO
DRILLS

G2

MDTA

HF VH/UP

MEF

ALU

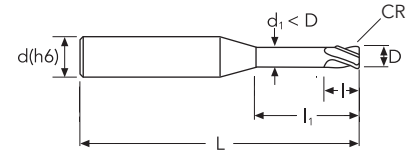
MEX

UH

HSS/CO-HSSP
END MILLSCARBIDE
BURRS

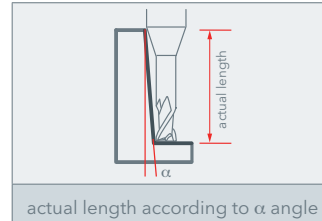
UHF4LN

cylindrical shank, 4F Unequal Pitch, extended and reduced neck, corner radius



P	M	K	N	S	H
☆		☆			★

★ 1st choice ☆ suitable

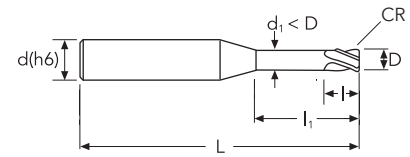


D	D Tol.	CR	CR Tol.	d(h6)	l	l1	d1	L	z	30'	1°	1°30'	2°	3°	EDP No.	Stock
1	0/-0.020	0.10	+/-0.010	4	1	4	0.90	50	4	4.32	4.46	4.62	4.78	5.13	UHF4LN0100104	●
1	0/-0.020	0.10	+/-0.010	4	1	6	0.90	50	4	6.39	6.60	6.83	7.08	7.60	UHF4LN0100106	●
1	0/-0.020	0.10	+/-0.010	4	1	8	0.90	50	4	8.45	8.74	9.05	9.37	10.07	UHF4LN0100108	●
1	0/-0.020	0.10	+/-0.010	4	1	12	0.90	50	4	12.59	13.02	13.48	13.96	15.00	UHF4LN0100112	●
1	0/-0.020	0.10	+/-0.010	4	1	14	0.90	50	4	14.66	15.16	15.69	16.25	17.47	UHF4LN0100114	●
1	0/-0.020	0.10	+/-0.010	4	1	16	0.90	50	4	16.72	17.30	17.91	18.55	19.94	UHF4LN0100116	●
1	0/-0.020	0.10	+/-0.010	4	1	20	0.90	75	4	20.86	21.57	22.33	23.14	24.87	UHF4LN0100120	●
1	0/-0.020	0.20	+/-0.010	4	1	4	0.90	50	4	4.32	4.46	4.61	4.77	5.11	UHF4LN0100204	●
1	0/-0.020	0.20	+/-0.010	4	1	6	0.90	50	4	6.38	6.60	6.82	7.06	7.57	UHF4LN0100206	●
1	0/-0.020	0.20	+/-0.010	4	1	8	0.90	50	4	8.45	8.73	9.04	9.35	10.04	UHF4LN0100208	●
1	0/-0.020	0.20	+/-0.010	4	1	10	0.90	50	4	10.52	10.87	11.25	11.65	12.51	UHF4LN0100210	●
1	0/-0.020	0.20	+/-0.010	4	1	12	0.90	50	4	12.58	13.01	13.47	13.94	14.98	UHF4LN0100212	●
1	0/-0.020	0.20	+/-0.010	4	1	14	0.90	50	4	14.65	15.15	15.68	16.24	17.45	UHF4LN0100214	●
1	0/-0.020	0.20	+/-0.010	4	1	16	0.90	50	4	16.72	17.29	17.89	18.53	19.91	UHF4LN0100216	●
1	0/-0.020	0.20	+/-0.010	4	1	20	0.90	60	4	20.85	21.57	22.32	23.12	24.85	UHF4LN0100220	●
1	0/-0.020	0.30	+/-0.010	4	1	6	0.90	50	4	6.38	6.59	6.81	7.05	7.55	UHF4LN0100306	●
1	0/-0.020	0.30	+/-0.010	4	1	10	0.90	50	4	10.51	10.87	11.24	11.63	12.49	UHF4LN0100310	●
1	0/-0.020	0.30	+/-0.010	4	1	16	0.90	50	4	16.72	17.28	17.88	18.52	19.89	UHF4LN0100316	●
1	0/-0.020	0.30	+/-0.010	4	1	20	0.90	60	4	20.85	21.56	22.31	23.11	24.82	UHF4LN0100320	●
1.5	0/-0.020	0.10	+/-0.010	4	1.5	6	1.40	50	4	6.39	6.60	6.83	7.08	7.60	UHF4LN0150106	●
1.5	0/-0.020	0.10	+/-0.010	4	1.5	8	1.40	50	4	8.45	8.74	9.05	9.37	10.07	UHF4LN0150108	●
1.5	0/-0.020	0.10	+/-0.010	4	1.5	12	1.40	50	4	12.59	13.02	13.48	13.96	15.00	UHF4LN0150112	●
1.5	0/-0.020	0.10	+/-0.010	4	1.5	16	1.40	50	4	16.72	17.3	17.91	18.55	19.94	UHF4LN0150116	●
1.5	0/-0.020	0.10	+/-0.010	4	1.5	20	1.40	60	4	20.86	21.57	22.33	23.14	-	UHF4LN0150120	●
1.5	0/-0.020	0.20	+/-0.010	4	1.5	6	1.40	50	4	6.38	6.60	6.82	7.06	7.57	UHF4LN0150206	●
1.5	0/-0.020	0.20	+/-0.010	4	1.5	8	1.40	50	4	8.45	8.73	9.04	9.35	10.04	UHF4LN0150208	●
1.5	0/-0.020	0.20	+/-0.010	4	1.5	10	1.40	50	4	10.52	10.87	11.25	11.65	12.51	UHF4LN0150210	●
1.5	0/-0.020	0.20	+/-0.010	4	1.5	12	1.40	50	4	12.58	13.01	13.47	13.94	14.98	UHF4LN0150212	●
1.5	0/-0.020	0.20	+/-0.010	4	1.5	14	1.40	50	4	14.65	15.15	15.68	16.24	17.45	UHF4LN0150214	●
1.5	0/-0.020	0.20	+/-0.010	4	1.5	16	1.40	50	4	16.72	17.29	17.89	18.53	19.91	UHF4LN0150216	●
1.5	0/-0.020	0.20	+/-0.010	4	1.5	18	1.40	60	4	18.79	19.43	20.11	20.83	22.38	UHF4LN0150218	●
1.5	0/-0.020	0.20	+/-0.010	4	1.5	20	1.40	60	4	20.85	21.57	22.32	23.12	-	UHF4LN0150220	●
1.5	0/-0.020	0.30	+/-0.010	4	1.5	8	1.40	50	4	8.45	8.73	9.03	9.34	10.02	UHF4LN0150308	●
1.5	0/-0.020	0.30	+/-0.010	4	1.5	16	1.40	50	4	16.72	17.28	17.88	18.52	19.89	UHF4LN0150316	●
1.5	0/-0.020	0.30	+/-0.010	4	1.5	20	1.40	60	4	20.85	21.56	22.31	23.11	-	UHF4LN0150320	●
2	0/-0.020	0.20	+/-0.010	4	2	6	1.90	50	4	6.38	6.60	6.82	7.06	7.57	UHF4LN0200206	●
2	0/-0.020	0.20	+/-0.010	4	2	8	1.90	50	4	8.45	8.73	9.04	9.35	10.04	UHF4LN0200208	●
2	0/-0.020	0.20	+/-0.010	4	2	10	1.90	50	4	10.52	10.87	11.25	11.65	12.51	UHF4LN0200210	●

● stock standard ○ non-standard stock ▽ stock exhaustion

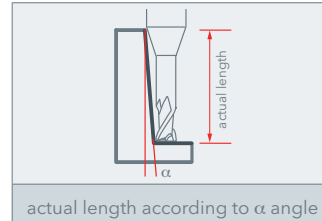
UHF4LN

cylindrical shank, 4F Unequal Pitch, extended and reduced neck, corner radius



P	M	K	N	S	H
☆		☆			★

★ 1st choice ☆ suitable

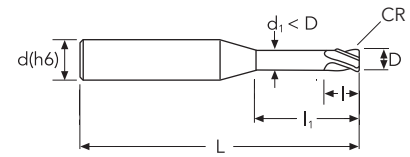


D	D Tol.	CR	CR Tol.	d(h6)	I	I1	d1	L	z	30'	1°	1°30'	2°	3°	EDP No.	Stock
2	0/-0.020	0.20	+/-0.010	4	2	12	1.90	50	4	12.58	13.01	13.47	13.94	14.98	UHF4LN0200212	●
2	0/-0.020	0.20	+/-0.010	4	2	14	1.90	50	4	14.65	15.15	15.68	16.24	17.45	UHF4LN0200214	●
2	0/-0.020	0.20	+/-0.010	4	2	16	1.90	50	4	16.72	17.29	17.89	18.53	-	UHF4LN0200216	●
2	0/-0.020	0.20	+/-0.010	4	2	18	1.90	60	4	18.79	19.43	20.11	20.83	-	UHF4LN0200218	●
2	0/-0.020	0.20	+/-0.010	4	2	20	1.90	60	4	20.85	21.57	22.32	23.12	-	UHF4LN0200220	●
2	0/-0.020	0.20	+/-0.010	4	2	25	1.90	75	4	26.02	26.91	27.86	-	-	UHF4LN0200225	●
2	0/-0.020	0.20	+/-0.010	4	2	30	1.90	75	4	31.19	32.26	33.40	-	-	UHF4LN0200230	●
2	0/-0.020	0.30	+/-0.010	4	2	8	1.90	50	4	8.45	8.73	9.03	9.34	10.02	UHF4LN0200308	●
2	0/-0.020	0.30	+/-0.010	4	2	16	1.90	50	4	16.72	17.28	17.88	18.52	-	UHF4LN0200316	●
2	0/-0.020	0.30	+/-0.010	4	2	20	1.90	60	4	20.85	21.56	22.31	23.11	-	UHF4LN0200320	●
2	0/-0.020	0.50	+/-0.010	4	2	6	1.90	50	4	6.37	6.58	6.79	7.02	7.50	UHF4LN0200506	●
2	0/-0.020	0.50	+/-0.010	4	2	8	1.90	50	4	8.44	8.71	9.00	9.31	9.97	UHF4LN0200508	●
2	0/-0.020	0.50	+/-0.010	4	2	12	1.90	50	4	12.57	12.99	13.43	13.9	14.91	UHF4LN0200512	●
2	0/-0.020	0.50	+/-0.010	4	2	16	1.90	50	4	16.71	17.27	17.86	18.49	-	UHF4LN0200516	●
2	0/-0.020	0.50	+/-0.010	4	2	20	1.90	60	4	20.84	21.55	22.29	23.08	-	UHF4LN0200520	●
2	0/-0.020	0.50	+/-0.010	4	2	25	1.90	75	4	26.01	26.89	27.83	28.82	-	UHF4LN0200525	●
2	0/-0.020	0.50	+/-0.010	4	2	30	1.90	75	4	31.18	32.24	33.36	-	-	UHF4LN0200530	●
2.5	0/-0.020	0.30	+/-0.010	4	2.5	8	2.40	50	4	8.45	8.73	9.03	9.34	10.02	UHF4LN0250308	●
2.5	0/-0.020	0.30	+/-0.010	4	2.5	10	2.40	50	4	10.51	10.87	11.24	11.63	12.49	UHF4LN0250310	●
2.5	0/-0.020	0.30	+/-0.010	4	2.5	12	2.40	50	4	12.58	13.01	13.45	13.93	-	UHF4LN0250312	●
2.5	0/-0.020	0.30	+/-0.010	4	2.5	14	2.40	50	4	14.65	15.14	15.67	16.22	-	UHF4LN0250314	●
2.5	0/-0.020	0.30	+/-0.010	4	2.5	16	2.40	50	4	16.72	17.28	17.88	18.52	-	UHF4LN0250316	●
2.5	0/-0.020	0.30	+/-0.010	4	2.5	18	2.40	60	4	18.78	19.42	20.10	20.81	-	UHF4LN0250318	●
2.5	0/-0.020	0.30	+/-0.010	4	2.5	20	2.40	60	4	20.85	21.56	22.31	-	-	UHF4LN0250320	●
2.5	0/-0.020	0.30	+/-0.010	4	2.5	25	2.40	60	4	26.02	26.91	27.85	-	-	UHF4LN0250325	●
2.5	0/-0.020	0.30	+/-0.010	4	2.5	30	2.40	75	4	31.19	32.25	-	-	-	UHF4LN0250330	●
2.5	0/-0.020	0.50	+/-0.010	4	2.5	8	2.40	50	4	8.44	8.71	9.00	9.31	9.97	UHF4LN0250508	●
2.5	0/-0.020	0.50	+/-0.010	4	2.5	12	2.40	50	4	12.57	12.99	13.43	13.90	-	UHF4LN0250512	●
2.5	0/-0.020	0.50	+/-0.010	4	2.5	16	2.40	50	4	16.71	17.27	17.86	18.49	-	UHF4LN0250516	●
2.5	0/-0.020	0.50	+/-0.010	4	2.5	20	2.40	60	4	20.84	21.55	22.29	-	-	UHF4LN0250520	●
2.5	0/-0.020	0.50	+/-0.010	4	2.5	25	2.40	60	4	26.01	26.89	27.83	-	-	UHF4LN0250525	●
2.5	0/-0.020	0.50	+/-0.010	4	2.5	30	2.40	75	4	31.18	32.24	-	-	-	UHF4LN0250530	●
3	0/-0.025	0.20	+/-0.010	6	3	8	2.80	50	4	8.64	8.93	9.24	9.57	10.27	UHF4LN0300208	●
3	0/-0.025	0.20	+/-0.010	6	3	10	2.80	50	4	10.71	11.07	11.46	11.86	12.73	UHF4LN0300210	●
3	0/-0.025	0.20	+/-0.010	6	3	12	2.80	50	4	12.78	13.21	13.67	14.16	15.20	UHF4LN0300212	●
3	0/-0.025	0.20	+/-0.010	6	3	14	2.80	50	4	14.84	15.35	15.89	16.45	17.67	UHF4LN0300214	●
3	0/-0.025	0.20	+/-0.010	6	3	16	2.80	60	4	16.91	17.49	18.10	18.74	20.14	UHF4LN0300216	●
3	0/-0.025	0.20	+/-0.010	6	3	18	2.80	60	4	18.98	19.63	20.31	21.04	22.60	UHF4LN0300218	●
3	0/-0.025	0.20	+/-0.010	6	3	20	2.80	60	4	21.05	21.77	22.53	23.33	25.07	UHF4LN0300220	●

INFO
TYPHOON TA-HTA-4HTA
TYPHOON PU-HPU
TYPHOON SUH
TYPHOON ALH
TYPHOON HRC
TYPHOON SUH MINI
TYPHOON HL
C-SD-TA
LFTA
SUTA
HSS-HSS/CO DRILLS
G2
MDTA
HF VH/UP
MEF
ALU
MEX
UH
HSS/CO-HSSP END MILLS
CARBIDE BURRS

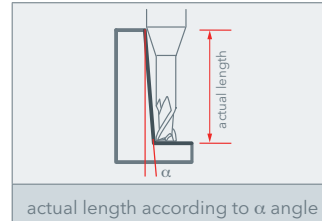
UHF4LN

cylindrical shank, 4F Unequal Pitch, extended and reduced neck, corner radius



P	M	K	N	S	H
☆		☆			★

★ 1st choice ☆ suitable



D	D Tol.	CR	CR Tol.	d(h6)	l	l1	d1	L	z	30'	1°	1°30'	2°	3°	EDP No.	Stock
3	0/-0.025	0.20	+/-0.010	6	3	25	2.80	75	4	26.21	27.11	28.07	29.07	-	UHF4LN0300225	●
3	0/-0.025	0.30	+/-0.010	6	3	8	2.80	50	4	8.64	8.93	9.23	9.55	10.24	UHF4LN0300308	●
3	0/-0.025	0.30	+/-0.010	6	3	10	2.80	50	4	10.71	11.07	11.45	11.85	12.71	UHF4LN0300310	●
3	0/-0.025	0.30	+/-0.010	6	3	12	2.80	50	4	12.77	13.20	13.66	14.14	15.18	UHF4LN0300312	●
3	0/-0.025	0.30	+/-0.010	6	3	14	2.80	50	4	14.84	15.34	15.87	16.44	17.64	UHF4LN0300314	●
3	0/-0.025	0.30	+/-0.010	6	3	16	2.80	60	4	16.91	17.48	18.09	18.73	20.11	UHF4LN0300316	●
3	0/-0.025	0.30	+/-0.010	6	3	18	2.80	60	4	18.98	19.62	20.30	21.02	22.58	UHF4LN0300318	●
3	0/-0.025	0.30	+/-0.010	6	3	20	2.80	60	4	21.04	21.76	22.52	23.32	25.05	UHF4LN0300320	●
3	0/-0.025	0.30	+/-0.010	6	3	30	2.80	75	4	31.38	32.45	33.59	34.79	-	UHF4LN0300330	●
3	0/-0.025	0.50	+/-0.010	6	3	8	2.80	50	4	8.63	8.91	9.21	9.52	10.20	UHF4LN0300508	●
3	0/-0.025	0.50	+/-0.010	6	3	10	2.80	50	4	10.7	11.05	11.42	11.82	12.66	UHF4LN0300510	●
3	0/-0.025	0.50	+/-0.010	6	3	12	2.80	50	4	12.77	13.19	13.64	14.11	15.13	UHF4LN0300512	●
3	0/-0.025	0.50	+/-0.010	6	3	14	2.80	50	4	14.83	15.33	15.85	16.41	17.60	UHF4LN0300514	●
3	0/-0.025	0.50	+/-0.010	6	3	16	2.80	60	4	16.9	17.47	18.07	18.70	20.07	UHF4LN0300516	●
3	0/-0.025	0.50	+/-0.010	6	3	18	2.80	60	4	18.97	19.61	20.28	20.99	22.53	UHF4LN0300518	●
3	0/-0.025	0.50	+/-0.010	6	3	20	2.80	60	4	21.04	21.75	22.50	23.29	25.00	UHF4LN0300520	●
3	0/-0.025	0.50	+/-0.010	6	3	30	2.80	75	4	31.37	32.44	33.57	34.76	-	UHF4LN0300530	●
4	0/-0.025	0.30	+/-0.010	6	4	10	3.70	60	4	10.90	11.26	11.65	12.06	12.93	UHF4LN0400310	●
4	0/-0.025	0.30	+/-0.010	6	4	15	3.70	60	4	16.07	16.61	17.19	17.79	19.10	UHF4LN0400315	●
4	0/-0.025	0.30	+/-0.010	6	4	20	3.70	60	4	21.24	21.96	22.72	23.53	-	UHF4LN0400320	●
4	0/-0.025	0.30	+/-0.010	6	4	25	3.70	75	4	26.4	27.31	28.26	-	-	UHF4LN0400325	●
4	0/-0.025	0.30	+/-0.010	6	4	32	3.70	75	4	33.64	34.79	36.01	-	-	UHF4LN0400332	●
4	0/-0.025	0.30	+/-0.010	6	4	40	3.70	75	4	41.91	43.35	-	-	-	UHF4LN0400340	●
4	0/-0.025	0.50	+/-0.010	6	4	10	3.70	60	4	10.89	11.25	11.63	12.03	12.89	UHF4LN0400510	●
4	0/-0.025	0.50	+/-0.010	6	4	15	3.70	60	4	16.06	16.60	17.17	17.76	19.06	UHF4LN0400515	●
4	0/-0.025	0.50	+/-0.010	6	4	20	3.70	60	4	21.23	21.94	22.7	23.50	-	UHF4LN0400520	●
4	0/-0.025	0.50	+/-0.010	6	4	25	3.70	75	4	26.4	27.29	28.24	-	-	UHF4LN0400525	●
4	0/-0.025	0.50	+/-0.010	6	4	32	3.70	75	4	33.63	34.78	35.99	-	-	UHF4LN0400532	●
4	0/-0.025	0.50	+/-0.010	6	4	40	3.70	75	4	41.9	43.33	-	-	-	UHF4LN0400540	●

● stock standard ○ non-standard stock ▽ stock exhaustion

CUTTING PARAMETERS

UHF4LN

Material Group ISO 513			P3 P4 P5 K2 K3					P6 K4 H1 H4 H5					H2			H3		
Hardness/Rm			< 45 HRC					45 - 55 HRC					55 - 60 HRC			60 - 65 HRC		
ap x ae			ap x D					ap x D					ap x D			ap x D		
Vc (m/min)			80-120					60-100					50-70			30-50		
D (mm)	l1 (mm)	ae (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)				
1	≤ 6D	0.05	31800	0.010	1300	25440	0.009	930	19080	0.008	625	12720	0.007	365				
	≤ 8D	0.04	28700	0.009	1000	22960	0.008	720	17220	0.007	480	11480	0.006	280				
	≤ 10D	0.04	25500	0.007	730	20400	0.006	520	15300	0.006	350	10200	0.005	205				
	≤ 12D	0.03	22300	0.006	500	17840	0.005	360	13380	0.004	240	8920	0.004	140				
1.5	≤ 6D	0.08	21200	0.021	1800	16960	0.019	1300	12720	0.017	865	8480	0.015	505				
	≤ 8D	0.06	19100	0.018	1380	15280	0.016	990	11460	0.014	660	7640	0.013	385				
	≤ 10D	0.05	17000	0.015	1010	13600	0.013	730	10200	0.012	485	6800	0.010	285				
	≤ 12D	0.04	14900	0.012	700	11920	0.011	500	8940	0.009	335	5960	0.008	195				
	≤ 15D	0.03	12700	0.010	490	10160	0.009	350	7620	0.008	235	5080	0.007	135				
2	> 15D	0.02	10600	0.006	270	8480	0.006	190	6360	0.005	130	4240	0.004	75				
	≤ 6D	0.10	15900	0.026	1620	12720	0.023	1170	9540	0.020	780	6360	0.018	455				
	≤ 8D	0.09	14300	0.022	1240	11440	0.020	890	8580	0.017	595	5720	0.015	345				
	≤ 10D	0.07	12700	0.018	910	10160	0.016	650	7620	0.014	435	5080	0.012	255				
	≤ 12D	0.06	11100	0.014	620	8880	0.013	450	6660	0.011	300	4440	0.010	175				
2.5	≤ 15D	0.05	9600	0.011	440	7680	0.010	320	5760	0.009	210	3840	0.008	125				
	> 15D	0.03	9600	0.008	290	7680	0.007	210	5760	0.006	140	3840	0.005	80				
	≤ 6D	0.13	12700	0.030	1510	10160	0.027	1090	7620	0.024	725	5080	0.021	425				
	≤ 8D	0.11	11500	0.025	1160	9200	0.023	840	6900	0.020	560	4600	0.018	325				
	≤ 10D	0.09	10200	0.021	850	8160	0.019	610	6120	0.017	410	4080	0.015	240				
3	≤ 12D	0.07	8900	0.016	580	7120	0.015	420	5340	0.013	280	3560	0.011	165				
	≤ 15D	0.06	7600	0.013	410	6080	0.012	290	4560	0.011	195	3040	0.009	115				
	> 15D	0.04	7600	0.009	270	6080	0.008	200	4560	0.007	130	3040	0.006	75				
	≤ 6D	0.15	10600	0.034	1440	8480	0.031	1040	6360	0.027	690	4240	0.024	405				
	≤ 8D	0.13	9600	0.029	1110	7680	0.026	800	5760	0.023	535	3840	0.020	310				
4	≤ 10D	0.11	8500	0.024	810	6800	0.021	580	5100	0.019	390	3400	0.017	225				
	≤ 12D	0.08	7400	0.019	550	5920	0.017	400	4440	0.015	265	2960	0.013	155				
	≤ 15D	0.07	6400	0.015	390	5120	0.014	280	3840	0.012	190	2560	0.011	110				
	> 15D	0.05	6400	0.010	260	5120	0.009	190	3840	0.008	125	2560	0.007	75				
4	≤ 6D	0.20	8000	0.043	1360	6400	0.038	980	4800	0.034	655	3200	0.030	380				
	≤ 8D	0.17	7200	0.036	1040	5760	0.033	750	4320	0.029	500	2880	0.025	290				
	≤ 10D	0.14	6400	0.030	760	5120	0.027	550	3840	0.024	365	2560	0.021	215				
	≤ 12D	0.11	5600	0.023	520	4480	0.021	380	3360	0.019	250	2240	0.016	145				
	≤ 15D	0.09	4800	0.019	370	3840	0.017	260	2880	0.015	175	1920	0.013	105				
> 15D	0.06	4800	0.013	240	3840	0.011	180	2880	0.010	120	1920	0.009	70					



- INFO
- TYPHOON TA-HTA-4HTA
- TYPHOON PU-HPU
- TYPHOON SUH
- TYPHOON ALH
- TYPHOON HRC
- TYPHOON SUH MINI
- TYPHOON HL
- C-SD-TA
- LFTA
- SUTA
- HSS-HSS/CO DRILLS
- G2
- MDTA
- HF VH/UP
- MEF
- ALU
- MEX
- UH
- HSS/CO-HSSP END MILLS
- CARBIDE BURRS

CUTTING PARAMETERS

UHF4

	Material Group ISO 513	P3 P4 P5 K2 K3			P6 K4 H1 H4 H5			H2			H3		
	Hardness/Rm	< 45 HRC			45 - 55 HRC			55 - 60 HRC			60 - 65 HRC		
	ap x ae	0.03D x 0.4D			0.03D x 0.3D			0.02D x 0.3D			0.02D x 0.3D		
	Vc (m/min)	110-150			90-130			60-100			50-70		
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)
	2	20700	0.033	2710	17520	0.029	2070	12740	0.026	1335	9550	0.023	875
	3	13800	0.050	2730	11680	0.045	2080	8490	0.040	1345	6370	0.035	885
	4	10350	0.068	2790	8760	0.061	2130	6370	0.054	1375	4780	0.047	905
	5	8280	0.086	2830	7010	0.077	2160	5100	0.068	1395	3820	0.060	915
	6	6900	0.104	2860	5840	0.093	2180	4250	0.083	1410	3180	0.072	920
8	5180	0.122	2520	4380	0.109	1920	3180	0.097	1235	2390	0.085	815	
10	4140	0.140	2310	3500	0.126	1760	2550	0.112	1140	1910	0.098	745	
12	3450	0.158	2170	2920	0.142	1660	2120	0.126	1070	1590	0.110	700	
ap x ae	D2 - D3	0.02D x 0.3D			0.02D x 0.25D			0.01D x 0.02D			0.01D x 0.02D		

