SGS Solid Carbide Tools

Keeping the world moving

2023 Global Product Catalogue
Metric Tools

KYOCERA

www.kyocera-sgstool.com

ISO 9001:2015 Certified

SGS®
Solid Carbide Tools

Keeping the world moving

KYOCERA SGS Precision Tools (KSPT) is an ISO 9001:2015 Certified manufacturer of industry leading round solid carbide cutting tools. State of the art manufacturing and warehouse facilities have the capacity and processes to meet the quality and delivery demands of customers in all markets around the world. Complete inspections performed within its metallurgical lab and manufacturing quality departments ensure the use of high quality carbide and reliable manufacturing consistency regardless of when a cutting tool is produced.

KSPT is proud to have pioneered some of the world's most advanced cutting technologies due to rigorous testing of tools, coatings, and materials within its Global Innovation Center. It is this commitment to innovation that has launched patented products and technologies like the Z-Carb with its variable geometry and cutting edge preparation, Series 43 APR® and APF® ultra high performance aluminum cutting tools, and the JetStream coolant technology.

SGS has become an important part of the KYOCERA Precision Tools family, and while the name has changed, one thing has not: Its dedicated people and their relentless commitment to the customer. KSPT Technical Sales Engineers, Application Specialists, and Distribution Partners blanket the globe, delivering reliable service and support to all market segments. It is these people and products that drive innovative application strategies and cutting tool technologies into the end user, continually exceeding expectations and keeping the world moving.

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SGS®
Solid Carbide Tools

MORE THAN JUST ANOTHER CUTTING TOOL SUPPLIER

KYOCERA SGS PRECISION TOOLS EUROPE, LTD.
The state of the art KYOCERA SGS Precision Tools Europe facility is located in Wokingham, England and is focused on the manufacture of special cutting tools, high accuracy form tools, tool modifications and regrinds. A highly skilled team of professionals specialise in the supply and support of high performance tools for the Aerospace, Medical, Power Generation and Motorsport markets.

KYOCERA SGS Precision Tools Europe also offers a full range of end mill and drill products as follows:

- Multi-Million Euro Warehouse Stocking Full Range of Catalogue Products
- Same Day Shipment on Stock Items
- Multi-Lingual Sales and Technical Support
- Online Portal for Stock Availability
- High Performance Product and Application Training, Including the New KYOCERA SGS Tool Clinic

Additional services provided at this facility include:

- A Fast Track for Special Tools Via Our Rapid Response Centre
- Inhouse PVD coating facility and R&D Centre
- Product Research and Development
- Product Engineering and Tool Application Support
- CAD/CAM Software Support

UK TECHNOLOGY CENTRE

Introducing Kyocera SGS Precision Tools Europe's Technology Centre.

An ever-growing part of our business, where new tooling solution projects are worked on daily by our talented team of engineers.

This state-of-the-art facility is equipped with the latest 5-axis milling capability, which enables us to offer:

- Customer projects / application testing
- Cycle time studies
- Training demonstrations
- Research & Developments
- Onsite cutting demonstrations and training for customers and partners
- Design and prove out the of new machining strategies.

RESEARCH AND DEVELOPMENT TEAM

Our people remain our greatest asset and clearest differentiator. You will have access to this team's skills, experience and tooling knowledge. They will aim to continuously work closely with you to improve processes, productivity and increase in profitability.

TOOLING SERVICES

KSPT is committed to providing superior tooling services in the areas of Reconditioning, Recoating, Regrinding, Specials and Alterations. These services are offered to provide unique solutions and enhanced tool life with involvement from the KSPT Technical Support Team.

KSPT proudly offers Tooling Services in North America and Europe.

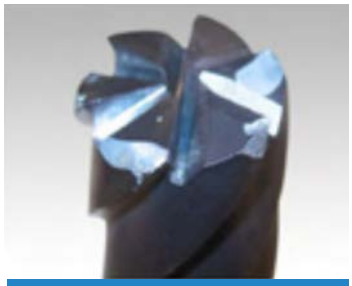
KSPT TOOLING SERVICES FACILITIES

UNITED STATES OF AMERICA KSPT
150 Marc Drive
Cuyahoga Falls, Ohio 44223 U.S.A.
customer service -
US and Canada: (330) 686-5700
fax - US & Canada: (800) 447-4017
international fax: (330) 686-2146

EUROPE KSPTE
10 Ashville Way
Wokingham, Berkshire
RG41 2PL
phone: (44) 1189-795-200
e-mail: SalesEU@kyocera-sgstool.com

KYOCERA SGS Precision Tools West Coast Service Center
1832 W. Collins Ave.
Orange, California 92867
phone: (714) 363-3701
fax: (714) 363-3711
email: sgswest@kyocera-sgstool.com

KYOCERA SGS Precision Tools Tech Hub
149 Slayton Avenue
Danville, Virginia 24540
US and Canada: (434) 791-2020
Fax US & Canada: (434) 791-2044
web: www.kyocera-techhub.com



BEFORE

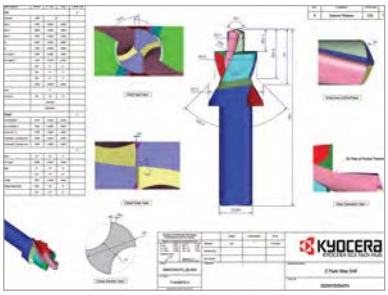
AFTER

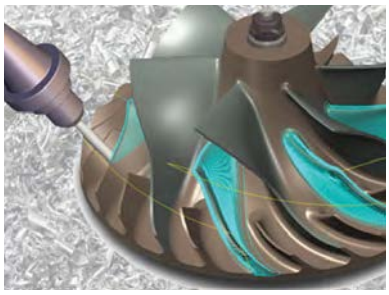
KYOCERA SGS Tech Hub

The KYOCERA SGS Tech Hub (KSTH) is a purpose created division of KYOCERA SGS Precision Tools Inc. created to focus on designing custom high-performance cutting tool solutions to complement the deep range of standard catalogue tools KSPT provides. With KSTH having a sole focus and culture designed around prioritising and understanding the unique challenges of special tailored tooling, KSPT is able to provide complete solutions that maximise your result.

CUSTOM CUTTING TOOL SOLUTIONS

- As part of the KSPT dedication to keeping the world moving, a multi-million dollar investment was made for a division solely focused on custom tailored special cutting tools
- The state of the art facility is completely designed, staffed, and committed to addressing blueprint special engineered solid carbide round tool solutions
- It was critical to build a facility with the culture built around agile capacity and know how to quote, build, and ship complex special tools with industry leading high performance tool designs
- Special tooling, the attention required and solutions needed, is not simply a department or isolated machines on the factory floor but rather a standalone division focused and prepared to react with effectiveness and efficiency





KYOCERA SGS Tech Hub
149 Slayton Avenue
Danville, Virginia 24540
US and Canada: (434) 791-2020
Fax US & Canada: (434) 791-2044
web: www.kyocera-techhub.com

KYOCERA SGS Precision Tools
Medical Division

WHO WE ARE

With over 20 years of industry experience, KSPT Medical produces unique, customer designed orthopedic devices using highly trained engineers dedicated to new technology. KSPT Medical is a division of KYOCERA SGS Precision Tools, who proudly pioneered some of the world's most advanced metal cutting technology and sells to more than 60 countries. With over 20 years of industry experience, KSPT Medical Division is ISO 13485:2016 Certified and is FDA Registered in the production of medical devices in the orthopedic marketplace.

ENGINEERING

We approach each opportunity as a project and manage it as such. We pride ourselves on engineering each project to the specific needs of our customers. Providing quotes often within 24 hours and following through with detailed drawings, solid models, process plans, and programme simulations if needed. Our goal is to work hand in hand with the end user and maintain constant communication to customise our support to their needs.

MACHINING CAPABILITIES

- GRINDING
- MILLING
- TURNING
- PROFILING
- BENDING
- Services Offered; Welding, Various Coatings, Anodising, Passivation, Electropolishing, Laser Etching and Heat Treating

KYOCERA SGS
Precision Tools Medical Division
201 S. Towerview Dr.
Columbia City, Indiana 46725
phone: (260) 244-7677
fax: (260) 244-7466
www.ksptmedical.com

To Request a Quote:
rfq@kyocera-sgstool.com

Customer Service and Orders:
salesmd@kyocera-sgstool.com

FDA REGISTERED ISO 13485:2016 Certified

Keeping the world moving

An interactive and dynamic platform to help select the correct SGS tool for the operation and provide optimal machining parameters.

- A quick and reliable 3 step process:
  1. Choose the material
  2. Enter the application
  3. From the list of recommended results, choose the tool that best fits your machining needs
- Speed & Feed rates will be generated based on application parameters combined with the selected tool's capabilities in the desired material.

TO SIGN UP FOR THE TOOLWIZARD®:

1. Visit Toolwizard.kyocera-sgstool.com
2. Register for an account
3. Start calculating
4. Start saving!

Common Legend
Leyenda habitual
Légende commune
Gemeinsame Legende

TO ORDER: Please specify quantity and EDP number.
PARA SU PEDIDO: Por favor especifique cantidad y número de EDP.
POUR COMMANDER: Veuillez préciser la quantité et le code article EDP.
BESTELLEN: Bitte Menge und EDV-Nummer angeben.

RETURN POLICY: An RMA number must accompany all product returns.
Contact your Customer Service Representative for an RMA number.

DEVOLUCIONES: Todo material devuelto debe ir acompañado de un número de RMA correspondiente.
Para solicitarlo, póngase en contacto con su Representante de Atención al Cliente.

POLITIQUE DE RETOUR: Tous les produits retournés doivent être accompagnés d'un numéro RMA.
Contacter votre interlocuteur commercial pour obtenir un numéro RMA.

RÜCKNAHMEGARANTIE: Eine RMA-Nummer (Rücksendegenehmigung) muss bei allen Produktrücksendungen beiliegen.
Wenden Sie sich bitte an Ihren Kundendienstmitarbeiter für RMA-Nummer.

REGULATION SAFETY GLASSES SHOULD ALWAYS BE WORN WHEN USING HIGH-SPEED CUTTING EQUIPMENT

DEBEN USARSE GAFAS PROTECTORAS CUANDO SE UTILICEN EQUIPOS DE ALTA VELOCIDAD

DES LUNNETTES DE SÉCURITE DOIVENT ÊTRE IMPÉRATIVEMENT PORTÉES LORS D'UTILISATION D'OUTILS À GRANDE VITESSE

BEI SCHNELLLAUFENDEN SPANABHEBENDEN MASCHINEN MÜSSEN IMMER DIE VORGESCHRIEBENEN SICHERHEITSBRILLEN GETRAGEN WERDEN

WARNING: This product can expose you to chemicals including Cobalt, which is known to the State of California to cause cancer. For more information go to www.p65warnings.ca.gov

ADVERTENCIA: Este producto puede exponerlo a químicos como el Cobalto, reconocido como cancerígeno en el estado de California. Para mas informacion visite esta pagina web: www.p65warnings.ca.gov

ATTENTION: Ce produit vous expose aux produits chimiques incluant le Cobalt, qui est reconnu par l'Etat de Californie a etre une cause de cancer. Pour plus d'information veuillez regarder sur: www.p65warnings.ca.gov

WARNUNG: Dieses Produkt kann Sie mit Chemikalien wie Kobalt aussetzen, das dem Staat Kalifornien als krebserregend bekannt ist. Für weitere Informationen, besuchen Sie: www.p65warnings.ca.gov

INTELLECTUAL PROPERTY
PROPIEDAD INTELECTUAL
PROPRIÈTÈ INTELLECTUELLE
GEISTIGES EIGENTUM

KYOCERA SGS Precision Tools holds more than 20 patents globally. Please visit our website at https://kyocera-sgstool.co.uk/ to learn more.

KYOCERA SGS Precision Tools posee más de 20 patentes a nivel mundial. Para más información, visite nuestra página web www.kyocera-sgstool.com.

KYOCERA SGS Precision Tools possède plus de 20 brevets mondialement reconnus. Pour plus d'information, veuillez consulter notre site web www.kyocera-sgstool.com.

KYOCERA SGS Precision Tools besitzt mehr als 20 Patente weltweit. Bitte besuchen Sie unsere Webseite www.kyocera-sgstool.com für weitere Informationen.

Common Legend
Leyenda habitual
Légende commune
Gemeinsame Legende

MATERIALS
MATERIALES
MATÉRIAUX
WERKSTOFFE

Steels (P)
Aceros
Aciers
Stähle

Stainless Steels (M)
Aceros Inoxidables
Aciers inoxydables
Nichtrostende Stähle

Cast Iron (K)
Acero de Fundición
Fonte
Grauguss

Non-Ferrous (N)
No Férricos
Non Ferreux
Nichteisenmetalle

High Temp Alloys (S)
Aleaciones Termorresistentes
Alliages hautes températures
Warmfeste Legierungen

Hardened Steels (H)
Aceros Endurecidos
Aciers Trempés
Gehärteter Stahl

TOOL LENGTH
LONGITUDES DE HERRAMIENTAS
LONGUEUR DE L'OUTIL
WERKZEUGLÄNGE

Stub
Corta
Court
Kurze Bauform

Regular
Media
Moyen
Standard

Long
Larga
Long
Lang

Long Reach Neck
Larga con cuello
Détalonnage longue portée
Freischliff

Extra Long
Extra-larga
Extra-long
Extra-Lang

FLUTES
FILOS
DENTS
SCHNEIDEN

2
2 Flutes
2 Filos
2 Dents
2 Schneiden

3
3 Flutes
3 Filos
3 Dents
3 Schneiden

4
4 Flutes
4 Filos
4 Dents
4 Schneiden

5
5 Flutes
5 Filos
5 Dents
5 Schneiden

6
6 Flutes
6 Filos
6 Dents
6 Schneiden

7
7 Flutes
7 Filos
7 Dents
7 Schneiden

8
8 Flutes
8 Filos
8 Dents
8 Schneiden

9
9 Flutes
9 Filos
9 Dents
9 Schneiden

10
10 Flutes
10 Filos
10 Dents
10 Schneiden

11
11 Flutes
11 Filos
11 Dents
11 Schneiden

12
12 Flutes
12 Filos
12 Dents
12 Schneiden

End Mill Legend
Leyenda fresas
Légende fraise
Fräser-Legende

END CONFIGURATIONS
CONFIGURACIONES DE LA PUNTA
FORME DE L'OUTIL EN BOUT
ENDENAUSFÜHRUNG

Ball
Esférica
Boule
Kugelkopf

Corner
Plana con borde romo
Rayon mit Eckenradius

Square
Plana
Non rayonné
Scharfkantig

SIDE PROFILE
PERFIL LATERAL
PROFIL LATÉRAL
SEITENPROFI

Tapered Circle Segment
Perfil Cónico de Segmento Circular
Conique Segment de Cercle
Tonnen Segment

SHANK TYPE
TIPO DE VÁSTAGO
TYPE DE QUEUE
SCHAFTART

Common
Normal
Dégagée
Standard

Straight
Recto
Cylindrique
Gerade

DIN6535 HB
Drive Flat
DIN 6535 HB
Plano en el zanco
DIN 6535 HB
Entrainement méplat
DIN 6535 HB
Spannfläche
DIN 6535 HB

HELIX ANGLES
ANGULOS DE LAS HELICES
SPANWINKEL
ANGLES DE L'HÉLICE

Right Spiral
Hélice con corte a la derecha
Hélice droite
Rechtsspirale

Left Spiral
Hélice con corte a la izquierda
Hélice gauche
Linksspirale

Variable Right Spiral
Hélice con corte a la derecha y ángulo variable
Hélice droite variable
Rechtsspirale, variabel

COOLANT OPTIONS
OPCIONES DE REFRIGERACIÓN
OPTIONS DE REFROIDISSEMENT
KÜHLSCHMIERMITTEL-OPTIONEN

Internal Coolant
Refrigeración interna
Refroidissement interne
Innenkühlung

JetStream Coolant Slots
Ranuras de refrigeración JetStream
Fentes de refroidissement JetStream
JetStream-Kühlmittelschlitze

RAKE ANGLE
ANGULO DE DESPRENDIMIENTO
ANGLE DE COUPE
SPANWINKEL

Positive
Positivo
Positif
Positiv

Neutral
Neutro
Neutre
Neutral

Negative
Negativo
Négatif
Negativ

Variable
Variable
Variable
Variabel

ADDITIONAL GEOMETRY
GEOMETRÍAS ADICIONALES
GÉOMÉTRIE SUPPLÉMENTAIRE
WEITERE BAUFORMEN

Flute Spacing Unequal
Espaciado desigual de los filos
Denture décalée
Nutenabstand Ungleich

Chip Breaker
Rompevirutas
Brise-copeaux
Spanteiler

All tools are in Right Cut Direction unless noted
Todas las herramientas son con corte a la derecha a menos que se indique lo contrario
Tous les outils ont une coupe à droite, sauf indications contraires
Alle Werkzeuge sind rechtsschneidend, soweit nicht anders angegeben

All tools are straight or non-tapered unless noted
Todas las herramientas son rectas o no cónicas a menos que se indique lo contrario
Tous les outils sont droits ou non coniques, sauf indication contraire
Alle Werkzeuge sind gerade oder nicht konisch, sofern nicht anders angegeben

Drill Legend
Leyenda brocas
Légende perçage
Bohrer-Legende

SHANK TYPE
TIPO DE VÁSTAGO
TYPE DE TIGE
SCHAFTART

Common
Normal
Dégagée
Standard

Straight
Recto
Cylindrique
Gerade

REACH
ALCANCE
LONGUEUR
NUTZLÄNGE

3xD Reach
Alcance 3xD
Longueur 3xD
3xD Nutzlänge

5xD Reach
Alcance 5xD
Longueur 5xD
5xD Nutzlänge

8xD Reach
Alcance 8xD
Longueur 8xD
8xD Nutzlänge

12xD Reach
Alcance 12xD
Longueur 12xD
12xD Nutzlänge

HELIX ANGLES
ANGULOS DE LAS HELICES
ANGLES DE L'HÉLICE
SPANWINKEL

Right Spiral
Hélice con corte
a la derecha
Hélice à droite
Rechtsspirale

None
Ninguno
Aucun
gerade genutet

COOLANT OPTIONS
OPCIONES DE REFRIGERACIÓN
OPTIONS DE REFROIDISSEMENT
KÜHLSCHMIERMITTEL-OPTIONEN

Internal Coolant
Refrigeración interna
Refroidissement interne
Innenkühlung

External Coolant
Refrigeración externa
Refroidissement externe
Auskühlung

POINT ANGLE
ANGULO DE PUNTA
POINT D'ANGLE
SPITZENWINKEL

Point Angle
Angulo de la Punta
Angle de pointe
Spitzenwinkel

Point Angles
Ángulos de punta
Angles de pointe
Spitzenwinkel

CHAMFER ANGLE
ÁNGULO DE CHAFLÁN
ANGLE DE CHANFREIN
FASENWINKEL

Chamfer Angle
Ángulo de chaflán
Angle de chanfrein
Fasenwinkel

NUMBER OF MARGINS
NÚMERO DE MÁRGENES
NOMBRE DE MARGES
ANZAHL DER RÄNDER

2 Margins
2 Márgenes
2 Marges
2 Ränder

3 Margins
3 Márgenes
3 Marges
3 Ränder

4 Margins
4 Márgenes
4 Marges
4 Ränder

NUMBER OF FLUTES
FILOS
DENTS
SCHNEIDEN

1 Flute
1 Filo
1 Dent
1 Schneiden

2 Flutes
2 Filos
2 Dents
2 Schneiden

3 Flutes
3 Filos
3 Dents
3 Schneiden

Router Legend
Leyenda ranuradores
Légende détourage
Konturenfräser-Legende

SHANK TYPE
TIPO DE VÁSTAGO
TYPE DE TIGE
SCHAFTART

Straight
Recto
Cylindrique
Gerade

RAKE ANGLE
ANGULO DE DESPRENDIMIENTO
ANGLE DE PENTE
SPANWINKEL

Positive
Positivo
Positif
Positiv

Neutral
Neutro
Neutre
Neutral

Negative
Negativo
Négatif
Negativ

Variable
Variable
Variable
Variabel

HELIX ANGLES
ANGULOS DE LAS HELICES
ANGLES DE L'HÉLICE
SPANWINKEL

Right Spiral
Hélice con corte
a la derecha
Hélice à droite
Rechtsspirale

Left Spiral
Hélice con corte
a la izquierda
Hélice à gauche
Linksspirale

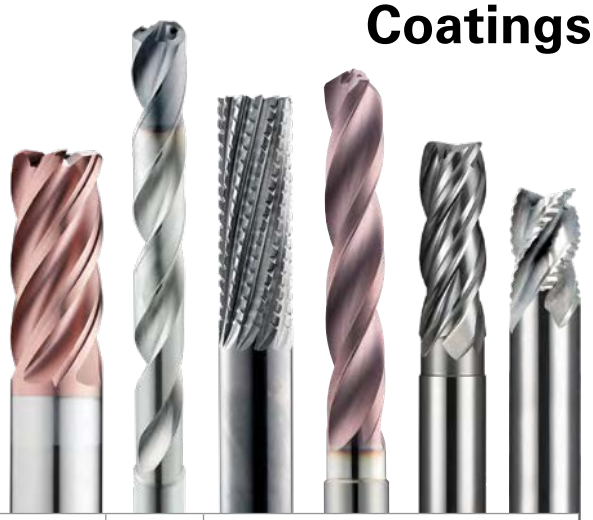
ADDITIONAL GEOMETRY
GEOMETRÍAS ADICIONALES
GÉOMÉTRIE SUPPLÉMENTAIRE
WEITERE BAUFORMEN

Left Hand Cut Direction
Fresado sentido izquierda
Coupe vers la gauche
Rechtsschneidend

Right Hand Cut Direction
Fresado sentido derecha
Coupe vers la droite
Linksschneidend

Chip Breaker
Rompevirutas
Brise-copeaux
Spanbrecher

Coatings



Ti-NAMITE® and Di-NAMITE® Tool Coatings are specifically engineered for KSPT solid carbide rotary tools. The coating lineup includes proprietary processes that result in optimized tool life and increased speed and feed rates in a variety of applications.