- INFO
- TYPHOON TA-HTA-4HTA
- TYPHOON PU-HPU
- TYPHOON SUH
- TYPHOON ALH
- TYPHOON HRC
- TYPHOON SUH MINI
- TYPHOON HL
- C-SD-TA
- LFTA
- SUTA
- HSS-HSS/CO DRILLS
- G2
- MDTA
- HF VH/UP
- MEF
- ALU
- MEX
- UH
- HSS/CO-HSSP END MILLS
- CARBIDE BURRS

CUTTING PARAMETERS

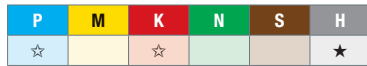
UHCS4

	Material Group ISO 513	P3 P4 P5 K2 K3			P6 K4 H1 H4 H5			H2			H3		
	Hardness/Rm	< 45 HRC			45 - 55 HRC			55 - 60 HRC			60 - 65 HRC		
	ap x ae	0.3D x D			0.2D x D			0.2D x D			0.1D x D		
	Vc (m/min)	90-130			60-100			50-70			30-50		
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)
	1	30000	0.010	1200	25480	0.009	920	19110	0.008	610	12740	0.007	355
	2	17520	0.020	1400	12740	0.018	920	9550	0.016	610	6370	0.014	355
	3	11680	0.030	1400	8490	0.027	920	6370	0.024	610	4250	0.021	355
	4	8760	0.040	1400	6370	0.036	920	4780	0.032	610	3180	0.028	355
	5	7010	0.045	1260	5100	0.041	830	3820	0.036	550	2550	0.032	320
6	5840	0.050	1170	4250	0.045	770	3180	0.040	510	2120	0.035	295	
8	4380	0.065	1140	3180	0.059	740	2390	0.052	495	1590	0.046	290	
10	3500	0.085	1190	2550	0.077	780	1910	0.068	520	1270	0.060	300	
12	2920	0.100	1170	2120	0.090	760	1590	0.080	510	1060	0.070	295	

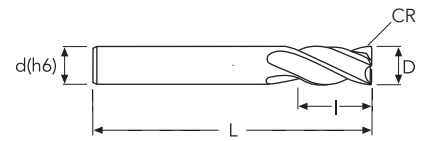
- INFO
- TYPHOON TA-HTA-4HTA
- TYPHOON PU-HPU
- TYPHOON SUH
- TYPHOON ALH
- TYPHOON HRC
- TYPHOON SUH MINI
- TYPHOON HL
- C-SD-TA
- LFTA
- SUTA
- HSS-HSS/CO DRILLS
- G2
- MDTA
- HF VH/UP
- MEF
- ALU
- MEX
- UH
- HSS/CO-HSSP END MILLS
- CARBIDE BURRS

UH410

cylindrical shank, 4F, corner radius




★ 1st choice ☆ suitable




D	D Tol.	CR	CR Tol.	d(h6)	l	l1	L	z	EDP No.	Stock
1	0/-0.020	0.20	+/-0.010	6	3		50	4	UH41001002	●
1.5	0/-0.020	0.20	+/-0.010	6	4.5		50	4	UH41001502	●
2	0/-0.020	0.30	+/-0.010	6	6.5		50	4	UH41002003	●
2.5	0/-0.020	0.30	+/-0.010	6	6.5		50	4	UH41002503	●
2.5	0/-0.020	0.50	+/-0.010	6	6.5		50	4	UH41002505	●
3	0/-0.025	0.20	+/-0.010	6	9		50	4	UH41003002	●
3	0/-0.025	0.30	+/-0.010	6	9		50	4	UH41003003	●
3	0/-0.025	0.50	+/-0.010	6	9		50	4	UH41003005	●
4	0/-0.025	0.30	+/-0.010	6	12		50	4	UH41004003	●
4	0/-0.025	0.50	+/-0.010	6	12		50	4	UH41004005	●
4	0/-0.025	1.00	+/-0.010	6	12		50	4	UH41004010	●
5	0/-0.025	0.30	+/-0.010	6	15		50	4	UH41005003	●
5	0/-0.025	0.50	+/-0.010	6	15		50	4	UH41005005	●
5	0/-0.025	1.00	+/-0.010	6	15		50	4	UH41005010	●
6	0/-0.025	0.30	+/-0.010	6	16		50	4	UH41006003	●
6	0/-0.025	0.50	+/-0.010	6	16		50	4	UH41006005	●
6	0/-0.025	1.00	+/-0.010	6	16		50	4	UH41006010	●
8	0/-0.030	0.30	+/-0.010	8	20		64	4	UH41008003	●
8	0/-0.030	0.50	+/-0.010	8	20		64	4	UH41008005	●
8	0/-0.030	1.00	+/-0.010	8	20		64	4	UH41008010	●
8	0/-0.030	1.50	+/-0.010	8	20		64	4	UH41008015	●
8	0/-0.030	2.00	+/-0.010	8	20		64	4	UH41008020	●
10	0/-0.030	0.30	+/-0.010	10	22		70	4	UH41010003	●
10	0/-0.030	0.50	+/-0.010	10	22		70	4	UH41010005	●
10	0/-0.030	1.00	+/-0.010	10	22		70	4	UH41010010	●
10	0/-0.030	1.50	+/-0.010	10	22		70	4	UH41010015	●
10	0/-0.030	2.00	+/-0.010	10	22		70	4	UH41010020	●
12	0/-0.030	0.30	+/-0.010	12	25		75	4	UH41012003	●
12	0/-0.030	0.50	+/-0.010	12	25		75	4	UH41012005	●
12	0/-0.030	1.00	+/-0.010	12	25		75	4	UH41012010	●
12	0/-0.030	1.50	+/-0.010	12	25		75	4	UH41012015	●
12	0/-0.030	2.00	+/-0.010	12	25		75	4	UH41012020	●
12	0/-0.030	3.00	+/-0.010	12	25		75	4	UH41012030	●
14	0/-0.030	0.50	+/-0.010	14	32		90	4	UH41014005	●
14	0/-0.030	1.00	+/-0.010	14	32		90	4	UH41014010	●
14	0/-0.030	2.00	+/-0.010	14	32		90	4	UH41014020	○
16	0/-0.030	0.30	+/-0.010	16	32		90	4	UH41016003	○
16	0/-0.030	0.50	+/-0.010	16	32		90	4	UH41016005	●
16	0/-0.030	1.00	+/-0.010	16	32		90	4	UH41016010	●

● stock standard ○ non-standard stock ▽ stock exhaustion

UH410

	Material Group ISO 513	P3 P4 P5 K2 K3			P6 K4 H1 H4 H5			H2			H3		
	Hardness/Rm	< 45 HRC			45 - 55 HRC			55 - 60 HRC			60 - 65 HRC		
	ap x ae	D x 0.05D			D x 0.05D			D x 0.05D			D x 0.05D		
	Vc (m/min)	90-130			60-100			50-70			30-50		
D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	
1	35030	0.010	1400	25480	0.009	920	19110	0.008	575	12740	0.007	330	
2	17520	0.018	1260	12740	0.016	830	9550	0.014	550	6370	0.013	320	
3	11680	0.027	1260	8490	0.024	830	6370	0.022	550	4250	0.019	320	
4	8760	0.036	1260	6370	0.032	830	4780	0.029	550	3180	0.025	320	
5	7010	0.041	1140	5100	0.036	740	3820	0.032	495	2550	0.028	290	
6	5840	0.045	1050	4250	0.041	690	3180	0.036	460	2120	0.032	265	
8	4380	0.059	1020	3180	0.053	670	2390	0.047	445	1590	0.041	260	
10	3500	0.077	1070	2550	0.069	700	1910	0.061	470	1270	0.054	270	
12	2920	0.090	1050	2120	0.081	690	1590	0.072	460	1060	0.063	265	
14	2500	0.102	1020	1820	0.092	670	1360	0.082	445	910	0.071	260	
16	2190	0.114	1000	1590	0.103	650	1190	0.091	435	800	0.080	255	
18	1950	0.126	980	1420	0.113	640	1060	0.101	425	710	0.088	250	
20	1750	0.138	970	1270	0.124	630	960	0.110	425	640	0.097	245	

UH411


	Material Group ISO 513	P3 P4 P5 K2 K3			P6 K4 H1 H4 H5			H2			H3		
	Hardness/Rm	< 45 HRC			45 - 55 HRC			55 - 60 HRC			60 - 65 HRC		
	ap x ae	D x 0.05D			D x 0.05D			D x 0.05D			D x 0.05D		
Vc (m/min)	90-130			60-100			50-70			30-50			
D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	
3	11680	0.027	1260	8490	0.024	830	6370	0.022	550	4250	0.019	320	
4	8760	0.036	1260	6370	0.032	830	4780	0.029	550	3180	0.025	320	
5	7010	0.041	1140	5100	0.036	740	3820	0.032	495	2550	0.028	290	
6	5840	0.045	1050	4250	0.041	690	3180	0.036	460	2120	0.032	265	
8	4380	0.059	1020	3180	0.053	670	2390	0.047	445	1590	0.041	260	
10	3500	0.077	1070	2550	0.069	700	1910	0.061	470	1270	0.054	270	
12	2920	0.090	1050	2120	0.081	690	1590	0.072	460	1060	0.063	265	

UH412


	Material Group ISO 513	P3 P4 P5 K2 K3			P6 K4 H1 H4 H5			H2			H3		
	Hardness/Rm	< 45 HRC			45 - 55 HRC			55 - 60 HRC			60 - 65 HRC		
	ap x ae	D x 0.05D			D x 0.05D			D x 0.05D			D x 0.05D		
	Vc (m/min)	80-120			60-100			50-70			30-50		
D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	
2	15920	0.016	1030	12740	0.015	740	9550	0.013	495	6370	0.011	290	
3	10620	0.024	1030	8490	0.022	740	6370	0.019	495	4250	0.017	290	
4	7960	0.032	1030	6370	0.029	740	4780	0.026	495	3180	0.023	290	
5	6370	0.036	930	5100	0.033	670	3820	0.029	445	2550	0.026	260	
6	5310	0.041	860	4250	0.036	620	3180	0.032	410	2120	0.028	240	
8	3980	0.053	840	3180	0.047	600	2390	0.042	405	1590	0.037	235	
10	3180	0.069	880	2550	0.062	630	1910	0.055	420	1270	0.048	245	
12	2650	0.081	860	2120	0.073	620	1590	0.065	410	1060	0.057	240	

- INFO
- TYPHOON TA-HTA-4HTA
- TYPHOON PU-HPU
- TYPHOON SUH
- TYPHOON ALH
- TYPHOON HRC
- TYPHOON SUH MINI
- TYPHOON HL
- C-SD-TA
- LFTA
- SUTA
- HSS-HSS/CO DRILLS
- G2
- MDTA
- HF VH/UP
- MEF
- ALU
- MEX
- UH
- HSS/CO-HSSP END MILLS
- CARBIDE BURRS


UH413

	Material Group ISO 513	P3 P4 P5 K2 K3			P6 K4 H1 H4 H5			H2			H3		
	Hardness/Rm	< 45 HRC			45 - 55 HRC			55 - 60 HRC			60 - 65 HRC		
	ap x ae	D x 0.05D			D x 0.05D			D x 0.05D			D x 0.05D		
Vc (m/min)	70-110			60-80			40-60			30-50			
D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	
6	4780	0.041	770	3720	0.036	540	2650	0.032	345	2120	0.028	240	
8	3580	0.053	750	2790	0.047	530	1990	0.042	335	1590	0.037	235	
10	2870	0.069	790	2230	0.062	550	1590	0.055	350	1270	0.048	245	
12	2390	0.081	770	1860	0.073	540	1330	0.065	345	1060	0.057	240	
16	1790	0.095	680	1390	0.086	480	1000	0.076	305	800	0.067	215	


UH610R


	Material Group ISO 513	P3 P4 P5 K2 K3			P6 K4 H1 H4 H5			H2			H3		
	Hardness/Rm	< 45 HRC			45 - 55 HRC			55 - 60 HRC			60 - 65 HRC		
	ap x ae	D x 0.1D			D x 0.05D			D x 0.05D			D x 0.05D		
	Vc (m/min)	140-180			100-140			70-110			60-80		
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)
6	8490	0.018	920	6370	0.016	620	4780	0.014	410	3720	0.013	280	
8	6370	0.028	1050	4780	0.025	710	3580	0.022	470	2790	0.019	320	
10	5100	0.034	1030	3820	0.030	690	2870	0.027	460	2230	0.024	310	
12	4250	0.041	1040	3180	0.037	700	2390	0.033	470	1860	0.029	320	

UH611R

	Material Group ISO 513	P3 P4 P5 K2 K3			P6 K4 H1 H4 H5			H2			H3		
	Hardness/Rm	< 45 HRC			45 - 55 HRC			55 - 60 HRC			60 - 65 HRC		
	ap x ae	1.5D x 0.05D			1.5D x 0.05D			1.5D x 0.05D			1.5D x 0.05D		
	Vc (m/min)	110-150			90-130			60-80			40-60		
D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	
6	6900	0.015	630	5840	0.014	480	3720	0.012	270	2650	0.011	170	
8	5180	0.023	730	4380	0.021	550	2790	0.019	310	1990	0.016	200	
10	4140	0.029	710	3500	0.026	540	2230	0.023	310	1590	0.020	190	
12	3450	0.035	720	2920	0.031	550	1860	0.028	310	1330	0.024	190	
14	2960	0.041	720	2500	0.037	550	1590	0.033	310	1140	0.029	200	
16	2590	0.048	740	2190	0.043	570	1390	0.038	320	1000	0.034	200	
18	2300	0.056	770	1950	0.050	590	1240	0.045	330	880	0.039	210	
20	2070	0.066	820	1750	0.060	630	1110	0.053	350	800	0.046	220	

UHMB204

	Material Group ISO 513		P3 P4 P5 K2 K3					P6 K4 H1 H4 H5					H2			H3		
	Hardness/Rm		< 45 HRC					45 - 55 HRC					55 - 60 HRC			60 - 65 HRC		
	ap x ae		0.05D x 0.1D					0.05D x 0.1D					0.05D x 0.1D			0.05D x 0.1D		
	Vc (m/min)		80-120					60-100					50-70			30-50		
D (mm)	D (eff.) (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)					
0.1	0.04	40000	0.004	320	40000	0.004	290	40000	0.003	255	40000	0.003	225					
0.2	0.09	40000	0.006	480	40000	0.005	430	40000	0.005	385	40000	0.004	335					
0.3	0.13	40000	0.008	640	40000	0.007	580	40000	0.006	510	40000	0.006	450					
0.4	0.17	40000	0.010	800	40000	0.009	720	40000	0.008	640	31850	0.007	445					
0.5	0.22	40000	0.012	960	40000	0.011	860	38220	0.010	735	25480	0.008	430					
0.6	0.26	40000	0.015	1200	40000	0.014	1080	31850	0.012	765	21230	0.011	445					
0.7	0.31	40000	0.018	1440	36400	0.016	1180	27300	0.014	785	18200	0.013	460					
0.8	0.35	39810	0.020	1590	31850	0.018	1150	23890	0.016	765	15920	0.014	445					
0.9	0.39	35390	0.023	1630	28310	0.021	1170	21230	0.018	780	14150	0.016	455					

	α	n (rpm)	Vf (mm/min)
	15°	x 1.1	x 1.1

INFO
TYPHOON TA-HTA-4HTA
TYPHOON PU-HPU
TYPHOON SUH
TYPHOON ALH
TYPHOON HRC
TYPHOON SUH MINI
TYPHOON HL
C-SD-TA
LFTA
SUTA
HSS-HSS/CO DRILLS
G2
MDTA
HF VH/UP
MEF
ALU
MEX
UH
HSS/CO-HSSP END MILLS
CARBIDE BURRS

UHMB206

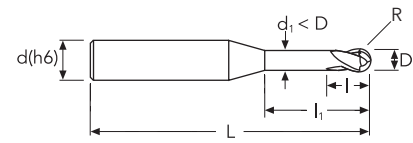
	Material Group ISO 513	P3 P4 P5 K2 K3					P6 K4 H1 H4 H5					H2			H3		
	Hardness/Rm	< 45 HRC					45 - 55 HRC					55 - 60 HRC			60 - 65 HRC		
	ap x ae	0.05D x 0.2D					0.05D x 0.2D					0.05D x 0.2D			0.05D x 0.2D		
	Vc (m/min)	80-120					60-100					50-70			30-50		
	D (mm)	D (eff.) (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)			
	0.4	0.17	40000	0.010	800	40000	0.009	720	40000	0.008	640	31850	0.007	445			
0.5	0.22	40000	0.012	960	40000	0.011	860	38220	0.010	735	25480	0.008	430				
0.6	0.26	40000	0.015	1200	40000	0.014	1080	31850	0.012	765	21230	0.011	445				
0.8	0.35	39810	0.020	1590	31850	0.018	1150	23890	0.016	765	15920	0.014	445				

	α	n (rpm)	Vf (mm/min)
	15°	x 1.1	x 1.1

- INFO
- TYPHOON TA-HTA-4HTA
- TYPHOON PU-HPU
- TYPHOON SUH
- TYPHOON ALH
- TYPHOON HRC
- TYPHOON SUH MINI
- HL
- C-SD-TA
- LFTA
- SUTA
- HSS-HSS/CO DRILLS
- G2
- MDTA
- HF VH/UP
- MEF
- ALU
- MEX
- UH
- HSS/CO-HSSP END MILLS
- CARBIDE BURRS

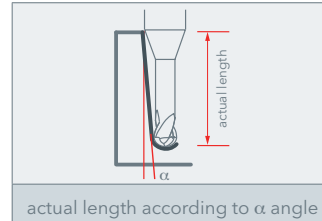
UHLNB2

cylindrical shank, 2 flutes ball nose, extended and reduced neck, miniature



P	M	K	N	S	H
☆		☆			★

★ 1st choice ☆ suitable



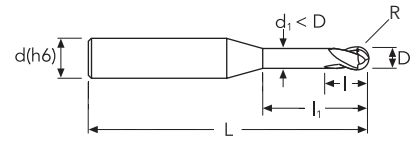
D	D Tol.	R	R Tol.	d(h6)	l	l1	d1	L	z	30°	1°	1°30'	2°	3°	EDP No.	Stock
0.2	0/-0.020	0.10	0/-0.020	4	0.2	0.5	0.15	50	2	0.57	0.58	0.60	0.62	0.66	UHLNB2002005	●
0.2	0/-0.020	0.10	0/-0.020	4	0.2	1	0.15	50	2	1.08	1.12	1.15	1.19	1.27	UHLNB200201	●
0.2	0/-0.020	0.10	0/-0.020	4	0.2	1.5	0.15	50	2	1.60	1.65	1.71	1.76	1.89	UHLNB2002015	●
0.3	0/-0.020	0.15	0/-0.020	4	0.3	1	0.25	50	2	1.08	1.11	1.15	1.18	1.26	UHLNB200301	●
0.3	0/-0.020	0.15	0/-0.020	4	0.3	2	0.25	50	2	2.12	2.18	2.25	2.33	2.49	UHLNB200302	●
0.3	0/-0.020	0.15	0/-0.020	4	0.3	3	0.25	50	2	3.15	3.25	3.36	3.48	3.73	UHLNB200303	●
0.4	0/-0.020	0.20	0/-0.020	4	0.4	1	0.35	50	2	1.08	1.11	1.14	1.18	1.25	UHLNB200401	●
0.4	0/-0.020	0.20	0/-0.020	4	0.4	2	0.35	50	2	2.11	2.18	2.25	2.32	2.48	UHLNB200402	●
0.4	0/-0.020	0.20	0/-0.020	4	0.4	3	0.35	50	2	3.15	3.25	3.36	3.47	3.72	UHLNB200403	●
0.4	0/-0.020	0.20	0/-0.020	4	0.4	4	0.35	50	2	4.18	4.32	4.46	4.62	4.95	UHLNB200404	●
0.4	0/-0.020	0.20	0/-0.020	4	0.4	5	0.35	50	2	5.21	5.39	5.57	5.77	6.18	UHLNB200405	●
0.5	0/-0.020	0.25	0/-0.020	4	0.4	2	0.45	50	2	2.15	2.22	2.29	2.36	2.52	UHLNB200502	●
0.5	0/-0.020	0.25	0/-0.020	4	0.4	3	0.45	50	2	3.18	3.29	3.39	3.51	3.75	UHLNB200503	●
0.5	0/-0.020	0.25	0/-0.020	4	0.4	4	0.45	50	2	4.22	4.35	4.50	4.65	4.98	UHLNB200504	●
0.5	0/-0.020	0.25	0/-0.020	4	0.4	5	0.45	50	2	5.25	5.42	5.61	5.80	6.22	UHLNB200505	●
0.5	0/-0.020	0.25	0/-0.020	4	0.4	6	0.45	50	2	6.28	6.49	6.71	6.95	7.45	UHLNB200506	●
0.5	0/-0.020	0.25	0/-0.020	4	0.4	8	0.45	50	2	8.35	8.63	8.93	9.24	9.92	UHLNB200508	●
0.6	0/-0.020	0.30	0/-0.020	4	0.5	2	0.55	50	2	2.15	2.21	2.28	2.35	2.50	UHLNB200602	●
0.6	0/-0.020	0.30	0/-0.020	4	0.5	3	0.55	50	2	3.18	3.28	3.39	3.50	3.74	UHLNB200603	●
0.6	0/-0.020	0.30	0/-0.020	4	0.5	4	0.55	50	2	4.22	4.35	4.49	4.65	4.97	UHLNB200604	●
0.6	0/-0.020	0.30	0/-0.020	4	0.5	5	0.55	50	2	5.25	5.42	5.60	5.79	6.21	UHLNB200605	●
0.6	0/-0.020	0.30	0/-0.020	4	0.5	6	0.55	50	2	6.28	6.49	6.71	6.94	7.44	UHLNB200606	●
0.6	0/-0.020	0.30	0/-0.020	4	0.5	8	0.55	50	2	8.35	8.63	8.92	9.23	9.91	UHLNB200608	●
0.8	0/-0.020	0.40	0/-0.020	4	0.6	2	0.75	50	2	2.15	2.21	2.27	2.34	2.48	UHLNB200802	●
0.8	0/-0.020	0.40	0/-0.020	4	0.6	4	0.75	50	2	4.21	4.34	4.48	4.63	4.95	UHLNB200804	●
0.8	0/-0.020	0.40	0/-0.020	4	0.6	6	0.75	50	2	6.28	6.48	6.70	6.93	7.42	UHLNB200806	●
0.8	0/-0.020	0.40	0/-0.020	4	0.6	8	0.75	50	2	8.35	8.62	8.91	9.22	9.88	UHLNB200808	●
0.8	0/-0.020	0.40	0/-0.020	4	0.6	10	0.75	50	2	10.41	10.76	11.13	11.51	12.35	UHLNB200810	●
1	0/-0.020	0.50	0/-0.020	4	0.8	3	0.95	50	2	3.27	3.37	3.47	3.57	3.80	UHLNB201003	●
1	0/-0.020	0.50	0/-0.020	4	0.8	4	0.95	50	2	4.31	4.44	4.58	4.72	5.04	UHLNB201004	●
1	0/-0.020	0.50	0/-0.020	4	0.8	5	0.95	50	2	5.34	5.51	5.68	5.87	6.27	UHLNB201005	●
1	0/-0.020	0.50	0/-0.020	4	0.8	6	0.95	50	2	6.37	6.58	6.79	7.02	7.50	UHLNB201006	●
1	0/-0.020	0.50	0/-0.020	4	0.8	8	0.95	50	2	8.44	8.71	9.00	9.31	9.97	UHLNB201008	●
1	0/-0.020	0.50	0/-0.020	4	0.8	10	0.95	50	2	10.51	10.85	11.22	11.61	12.44	UHLNB201010	●
1	0/-0.020	0.50	0/-0.020	4	0.8	12	0.95	50	2	12.57	12.99	13.43	13.90	14.91	UHLNB201012	●
1	0/-0.020	0.50	0/-0.020	4	0.8	14	0.95	50	2	14.64	15.13	15.65	16.19	17.37	UHLNB201014	●
1	0/-0.020	0.50	0/-0.020	4	0.8	16	0.95	50	2	16.71	17.27	17.86	18.49	19.84	UHLNB201016	●
1	0/-0.020	0.50	0/-0.020	4	0.8	20	0.95	60	2	20.84	21.55	22.29	23.08	24.78	UHLNB201020	●
1.2	0/-0.020	0.60	0/-0.020	4	1	6	1.15	50	2	6.37	6.57	6.78	7.00	7.48	UHLNB201206	●

INFO
TYPHOON TA-HTA-4HTA
TYPHOON PU-HPU
TYPHOON SUH
TYPHOON ALH
TYPHOON HRC
TYPHOON SUH MINI
TYPHOON HL
C-SD-TA
LFTA
SUTA
HSS-HSS/CO DRILLS
G2
MDTA
HF VH/UP
MEF
ALU
MEX
UH
HSS/CO-HSSP END MILLS
CARBIDE BURRS

● stock standard ○ non-standard stock ▽ stock exhaustion

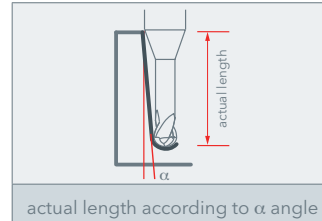
UHLNB2

cylindrical shank, 2 flutes ball nose, extended and reduced neck, miniature



P	M	K	N	S	H
☆		☆			★

★ 1st choice ☆ suitable

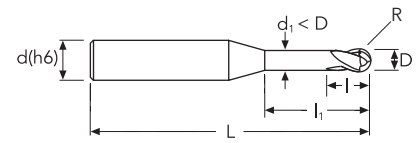


D	D Tol.	R	R Tol.	d(h6)	l	l1	d1	L	z	30°	1°	1°30'	2°	3°	EDP No.	Stock
1.2	0/-0.020	0.60	0/-0.020	4	1	8	1.15	50	2	8.44	8.71	8.99	9.30	9.95	UHLNB201208	●
1.2	0/-0.020	0.60	0/-0.020	4	1	10	1.15	50	2	10.50	10.85	11.21	11.59	12.42	UHLNB201210	●
1.2	0/-0.020	0.60	0/-0.020	4	1	12	1.15	50	2	12.57	12.98	13.42	13.89	14.88	UHLNB201212	●
1.4	0/-0.020	0.70	0/-0.020	4	1.1	8	1.35	50	2	8.43	8.70	8.98	9.28	9.93	UHLNB201408	●
1.4	0/-0.020	0.70	0/-0.020	4	1.1	12	1.35	50	2	12.57	12.98	13.41	13.87	14.86	UHLNB201412	●
1.4	0/-0.020	0.70	0/-0.020	4	1.1	16	1.35	50	2	16.70	17.26	17.84	18.46	19.80	UHLNB201416	●
1.5	0/-0.020	0.75	0/-0.020	4	1.2	8	1.45	50	2	8.43	8.70	8.98	9.27	9.91	UHLNB201508	●
1.5	0/-0.020	0.75	0/-0.020	4	1.2	12	1.45	50	2	12.57	12.97	13.41	13.86	14.85	UHLNB201512	●
1.5	0/-0.020	0.75	0/-0.020	4	1.2	16	1.45	50	2	16.70	17.25	17.84	18.45	19.78	UHLNB201516	●
1.5	0/-0.020	0.75	0/-0.020	4	1.2	18	1.45	60	2	18.77	19.39	20.05	20.75	22.25	UHLNB201518	●
1.5	0/-0.020	0.75	0/-0.020	4	1.2	20	1.45	60	2	20.84	21.53	22.26	23.04	24.72	UHLNB201520	●
1.6	0/-0.020	0.80	0/-0.020	4	1.3	8	1.55	50	2	8.43	8.69	8.97	9.27	9.90	UHLNB201608	●
1.6	0/-0.020	0.80	0/-0.020	4	1.3	12	1.55	50	2	12.56	12.97	13.40	13.86	14.84	UHLNB201612	●
1.6	0/-0.020	0.80	0/-0.020	4	1.3	16	1.55	50	2	16.70	17.25	17.83	18.45	19.77	UHLNB201616	●
1.6	0/-0.020	0.80	0/-0.020	4	1.3	20	1.55	60	2	20.83	21.53	22.26	23.03	-	UHLNB201620	●
1.8	0/-0.020	0.90	0/-0.020	4	1.4	8	1.75	50	2	8.43	8.69	8.96	9.25	9.88	UHLNB201808	●
1.8	0/-0.020	0.90	0/-0.020	4	1.4	12	1.75	50	2	12.56	12.96	13.39	13.84	14.81	UHLNB201812	●
1.8	0/-0.020	0.90	0/-0.020	4	1.4	16	1.75	50	2	16.70	17.24	17.82	18.43	19.75	UHLNB201816	●
1.8	0/-0.020	0.90	0/-0.020	4	1.4	20	1.75	60	2	20.83	21.52	22.25	23.02	-	UHLNB201820	●
2	0/-0.020	1.00	0/-0.020	4	1.6	4	1.95	50	2	4.29	4.40	4.52	4.65	4.92	UHLNB202004	●
2	0/-0.020	1.00	0/-0.020	4	1.6	6	1.95	50	2	6.36	6.54	6.74	6.94	7.39	UHLNB202006	●
2	0/-0.020	1.00	0/-0.020	4	1.6	8	1.95	50	2	8.42	8.68	8.95	9.24	9.86	UHLNB202008	●
2	0/-0.020	1.00	0/-0.020	4	1.6	10	1.95	50	2	10.49	10.82	11.17	11.53	12.32	UHLNB202010	●
2	0/-0.020	1.00	0/-0.020	4	1.6	12	1.95	50	2	12.56	12.96	13.38	13.83	14.79	UHLNB202012	●
2	0/-0.020	1.00	0/-0.020	4	1.6	14	1.95	50	2	14.62	15.10	15.59	16.12	17.26	UHLNB202014	●
2	0/-0.020	1.00	0/-0.020	4	1.6	16	1.95	50	2	16.69	17.23	17.81	18.42	19.73	UHLNB202016	●
2	0/-0.020	1.00	0/-0.020	4	1.6	18	1.95	60	2	18.76	19.37	20.02	20.71	-	UHLNB202018	●
2	0/-0.020	1.00	0/-0.020	4	1.6	20	1.95	60	2	20.83	21.51	22.24	23.00	-	UHLNB202020	●
2	0/-0.020	1.00	0/-0.020	4	1.6	22	1.95	60	2	22.89	23.65	24.45	25.30	-	UHLNB202022	●
2	0/-0.020	1.00	0/-0.020	4	1.6	25	1.95	75	2	25.99	26.86	27.77	28.74	-	UHLNB202025	●
2	0/-0.020	1.00	0/-0.020	4	1.6	30	1.95	75	2	31.16	32.21	33.31	-	-	UHLNB202030	●
3	0/-0.025	1.50	0/-0.020	6	2.4	8	2.85	50	2	8.60	8.84	9.10	9.37	9.96	UHLNB203008	●
3	0/-0.025	1.50	0/-0.020	6	2.4	10	2.85	50	2	10.67	10.98	11.32	11.67	12.43	UHLNB203010	●
3	0/-0.025	1.50	0/-0.020	6	2.4	12	2.85	50	2	12.73	13.12	13.53	13.96	14.90	UHLNB203012	●
3	0/-0.025	1.50	0/-0.020	6	2.4	16	2.85	60	2	16.87	17.40	17.96	18.55	19.83	UHLNB203016	●
3	0/-0.025	1.50	0/-0.020	6	2.4	20	2.85	60	2	21.00	21.68	22.39	23.14	24.77	UHLNB203020	●
3	0/-0.025	1.50	0/-0.020	6	2.4	25	2.85	75	2	26.17	27.02	27.93	28.88	-	UHLNB203025	●
3	0/-0.025	1.50	0/-0.020	6	2.4	30	2.85	75	2	31.34	32.37	33.46	34.62	-	UHLNB203030	●
3	0/-0.025	1.50	0/-0.020	6	2.4	35	2.85	75	2	36.51	37.72	39.00	40.35	-	UHLNB203035	●

● stock standard ○ non-standard stock ▽ stock exhaustion

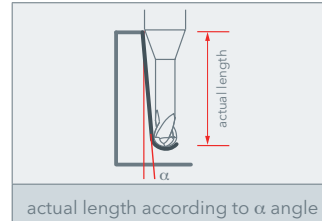
UHLNB2

cylindrical shank, 2 flutes ball nose, extended and reduced neck, miniature



P	M	K	N	S	H
☆		☆			★

★ 1st choice ☆ suitable



D	D Tol.	R	R Tol.	d(h6)	l	l1	d1	L	z	30°	1°	1°30'	2°	3°	EDP No.	Stock
4	0/-0.025	2.00	0/-0.020	6	3.2	10	3.85	50	2	10.84	11.15	11.47	11.81	12.54	UHLNB204010	●
4	0/-0.025	2.00	0/-0.020	6	3.2	16	3.85	60	2	17.04	17.56	18.11	18.69	19.94	UHLNB204016	●
4	0/-0.025	2.00	0/-0.020	6	3.2	20	3.85	60	2	21.18	21.84	22.54	23.28	-	UHLNB204020	●
4	0/-0.025	2.00	0/-0.020	6	3.2	25	3.85	75	2	26.35	27.19	28.08	29.02	-	UHLNB204025	●
4	0/-0.025	2.00	0/-0.020	6	3.2	30	3.85	75	2	31.51	32.53	33.61	-	-	UHLNB204030	●
4	0/-0.025	2.00	0/-0.020	6	3.2	35	3.85	75	2	36.68	37.88	39.15	-	-	UHLNB204035	●
4	0/-0.025	2.00	0/-0.020	6	3.2	40	3.85	100	2	41.85	43.23	-	-	-	UHLNB204040	●
4	0/-0.025	2.00	0/-0.020	6	3.2	45	3.85	100	2	47.02	48.57	-	-	-	UHLNB204045	●
4	0/-0.025	2.00	0/-0.020	6	3.2	50	3.85	100	2	52.19	53.92	-	-	-	UHLNB204050	●

INFO
TYPHOON TA-HTA-4HTA
TYPHOON PU-HPU
TYPHOON SUH
TYPHOON ALH
TYPHOON HRC
TYPHOON SUH MINI
TYPHOON HL
C-SD-TA
LFTA
SUTA
HSS-HSS/CO DRILLS
G2
MDTA
HF VH/UP
MEF
ALU
MEX
UH
HSS/CO-HSSP END MILLS
CARBIDE BURRS


UHLNB2


	Material Group ISO 513			P3 P4 P5 K2 K3					P6 K4 H1 H4 H5					H2			H3		
	Hardness/Rm			< 45 HRC					45 - 55 HRC					55 - 60 HRC			60 - 65 HRC		
	ap x ae			ap x 0.2D					ap x 0.2D					ap x 0.2D			ap x 0.2D		
	Vc (m/min)			140-160					110-130					80-100			50-70		
D (mm)	l1 (mm)	ap (mm)	D (eff.) (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)				
0.2	≤ 6D	0.01	0.09	40000	0.008	640	40000	0.007	580	40000	0.006	510	40000	0.006	450				
	≤ 8D	0.01	0.08	40000	0.007	580	40000	0.006	470	40000	0.005	415	40000	0.005	365				
	≤ 10D	0.01	0.07	40000	0.006	510	40000	0.005	370	40000	0.004	330	40000	0.004	285				
0.3	≤ 6D	0.02	0.13	40000	0.010	800	40000	0.009	720	40000	0.008	640	40000	0.007	560				
	≤ 8D	0.01	0.12	40000	0.009	720	40000	0.007	580	40000	0.006	520	40000	0.006	455				
	≤ 10D	0.01	0.11	40000	0.008	640	40000	0.006	460	40000	0.005	410	40000	0.004	360				
0.4	≤ 6D	0.02	0.17	40000	0.013	1040	40000	0.012	940	40000	0.010	830	40000	0.009	730				
	≤ 8D	0.02	0.16	40000	0.012	940	40000	0.009	760	40000	0.008	675	40000	0.007	590				
	≤ 10D	0.01	0.15	40000	0.010	830	40000	0.007	600	40000	0.007	530	38220	0.006	445				
0.5	≤ 6D	0.03	0.22	40000	0.017	1360	40000	0.015	1220	40000	0.014	1090	38220	0.012	910				
	≤ 8D	0.02	0.20	40000	0.015	1220	40000	0.012	990	40000	0.011	880	34390	0.010	665				
	≤ 10D	0.02	0.18	40000	0.014	1090	40000	0.010	780	40000	0.009	695	30570	0.008	465				
0.6	≤ 6D	0.03	0.26	40000	0.021	1680	40000	0.019	1510	40000	0.017	1345	31850	0.015	935				
	≤ 8D	0.03	0.24	40000	0.019	1510	40000	0.015	1220	40000	0.014	1090	28660	0.012	685				
	≤ 10D	0.02	0.22	40000	0.017	1340	40000	0.012	970	38220	0.011	820	25480	0.009	480				
0.8	≤ 6D	0.04	0.35	40000	0.025	2000	40000	0.023	1800	35830	0.020	1435	23890	0.018	835				
	≤ 8D	0.03	0.32	40000	0.023	1800	40000	0.018	1460	32250	0.016	1045	21500	0.014	610				
	≤ 10D	0.03	0.29	40000	0.020	1600	38220	0.014	1100	28660	0.013	735	19110	0.011	430				
1	≤ 6D	0.05	0.44	40000	0.030	2400	38220	0.027	2060	28660	0.024	1375	19110	0.021	805				
	≤ 8D	0.04	0.40	40000	0.027	2160	34390	0.022	1500	25800	0.019	1005	17200	0.017	585				
	≤ 10D	0.04	0.37	38220	0.024	1830	30570	0.017	1060	22930	0.015	705	15290	0.013	410				
	≤ 12D	0.03	0.33	33440	0.021	1400	26750	0.013	710	20060	0.012	470	13380	0.010	275				
> 12D	0.02	0.30	28660	0.018	1030	22930	0.010	450	17200	0.009	295	11460	0.008	175					
1.2	≤ 6D	0.06	0.52	39810	0.035	2790	31850	0.032	2010	23890	0.028	1340	15920	0.025	780				
	≤ 8D	0.05	0.48	35830	0.032	2260	28660	0.026	1460	21500	0.023	975	14330	0.020	570				
	≤ 10D	0.04	0.44	31850	0.028	1780	25480	0.020	1030	19110	0.018	685	12740	0.016	400				
	≤ 12D	0.03	0.39	27870	0.025	1370	22290	0.015	690	16720	0.014	460	11150	0.012	270				
> 12D	0.03	0.36	23890	0.021	1000	19110	0.011	430	14330	0.010	290	9550	0.009	170					
1.5	≤ 6D	0.08	0.65	31850	0.045	2870	25480	0.041	2060	19110	0.036	1375	12740	0.032	805				
	≤ 8D	0.06	0.61	28660	0.041	2320	22930	0.033	1500	17200	0.029	1005	11460	0.026	585				
	≤ 10D	0.05	0.55	25480	0.036	1830	20380	0.026	1060	15290	0.023	705	10190	0.020	410				
	≤ 12D	0.04	0.49	22290	0.032	1400	17830	0.020	710	13380	0.018	470	8920	0.015	275				
> 12D	0.03	0.44	19110	0.027	1030	15290	0.015	450	11460	0.013	295	7640	0.011	175					
2	≤ 6D	0.10	0.87	23890	0.060	2870	19110	0.054	2060	14330	0.048	1375	9550	0.042	800				
	≤ 8D	0.09	0.81	21500	0.054	2320	17200	0.044	1500	12900	0.039	1005	8600	0.034	585				
	≤ 10D	0.07	0.74	19110	0.048	1830	15290	0.035	1060	11460	0.031	705	7640	0.027	410				
	≤ 12D	0.06	0.65	16720	0.042	1400	13380	0.026	710	10030	0.024	470	6690	0.021	275				
> 12D	0.05	0.59	14330	0.036	1030	11460	0.019	450	8600	0.017	295	5730	0.015	175					
2.5	≤ 6D	0.13	1.09	19110	0.060	2290	15290	0.054	1650	11460	0.048	1100	7640	0.042	640				
	≤ 8D	0.11	1.01	17200	0.054	1860	13760	0.044	1200	10320	0.039	800	6880	0.034	470				
	≤ 10D	0.09	0.92	15290	0.048	1470	12230	0.035	850	9170	0.031	565	6110	0.027	330				
	≤ 12D	0.07	0.82	13380	0.042	1120	10700	0.026	570	8030	0.024	380	5350	0.021	220				
> 12D	0.06	0.74	11460	0.036	830	9170	0.019	360	6880	0.017	240	4590	0.015	140					
3	≤ 6D	0.15	1.31	15920	0.075	2390	12740	0.068	1720	9550	0.060	1145	6370	0.053	670				
	≤ 8D	0.13	1.21	14330	0.068	1930	11460	0.055	1250	8600	0.049	835	5730	0.043	485				
	≤ 10D	0.11	1.10	12740	0.060	1530	10190	0.043	880	7640	0.038	585	5100	0.034	345				
	≤ 12D	0.08	0.98	11150	0.053	1170	8920	0.033	590	6690	0.029	395	4460	0.026	230				
> 12D	0.07	0.89	9550	0.045	860	7640	0.024	370	5730	0.022	250	3820	0.019	145					



	α	n (rpm)	Vf (mm/min)
45°	x 1.65	x 1.65	
30°	x 1.30	x 1.30	
15°	x 1.15	x 1.15	

UHLNB2

	Material Group ISO 513				P3 P4 P5 K2 K3			P6 K4 H1 H4 H5			H2			H3		
	Hardness/Rm				< 45 HRC			45 - 55 HRC			55 - 60 HRC			60 - 65 HRC		
	ap x ae				ap x 0.2D			ap x 0.2D			ap x 0.2D			ap x 0.2D		
	Vc				140-160			110-130			80-100			50-70		
	D (mm)	l1 (mm)	ap (mm)	D (eff.) (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)
4	≤ 6D	0.20	1.74	11940	0.095	2270	9550	0.086	1630	7170	0.076	1090	4780	0.067	635	
	≤ 8D	0.17	1.61	10750	0.086	1840	8600	0.069	1190	6450	0.062	795	4300	0.054	465	
	≤ 10D	0.14	1.47	9550	0.076	1450	7640	0.055	840	5730	0.049	555	3820	0.043	325	
	≤ 12D	0.11	1.31	8360	0.067	1110	6690	0.042	560	5020	0.037	375	3340	0.033	220	
	> 12D	0.09	1.19	7170	0.057	820	5730	0.031	350	4300	0.027	235	2870	0.024	135	

	α	n (rpm)	Vf (mm/min)
	45°	x 1.65	x 1.65
	30°	x 1.30	x 1.30
	15°	x 1.15	x 1.15

INFO

TYPHOON
TA-HTA-4HTATYPHOON
PU-HPUTYPHOON
SUHTYPHOON
ALHTYPHOON
HRCTYPHOON
SUH MINITYPHOON
HL

C-SD-TA

LFTA

SUTA

HSS-HSS/CO
DRILLS

G2

MDTA

HF VH/UP

MEF

ALU

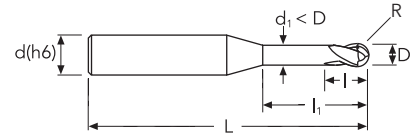
MEX

UH

HSS/CO-HSSP
END MILLSCARBIDE
BURRS

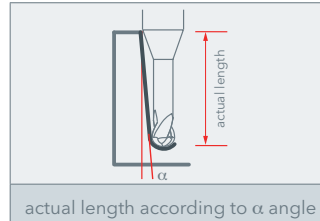
UHCRB2

cylindrical shank, 2 flutes ball nose, extended and reduced neck, miniature, 6 mm. shank



P	M	K	N	S	H
☆		☆			★

★ 1st choice ☆ suitable



D	D Tol.	R	R Tol.	d(h6)	l	l1	d1	L	z	30'	1°	1°30'	2°	3°	EDP No.	Stock
0.5	0/-0.012	0.25	+/-0.005	6	0.5	2	0.45	50	2	2.15	2.22	2.29	2.36	2.52	UHCRB20050156	●
0.5	0/-0.012	0.25	+/-0.005	6	0.5	4	0.45	50	2	4.22	4.35	4.50	4.65	4.98	UHCRB20050336	●
0.6	0/-0.012	0.30	+/-0.005	6	0.5	2	0.55	50	2	2.15	2.21	2.28	2.35	2.50	UHCRB20060206	●
0.6	0/-0.012	0.30	+/-0.005	6	0.5	4	0.55	50	2	4.22	4.35	4.49	4.65	4.97	UHCRB20060406	●
0.6	0/-0.012	0.30	+/-0.005	6	0.5	6	0.55	50	2	6.28	6.49	6.71	6.94	7.44	UHCRB20060606	●
0.8	0/-0.012	0.40	+/-0.005	6	0.8	2	0.75	50	2	2.15	2.21	2.27	2.34	2.48	UHCRB20080256	●
0.8	0/-0.012	0.40	+/-0.005	6	0.8	4	0.75	50	2	4.21	4.34	4.48	4.63	4.95	UHCRB20080406	●
0.8	0/-0.012	0.40	+/-0.005	6	0.8	6	0.75	50	2	6.28	6.48	6.70	6.93	7.42	UHCRB20080556	●
1	0/-0.012	0.50	+/-0.005	6	1	3	0.90	50	2	3.27	3.37	3.47	3.57	3.80	UHCRB20100336	●
1	0/-0.012	0.50	+/-0.005	6	1	6	0.90	50	2	6.37	6.58	6.79	7.02	7.50	UHCRB20100676	●
1	0/-0.012	0.50	+/-0.005	6	1	8	0.90	50	2	8.44	8.71	9.00	9.31	9.97	UHCRB20100806	●
1	0/-0.012	0.50	+/-0.005	6	1	10	0.90	50	2	10.51	10.85	11.22	11.61	12.44	UHCRB20101206	●
1.2	0/-0.012	0.60	+/-0.005	6	1.2	6	1.10	50	2	6.37	6.57	6.78	7.00	7.48	UHCRB20120606	●
1.2	0/-0.012	0.60	+/-0.005	6	1.2	8	1.10	50	2	8.44	8.71	8.99	9.30	9.95	UHCRB2012086	●
1.2	0/-0.012	0.60	+/-0.005	6	1.2	10	1.10	50	2	10.50	10.85	11.21	11.59	12.42	UHCRB20121006	●
1.5	0/-0.012	0.75	+/-0.005	6	1.5	4	1.40	50	2	4.30	4.42	4.55	4.68	4.98	UHCRB2015056	●
1.5	0/-0.012	0.75	+/-0.005	6	1.5	8	1.40	50	2	8.43	8.70	8.98	9.27	9.91	UHCRB20150806	●
1.5	0/-0.012	0.75	+/-0.005	6	1.5	10	1.40	50	2	10.50	10.84	11.19	11.57	12.38	UHCRB20150976	●
1.5	0/-0.012	0.75	+/-0.005	6	1.5	12	1.40	50	2	12.57	12.97	13.41	13.86	14.85	UHCRB2015156	●
1.5	0/-0.012	0.75	+/-0.005	6	1.5	16	1.40	50	2	16.70	17.25	17.84	18.45	19.78	UHCRB20151606	●
2	0/-0.012	1.00	+/-0.005	6	3	6	1.90	50	2	6.36	6.54	6.74	6.94	7.39	UHCRB2020066	●
2	0/-0.012	1.00	+/-0.005	6	3	8	1.90	50	2	8.42	8.68	8.95	9.24	9.86	UHCRB20200806	●
2	0/-0.012	1.00	+/-0.005	6	3	10	1.90	50	2	10.49	10.82	11.17	11.53	12.32	UHCRB20201006	●
2	0/-0.012	1.00	+/-0.005	6	3	12	1.90	50	2	12.56	12.96	13.38	13.83	14.79	UHCRB2020136	●
2	0/-0.012	1.00	+/-0.005	6	3	16	1.90	50	2	16.69	17.23	17.81	18.42	19.73	UHCRB20201606	●
2	0/-0.012	1.00	+/-0.005	6	3	20	1.90	50	2	20.83	21.51	22.24	23.00	24.66	UHCRB2020206	●

● stock standard ○ non-standard stock ▽ stock exhaustion

UHCRB2

Material Group ISO 513				P3 P4 P5 K2 K3			P6 K4 H1 H4 H5			H2			H3		
Hardness/Rm				< 45 HRC			45 - 55 HRC			55 - 60 HRC			60 - 65 HRC		
ap x ae				ap x 0.2D			ap x 0.2D			ap x 0.2D			ap x 0.2D		
Vc (m/min)				140-160			110-130			80-100			50-70		
D (mm)	l1 (mm)	ap (mm)	D (eff.) (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)
0.5	≤ 6D	0.03	0.22	40000	0.020	1600	40000	0.018	1440	40000	0.016	1280	38220	0.014	1070
	≤ 8D	0.02	0.20	40000	0.018	1440	40000	0.015	1170	40000	0.013	1035	34390	0.011	780
	≤ 10D	0.02	0.18	40000	0.016	1280	40000	0.012	920	40000	0.010	820	30570	0.009	550
0.6	≤ 6D	0.03	0.26	40000	0.022	1760	40000	0.020	1580	40000	0.018	1410	31850	0.015	980
	≤ 8D	0.03	0.24	40000	0.020	1580	40000	0.016	1280	40000	0.014	1140	28660	0.012	715
	≤ 10D	0.02	0.22	40000	0.018	1410	40000	0.013	1010	38220	0.011	860	25480	0.010	500
0.8	≤ 6D	0.04	0.35	40000	0.025	2000	40000	0.023	1800	35830	0.020	1435	23890	0.018	835
	≤ 8D	0.03	0.32	40000	0.023	1800	40000	0.018	1460	32250	0.016	1045	21500	0.014	610
	≤ 10D	0.03	0.29	40000	0.020	1600	38220	0.014	1100	28660	0.013	735	19110	0.011	430
1	≤ 6D	0.05	0.44	40000	0.030	2400	38220	0.027	2060	28660	0.024	1375	19110	0.021	805
	≤ 8D	0.04	0.40	40000	0.027	2160	34390	0.022	1500	25800	0.019	1005	17200	0.017	585
	≤ 10D	0.04	0.37	38220	0.024	1830	30570	0.017	1060	19110	0.015	585	15290	0.013	410
	≤ 12D	0.03	0.33	33440	0.021	1400	26750	0.013	710	16720	0.012	395	13380	0.010	275
	> 12D	0.02	0.30	28660	0.018	1030	22930	0.010	450	14330	0.009	250	11460	0.008	175
1.2	≤ 6D	0.06	0.52	39810	0.035	2790	31850	0.032	2010	23890	0.028	1340	15920	0.025	780
	≤ 8D	0.05	0.48	35830	0.032	2260	28660	0.026	1460	21500	0.023	975	14330	0.020	570
	≤ 10D	0.04	0.44	31850	0.028	1780	25480	0.020	1030	19110	0.018	685	12740	0.016	400
	≤ 12D	0.03	0.39	27870	0.025	1370	22290	0.015	690	16720	0.014	460	11150	0.012	270
1.5	> 12D	0.03	0.36	23890	0.021	1000	19110	0.011	430	14330	0.010	290	9550	0.009	170
	≤ 6D	0.08	0.65	31850	0.045	2870	25480	0.041	2060	19110	0.036	1375	12740	0.032	805
	≤ 8D	0.06	0.61	28660	0.041	2320	22930	0.033	1500	17200	0.029	1005	11460	0.026	585
	≤ 10D	0.05	0.55	25480	0.036	1830	20380	0.026	1060	15290	0.023	705	10190	0.020	410
2	≤ 12D	0.04	0.49	22290	0.032	1400	17830	0.020	710	13380	0.018	470	8920	0.015	275
	> 12D	0.03	0.44	19110	0.027	1030	15290	0.015	450	11460	0.013	295	7640	0.011	175
	≤ 6D	0.10	0.87	23890	0.060	2870	19110	0.054	2060	14330	0.048	1375	9550	0.042	800
	≤ 8D	0.09	0.81	21500	0.054	2320	17200	0.044	1500	12900	0.039	1005	8600	0.034	585
	≤ 10D	0.07	0.74	19110	0.048	1830	15290	0.035	1060	11460	0.031	705	7640	0.027	410
	≤ 12D	0.06	0.65	16720	0.042	1400	13380	0.026	710	10030	0.024	470	6690	0.021	275
	> 12D	0.05	0.59	14330	0.036	1030	11460	0.019	450	8600	0.017	295	5730	0.015	175