	Coating	Identifying Color	Layer Structure	Thickness	Hardness (HV)	Coefficient of Friction (Fretting)	Thermal Stability	General Information
Ti-NAMITE®	Titanium Nitride (TiN)	gold	Multilayer	1–5 microns	2200	0.40–0.65	600°C / 1112°F	A general purpose coating with good adhesion and abrasion resistant properties. Suitable for a wide variety of materials.
Ti-NAMITE-A®	Aluminum Titanium Nitride (AlTiN)	dark grey	Nano structure	1–5 microns	3700	0.30	1100°C / 2010°F	Excellent thermal and chemical resistance allows for dry cutting and improvements in performance of carbide. The coating has a high hardness giving great protection against abrasive wear and erosion.
Ti-NAMITE-B®	Titanium DiBoride (TiB2)	light grey-silver	Monolayer	1–2 microns	4000	0.10–0.20	850°C / 1562°F	This ceramic based coating ensures a smooth surface and a low affinity to cold welding or edge build up, which makes it optimal for aluminum, copper, and other non-ferrous applications. It has high toughness and high hardness.
Ti-NAMITE-C®	Titanium Carbonitride (TiCN)	pink-red	Multilayer	1–5 microns	3000	0.30–0.45	400°C / 752°F	A very wear resistant coating with high toughness and shock resistance. Good in interrupted cuts found in applications like milling.
Ti-NAMITE-X® ADVANCED TOOL COATING	Proprietary (TX)	black	Nano Composite	1–5 microns	3600	0.45	1150°C / 2100°F	The structural design of Ti-Namite-X is adapted to meet a diverse range of applications; everything from high- and low-alloy steels to hardened materials (up to 65 HRC core hardness). Ti-Namite-X is suitable for operations which require high cutting speeds, high temperatures at the cutting edge, and high metal removal rates.
Di-NAMITE® CRYSTALLINE DIAMOND COATING	Crystalline Diamond (Diamond)	black	Monolayer	6–20 microns	>8000	0.15–0.20	800°C / 1470°F	This is the hardest coating available with the best abrasion resistance. Diamond coating is suitable for machining highly abrasive, non-ferrous materials such as CFRP and graphite.
Ti-NAMITE-M®	Proprietary (TM)	copper	Nano Composite	1–5 microns	3600	0.45	1150°C / 2100°F	Features include high wear resistance, reduced friction, and excellent prevention of edge build up. This coating provides superior material removal rates and tool life when used in high performance operations with difficult to machine materials like titanium.
Ti-NAMITE-H®	Proprietary (TH)	copper	Nano Composite	1–5 microns	3800	0.30	1100°C / 2010°F	This coating demonstrates a superior combination of hardness and adhesion in hard machining of molds and dies and machining high-alloy stainless steels for high temperature applications such as turbines. The smooth surface ensures optimum surface quality and decreases the temperature in the cutting zone by reducing friction.

Other coatings available upon request.

SGS Solid Carbide Tools

Keeping the world moving

High Performance End Mills

Milling

HIGH PERFORMANCE END MILLS	SERIES	DESCRIPTION	PAGE	S&F PAGE
Z-Carb-HPR	Z5MCR	5 Flute Rougher Corner Radius Metric	28	30
Z-Carb-AP	Z1MPCR	4 Flute Variable Rake Corner Radius Metric	32	35
	Z1MPIC	4 Flute Variable Rake Intermediate Reach Corner Radius Metric	34	35
	Z1MPLC	4 Flute Variable Rake Long Reach Corner Radius Metric	34	35
Z-Carb	Z1M	4 Flute Variable Geometry Square End Metric	32	35
	Z1MB	4 Flute Variable Geometry Ball End Metric	37	38
Z-Carb-HTA	ZH1MCR	4 Flute Variable Geometry High Temp Alloys Corner Radius Metric	40	41
	ZH1MCRS	4 Flute Variable Geometry High Temp Alloys Stub Corner Radius Metric	40	41
	ZD1MCR	4 Flute Variable Geometry Hard Materials Long Reach Corner Radius Metric	42	43
V-Carb	55M	5 Flute Finisher & Semi-Finisher Square End Metric	44	48
	55MCR	5 Flute Finisher & Semi-Finisher Corner Radius Metric	44	48
	55MB	5 Flute Finisher & Semi-Finisher Ball End Metric	47	48
T-Carb®	51M	6 Flute High Speed Machining Square End Metric	50	53
	51MCR	6 Flute High Speed Machining Corner Radius Metric	50	53
	51ML	6 Flute High Speed Machining Square End Long Reach Metric	51	53
	51MLC	6 Flute High Speed Machining Long Reach Corner Radius Metric	51	53
	51MB	6 Flute High Speed Machining Ball End Metric	52	53
	51MLB	6 Flute High Speed Machining Ball End Long Reach Metric	52	53
H-Carb	77M	7 Flute High Efficiency Square End Metric	55	57
	77MCR	7 Flute High Efficiency Corner Radius Metric	55	57
Multi-Carb	66M	Multi-Flute Finisher Square End Metric	59	61
	66MCR	Multi-Flute Finisher Corner Radius Metric	59	61
	67B	Multi-Flute Barrel Cutter Metric	63	64
Series 33	33MCR	3 Flute Difficult to Machine Materials Corner Radius Metric	65	66
Series 7	7M	4 Flute Variable Geometry Long Length Square End Metric	68	69
	7MB	4 Flute Variable Geometry Long Length Ball End Metric	68	69
Turbo-Carb	56MB	2 Flute Contouring Long Reach Ball End Metric	70	71
Power-Carb®	57M	6 Flute Finisher Square End Metric	72	73
CFRP Slow Helix	27M	4 Flute Slow Helix Square End Metric	74	75

Fresado

FRESAS DE ALTO RENDIMIENTO	SERIE	DESCRIPCIÓN	PÁGINA	S&F PÁGINA
Z-Carb-HPR	Z5MCR	5 filos, desbastador, radio angulado, métrico	28	30
Z-Carb-AP	Z1MPCR	4 filos, inclinación variable, radio angulado, métrico	32	35
	Z1MPIC	4 filos, inclinación variable, medio alcance, radio angulado, métrico	34	35
	Z1MPLC	4 filos, inclinación variable, largo alcance, radio angulado, métrico	34	35
Z-Carb	Z1M	4 filos, geometría variable, punta cuadrada, métrico	32	35
	Z1MB	4 filos, geometría variable, punta esférica, métrico	37	38
Z-Carb-HTA	ZH1MCR	4 filos, geometría variable, aleaciones termorresistentes, radio angulado, métrico	40	41
	ZH1MCRS	4 filos, geometría variable, aleaciones termorresistentes, versión corta, radio angulado, métrico	40	41
Z-Carb-MD	ZD1MCR	4 filos, geometría variable, materiales duros, largo alcance, radio angulado, métrico	42	43
V-Carb	55M	5 filos, acabador y semiacabador, punta cuadrada, métrico	44	48
	55MCR	5 filos, acabador y semiacabador, radio angulado, métrico	44	48
	55MB	5 filos, acabador y semiacabador, punta esférica, métrico	47	48
T-Carb®	51M	6 filos, mecanizado de alta velocidad, punta cuadrada, métrico	50	53
	51MCR	6 filos mecanizado de alta velocidad, radio angulado, métrico	50	53
	51ML	6 filos, mecanizado de alta velocidad, punta cuadrada, largo alcance, métrico	51	53
	51MLC	6 filos mecanizado de alta velocidad, largo alcance, radio angulado, métrico	51	53
	51MB	6 filos, fresa esférica para mecanizados de alta velocidad, métrico	52	53
	51MLB	6 filos, fresa esférica larga para mecanizados de alta velocidad, métrico	52	53
H-Carb	77M	7 filos métrica de alta eficiencia, punta cuadrada, métrico	55	57
	77MCR	7 filos métrica de alta eficiencia, radio angulado, métrico	55	57
Multi-Carb	66M	Filo múltiple, acabador, punta cuadrada, métrico	59	61
	66MCR	Filo múltiple, acabador, radio angulado, métrico	59	61
	67B	Fresa cónica circular multi-filos tipo barril, métrica	63	64
Serie 33	33MCR	3 filos, materiales difíciles de mecanizar, radio angulado, métrico	65	66
Serie 7	7M	4 filos, geometría variable, longitud larga, punta cuadrada, métrico	68	69
	7MB	4 filos, geometría variable, longitud larga, punta esférica, métrico	68	69
Turbo-Carb	56B	2 filos, contorneado, largo alcance, punta esférica, fraccional	70	71
Power-Carb®	57M	6 filos, acabador, punta cuadrada, métrico	72	73
Helicoidal de avance lento CFRP	27M	4 filos, helicoidal de avance lento, punta cuadrada, métrico	74	75

Recomendaciones de velocidades y avances mostradas tras cada serie

Fraisage

FRAISES A DETOURER UNIVERSELLES	SÉRIES	DESCRIPTION	PAGE	S&F PAGE
Z-Carb-HPR	Z5MCR	5 dents rayonnée pour l'ébauche (métrique)	28	30
Z-Carb-AP	Z1MPCR	4 dents pas décalé et hélice variable rayonnés (métrique)	32	35
	Z1MPIC	4 dents pas décalé, hélice variable, détalonné, rayonnés (métrique)	34	35
	Z1MPLC	4 dents pas décalé et hélice variable rayonnés (métrique)	34	35
Z-Carb	Z1M	4 dents géométrie variable non rayonné (métrique)	32	35
	Z1MB	4 dents géométrie variable à bout hémisphérique (métrique)	37	38
Z-Carb-HTA	ZH1MCR	4 dents géométrie variable alliages haute température rayonné (métrique)	40	41
	ZH1MCRS	4 dents géométrie variable, alliages haute température, longueur de l'outil court, rayonné (métrique)	40	41
Z-Carb-MD	ZD1MCR	4 dents géométrie variable matériaux durs longue portée rayonné (métrique)	42	43
V-Carb	55M	5 dents en bout de finition et semi-finition plat (métrique)	44	48
	55MCR	5 dents en bout finition et semi-finition rayonné (métrique)	44	48
	55MB	5 dents en bout de finition et semi-finition hémisphérique (métrique)	47	48
T-Carb®	51M	6 dents pour usinage grande vitesse non rayonné (métrique)	50	53
	51MCR	6 dents pour usinage grande vitesse rayonné (métrique)	50	53
	51ML	6 dents pour usinage grande vitesse non rayonné extra longue (métrique)	51	53
	51MLC	6 dents pour usinage grande vitesse extra longue rayonné (métrique)	51	53
	51MB	6 dents hémisphérique UGV dimensions cotes (métrique)	52	53
	51MLB	6 dents hémisphérique détalonnée UGV dimensions cotes (métrique)	52	53
H-Carb	77M	7 dents hautes performances droite côtes (métrique)	55	57
	77MCR	7 dents hautes performances torique côtes (métrique)	55	57
Multi-Carb	66M	Multi-dents non rayonné pour finition (métrique)	59	61
	66MCR	Multi-dents rayonné pour finition (métrique)	59	61
	67B	Fraise tonneau à segments de cercle cotes (métrique)	63	64
Série 33	33MCR	3 dents rayonné pour l'ébauche dans tous les matériaux sauf non-ferreux (métrique)	65	66
Série 7	7M	4 dents géométrie variable à queue longue non rayonné (métrique)	68	69
	7MB	4 dents géométrie variable à queue longue à bout hémisphérique (métrique)	68	69
Turbo-Carb	56MB	2 dents contournage longue portée à bout hémisphérique (métrique)	70	71
Power-Carb®	57M	6 dents en bout de finition plat (métrique)	72	73
CFRP hélice lente	27M	4 dents hélice lente non rayonné (métrique)	74	75

Recommandativons de vitesse et avance indiquées après chaque série

HOCHLEISTUNGS-SCHAFTFRÄSER	SERIE	BESCHREIBUNG	SEITE	S&F SEITE
Z-Carb-HPR	Z5MCR	Schruppfräser mit 5 Schneiden und Eckenradien	28	30
Z-Carb-AP	Z1MPCR	Fräser mit 4 Schneiden und variablen Spanwinkel	32	35
	Z1MPIC	Fräser mittlerer Länge mit 4 variablen Schneiden und Eckenradien	34	35
	Z1MPLC	Langlochfräser mit 4 variablen Schneiden und Eckenradien	34	35
Z-Carb	Z1M	Schaftfräser mit 4 Schneiden ohne Eckenradien und variabler Form	32	35
	Z1MB	Radiusschaftfräser mit 4 Schneiden und variabler Form	37	38
Z-Carb-HTA	ZH1MCR	Hochwarmfester Fräser mit 4 variablen Schneiden und Eckenradien	40	41
	ZH1MCRS	Hochwarmfester Fräser mit 4 variablen Schneiden und Eckenradien	40	41
Z-Carb-MD	ZD1MCR	Langlochfräser mit 4 variablen Schneiden, Eckenradien und Form aus Hartmetall	42	43
V-Carb	55M	Schlicht- und Halbschlichtfräser mit 5 Schneiden ohne Eckenradien und variabler Form	44	48
	55MCR	Schlicht- und Halbschlichtfräser mit 5 Schneiden und Eckenradien	44	48
	55MB	Schlicht- und Halbschlicht-Radiusschaftfräser mit 5 Schneiden und variabler Form	47	48
T-Carb®	51ML	Langloch-Schaftfräser aus Schnellstahl mit 6 Schneiden ohne Eckenradien	50	53
	51M	Schaftfräser für die Hochgeschwindigkeitsbearbeitung mit 6 Schneiden ohne Eckenradien	50	53
	51MCR	Fräser für die Hochgeschwindigkeitsbearbeitung mit 6 Schneiden und Eckenradien aus Schnellstahl	51	53
	51MLC	Langlochfräser für die Hochgeschwindigkeitsbearbeitung mit 6 Schneiden und Eckenradien	51	53
	51MB	6- Schneider Vollradiusfräser für Hochgeschwindigkeitsbearbeitung	52	53
	51MLB	6 -Schneider Vollradiusfräser mit Freischliff für Hochgeschwindigkeitsbearbeitung	52	53
H-Carb	77M	Hocheffizienter mit 7 Schneiden ohne Eckenradien	55	57
	77MCR	Hocheffizienter mit 7 Schneiden und Eckenradien	55	57
Multi-Carb	66M	mehrschneidiger Schlichtfräser ohne Eckenradien	59	61
	66MCR	mehrschneidiger Schlichtfräser mit Eckenradien	59	61
	67B	Fresa cónica circular multi-filos tipo barril, métrica	63	64
Serie 33	33MCR	Fräser mit 3 Schneiden und Eckenradien für schwerspanbare Werkstoffe	65	66
Serie 7	7M	Langloch-Schaftfräser mit 4 Schneiden ohne Eckenradien und variabler Form	68	69
	7MB	Langloch-Radiusschaftfräser mit 4 Schneiden und variabler Form	68	69
Turbo-Carb	56MB	Langloch-Profil-Radiusschaftfräser mit 2 Schneiden	70	71
Power-Carb®	57M	Schlichtfräser mit 6 Schneiden ohne Eckenradien	72	73
CFRP Slow Helix	27M	Schaftfräser mit 4 steilen Schneiden ohne Eckenradien	74	75

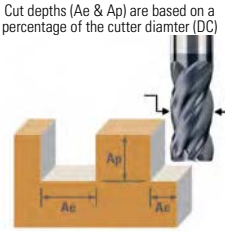
Empfehlungen für Drehzahl & Vorschub im Anhang zu jeder Serie

End Mill Matrix

Preferred materials for each Series are designated below.

Coolant required in these materials
Plunging not recommended in these materials

Cut depths (Ae & Ap) are based on a percentage of the cutter diamter (DC)



Material hardness and machinability affect speed, feed, and cut depths. Long flute or long reach tools require reduced rates and cut depths.

Name	Series	Page	Steel			Stainless Steel			Cast Iron			Non Ferrous			HRSA			Hard Steel		
			Low Carbon ≤ 20 HRc	Medium Carbon, Alloy 20 to 35 HRc	High Carbon, Alloy 35 to 45 HRc	Ferritic & Martensitic ≤ 45 HRc	Austenitic & Duplex ≤ 25 HRc	Precipitation Hardened ≤ 45 HRc	Low Alloy, Grey, Ductile ≤ 25 HRc	Med-High Alloy, Nodular 25 to 35 HRc	High Alloy, Nodular ≥ 35 HRc	Aluminum Alloys	Copper Alloys	Plastics, Composites	Titanium Alloys ≤ 45 HRc	Iron, Nickel, Cobalt Alloys ≤ 45 HRc	Refractory Alloys, Mo, Ta, W ≤ 35 HRc	High Carbon, Med Alloy 45 to 50 HRc	Tool, Mold & Die 45 to 55 HRc	Tool, Mold & Die 55 to 65 HRc
Series 33	33	65	★	★	★	★	★	☆	★	★	☆				★	☆	☆	○	○	
Z-Carb-AP	Z1P	32	★	★	★	★	★	★	★	★	★				★	★	★	☆	○	
Z-Carb-HTA	ZH1	40	★	★	★	★	★	★	★	★	★				★	★	★	☆	○	
Series 7	7	68	★	★	★	★	★	★	★	★	★				★	★	☆	☆	○	
Z-Carb HPR	Z5	28	★	★	★	★	★	★	★	★	★				★	★	★	☆	○	
V-Carb	55	44	★	★	★	★	★	★	★	★	★				★	★	☆	○	○	
T-Carb®	51	50	★	★	★	★	★	★	★	★	★				★	★	★	☆	○	
H-Carb	77	55	★	★	★	★	★	★	★	★	★				★	★	★	☆	○	
Multi Carb	66	59	★	★	★	★	☆	★	★	★	★				★	★	★	☆	○	
Multi Carb-B	67B	63	★	★	★	★	★	★	★	★	★				★	★	★	☆	○	
Turbo Carb	56B	70	★	★	★				★	★	★							★	★	★
Z-Carb-MD	ZD1	42			☆					☆	★							★	★	★
Power-Carb®	57	72									☆							★	★	★
Ski-Carb	44	100										★	☆	○						
S-Carb® 2 Flute	47	97										★	★	○						
S-Carb® 3 Flute	43	88										★	★	○						
S-Carb® APR-3	43APR-3	81										★	★	○						
S-Carb® APR-4	43APR-4	82										★	★	○						
S-Carb® APF	43APF	84										★	★	○						
S-Carb® APF-B	43APF-B	86										★	★	☆						
CCR	20-CCR	279												★						
CCR Coarse	31-CCR	281												★						
Compression Router	25	283												★						
Up Cut Router	21	285										☆	○	★						
Down Cut Router	22	286										☆	○	★						

End Mill Matrix

	Preferred Cut Type for Series ★ Best ☆ Better ○ Good (blank) Not Recommended						Preferred Entry Method for Series			Preferred Tool Path for Series	
	Unless blank, a high quality wall or floor finish can be achieved with any Series with adjusted speed & feed.						Speed & Feed are based on ramp angle.			For rough milling, HEM tool paths are usually preferred in most situations, however, Standard paths may be more efficient using suitable tools with moderate to heavy cut types.	
	Heavy	**Moderate**	**Light**	**Fine**	**Finish-Wall**	**Finish - Floor**	**Plunge**	**Straight Ramp**	**Helical Ramp**		
	Ae = 1 to .4 x DC Ap ≤ 1 x DC	Ae = .4 to .25 x DC Ap ≤ 1.5 x DC	Ae = .25 to .1 x DC Ap ≤ 2.5 x DC	Ae = .1 to .02 x DC Ap ≤ 4.5 x DC	Ae ≤ .02 x DC any Ap	Ae ≥ .5 x DC Ap ≤ .02 x DC	Ap ≤ 1 x DC lower feed rates	Ap ≤ 2 x DC medium feed rates	Ap ≤ 4 x DC higher feed rates	**Standard Path**	**HEM Path**
	★	★	☆	☆	○	☆	☆	★	★	★	☆
	★	★	☆	☆	○	☆	☆	★	★	★	☆
	★	★	☆	☆	○	☆	☆	★	★	★	☆
	○	○	○	★	★	☆		○	☆	○	☆
	☆	★	★	☆	☆	★		★	★	★	★
	○	☆	★	★	★	★		○	☆	☆	★
	○	○	☆	★	★	★		○	★	○	★
	○	○	○	★	★	★		○	★	○	★
	○	○	○	☆	★	★		○	★	○	★
				★	★			○	○	★	
	○	○	☆	★	★		○	○	★	★	★
	★	★	☆	☆	☆	☆		☆	★	☆	★
	○	○	☆	★	★	★		○	☆	☆	★
	☆	☆	☆	★	★	☆	☆	★	★	★	☆
	★	★	☆	☆	○	☆	☆	★	★	★	☆
	★	★	☆	☆	☆	★	☆	★	★	★	☆
	★	★	☆	☆		★	☆	★	★	★	☆
	★	★	☆	☆		★	☆	★	★	★	☆
	○	○	☆	★	★	★	○	☆	★	☆	★
				★	★	☆	○	○		★	
	★	★	☆	☆		☆	○	☆	★	★	☆
	★	★	☆	☆		☆	○	☆	★	★	☆
	○	○	☆	☆	★	☆	○	☆	★	★	☆
	★	★	☆	☆	○	☆	○	☆	★	★	☆
	○	○	☆	☆	☆	☆				★	☆

End Mill Matrix

Name	Series	Page	Flute Count	Cut Diameter Range inch mm	Cut Length Availability (x DC) **	Reach Option (x DC) **	End Styles Square Radius Ball
Series 33	33	33	3	0.125 to 1 3 to 20	2.25 to 3	–	R
Z-Carb-AP	Z1P	32	4	0.0156 to 1 1 to 25	1 to 3.25	2.5 to 8.5	S, R, B
Z-Carb-HTA	ZH1	40	4	0.250 to 1 6 to 20	1.25 to 3	–	R
Series 7	7	68	4	0.125 to 1 3 to 25	2.25 to 8.25	–	S, B
Z-Carb HPR	Z5	28	5	0.125 – 1 6 – 25	1 to 3	–	S, R
V-Carb	55	44	5	0.125 to 1 6 to 20	1.25 to 5	–	S, R, B
T-Carb®	51	50	6	0.250 to 1 6 to 20	1.25 to 3	3.25 to 5.5	S, R
H-Carb	77	55	7	0.250 to 1 6 to 25	2.5 to 4	–	S, R
Multi Carb	66	69	7, 9, 11	0.188 to 1 6 to 25	1.5 to 3.25	–	S, R
Multi Carb-B	67	63	4, 6, 8	– 6 to 16	1.2 to 1.9	–	B
Turbo Carb	56B	70	2	0.031 to 0.750 1 to 20	1	2 to 2.25	B
Z-Carb-MD	ZD1	42	4	0.118 to 0.750 5 to 20	1 to 1.25	2.25 to 5	R
Power-Carb®	57	72	6	0.250 to 0.500 6 to 20	2 to 2.25	–	S
Ski-Carb	44	100	2	0.250 to 1 3 to 20	1.25 to 7	–	S, R
S-Carb® 2 Flute	47	97	2	0.125 to 1 3 to 25	1 to 3	3 to 9	S, B
S-Carb® 3 Flute	43	88	3	0.125 to 1 3 to 25	1 to 7	2.25 to 8.5	S, R, B
S-Carb® APR-3	43APR–3	81	3	0.750 to 1 12 to 26	1.25 to 1.75	3 to 4	S, R
S-Carb® APR-4	43APR–4	82	4	20 to 25	1.25 to 1.75	2.25 to 3.5	S, R
S-Carb® APF	43APF	84	4	0.500 to 0.750 6 to 25	2.5 to 4	3 to 5	S, R
S-Carb® APF-B	43APF–B	86	3, 4	– 6 to 16	1.2 to 1.9	–	B
CCR	20–CCR	279	5, 8, 10, 12	0.250 to 0.500 2 to 12	2.75 to 4	–	S
CCR Coarse	31–CCR	281	5, 7, 8, 10	0.250 to 0.500 6 to 12	2.75 to 4	–	S
Compression Router	25	283	4, 6, 8	0.250 to 0.500 6 to 12	2.75 to 4	–	S
Up Cut Router	21	285	2	0.125 to 0.750 3 to 12	2.5 to 4.25	–	S
Down Cut Router	22	286	2	0.125 to 0.750 3 to 12	2.5 to 4.25	–	S

	Chipbreaker Option	Shank Option Solid Round Weldon Flat Jet Stream Coolant Hole	Center Cutting	Helix Angle	Flute Index	Coating	Maximum Recommended Ramp Angle ***
	By Request	SR, WF	Yes	32 / 48	Unequal	Ti–NAMITE®–A	90
	By Request	SR, WF, JS	Yes	35 / 38	Unequal	Ti–NAMITE®–X	90
	By Request	SR, WF	Yes	38 / 41	Unequal	Ti–NAMITE®–A	20
	By Request	SR	Yes	38	Unequal	Ti–NAMITE®–A	1
	By Request	SR, WF, CH	No	37	Unequal	Ti–NAMITE®–M Ti–NAMITE®–A	7
	By Request	SR, WF	Yes	45	Unequal	Ti–NAMITE®–A	5
	By Request	SR	Yes	41	Unequal	Ti–NAMITE®–X	3
	In Stock Available	SR	No	37	Unequal	Ti–NAMITE®–M Ti–NAMITE®–A	1
	By Request	SR	No	35	Equal	Ti–NAMITE®–X	1
	By Request	SR	Yes	varies	Equal	Ti–NAMITE®–H	1
	By Request	SR	Yes	30	Equal	Ti–NAMITE®–X	25
	By Request	SR	Yes	42 / 45	Unequal	Ti–NAMITE®–X	2
	By Request	SR	Yes	45	Equal	Ti–NAMITE®–X	1
	By Request	SR, WF	Yes	45	Equal	uncoated or Ti–NAMITE®–B	90
	By Request	SR	Yes	35	Equal	uncoated or Ti–NAMITE®–B	90
	In Stock Available	SR	Yes	38	Equal	uncoated or Ti–NAMITE®–B	90
	Standard	CH	Yes	38	Unequal	Ti–NAMITE®–B	90
	Standard	CH	Yes	38 / 41	Unequal	Ti–NAMITE®–B	90
	By Request	CH	Yes	38 / 41	Unequal	Ti–NAMITE®–B	25
	By Request	SR	Yes	varies	Equal	Ti–NAMITE®–B	1
	Standard	SR	Based upon end style	15	Equal	uncoated or Di–NAMITE®	5 (for end cut styles)
	Standard	SR	Based upon end style	15	Equal	uncoated or Di–NAMITE®	5 (for end cut styles)
	By Request	SR	Yes	30	Equal	uncoated or Di–NAMITE®	5
	By Request	SR	Yes	35	Equal	various optional	90
	By Request	SR	Yes	35	Equal	various optional	–

Application Tips

Tool	• Whenever possible, select an end mill with the largest diameter, shortest flute length, and shortest overall length for the best rigidity • Long flute tools are not intended for pocketing, slotting, or heavy profiling – limit Ae to .02D • High Performance tools minimise cycle time and extend tool life
Tool Holders	• Holders with adequate gripping pressure and TIR are required • Stub holders or zero length collet style holders are recommended for heavy stock removal • When using solid holders, hand ground screw flats are not recommended
Workpiece	• Secure clamping of the workpiece will reduce chatter and deflection
Machine	• Spindle must be in optimum condition for precise TIR and maximum tool life • Sufficient horsepower is required to perform at recommended speeds and feeds • Reduce rates for low power machines to prevent workpiece and / or tool damage
Coolant	• Avoid re-milling chips through use of air blast or liquid coolant as necessary • Maintain clean coolant with appropriate concentration • General recommendations: —Water Soluble Oil or Air Blast: Tool Steels, Mold & Die Steels, Carbon or Alloy Steels —Water Soluble Oil: Stainless Steels, Titanium, High Temperature Alloys, Non-Ferrous Alloys
Methods	• Climb milling is generally preferred • Attention to programming details, tool holders, TIR, balance, fixturing, etc. improve cutting tool performance and extend tool life

END MILLING GUIDELINE

DC = cutting diameter APMX = flute length

Speeds and Feeds for Cut Types are based on Radial Width (Ae) and Axial Depth (Ap)

Reductions to Speeds and Feeds may be necessary when:
- Ae and Ap exceed recommendations
- Using long flute or extended reach tools
- Using long tool holders
- Machining materials harder than listed

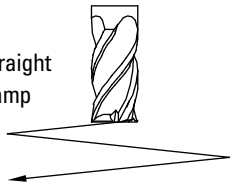
ENTRY METHODS

Pre-Drilled Hole

Pre-drilling is the preferred entry method for most applications.

Helical Ramp

Straight Ramp



Alternative methods are helical and straight ramping. High ramp angles require reduced feed. Lower ramp angles will allow higher feed rates and extend tool life. Use slotting speeds and feeds for ramp angles of 1° to 2°. Reduce feed to 25% when ramp angles approach 6°. General purpose tools and/or difficult to machine materials will require lower ramp angles and reduced feed.

Plunge

Plunge only in non-ferrous and short-chipping materials using slotting speeds and 25% slotting feeds.

Recomendaciones de uso

Herramientas	• Siempre que sea posible, seleccione la herramienta de mayor diámetro y menor longitud total y de filo para obtener una mayor rigidez. • Las herramientas con filos largos no son recomendadas para operaciones de apertura de cajas en el maquinado, operación de ranurado o perfilado pesado – limitar la profundidad radial (Ae) a .02D • Las herramientas de alto desempeño minimizan el tiempo de ciclo del maquinado y extienden la vida útil de la herramienta
Portaherramientas	• Los Portaherramientas deberán tener buena presión de amarre para la sujeción de la herramienta y una concentricidad máxima indicada (TIR) • Se recomienda usar portaherramientas de amarre directo cortos, o de boquilla con longitud cero para lograr un máximo arranque de viruta • Cuando se utilicen portaherramientas de amarre directo, no se recomienda hacer manualmente el plano para la sujeción del tornillo en el zanco de la herramienta
Pieza a maquinar	• La buena sujeción de la pieza a maquinar reducirá la vibración y la desviación de la herramienta
Máquina	• El husillo de la maquina debe estar en condiciones optimas, para asegurar la concentricidad de giro (TIR) y asegurar el máximo rendimiento de la herramienta • Para lograr los avances y velocidades recomendados, se necesita suficiente potencia (HP) en la maquina • Reducir los parámetros de corte en maquinas de baja potencia (HP) para prevenir el daño en la herramienta o pieza de trabajo
Refrigeración	• Evite el re-maquinado de virutas usando aire a presión o líquido refrigeración según sea necesario • Mantener limpio la refrigeración con su concentración adecuada • Recomendaciones generales: –Para el maquinado de aceros de herramienta, para Moldes y Dados o Aleaciones de Bajo Carbón, utilice Aceite Soluble en Agua o aire a presión –Para el maquinado de Aleaciones Inoxidables, Aleaciones Termorresistentes, Titanio y Aleaciones No Ferrosas, utilice solamente Aceite Soluble en Agua
Métodos	• Se recomienda el maquinado en sentido ascendente o trepado • El cuidado en los detalles de la programación, la concentricidad de giro (TIR) el balance de los portaherramientas, la sujeción de la pieza a maquinar, etc. son factores que contribuyen a prolongar la vida de la herramienta

GUÍAS DE FRESADO

DC = diámetro de corte APMX = largo de filo

Las velocidades y avances para cortes están basados en la profundidad radial (Ae), y profundidad axial (Ap)

Reducciones en velocidades y avances serán necesarias cuando:
- Ae y Ap exceda las recomendaciones
- Se utilicen filos largos o herramientas de largo alcance
- Se utilicen portaherramientas largos
- Se maquinen materiales más duros que los recomendados

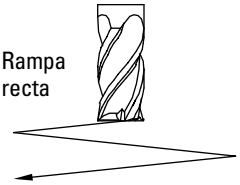
MÉTODOS DE ENTRADA

Barreno previo

Preferentemente usar un barreno previo como método de entrada para la mayor parte de las aplicaciones.

Rampa helicoidal

Rampa recta



Los métodos alternativos son las rampas helicoidales y rectas. Un ángulo elevado de rampa necesita un avance reducido. Un ángulo de rampa inferior permitirá tasas de avance más elevadas y una mayor duración de la herramienta. Usar velocidades y alcances de ranurado para ángulos de rampa de 1° a 2°. Disminuir el avance un 25% cuando los ángulos de rampa se aproximan a 6°. Las herramientas de uso general y/o materiales difíciles de mecanizar precisarán ángulos de rampa inferiores y un avance reducido.

Agujero o Barrenado

Este método se puede utilizar únicamente en materiales no ferrosos y materiales de formación de virutas cortas, usando la velocidad de ranurado y el 25% de su avance.

Conseils relatifs à l'application

Outil	• Chaque fois que possible, choisissez une fraise de plus grand diamètre possible, la plus courte possible, elle garantira la meilleure rigidité • Les outils longs ne sont pas optimum pour l'ébauche, le pocketing, le rainurage – Ae limité à 0,02 D • Les outils Haute performance optimisent les temps de cycle et de augmentent la durée de vie
Porte-outils	• Des attachements à serrage puissant et à faux rond précis sont recommandés • Attachements à méplats ou pinces à serrage nominale sont recommandées pour les ébauches • Lorsque vous utilisez des attachement rigides, les serrage de l'outil par vis ne sont pas recommandés
Pièce	• Le système de fixation et de bridage de la pièce devra permettre de réduire les vibrations et la déformation
Machine	• Broche doit être en bon état optimal au niveau de son faux rond • Suffisamment puissance est nécessaire pour effectuer à des vitesses recommandées et se nourrit • Réduire les efforts pour les machines de faible puissance pour éviter l'endommagement de la pièce et / ou de l'outil
Liquide de refroidissement	• Évitez les recyclage de copeaux par l'utilisation de soufflage d'air comprimé ou de liquide de refroidissement. • Maintenir le lubrifiant propre à la concentration appropriée • Recommandations générales – –Huile soluble ou Air comprimé: aciers à outils, aciers pour moules, aciersau carbone ou alliés –Huile soluble: aciers inoxydables, titane, alliages à haute température, alliages non ferreux
Méthodes	• L'usinage en avalant est généralement préconisé • Attention à la programmation, porte-outils, faux rond, équilibrage, fixation, etc améliorent les performances de l'outil en coupe et prolonge la durée de vie

GUIDE DU FRAISAGE

DC = diamètre de coupe APMX = longueur de coupe

Vitesses & avances pour ces cas d'usinage sont basées sur l'engagement radial (Ae), et axial (Ap)

La réduction de la vitesse et de l'avance doit être nécessaire quand:
- Les engagements Ae et Ap sont importants
- Des dentures longues ou des séries longues sont utilisées
- Des attachement longs sont utilisés
- Lors d'usinage de matériaux durs

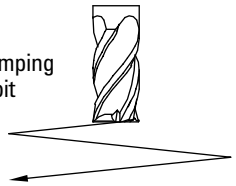
TYPES D'ENTREE MATIERE

Preperçage

Le préperçage est la méthode préférable dans la plupart de applications.

Ramping hélicoïdal

Ramping droit



Les autres méthodes sont un ramping hélicoïdal et un ramping droit. Les angles de ramping élevés exigent une avance inférieure. Les angles de ramping inférieurs permettent les taux d'avance supérieurs et prolongeront la vie de l'outil. Utilisez des avances et vitesses de mortaisage pour les angles de ramping de 1° à 2°. Réduisez l'avance à 25 % lorsque les angles de ramping avoisinent 6°. Les outils tout usage et/ou les matériaux difficiles à usiner exigeront des angles de ramping inférieurs et une charge réduite.

Plongée

Plongée uniquement dans les non ferreux. Vitesse rainurage et avances réduites de 25%.

Anwendungstipps

Werkzeug	• Wählen Sie möglichst immer den Schaftfräser mit dem größten Durchmesser, der kürzesten Schneide und Gesamtlänge, um eine hohe Steifigkeit zu erhalten • Langlochschaftfräser sind nicht zum Taschen-, Schlitz- oder Profilfräsen bestimmt – die Dehnung auf Ae 0,2 der Streckgrenze nicht überschreiten • Hochleistungswerkzeuge minimieren die Bearbeitungszeit und verlängern die Werkzeugstandzeit
Werkzeughalter	• Es werden Spannzangen mit genauem Rundlauf benötigt • Steilkegel oder bündige Spannfutter werden bei hohem Materialabtrag empfohlen • Von der Verwendung fester handverschraubter Halterungen wird abgeraten
Werkstück	• Sicheres Werkzeugspannen verringert Vibrationen und das Auswandern aus der Spannvorrichtung
Werkzeugmaschine	• Die Spindel muss in optimalem Zustand sein, um einen genauen Rundlauf und maximale Standzeit zu erzielen • Für die empfohlenen Drehzahlen und Vorschubgeschwindigkeiten ist genügend Leistung bereitzustellen • Bei leistungsschwachen Antrieben sind die Werte zu verringern, um Beschädigungen am Werkstück und/oder Werkzeug zu vermeiden
Kühlmittel	• Das Stauen der Späne durch Luftstrahl oder flüssige Kühlmittel möglichst verhindern • Kühlmittel in geeigneter Konzentration verwenden • Allgemeine Empfehlungen: – Wasser-Öl-Emulsionen oder Luftstrahl: Werkzeugstähle, Form- und Schneidstähle, unlegierte oder legierte Stähle – Wasser-Öl-Emulsion: Nichtrostender Stahl, Titan, Warmfeste Legierungen, Nichteisenlegierungen
Verfahren	• Vorzugsweise Gleichlauffräsen anwenden • Das Beachten der Fräsparameter, Werkzeughalter, Rundlauf, Auswuchten, Einspannen, usw. verbessert die Schnittleistung und verlängert die Standzeit

RICHTWERTE ZUM FRÄSEN

DC = Fräsdurchmesser APMX = Schnittlänge

Drehzahl und Vorschub für Fräsarbeiten hängen von Radialbreite (→|Ae|←) und Frästiefe (Ap) ab

Drehzahl und Vorschub müssen ggfs. verringert werden wenn:

- die empfohlenen Werte für Ae und Ap überschritten werden
- lange Schneiden oder Langschaftfräser verwendet werden
- lange Werkzeughalter verwendet werden
- die Werkstoffe härter als vorgesehen sind

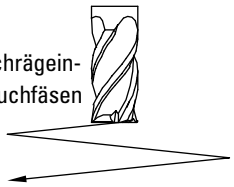
VORBEREITUNGEN

Vorbohrung

Vorbohren ist in den meisten Fällen ratsam.

Zirkulareintauchfräsen

Schrägeintauchfäsen



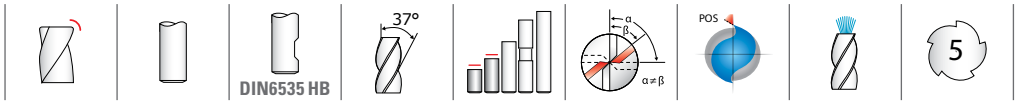
Alternative Verfahren sind Zirkulareintauchen und Schrägeintauchen. Starke Tauchwinkel erfordern verringerte Vorschubgeschwindigkeiten. Geringe Tauchwinkel ermöglichen höhere Vorschubgeschwindigkeiten und verlängern die Standzeit. Verwenden Sie die Drehzahlen und Vorschübe zum Schlitzfräsen für Tauchwinkel von 1° bis 2°. Den Vorschub auf 25 % verringern, wenn der Tauchwinkel 6° erreicht. Standardwerkzeuge und / oder schwer zu bearbeitende Werkstoffe verlangen kleine Tauchwinkel und verringerte Vorschubgeschwindigkeiten.

Stechen

Stechen Sie in Nichteisenmetalle und kurzspanende Werkstoffe nur mit Schlitzfräsdrehzahl und 25 % der Schlitzvorschubgeschwindigkeit ein.

METRIC

Z-Carb-HPR



TOLERANCES (mm)

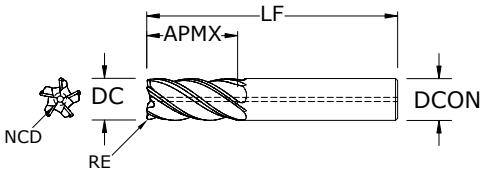
6 DIAMETER
DC = +0,000/–0,030
DCON = h_6
RE = +0,000/–0,050

>6–10 DIAMETER
DC = +0,000/–0,040
DCON = h_6
RE = +0,000/–0,050

>10–25 DIAMETER
DC = +0,000/–0,050
DCON = h_6
RE = +0,000/–0,050

Z5MCR

METRIC SERIES



- An ideal balance of helix, indexing, flute depth, rake and relief
- Variable indexing for chatter supression and patented edge geometry for shearing and strength
- Chatter-free geometry allows deep cutting and high speed machining
- Central coolant hole delivers coolant effectively to the cutting zone enhancing chip removal when pocketing or slotting
- Enhanced corner geometry with tight tolerance corner radii
- Excels at roughing, ramping, high speed machining and finishing in a variety of materials
- Recommended for materials ≤ 45 HRc (≤ 420 Bhn)

STEELS
STAINLESS STEELS
CAST IRON
HIGH TEMP ALLOYS

For patent information visit www.ksptpatents.com

mm						EDP NO.					
CUTTING DIAMETER DC	LENGTH OF CUT APMX	OVERALL LENGTH LF	SHANK DIAMETER DCON	CORNER RADIUS RE	NON-CUTTING CENTER DIAMETER NCD	Ti-NAMITE®-A (TA)	Ti-NAMITE®-A (TA) W/FLAT	Ti-NAMITE®-A (TA) W/INTERNAL COOLANT	Ti-NAMITE®-M (TM)	Ti-NAMITE®-M (TM) W/ FLAT	Ti-NAMITE®-M (TM) W/INTERNAL COOLANT
6,0	9,0	54,0	6,0	0,5	2,11	48000	–	–	47000	–	–
6,0	13,0	57,0	6,0	0,3	2,11	48001	–	–	47001	–	–
6,0	13,0	57,0	6,0	0,5	2,11	47120	–	–	47002	–	–
6,0	13,0	57,0	6,0	1,0	2,11	48002	–	–	47003	–	–
6,0	13,0	57,0	6,0	1,5	2,11	48003	–	–	47004	–	–
8,0	11,0	58,0	8,0	0,5	2,79	48004	–	–	47005	–	–
8,0	18,0	63,0	8,0	0,5	2,79	47121	–	–	47006	–	–
8,0	18,0	63,0	8,0	1,0	2,79	47122	–	–	47007	–	–
8,0	18,0	63,0	8,0	1,5	2,79	48005	–	–	47008	–	–
8,0	18,0	63,0	8,0	2,0	2,79	48006	–	–	47009	–	–
10,0	13,0	66,0	10,0	1,0	3,51	48007	–	–	47010	–	–
10,0	22,0	72,0	10,0	0,5	3,51	47123	–	–	47011	–	–
10,0	22,0	72,0	10,0	1,0	3,51	47124	–	–	47012	–	–
10,0	22,0	72,0	10,0	1,5	3,51	48008	–	–	47013	–	–
10,0	22,0	72,0	10,0	2,0	3,51	48009	–	–	47014	–	–
10,0	22,0	72,0	10,0	2,5	3,51	48010	–	–	47015	–	–
12,0	15,0	73,0	12,0	1,0	4,19	48011	48029	–	47016	47024	–
12,0	26,0	83,0	12,0	0,5	4,19	47125	47128	47160	47017	47025	47161
12,0	26,0	83,0	12,0	0,76	4,19	47126	47129	47162	47018	47026	47163
12,0	26,0	83,0	12,0	1,0	4,19	47127	47130	47164	47019	47027	47165
12,0	26,0	83,0	12,0	1,5	4,19	48012	48030	47166	47020	47028	47167
12,0	26,0	83,0	12,0	2,0	4,19	48013	48031	47168	47021	47029	47169
12,0	26,0	83,0	12,0	2,5	4,19	48014	48032	47170	47022	47030	47171
12,0	26,0	83,0	12,0	3,0	4,19	48015	48033	47172	47023	47031	47173
16,0	19,0	82,0	16,0	1,0	5,59	48016	48034	48056	47032	47039	47046
16,0	19,0	82,0	16,0	1,5	5,59	48070	–	–	48071	–	–
16,0	35,0	92,0	16,0	1,0	5,59	47131	48035	47134	47033	47040	47047
16,0	35,0	92,0	16,0	1,5	5,59	48017	48036	48057	47034	47041	47048
16,0	35,0	92,0	16,0	2,0	5,59	47132	48037	47135	47035	47042	47049
16,0	35,0	92,0	16,0	2,5	5,59	48018	48038	48058	47036	47043	47050

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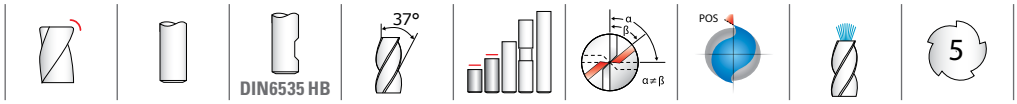
Z-Carb-HPR

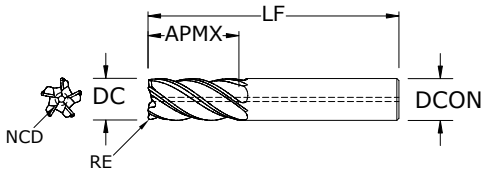


TOLERANCES (mm)