	α	n (rpm)	Vf (mm/min)
	45°	x 1.65	x 1.65
	30°	x 1.30	x 1.30
	15°	x 1.15	x 1.15

INFO
TYPHOON TA-HTA-4HTA
TYPHOON PU-HPU
TYPHOON SUH
TYPHOON ALH
TYPHOON HRC
TYPHOON SUH MINI
TYPHOON HL
C-SD-TA
LFTA
SUTA
HSS-HSS/CO DRILLS
G2
MDTA
HF VH/UP
MEF
ALU
MEX
UH
HSS/CO-HSSP END MILLS
CARBIDE BURRS

UHCSB2

	Material Group ISO 513		P3 P4 P5 K2 K3					P6 K4 H1 H4 H5					H2			H3		
	Hardness/Rm		< 45 HRC					45 - 55 HRC					55 - 60 HRC			60 - 65 HRC		
	ap x ae		0.05D x 0.2D					0.05D x 0.2D					0.05D x 0.2D			0.05D x 0.2D		
	Vc (m/min)		140-180					100-140					80-100			60-80		
D (mm)	D (eff.) (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)					
1	0.44	40000	0.009	720	38220	0.008	620	28660	0.007	410	22290	0.006	280					
1.5	0.65	33970	0.012	820	25480	0.011	550	19110	0.010	370	14860	0.008	250					
2	0.87	25480	0.012	610	19110	0.011	410	14330	0.010	280	11150	0.008	190					
2.5	1.09	20380	0.015	610	15290	0.014	410	11460	0.012	280	8920	0.011	190					
3	1.31	16990	0.018	610	12740	0.016	410	9550	0.014	280	7430	0.013	190					
4	1.74	12740	0.025	640	9550	0.023	430	7170	0.020	290	5570	0.018	190					
5	2.18	10190	0.032	650	7640	0.029	440	5730	0.026	290	4460	0.022	200					
6	2.62	8490	0.038	650	6370	0.034	440	4780	0.030	290	3720	0.027	200					
8	3.49	6370	0.048	610	4780	0.043	410	3580	0.038	270	2790	0.034	190					
10	4.36	5100	0.057	580	3820	0.051	390	2870	0.046	260	2230	0.040	180					
12	5.23	4250	0.067	570	3180	0.060	380	2390	0.054	260	1860	0.047	170					
14	6.10	3640	0.08	580	2730	0.072	390	2050	0.064	260	1590	0.056	180					
16	6.97	3180	0.095	600	2390	0.086	410	1790	0.076	270	1390	0.067	180					
18	7.85	2830	0.108	610	2120	0.097	410	1590	0.086	270	1240	0.076	190					
20	8.72	2550	0.108	550	1910	0.097	370	1430	0.086	250	1110	0.076	170					



COPYING

	α	n (rpm)	Vf (mm/min)
	15°	x 1.1	x 1.1

INFO

TYPHOON
TA-HTA-4HTATYPHOON
PU-HPUTYPHOON
SUHTYPHOON
ALHTYPHOON
HRCTYPHOON
SUH MINITYPHOON
HL

C-SD-TA

LFTA

SUTA

HSS-HSS/CO
DRILLS

G2

MDTA

HF VH/UP

MEF

ALU

MEX

UH

HSS/CO-HSSP
END MILLSCARBIDE
BURRS

UH250

Material Group ISO 513		P3 P4 P5 K2 K3			P6 K4 H1 H4 H5			H2			H3		
Hardness/Rm		< 45 HRC			45 - 55 HRC			55 - 60 HRC			60 - 65 HRC		
ap x ae		0.05D x 0.2D			0.05D x 0.2D			0.05D x 0.2D			0.05D x 0.2D		
Vc (m/min)		120-160			90-130			70-90			50-70		
D (mm)	D (eff.) (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)
1	0.44	30000	0.015	900	30000	0.014	810	25480	0.012	610	19110	0.011	400
2	0.87	22290	0.021	950	17520	0.019	670	12740	0.017	430	9550	0.015	280
3	1.31	14860	0.027	810	11680	0.024	570	8490	0.022	370	6370	0.019	240
4	1.74	11150	0.037	820	8760	0.033	580	6370	0.029	370	4780	0.026	240
5	2.18	8920	0.045	800	7010	0.041	570	5100	0.036	370	3820	0.032	240
6	2.62	7430	0.051	760	5840	0.046	540	4250	0.041	350	3180	0.036	230
8	3.49	5570	0.060	660	4380	0.054	470	3180	0.048	300	2390	0.042	200
10	4.36	4460	0.068	610	3500	0.061	430	2550	0.054	280	1910	0.048	180
12	5.23	3720	0.077	570	2920	0.069	400	2120	0.061	260	1590	0.054	170
14	6.10	3180	0.089	570	2500	0.080	400	1820	0.071	260	1360	0.062	170
16	6.97	2790	0.102	570	2190	0.092	400	1590	0.082	260	1190	0.071	170
18	7.85	2480	0.115	570	1950	0.103	400	1420	0.092	260	1060	0.080	170
20	8.72	2230	0.132	590	1750	0.119	420	1270	0.106	270	960	0.092	180



α	n (rpm)	Vf (mm/min)
30°	x 0.8	x 0.8
15°	x 0.7	x 0.7
0°	x 0.6	x 0.6



INFO
TYPHOON TA-HTA-4HTA
TYPHOON PU-HPU
TYPHOON SUH
TYPHOON ALH
TYPHOON HRC
TYPHOON SUH MINI
TYPHOON HL
C-SD-TA
LFTA
SUTA
HSS-HSS/CO DRILLS
G2
MDTA
HF VH/UP
MEF
ALU
MEX
UH
HSS/CO-HSSP END MILLS
CARBIDE BURRS

UH253

Material Group ISO 513		P3 P4 P5 K2 K3			P6 K4 H1 H4 H5			H2			H3		
Hardness/Rm		< 45 HRC			45 - 55 HRC			55 - 60 HRC			60 - 65 HRC		
ap x ae		0.05D x 0.2D			0.05D x 0.2D			0.05D x 0.2D			0.05D x 0.2D		
Vc (m/min)		110-150			80-120			60-80			40-60		
D (mm)	D (eff.) (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)
1	0.44	30000	0.021	1280	30000	0.019	1150	22290	0.017	760	15920	0.015	470
2	0.87	20700	0.021	880	15920	0.019	610	11150	0.017	380	7960	0.015	240
3	1.31	13800	0.027	750	10620	0.024	520	7430	0.022	320	5310	0.019	200
4	1.74	10350	0.037	760	7960	0.033	520	5570	0.029	330	3980	0.026	200
5	2.18	8280	0.045	750	6370	0.041	520	4460	0.036	320	3180	0.032	200
6	2.62	6900	0.051	700	5310	0.046	490	3720	0.041	300	2650	0.036	190
8	3.49	5180	0.060	620	3980	0.054	430	2790	0.048	270	1990	0.042	170
10	4.36	4140	0.068	560	3180	0.061	390	2230	0.054	240	1590	0.048	150
12	5.23	3450	0.077	530	2650	0.069	360	1860	0.061	230	1330	0.054	140
14	6.10	2960	0.089	530	2270	0.080	360	1590	0.071	230	1140	0.062	140
16	6.97	2590	0.102	530	1990	0.092	370	1390	0.082	230	1000	0.071	140
18	7.85	2300	0.115	530	1770	0.103	370	1240	0.092	230	880	0.080	140
20	8.72	2070	0.132	550	1590	0.119	380	1110	0.106	230	800	0.092	150



α	n (rpm)	Vf (mm/min)
30°	x 0.8	x 0.8
15°	x 0.7	x 0.7
0°	x 0.6	x 0.6



INFO
TYPHOON TA-HTA-4HTA
TYPHOON PU-HPU
TYPHOON SUH
TYPHOON ALH
TYPHOON HRC
TYPHOON SUH MINI
TYPHOON HL
C-SD-TA
LFTA
SUTA
HSS-HSS/CO DRILLS
G2
MDTA
HF VH/UP
MEF
ALU
MEX
UH
HSS/CO-HSSP END MILLS
CARBIDE BURRS

HSS END MILLS


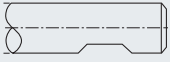


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🇮🇹 Legenda 🇩🇪 Verzeichnis 🇫🇷 Légende 🇪🇸 Leyenda 🇷🇺 Условные обозначения

STOCK		
●	<ul style="list-style-type: none"> 🇩🇪 stock standard 🇮🇹 stock standard 🇩🇪 Standard Lager 	<ul style="list-style-type: none"> 🇫🇷 stock standard 🇪🇸 stock estándar 🇷🇺 складская позиция
○	<ul style="list-style-type: none"> 🇩🇪 non-standard stock 🇮🇹 stock non standard 🇩🇪 nicht Standard Lager 	<ul style="list-style-type: none"> 🇫🇷 stock non standard 🇪🇸 stock no estándar 🇷🇺 не складская позиция
▽	<ul style="list-style-type: none"> 🇩🇪 stock exhaustion 🇮🇹 esaurimento stock 🇩🇪 Vorraterschöpfung 	<ul style="list-style-type: none"> 🇫🇷 épuisement du stock 🇪🇸 agotamiento de stock 🇷🇺 складские остатки




🇩🇪 APPLICATION GUIDELINES 🇮🇹 INDICAZIONI PER L'APPLICAZIONE 🇩🇪 LEITFADEN ZUR ANWENDUNG 🇫🇷 INDICATIONS POUR L'APPLICATION 🇪🇸 INDICACIONES PARA SU APLICACIÓN 🇷🇺 УКАЗАНИЯ ПО ПРИМЕНЕНИЮ		
★	<ul style="list-style-type: none"> 🇩🇪 1st choice 🇮🇹 1° scelta 🇩🇪 1. Wahl 	<ul style="list-style-type: none"> 🇫🇷 1er choix 🇪🇸 1ª elección 🇷🇺 1-й выбор
☆	<ul style="list-style-type: none"> 🇩🇪 suitable 🇮🇹 adatto 🇩🇪 geeignet 	<ul style="list-style-type: none"> 🇫🇷 adapté 🇪🇸 adecuado 🇷🇺 пригоден



🇩🇪 SHANK 🇮🇹 ATTACCO 🇩🇪 SCHAFT 🇫🇷 QUEUE 🇪🇸 MANGO 🇷🇺 ХВОСТОВИК		
	<ul style="list-style-type: none"> 🇩🇪 cylindrical shank 🇮🇹 attacco cilindrico 🇩🇪 zylindrischer Schaft 	<ul style="list-style-type: none"> 🇫🇷 queue cylindrique 🇪🇸 mango cilíndrico 🇷🇺 цилиндрическое крепление
	Weldon	

🇩🇪 MILLING STRATEGY 🇮🇹 STRATEGIA DI FRESATURA 🇩🇪 FRÄSSTRATEGIE 🇫🇷 STRATÉGIES DE FRAISAGE 🇪🇸 ESTRATEGIA DE FRESADO 🇷🇺 СТРАТЕГИЯ ФРЕЗЕРОВАНИЯ		
	<ul style="list-style-type: none"> 🇩🇪 slotting 🇮🇹 fresatura di cave 🇩🇪 Nutfräsen 	<ul style="list-style-type: none"> 🇫🇷 fraisage de pièce taillée dans la masse 🇪🇸 fresado de una sola pieza 🇷🇺 фрезерование пазов
	<ul style="list-style-type: none"> 🇩🇪 side milling 🇮🇹 contornatura 🇩🇪 Konturfräsen 	<ul style="list-style-type: none"> 🇫🇷 contournage 🇪🇸 perfiladura 🇷🇺 фрезерование по контуру
	<ul style="list-style-type: none"> 🇩🇪 copying 🇮🇹 copiatura 🇩🇪 Kopieren 	<ul style="list-style-type: none"> 🇫🇷 copiage 🇪🇸 copia 🇷🇺 копирование
	<ul style="list-style-type: none"> 🇩🇪 drilling 🇮🇹 foratura 🇩🇪 Bohren 	<ul style="list-style-type: none"> 🇫🇷 perçage 🇪🇸 perforación 🇷🇺 сверление

🇮🇹 Legenda 🇩🇪 Verzeichnis 🇫🇷 Légende 🇪🇸 Leyenda 🇷🇺 Условные обозначения

🇬🇧 MILLING STRATEGY 🇮🇹 STRATEGIA DI FRESATURA 🇩🇪 FRÄSSTRATEGIE 🇫🇷 STRATÉGIES DE FRAISAGE 🇪🇸 ESTRATEGIA DE FRESADO 🇷🇺 СТРАТЕГИЯ ФРЕЗЕРОВАНИЯ		
	🇬🇧 rounding 🇮🇹 raggatura concava 🇩🇪 Konkavradius	🇫🇷 rayon concave 🇪🇸 redondeo cóncavo 🇷🇺 кругление
	dovetail A	
	dovetail B	
	🇬🇧 T slot 🇮🇹 cave a T 🇩🇪 T Nut	🇫🇷 rainure en T 🇪🇸 ranurado en T 🇷🇺 обработка T-образного паза
	Woodruff	



🇬🇧 APPLICATION RANGE 🇮🇹 GAMMA DI APPLICAZIONE 🇩🇪 ANWENDUNGSBEREICH 🇫🇷 GAMME D'APPLICATION 🇪🇸 RANGO DE APLICACIÓN 🇷🇺 ОБЛАСТЬ ПРИМЕНЕНИЯ		
	🇬🇧 general purpose 🇮🇹 uso generico 🇩🇪 allgemeine Anwendung	🇫🇷 applications génériques 🇪🇸 uso genérico 🇷🇺 общего назначения
	🇬🇧 HSSP high performance 🇮🇹 HSSP alto rendimento 🇩🇪 HSSP hochleistung	🇫🇷 HSSP haute performance 🇪🇸 HSSP alto rendimiento 🇷🇺 Высокопроизводительная быстрорежущая сталь
	🇬🇧 for aluminium 🇮🇹 per alluminio 🇩🇪 für Aluminium	🇫🇷 pour aluminium 🇪🇸 para aluminio 🇷🇺 для алюминия


🇬🇧 TYPE 🇮🇹 TIPO 🇩🇪 TYP 🇫🇷 TYPE 🇪🇸 TIPO 🇷🇺 ТИП		
	🇬🇧 sharp corner 🇮🇹 spigolo vivo 🇩🇪 scharfe Kante	🇫🇷 arête vive 🇪🇸 arista viva 🇷🇺 острая кромка
	🇬🇧 ball nose 🇮🇹 raggata 🇩🇪 runder Stirn	🇫🇷 bout hémisphérique 🇪🇸 fresa de bola 🇷🇺 сферическая

🇮🇹 Legenda 🇩🇪 Verzeichnis 🇫🇷 Légende 🇪🇸 Leyenda 🇷🇺 Условные обозначения































✚ NR. OF FLUTES 🇮🇹 N. DI TAGLIENTI 🇩🇪 ANZAHL DER SCHNEIDEN 🇫🇷 NOMBRE DE DENTS 🇪🇸 N. DE LABIOS 🇷🇺 КОЛИЧЕСТВО РЕЖУЩИХ КРОМОК		
 <p>Z2</p>	<p>✚ 2 flutes 🇮🇹 2 taglienti 🇩🇪 2 Schneiden</p>	<p>🇫🇷 2 arêtes de coupe 🇪🇸 2 filos 🇷🇺 2 зуба</p>
 <p>Z3</p>	<p>✚ 3 flutes 🇮🇹 3 taglienti 🇩🇪 3 Schneiden</p>	<p>🇫🇷 3 arêtes de coupe 🇪🇸 3 filos 🇷🇺 3 зуба</p>
 <p>Z4</p>	<p>✚ 4 flutes 🇮🇹 4 taglienti 🇩🇪 4 Schneiden</p>	<p>🇫🇷 4 arêtes de coupe 🇪🇸 4 filos 🇷🇺 4 зуба</p>
 <p>Z6</p>	<p>✚ 6 flutes 🇮🇹 6 taglienti 🇩🇪 6 Schneiden</p>	<p>🇫🇷 6 arêtes de coupe 🇪🇸 6 filos 🇷🇺 6 зубьев</p>
 <p>Z>6</p>	<p>✚ >6 flutes 🇮🇹 >6 taglienti 🇩🇪 >6 Schneiden</p>	<p>🇫🇷 >6 arêtes de coupe 🇪🇸 >6 filos 🇷🇺 >6 зубьев</p>

✚ CHIPBREAKER STYLE 🇮🇹 TIPO DI ROMPIRUCIOLO 🇩🇪 SPÄNEBRECHER TYP 🇫🇷 TYPE DE BRISE-COPEAUX 🇪🇸 TIPO DE ROMPEVIRUTAS 🇷🇺 ТИП СТРУЖКОЛОМА		
 <p>NR COARSE</p>	<p>✚ roughing coarse pitch 🇮🇹 sgrossare passo grosso 🇩🇪 Schruppfräser Regelgewinde</p>	<p>🇫🇷 ébauche pas gros 🇪🇸 desbaste paso grueso 🇷🇺 черновая с крупным шагом</p>
 <p>HR FINE</p>	<p>✚ roughing fine pitch 🇮🇹 sgrossare passo fine 🇩🇪 Schruppfräser Feingewinde</p>	<p>🇫🇷 ébauche pas fin 🇪🇸 desbaste paso fino 🇷🇺 черновая с мелким шагом</p>

✚ MATERIAL 🇮🇹 MATERIALE 🇩🇪 WERKSTOFF 🇫🇷 MATIÈRE 🇪🇸 MATERIAL 🇷🇺 МАТЕРИАЛ		
 <p>HSS/Co ...</p>	<p>✚ high speed steel 5%÷8% Co 🇮🇹 acciaio super rapido 5%÷8% Co 🇩🇪 Hochleistungsschnellschnittstahl 5%÷8% Co</p>	<p>🇫🇷 acier rapide 5%÷8% Co 🇪🇸 acero súper rápido 5%÷8% Co 🇷🇺 быстрорежущая сталь с кобальтом 5÷8%</p>
 <p>HSS-P ...</p>	<p>✚ powder steel 🇮🇹 acciaio sinterizzato 🇩🇪 Sinterstahl</p>	<p>🇫🇷 acier fritté 🇪🇸 acero sinterizado 🇷🇺 порошковая сталь</p>

✚ SURFACE TREATMENT 🇮🇹 TRATTAMENTO SUPERFICIALE 🇩🇪 OBERFLÄCHENBEHANDLUNG 🇫🇷 TRAITEMENT DE SURFACE 🇪🇸 TRATAMIENTO SUPERFICIAL 🇷🇺 ОБРАБОТКА ПОВЕРХНОСТИ		
 <p>... BR</p>	<p>✚ uncoated 🇮🇹 non rivestito 🇩🇪 unbeschichtet</p>	<p>🇫🇷 non revêtu 🇪🇸 no revestido 🇷🇺 без покрытия</p>

 Legenda
  Verzeichnis
  Légende
  Leyenda
  Условные обозначения










 COATINGS  RIVESTIMENTI  BESCHICHTUNGEN  REVÊTEMENTS  RECUBRIMIENTOS  ПОКРЫТИЕ		
		<div style="border: 1px solid black; padding: 2px; text-align: center;"> ... PV200 </div>
 hardness (HV)  durezza (HV)  Härte (HV)	 dureté (HV)  dureza (HV)  твёрдость (HV)	3300
 friction coefficient  coefficiente d'attrito  Reibungskoeffizient	 coefficient de frottement  coeficiente de rozamiento  коэффициент трения	0.3
 thickness (μ)  spessore (μ)  dicke (μ)	 épaisseur (μ)  espesor (μ)  толщина (мкм)	3
 max working temperature (°C)  temperatura max (°C)  höchste Temperatur (°C)	 température maximale (°C)  temperatura máx (°C)  макс. температура (°C)	950

	ITEM No.	PAGE	
HSS/Co - HSSP general purpose, square	WS2	658	
	TAWS2	658	
	UMWS2	658	
	WL2	661	
	TAWL2	661	
	WSA2	663	
	WS3	665	
	TAWS3	665	
	WL3	667	
	TAWL3	667	
	TAWSH3	669	
	WS4(6)	671	
	TAWS4(6)	671	
	UMWS4	671	
	WL4(6)	673	
TAWL4(6)	673		
HSS/Co - HSSP general purpose, roughing	TAWSR	675	
	WSFR	677	
	TAWSFR	677	
	UMWSFR	677	
	WLFR	679	
	TAWLFR	679	
HSS/Co general purpose, ball nose	WSB2	681	
	TAWSB2	681	
	WLB2	683	
	TAWLB2	683	

RANGE	NORM	TYPE	MATERIAL / COATING	HELIX ANGLE	GEOMETRY	Z	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H
1-30	DIN 327	N	HSS/Co BR	30°	SQUARE	2	★	☆	★	☆		
1-25	DIN 327	N	HSS/Co PV200	30°	SQUARE	2	★	☆	★	☆		
2-20	DIN 327	UM	HSSP PV200	30°	SQUARE	2	★	★	★			
3-30	DIN 844	N	HSS/Co BR	30°	SQUARE	2	★	☆	★	☆		
3-20	DIN 844	N	HSS/Co PV200	30°	SQUARE	2	★	☆	★	☆		
2-20	DIN 844	ALU	HSS/Co BR	42°	SQUARE	2				★		
1-32	DIN 844	N	HSS/Co BR	30°	SQUARE	3	★	☆	★	☆		
1-25	DIN 844	N	HSS/Co PV200	30°	SQUARE	3	★	☆	★	☆		
3-25	DIN 844	N	HSS/Co BR	30°	SQUARE	3	★	☆	★	☆		
3-20	DIN 844	N	HSS/Co PV200	30°	SQUARE	3	★	☆	★	☆		
6-20	DIN 844	N	HSS/Co PV200	45°	SQUARE	3	★	☆	★	☆		
2-30	DIN 844	N	HSS/Co BR	30°	SQUARE	4-6	★	☆	★	☆		
2-40	DIN 844	N	HSS/Co PV200	30°	SQUARE	4-6	★	☆	★	☆		
3-20	DIN 844	UM	HSSP PV200	30°	SQUARE	4	★	★	★			
3-25	DIN 844	N	HSS/Co BR	30°	SQUARE	4-6	★	☆	★	☆		
3-40	DIN 844	N	HSS/Co PV200	30°	SQUARE	4-6	★	☆	★	☆		
6-20	DIN 844	N - NR	HSS/Co PV200	30°	SQUARE	3-4	★	☆	★	☆		
6-20	DIN 844	N - HR	HSS/Co BR	30°	SQUARE	3-4	★	☆	★	☆		
6-40	DIN 844	N - HR	HSS/Co PV200	30°	SQUARE	3-6	★	☆	★	☆		
6-20	DIN 844	UM - HR	HSSP PV200	30°	SQUARE	3-4	★	★	★			
6-20	DIN 844	N - HR	HSS/Co BR	30°	SQUARE	3-4	★	☆	★	☆		
6-40	DIN 844	N - HR	HSS/Co PV200	30°	SQUARE	3-6	★	☆	★	☆		
2-30	DIN 327	N	HSS/Co BR	30°	BALL NOSE	2	★	☆	★	☆		
2-20	DIN 327	N	HSS/Co PV200	30°	BALL NOSE	2	★	☆	★	☆		
3-20	DIN 1889	N	HSS/Co BR	30°	BALL NOSE	2	★	☆	★	☆		
3-20	DIN 1889	N	HSS/Co PV200	30°	BALL NOSE	2	★	☆	★	☆		

★ 1st choice ☆ suitable

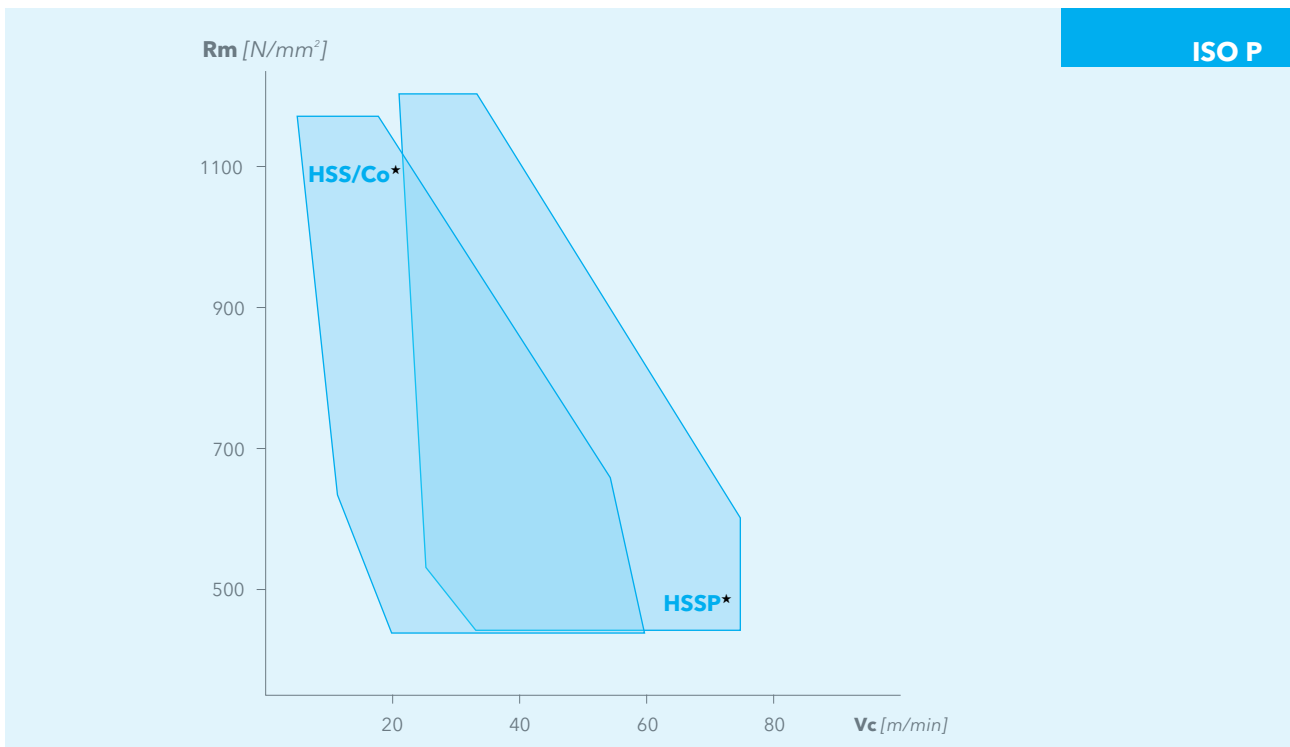


	ITEM No.	PAGE	
HSS/Co general purpose, shell	FM	685	
	TAFM	685	
	FFR	687	
HSS/Co general purpose, shell	TAFFR	687	
HSS/Co general purpose, corner rounding	WCR	689	
HSS/Co general purpose, dovetail	WDC	691	
	WDD	693	
HSS/Co general purpose, T-slot	WTM	695	
HSS/Co general purpose, woodruff	WWK	697	