6 DIAMETER
DC = +0,000/–0,030
DCON = h_6
RE = +0,000/–0,050

>6–10 DIAMETER
DC = +0,000/–0,040
DCON = h_6
RE = +0,000/–0,050

>10–25 DIAMETER
DC = +0,000/–0,050
DCON = h_6
RE = +0,000/–0,050



Z5MCR
METRIC SERIES

mm						EDP NO.					
CUTTING DIAMETER DC	LENGTH OF CUT APMX	OVERALL LENGTH LF	SHANK DIAMETER DCON	CORNER RADIUS RE	NON-CUTTING CENTER DIAMETER NCD	Ti-NAMITE®-A (TA)	Ti-NAMITE®-A (TA) W/FLAT	Ti-NAMITE®-A (TA) W/INTERNAL COOLANT	Ti-NAMITE®-M (TM)	Ti-NAMITE®-M (TM) W/ FLAT	Ti-NAMITE®-M (TM) W/INTERNAL COOLANT
16,0	35,0	92,0	16,0	3,0	5,59	47133	48039	47136	47037	47044	47051
16,0	35,0	92,0	16,0	4,0	5,59	48019	48040	48059	47038	47045	47052
20,0	23,0	92,0	20,0	1,0	7,01	48020	48041	48060	47053	47061	47069
20,0	43,0	104,0	20,0	1,0	7,01	47137	48042	47140	47054	47062	47070
20,0	43,0	104,0	20,0	1,5	7,01	48021	48043	48061	47055	47063	47071
20,0	43,0	104,0	20,0	2,0	7,01	47138	48044	47141	47056	47064	47072
20,0	43,0	104,0	20,0	2,5	7,01	48022	48045	48062	47057	47065	47073
20,0	43,0	104,0	20,0	3,0	7,01	47139	48046	47142	47058	47066	47074
20,0	43,0	104,0	20,0	4,0	7,01	48023	48047	48063	47059	47067	47075
20,0	43,0	104,0	20,0	5,0	7,01	48024	48048	48064	47060	47068	47076
25,0	28,0	100,0	25,0	1,0	8,76	48025	48049	48065	47077	47084	47091
25,0	53,0	121,0	25,0	1,0	8,76	47143	48050	47146	47078	47085	47092
25,0	53,0	121,0	25,0	2,0	8,76	47144	48051	47147	47079	47086	47093
25,0	53,0	121,0	25,0	2,5	8,76	48026	48052	48066	47080	47087	47094
25,0	53,0	121,0	25,0	3,0	8,76	47145	48053	47148	47081	47088	47095
25,0	53,0	121,0	25,0	4,0	8,76	48027	48054	48067	47082	47089	47096
25,0	53,0	121,0	25,0	5,0	8,76	48028	48055	48068	47083	47090	47097

- STEELS
- STAINLESS STEELS
- CAST IRON
- HIGH TEMP ALLOYS

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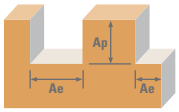
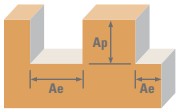
Z-Carb-HPR



	Series Z5MCR Metric	Hardness		Ae x DC	Ap x DC	Vc (m/min)		DC • mm 6	8	10	12	16	20	25
P	CARBON STEELS 1018, 1040, 1080, 1090, 10L50, 1140, 1212, 12L15, 1525, 1536	≤ 275 Bhn or ≤ 28 HRc	Profile	≤ 0.5	≤ 1.5	169 (135-203)	RPM	8967	6725	5380	4484	3363	2690	2152
							Fz	0.029	0.049	0.061	0.074	0.087	0.099	0.108
							Feed (mm/min)	1291	1650	1650	1668	1463	1327	1157
			Slot	1	≤ 1	134 (107-161)	RPM	7109	5332	4265	3555	2666	2133	1706
							Fz	0.029	0.049	0.061	0.074	0.087	0.099	0.108
							Feed (mm/min)	1024	1308	1308	1322	1160	1052	917
	ALLOY STEELS 4140, 4150, 4320, 5120, 5150, 8630, 86L20, 50100	≤ 375 Bhn or ≤ 40 HRc	Profile	≤ 0.5	≤ 1.5	96 (77-115)	RPM	5089	3817	3054	2545	1909	1527	1221
							Fz	0.022	0.036	0.045	0.055	0.067	0.075	0.080
							Feed (mm/min)	550	692	692	702	635	570	489
			Slot	1	≤ 1	76 (61-91)	RPM	4039	3029	2424	2020	1515	1212	969
							Fz	0.022	0.036	0.045	0.055	0.067	0.075	0.080
							Feed (mm/min)	436	549	549	557	504	452	388
	TOOL STEELS A2, D2, H13, L2, M2, P20, S7, T15, W2	≤ 375 Bhn or ≤ 40 HRc	Profile	≤ 0.5	≤ 1.5	56 (45-68)	RPM	2989	2242	1793	1495	1121	897	717
							Fz	0.017	0.030	0.037	0.043	0.051	0.059	0.065
							Feed (mm/min)	251	335	335	323	287	263	233
			Slot	1	≤ 1	44 (35-53)	RPM	2343	1757	1406	1171	879	703	562
							Fz	0.017	0.030	0.037	0.043	0.051	0.059	0.065
							Feed (mm/min)	197	262	262	253	225	206	183
M	STAINLESS STEELS (FREE MACHINING) 303, 416, 420F, 430F, 440F	≤ 275 Bhn or ≤ 28 HRc	Profile	≤ 0.5	≤ 1.5	149 (119-179)	RPM	7917	5938	4750	3958	2969	2375	1900
							Fz	0.022	0.036	0.045	0.055	0.067	0.075	0.080
							Feed (mm/min)	855	1077	1077	1092	988	887	760
			Slot	1	≤ 1	119 (95-143)	RPM	6301	4726	3781	3151	2363	1890	1512
							Fz	0.022	0.036	0.045	0.055	0.067	0.075	0.080
							Feed (mm/min)	680	857	857	869	786	706	605
	STAINLESS STEELS (DIFFICULT) 304, 304L, 316, 316L	≤ 275 Bhn or ≤ 28 HRc	Profile	≤ 0.5	≤ 1.5	104 (83-124)	RPM	5493	4120	3296	2747	2060	1648	1318
							Fz	0.017	0.030	0.037	0.043	0.051	0.059	0.063
							Feed (mm/min)	461	615	615	593	527	483	412
			Slot	1	≤ 1	82 (66-99)	RPM	4362	3272	2617	2181	1636	1309	1047
							Fz	0.017	0.030	0.037	0.043	0.051	0.059	0.063
							Feed (mm/min)	366	489	489	471	419	384	327
	STAINLESS STEELS (PH) 13-8 PH, 15-5PH, 17-4 PH, CUSTOM 450	≤ 325 Bhn or ≤ 35 HRc	Profile	≤ 0.5	≤ 1.5	94 (76-113)	RPM	5009	3756	3005	2504	1878	1503	1202
							Fz	0.017	0.030	0.037	0.043	0.051	0.059	0.063
							Feed (mm/min)	421	561	561	541	481	441	376
			Slot	1	≤ 1	76 (61-91)	RPM	4039	3029	2424	2020	1515	1212	969
							Fz	0.017	0.030	0.037	0.043	0.051	0.059	0.063
							Feed (mm/min)	339	452	452	436	388	355	303
K	CAST IRONS (LOW & MEDIUM ALLOY) Gray, Malleable, Ductile	≤ 220 Bhn or ≤ 19 HRc	Profile	≤ 0.5	≤ 1.5	136 (109-163)	RPM	7190	5392	4314	3595	2696	2157	1726
							Fz	0.026	0.045	0.056	0.067	0.079	0.091	0.098
							Feed (mm/min)	949	1208	1208	1208	1070	978	841
			Slot	1	≤ 1	108 (87-130)	RPM	5736	4302	3441	2868	2151	1721	1377
							Fz	0.026	0.045	0.056	0.067	0.079	0.091	0.098
							Feed (mm/min)	757	964	964	964	853	780	671
	CAST IRONS (HIGH ALLOY) Gray, Malleable, Ductile	≤ 260 Bhn or ≤ 26 HRc	Profile	≤ 0.5	≤ 1.5	104 (83-124)	RPM	5493	4120	3296	2747	2060	1648	1318
							Fz	0.020	0.034	0.043	0.050	0.059	0.067	0.073
							Feed (mm/min)	554	703	703	692	606	549	478
			Slot	1	≤ 1	82 (66-99)	RPM	4362	3272	2617	2181	1636	1309	1047
							Fz	0.020	0.034	0.043	0.050	0.059	0.067	0.073
							Feed (mm/min)	440	558	558	550	482	436	380

continued on next page

Z-Carb-HPR



	Series Z5MCR Metric	Hardness		Ae x DC	Ap x DC	Vc (m/min)		DC • mm 6	8	10	12	16	20	25
S	HIGH TEMP ALLOYS (NICKEL , COBALT, IRON BASE) Inconel 601, 617, 625, Incoloy, Monel 400	≤ 300 Bhn or ≤ 32 HRc	Profile	≤ 0.5	≤ 1.5	24 (20-29)	RPM	1293	969	776	646	485	388	310
							Fz	0.0160	0.0272	0.0340	0.0409	0.0478	0.0531	0.0599
							Feed (mm/min)	103	132	132	132	116	103	93
			Slot	1	≤ 1	20 (16-24)	RPM	1050	788	630	525	394	315	252
							Fz	0.0160	0.0272	0.0340	0.0409	0.0478	0.0531	0.0599
							Feed (mm/min)	84	107	107	107	94	84	75
	HIGH TEMP ALLOYS (NICKEL, COBALT, IRON BASE) Inconel 718, X-750, Incoloy, Waspaloy, Hastelloy, Rene	≤ 400 Bhn or ≤ 43 HRc	Profile	≤ 0.5	≤ 1.5	19 (15-23)	RPM	1002	751	601	501	376	301	240
							Fz	0.0112	0.0192	0.0239	0.0284	0.0333	0.0371	0.0420
							Feed (mm/min)	56	72	72	71	63	56	50
			Slot	1	≤ 1	15 (12-18)	RPM	808	606	485	404	303	242	194
							Fz	0.0112	0.0192	0.0239	0.0284	0.0333	0.0371	0.0420
							Feed (mm/min)	45	58	58	57	50	45	41
	TITANIUM ALLOYS Pure Ttanium, Ti6Al4V, Ti6Al2Sn4Zr2Mo, Ti4Al4Mo2Sn0.5Si	≤ 350 Bhn or ≤ 38 HRc	Profile	≤ 0.5	≤ 1.5	66 (52-79)	RPM	3474	2605	2084	1737	1303	1042	834
							Fz	0.019	0.032	0.040	0.048	0.056	0.064	0.070
							Feed (mm/min)	333	417	417	417	367	333	292
			Slot	1	≤ 1	52 (41-62)	RPM	2747	2060	1648	1373	1030	824	659
							Fz	0.019	0.032	0.040	0.048	0.056	0.064	0.070
							Feed (mm/min)	264	330	330	330	290	264	231
	TITANIUM ALLOYS (DIFFICULT) Ti10V2Fe3Al, Ti5Al5V5Mo3Cr, Ti7Al4Mo, Ti3Al8V6Cr4Zr4Mo, Ti6Al6V6Sn, Ti15V3 Cr3Sn3Al	≤ 420 Bhn or ≤ 45 HRc	Profile	≤ 0.5	≤ 1.5	23 (18-27)	RPM	1212	909	727	606	454	364	291
							Fz	0.019	0.032	0.040	0.048	0.056	0.064	0.071
							Feed (mm/min)	116	145	145	145	128	116	103
			Slot	1	≤ 1	18 (15-22)	RPM	969	727	582	485	364	291	233
							Fz	0.019	0.032	0.040	0.048	0.056	0.064	0.071
							Feed (mm/min)	93	116	116	116	102	93	83

Bhn (Brinell) HRc (Rockwell C)
rpm = (Vc x 1000) / (DC x 3.14)
mm/min = Fz x 5 x rpm
ramp up to 5 degrees using slotting speed and feed rates. Do not plunge.
reduce speed and feed for materials harder than listed
reduce feed and Ae when finish milling (.02 x DC maximum)
feed rates listed have chip thinning adjustments included where applicable
refer to the SGS Tool Wizard® for complete technical information (www.kyocera-sgstool.com)

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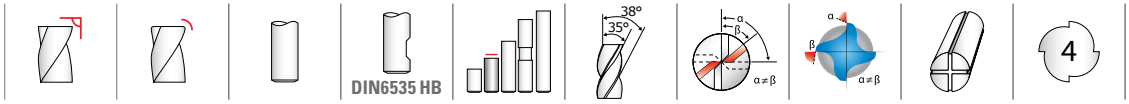
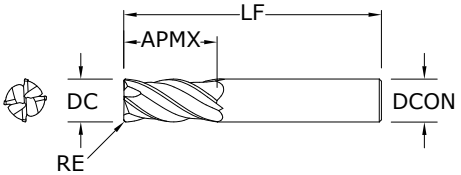


Z1MPCR • Z1M

METRIC SERIES



- Variable rake geometry alters and controls the cutting dynamic taking chatter suppression to an unprecedented level
- Unequal helix design changes the cutting angle to improve harmonics
- Unequal flute spacing helps to disrupt the rhythmic pattern created by the cutting edge helping to suppress damaging harmonics
- Enhanced corner geometry with tight tolerance corner radii
- Recommended for materials ≤ 45 HRc (≤ 420 Bhn)

mm					EDP NO.			SERIES
CUTTING DIAMETER DC	LENGTH OF CUT APMX	OVERALL LENGTH LF	SHANK DIAMETER DCON	CORNER RADIUS RE	Ti-NAMITE®-X (TX)	Ti-NAMITE®-X (TX) W/FLAT	JetStream	
1,0	3,0	57,0	6,0	0,1	46873*	–	–	Z1MPCR
1,5	4,5	57,0	6,0	0,1	46849*	–	–	Z1MPCR
2,0	6,0	57,0	6,0	0,2	46850*	–	–	Z1MPCR
2,5	7,0	57,0	6,0	0,2	46874*	–	–	Z1MPCR
3,0	8,0	57,0	6,0	–	46357	–	–	Z1M
3,0	8,0	57,0	6,0	0,3	46851	–	–	Z1MPCR
3,0	8,0	57,0	6,0	0,5	46880	–	–	Z1MPCR
4,0	11,0	57,0	6,0	–	46358	–	–	Z1M
4,0	11,0	57,0	6,0	0,3	46852	–	–	Z1MPCR
4,0	11,0	57,0	6,0	0,5	46881	–	–	Z1MPCR
5,0	13,0	57,0	6,0	–	46359	–	–	Z1M
5,0	13,0	57,0	6,0	0,3	46853	–	–	Z1MPCR
6,0	13,0	57,0	6,0	–	46360	–	–	Z1M
6,0	13,0	57,0	6,0	0,25	46882	–	–	Z1MPCR
6,0	13,0	57,0	6,0	0,5	46854	–	–	Z1MPCR
6,0	13,0	57,0	6,0	1,0	46855	–	–	Z1MPCR
6,0	13,0	57,0	6,0	1,5	46884	–	–	Z1MPCR
8,0	19,0	63,0	8,0	–	46362	–	–	Z1M
8,0	19,0	63,0	8,0	0,5	46856	–	–	Z1MPCR
8,0	19,0	63,0	8,0	1,0	46857	–	–	Z1MPCR
8,0	19,0	63,0	8,0	1,5	46886	–	–	Z1MPCR
8,0	19,0	63,0	8,0	2,0	46887	–	–	Z1MPCR
10,0	22,0	72,0	10,0	–	46364	–	–	Z1M
10,0	22,0	72,0	10,0	0,5	46858	–	–	Z1MPCR
10,0	22,0	72,0	10,0	1,0	46859	–	–	Z1MPCR
10,0	22,0	72,0	10,0	1,5	46889	–	–	Z1MPCR
10,0	22,0	72,0	10,0	2,0	46890	–	–	Z1MPCR
10,0	22,0	72,0	10,0	2,5	46891	–	–	Z1MPCR
12,0	26,0	83,0	12,0	–	46366	–	–	Z1M
12,0	26,0	83,0	12,0	0,5	46860	46909	–	Z1MPCR
12,0	26,0	83,0	12,0	0,75	46861	46910	46493	Z1MPCR
12,0	26,0	83,0	12,0	1,0	46893	46911	–	Z1MPCR

*Variable flute spacing. Helix and rake do not vary.

continued on next page

TOLERANCES (mm)

<3 DIAMETER
DC = +0,012/–0,012
DCON = h_6
RE = +0,000/–0,025

>3–6 DIAMETER
DC = +0,000/–0,030
DCON = h_6
RE = +0,000/–0,050

>6–10 DIAMETER
DC = +0,000/–0,040
DCON = h_6
RE = +0,000/–0,050

>10–25 DIAMETER
DC = +0,000/–0,050
DCON = h_6
RE = +0,000/–0,050

STEELS
STAINLESS STEELS
CAST IRON
HIGH TEMP ALLOYS

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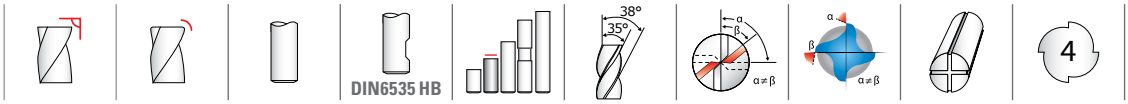

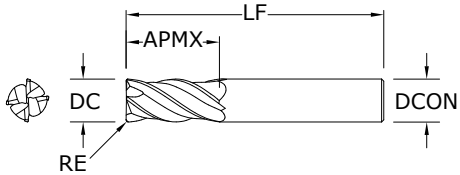

Z1MPCR • Z1M

METRIC SERIES

TOLERANCES (mm)

<3 DIAMETER
DC = +0,012/–0,012
DCON = h_6
RE = +0,000/–0,025

>3–6 DIAMETER
DC = +0,000/–0,030
DCON = h_6
RE = +0,000/–0,050

>6–10 DIAMETER
DC = +0,000/–0,040
DCON = h_6
RE = +0,000/–0,050

>10–25 DIAMETER
DC = +0,000/–0,050
DCON = h_6
RE = +0,000/–0,050

- STEELS
- STAINLESS STEELS
- CAST IRON
- HIGH TEMP ALLOYS

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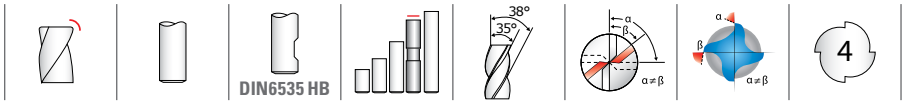
mm					EDP NO.			SERIES
CUTTING DIAMETER DC	LENGTH OF CUT APMX	OVERALL LENGTH LF	SHANK DIAMETER DCON	CORNER RADIUS RE	Ti-NAMITE®-X (TX)	Ti-NAMITE®-X (TX) W/FLAT	JetStream	
12,0	26,0	83,0	12,0	1,5	46894	46912	–	Z1MPCR
12,0	26,0	83,0	12,0	2,0	46895	46913	–	Z1MPCR
12,0	26,0	83,0	12,0	2,5	46896	46914	–	Z1MPCR
12,0	26,0	83,0	12,0	3,0	42718	46915	42719	Z1MPCR
14,0	26,0	83,0	14,0	–	46368	46506	–	Z1M
14,0	26,0	83,0	14,0	1,0	46862	46916	46494	Z1MPCR
16,0	32,0	92,0	16,0	–	46370	46507	–	Z1M
16,0	32,0	92,0	16,0	1,0	46863	46917	46495	Z1MPCR
16,0	32,0	92,0	16,0	1,5	46898	46918	–	Z1MPCR
16,0	32,0	92,0	16,0	2,0	46899	46919	–	Z1MPCR
16,0	32,0	92,0	16,0	2,5	46900	46920	–	Z1MPCR
16,0	32,0	92,0	16,0	3,0	46864	46921	42721	Z1MPCR
16,0	32,0	92,0	16,0	4,0	46867	46944	–	Z1MPCR
18,0	32,0	92,0	18,0	–	46372	46508	–	Z1M
20,0	38,0	104,0	20,0	–	46374	46509	–	Z1M
20,0	38,0	104,0	20,0	1,0	46865	46922	46497	Z1MPCR
20,0	38,0	104,0	20,0	1,5	46903	46923	–	Z1MPCR
20,0	38,0	104,0	20,0	2,0	46904	46924	–	Z1MPCR
20,0	38,0	104,0	20,0	2,5	46905	46925	–	Z1MPCR
20,0	38,0	104,0	20,0	3,0	42722	46926	42723	Z1MPCR
20,0	38,0	104,0	20,0	4,0	46868	46945	–	Z1MPCR
20,0	38,0	104,0	20,0	5,0	46869	46946	–	Z1MPCR
25,0	38,0	104,0	25,0	–	46376	46510	–	Z1M
25,0	38,0	104,0	25,0	1,0	46866	46927	46498	Z1MPCR

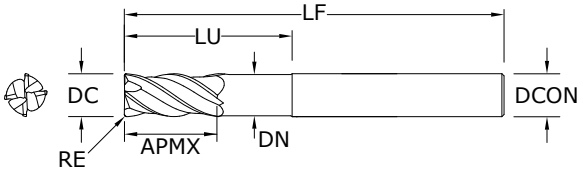
- Variable rake geometry alters and controls the cutting dynamic taking chatter suppression to an unprecedented level
- Unequal helix design changes the cutting angle to improve harmonics
- Unequal flute spacing helps to disrupt the rhythmic pattern created by the cutting edge helping to suppress damaging harmonics
- Enhanced corner geometry with tight tolerance corner radii
- Recommended for materials ≤ 45 HRc (≤ 420 Bhn)

Z-Carb-AP



Z1MPIC • Z1MPLC

METRIC SERIES



- Variable rake geometry alters and controls the cutting dynamic taking chatter suppression to an unprecedented level
- Unequal helix design changes the cutting angle to improve harmonics
- Unequal flute spacing helps to disrupt the rhythmic pattern created by the cutting edge helping to suppress damaging harmonics
- Long reach design allows for deeper and faster cuts
- Enhanced corner geometry with tight tolerance corner radii
- Recommended for materials ≤ 45 HRc (≤ 420 Bhn)

mm							EDP NO.	
CUTTING DIAMETER DC	LENGTH OF CUT APMX	OVERALL LENGTH LF	SHANK DIAMETER DCON	REACH LU	NECK DIAMETER DN	CORNER RADIUS RE	Ti-NAMITE®-X (TX)	Ti-NAMITE®-X (TX) W/FLAT
6,0	8,0	75,0	6,0	24,0	5,49	0,5	46821	–
8,0	10,0	75,0	8,0	32,0	7,49	1,0	46822	–
8,0	10,0	75,0	8,0	32,0	7,49	2,0	46823	–
10,0	12,0	100,0	10,0	40,0	9,50	1,0	46824	–
10,0	12,0	100,0	10,0	40,0	9,50	2,0	46825	–
12,0	15,0	100,0	12,0	48,0	11,48	1,0	46826	46928
12,0	15,0	100,0	12,0	48,0	11,48	1,5	46827	46929
12,0	15,0	100,0	12,0	48,0	11,48	2,0	46828	46930
12,0	15,0	100,0	12,0	48,0	11,48	3,0	46829	46931
12,0	26,0	83,0	12,0	36,0	11,48	2,5	–	42731
12,0	26,0	83,0	12,0	36,0	11,48	3,0	–	42732
12,0	26,0	83,0	12,0	36,0	11,48	4,0	–	42733
16,0	32,0	92,0	16,0	42,0	15,49	2,5	–	42734
16,0	32,0	92,0	16,0	42,0	15,49	4,0	–	42735
16,0	32,0	92,0	16,0	42,0	15,49	6,0	–	42736
16,0	20,0	115,0	16,0	65,0	15,49	1,0	46830	46932
16,0	20,0	115,0	16,0	65,0	15,49	1,5	46831	46933
16,0	20,0	115,0	16,0	65,0	15,49	2,0	46832	46934
16,0	20,0	115,0	16,0	65,0	15,49	3,0	46833	46935
16,0	20,0	115,0	16,0	65,0	15,49	4,0	46834	46936
16,0	20,0	115,0	16,0	65,0	15,49	5,0	46835	46937
20,0	24,0	140,0	20,0	80,0	19,48	1,0	46836	46938
20,0	24,0	140,0	20,0	80,0	19,48	1,5	46837	46939
20,0	24,0	140,0	20,0	80,0	19,48	2,0	46838	46940
20,0	24,0	140,0	20,0	80,0	19,48	3,0	46839	46941
20,0	24,0	140,0	20,0	80,0	19,48	4,0	46840	46942
20,0	24,0	140,0	20,0	80,0	19,48	5,0	46841	46943
20,0	38,0	104,0	20,0	52,0	19,48	2,5	–	42737
20,0	38,0	104,0	20,0	52,0	19,48	4,0	–	42738
20,0	38,0	104,0	20,0	52,0	19,48	6,0	–	42739

TOLERANCES (mm)

6 DIAMETER
DC = +0,000/–0,030
DCON = h_6
RE = +0,000/–0,050

>6–10 DIAMETER
DC = +0,000/–0,040
DCON = h_6
RE = +0,000/–0,050

>10–20 DIAMETER
DC = +0,000/–0,050
DCON = h_6
RE = +0,000/–0,050

STEELS
STAINLESS STEELS
CAST IRON
HIGH TEMP ALLOYS

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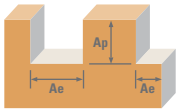
Z-Carb-AP



	Series Z1M, Z1MPCR, Z1MPIC, Z1MPLC Metric	Hardness		Ae x DC	Ap x DC	Vc (m/min)		DC • mm 1	3	6	8	10	12	16	20	25
P	CARBON STEELS 1018, 1040, 1080, 1090, 10L50, 1140, 1212, 12L15, 1525, 1536	≤ 275 Bhn or ≤ 28 HRc	Profile	≤ 0.5	≤ 1.5	169	RPM	53803	17934	8967	6725	5380	4484	3363	2690	2152
						(135-203)	Fz	0.0030	0.0109	0.029	0.049	0.061	0.074	0.087	0.099	0.108
							Feed (mm/min)	646	782	1040	1318	1313	1327	1170	1065	930
			Slot	1	≤ 1	134	RPM	42654	14218	7109	5332	4265	3555	2666	2133	1706
						(107-161)	Fz	0.0030	0.0109	0.029	0.049	0.061	0.074	0.087	0.099	0.108
							Feed (mm/min)	512	620	825	1045	1041	1052	928	845	737
	ALLOY STEELS 4140, 4150, 4320, 5120, 5150, 8630, 86L20, 50100	≤ 375 Bhn or ≤ 40 HRc	Profile	≤ 0.5	≤ 1.5	96	RPM	30537	10179	5089	3817	3054	2545	1909	1527	1221
						(77-115)	Fz	0.0023	0.0081	0.022	0.036	0.045	0.055	0.067	0.075	0.080
							Feed (mm/min)	281	330	448	550	550	560	511	458	391
			Slot	1	≤ 1	76	RPM	24235	8078	4039	3029	2424	2020	1515	1212	969
						(61-91)	Fz	0.0023	0.0081	0.022	0.036	0.045	0.055	0.067	0.075	0.080
							Feed (mm/min)	223	262	355	436	436	444	406	364	310
	TOOL STEELS A2, D2, H13, L2, M2, P20, S7, T15, W2	≤ 375 Bhn or ≤ 40 HRc	Profile	≤ 0.5	≤ 1.5	56	RPM	17934	5978	2989	2242	1793	1495	1121	897	717
						(45-68)	Fz	0.0018	0.0066	0.017	0.030	0.037	0.043	0.051	0.059	0.065
							Feed (mm/min)	129	158	203	269	265	257	229	212	187
			Slot	1	≤ 1	44	RPM	14057	4686	2343	1757	1406	1171	879	703	562
						(35-53)	Fz	0.0018	0.0066	0.017	0.030	0.037	0.043	0.051	0.059	0.065
							Feed (mm/min)	101	124	159	211	208	201	179	166	146
M	STAINLESS STEELS (FREE MACHINING) 303, 416, 420F, 430F, 440F	≤ 275 Bhn or ≤ 28 HRc	Profile	≤ 0.5	≤ 1.5	149	RPM	47501	15834	7917	5938	4750	3958	2969	2375	1900
						(119-179)	Fz	0.0023	0.0081	0.022	0.036	0.045	0.055	0.067	0.075	0.080
							Feed (mm/min)	437	513	697	855	855	871	796	713	608
			Slot	1	≤ 1	119	RPM	37807	12602	6301	4726	3781	3151	2363	1890	1512
						(95-143)	Fz	0.0023	0.0081	0.022	0.036	0.045	0.055	0.067	0.075	0.080
							Feed (mm/min)	348	408	555	681	681	693	633	567	484
	STAINLESS STEELS (DIFFICULT) 304, 304L, 316, 316L	≤ 275 Bhn or ≤ 28 HRc	Profile	≤ 0.5	≤ 1.5	104	RPM	32960	10987	5493	4120	3296	2747	2060	1648	1318
						(83-124)	Fz	0.0018	0.0064	0.017	0.030	0.037	0.043	0.051	0.059	0.063
							Feed (mm/min)	237	281	374	494	488	472	420	389	332
			Slot	1	≤ 1	82	RPM	26174	8725	4362	3272	2617	2181	1636	1309	1047
						(66-99)	Fz	0.0018	0.0064	0.017	0.030	0.037	0.043	0.051	0.059	0.063
							Feed (mm/min)	188	223	297	393	387	375	334	309	264
	STAINLESS STEELS (PH) 13-8 PH, 15-5 PH, 17-4 PH, Custom 450	≤ 325 Bhn or ≤ 35 HRc	Profile	≤ 0.5	≤ 1.5	94	RPM	30052	10017	5009	3756	3005	2504	1878	1503	1202
						(76-113)	Fz	0.0018	0.0064	0.017	0.030	0.037	0.043	0.051	0.059	0.063
							Feed (mm/min)	216	256	341	451	445	431	383	355	303
			Slot	1	≤ 1	76	RPM	24235	8078	4039	3029	2424	2020	1515	1212	969
						(61-91)	Fz	0.0018	0.0064	0.017	0.030	0.037	0.043	0.051	0.059	0.063
							Feed (mm/min)	174	207	275	364	359	347	309	286	244

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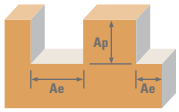
METRIC

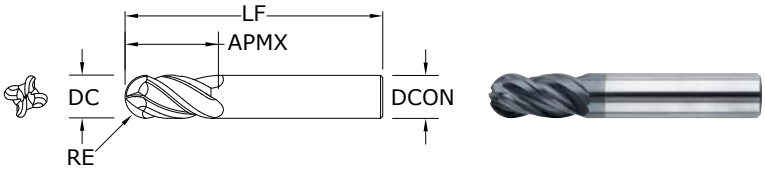
Z-Carb-AP



	Series Z1M, Z1MPCR, Z1MPIC, Z1MPLC Metric	Hardness		Ae x DC	Ap x DC	Vc (m/min)		DC • mm 1	3	6	8	10	12	16	20	25
K	CAST IRONS (LOW & MEDIUM ALLOY) Gray, Malleable, Ductile	≤ 220 Bhn or ≤ 19 HRc	Profile	≤ 0.5	≤ 1.5	136	RPM	43139	14380	7190	5392	4314	3595	2696	2157	1726
						(109-163)	Fz	0.0028	0.0099	0.026	0.045	0.056	0.067	0.079	0.091	0.098
							Feed (mm/min)	483	569	748	971	966	963	852	785	676
			Slot	1	≤ 1	108	RPM	34414	11471	5736	4302	3441	2868	2151	1721	1377
						(87-130)	Fz	0.0028	0.0099	0.026	0.045	0.056	0.067	0.079	0.091	0.098
							Feed (mm/min)	385	454	597	774	771	769	680	626	540
	CAST IRONS (HIGH ALLOY) Gray, Malleable, Ductile	≤ 260 Bhn or ≤ 26 HRc	Profile	≤ 0.5	≤ 1.5	104	RPM	32960	10987	5493	4120	3296	2747	2060	1648	1318
						(83-124)	Fz	0.0020	0.0074	0.020	0.034	0.043	0.050	0.059	0.067	0.074
							Feed (mm/min)	264	325	439	560	567	549	486	442	390
			Slot	1	≤ 1	82	RPM	26174	8725	4362	3272	2617	2181	1636	1309	1047
						(66-99)	Fz	0.0020	0.0074	0.020	0.034	0.043	0.050	0.059	0.067	0.074
							Feed (mm/min)	209	258	349	445	450	436	386	351	310
S	HIGH TEMP ALLOYS (NICKEL, COBALT, IRON BASE) Inconel 601, 617, 625, Incoloy, Monel 400	≤ 300 Bhn or ≤ 32 HRc	Profile	≤ 0.5	≤ 1.5	24	RPM	7755	2585	1293	969	776	646	485	388	310
						(20-29)	Fz	0.0018	0.0061	0.016	0.027	0.034	0.041	0.048	0.053	0.060
							Feed (mm/min)	56	63	83	105	105	106	93	82	74
			Slot	1	≤ 1	20	RPM	6301	2100	1050	788	630	525	394	315	252
						(16-24)	Fz	0.0018	0.0061	0.016	0.027	0.034	0.041	0.048	0.053	0.060
							Feed (mm/min)	45	51	67	85	86	86	76	67	60
	HIGH TEMP ALLOYS (NICKEL, COBALT, IRON BASE) Inconel 718, X-750, Incoloy, Waspaloy, Hastelloy, Rene	≤ 400 Bhn or ≤ 43 HRc	Profile	≤ 0.5	≤ 1.5	19	RPM	6010	2003	1002	751	601	501	376	301	240
						(15-23)	Fz	0.0013	0.0043	0.011	0.019	0.024	0.028	0.033	0.037	0.042
							Feed (mm/min)	31	34	44	57	58	56	50	44	40
			Slot	1	≤ 1	15	RPM	4847	1616	808	606	485	404	303	242	194
						(12-18)	Fz	0.0013	0.0043	0.011	0.019	0.024	0.028	0.033	0.037	0.042
							Feed (mm/min)	25	28	36	46	47	45	40	36	33
	TITANIUM ALLOYS Pure Titanium, Ti6Al4V, Ti6Al2Sn4Zr2Mo, Ti4Al4Mo2Sn0.5Si	≤ 350 Bhn or ≤ 38 HRc	Profile	≤ 0.5	≤ 1.5	66	RPM	20842	6947	3474	2605	2084	1737	1303	1042	834
						(52-79)	Fz	0.0020	0.0071	0.019	0.032	0.040	0.048	0.056	0.064	0.070
							Feed (mm/min)	167	197	264	333	333	333	292	267	233
			Slot	1	≤ 1	52	RPM	16480	5493	2747	2060	1648	1373	1030	824	659
						(41-62)	Fz	0.0020	0.0071	0.019	0.032	0.040	0.048	0.056	0.064	0.070
							Feed (mm/min)	132	156	209	264	264	264	231	211	185
	TITANIUM ALLOYS (DIFFICULT) Ti10V2Fe3Al, Ti5Al5V5Mo3Cr, Ti7Al4Mo, Ti3Al8V6Cr4Zr4Mo, Ti6Al6V6Sn, Ti15V3 Cr3Sn3Al	≤ 420 Bhn or ≤ 45 HRc	Profile	≤ 0.5	≤ 1.5	23	RPM	7271	2424	1212	909	727	606	454	364	291
						(18-27)	Fz	0.0020	0.0071	0.019	0.032	0.040	0.048	0.056	0.064	0.070
							Feed (mm/min)	58	69	92	116	116	116	102	93	81
			Slot	1	≤ 1	18	RPM	5816	1939	969	727	582	485	364	291	233
						(15-22)	Fz	0.0020	0.0071	0.019	0.032	0.040	0.048	0.056	0.064	0.070
							Feed (mm/min)	47	55	74	93	93	93	81	74	65

2p5.445

Bhn (Brinell) HRc (Rockwell C)
rpm = (Vc x 1000) / (DC x 3.14)
mm/min = Fz x 4 x rpm
maximum Slotting Ap for Z1PCR <3mm diameter and all Z1MPLC / Z1MPLB is .25 x DC
maximum Profile Ae for Z1PCR <3mm diameter and all Z1MPLC / Z1MPLB is .20 x DC
reduce speed and feed for materials harder than listed
reduce feed and Ae when finish milling (.02 x DC maximum)
feed rates listed have chip thinning adjustments included where applicable
refer to the SGS Tool Wizard® for complete technical information (www.kyocera-sgstool.com)



Z1MB
METRIC SERIES

TOLERANCES (mm)

3–6 DIAMETER
DC = +0,000/–0,030
DCON = h_6
RE = +0,000/–0,015

>6–10 DIAMETER
DC = +0,000/–0,040
DCON = h_6
RE = +0,000/–0,020

>10–25 DIAMETER
DC = +0,000/–0,050
DCON = h_6
RE = +0,000/–0,025

STEELS
STAINLESS STEELS
CAST IRON
HIGH TEMP ALLOYS

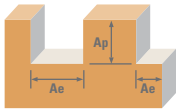
For patent information visit www.ksptpatents.com

mm				EDP NO.	
CUTTING DIAMETER DC	LENGTH OF CUT APMX	OVERALL LENGTH LF	SHANK DIAMETER DCON	Ti-NAMITE®-X (TX)	JetStream
3,0	8,0	57,0	6,0	46354	–
4,0	11,0	57,0	6,0	46355	–
5,0	13,0	57,0	6,0	46356	–
6,0	13,0	57,0	6,0	46343	–
8,0	19,0	63,0	8,0	46344	–
10,0	22,0	72,0	10,0	46345	–
12,0	26,0	83,0	12,0	46346	–
14,0	26,0	83,0	14,0	46347	46518
16,0	32,0	92,0	16,0	46348	46519
18,0	32,0	92,0	18,0	46349	46520
20,0	38,0	104,0	20,0	46350	46521
25,0	38,0	104,0	25,0	46351	46522

RE = 1/2 Cutting Diameter (DC)

- Unequal helix design reduces damaging harmonics by changing the angle at which each cutting edge enters and exits the material
- Unequal flute spacing helps to disrupt the rhythmic pattern created by the cutting edge helping to suppress damaging harmonics
- Optimal material removal rates through increased feed and depths of cut
- Ball end design ideal for finishing operations in complex workpieces
- Recommended for materials ≤ 45 HRc (≤ 420 Bhn)

Z-Carb



	Series Z1MB Metric	Hardness		Ae x DC	Ap x DC	Vc (m/min)		DC • mm 3	6	8	10	12	16	20	25
P	CARBON STEELS 1018, 1040, 1080, 1090, 10L50, 1140, 1212, 12L15, 1525, 1536	≤ 275 Bhn or ≤ 28 HRc	Profile	≤ 0.5	≤ 1.5	169	RPM	17934	8967	6725	5380	4484	3363	2690	2152
						(135-203)	Fz	0.009	0.024	0.041	0.051	0.060	0.079	0.086	0.088
							Feed (mm/min)	654	861	1091	1090	1076	1067	927	753
			Slot	1	≤ 1	134	RPM	14218	7109	5332	4265	3555	2666	2133	1706
						(107-161)	Fz	0.009	0.024	0.041	0.051	0.060	0.079	0.086	0.088
							Feed (mm/min)	519	682	865	864	853	846	735	597
	ALLOY STEELS 4140, 4150, 4320, 5120, 5150, 8630, 86L20, 50100	≤ 375 Bhn or ≤ 40 HRc	Profile	≤ 0.5	≤ 1.5	96	RPM	10179	5089	3817	3054	2545	1909	1527	1221
						(77-115)	Fz	0.007	0.019	0.030	0.037	0.046	0.061	0.067	0.068
							Feed (mm/min)	274	391	456	456	464	469	407	330
			Slot	1	≤ 1	76	RPM	8078	4039	3029	2424	2020	1515	1212	969
						(61-91)	Fz	0.007	0.019	0.030	0.037	0.046	0.061	0.067	0.068
							Feed (mm/min)	217	310	362	362	368	372	323	262
	TOOL STEELS A2, D2, H13, L2, M2, P20, S7, T15, W2	≤ 375 Bhn or ≤ 40 HRc	Profile	≤ 0.5	≤ 1.5	56	RPM	5978	2989	2242	1793	1495	1121	897	717
						(45-68)	Fz	0.005	0.012	0.021	0.027	0.031	0.041	0.045	0.045
							Feed (mm/min)	115	143	191	191	186	184	163	129
			Slot	1	≤ 1	44	RPM	4686	2343	1757	1406	1171	879	703	562
						(35-53)	Fz	0.005	0.012	0.021	0.027	0.031	0.041	0.045	0.045
							Feed (mm/min)	90	112	150	150	146	144	127	101
M	STAINLESS STEELS (FREE MACHINING) 303, 416, 420F, 430F, 440F	≤ 275 Bhn or ≤ 28 HRc	Profile	≤ 0.5	≤ 1.5	149	RPM	15834	7917	5938	4750	3958	2969	2375	1900
						(119-179)	Fz	0.007	0.017	0.030	0.037	0.043	0.059	0.064	0.063
							Feed (mm/min)	456	532	709	709	684	699	608	475
			Slot	1	≤ 1	119	RPM	12602	6301	4726	3781	3151	2363	1890	1512
						(95-143)	Fz	0.007	0.017	0.030	0.037	0.043	0.059	0.064	0.063
							Feed (mm/min)	363	423	565	565	544	557	484	378
	STAINLESS STEELS (DIFFICULT) 304, 304L, 316, 316L	≤ 275 Bhn or ≤ 28 HRc	Profile	≤ 0.5	≤ 1.5	104	RPM	10987	5493	4120	3296	2747	2060	1648	1318
						(83-124)	Fz	0.005	0.014	0.023	0.029	0.034	0.046	0.051	0.050
							Feed (mm/min)	211	316	387	387	369	380	334	264
			Slot	1	≤ 1	82	RPM	8725	4362	3272	2617	2181	1636	1309	1047
						(66-99)	Fz	0.005	0.014	0.023	0.029	0.034	0.046	0.051	0.050
							Feed (mm/min)	168	251	307	307	293	302	265	209
	STAINLESS STEELS (PH) 13-8 PH, 15-5 PH, 17-4 PH, Custom 450	≤ 325 Bhn or ≤ 35 HRc	Profile	≤ 0.5	≤ 1.5	94	RPM	10017	5009	3756	3005	2504	1878	1503	1202
						(76-113)	Fz	0.005	0.014	0.023	0.029	0.034	0.046	0.051	0.050
							Feed (mm/min)	192	288	353	353	337	346	305	240
			Slot	1	≤ 1	76	RPM	8078	4039	3029	2424	2020	1515	1212	969
						(61-91)	Fz	0.005	0.014	0.023	0.029	0.034	0.046	0.051	0.050
							Feed (mm/min)	155	233	284	284	271	279	246	194

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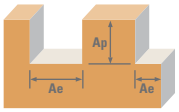
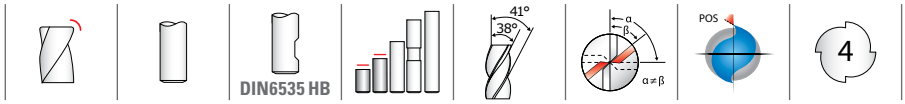
Z-Carb



	Series Z1MB Metric	Hardness		Ae x DC	Ap x DC	Vc (m/min)		DC • mm 3	6	8	10	12	16	20	25
K	CAST IRONS (LOW & MEDIUM ALLOY) Gray, Malleable, Ductile	≤ 220 Bhn or ≤ 19 HRc	Profile	≤ 0.5	≤ 1.5	136	RPM	14380	7190	5392	4314	3595	2696	2157	1726
						(109-163)	Fz	0.008	0.024	0.038	0.048	0.058	0.077	0.083	0.085
							Feed (mm/min)	483	690	828	828	828	828	713	587
			Slot	1	≤ 1	108	RPM	11471	5736	4302	3441	2868	2151	1721	1377
						(87-130)	Fz	0.008	0.024	0.038	0.048	0.058	0.077	0.083	0.085
							Feed (mm/min)	385	551	661	661	661	661	569	468
	CAST IRONS (HIGH ALLOY) Gray, Malleable, Ductile	≤ 260 Bhn or ≤ 26 HRc	Profile	≤ 0.5	≤ 1.5	104	RPM	10987	5493	4120	3296	2747	2060	1648	1318
						(83-124)	Fz	0.007	0.017	0.030	0.037	0.043	0.059	0.064	0.063
							Feed (mm/min)	316	369	492	492	475	485	422	330
			Slot	1	≤ 1	82	RPM	8725	4362	3272	2617	2181	1636	1309	1047
						(66-99)	Fz	0.007	0.017	0.030	0.037	0.043	0.059	0.064	0.063
							Feed (mm/min)	251	293	391	391	377	385	335	262
S	HIGH TEMP ALLOYS (NICKEL, COBALT, IRON BASE) Inconel 601, 617, 625, Incoloy, Monel 400	≤ 300 Bhn or ≤ 32 HRc	Profile	≤ 0.5	≤ 1.5	24	RPM	2585	1293	969	776	646	485	388	310
						(20-29)	Fz	0.005	0.010	0.017	0.021	0.024	0.033	0.037	0.038
							Feed (mm/min)	55	50	66	53	62	65	58	47
			Slot	1	≤ 1	20	RPM	2100	1050	788	630	525	394	315	252
						(16-24)	Fz	0.005	0.010	0.017	0.021	0.024	0.033	0.037	0.038
							Feed (mm/min)	40	40	54	54	50	52	47	38
	HIGH TEMP ALLOYS (NICKEL, COBALT, IRON BASE) Inconel 718, X-750, Incoloy, Waspaloy, Hastelloy, Rene	≤ 400 Bhn or ≤ 43 HRc	Profile	≤ 0.5	≤ 1.5	19	RPM	2003	1002	751	601	501	376	301	240
						(15-23)	Fz	0.002	0.007	0.011	0.013	0.017	0.020	0.024	0.025
							Feed (mm/min)	19	29	32	32	34	31	29	24
			Slot	1	≤ 1	15	RPM	1583	792	594	475	396	297	238	190
						(12-18)	Fz	0.002	0.007	0.011	0.013	0.017	0.020	0.024	0.025
							Feed (mm/min)	15	23	25	25	27	24	23	19
	TITANIUM ALLOYS Pure Titanium, Ti6Al4V, Ti6Al2Sn4Zr2Mo, Ti4Al4Mo2Sn0.5Si	≤ 350 Bhn or ≤ 38 HRc	Profile	≤ 0.5	≤ 1.5	66	RPM	6947	3474	2605	2084	1737	1303	1042	834
						(52-79)	Fz	0.005	0.012	0.021	0.027	0.031	0.041	0.045	0.045
							Feed (mm/min)	133	167	222	222	217	213	189	150
			Slot	1	≤ 1	52	RPM	5493	2747	2060	1648	1373	1030	824	659
						(41-62)	Fz	0.005	0.012	0.021	0.027	0.031	0.041	0.045	0.045
							Feed (mm/min)	105	132	176	176	171	169	149	119
	TITANIUM ALLOYS (DIFFICULT) Ti10V2Fe3Al, Ti5Al5V5Mo3Cr, Ti7Al4Mo, Ti3Al8V6Cr4Zr4Mo, Ti6Al6V6Sn, Ti15V3 Cr3Sn3Al	≤ 420 Bhn or ≤ 45 HRc	Profile	≤ 0.5	≤ 1.5	23	RPM	2424	1212	909	727	606	454	364	291
						(18-27)	Fz	0.005	0.012	0.021	0.027	0.031	0.041	0.045	0.045
							Feed (mm/min)	47	58	78	78	76	74	66	52
			Slot	1	≤ 1	18	RPM	1939	969	727	582	485	364	291	233
						(15-22)	Fz	0.005	0.012	0.021	0.027	0.031	0.041	0.045	0.045
							Feed (mm/min)	37	47	62	62	60	60	53	42