RANGE	NORM	TYPE	MATERIAL / COATING	HELIX ANGLE	GEOMETRY	Z	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H
40-100	DIN 1880	N	HSS/Co BR	30°	SQUARE	8-10	★	☆	★	☆		
40-100	DIN 1880	N	HSS/Co PV200	30°	SQUARE	8-10	★	☆	★	☆		
40-100	DIN 1880	N - HR	HSS/Co BR	30°	SQUARE	6-10	★	☆	★	☆		
40-100	DIN 1880	N - HR	HSS/Co PV200	30°	SQUARE	6-10	★	☆	★	☆		
R1-R11	DIN 6518	N	HSS/Co BR	0°	RADIUS	4	★	☆	★	☆		
16-38	DIN 1833	N	HSS/Co BR	45°-60°	SQUARE	6-12	★	☆	★	☆		
16-38	DIN 1833	N	HSS/Co BR	45°-60°	SQUARE	6-12	★	☆	★	☆		
12.5-36	DIN 851	N	HSS/Co BR	15°	SQUARE	6-8	★	☆	★	☆		
10.5-32.5	DIN850	N	HSS/Co BR	10°	SQUARE	8-12	★	☆	★	☆		

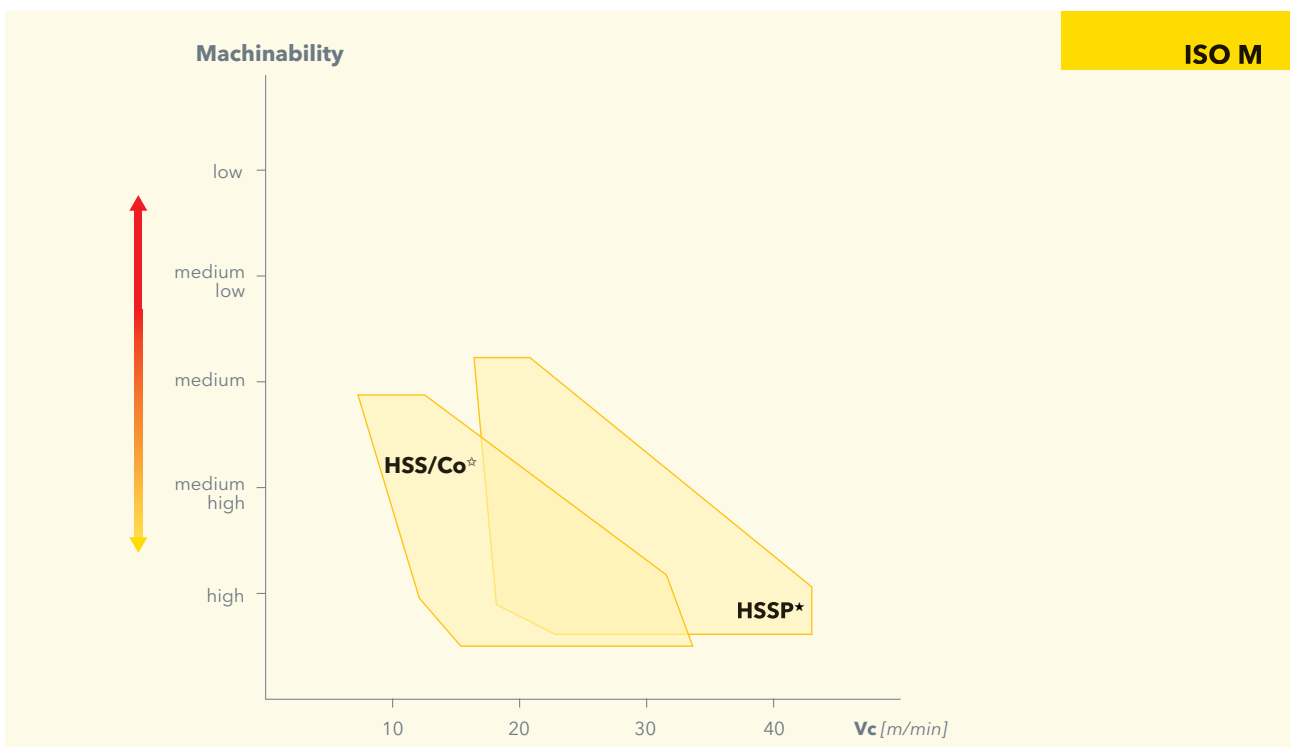
★ 1st choice ☆ suitable

STEEL APPLICATION



★ 1st choice ☆ suitable

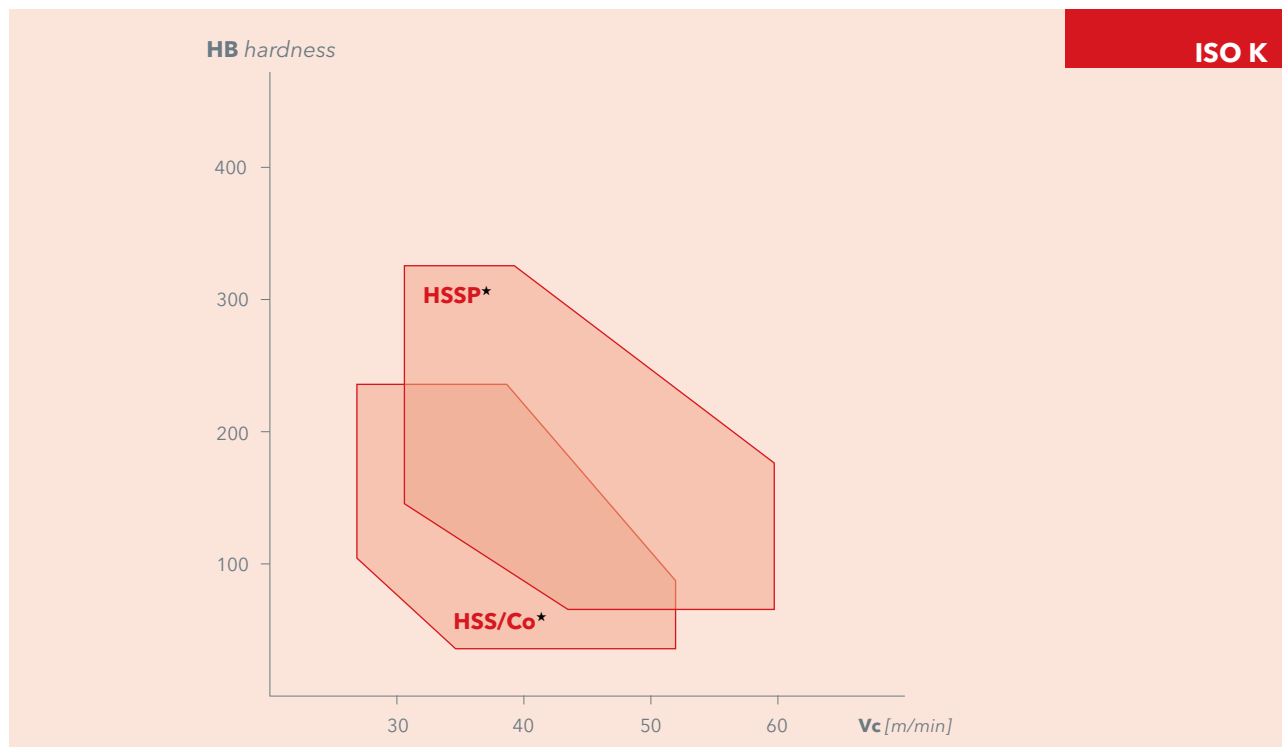
STAINLESS STEEL APPLICATION



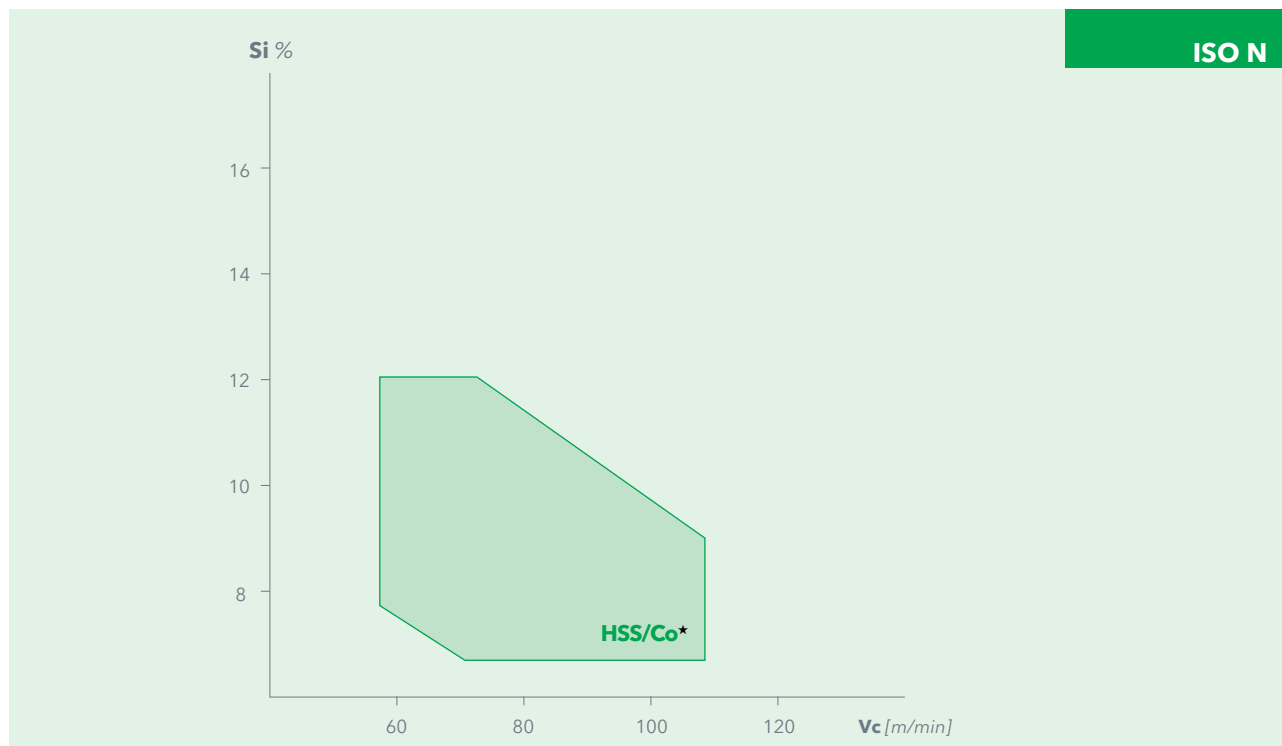
HSS/Co : general purpose (page 658)
 HSSP : high performance (page 658)

★ 1st choice ☆ suitable

CAST IRON APPLICATION



NON-FERROUS MATERIALS APPLICATION



HSS/Co : general purpose (page 658)
 HSSP : high performance (page 658)



HSS/CO - HSSP

GENERAL PURPOSE

🇺🇸 The Osawa catalogue includes a wide range of HSS/Co - HSSP end mills, both coated and uncoated.

🇮🇹 Il catalogo Osawa include un'ampia scelta di frese in HSS/Co - HSSP nudo e rivestito.

🇩🇪 Der Osawa Katalog umfasst eine große Auswahl an beschichteten und unbeschichteten Fräsern aus HSS/Co - HSSP.

🇫🇷 Le catalogue Osawa inclut une large gamme de fraises en HSS/Co - HSSP, soit revêtues, soit non revêtues.

🇪🇸 El catálogo Osawa incluye una amplia variedad de fresas de HSS/Co - HSSP con o sin recubrimiento.

🇷🇺 В каталоге Osawa также представлена широкая гамма концевых фрез изготовленных из HSS/Co - HSSP с покрытием и без покрытия.

INFO
TYPHOON TA-HTA-4HTA
TYPHOON PU-HPU
TYPHOON SUH
TYPHOON ALH
TYPHOON HRC
TYPHOON SUH MINI
TYPHOON HL
C-SD-TA
LFTA
SUTA
HSS-HSS/CO DRILLS
G2
MDTA
HF VH/UP
MEF
ALU
MEX
UH
HSS/CO-HSSP END MILLS
CARBIDE BURRS

WS2-TAWS2-UMWS2

weldon shank, 2 flutes

DIN 327
N
HSS/Co BR
HSS/Co PV200
30°
SQUARE
ZZ

WS2/TAWS2 WS2 TAWS2



WS2



TAWS2

UM
HSS-P PV200

UMWS2

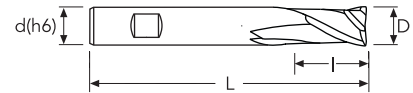


UMWS2

P	M	K	N	S	H
★	☆	★	☆		
★	★	★			

WS2-TAWS2
UMWS2

★ 1st choice ☆ suitable



D(e8)	D Tol.	d(h6)	l	l1	L	z	WS2		TAWS2		UMWS2	
							EDP No.	Stock	EDP No.	Stock	EDP No.	Stock
1	-0.014/-0.028	6	2.5		47	2	WS2010	●	TAWS2010	●		
1.5	-0.014/-0.028	6	3		47	2	WS2015	●	TAWS2015	●		
2	-0.014/-0.028	6	4		48	2	WS2020	●	TAWS2020	●	UMWS2020	●
2.5	-0.014/-0.028	6	5		49	2	WS2025	●	TAWS2025	●		
3	-0.014/-0.028	6	5		49	2	WS2030	●	TAWS2030	●	UMWS2030	●
3.5	-0.020/-0.038	6	6		50	2	WS2035	●	TAWS2035	●		
4	-0.020/-0.038	6	7		51	2	WS2040	●	TAWS2040	●	UMWS2040	●
4.5	-0.020/-0.038	6	7		51	2	WS2045	●	TAWS2045	●		
5	-0.020/-0.038	6	8		52	2	WS2050	●	TAWS2050	●	UMWS2050	●
5.5	-0.020/-0.038	6	8		52	2	WS2055	●	TAWS2055	●		
6	-0.020/-0.038	6	8		52	2	WS2060	●	TAWS2060	●	UMWS2060	●
6.5	-0.025/-0.047	10	10		60	2	WS2065	●	TAWS2065	●		
7	-0.025/-0.047	10	10		60	2	WS2070	●	TAWS2070	●		
7.5	-0.025/-0.047	10	10		60	2	WS2075	●	TAWS2075	●		
8	-0.025/-0.047	10	11		61	2	WS2080	●	TAWS2080	●	UMWS2080	●
8.5	-0.025/-0.047	10	11		61	2	WS2085	●	TAWS2085	●		
9	-0.025/-0.047	10	11		61	2	WS2090	●	TAWS2090	●		
9.5	-0.025/-0.047	10	11		61	2	WS2095	●	TAWS2095	●		
10	-0.025/-0.047	10	13		63	2	WS2100	●	TAWS2100	●	UMWS2100	●
10.5	-0.032/-0.059	12	13		70	2	WS2105	●	TAWS2105	●		
11	-0.032/-0.059	12	13		70	2	WS2110	●	TAWS2110	●		
11.5	-0.032/-0.059	12	13		70	2	WS2115	●	TAWS2115	●		
12	-0.032/-0.059	12	16		73	2	WS2120	●	TAWS2120	●	UMWS2120	●
12.5	-0.032/-0.059	12	16		73	2	WS2125	●	TAWS2125	●		
13	-0.032/-0.059	12	16		73	2	WS2130	●	TAWS2130	●		
13.5	-0.032/-0.059	12	16		73	2	WS2135	●	TAWS2135	●		
14	-0.032/-0.059	12	16		73	2	WS2140	●	TAWS2140	●	UMWS2140	●
15	-0.032/-0.059	12	16		73	2	WS2150	●	TAWS2150	●		
16	-0.032/-0.059	16	19		79	2	WS2160	●	TAWS2160	●	UMWS2160	●
17	-0.032/-0.059	16	19		79	2	WS2170	●	TAWS2170	●		
18	-0.032/-0.059	16	19		79	2	WS2180	●	TAWS2180	●	UMWS2180	●
19	-0.040/-0.073	16	19		79	2	WS2190	●	TAWS2190	●		
20	-0.040/-0.073	20	22		88	2	WS2200	●	TAWS2200	●	UMWS2200	●
22	-0.040/-0.073	20	22		88	2	WS2220	●	TAWS2220	●		
24	-0.040/-0.073	25	26		102	2	WS2240	●				
25	-0.040/-0.073	25	26		102	2	WS2250	●	TAWS2250	●		
26	-0.040/-0.073	25	26		102	2	WS2260	●				
28	-0.040/-0.073	25	26		102	2	WS2280	●				
30	-0.040/-0.073	25	26		102	2	WS2300	●				

● stock standard ○ non-standard stock ▽ stock exhaustion

TAWS2

UMWS2 (n and Vf = +20%) - WS2 (n and Vf = -20% ÷ -30%)

	Material Group ISO 513	P1 P2			P3 M1 K1			P4 M2 K2			P5 M3		
	Hardness/Rm	≤ 700 N/mm ²			600-800 N/mm ²			800-1000 N/mm ²			900-1200 N/mm ²		
	ap x ae	0.5D x D			0.5D x D			0.5D x D			0.5D x D		
	Vc (m/min)	40-60			30-50			25-35			15-25		
D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	
1	15920	0.003	90	12740	0.003	60	9550	0.002	40	6370	0.002	20	
2	7960	0.006	95	6370	0.005	70	4780	0.005	45	3180	0.004	25	
3	5310	0.009	95	4250	0.008	70	3180	0.007	45	2120	0.006	25	
4	3980	0.013	105	3180	0.012	75	2390	0.010	45	1590	0.009	30	
5	3180	0.017	110	2550	0.015	80	1910	0.013	50	1270	0.012	30	
6	2650	0.022	115	2120	0.020	85	1590	0.017	50	1060	0.015	35	
8	1990	0.032	125	1590	0.029	90	1190	0.024	55	800	0.022	35	
10	1590	0.040	125	1270	0.036	90	960	0.030	60	640	0.028	35	
12	1330	0.048	130	1060	0.043	90	800	0.036	60	530	0.034	35	
14	1140	0.057	130	910	0.051	95	680	0.043	60	450	0.040	35	
16	1000	0.067	135	800	0.060	95	600	0.050	60	400	0.047	40	
18	880	0.077	135	710	0.069	100	530	0.058	60	350	0.054	40	
20	800	0.088	140	640	0.079	100	480	0.066	65	320	0.062	40	
22	720	0.098	140	580	0.088	100	430	0.074	65	290	0.069	40	
24	660	0.105	140	530	0.095	100	400	0.079	65	270	0.074	40	
25	640	0.110	140	510	0.099	100	380	0.083	65	250	0.077	40	
26	610	0.116	140	490	0.104	100	370	0.087	65	240	0.081	40	
28	570	0.122	140	450	0.110	100	340	0.092	60	230	0.085	40	
30	530	0.128	135	420	0.115	95	320	0.096	60	210	0.090	40	
ap x ae	≤ D3	0.25D x D											

	Material Group ISO 513	P1 P2			P3 M1 K1			P4 M2 K2			P5 M3		
	Hardness/Rm	≤ 700 N/mm ²			600-800 N/mm ²			800-1000 N/mm ²			900-1200 N/mm ²		
	ap x ae	1.5D x 0.5D			1.5D x 0.5D			1.5D x 0.3D			1.5D x 0.3D		
	Vc (m/min)	50-70			40-60			25-35			20-30		
D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	
1	19110	0.003	130	15920	0.003	100	11150	0.003	60	7960	0.004	60	
2	9550	0.007	140	7960	0.006	100	5570	0.006	60	3980	0.008	60	
3	6370	0.007	90	5310	0.006	70	3720	0.006	45	2650	0.005	25	
4	4780	0.011	105	3980	0.010	75	2790	0.009	50	1990	0.008	30	
5	3820	0.016	120	3180	0.014	90	2230	0.012	55	1590	0.011	35	
6	3180	0.020	130	2650	0.018	95	1860	0.016	60	1330	0.014	40	
8	2390	0.026	125	1990	0.024	95	1390	0.021	60	1000	0.018	35	
10	1910	0.038	145	1590	0.035	110	1110	0.031	70	800	0.027	45	
12	1590	0.048	155	1330	0.043	115	930	0.038	70	660	0.034	45	
14	1360	0.058	155	1140	0.052	120	800	0.046	75	570	0.040	45	
16	1190	0.068	165	1000	0.062	125	700	0.055	75	500	0.048	50	
18	1060	0.080	170	880	0.072	125	620	0.064	80	440	0.056	50	
20	960	0.092	175	800	0.083	135	560	0.074	85	400	0.065	50	
22	870	0.106	185	720	0.095	135	510	0.084	85	360	0.074	55	
24	800	0.118	190	660	0.106	140	460	0.094	85	330	0.082	55	
25	760	0.126	190	640	0.113	145	450	0.101	90	320	0.088	55	
26	730	0.132	195	610	0.119	145	430	0.106	90	310	0.092	55	
28	680	0.139	190	570	0.125	145	400	0.111	90	280	0.097	55	
30	640	0.146	185	530	0.132	140	370	0.117	85	270	0.102	55	
ap x ae	≤ D3	1.5D x 0.25D		1.5D x 0.25D		1.2D x 0.1D			1.2D x 0.1D				

- INFO
- TYPHOON TA-HTA-4HTA
- TYPHOON PU-HPU
- TYPHOON SUH
- TYPHOON ALH
- TYPHOON HRC
- TYPHOON SUH MINI
- TYPHOON HL
- C-SD-TA
- LFTA
- SUTA
- HSS-HSS/CO DRILLS
- G2
- MDTA
- HF VH/UP
- MEF
- ALU
- MEX
- UH
- HSS/CO-HSSP END MILLS
- CARBIDE BURRS

TAWS2

UMWS2 (n and Vf = +20%) - WS2 (n and Vf = -20% ÷ -30%)

Material Group ISO 513	P1 P2			P3 M1 K1			P4 M2 K2			P5 M3					
	Hardness/Rm			≤ 700 N/mm ²			600-800 N/mm ²			800-1000 N/mm ²			900-1200 N/mm ²		
	ap x ae			0.5D x D			0.5D x D			0.5D x D			0.5D x D		
	Vc (m/min)			30-50			25-35			20-30			12-18		
D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)			
3	4250	0.005	40	3180	0.003	15	2650	0.002	10	1590	0.002	5			
4	3180	0.007	40	2390	0.004	20	1990	0.003	15	1190	0.003	5			
5	2550	0.009	45	1910	0.006	20	1590	0.005	15	960	0.005	10			
6	2120	0.011	45	1590	0.008	25	1330	0.006	15	800	0.006	10			
8	1590	0.016	50	1190	0.010	25	1000	0.008	15	600	0.008	10			
10	1270	0.020	50	960	0.014	30	800	0.012	20	480	0.011	10			
12	1060	0.024	50	800	0.018	30	660	0.015	20	400	0.014	10			
14	910	0.029	50	680	0.022	30	570	0.018	20	340	0.017	10			
16	800	0.034	55	600	0.026	30	500	0.021	20	300	0.020	10			
18	710	0.039	55	530	0.030	30	440	0.025	20	270	0.023	15			
20	640	0.044	55	480	0.035	35	400	0.029	25	240	0.027	15			
22	580	0.049	55	430	0.040	35	360	0.033	25	220	0.031	15			
24	530	0.053	55	400	0.044	35	330	0.037	25	200	0.034	15			
25	510	0.055	55	380	0.047	35	320	0.039	25	190	0.037	15			
26	490	0.058	55	370	0.050	35	310	0.041	25	180	0.039	15			
28	450	0.061	55	340	0.052	35	280	0.044	25	170	0.041	15			
30	420	0.064	55	320	0.055	35	270	0.046	25	160	0.043	15			



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WL2-TAWL2

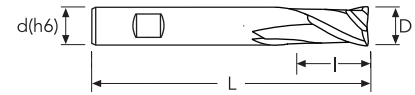
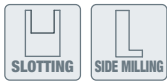
weldon shank, 2 flutes, long

DIN 844	N	HSS/Co BR	HSS/Co PV200	30°	SQUARE	ZZ
		WL2	TAWL2			



P	M	K	N	S	H
★	☆	★	☆		

★ 1st choice ☆ suitable



D(e8)	D Tol.	d(h6)	l	l1	L	z	WL2		TAWL2	
							EDP No.	Stock	EDP No.	Stock
3	-0.014/-0.028	6	8		56	2	WL2030	●	TAWL2030	●
4	-0.020/-0.038	6	11		63	2	WL2040	●	TAWL2040	●
5	-0.020/-0.038	6	13		68	2	WL2050	●	TAWL2050	●
6	-0.020/-0.038	6	13		68	2	WL2060	●	TAWL2060	●
7	-0.025/-0.047	10	16		80	2	WL2070	●		
8	-0.025/-0.047	10	19		88	2	WL2080	●	TAWL2080	●
9	-0.025/-0.047	10	19		88	2	WL2090	●		
10	-0.025/-0.047	10	22		95	2	WL2100	●	TAWL2100	●
11	-0.032/-0.059	12	22		102	2	WL2110	●		
12	-0.032/-0.059	12	26		110	2	WL2120	●	TAWL2120	●
13	-0.032/-0.059	12	26		110	2	WL2130	●		
14	-0.032/-0.059	12	26		110	2	WL2140	●	TAWL2140	●
15	-0.032/-0.059	12	26		110	2	WL2150	●		
16	-0.032/-0.059	16	32		123	2	WL2160	●	TAWL2160	●
18	-0.032/-0.059	16	32		123	2	WL2180	●	TAWL2180	●
20	-0.040/-0.073	20	38		141	2	WL2200	●	TAWL2200	●
22	-0.040/-0.073	20	38		141	2	WL2220	●		
24	-0.040/-0.073	25	45		166	2	WL2240	○		
25	-0.040/-0.073	25	45		166	2	WL2250	●		
28	-0.040/-0.073	25	45		166	2	WL2280	●		
30	-0.040/-0.073	25	45		166	2	WL2300	●		