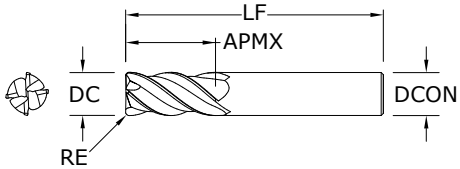
Bhn (Brinell) HRc (Rockwell C)
rpm = (Vc x 1000) / (DC x 3.14)
mm/min = Fz x 4 x rpm
reduce speed and feed for materials harder than listed
reduce feed and Ae when finish milling (.02 x DC maximum)
feed rates listed have chip thinning adjustments included where applicable
refer to the SGS Tool Wizard® for complete technical information (www.kyocera-sgstool.com)

Z-Carb-HTA



ZH1MCRS • ZH1MCR

METRIC SERIES



- The original Z-Carb design with an enhanced core and higher helix suited for the demands of high temperature alloys
- Unequal flute spacing helps to disrupt the rhythmic pattern created by the cutting edge helping to suppress damaging harmonics
- Optimal material removal rates through increased feed and depths of cut for difficult to machine materials
- Enhanced corner geometry with tight tolerance corner radii
- Recommended for materials ≤ 45 HRc (≤ 420 Bhn)

mm					EDP NO.	
CUTTING DIAMETER DC	LENGTH OF CUT APMX	OVERALL LENGTH LF	SHANK DIAMETER DCON	CORNER RADIUS RE	Ti-NAMITE®-A (AlTiN)	Ti-NAMITE®-A (AlTiN) W/FLAT
6,0	10,0	54,0	6,0	0,5	–	42712
6,0	13,0	57,0	6,0	0,5	46450	–
6,0	13,0	57,0	6,0	1,0	46451	–
6,0	13,0	57,0	6,0	1,5	46452	–
8,0	12,0	58,0	8,0	0,5	–	42713
8,0	19,0	63,0	8,0	0,5	46453	–
8,0	19,0	63,0	8,0	1,0	46454	–
8,0	19,0	63,0	8,0	1,5	46455	–
10,0	14,0	66,0	10,0	0,5	–	42714
10,0	22,0	72,0	10,0	0,5	46456	–
10,0	22,0	72,0	10,0	1,0	46457	–
10,0	22,0	72,0	10,0	1,5	46458	–
10,0	22,0	72,0	10,0	2,0	46459	–
12,0	16,0	73,0	12,0	0,7	–	42715
12,0	26,0	83,0	12,0	0,5	46460	46471
12,0	26,0	83,0	12,0	1,0	46461	46472
12,0	26,0	83,0	12,0	1,5	46462	46473
12,0	26,0	83,0	12,0	2,0	46463	46474
12,0	26,0	83,0	12,0	3,0	46464	46475
16,0	22,0	82,0	16,0	1,0	–	42716
16,0	32,0	92,0	16,0	1,5	46465	46476
16,0	32,0	92,0	16,0	2,0	46466	46477
16,0	32,0	92,0	16,0	3,0	46467	46478
16,0	32,0	92,0	16,0	4,0	46482	46483
20,0	26,0	92,0	20,0	1,0	–	42717
20,0	38,0	104,0	20,0	3,0	46468	46479
20,0	38,0	104,0	20,0	4,0	46469	46480
20,0	38,0	104,0	20,0	5,0	46470	46481

TOLERANCES (mm)

6 DIAMETER
DC = +0,000/–0,030
DCON = h_6
RE = +0,000/–0,050

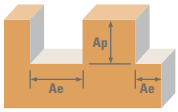
>6–10 DIAMETER
DC = +0,000/–0,040
DCON = h_6
RE = +0,000/–0,050

>10–20 DIAMETER
DC = +0,000/–0,050
DCON = h_6
RE = +0,000/–0,050

HIGH TEMP ALLOYS

For patent information visit www.ksptpatents.com

Z-Carb-HTA



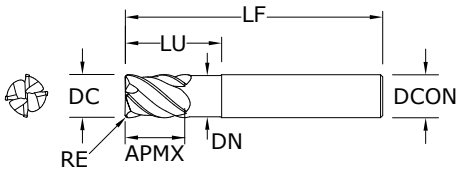
	Series ZH1MCRS, ZH1MCR Metric	Hardness		Ae x DC	Ap x DC	Vc (m/min)		DC • mm 6	10	12	20
S	HIGH TEMP ALLOYS (NICKEL, COBALT, IRON BASE) Inconel 601, 617, 625, Incoloy, Monel 400	≤ 300 Bhn or ≤ 32 HRc	Profile	≤ 0.5	≤ 1.5	26	RPM	1373	824	687	412
						(21-31)	Fz	0.017	0.032	0.041	0.053
							Feed (mm/min)	93	105	113	87
			Slot	1	≤ 1	21	RPM	1131	679	565	339
						(17-26)	Fz	0.017	0.032	0.041	0.053
							Feed (mm/min)	77	87	93	72
	HIGH TEMP ALLOYS (NICKEL, COBALT, IRON BASE) Inconel 718, X-750, Incoloy, Waspaloy, Hastelloy, Rene	≤ 400 Bhn or ≤ 43 HRc	Profile	≤ 0.5	≤ 1.5	21	RPM	1131	679	565	339
						(17-26)	Fz	0.012	0.024	0.029	0.037
							Feed (mm/min)	54	65	66	50
			Slot	1	≤ 1	17	RPM	889	533	444	267
						(13-20)	Fz	0.012	0.024	0.029	0.037
							Feed (mm/min)	43	51	52	39
	TITANIUM ALLOYS Pure Titanium, Ti6Al4V, Ti6Al2Sn4Zr2Mo, Ti4Al4Mo2Sn0.5Si	≤ 350 Bhn or ≤ 38 HRc	Profile	≤ 0.5	≤ 1.5	66	RPM	3474	2084	1737	1042
						(52-79)	Fz	0.019	0.041	0.049	0.057
							Feed (mm/min)	264	342	340	238
			Slot	1	≤ 1	52	RPM	2747	1648	1373	824
						(41-62)	Fz	0.019	0.041	0.049	0.057
							Feed (mm/min)	209	270	269	188
	TITANIUM ALLOYS (DIFFICULT) Ti10V2Fe3Al, Ti5Al5V5Mo3Cr, Ti7Al4Mo, Ti3Al8V6Cr4Zr4Mo, Ti6Al6V6Sn, Ti15V3 Cr3Sn3Al	≤ 420 Bhn or ≤ 45 HRc	Profile	≤ 0.5	≤ 1.5	23	RPM	1212	727	606	364
						(18-27)	Fz	0.019	0.041	0.049	0.057
							Feed (mm/min)	92	119	119	83
			Slot	1	≤ 1	18	RPM	969	582	485	291
						(15-22)	Fz	0.019	0.041	0.049	0.057
							Feed (mm/min)	74	95	95	66

Bhn (Brinell) HRc (Rockwell C)
rpm = (Vc x 1000) / (DC x 3.14)
ipm = Fz x 4 x rpm
reduce speed and feed for materials harder than listed
reduce feed and Ae when finish milling (.02 x DC maximum)
feed rates listed have chip thinning adjustments included where applicable
refer to the SGS Tool Wizard® for complete technical information (www.kyocera-sgstool.com)

Z-Carb-MD

ZD1MCR

METRIC SERIES



- The original Z-Carb design with negative rake, heavy core, and higher helix for strength and shearing of hard mold & die materials
- Unequal flute spacing helps to disrupt the rhythmic pattern created by the cutting edge helping to suppress damaging harmonics
- Enhanced corner geometry with tight tolerance corner radii
- Recommended for materials 35-60HRc (327 to 654 Bhn)

mm							EDP NO.
CUTTING DIAMETER DC	LENGTH OF CUT APMX	OVERALL LENGTH LF	SHANK DIAMETER DCON	REACH LU	NECK DIAMETER DN	CORNER RADIUS RE	Ti-NAMITE®-X (TX)
3,0	4,0	57,0	6,0	15,0	2,62	0,2	46560
4,0	5,0	57,0	6,0	15,0	3,61	0,3	46561
5,0	6,0	57,0	6,0	15,0	4,60	0,5	46562
6,0	7,0	57,0	6,0	15,0	5,61	1,0	46563
8,0	10,0	63,0	8,0	25,0	7,62	1,0	46564
10,0	12,0	72,0	10,0	30,0	9,60	1,0	46565
12,0	15,0	83,0	12,0	35,0	11,61	1,0	46566
16,0	20,0	92,0	16,0	45,0	15,60	1,5	46567
20,0	24,0	104,0	20,0	55,0	19,61	2,0	46568

TOLERANCES (mm)

3–6 DIAMETER
DC = +0,000/–0,030
DCON = h_6
RE = +0,000/–0,050

>6–10 DIAMETER
DC = +0,000/–0,040
DCON = h_6
RE = +0,000/–0,050

>10–20 DIAMETER
DC = +0,000/–0,050
DCON = h_6
RE = +0,000/–0,050

STEELS

HARDENED STEELS

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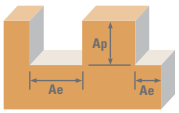
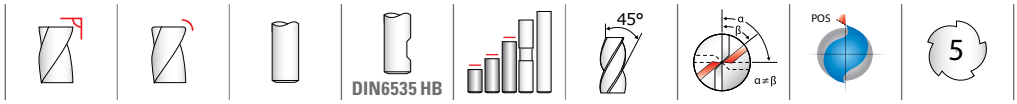
Z-Carb-MD



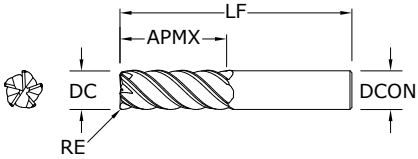
	Series ZD1MCR Metric	Hardness		Ae x DC	Ap x DC	Vc (m/min)		Diameter (DC) (mm) 3	6	8	10	12	16	20
P	TOOL STEELS A2, D2, H13, L2, M2, P20, S7, T15, W2	≤ 375 Bhn or ≤ 40 HRc	Profile	≤ 0.4	≤ 1	123	RPM	13087	6544	4908	3926	3272	2454	1963
						(99-148)	Fz	0.012	0.029	0.049	0.061	0.072	0.083	0.112
							Feed (mm/min)	628	754	963	963	942	817	879
			Slot	1	≤ 0.4	98	RPM	10340	5170	3878	3102	2585	1939	1551
						(78-117)	Fz	0.012	0.029	0.049	0.061	0.072	0.083	0.112
							Feed (mm/min)	496	596	761	761	744	645	695
H	TOOL STEELS A2, D2, H13, L2, M2, P20, S7, T15, W2	≤ 475 Bhn or ≤ 50 HRc	Profile	≤ 0.4	≤ 1	64	RPM	6786	3393	2545	2036	1696	1272	1018
						(51-77)	Fz	0.010	0.024	0.041	0.051	0.060	0.068	0.093
							Feed (mm/min)	261	326	413	413	407	347	380
			Slot	1	≤ 0.4	52	RPM	5493	2747	2060	1648	1373	1030	824
						(41-62)	Fz	0.010	0.024	0.041	0.051	0.060	0.068	0.093
							Feed (mm/min)	211	264	334	334	330	281	308
	TOOL STEELS A2, D2, H13, L2, M2, P20, S7, T15, W2	≤ 655 Bhn or ≤ 60 HRc	Profile	≤ 0.4	≤ 1	27	RPM	2908	1454	1091	872	727	545	436
						(22-33)	Fz	0.005	0.012	0.021	0.027	0.031	0.036	0.048
							Feed (mm/min)	56	70	93	93	91	79	84
			Slot	1	≤ 0.4	21	RPM	2262	1131	848	679	565	424	339
						(17-26)	Fz	0.005	0.012	0.021	0.027	0.031	0.036	0.048
							Feed (mm/min)	43	54	72	72	71	62	65

Bhn (Brinell) HRc (Rockwell C)
rpm = (Vc x 1000) / (DC x 3.14)
ipm = Fz x 4 x rpm
reduce speed and feed for materials harder than listed
reduce feed and Ae when finish milling (.02 x DC maximum)
feed rates listed have chip thinning adjustments included where applicable
refer to the SGS Tool Wizard® for complete technical information (www.kyocera-sgstool.com)



55M • 55MCR

METRIC SERIES



- Unequal indexing, high helix and an ideal rake and relief combination for unmatched finishing capability
- The choice when peak finish quality is the requirement
- Enhanced corner geometry with tight tolerance corner radii
- Recommended for materials ≤ 45 HRc (≤ 420 Bhn)

mm					EDP NO.	
CUTTING DIAMETER DC	LENGTH OF CUT APMX	OVERALL LENGTH LF	SHANK DIAMETER DCON	CORNER RADIUS RE	Ti-NAMITE®-A (AlTiN)	Ti-NAMITE®-A (AlTiN) W/FLAT
6,0	12,0	50,0	6,0	–	42606	–
6,0	12,0	50,0	6,0	0,5	42660	–
6,0	19,0	63,0	6,0	–	42607	–
6,0	19,0	63,0	6,0	0,25	42661	–
6,0	19,0	63,0	6,0	0,5	42662	–
6,0	19,0	63,0	6,0	1,0	42663	–
6,0	19,0	63,0	6,0	1,5	42664	–
6,0	25,0	75,0	6,0	–	42608	–
6,0	25,0	75,0	6,0	0,5	42665	–
8,0	12,0	50,0	8,0	–	42609	–
8,0	12,0	50,0	8,0	0,5	42666	–
8,0	20,0	63,0	8,0	–	42610	–
8,0	20,0	63,0	8,0	0,5	42667	–
8,0	20,0	63,0	8,0	1,0	42668	–
8,0	20,0	63,0	8,0	1,5	42669	–
8,0	20,0	63,0	8,0	2,0	42670	–
8,0	25,0	75,0	8,0	–	42611	–
8,0	25,0	75,0	8,0	0,5	42671	–
10,0	16,0	50,0	10,0	–	42612	–
10,0	16,0	50,0	10,0	0,5	42672	–
10,0	22,0	75,0	10,0	–	42622	42613
10,0	22,0	75,0	10,0	0,5	42673	–
10,0	22,0	75,0	10,0	1,0	42674	–
10,0	22,0	75,0	10,0	1,5	42675	–
10,0	22,0	75,0	10,0	2,0	42676	–
10,0	22,0	75,0	10,0	2,5	42677	–
10,0	38,0	100,0	10,0	–	42614	–
10,0	38,0	100,0	10,0	0,5	42678	–
12,0	19,0	63,0	12,0	–	42615	–
12,0	19,0	63,0	12,0	0,5	42679	–
12,0	25,0	75,0	12,0	–	42616	42623
12,0	25,0	75,0	12,0	0,5	42680	–
12,0	25,0	75,0	12,0	1,0	42681	–
12,0	25,0	75,0	12,0	1,5	42682	–
12,0	25,0	75,0	12,0	2,0	42683	–
12,0	25,0	75,0	12,0	2,5	42684	–

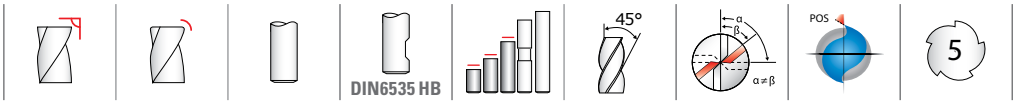
continued on next page

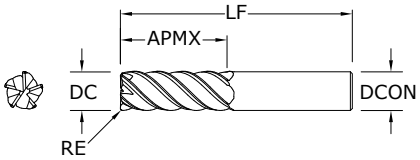
TOLERANCES (inch)

DC = +0.0000/–0.0020
DCON = h_6
RE = +0.0000/–0.0020

- STEELS
- STAINLESS STEELS
- CAST IRON
- HIGH TEMP ALLOYS

For patent information visit www.ksptpatents.com





55M • 55MCR

METRIC SERIES

TOLERANCES (mm)

DC = +0,000/–0,050
DCON = h_6
RE = +0,000/–0,050

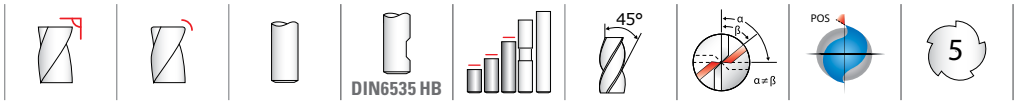
- STEELS
- STAINLESS STEELS
- CAST IRON
- HIGH TEMP ALLOYS

For patent information visit www.ksptpatents.com

mm					EDP NO.	
CUTTING DIAMETER DC	LENGTH OF CUT APMX	OVERALL LENGTH LF	SHANK DIAMETER DCON	CORNER RADIUS RE	Ti-NAMITE®-A (AlTiN)	Ti-NAMITE®-A (AlTiN) W/FLAT
12,0	25,0	75,0	12,0	3,0	42685	–
12,0	50,0	100,0	12,0	–	42617	–
12,0	50,0	100,0	12,0	0,5	42686	–
12,0	50,0	100,0	12,0	3,0	42630	–
12,0	50,0	100,0	12,0	4,0	42631	–
16,0	32,0	89,0	16,0	–	42618	42624
16,0	32,0	89,0	16,0	1,0	42687	–
16,0	32,0	89,0	16,0	1,5	42688	–
16,0	32,0	89,0	16,0	2,0	42689	–
16,0	32,0	89,0	16,0	2,5	42690	–
16,0	32,0	89,0	16,0	3,0	42691	–
16,0	32,0	89,0	16,0	4,0	42692	–
16,0	50,0	100,0	16,0	–	42626	–
16,0	50,0	100,0	16,0	2,0	42656	–
16,0	50,0	100,0	16,0	2,5	42657	–
16,0	50,0	100,0	16,0	3,0	42658	–
16,0	50,0	100,0	16,0	4,0	42659	–
16,0	50,0	100,0	16,0	5,0	42628	–
16,0	75,0	150,0	16,0	–	42619	–
16,0	75,0	150,0	16,0	1,0	42693	–
16,0	75,0	150,0	16,0	3,0	42632	–
16,0	75,0	150,0	16,0	4,0	42633	–
20,0	38,0	100,0	20,0	–	42620	42625
20,0	38,0	100,0	20,0	1,0	42694	–
20,0	38,0	100,0	20,0	1,5	42695	–
20,0	38,0	100,0	20,0	2,0	42696	–
20,0	38,0	100,0	20,0	2,5	42697	–
20,0	38,0	100,0	20,0	3,0	42698	–
20,0	38,0	100,0	20,0	4,0	42699	–
20,0	38,0	100,0	20,0	5,0	42700	–
20,0	38,0	100,0	20,0	6,0	42648	–
20,0	50,0	100,0	20,0	–	42627	–
20,0	50,0	100,0	20,0	2,0	42649	–
20,0	50,0	100,0	20,0	2,5	42650	–
20,0	50,0	100,0	20,0	3,0	42651	–
20,0	50,0	100,0	20,0	4,0	42652	–

continued on next page

- Unequal indexing, high helix and an ideal rake and relief combination for unmatched finishing capability
- The choice when peak finish quality is the requirement
- Enhanced corner geometry with tight tolerance corner radii
- Recommended for materials ≤ 45 HRc (≤ 420 Bhn)



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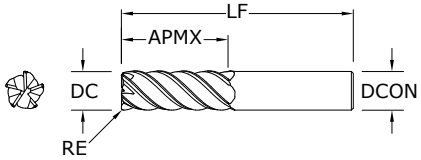
METRIC SERIES



- Unequal indexing, high helix and an ideal rake and relief combination for unmatched finishing capability
- The choice when peak finish quality is the requirement
- Enhanced corner geometry with tight tolerance corner radii
- Recommended for materials ≤ 45 HRc (≤ 420 Bhn)

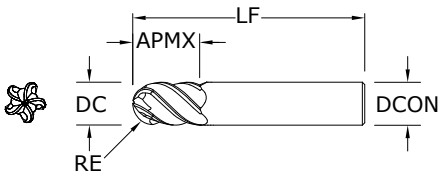
mm					EDP NO.	
CUTTING DIAMETER DC	LENGTH OF CUT APMX	OVERALL LENGTH LF	SHANK DIAMETER DCON	CORNER RADIUS RE	Ti-NAMITE®-A (AlTiN)	Ti-NAMITE®-A (AlTiN) W/FLAT
20,0	50,0	100,0	20,0	5,0	42653	–
20,0	50,0	100,0	20,0	6,0	42654	–
20,0	75,0	150,0	20,0	–	42621	–
20,0	75,0	150,0	20,0	1,0	42701	–
20,0	75,0	150,0	20,0	2,0	42702	–
20,0	75,0	150,0	20,0	3,0	42703	–
20,0	75,0	150,0	20,0	4,0	42704	–
20,0	75,0	150,0	20,0	5,0	42705	–
20,0	75,0	150,0	20,0	6,0	42655	–

TOLERANCES (mm)

DC = +0,000/–0,050
DCON = h_6
RE = +0,000/–0,050

- STEELS
- STAINLESS STEELS
- CAST IRON
- HIGH TEMP ALLOYS

For patent information visit www.ksptpatents.com



55MB
METRIC SERIES

TOLERANCES (mm)

DC = +0,000/–0,050
DCON = h_6
RE = +0,000/–0,050

- STEELS
- STAINLESS STEELS
- CAST IRON
- HIGH TEMP ALLOYS

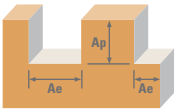
For patent information visit www.ksptpatents.com

mm				EDP NO.
CUTTING DIAMETER DC	LENGTH OF CUT APMX	OVERALL LENGTH LF	SHANK DIAMETER DCON	Ti-NAMITE®-A (AlTiN)
6,0	13,0	57,0	6,0	42750
8,0	19,0	63,0	8,0	42751
10,0	22,0	72,0	10,0	42752
12,0	26,0	83,0	12,0	42753
16,0	32,0	92,0	16,0	42754
20,0	38,0	104,0	20,0	42755

RE = 1/2 Cutting Diameter (DC)

- Unequal indexing, high helix and an ideal rake and relief combination for unmatched finishing capability
- The choice when peak finish quality is the requirement
- Ball end design ideal for finishing operations in complex workpieces
- Recommended for materials ≤ 45 HRc (≤ 420 Bhn)

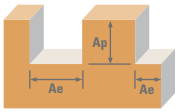
V-Carb



	Series 55M, 55MCR, 55MB Metric	Hardness		Ae x DC	Ap x DC	Vc (m/min)		DC • mm 6	8	10	12	16	20
P	CARBON STEELS 1018, 1040, 1080, 1090, 10L50, 1140, 1212, 12L15, 1525, 1536	≤ 275 Bhn or ≤ 28 HRc	Profile	≤ 0.25	≤ 1.5	117	RPM	6220	4665	3732	3110	2333	1866
						(94-141)	Fz	0.022	0.036	0.061	0.070	0.072	0.085
							Feed (mm/min)	672	846	1145	1082	836	796
			HSM	≤ 0.05	≤ 2	192	RPM	10179	7634	6107	5089	3817	3054
						(154-230)	Fz	0.043	0.073	0.123	0.137	0.141	0.154
							Feed (mm/min)	2198	2769	3746	3481	2687	2345
	ALLOY STEELS 4140, 4150, 4320, 5120, 5150, 8630, 86L20, 50100	≤ 375 Bhn or ≤ 40 HRc	Profile	≤ 0.25	≤ 1.5	99	RPM	5251	3938	3151	2626	1969	1575
						(79-119)	Fz	0.017	0.028	0.045	0.053	0.054	0.064
							Feed (mm/min)	441	546	571	693	529	504
			HSM	≤ 0.05	≤ 2	162	RPM	8563	6422	5138	4282	3211	2569
						(129-194)	Fz	0.034	0.055	0.091	0.103	0.105	0.128
							Feed (mm/min)	1438	1781	2329	2209	1685	1644
	TOOL STEELS A2, D2, H13, L2, M2, P20, S7, T15, W2	≤ 375 Bhn or ≤ 40 HRc	Profile	≤ 0.25	≤ 1.5	53	RPM	2827	2121	1696	1414	1060	848
						(43-64)	Fz	0.012	0.021	0.035	0.038	0.044	0.048
							Feed (mm/min)	170	226	294	271	231	204
			HSM	≤ 0.05	≤ 2	88	RPM	4686	3514	2811	2343	1757	1406
						(71-106)	Fz	0.024	0.041	0.067	0.077	0.084	0.093
							Feed (mm/min)	562	712	937	900	742	656
M	STAINLESS STEELS (FREE MACHINING) 303, 416, 420F, 430F, 440F	≤ 275 Bhn or ≤ 28 HRc	Profile	≤ 0.25	≤ 1.5	113	RPM	5978	4484	3587	2989	2242	1793
						(90-135)	Fz	0.017	0.028	0.045	0.053	0.059	0.064
							Feed (mm/min)	502	622	813	789	660	574
			HSM	≤ 0.05	≤ 2	171	RPM	9048	6786	5429	4524	3393	2714
						(137-205)	Fz	0.034	0.055	0.091	0.103	0.113	0.128
							Feed (mm/min)	1520	1882	2461	2334	1911	1737
	STAINLESS STEELS (DIFFICULT) 304, 304L, 316, 316L	≤ 275 Bhn or ≤ 28 HRc	Profile	≤ 0.25	≤ 1.5	78	RPM	4120	3090	2472	2060	1545	1236
						(62-93)	Fz	0.014	0.026	0.043	0.048	0.054	0.061
							Feed (mm/min)	297	396	527	494	415	379
			HSM	≤ 0.05	≤ 2	117	RPM	6220	4665	3732	3110	2333	1866
						(94-141)	Fz	0.031	0.051	0.085	0.096	0.105	0.120
							Feed (mm/min)	970	1194	1592	1493	1224	1120
	STAINLESS STEELS (PH) 13-8 PH, 15-5 PH, 17-4 PH, Custom 450	≤ 325 Bhn or ≤ 35 HRc	Profile	≤ 0.25	≤ 1.5	72	RPM	3797	2848	2278	1898	1424	1139
						(57-86)	Fz	0.014	0.021	0.037	0.041	0.046	0.051
							Feed (mm/min)	273	304	425	387	328	289
			HSM	≤ 0.05	≤ 2	108	RPM	5736	4302	3441	2868	2151	1721
						(87-130)	Fz	0.026	0.045	0.075	0.082	0.092	0.104
							Feed (mm/min)	757	964	1285	1170	991	895

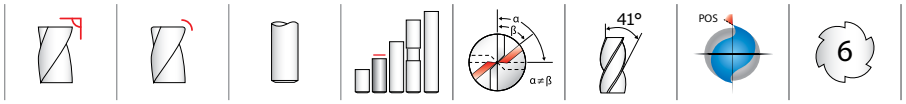
continued on next page

V-Carb



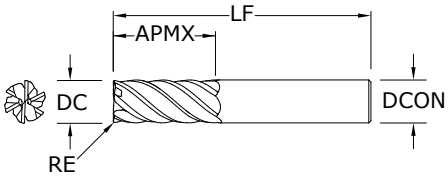
	Series 55M, 55MCR, 55MB Metric	Hardness		Ae x DC	Ap x DC	Vc (m/min)		DC • mm 6	8	10	12	16	20
K	CAST IRONS (LOW & MEDIUM ALLOY) Gray, Malleable, Ductile	≤ 220 Bhn or ≤ 19 HRc	Profile	≤ 0.25	≤ 1.5	143	RPM	7594	5695	4556	3797	2848	2278
						(115-172)	Fz	0.022	0.036	0.061	0.070	0.077	0.085
							Feed (mm/min)	820	1033	1397	1321	1093	972
			HSM	≤ 0.05	≤ 2	215	RPM	11391	8543	6834	5695	4271	3417
						(172-258)	Fz	0.043	0.073	0.123	0.137	0.151	0.171
							Feed (mm/min)	2460	3099	4192	3895	3226	2916
	CAST IRONS (HIGH ALLOY) Gray, Malleable, Ductile	≤ 260 Bhn or ≤ 26 HRc	Profile	≤ 0.25	≤ 1.5	110	RPM	5816	4362	3490	2908	2181	1745
						(88-132)	Fz	0.017	0.028	0.045	0.053	0.059	0.064
							Feed (mm/min)	489	605	791	768	642	558
			HSM	≤ 0.05	≤ 2	165	RPM	8725	6544	5235	4362	3272	2617
						(132-198)	Fz	0.034	0.055	0.091	0.103	0.113	0.128
							Feed (mm/min)	1466	1815	2373	2251	1843	1675
S	HIGH TEMP ALLOYS (NICKEL, COBALT, IRON BASE) Inconel 601, 617, 625, Incoloy, Monel 400	≤ 300 Bhn or ≤ 32 HRc	Profile	≤ 0.25	≤ 1.5	21	RPM	1131	848	679	565	424	339
						(17-26)	Fz	0.014	0.021	0.037	0.041	0.046	0.051
							Feed (mm/min)	81	90	127	115	98	86
			HSM	≤ 0.05	≤ 2	33	RPM	1729	1297	1037	864	648	519
						(26-39)	Fz	0.026	0.045	0.075	0.082	0.092	0.104
							Feed (mm/min)	228	290	387	353	299	270
	HIGH TEMP ALLOYS (NICKEL, COBALT, IRON BASE) Inconel 718, X-750, Incoloy, Waspaloy, Hastelloy, Rene	≤ 400 Bhn or ≤ 43 HRc	Profile	≤ 0.25	≤ 1.5	17	RPM	889	666	533	444	333	267
						(13-20)	Fz	0.010	0.017	0.027	0.031	0.036	0.040
							Feed (mm/min)	43	57	71	69	60	53
			HSM	≤ 0.05	≤ 2	26	RPM	1373	1030	824	687	515	412
						(21-31)	Fz	0.019	0.032	0.056	0.062	0.069	0.077
							Feed (mm/min)	132	165	231	214	178	159
S	TITANIUM ALLOYS Pure Titanium, Ti6Al4V, Ti6Al2Sn4Zr2Mo, Ti4Al4Mo2Sn0.5Si	≤ 350 Bhn or ≤ 38 HRc	Profile	≤ 0.25	≤ 1.5	72	RPM	3797	2848	2278	1898	1424	1139
						(57-86)	Fz	0.014	0.026	0.043	0.048	0.054	0.061
							Feed (mm/min)	273	365	486	456	383	349
			HSM	≤ 0.05	≤ 2	119	RPM	6301	4726	3781	3151	2363	1890
						(95-143)	Fz	0.031	0.051	0.085	0.096	0.105	0.120
							Feed (mm/min)	983	1210	1613	1512	1240	1134
	TITANIUM ALLOYS (DIFFICULT) Ti10V2Fe3Al, Ti5Al5V5Mo3Cr, Ti7Al4Mo, Ti3Al8V6Cr4Zr4Mo, Ti6Al6V6Sn, Ti15V3 Cr3Sn3Al	≤ 420 Bhn or ≤ 45 HRc	Profile	≤ 0.25	≤ 1.5	26	RPM	1373	1030	824	687	515	412
						(21-31)	Fz	0.014	0.026	0.043	0.048	0.054	0.061
							Feed (mm/min)	99	132	176	165	138	126
			HSM	≤ 0.05	≤ 2	43	RPM	2262	1696	1357	1131	848	679
						(34-51)	Fz	0.031	0.051	0.085	0.096	0.108	0.120
							Feed (mm/min)	353	434	579	543	456	407

Bhn (Brinell) HRc (Rockwell C) HSM (High Speed Machining)
rpm = (Vc x 1000) / (DC x 3.14)
mm/min = Fz x 5 x rpm
reduce speed and feed for materials harder than listed
reduce feed and Ae when finish milling (.02 x DC maximum)
reduce Ap to 1 x DC (maximum) when profile milling with long or extra long flute length tools
feed rates listed have chip thinning adjustments included where applicable
refer to the SGS Tool Wizard® for complete technical information (www.kyocera-sgstool.com)



51M • 51MCR

METRIC SERIES



- Engineered for High Speed Milling using Trochoidal and Peel Milling techniques
- Eccentric relief provides superior strength and smoother surface finish
- Enhanced corner geometry with tight tolerance corner radii
- Recommended for materials ≤ 45 HRc (≤ 420 Bhn)

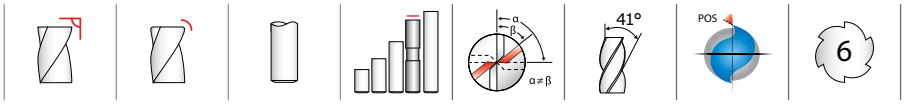
		mm			EDP NO.
CUTTING DIAMETER DC	LENGTH OF CUT APMX	OVERALL LENGTH LF	SHANK DIAMETER DCON	CORNER RADIUS RE	Ti-NAMITE®-X (TX)
6,0	19,0	63,0	6,0	–	45100
6,0	19,0	63,0	6,0	0,5	45112
6,0	19,0	63,0	6,0	1,0	45170
6,0	19,0	63,0	6,0	1,5	45171
8,0	20,0	63,0	8,0	–	45101
8,0	20,0	63,0	8,0	0,5	45113
8,0	20,0	63,0	8,0	1,0	45114
8,0	20,0	63,0	8,0	1,2	45150
8,0	20,0	63,0	8,0	1,5	45172
8,0	20,0	63,0	8,0	2,0	45173
10,0	22,0	75,0	10,0	–	45102
10,0	22,0	75,0	10,0	0,5	45174
10,0	22,0	75,0	10,0	1,0	45115
10,0	22,0	75,0	10,0	1,5	45116
10,0	22,0	75,0	10,0	2,0	45117
10,0	22,0	75,0	10,0	2,5	45175
12,0	26,0	83,0	12,0	–	45103
12,0	26,0	83,0	12,0	0,5	45176
12,0	26,0	83,0	12,0	0,76	45177
12,0	26,0	83,0	12,0	1,0	45118
12,0	26,0	83,0	12,0	1,5	45119
12,0	26,0	83,0	12,0	2,0	45120
12,0	26,0	83,0	12,0	2,5	45178
12,0	26,0	83,0	12,0	3,0	45179
16,0	32,0	92,0	16,0	–	45104
16,0	32,0	92,0	16,0	1,0	45121
16,0	32,0	92,0	16,0	1,5	45122
16,0	32,0	92,0	16,0	2,0	45123
16,0	32,0	92,0	16,0	2,5	45180
16,0	32,0	92,0	16,0	3,0	45181
16,0	32,0	92,0	16,0	4,0	45182
20,0	38,0	104,0	20,0	–	45105
20,0	38,0	104,0	20,0	1,0	45124
20,0	38,0	104,0	20,0	1,5	45125
20,0	38,0	104,0	20,0	2,0	45126
20,0	38,0	104,0	20,0	2,5	45183
20,0	38,0	104,0	20,0	3,0	45184
20,0	38,0	104,0	20,0	4,0	45185
20,0	38,0	104,0	20,0	5,0	45186

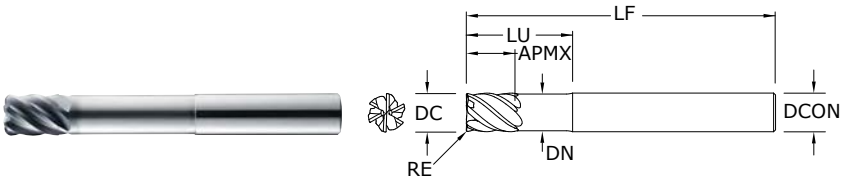
TOLERANCES (mm)

DC = +0,000/–0,050
DCON = h_6
RE = +0,000/–0,050

- STEELS
- STAINLESS STEELS
- CAST IRON
- HIGH TEMP ALLOYS

For patent information visit www.ksptpatents.com





51ML • 51MLC

METRIC SERIES

TOLERANCES (mm)

DC = +0,000/–0,050
DCON = h_6
RE = +0,000/–0,050

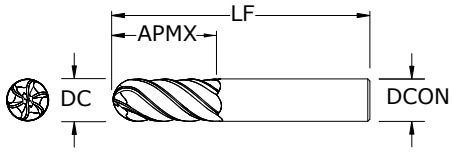
- STEELS
- STAINLESS STEELS
- CAST IRON
- HIGH TEMP ALLOYS

For patent information visit www.ksptpatents.com

mm							EDP NO.
CUTTING DIAMETER DC	LENGTH OF CUT APMX	OVERALL LENGTH LF	SHANK DIAMETER DCON	REACH LU	NECK DIAMETER DN	CORNER RADIUS RE	Ti-NAMITE®-X (TX)
6,0	8,0	75,0	6,0	32,0	5,69	–	45106
6,0	8,0	75,0	6,0	32,0	5,69	0,5	45127
6,0	8,0	75,0	6,0	32,0	5,69	1,0	45187
6,0	8,0	75,0	6,0	32,0	5,69	1,5	45188
8,0	10,0	75,0	8,0	32,0	7,59	–	45107
8,0	10,0	75,0	8,0	32,0	7,59	0,5	45128
8,0	10,0	75,0	8,0	32,0	7,59	1,0	45129
8,0	10,0	75,0	8,0	32,0	7,59	1,5	45189
8,0	10,0	75,0	8,0	32,0	7,59	2,0	45190
10,0	12,0	100,0	10,0	40,0	9,50	–	45108
10,0	12,0	100,0	10,0	40,0	9,50	0,5	45191
10,0	12,0	100,0	10,0	40,0	9,50	1,0	45130
10,0	12,0	100,0	10,0	40,0	9,50	1,5	45131
10,0	12,0	100,0	10,0	40,0	9,50	2,0	45132
10,0	12,0	100,0	10,0	40,0	9,50	2,5	45192
12,0	15,0	100,0	12,0	48,0	11,38	–	45109
12,0	15,0	100,0	12,0	48,0	11,38	0,5	45193
12,0	15,0	100,0	12,0	48,0	11,38	0,76	45194
12,0	15,0	100,0	12,0	48,0	11,38	1,0	45133
12,0	15,0	100,0	12,0	48,0	11,38	1,5	45134
12,0	15,0	100,0	12,0	48,0	11,38	2,0	45135
12,0	15,0	100,0	12,0	48,0	11,38	2,5	45195
12,0	15,0	100,0	12,0	48,0	11,38	3,0	45196
16,0	20,0	115,0	16,0	65,0	15,19	–	45110
16,0	20,0	115,0	16,0	65,0	15,19	1,0	45136
16,0	20,0	115,0	16,0	65,0	15,19	1,5	45137
16,0	20,0	115,0	16,0	65,0	15,19	2,0	45138
16,0	20,0	115,0	16,0	65,0	15,19	2,5	45197
16,0	20,0	115,0	16,0	65,0	15,19	3,0	45198
16,0	20,0	115,0	16,0	65,0	15,19	4,0	45199
20,0	24,0	150,0	20,0	80,0	19,00	–	45111
20,0	24,0	150,0	20,0	80,0	19,00	1,0	45139
20,0	24,0	150,0	20,0	80,0	19,00	1,5	45140
20,0	24,0	150,0	20,0	80,0	19,00	2,0	45141
20,0	24,0	150,0	20,0	80,0	19,00	2,5	45200
20,0	24,0	150,0	20,0	80,0	19,00	3,0	45201
20,0	24,0	150,0	20,0	80,0	19,00	4,0	45202
20,0	24,0	150,0	20,0	80,0	19,00	5,0	45203

- Engineered for High Speed Milling using Trochoidal and Peel Milling techniques
- Eccentric relief provides superior strength and smoother surface finish
- Necked design with blended diameter transitions provide clearance to reach
- Enhanced corner geometry with tight tolerance corner radii
- Recommended for materials ≤ 45 HRc (≤ 420 Bhn)

51MB
METRIC SERIES



- Engineered for High Speed Milling using Trochoidal and Peel Milling techniques
- Faceted relief provides superior strength and smoother surface finish
- Ball end design ideal for finishing operations in complex workpieces
- Recommended for materials ≤ 45 HRc (≤ 420 Bhn)

mm				EDP NO.
CUTTING DIAMETER DC	LENGTH OF CUT APMX	OVERALL LENGTH LF	SHANK DIAMETER DCON	Ti-NAMITE®-X (TX)
6,0	19,0	63,0	6,0	45204
8,0	20,0	63,0	8,0	45206
10,0	22,0	75,0	10,0	45208
12,0	26,0	83,0	12,0	45210
16,0	32,0	92,0	16,0	45212
20,0	38,0	104,0	20,0	45214

RE=1/2 Cutting Diameter (DC)v

TOLERANCES (mm)

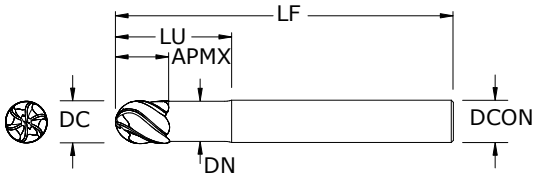
6,0–10,0 DIAMETER
DC = +0,000/–0,040
DCON = h_6
RE = +0,000/–0,025

12,0–20,0 DIAMETER
DC = +0,000/–0,050
DCON = h_6
RE = +0,000/–0,025

STEELS
STAINLESS STEELS
CAST IRON
HIGH TEMP ALLOYS

For patent information visit www.ksptpatents.com

51MLB
METRIC SERIES



- Engineered for High Speed Milling using Trochoidal and Peel Milling techniques
- Faceted relief provides superior strength and smoother surface finish
- Ball end design ideal for finishing operations in complex workpieces
- Recommended for materials ≤ 45 HRc (≤ 420 Bhn)

mm						EDP NO.
CUTTING DIAMETER DC	LENGTH OF CUT APMX	OVERALL LENGTH LF	SHANK DIAMETER DCON	REACH LU	NECK DIAMETER DN	Ti-NAMITE®-X (TX)
6,0	8,0	75,0	6,0	32,0	5,68	45205
8,0	10,0	75,0	8,0	32,0	7,58	45207
10,0	12,0	100,0	10,0	40,0	9,49	45209
12,0	15,0	100,0	12,0	48,0	11,37	45211
16,0	20,0	115,0	16,0	65,0	15,18	45213
20,0	24,0	150,0	20,0	80,0	18,99	45215

RE=1/2 Cutting Diameter (DC)

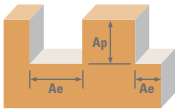
TOLERANCES (mm)

6,0–10,0 DIAMETER
DC = +0,000/–0,040
DCON = h_6
RE = +0,000/–0,025

12,0–20,0 DIAMETER
DC = +0,000/–0,050
DCON = h_6
RE = +0,000/–0,025

STEELS
STAINLESS STEELS
CAST IRON
HIGH TEMP ALLOYS

For patent information visit www.ksptpatents.com



	Series 51M, 51MCR, 51ML, 51MLC, 51MB, 51MLB Metric	Hardness		Ae x DC	Ap x DC	Vc (m/min)		DC • mm 6	8	10	12	16	20
P	CARBON STEELS 1018, 1040, 1080, 1090, 10L50, 1140, 1212, 12L15, 1525, 1536	≤ 275 Bhn or ≤ 28 HRc	Profile	≤ 0.1	≤ 1	219	RPM	11633	8725	6980	5816	4362	3490
						(176-263)	Fz	0.048	0.075	0.093	0.120	0.141	0.163
							Feed (mm/min)	3350	3909	3909	4188	3685	3406
			HSM	≤ 0.05	≤ 2	279	RPM	14784	11088	8870	7392	5544	4435
						(223-335)	Fz	0.067	0.113	0.141	0.168	0.197	0.227
							Feed (mm/min)	5960	7523	7522	7450	6557	6032
	ALLOY STEELS 4140, 4150, 4320, 5120, 5150, 8630, 86L20, 50100	≤ 375 Bhn or ≤ 40 HRc	Profile	≤ 0.1	≤ 1	149	RPM	7917	5938	4750	3958	2969	2375
						(119-179)	Fz	0.036	0.062	0.077	0.091	0.108	0.123
							Feed (mm/min)	1710	2204	2204	2166	1915	1748
			HSM	≤ 0.05	≤ 2	189	RPM	10017	7513	6010	5009	3756	3005
						(151-227)	Fz	0.050	0.083	0.104	0.125	0.146	0.165
							Feed (mm/min)	3029	3751	3750	3750	3289	2981
	TOOL STEELS A2, D2, H13, L2, M2, P20, S7, T15, W2	≤ 375 Bhn or ≤ 40 HRc	Profile	≤ 0.1	≤ 1	73	RPM	3878	2908	2327	1939	1454	1163
						(59-88)	Fz	0.029	0.049	0.061	0.072	0.087	0.099
							Feed (mm/min)	670	856	856	838	759	689
			HSM	≤ 0.05	≤ 2	93	RPM	4928	3696	2957	2464	1848	1478
						(74-112)	Fz	0.041	0.068	0.085	0.101	0.118	0.133
							Feed (mm/min)	1206	1514	1514	1490	1306	1183
M	STAINLESS STEELS (FREE MACHINING) 303, 416, 420F, 430F, 440F	≤ 275 Bhn or ≤ 28 HRc	Profile	≤ 0.1	≤ 1	155	RPM	8240	6180	4944	4120	3090	2472
						(140-171)	Fz	0.036	0.060	0.075	0.091	0.105	0.120
							Feed (mm/min)	1780	2215	2215	2254	1946	1780
			HSM	≤ 0.05	≤ 2	198	RPM	10502	7877	6301	5251	3938	3151
						(178-218)	Fz	0.050	0.081	0.101	0.122	0.143	0.163
							Feed (mm/min)	3176	3832	3831	3856	3387	3075
	STAINLESS STEELS (DIFFICULT) 304, 304L, 316, 316L	≤ 275 Bhn or ≤ 28 HRc	Profile	≤ 0.1	≤ 1	107	RPM	5655	4241	3393	2827	2121	1696
						(96-117)	Fz	0.029	0.049	0.061	0.072	0.084	0.096
							Feed (mm/min)	977	1249	1249	1221	1075	977
			HSM	≤ 0.05	≤ 2	137	RPM	7271	5453	4362	3635	2726	2181
						(123-151)	Fz	0.041	0.068	0.085	0.101	0.118	0.133
							Feed (mm/min)	1780	2234	2234	2198	1926	1745
	STAINLESS STEELS (PH) 13-8 PH, 15-5 PH, 17-4 PH, Custom 450	≤ 325 Bhn or ≤ 35 HRc	Profile	≤ 0.1	≤ 1	99	RPM	5251	3938	3151	2626	1969	1575
						(89-109)	Fz	0.029	0.049	0.061	0.072	0.084	0.096
							Feed (mm/min)	907	1160	1159	1134	998	907
			HSM	≤ 0.05	≤ 2	125	RPM	6624	4968	3975	3312	2484	1987
						(112-137)	Fz	0.041	0.068	0.085	0.101	0.118	0.133
							Feed (mm/min)	1621	2035	2035	2003	1755	1590