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- MEF
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- MEX
- UH
- HSS/CO-HSSP END MILLS
- CARBIDE BURRS

● stock standard ○ non-standard stock ▽ stock exhaustion

TAWL2

WL2 (n and Vf = -20% ÷ -30%)

	Material Group ISO 513	P1 P2			P3 M1 K1			P4 M2 K2			P5 M3		
	Hardness/Rm	≤ 700 N/mm ²			600-800 N/mm ²			800-1000 N/mm ²			900-1200 N/mm ²		
	ap x ae	0.3D x D			0.3D x D			0.3D x D			0.2D x D		
	Vc (m/min)	30-50			25-35			20-30			12-18		
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)
	3	4250	0.006	50	3180	0.005	30	2650	0.005	25	1590	0.004	15
	4	3180	0.008	50	2390	0.007	35	1990	0.007	25	1190	0.006	15
	5	2550	0.011	55	1910	0.010	35	1590	0.009	25	960	0.008	15
	6	2120	0.014	60	1590	0.012	40	1330	0.011	30	800	0.010	15
	8	1590	0.020	65	1190	0.018	45	1000	0.016	30	600	0.015	20
	10	1270	0.025	65	960	0.023	45	800	0.020	30	480	0.019	20
	12	1060	0.030	65	800	0.027	45	660	0.024	30	400	0.023	20
	14	910	0.036	65	680	0.032	45	570	0.029	35	340	0.027	20
	16	800	0.042	70	600	0.038	45	500	0.034	35	300	0.032	20
18	710	0.048	70	530	0.043	45	440	0.038	35	270	0.036	20	
20	640	0.053	70	480	0.048	45	400	0.043	35	240	0.040	20	
22	580	0.060	70	430	0.054	45	360	0.048	35	220	0.045	20	
25	510	0.070	70	380	0.063	50	320	0.056	35	190	0.053	20	
28	450	0.077	70	340	0.069	45	280	0.062	35	170	0.058	20	
30	420	0.084	70	320	0.076	50	270	0.067	35	160	0.063	20	
ap x ae	≤ D5			0.25D x D									

	Material Group ISO 513	P1 P2			P3 M1 K1			P4 M2 K2			P5 M3		
	Hardness/Rm	≤ 700 N/mm ²			600-800 N/mm ²			800-1000 N/mm ²			900-1200 N/mm ²		
	ap x ae	2D x 0.1D			2D x 0.1D			2D x 0.1D			2D x 0.1D		
	Vc (m/min)	40-50			30-40			25-35			10-20		
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)
	3	4780	0.006	60	3720	0.006	40	3180	0.005	30	1590	0.005	10
	4	3580	0.009	65	2790	0.008	50	2390	0.007	30	1190	0.007	20
	5	2870	0.012	70	2230	0.011	50	1910	0.009	40	960	0.009	20
	6	2390	0.015	75	1860	0.014	50	1590	0.012	40	800	0.011	20
	8	1790	0.022	80	1390	0.020	60	1190	0.018	40	600	0.017	20
	10	1430	0.028	80	1110	0.025	60	960	0.022	40	480	0.021	20
	12	1190	0.033	80	930	0.030	60	800	0.027	40	400	0.025	20
	14	1020	0.040	80	800	0.036	60	680	0.032	40	340	0.030	20
	16	900	0.046	85	700	0.042	60	600	0.037	40	300	0.035	20
18	800	0.052	85	620	0.047	60	530	0.042	40	270	0.039	20	
20	720	0.059	85	560	0.053	60	480	0.047	40	240	0.044	20	
22	650	0.065	85	510	0.059	60	430	0.052	50	220	0.049	20	
25	570	0.077	90	450	0.069	60	380	0.062	50	190	0.058	20	
28	510	0.085	85	400	0.076	60	340	0.068	50	170	0.064	20	
30	480	0.092	90	370	0.083	60	320	0.074	50	160	0.069	20	
ap x ae	≤ D5			1.5D x 0.05D									

WSA2

	Material Group ISO 513	N1			N2			N3 N4			N5		
	Material	≤ 12% Si			> 12% Si			Non ferrous materials			Plastics		
	ap x ae	0.5D x D			0.5D x D			0.5D x D			0.5D x D		
	Vc (m/min)	90-110			70-90			60-80			100-140		
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)
2	15920	0.015	480	12740	0.014	345	11150	0.012	270	19110	0.018	690	
3	10620	0.020	425	8490	0.018	305	7430	0.016	240	12740	0.024	610	
4	7960	0.030	480	6370	0.027	345	5570	0.024	265	9550	0.036	690	
5	6370	0.035	445	5100	0.032	320	4460	0.028	250	7640	0.042	640	
6	5310	0.042	445	4250	0.038	320	3720	0.034	250	6370	0.050	640	
8	3980	0.056	445	3180	0.050	320	2790	0.045	250	4780	0.067	640	
10	3180	0.073	465	2550	0.066	335	2230	0.058	260	3820	0.088	670	
12	2650	0.090	475	2120	0.081	345	1860	0.072	270	3180	0.108	685	
14	2270	0.106	480	1820	0.095	345	1590	0.085	270	2730	0.127	695	
16	1990	0.120	480	1590	0.108	345	1390	0.096	265	2390	0.144	690	
18	1770	0.135	480	1420	0.122	345	1240	0.108	270	2120	0.162	685	
20	1590	0.150	475	1270	0.135	345	1110	0.120	265	1910	0.180	690	
ap x ae	≤ D3	0.2D x D											

	Material Group ISO 513	N1			N2			N3 N4			N5		
	Material	≤ 12% Si			> 12% Si			Non ferrous materials			Plastics		
	ap x ae	1.5D x 0.5D			1.5D x 0.5D			1.5D x 0.5D			1.5D x 0.5D		
	Vc (m/min)	100-140			90-110			70-90			130-150		
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)
2	19110	0.018	690	15920	0.016	520	12740	0.014	370	22290	0.020	880	
3	12740	0.018	460	10620	0.016	345	8490	0.014	245	14860	0.013	375	
4	9550	0.024	460	7960	0.022	345	6370	0.019	245	11150	0.017	375	
5	7640	0.036	550	6370	0.032	415	5100	0.029	295	8920	0.025	450	
6	6370	0.042	535	5310	0.038	400	4250	0.034	285	7430	0.029	435	
8	4780	0.050	480	3980	0.045	360	3180	0.040	255	5570	0.035	395	
10	3820	0.067	515	3180	0.060	385	2550	0.054	275	4460	0.047	420	
12	3180	0.088	555	2650	0.079	420	2120	0.070	295	3720	0.061	455	
14	2730	0.108	590	2270	0.097	440	1820	0.086	315	3180	0.076	480	
16	2390	0.127	610	1990	0.114	455	1590	0.102	325	2790	0.089	495	
18	2120	0.144	610	1770	0.130	460	1420	0.115	325	2480	0.101	500	
20	1910	0.162	620	1590	0.146	465	1270	0.130	330	2230	0.113	505	
ap x ae	≤ D3	1.2D x 0.1D											

	Material Group ISO 513	N1			N2			N3 N4			N5		
	Material	≤ 12% Si			> 12% Si			Non ferrous materials			Plastics		
	ap x ae	0.5D x D			0.5D x D			0.5D x D			0.5D x D		
	Vc (m/min)	70-90			55-75			50-60			90-110		
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)
3	8490	0.010	170	6900	0.007	95	5840	0.006	70	10620	0.009	192	
4	6370	0.015	190	5180	0.009	95	4380	0.008	70	7960	0.012	192	
5	5100	0.018	180	4140	0.014	110	3500	0.012	85	6370	0.018	230	
6	4250	0.021	180	3450	0.016	110	2920	0.014	80	5310	0.021	224	
8	3180	0.028	180	2590	0.019	100	2190	0.017	75	3980	0.025	200	
10	2550	0.037	185	2070	0.025	105	1750	0.022	80	3180	0.034	214	
12	2120	0.045	190	1730	0.033	115	1460	0.029	85	2650	0.044	232	
14	1820	0.053	195	1480	0.041	120	1250	0.036	90	2270	0.054	246	
16	1590	0.060	190	1290	0.048	125	1090	0.042	90	1990	0.064	254	
18	1420	0.068	190	1150	0.054	125	970	0.048	95	1770	0.072	254	
20	1270	0.075	190	1040	0.061	125	880	0.054	95	1590	0.081	258	

WS3-TAWS3

weldon shank, 3 flutes

DIN 844	N	HSS/Co BR	HSS/Co PV200	30°	SQUARE	Z3
		WS3	TAWS3			



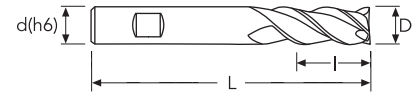
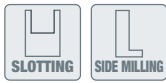
WS3



TAWS3

P	M	K	N	S	H
★	☆	★	☆		

★ 1st choice ☆ suitable



D(e8)	D Tol.	d(h6)	l	l1	L	z	WS3		TAWS3	
							EDP No.	Stock	EDP No.	Stock
1	-0.014/-0.028	6	3		47	3	WS3010	●	TAWS3010	○
1.5	-0.014/-0.028	6	7		51	3	WS3015	●	TAWS3015	○
2	-0.014/-0.028	6	7		51	3	WS3020	●	TAWS3020	●
2.5	-0.014/-0.028	6	8		52	3	WS3025	●	TAWS3025	●
3	-0.014/-0.028	6	8		52	3	WS3030	●	TAWS3030	●
3.5	-0.020/-0.038	6	10		54	3	WS3035	●	TAWS3035	●
4	-0.020/-0.038	6	11		55	3	WS3040	●	TAWS3040	●
4.5	-0.020/-0.038	6	11		55	3	WS3045	●	TAWS3045	●
5	-0.020/-0.038	6	13		57	3	WS3050	●	TAWS3050	●
5.5	-0.020/-0.038	6	13		57	3	WS3055	●	TAWS3055	●
6	-0.020/-0.038	6	13		57	3	WS3060	●	TAWS3060	●
6.5	-0.025/-0.047	10	16		66	3	WS3065	●	TAWS3065	●
7	-0.025/-0.047	10	16		66	3	WS3070	●	TAWS3070	●
8	-0.025/-0.047	10	19		69	3	WS3080	●	TAWS3080	●
8.5	-0.025/-0.047	10	19		69	3	WS3085	●	TAWS3085	●
9	-0.025/-0.047	10	19		69	3	WS3090	●	TAWS3090	●
10	-0.025/-0.047	10	22		72	3	WS3100	●	TAWS3100	●
11	-0.032/-0.059	12	22		79	3	WS3110	●	TAWS3110	●
12	-0.032/-0.059	12	26		83	3	WS3120	●	TAWS3120	●
13	-0.032/-0.059	12	26		83	3	WS3130	●	TAWS3130	●
14	-0.032/-0.059	12	26		83	3	WS3140	●	TAWS3140	●
15	-0.032/-0.059	12	26		83	3	WS3150	●	TAWS3150	●
16	-0.032/-0.059	16	32		92	3	WS3160	●	TAWS3160	●
18	-0.032/-0.059	16	32		92	3	WS3180	●	TAWS3180	●
20	-0.040/-0.073	20	38		104	3	WS3200	●	TAWS3200	●
22	-0.040/-0.073	20	38		104	3	WS3220	●	TAWS3220	●
25	-0.040/-0.073	25	45		121	3	WS3250	●	TAWS3250	●
30	-0.040/-0.073	25	45		121	3	WS3300	●		
32	-0.050/-0.089	32	53		133	3	WS3320	●		

- INFO
- TYPHOON TA-HTA-4HTA
- TYPHOON PU-HPU
- TYPHOON SUH
- TYPHOON ALH
- TYPHOON HRC
- TYPHOON SUH MINI
- TYPHOON HL
- C-SD-TA
- LFTA
- SUTA
- HSS-HSS/CO DRILLS
- G2
- MDTA
- HF VH/UP
- MEF
- ALU
- MEX
- UH
- HSS/CO-HSSP END MILLS
- CARBIDE BURRS

● stock standard ○ non-standard stock ▽ stock exhaustion

TAWS3

WS3 (n and Vf = -20% ÷ -30%)

Material Group ISO 513	P1 P2			P3 M1 K1			P4 M2 K2			P5 M3		
	Hardness/Rm			600-800 N/mm ²			800-1000 N/mm ²			900-1200 N/mm ²		
	ap x ae			0.3D x D			0.3D x D			0.3D x D		
	Vc (m/min)			40-60			30-50			25-35		
D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)
1	15920	0.003	120	12740	0.002	90	9550	0.002	50	6370	0.002	30
2	7960	0.005	130	6370	0.005	95	4780	0.004	60	3180	0.004	35
3	5310	0.008	130	4250	0.007	95	3180	0.006	60	2120	0.006	35
4	3980	0.012	140	3180	0.011	100	2390	0.009	65	1590	0.008	40
5	3180	0.015	145	2550	0.014	105	1910	0.011	65	1270	0.011	40
6	2650	0.020	155	2120	0.018	115	1590	0.015	70	1060	0.014	45
8	1990	0.029	170	1590	0.026	125	1190	0.022	75	800	0.020	50
10	1590	0.036	170	1270	0.032	125	960	0.027	80	640	0.025	50
12	1330	0.043	170	1060	0.039	125	800	0.032	80	530	0.030	50
14	1140	0.051	175	910	0.046	125	680	0.038	80	450	0.036	50
16	1000	0.060	180	800	0.054	130	600	0.045	80	400	0.042	50
18	880	0.069	185	710	0.062	135	530	0.052	85	350	0.049	50
20	800	0.079	190	640	0.071	135	480	0.059	85	320	0.055	55
22	720	0.088	190	580	0.079	140	430	0.066	85	290	0.062	55
25	640	0.099	190	510	0.089	135	380	0.074	85	250	0.069	50
28	570	0.122	210	450	0.110	150	340	0.092	95	230	0.085	60
30	530	0.128	205	420	0.115	145	320	0.096	90	210	0.090	55
32	500	0.136	200	400	0.116	140	300	0.095	90	200	0.095	60

ap x ae ≤ D3 0.2D x D

Material Group ISO 513	P1 P2			P3 M1 K1			P4 M2 K2			P5 M3		
	Hardness/Rm			600-800 N/mm ²			800-1000 N/mm ²			900-1200 N/mm ²		
	ap x ae			1.5D x 0.5D			1.5D x 0.5D			1.5D x 0.3D		
	Vc (m/min)			50-70			40-60			25-35		
D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)
1	19110	0.003	170	15920	0.003	130	11150	0.002	80	7960	0.003	80
2	9550	0.006	190	7960	0.006	140	5570	0.005	90	3980	0.007	90
3	6370	0.006	125	5310	0.006	95	3720	0.005	60	2650	0.005	35
4	4780	0.010	140	3980	0.009	105	2790	0.008	65	1990	0.007	40
5	3820	0.014	160	3180	0.013	120	2230	0.011	75	1590	0.010	45
6	3180	0.018	175	2650	0.017	130	1860	0.015	80	1330	0.013	50
8	2390	0.024	170	1990	0.021	130	1390	0.019	80	1000	0.017	50
10	1910	0.035	200	1590	0.031	150	1110	0.028	90	800	0.024	60
12	1590	0.043	205	1330	0.039	155	930	0.035	95	660	0.030	60
14	1360	0.052	210	1140	0.047	160	800	0.041	100	570	0.036	60
16	1190	0.062	220	1000	0.055	165	700	0.049	105	500	0.043	65
18	1060	0.072	230	880	0.065	170	620	0.058	110	440	0.051	65
20	960	0.083	240	800	0.075	180	560	0.067	110	400	0.058	70
22	870	0.095	250	720	0.086	185	510	0.076	115	360	0.067	70
25	760	0.113	260	640	0.102	195	450	0.091	120	320	0.079	75
28	680	0.139	285	570	0.125	215	400	0.111	135	280	0.097	80
32	600	0.146	265	500	0.132	200	350	0.117	125	250	0.102	75

ap x ae ≤ D3 1.5D x 0.25D 1.5D x 0.25D 1.2D x 0.1D 1.2D x 0.1D

INFO
TYPHOON TA-HTA-4HTA
TYPHOON PU-HPU
TYPHOON SUH
TYPHOON ALH
TYPHOON HRC
TYPHOON SUH MINI
TYPHOON HL
C-SD-TA
LFTA
SUTA
HSS-HSS/CO DRILLS
G2
MDTA
HF VH/UP
MEF
ALU
MEX
UH
HSS/CO-HSSP END MILLS
CARBIDE BURRS

WL3-TAWL3

weldon shank, 3 flutes, long

DIN 844	N	HSS/Co BR	HSS/Co PV200	30°	SQUARE	Z3
		WL3	TAWL3			



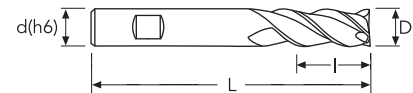
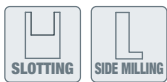
WL3



TAWL3

P	M	K	N	S	H
★	☆	★	☆		

★ 1st choice ☆ suitable



D(e8)	D(e8) Tol.	d(h6)	l	l1	L	z	WL3		TAWL3	
							EDP No.	Stock	EDP No.	Stock
3	-0.014/-0.028	6	12		56	3	WL3030	●	TAWL3030	●
4	-0.020/-0.038	6	19		63	3	WL3040	●	TAWL3040	●
5	-0.020/-0.038	6	24		68	3	WL3050	●	TAWL3050	●
6	-0.020/-0.038	6	24		68	3	WL3060	●	TAWL3060	●
8	-0.025/-0.047	10	38		88	3	WL3080	●	TAWL3080	●
10	-0.025/-0.047	10	45		95	3	WL3100	●	TAWL3100	●
12	-0.032/-0.059	12	53		110	3	WL3120	●	TAWL3120	●
14	-0.032/-0.059	12	53		110	3	WL3140	●	TAWL3140	●
16	-0.032/-0.059	16	63		123	3	WL3160	●	TAWL3160	●
18	-0.032/-0.059	16	63		123	3	WL3180	●	TAWL3180	●
20	-0.040/-0.073	20	75		141	3	WL3200	●	TAWL3200	●
22	-0.040/-0.073	20	75		141	3	WL3220	●		
25	-0.040/-0.073	25	90		166	3	WL3250	●		

- INFO
- TYPHOON TA-HTA-4HTA
- TYPHOON PU-HPU
- TYPHOON SUH
- TYPHOON ALH
- TYPHOON HRC
- TYPHOON SUH MINI
- TYPHOON HL
- C-SD-TA
- LFTA
- SUTA
- HSS-HSS/CO DRILLS
- G2
- MDTA
- HF VH/UP
- MEF
- ALU
- MEX
- UH
- HSS/CO-HSSP END MILLS
- CARBIDE BURRS

● stock standard ○ non-standard stock ▽ stock exhaustion

TAWL3

WL3 (n and Vf = -20% ÷ -30%)

	Material Group ISO 513	P1 P2			P3 M1 K1			P4 M2 K2			P5 M3		
	Hardness/Rm	≤ 700 N/mm ²			600-800 N/mm ²			800-1000 N/mm ²			900-1200 N/mm ²		
	ap x ae	0.3D x D			0.3D x D			0.3D x D			0.2D x D		
	Vc (m/min)	30-50			25-35			20-30			12-18		
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)
3	4250	0.006	70	3180	0.005	50	2650	0.005	35	1590	0.004	20	
4	3180	0.008	80	2390	0.007	55	1990	0.007	40	1190	0.006	20	
5	2550	0.011	80	1910	0.010	55	1590	0.009	40	960	0.008	25	
6	2120	0.014	90	1590	0.012	60	1330	0.011	45	800	0.010	25	
8	1590	0.020	95	1190	0.018	65	1000	0.016	50	600	0.015	25	
10	1270	0.025	95	960	0.023	65	800	0.020	50	480	0.019	25	
12	1060	0.030	95	800	0.027	65	660	0.024	50	400	0.023	25	
14	910	0.036	100	680	0.032	65	570	0.029	50	340	0.027	25	
16	800	0.042	100	600	0.038	70	500	0.034	50	300	0.032	30	
18	710	0.048	100	530	0.043	70	440	0.038	50	270	0.036	30	
20	640	0.053	100	480	0.048	70	400	0.043	50	240	0.040	30	
22	580	0.060	105	430	0.054	70	360	0.048	50	220	0.045	30	
25	510	0.070	105	380	0.063	70	320	0.056	55	190	0.053	30	
ap x ae	≤ D5	0.25D x D											

	Material Group ISO 513	P1 P2			P3 M1 K1			P4 M2 K2			P5 M3		
	Hardness/Rm	≤ 700 N/mm ²			600-800 N/mm ²			800-1000 N/mm ²			900-1200 N/mm ²		
	ap x ae	2D x 0.1D			2D x 0.1D			2D x 0.1D			2D x 0.1D		
	Vc (m/min)	40-50			30-40			25-35			10-20		
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)
3	4780	0.006	90	3720	0.006	60	3180	0.005	50	1590	0.005	20	
4	3580	0.009	95	2790	0.008	70	2390	0.007	50	1190	0.007	20	
5	2870	0.012	100	2230	0.011	70	1910	0.009	50	960	0.009	30	
6	2390	0.015	110	1860	0.014	80	1590	0.012	60	800	0.011	30	
8	1790	0.022	120	1390	0.020	80	1190	0.018	60	600	0.017	30	
10	1430	0.028	120	1110	0.025	80	960	0.022	60	480	0.021	30	
12	1190	0.033	120	930	0.030	80	800	0.027	60	400	0.025	30	
14	1020	0.040	120	800	0.036	90	680	0.032	60	340	0.030	30	
16	900	0.046	125	700	0.042	90	600	0.037	70	300	0.035	30	
18	800	0.052	125	620	0.047	90	530	0.042	70	270	0.039	30	
20	720	0.059	125	560	0.053	90	480	0.047	70	240	0.044	30	
22	650	0.065	130	510	0.059	90	430	0.052	70	220	0.049	30	
25	570	0.077	130	450	0.069	90	380	0.062	70	190	0.058	30	
ap x ae	≤ D5	1.5D x 0.05D											

TAWSH3

	Material Group ISO 513	P1 P2			P3 M1 K1			P4 M2 K2			P5 M3		
	Hardness/Rm	≤ 700 N/mm ²			600-800 N/mm ²			800-1000 N/mm ²			900-1200 N/mm ²		
	ap x ae	0.3D x D			0.3D x D			0.3D x D			0.3D x D		
	Vc (m/min)	40-60			30-50			25-35			15-25		
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)
	6	2650	0.020	155	2120	0.018	115	1590	0.015	70	1060	0.014	45
	8	1990	0.029	170	1590	0.026	125	1190	0.022	75	800	0.020	50
	10	1590	0.036	170	1270	0.032	125	960	0.027	80	640	0.025	50
	12	1330	0.043	170	1060	0.039	125	800	0.032	80	530	0.030	50
	14	1140	0.051	175	910	0.046	125	680	0.038	80	450	0.036	50
16	1000	0.060	180	800	0.054	130	600	0.045	80	400	0.042	50	
18	880	0.069	185	710	0.062	135	530	0.052	85	350	0.049	50	
20	800	0.079	190	640	0.071	135	480	0.059	85	320	0.055	55	

	Material Group ISO 513	P1 P2			P3 M1 K1			P4 M2 K2			P5 M3		
	Hardness/Rm	≤ 700 N/mm ²			600-800 N/mm ²			800-1000 N/mm ²			900-1200 N/mm ²		
	ap x ae	1.5D x 0.5D			1.5D x 0.5D			1.5D x 0.3D			1.5D x 0.3D		
	Vc (m/min)	50-70			40-60			25-35			20-30		
	D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)
	6	3180	0.018	175	2650	0.017	130	1860	0.015	80	1330	0.013	50
	8	2390	0.024	170	1990	0.021	130	1390	0.019	80	1000	0.017	50
	10	1910	0.035	200	1590	0.031	150	1110	0.028	90	800	0.024	60
	12	1590	0.043	205	1330	0.039	155	930	0.035	95	660	0.030	60
	14	1360	0.052	210	1140	0.047	160	800	0.041	100	570	0.036	60
16	1190	0.062	220	1000	0.055	165	700	0.049	105	500	0.043	65	
18	1060	0.072	230	880	0.065	170	620	0.058	110	440	0.051	65	
20	960	0.083	240	800	0.075	180	560	0.067	110	400	0.058	70	

WS4(6)-TAWS4(6)-UMWS4

weldon shank, 4 flutes-6 flutes

DIN 844	N	HSS/Co BR	HSS/Co PV200	30°	SQUARE	Z4-Z6
WS4(6) TAWS4(6)		WS4(6) TAWS4(6)				



WS4(6)



TAWS4(6)

UM	HSS-P PV200
UMWS4	



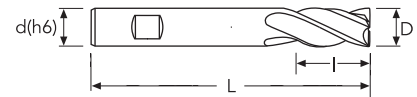
UMWS4

P	M	K	N	S	H
★	☆	★	☆		
★	★	★			

WS4(6)-TAWS4(6)

UMWS4

★ 1st choice ☆ suitable



D	D Tol.	d(h6)	l	l1	L	z	WS4(6)		TAWS4(6)		UMWS4	
							EDP No.	Stock	EDP No.	Stock	EDP No.	Stock
2	0/+0.040	6	7		51	4	WS4020	●	TAWS4020	●		
3	0/+0.040	6	8		52	4	WS4030	●	TAWS4030	●	UMWS4030	●
4	0/+0.040	6	11		55	4	WS4040	●	TAWS4040	●	UMWS4040	●
5	0/+0.040	6	13		57	4	WS4050	●	TAWS4050	●	UMWS4050	●
6	0/+0.040	6	13		57	4	WS4060	●	TAWS4060	●	UMWS4060	●
7	0/+0.040	10	16		66	4	WS4070	●	TAWS4070	●		
8	0/+0.040	10	19		69	4	WS4080	●	TAWS4080	●	UMWS4080	●
9	0/+0.040	10	19		69	4	WS4090	●	TAWS4090	●		
10	0/+0.040	10	22		72	4	WS4100	●	TAWS4100	●	UMWS4100	●
11	0/+0.040	12	22		79	4	WS4110	●	TAWS4110	●		
12	0/+0.040	12	26		83	4	WS4120	●	TAWS4120	●	UMWS4120	●
13	0/+0.040	12	26		83	4	WS4130	●	TAWS4130	●		
14	0/+0.040	12	26		83	4	WS4140	●	TAWS4140	●	UMWS4140	●
15	0/+0.040	12	26		83	4	WS4150	●	TAWS4150	●		
16	0/+0.040	16	32		92	4	WS4160	●	TAWS4160	●	UMWS4160	●
17	0/+0.040	16	32		92	4			TAWS4170	●		
18	0/+0.040	16	32		92	4	WS4180	●	TAWS4180	●	UMWS4180	●
19	0/+0.040	16	32		92	4			TAWS4190	●		
20	0/+0.040	20	38		104	4	WS4200	●	TAWS4200	●	UMWS4200	●
22	0/+0.040	20	38		104	4	WS4220	●	TAWS4220	●		
24	0/+0.040	25	45		121	6	WS6240	●				
25	0/+0.040	25	45		121	4	WS4250	●	TAWS4250	●		
28	0/+0.040	25	45		121	6	WS6280	●	TAWS6280	●		
30	0/+0.040	25	45		121	6	WS6300	●	TAWS6300	●		
32	0/+0.040	32	53		133	6			TAWS6320	●		
36	0/+0.040	32	53		133	6			TAWS6360	●		
40	0/+0.040	32	63		143	6			TAWS6400	●		

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- CARBIDE BURRS

● stock standard ○ non-standard stock ▽ stock exhaustion

TAWS4

UMWS4 (n and Vf = +20%) - WS4 (n and Vf = -20% ÷ -30%)

Material Group ISO 513			P1 P2			P3 M1 K1			P4 M2 K2			P5 M3		
	Hardness/Rm		≤ 700 N/mm ²			600-800 N/mm ²			800-1000 N/mm ²			900-1200 N/mm ²		
	ap x ae		1.5D x 0.5D			1.5D x 0.5D			1.5D x 0.3D			1.5D x 0.3D		
	Vc (m/min)		50-70			40-60			25-35			20-30		
D (mm)	Z (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	
2	4	9550	0.006	220	7960	0.005	170	5570	0.005	100	3980	0.004	70	
3	4	6370	0.006	145	5310	0.005	110	3720	0.005	70	2650	0.004	45	
4	4	4780	0.009	165	3980	0.008	125	2790	0.007	75	1990	0.006	50	
5	4	3820	0.012	190	3180	0.011	145	2230	0.010	90	1590	0.009	60	
6	4	3180	0.016	210	2650	0.015	155	1860	0.013	95	1330	0.012	65	
8	4	2390	0.021	200	1990	0.019	150	1390	0.017	95	1000	0.016	65	
10	4	1910	0.031	235	1590	0.028	175	1110	0.025	110	800	0.023	75	
12	4	1590	0.038	245	1330	0.035	185	930	0.031	115	660	0.029	75	
14	4	1360	0.046	250	1140	0.041	190	800	0.037	120	570	0.035	80	
16	4	1190	0.055	260	1000	0.049	195	700	0.044	125	500	0.041	80	
18	4	1060	0.064	275	880	0.058	205	620	0.051	130	440	0.048	85	
20	4	960	0.074	285	800	0.067	215	560	0.059	130	400	0.055	90	
22	4	870	0.084	295	720	0.076	220	510	0.068	140	360	0.063	90	
24	6	800	0.088	425	660	0.079	315	460	0.071	195	330	0.066	130	
25	4	760	0.106	320	640	0.095	245	450	0.084	150	320	0.079	100	
28	6	680	0.102	420	570	0.092	315	400	0.082	195	280	0.077	130	
30	6	640	0.108	415	530	0.097	310	370	0.086	190	270	0.081	130	
32	6	600	0.113	410	500	0.102	305	350	0.091	190	250	0.085	130	
36	6	530	0.127	405	440	0.114	300	310	0.101	190	220	0.095	125	
40	6	480	0.139	400	400	0.125	300	280	0.111	185	200	0.104	125	
ap x ae	≤ D3	1.5D x 0.25D			1.5D x 0.25D			1.2D x 0.1D			1.2D x 0.1D			



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WL4(6)-TAWL4(6)

weldon shank, 4 flutes-6 flutes, long

DIN 844	N	HSS/Co BR	HSS/Co PV200	30°	SQUARE	Z4-Z6
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WL4(6) TAWL4(6)



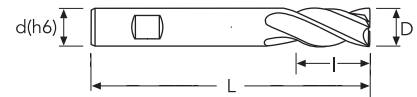
WL4(6)



TAWL4(6)

P	M	K	N	S	H
★	☆	★	☆		

★ 1st choice ☆ suitable



D	D Tol.	d(h6)	l	l1	L	z	WL4(6)		TAWL4(6)	
							EDP No.	Stock	EDP No.	Stock
3	0/+0.040	6	12		56	4	WL4030	●	TAWL4030	●
4	0/+0.040	6	19		63	4	WL4040	●	TAWL4040	●
5	0/+0.040	6	24		68	4	WL4050	●	TAWL4050	●
6	0/+0.040	6	24		68	4	WL4060	●	TAWL4060	●
7	0/+0.050	10	30		80	4	WL4070	●	TAWL4070	●
8	0/+0.050	10	38		88	4	WL4080	●	TAWL4080	●
9	0/+0.050	10	38		88	4	WL4090	●	TAWL4090	●
10	0/+0.050	10	45		95	4	WL4100	●	TAWL4100	●
11	0/+0.050	12	45		102	4	WL4110	●	TAWL4110	●
12	0/+0.050	12	53		110	4	WL4120	●	TAWL4120	●
13	0/+0.050	12	53		110	4	WL4130	●	TAWL4130	●
14	0/+0.050	12	53		110	4	WL4140	●	TAWL4140	●
15	0/+0.050	12	53		110	4	WL4150	●	TAWL4150	●
16	0/+0.050	16	63		123	4	WL4160	●	TAWL4160	●
17	0/+0.050	16	63		123	4	WL4170	●	TAWL4170	●
18	0/+0.050	16	63		123	4	WL4180	●	TAWL4180	●
19	0/+0.050	16	63		123	4	WL4190	●	TAWL4190	●
20	0/+0.050	20	75		141	4	WL4200	●	TAWL4200	●
22	0/+0.050	20	75		141	6	WL6220	●	TAWL6220	●
25	0/+0.050	25	90		166	6	WL6250	●	TAWL6250	●
30	0/+0.050	25	90		166	6			TAWL6300	●
32	0/+0.050	32	106		186	6			TAWL6320	●
36	0/+0.050	32	106		186	6			TAWL6360	●
40	0/+0.050	40	125		217	6			TAWL6400	●

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- CARBIDE BURRS

● stock standard ○ non-standard stock ▽ stock exhaustion

TAWL4

WL4 (n and Vf = -20% ÷ -30%)

	Material Group ISO 513		P1 P2			P3 M1 K1			P4 M2 K2			P5 M3		
	Hardness/Rm		≤ 700 N/mm ²			600-800 N/mm ²			800-1000 N/mm ²			900-1200 N/mm ²		
	ap x ae		2D x 0.1D			2D x 0.1D			2D x 0.1D			2D x 0.1D		
	Vc (m/min)		40-50			30-40			25-35			10-20		
D (mm)	Z (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	
3	4	4780	0.004	75	3720	0.004	50	3180	0.003	40	1590	0.003	20	
4	4	3580	0.006	85	2790	0.005	60	2390	0.005	50	1190	0.004	20	
5	4	2870	0.009	100	2230	0.008	70	1910	0.007	50	960	0.006	20	
6	4	2390	0.012	115	1860	0.011	80	1590	0.010	60	800	0.009	30	
8	4	1790	0.015	105	1390	0.013	70	1190	0.012	60	600	0.011	30	
10	4	1430	0.021	120	1110	0.019	90	960	0.017	70	480	0.016	30	
12	4	1190	0.027	125	930	0.024	90	800	0.021	70	400	0.020	30	
14	4	1020	0.032	130	800	0.029	90	680	0.026	70	340	0.024	30	
16	4	900	0.038	135	700	0.034	100	600	0.030	70	300	0.028	30	
18	4	800	0.045	145	620	0.040	100	530	0.036	80	270	0.033	40	
20	4	720	0.050	145	560	0.045	100	480	0.040	80	240	0.038	40	
22	6	650	0.056	220	510	0.051	155	430	0.045	115	220	0.042	55	
25	6	570	0.068	230	450	0.061	165	380	0.054	125	190	0.051	60	
32	6	450	0.077	210	350	0.069	145	300	0.062	110	150	0.054	50	
36	6	400	0.085	205	310	0.077	140	270	0.068	110	130	0.060	45	
40	6	360	0.095	205	280	0.086	145	240	0.076	110	120	0.067	50	

ap x ae	≤ D5	1.5D x 0.05D	1.5D x 0.05D	1.2D x 0.05D	1.2D x 0.05D
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- INFO
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TAWSR

	Material Group ISO 513		P1 P2			P3 M1 K1			P4 M2 K2			P5 M3		
	Hardness/Rm		≤ 700 N/mm ²			600-800 N/mm ²			800-1000 N/mm ²			900-1200 N/mm ²		
	ap x ae		D x D			D x D			D x D			0.5D x D		
	Vc (m/min)		40-60			30-50			25-35			15-25		
D (mm)	Z (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	
6	3	2650	0.022	175	2120	0.020	125	1590	0.018	85	1060	0.017	50	
8	3	1990	0.028	165	1590	0.025	120	1190	0.022	80	800	0.019	45	
10	4	1590	0.035	225	1270	0.032	160	960	0.028	110	640	0.025	65	
12	4	1330	0.045	240	1060	0.041	170	800	0.036	115	530	0.032	65	
14	4	1140	0.055	250	910	0.050	180	680	0.044	120	450	0.039	70	
16	4	1000	0.065	260	800	0.059	185	600	0.052	125	400	0.046	75	
18	4	880	0.075	265	710	0.068	190	530	0.060	125	350	0.053	75	
20	4	800	0.085	270	640	0.077	195	480	0.068	130	320	0.060	75	

	Material Group ISO 513		P1 P2			P3 M1 K1			P4 M2 K2			P5 M3		
	Hardness/Rm		≤ 700 N/mm ²			600-800 N/mm ²			800-1000 N/mm ²			900-1200 N/mm ²		
	ap x ae		1.5D x 0.5D			1.5D x 0.5D			1.5D x 0.3D			1.5D x 0.3D		
	Vc (m/min)		50-70			40-60			30-40			20-30		
D (mm)	Z (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	
6	3	3180	0.026	250	2650	0.024	190	1860	0.021	120	1330	0.018	75	
8	3	2390	0.033	235	1990	0.030	175	1390	0.026	110	1000	0.023	70	
10	4	1910	0.042	320	1590	0.038	180	1110	0.034	110	800	0.029	70	
12	4	1590	0.054	345	1330	0.049	195	930	0.043	120	660	0.038	75	
14	4	1360	0.066	360	1140	0.059	205	800	0.053	125	570	0.046	80	
16	4	1190	0.078	370	1000	0.070	210	700	0.062	130	500	0.055	80	
18	4	1060	0.090	380	880	0.081	215	620	0.072	135	440	0.063	85	
20	4	960	0.102	390	800	0.092	220	560	0.082	135	400	0.071	85	

INFO
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 UH
 HSS/CO-HSSP END MILLS
 CARBIDE BURRS

WSFR-TAWSFR-UMWSFR

weldon shank, roughing HR

DIN 844	N	HSS/Co BR	HSS/Co PV200	HR FINE	Z3-Z6
WSFR TAWSFR		WSFR	TAWSFR		
			UM	HSS-P PV200	
			UMWSFR		



WSFR



TAWSFR



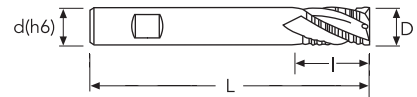
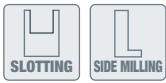
UMWSFR

P	M	K	N	S	H
★	☆	★	☆		
★	★	★			

WSFR-TAWSFR

UMWSFR

★ 1st choice ☆ suitable



D(js12)	D Tol.	d(h6)	l	l1	L	z	WSFR		TAWSFR		UMWSFR	
							EDP No.	Stock	EDP No.	Stock	EDP No.	Stock
6	+/-0.060	6	13		57	3	WSFR060	●	TAWSFR060	●	UMWSFR060	●
7	+/-0.075	10	16		66	3			TAWSFR070	●	UMWSFR070	●
8	+/-0.075	10	19		69	3	WSFR080	●	TAWSFR080	●	UMWSFR080	●
9	+/-0.075	10	19		69	3			TAWSFR090	●	UMWSFR090	●
10	+/-0.075	10	22		72	4	WSFR100	●	TAWSFR100	●	UMWSFR100	●
11	+/-0.090	12	22		79	4			TAWSFR110	●		
12	+/-0.090	12	26		83	4	WSFR120	●	TAWSFR120	●	UMWSFR120	●
13	+/-0.090	12	26		83	4			TAWSFR130	●		
14	+/-0.090	12	26		83	4	WSFR140	●	TAWSFR140	●	UMWSFR140	●
15	+/-0.090	12	26		83	4			TAWSFR150	●		
16	+/-0.090	16	32		92	4	WSFR160	●	TAWSFR160	●	UMWSFR160	●
17	+/-0.090	16	32		92	4			TAWSFR170	●		
18	+/-0.090	16	32		92	4	WSFR180	●	TAWSFR180	●	UMWSFR180	●
20	+/-0.105	20	38		104	4	WSFR200	●	TAWSFR200	●	UMWSFR200	●
22	+/-0.105	20	38		104	5			TAWSFR220	●		
25	+/-0.105	25	45		121	5			TAWSFR250	●		
28	+/-0.105	25	45		121	6 CH			TAWSFR280	●		
30	+/-0.105	25	45		121	6			TAWSFR300	●		
32	+/-0.125	32	53		133	6			TAWSFR320	●		
36	+/-0.125	32	53		133	6			TAWSFR360	●		
40	+/-0.125	32	63		155	6			TAWSFR400	●		

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- MEF
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- CARBIDE BURRS

● stock standard ○ non-standard stock ▽ stock exhaustion

TAWSFR

UMWSFR (n and Vf = +20%) - WSFR (n and Vf = -20% ÷ -30%)

Material Group ISO 513	P1 P2					P3 M1 K1			P4 M2 K2			P5 M3					
	Hardness/Rm					≤ 700 N/mm ²			600-800 N/mm ²			800-1000 N/mm ²			900-1200 N/mm ²		
	ap x ae					D x D			D x D			D x D			0.5D x D		
	Vc (m/min)					40-60			30-50			25-35			15-25		
D (mm)	Z (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)				
6	3	2650	0.022	175	2120	0.020	125	1590	0.018	85	1060	0.017	50				
8	3	1990	0.028	165	1590	0.025	120	1190	0.022	80	800	0.019	45				
10	4	1590	0.035	225	1270	0.032	160	960	0.028	110	640	0.025	65				
12	4	1330	0.045	240	1060	0.041	170	800	0.036	115	530	0.032	65				
14	4	1140	0.055	250	910	0.050	180	680	0.044	120	450	0.039	70				
16	4	1000	0.065	260	800	0.059	185	600	0.052	125	400	0.046	75				
18	4	880	0.075	265	710	0.068	190	530	0.060	125	350	0.053	75				
20	4	800	0.085	270	640	0.077	195	480	0.068	130	320	0.060	75				
22	5	720	0.086	310	580	0.077	225	430	0.068	145	290	0.060	85				
25	5	640	0.099	315	510	0.089	225	380	0.079	150	250	0.069	85				
28	6	570	0.100	340	450	0.090	245	340	0.080	165	230	0.070	95				
30	6	530	0.108	345	420	0.097	245	320	0.086	165	210	0.076	95				
32	6	500	0.116	350	400	0.104	250	300	0.093	165	200	0.081	95				
36	6	440	0.130	345	350	0.111	230	270	0.104	170	180	0.091	100				
40	6	400	0.145	350	320	0.123	235	240	0.116	165	160	0.102	95				



Material Group ISO 513	P1 P2					P3 M1 K1			P4 M2 K2			P5 M3					
	Hardness/Rm					≤ 700 N/mm ²			600-800 N/mm ²			800-1000 N/mm ²			900-1200 N/mm ²		
	ap x ae					1.5D x 0.5D			1.5D x 0.5D			1.5D x 0.3D			1.5D x 0.3D		
	Vc (m/min)					50-70			40-60			30-40			20-30		
D (mm)	Z (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)				
6	3	3180	0.026	250	2650	0.024	190	1860	0.021	120	1330	0.018	75				
8	3	2390	0.033	235	1990	0.030	175	1390	0.026	110	1000	0.023	70				
10	4	1910	0.042	320	1590	0.038	180	1110	0.034	110	800	0.029	70				
12	4	1590	0.054	345	1330	0.049	195	930	0.043	120	660	0.038	75				
14	4	1360	0.066	360	1140	0.059	205	800	0.053	125	570	0.046	80				
16	4	1190	0.078	370	1000	0.070	210	700	0.062	130	500	0.055	80				
18	4	1060	0.090	380	880	0.081	215	620	0.072	135	440	0.063	85				
20	4	960	0.102	390	800	0.092	220	560	0.082	135	400	0.071	85				
22	5	870	0.103	445	720	0.092	200	510	0.082	125	360	0.072	80				
25	5	760	0.119	450	640	0.107	205	450	0.095	130	320	0.083	80				
28	6	680	0.120	490	570	0.108	245	400	0.096	155	280	0.084	95				
30	6	640	0.130	500	530	0.117	245	370	0.104	155	270	0.091	100				
32	6	600	0.139	500	500	0.125	250	350	0.111	155	250	0.097	95				
36	6	530	0.156	495	440	0.140	245	310	0.125	155	220	0.109	95				
40	6	480	0.174	500	400	0.157	250	280	0.139	155	200	0.122	95				



TAWLFR

WLFR (n and Vf = -20% ÷ -30%)

Material Group ISO 513	P1 P2					P3 M1 K1			P4 M2 K2			P5 M3					
	Hardness/Rm					≤ 700 N/mm ²			600-800 N/mm ²			800-1000 N/mm ²			900-1200 N/mm ²		
	ap x ae					0.5D x D			0.5D x D			0.5D x D			0.3D x D		
	Vc (m/min)					35-45			25-35			20-30			10-20		
D (mm)	Z (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)				
6	3	2120	0.014	90	1590	0.013	60	1330	0.011	45	800	0.011	25				
8	3	1590	0.020	95	1190	0.018	65	1000	0.016	50	600	0.014	25				
10	4	1270	0.025	125	960	0.022	85	800	0.020	65	480	0.017	35				
12	4	1060	0.032	135	800	0.028	90	660	0.025	65	400	0.022	35				
14	4	910	0.039	140	680	0.035	95	570	0.031	70	340	0.027	35				
16	4	800	0.046	145	600	0.041	100	500	0.036	75	300	0.032	40				
18	4	710	0.053	150	530	0.047	100	440	0.042	75	270	0.037	40				
20	4	640	0.060	150	480	0.054	105	400	0.048	75	240	0.042	40				
22	5	580	0.060	175	430	0.054	115	360	0.048	85	220	0.042	45				
25	5	510	0.069	175	380	0.062	120	320	0.055	90	190	0.049	45				
28	6	450	0.070	190	340	0.063	130	280	0.056	95	170	0.049	50				
30	6	420	0.076	190	320	0.068	130	270	0.060	100	160	0.053	50				
32	6	400	0.081	195	300	0.073	130	250	0.065	95	150	0.057	50				
36	6	350	0.091	190	270	0.077	125	220	0.073	95	130	0.064	50				
40	6	320	0.102	195	240	0.086	125	200	0.081	95	120	0.071	50				



Material Group ISO 513	P1 P2					P3 M1 K1			P4 M2 K2			P5 M3					
	Hardness/Rm					≤ 700 N/mm ²			600-800 N/mm ²			800-1000 N/mm ²			900-1200 N/mm ²		
	ap x ae					1.5D x 0.3D			1.5D x 0.3D			1.5D x 0.3D			1.5D x 0.2D		
	Vc (m/min)					40-50			30-40			25-35			10-20		
D (mm)	Z (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)				
6	3	2390	0.017	120	1860	0.015	85	1590	0.013	65	800	0.012	30				
8	3	1790	0.024	130	1390	0.022	90	1190	0.019	70	600	0.017	30				
10	4	1430	0.029	170	1110	0.026	90	960	0.024	70	480	0.021	30				
12	4	1190	0.038	180	930	0.034	95	800	0.030	75	400	0.026	30				
14	4	1020	0.046	190	800	0.042	100	680	0.037	75	340	0.032	35				
16	4	900	0.055	195	700	0.049	105	600	0.044	80	300	0.038	35				
18	4	800	0.063	200	620	0.057	105	530	0.050	80	270	0.044	35				
20	4	720	0.071	205	560	0.064	110	480	0.057	80	240	0.050	35				
22	5	650	0.072	235	510	0.065	100	430	0.057	75	220	0.050	35				
25	5	570	0.083	235	450	0.075	100	380	0.067	75	190	0.058	35				
28	6	510	0.084	255	400	0.076	120	340	0.067	90	170	0.059	40				
30	6	480	0.091	260	370	0.082	120	320	0.073	95	160	0.064	40				
32	6	450	0.097	265	350	0.088	125	300	0.078	95	150	0.068	40				
36	6	400	0.109	260	310	0.098	120	270	0.087	95	130	0.076	40				
40	6	360	0.122	265	280	0.110	125	240	0.097	95	120	0.085	40				



WSB2-TAWSB2

weldon shank, 2 flutes ball nose

DIN 327	N	HSS/Co BR	HSS/Co PV200	30°	BALL NOSE	Z2 BALL
		WSB2 TAWSB2				



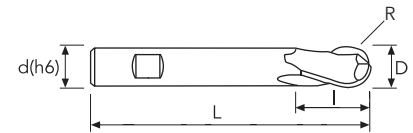
WSB2



TAWSB2

P	M	K	N	S	H
★	☆	★	☆		

★ 1st choice ☆ suitable



D(e8)	D(e8) Tol.	R	R Tol.	d(h6)	l	l1	L	z	WSB2		TAWSB2	
									EDP No.	Stock	EDP No.	Stock
2	-0.014/-0.028	1.00	+0.020/-0.020	6	4		48	2	WSB2020	●	TAWSB2020	○
3	-0.014/-0.028	1.50	+0.020/-0.020	6	5		49	2	WSB2030	●	TAWSB2030	●
4	-0.020/-0.038	2.00	+0.020/-0.020	6	7		51	2	WSB2040	●	TAWSB2040	●
5	-0.020/-0.038	2.50	+0.020/-0.020	6	8		52	2	WSB2050	●	TAWSB2050	●
6	-0.020/-0.038	3.00	+0.020/-0.020	6	8		52	2	WSB2060	●	TAWSB2060	●
8	-0.025/-0.047	4.00	+0.020/-0.020	10	11		61	2	WSB2080	●	TAWSB2080	●
10	-0.025/-0.047	5.00	+0.020/-0.020	10	13		63	2	WSB2100	●	TAWSB2100	●
12	-0.032/-0.059	6.00	+0.020/-0.020	12	16		73	2	WSB2120	●	TAWSB2120	●
14	-0.032/-0.059	7.00	+0.020/-0.020	12	16		73	2	WSB2140	●	TAWSB2140	●
16	-0.032/-0.059	8.00	+0.020/-0.020	16	19		79	2	WSB2160	●	TAWSB2160	●
18	-0.032/-0.059	9.00	+0.020/-0.020	16	19		79	2	WSB2180	●	TAWSB2180	●
20	-0.040/-0.073	10.00	+0.020/-0.020	20	22		88	2	WSB2200	●	TAWSB2200	●
25	-0.040/-0.073	12.50	+0.020/-0.020	25	26		102	2	WSB2250	●		
28	-0.040/-0.073	14.00	+0.020/-0.020	25	26		102	2	WSB2280	○		
30	-0.040/-0.073	15.00	+0.020/-0.020	25	26		102	2	WSB2300	○		

- INFO
- TYPHOON TA-HTA-4HTA
- TYPHOON PU-HPU
- TYPHOON SUH
- TYPHOON ALH
- TYPHOON HRC
- TYPHOON SUH MINI
- TYPHOON HL
- C-SD-TA
- LFTA
- SUTA
- HSS-HSS/CO DRILLS
- G2
- MDTA
- HF VH/UP
- MEF
- ALU
- MEX
- UH
- HSS/CO-HSSP END MILLS
- CARBIDE BURRS

● stock standard ○ non-standard stock ▽ stock exhaustion

TAWSB2

WSB2 (n and Vf = -20% ÷ -30%)

Material Group ISO 513	P1 P2					P3 M1 K1			P4 M2 K2			P5 M3								
	Hardness/Rm					≤ 700 N/mm ²			600-800 N/mm ²			800-1000 N/mm ²			900-1200 N/mm ²					
	ap x ae					0.1 D x 0.2 D					0.1 D x 0.2 D					0.1 D x 0.2 D				
	Vc (m/min)					40-60					30-50			25-35			15-25			
D (mm)	D (eff.) (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)							
2	1.20	7960	0.020	320	6370	0.018	230	4780	0.016	150	3180	0.015	100							
3	1.80	5310	0.040	420	4250	0.036	310	3180	0.032	200	2120	0.030	130							
4	2.40	3980	0.060	480	3180	0.054	340	2390	0.048	230	1590	0.045	140							
5	3.00	3180	0.070	450	2550	0.063	320	1910	0.056	210	1270	0.053	130							
6	3.60	2650	0.082	430	2120	0.074	310	1590	0.066	210	1060	0.062	130							
8	4.80	1990	0.094	370	1590	0.085	270	1190	0.075	180	800	0.071	110							
10	6.00	1590	0.110	350	1270	0.099	250	960	0.088	170	640	0.083	110							
12	7.20	1330	0.130	350	1060	0.117	250	800	0.104	170	530	0.098	100							
14	8.40	1140	0.150	340	910	0.135	250	680	0.120	160	450	0.113	100							
16	9.60	1000	0.170	340	800	0.153	240	600	0.136	160	400	0.128	100							
18	10.80	880	0.190	330	710	0.171	240	530	0.152	160	350	0.143	100							
20	12.00	800	0.210	340	640	0.189	240	480	0.168	160	320	0.158	100							
22	13.20	720	0.232	330	580	0.209	240	430	0.186	160	290	0.174	100							
25	15.00	640	0.262	340	510	0.236	240	380	0.210	160	250	0.197	100							
28	16.80	570	0.285	320	450	0.257	230	340	0.228	160	230	0.214	100							
30	18.00	530	0.292	310	420	0.263	220	320	0.233	150	210	0.219	90							



α	n (rpm)	Vf (mm/min)
15°	x 1.1	x 1.1

- INFO
- TYPHOON TA-HTA-4HTA
- TYPHOON PU-HPU
- TYPHOON SUH
- TYPHOON ALH
- TYPHOON HRC
- TYPHOON SUH MINI
- TYPHOON HL
- C-SD-TA
- LFTA
- SUTA
- HSS-HSS/CO DRILLS
- G2
- MDTA
- HF VH/UP
- MEF
- ALU
- MEX
- UH
- HSS/CO-HSSP END MILLS
- CARBIDE BURRS

TAWLB2

WLB2 (n and Vf = -20% ÷ -30%)

Material Group ISO 513		P1 P2			P3 M1 K1			P4 M2 K2			P5 M3		
Hardness/Rm		≤ 700 N/mm ²			600-800 N/mm ²			800-1000 N/mm ²			900-1200 N/mm ²		
ap x ae		0.1 D x 0.2 D			0.1 D x 0.2 D			0.1 D x 0.2 D			0.1 D x 0.2 D		
Vc (m/min)		30-50			25-35			20-30			12-18		
D (mm)	D (eff.) (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)
3	1.80	4250	0.034	290	3180	0.031	190	2650	0.027	140	1590	0.026	80
4	2.40	3180	0.051	320	2390	0.046	220	1990	0.041	160	1190	0.038	90
5	3.00	2550	0.060	300	1910	0.054	200	1590	0.048	150	960	0.045	90
6	3.60	2120	0.070	300	1590	0.063	200	1330	0.056	150	800	0.052	80
8	4.80	1590	0.080	250	1190	0.072	170	1000	0.064	130	600	0.060	70
10	6.00	1270	0.094	240	960	0.084	160	800	0.075	120	480	0.070	70
12	7.20	1060	0.111	230	800	0.099	160	660	0.088	120	400	0.083	70
14	8.40	910	0.128	230	680	0.115	160	570	0.102	120	340	0.096	70
16	9.60	800	0.145	230	600	0.130	160	500	0.116	120	300	0.108	70
18	10.80	710	0.162	230	530	0.145	150	440	0.129	110	270	0.121	70
20	12.00	640	0.179	230	480	0.161	150	400	0.143	110	240	0.134	60



α	n (rpm)	Vf (mm/min)
15°	x 1.1	x 1.1

INFO
TYPHOON TA-HTA-4HTA
TYPHOON PU-HPU
TYPHOON SUH
TYPHOON ALH
TYPHOON HRC
TYPHOON SUH MINI
TYPHOON HL
C-SD-TA
LFTA
SUTA
HSS-HSS/CO DRILLS
G2
MDTA
HF VH/UP
MEF
ALU
MEX
UH
HSS/CO-HSSP END MILLS
CARBIDE BURRS

TAFM

FM (n and Vf = -20% ÷ -30%)

	Material Group ISO 513		P1 P2			P3 M1 K1			P4 M2 K2			P5 M3		
	Hardness/Rm		≤ 700 N/mm ²			600-800 N/mm ²			800-1000 N/mm ²			900-1200 N/mm ²		
	ap x ae		0.25D x 0.75D			0.25D x 0.75D			0.25D x 0.75D			0.25D x 0.75D		
	Vc (m/min)		40-60			30-50			25-35			15-25		
D (mm)	Z (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	
40	8	400	0.060	190	320	0.054	140	240	0.048	90	160	0.045	60	
50	8	320	0.070	180	250	0.063	125	190	0.056	85	130	0.053	55	
63	8	250	0.080	200	200	0.072	145	150	0.064	95	100	0.060	60	
80	10	200	0.100	200	160	0.090	145	120	0.080	95	80	0.075	60	
100	10	160	0.120	190	130	0.108	140	100	0.096	95	60	0.090	55	

- INFO
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- TYPHOON PU-HPU
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- TYPHOON HL
- C-SD-TA
- LFTA
- SUTA
- HSS-HSS/CO DRILLS
- G2
- MDTA
- HF VH/UP
- MEF
- ALU
- MEX
- UH
- HSS/CO-HSSP END MILLS
- CARBIDE BURRS

TAFFR

FFR (n and Vf = -20% ÷ -30%)

	Material Group ISO 513		P1 P2			P3 M1 K1			P4 M2 K2			P5 M3		
	Hardness/Rm		≤ 700 N/mm ²			600-800 N/mm ²			800-1000 N/mm ²			900-1200 N/mm ²		
	ap x ae		0.25D x 0.75D			0.25D x 0.75D			0.25D x 0.75D			0.25D x 0.75D		
	Vc (m/min)		40-60			30-50			25-35			15-25		
D (mm)	Z (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	
40	8	400	0.080	255	320	0.072	185	240	0.064	125	160	0.060	75	
50	8	320	0.100	255	250	0.090	180	190	0.080	120	130	0.075	80	
63	8	250	0.120	300	200	0.108	215	150	0.096	145	100	0.090	90	
80	10	200	0.120	240	160	0.108	175	120	0.096	115	80	0.090	70	
100	10	160	0.140	225	130	0.126	165	100	0.112	110	60	0.105	65	

- INFO
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- TYPHOON PU-HPU
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- TYPHOON HL
- C-SD-TA
- LFTA
- SUTA
- HSS-HSS/CO DRILLS
- G2
- MDTA
- HF VH/UP
- MEF
- ALU
- MEX
- UH
- HSS/CO-HSSP END MILLS
- CARBIDE BURRS

WCR

	Material Group ISO 513	P1 P2 P3 P4			M1 M2			K1 K2			N1 N2 N3 N4		
	Hardness/Rm	< 800 N/mm ²			< 750 N/mm ²			< 350 HB					
	ap x ae	0.2D x 0.2D			0.2D x 0.2D			0.2D x 0.2D			0.2D x 0.2D		
	Vc (m/min)	30-50			15-25			30-40			60-80		
D (mm)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	
8	1590	0.006	40	800	0.004	10	1390	0.005	30	2790	0.007	70	
9	1420	0.008	45	710	0.006	15	1240	0.007	35	2480	0.009	85	
10	1270	0.010	50	640	0.007	20	1110	0.009	40	2230	0.011	100	
11	1160	0.012	55	580	0.008	20	1010	0.010	40	2030	0.013	105	
12	1060	0.015	60	530	0.010	20	930	0.012	45	1860	0.016	120	
13	980	0.017	65	490	0.012	25	860	0.014	50	1710	0.019	130	
14	910	0.020	70	450	0.014	25	800	0.017	55	1590	0.021	135	
15	850	0.023	75	420	0.016	25	740	0.019	55	1490	0.025	150	
16	800	0.025	80	400	0.018	30	700	0.021	60	1390	0.028	155	
17	750	0.026	80	370	0.018	25	660	0.022	60	1310	0.029	150	
18	710	0.027	75	350	0.019	25	620	0.023	55	1240	0.030	145	
19	670	0.029	75	340	0.020	25	590	0.024	55	1170	0.031	145	
20	640	0.030	75	320	0.021	25	560	0.026	55	1110	0.033	145	
21	610	0.033	80	300	0.023	25	530	0.028	60	1060	0.036	150	
22	580	0.035	80	290	0.025	30	510	0.030	60	1010	0.039	155	
23	550	0.038	85	280	0.026	30	480	0.032	60	970	0.041	160	
24	530	0.040	85	270	0.028	30	460	0.034	65	930	0.044	165	
25	510	0.042	85	250	0.029	30	450	0.035	65	890	0.046	165	
26	490	0.043	85	240	0.030	30	430	0.037	65	860	0.047	165	
27	470	0.045	85	240	0.031	30	410	0.038	60	830	0.049	165	
28	450	0.046	85	230	0.032	30	400	0.039	65	800	0.051	160	
32	400	0.050	80	200	0.035	30	350	0.043	60	700	0.055	155	



- INFO
- TYPHOON TA-HTA-4HTA
- TYPHOON PU-HPU
- TYPHOON SUH
- TYPHOON ALH
- TYPHOON HRC
- TYPHOON SUH MINI
- TYPHOON HL
- C-SD-TA
- LFTA
- SUTA
- HSS-HSS/CO DRILLS
- G2
- MDTA
- HF VH/UP
- MEF
- ALU
- MEX
- UH
- HSS/CO-HSSP END MILLS
- CARBIDE BURRS

WDC 45° - 60°

	Material Group ISO 513		P1 P2 P3 P4			M1 M2			K1 K2			N1 N2 N3 N4		
	Hardness/Rm		< 800 N/mm ²			< 750 N/mm ²			< 350 HB					
	ap x ae		0.2D x 0.15D			0.2D x 0.15D			0.2D x 0.15D			0.2D x 0.15D		
Vc (m/min)		30-50			15-25			30-40			50-70			
D (mm)	z	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	
16	6	800	0.015	70	400	0.011	25	700	0.013	55	1190	0.017	120	
20	6	640	0.017	65	320	0.012	20	560	0.014	45	960	0.018	105	
22	6	580	0.018	65	290	0.013	20	510	0.015	45	870	0.020	105	
25	8	510	0.020	80	250	0.014	20	450	0.017	45	760	0.022	100	
28	8	450	0.023	80	230	0.016	20	400	0.019	45	680	0.025	100	
32	10	400	0.025	100	200	0.018	20	350	0.021	45	600	0.028	100	
38	12	340	0.028	115	170	0.020	20	290	0.024	40	500	0.031	90	

- INFO
- TYPHOON TA-HTA-4HTA
- TYPHOON PU-HPU
- TYPHOON SUH
- TYPHOON ALH
- TYPHOON HRC
- TYPHOON SUH MINI
- TYPHOON HL
- C-SD-TA
- LFTA
- SUTA
- HSS-HSS/CO DRILLS
- G2
- MDTA
- HF VH/UP
- MEF
- ALU
- MEX
- UH
- HSS/CO-HSSP END MILLS
- CARBIDE BURRS

WDD 45° - 60°

	Material Group ISO 513		P1 P2 P3 P4			M1 M2			K1 K2			N1 N2 N3 N4		
	Hardness/Rm		< 800 N/mm ²			< 750 N/mm ²			< 350 HB					
	ap x ae		0.2D x 0.15D			0.2D x 0.15D			0.2D x 0.15D			0.2D x 0.15D		
Vc (m/min)		30-50			15-25			30-40			50-70			
D (mm)	z	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	
16	6	800	0.015	70	400	0.011	25	700	0.013	55	1190	0.017	120	
20	6	640	0.017	65	320	0.012	20	560	0.014	45	960	0.018	105	
22	6	580	0.018	65	290	0.013	20	510	0.015	45	870	0.020	105	
25	8	510	0.020	80	250	0.014	20	450	0.017	45	760	0.022	100	
28	8	450	0.023	80	230	0.016	20	400	0.019	45	680	0.025	100	
32	10	400	0.025	100	200	0.018	20	350	0.021	45	600	0.028	100	
38	12	340	0.028	115	170	0.020	20	290	0.024	40	500	0.031	90	

- INFO
- TYPHOON TA-HTA-4HTA
- TYPHOON PU-HPU
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- TYPHOON ALH
- TYPHOON HRC
- TYPHOON SUH MINI
- TYPHOON HL
- C-SD-TA
- LFTA
- SUTA
- HSS-HSS/CO DRILLS
- G2
- MDTA
- HF VH/UP
- MEF
- ALU
- MEX
- UH
- HSS/CO-HSSP END MILLS
- CARBIDE BURRS

WTM

	Material Group ISO 513		P1 P2 P3 P4			M1 M2			K1 K2			N1 N2 N3 N4		
	Hardness/Rm		< 800 N/mm ²			< 750 N/mm ²			< 350 HB					
	ap x ae		DIN Norm 650			DIN Norm 650			DIN Norm 650			DIN Norm 650		
	Vc (m/min)		25-35			12-18			20-30			40-60		
D (mm)	z	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	
12.5	6	760	0.010	45	380	0.007	15	640	0.009	35	1270	0.011	85	
16	6	600	0.025	90	300	0.018	30	500	0.021	65	1000	0.028	165	
18	6	530	0.030	95	270	0.021	35	440	0.026	65	880	0.033	175	
19	6	500	0.035	105	250	0.025	35	420	0.030	75	840	0.039	195	
21	6	450	0.040	110	230	0.028	40	380	0.034	80	760	0.044	200	
22	6	430	0.043	110	220	0.030	40	360	0.036	80	720	0.047	200	
25	6	380	0.045	105	190	0.032	35	320	0.038	75	640	0.050	190	
28	6	340	0.050	100	170	0.035	35	280	0.043	70	570	0.055	190	
32	8	300	0.057	135	150	0.040	50	250	0.048	95	500	0.063	250	
36	8	270	0.065	140	130	0.046	45	220	0.055	95	440	0.072	250	

- INFO
- TYPHOON TA-HTA-4HTA
- TYPHOON PU-HPU
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- HSS/CO-HSSP END MILLS
- CARBIDE BURRS








WWK

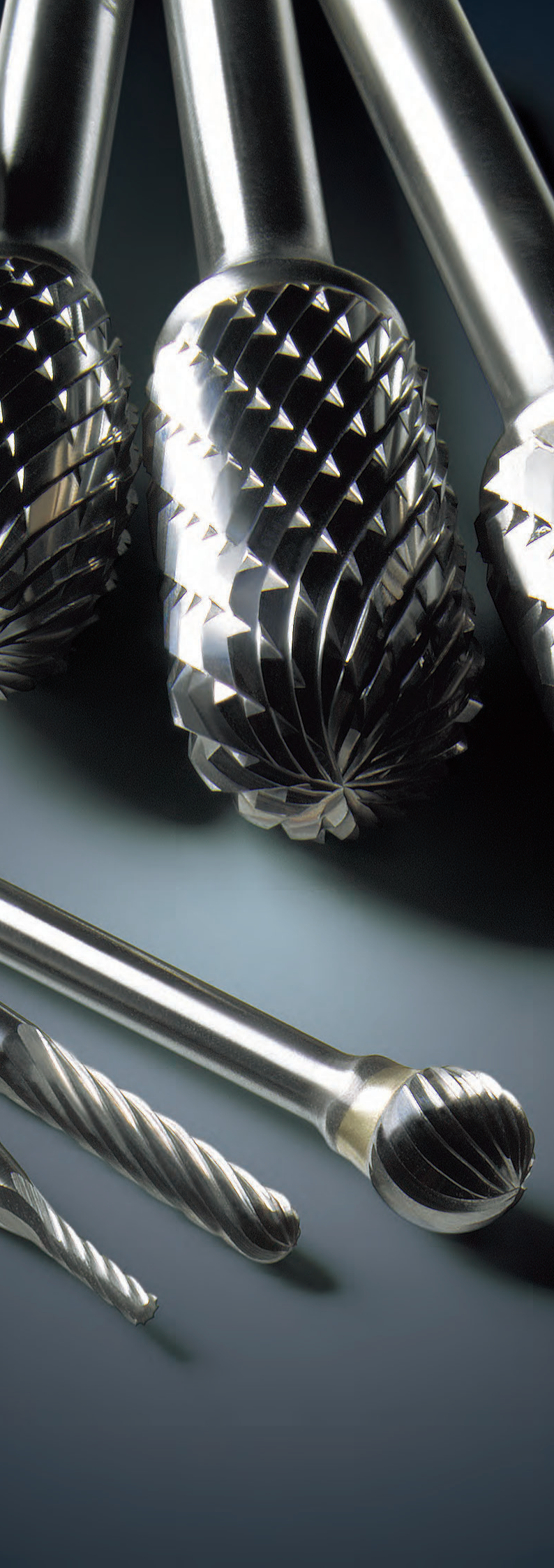
	Material Group ISO 513		P1 P2 P3 P4				M1 M2			K1 K2			N1 N2 N3 N4			
	Hardness/Rm		< 800 N/mm ²				< 750 N/mm ²			< 350 HB						
	ap x ae		DIN Norm 6888				DIN Norm 6888			DIN Norm 6888			DIN Norm 6888			
	Vc (m/min)		25-35				12-18			20-30			40-60			
D (mm)	z	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)	n (rpm)	fz (mm/z)	Vf (mm/min)			
10.5	8	910	0.010	75	450	0.007	25	760	0.009	50	1520	0.011	135			
13.5	8	710	0.018	100	350	0.012	35	590	0.015	70	1180	0.019	180			
16.5	8	580	0.025	115	290	0.018	40	480	0.021	80	970	0.028	215			
19.5	8	490	0.033	125	240	0.023	45	410	0.028	90	820	0.036	235			
22.5	10	420	0.040	170	210	0.028	60	350	0.034	120	710	0.044	310			
25.5	10	370	0.045	165	190	0.032	60	310	0.038	120	620	0.050	305			
28.5	10	340	0.050	170	170	0.035	60	280	0.043	120	560	0.055	310			
32.5	12	290	0.055	190	150	0.039	70	240	0.047	135	490	0.061	355			

- INFO
- TYPHOON TA-HTA-4HTA
- TYPHOON PU-HPU
- TYPHOON SUH
- TYPHOON ALH
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- ALU
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- CARBIDE BURRS

CARBIDE BURRS



ITEM No.	PAGE	Ø3 mm	Ø6 mm
SA	703		
SB	704		 
SC	705		
SD	706		
SE	707		
SF	708		
SG	709		
SH	710		
SJ	711		
SK	712		
SL	713		
SM	714		
SN	715		



CARBIDE BURRS

🇬🇧 Don't miss the Osawa quality on carbide rotary burrs, available in a wide variety of shapes and geometries.

🇮🇹 Ritrovate tutta la qualità Osawa anche nella gamma di lime rotative in metallo duro, disponibili in un'ampia scelta di forme e geometrie.

🇩🇪 Die Osawa- Qualität steht auch für Hartmetall-Rotierfräser. Diese sind in einer breiten Auswahl an Formen und Geometrien erhältlich.

🇫🇷 Retrouvez toute la qualité Osawa dans la gamme de limes rotatives carbure, disponibles dans une grande variété de formes et géométries.

🇪🇸 Toda la calidad Osawa también se propone en la gama de limas rotativas de metal duro, disponibles con una amplia variedad de formas y geometrías.

🇷🇺 Широкий выбор форм и геометрии в сочетании с высочайшим качеством характеризует линию твёрдосплавных борфрез Osawa.

INFO
TYPHOON TA-HTA-4HTA
TYPHOON PU-HPU
TYPHOON SUH
TYPHOON ALH
TYPHOON HRC
TYPHOON SUH MINI
TYPHOON HL
C-SD-TA
LFTA
SUTA
HSS-HSS/CO DRILLS
G2
MDTA
HF VH/UP
MEF
ALU
MEX
UH
HSS/CO-HSSP END MILLS
CARBIDE BURRS

CARBIDE BURRS

INFO

TYPHOON TA-HTA-4HTA

TYPHOON PU-HPU

TYPHOON SUH

TYPHOON ALH

TYPHOON HRC

TYPHOON SUH MINI

TYPHOON HL

C-SD-TA

LFTA

SUTA

HSS-HSS/CO DRILLS

G2

MDTA

HF VH/UP

MEF

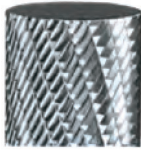
ALU

MEX

UH

HSS/CO-HSSP END MILLS

CARBIDE BURRS



M



MPC



MFN

M

- Double cut
- Doppio taglio
- 2 Schneiden

- Coupe double
- Doble corte
- Двойная заточка

MPC

- Plain cut
- Taglio piano
- Flachschnide

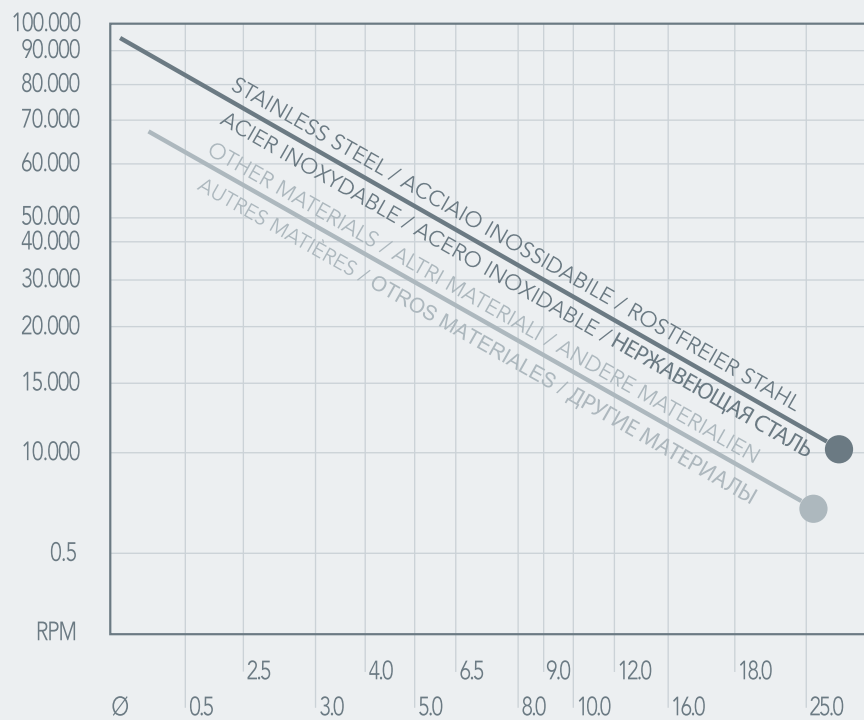
- Coupe plane
- Corte plano
- Обычная заточка

MFN

Alucut

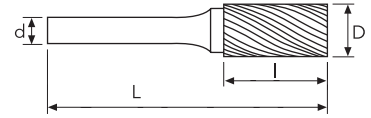
- SPEED TABLE
- TABELLA VELOCITÀ
- GESCHWINDIGKEITSTABELLE

- TABLEAU DE VITESSE
- TABLA DE VELOCIDAD
- ТАБЛИЦА СКОРОСТЕЙ



SK

OSAWA
NORM



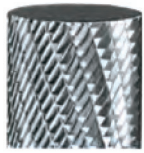
- ⚠ Always wear goggles when using the rotary burrs
- 🇮🇹 Per l'uso delle lime rotative è obbligatorio indossare occhiali protettivi
- 🇩🇪 Tragen Sie immer die Schutzbrille wenn Sie die Fräser benutzen
- 🇫🇷 Toujours porter les lunettes de sécurité en utilisant les limes rotatives
- 🇪🇸 Para usar las limas rotativas es obligatorio usar gafas de protección
- 🇷🇺 При работе с борфрезами всегда используйте защитные очки



	D	d (3)	d (6)	l	L	ANGLE	PACKAGING	EDP No.	Stock	EDP No.	Stock	EDP No.	Stock
TYPHOON TA-HTA-4HTA	3.0	3		1.5	38	90°	5	SK42M	●	SK42MPC	●		
TYPHOON PU-HPU	6.0		6	3	50	90°	5	SK1M	●	SK1MPC	○		
TYPHOON SUH	9.5		6	4.7	53	90°	5	SK3M	●	SK3MPC	○		
TYPHOON ALH	12.7		6	6.3	55	90°	5	SK5M	●	SK5MPC	○		
TYPHOON HRC	16.0		6	8	57	90°	5	SK6M	●	SK6MPC	○		
TYPHOON SUH MINI	19.0		6	9.5	59	90°	5	SK7M	○	SK7MPC	○		
TYPHOON HL	25.0		6	12.7	60	90°	5	SK9M	○	SK9MPC	○		
C-SD-TA													
LFTA													
SUTA													
HSS-HSS/CO DRILLS													
G2													
MDTA													
HF VH/UP													
MEF													
ALU													
MEX													
UH													
HSS/CO-HSSP END MILLS													
CARBIDE BURRS													

● stock standard ○ non-standard stock ▽ stock exhaustion

INFO
TYPHOON TA-HTA-4HTA
TYPHOON PU-HPU
TYPHOON SUH
TYPHOON ALH
TYPHOON HRC
TYPHOON SUH MINI
TYPHOON HL
C-SD-TA
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MEF
ALU
MEX
UH
HSS/CO-HSSP END MILLS
CARBIDE BURRS



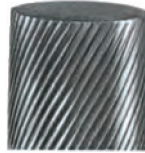
M



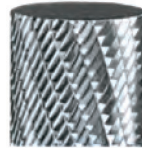
BUR10 M TYPE

Set 10pcs. - shank Ø6 mm

SA1 - SB1 - SC1 - SD1 - SE1 - SF1 - SG1 - SL1 - SM1 - SN1



MPC



M



A15FW MPC TYPE

Set 15pcs. - shank Ø3 mm

SA41 - SA42 - SA43 - SA52 - SB43 - SC42 - SD41 - SD42 - SD53 - SE41 - SG43 - SL42 - SM42 - SM43 - SN42

A16FW M TYPE

Set 15pcs. - shank Ø3 mm

SA41 - SA42 - SA43 - SA52 - SB43 - SC42 - SD41 - SD42 - SD53 - SE41 - SG43 - SL42 - SM42 - SM43 - SN42

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