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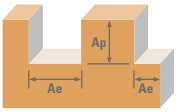
METRIC

T-Carb®



	Series 51M, 51MCR, 51ML, 51MLC, 51MB, 51MLB Metric	Hardness		Ae x DC	Ap x DC	Vc (m/min)		DC • mm 6	8	10	12	16	20
K	CAST IRONS (LOW & MEDIUM ALLOY) Gray, Malleable, Ductile	≤ 220 Bhn or ≤ 19 HRc	Profile	≤ 0.25	≤ 1.5	575	RPM	9290	6968	5574	4645	3484	2787
						(460-690)	Fz	0.043	0.075	0.093	0.108	0.128	0.147
							Feed (mm/min)	2408	3122	3122	3010	2675	2453
			HSM	≤ 0.05	≤ 2	730	RPM	11795	8846	7077	5897	4423	3538
						(584-876)	Fz	0.060	0.100	0.125	0.154	0.179	0.203
							Feed (mm/min)	4246	5322	5322	5434	4755	4303
	CAST IRONS (HIGH ALLOY) Gray, Malleable, Ductile	≤ 260 Bhn or ≤ 26 HRc	Profile	≤ 0.25	≤ 1.5	430	RPM	6947	5211	4168	3474	2605	2084
						(344-516)	Fz	0.043	0.075	0.093	0.108	0.128	0.147
							Feed (mm/min)	1801	2335	2334	2251	2001	1834
			HSM	≤ 0.05	≤ 2	545	RPM	8806	6604	5283	4403	3302	2642
						(436-654)	Fz	0.060	0.100	0.125	0.154	0.179	0.203
							Feed (mm/min)	3170	3974	3973	4057	3550	3212
S	HIGH TEMP ALLOYS (NICKEL, COBALT, IRON BASE) Inconel 601, 617, 625, Incoloy, Monel 400	≤ 300 Bhn or ≤ 32 HRc	Profile	≤ 0.1	≤ 1	32	RPM	1696	1272	1018	848	636	509
						(26-38)	Fz	0.034	0.058	0.072	0.086	0.100	0.115
							Feed (mm/min)	342	440	440	440	381	350
			HSM	≤ 0.05	≤ 2	40	RPM	2100	1575	1260	1050	788	630
						(32-48)	Fz	0.038	0.077	0.096	0.115	0.136	0.155
							Feed (mm/min)	484	726	726	726	641	585
	HIGH TEMP ALLOYS (NICKEL, COBALT, IRON BASE) Inconel 718, X-750, Incoloy, Waspaloy, Hastelloy, Rene	≤ 400 Bhn or ≤ 43 HRc	Profile	≤ 0.1	≤ 1	24	RPM	1293	969	776	646	485	388
						(20-29)	Fz	0.024	0.038	0.048	0.060	0.069	0.077
							Feed (mm/min)	186	223	223	233	201	180
			HSM	≤ 0.05	≤ 2	30	RPM	1616	1212	969	808	606	485
						(24-37)	Fz	0.031	0.053	0.067	0.082	0.095	0.109
							Feed (mm/min)	302	388	388	395	344	318
	TITANIUM ALLOYS Pure Titanium, Ti6Al4V, Ti6Al2Sn4Zr2Mo, Ti4Al4Mo2Sn0.5Si	≤ 350 Bhn or ≤ 38 HRc	Profile	≤ 0.1	≤ 1	85	RPM	4524	3393	2714	2262	1696	1357
						(68-102)	Fz	0.024	0.038	0.048	0.060	0.069	0.077
							Feed (mm/min)	651	782	782	814	704	630
			HSM	≤ 0.05	≤ 2	108	RPM	5736	4302	3441	2868	2151	1721
						(87-130)	Fz	0.031	0.053	0.067	0.082	0.095	0.109
							Feed (mm/min)	1074	1377	1377	1404	1222	1129
	TITANIUM ALLOYS (DIFFICULT) Ti10V2Fe3Al, Ti5Al5V5Mo3Cr, Ti7Al4Mo, Ti3Al8V6Cr4Zr4Mo, Ti6Al6V6Sn, Ti15V3 Cr3Sn3Al	≤ 420 Bhn or ≤ 45 HRc	Profile	≤ 0.1	≤ 1	47	RPM	2504	1878	1503	1252	939	751
						(38-57)	Fz	0.024	0.038	0.048	0.060	0.069	0.077
							Feed (mm/min)	361	433	433	451	389	349
			HSM	≤ 0.05	≤ 2	61	RPM	3231	2424	1939	1616	1212	969
						(49-73)	Fz	0.031	0.053	0.067	0.082	0.095	0.109
							Feed (mm/min)	605	776	776	791	689	636

Bhn (Brinell) HRc (Rockwell C) HSM (High Speed Machining)
rpm = (Vc x 1000) / (DC x 3.14)
mm/min = Fz x 6 x rpm
reduce speed and feed for materials harder than listed
reduce feed and Ae when finish milling (.02 x DC maximum)
feed rates listed have chip thinning adjustments included where applicable
refer to the SGS Tool Wizard® for complete technical information (www.kyocera-sgstool.com)

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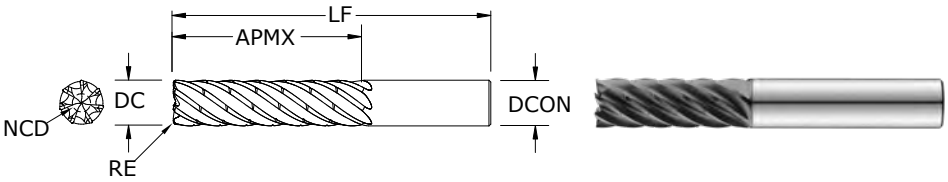
37° 2.5xD 3xD 4xD POS 7



77M • 77MCR

METRIC SERIES

TOLERANCES (mm)

6 DIAMETER
DC = +0,000/–0,030
DCON = h_6
RE = +0,000 / -0,050

>6–10 DIAMETER
DC = +0,000/–0,040
DCON = h_6
RE = +0,000 / -0,050

>10–25 DIAMETER
DC = +0,000/–0,050
DCON = h_6
RE = +0,000 / -0,050

STEELS
STAINLESS STEELS
CAST IRON
HIGH TEMP ALLOYS

For patent information visit www.ksptpatents.com

mm						EDP NO.			
CUTTING DIAMETER DC	LENGTH OF CUT APMX	OVERALL LENGTH LF	SHANK DIAMETER DCON	CORNER RADIUS RE	NON-CUTTING CENTER DIAMETER NCD	Ti-NAMITE®-A (TA) EDP NO.	Ti-NAMITE®-A (TA) EDP NO. CHIP BREAKER	Ti-NAMITE®-M (TM) EDP NO.	Ti-NAMITE®-M (TM) EDP NO. CHIP BREAKER
6,0	15,0	63,0	6,0	–	2,03	74300	74302	74301	74303
6,0	15,0	63,0	6,0	0,3	2,03	74304	74306	74305	74307
6,0	15,0	63,0	6,0	0,5	2,03	74308	74310	74309	74311
6,0	18,0	63,0	6,0	–	2,03	74316	74318	74317	74319
6,0	18,0	63,0	6,0	0,3	2,03	74320	74322	74321	74323
6,0	18,0	63,0	6,0	0,5	2,03	74324	74326	74325	74327
6,0	24,0	75,0	6,0	–	2,03	74332	74334	74333	74335
6,0	24,0	75,0	6,0	0,3	2,03	74336	74338	74337	74339
6,0	24,0	75,0	6,0	0,5	2,03	74340	74342	74341	74343
8,0	20,0	75,0	8,0	–	2,71	74348	74350	74349	74351
8,0	20,0	75,0	8,0	0,5	2,71	74352	74354	74353	74355
8,0	20,0	75,0	8,0	1,0	2,71	74356	74358	74357	74359
8,0	20,0	75,0	8,0	2,0	2,71	74360	74362	74361	74363
8,0	24,0	75,0	8,0	–	2,71	74364	74366	74365	74367
8,0	24,0	75,0	8,0	0,5	2,71	74368	74370	74369	74371
8,0	24,0	75,0	8,0	1,0	2,71	74372	74374	74373	74375
8,0	24,0	75,0	8,0	2,0	2,71	74376	74378	74377	74379
8,0	32,0	85,0	8,0	–	2,71	74380	74382	74381	74383
8,0	32,0	85,0	8,0	0,5	2,71	74384	74386	74385	74387
8,0	32,0	85,0	8,0	1,0	2,71	74388	74390	74389	74391
8,0	32,0	85,0	8,0	2,0	2,71	74392	74394	74393	74395
10,0	25,0	75,0	10,0	–	3,38	74396	74398	74397	74399
10,0	25,0	75,0	10,0	0,5	3,38	74400	74402	74401	74403
10,0	25,0	75,0	10,0	1,0	3,38	74404	74406	74405	74407
10,0	30,0	80,0	10,0	–	3,38	74408	74410	74409	74411
10,0	30,0	80,0	10,0	0,5	3,38	74412	74414	74413	74415
10,0	30,0	80,0	10,0	1,0	3,38	74416	74418	74417	74419
10,0	40,0	100,0	10,0	–	3,38	74420	74422	74421	74423
10,0	40,0	100,0	10,0	0,5	3,38	74424	74426	74425	74427
10,0	40,0	100,0	10,0	1,0	3,38	74428	74430	74429	74431
12,0	30,0	83,0	12,0	–	4,06	74432	74434	74433	74435
12,0	30,0	83,0	12,0	0,5	4,06	74436	74438	74437	74439
12,0	30,0	83,0	12,0	1,0	4,06	74440	74442	74441	74443
12,0	30,0	83,0	12,0	2,0	4,06	74600	74601	74602	74603
12,0	30,0	83,0	12,0	3,0	4,06	74604	74605	74606	74607
12,0	36,0	83,0	12,0	–	4,06	74444	74446	74445	74447
12,0	36,0	83,0	12,0	0,5	4,06	74448	74450	74449	74451
12,0	36,0	83,0	12,0	1,0	4,06	74452	74454	74453	74455
12,0	36,0	83,0	12,0	2,0	4,06	74608	74609	74610	74611
12,0	36,0	83,0	12,0	3,0	4,06	74612	74613	74614	74615
12,0	48,0	100,0	12,0	–	4,06	74456	74458	74457	74459
12,0	48,0	100,0	12,0	0,5	4,06	74460	74462	74461	74463
12,0	48,0	100,0	12,0	1,0	4,06	74464	74466	74465	74467
12,0	48,0	100,0	12,0	2,0	4,06	74616	74617	74618	74619
12,0	48,0	100,0	12,0	3,0	4,06	74620	74621	74622	74623
16,0	40,0	92,0	16,0	–	5,41	74468	74470	74469	74471

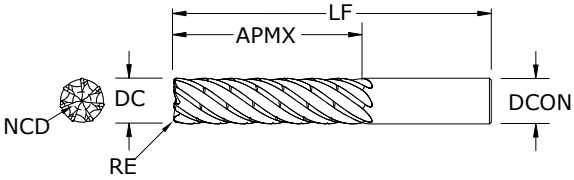
continued on next page

- Specializes in deep axial trochoidal and high-speed milling applications
- Optimized core improves rigidity, chip flow and reduces deflection
- Chip Breaker design breaks up chips from the long flute length allowing for better chip flow and evacuation in deep pocketing operations
- Recommended for materials ≤ 45 HRc (≤ 420 Bhn)

H-Carb

77M • 77MCR

METRIC SERIES



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mm						EDP NO.			
CUTTING DIAMETER DC	LENGTH OF CUT APMX	OVERALL LENGTH LF	SHANK DIAMETER DCON	CORNER RADIUS RE	NON-CUTTING CENTER DIAMETER NCD	Ti-NAMITE®-A (TA) EDP NO.	Ti-NAMITE®-A (TA) EDP NO. CHIP BREAKER	Ti-NAMITE®-M (TM) EDP NO.	Ti-NAMITE®-M (TM) EDP NO. CHIP BREAKER
16,0	40,0	92,0	16,0	0,5	5,41	74472	74474	74473	74475
16,0	40,0	92,0	16,0	1,0	5,41	74476	74478	74477	74479
16,0	40,0	92,0	16,0	2,0	5,41	74624	74625	74626	74627
16,0	40,0	92,0	16,0	3,0	5,41	74628	74629	74630	74631
16,0	48,0	100,0	16,0	–	5,41	74480	74482	74481	74483
16,0	48,0	100,0	16,0	0,5	5,41	74484	74486	74485	74487
16,0	48,0	100,0	16,0	1,0	5,41	74488	74490	74489	74491
16,0	48,0	100,0	16,0	2,0	5,41	74632	74633	74634	74635
16,0	48,0	100,0	16,0	3,0	5,41	74636	74637	74638	74639
16,0	64,0	115,0	16,0	–	5,41	74492	74494	74493	74495
16,0	64,0	115,0	16,0	0,5	5,41	74496	74498	74497	74499
16,0	64,0	115,0	16,0	1,0	5,41	74500	74502	74501	74503
16,0	64,0	115,0	16,0	2,0	5,41	74640	74641	74642	74643
16,0	64,0	115,0	16,0	3,0	5,41	74644	74645	74646	74647
20,0	50,0	100,0	20,0	–	6,76	74504	74506	74505	74507
20,0	50,0	100,0	20,0	0,5	6,76	74508	74510	74509	74511
20,0	50,0	100,0	20,0	1,0	6,76	74512	74514	74513	74515
20,0	50,0	100,0	20,0	2,0	6,76	74516	74518	74517	74519
20,0	50,0	100,0	20,0	3,0	6,76	74648	74649	74650	74651
20,0	50,0	100,0	20,0	4,0	6,76	74652	74653	74654	74655
20,0	60,0	115,0	20,0	–	6,76	74520	74522	74521	74523
20,0	60,0	115,0	20,0	0,5	6,76	74524	74526	74525	74527
20,0	60,0	115,0	20,0	1,0	6,76	74528	74530	74529	74531
20,0	60,0	115,0	20,0	2,0	6,76	74532	74534	74533	74535
20,0	60,0	115,0	20,0	3,0	6,76	74656	74657	74658	74659
20,0	60,0	115,0	20,0	4,0	6,76	74660	74661	74662	74663
20,0	80,0	140,0	20,0	–	6,76	74536	74538	74537	74539
20,0	80,0	140,0	20,0	0,5	6,76	74540	74542	74541	74543
20,0	80,0	140,0	20,0	1,0	6,76	74544	74546	74545	74547
20,0	80,0	140,0	20,0	2,0	6,76	74548	74550	74549	74551
20,0	80,0	140,0	20,0	3,0	6,76	74664	74665	74666	74667
20,0	80,0	140,0	20,0	4,0	6,76	74668	74669	74670	74671
25,0	63,0	135,0	25,0	–	8,45	74552	74554	74553	74555
25,0	63,0	135,0	25,0	1,0	8,45	74556	74558	74557	74559
25,0	63,0	135,0	25,0	2,0	8,45	74560	74562	74561	74563
25,0	63,0	135,0	25,0	3,0	8,45	74564	74566	74565	74567
25,0	75,0	150,0	25,0	–	8,45	74568	74570	74569	74571
25,0	75,0	150,0	25,0	1,0	8,45	74572	74574	74573	74575
25,0	75,0	150,0	25,0	2,0	8,45	74576	74578	74577	74579
25,0	75,0	150,0	25,0	3,0	8,45	74580	74582	74581	74583
25,0	100,0	170,0	25,0	–	8,45	74584	74586	74585	74587
25,0	100,0	170,0	25,0	1,0	8,45	74588	74590	74589	74591
25,0	100,0	170,0	25,0	2,0	8,45	74592	74594	74593	74595
25,0	100,0	170,0	25,0	3,0	8,45	74596	74598	74597	74599

TOLERANCES (mm)

6 DIAMETER
DC = +0,000/–0,030
DCON = h_6
RE = +0,000 / -0,050

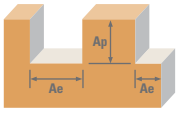
>6–10 DIAMETER
DC = +0,000/–0,040
DCON = h_6
RE = +0,000 / -0,050

>10–25 DIAMETER
DC = +0,000/–0,050
DCON = h_6
RE = +0,000 / -0,050

- STEELS
- STAINLESS STEELS
- CAST IRON
- HIGH TEMP ALLOYS

For patent information visit www.ksptpatents.com

H-Carb



	Series 77M, 77MCR Metric	Hardness		Ae x DC	Ap x DC	Vc (m/min)		DC • mm 6	8	10	12	16	20	25
P	CARBON STEELS 1018, 1040, 1080, 1090, 10L50, 1140, 1212, 12L15, 1525, 1536	≤ 275 Bhn or ≤ 28 HRc					RPM	12208	9156	7325	6104	4578	3662	2930
			HSM	2.5xD		284 (227-341)	Fz	0.0413	0.0411	0.0640	0.0711	0.0889	0.1013	0.1050
				≤ 0.2	≤ APMX		Feed (mm/min)	3529	2634	3282	3038	2849	2597	2154
			HSM	3xD		257 (206-308)	Fz	0.0347	0.0461	0.0717	0.0797	0.0996	0.1135	0.1176
				≤ 0.15	≤ APMX		Feed (mm/min)	2965	2955	3676	3405	3192	2910	2412
			HSM	4xD		230 (184-276)	Fz	0.0362	0.0480	0.0747	0.0830	0.1037	0.1182	0.0919
				≤ 0.1	≤ APMX		Feed (mm/min)	3094	3076	3830	3546	3323	3030	1885
	ALLOY STEELS 4140, 4150, 4320, 5120, 5150, 8630, 86L20, 50100	≤ 375 Bhn or ≤ 40 HRc					RPM	8068	6051	4841	4034	3025	2420	1936
			HSM	2.5xD		132 (106-159)	Fz	0.0213	0.0285	0.0512	0.0610	0.0711	0.0827	0.0875
				≤ 0.2	≤ APMX		Feed (mm/min)	1203	1207	1735	1723	1506	1401	1186
			HSM	3xD		138 (111-166)	Fz	0.0239	0.0319	0.0574	0.0683	0.0797	0.0926	0.0980
				≤ 0.15	≤ APMX		Feed (mm/min)	1350	1351	1945	1929	1688	1569	1328
			HSM	4xD		152 (122-182)	Fz	0.0249	0.0332	0.0597	0.0711	0.0830	0.0964	0.1021
				≤ 0.1	≤ APMX		Feed (mm/min)	1406	1406	2023	2008	1758	1633	1384
	TOOL STEELS A2, D2, H13, L2, M2, P20, S7, T15, W2	≤ 375 Bhn or ≤ 40 HRc					RPM	4087	3065	2452	2044	1533	1226	981
			HSM	2.5xD		83 (66-100)	Fz	0.0140	0.0183	0.0294	0.0356	0.0457	0.0560	0.0625
				≤ 0.2	≤ APMX		Feed (mm/min)	401	393	505	509	490	481	429
			HSM	3xD		86 (69-103)	Fz	0.0157	0.0205	0.0330	0.0398	0.0512	0.0627	0.0700
				≤ 0.15	≤ APMX		Feed (mm/min)	449	440	566	569	549	538	481
			HSM	4xD		77 (62-92)	Fz	0.0163	0.0213	0.0344	0.0415	0.0533	0.0653	0.0729
				≤ 0.1	≤ APMX		Feed (mm/min)	466	457	590	594	572	560	501
M	STAINLESS STEELS (FREE MACHINING) 303, 416, 420F, 430F, 440F	≤ 275 Bhn or ≤ 28 HRc					RPM	9660	7245	5796	4830	3623	2898	2318
			HSM	2.5xD		197 (158-236)	Fz	0.0216	0.0285	0.0448	0.0533	0.0635	0.0747	0.0800
				≤ 0.2	≤ APMX		Feed (mm/min)	1461	1445	1818	1803	1610	1515	1298
			HSM	3xD		204 (163-245)	Fz	0.0242	0.0319	0.0502	0.0598	0.0711	0.0837	0.0896
				≤ 0.15	≤ APMX		Feed (mm/min)	1636	1618	2037	2022	1803	1698	1454
			HSM	4xD		182 (146-218)	Fz	0.0252	0.0332	0.0523	0.0622	0.0741	0.0871	0.0933
				≤ 0.1	≤ APMX		Feed (mm/min)	1704	1684	2122	2104	1879	1767	1514
	STAINLESS STEELS (DIFFICULT) 304, 304L, 316, 316L	≤ 275 Bhn or ≤ 28 HRc					RPM	6369	4777	3822	3185	2389	1911	1529
			HSM	2.5xD		130 (104-156)	Fz	0.0168	0.0221	0.0371	0.0432	0.0584	0.0693	0.0750
				≤ 0.2	≤ APMX		Feed (mm/min)	749	739	993	963	976	927	803
			HSM	3xD		134 (107-161)	Fz	0.0188	0.0248	0.0416	0.0484	0.0655	0.0777	0.0840
				≤ 0.15	≤ APMX		Feed (mm/min)	838	829	1113	1079	1095	1039	899
			HSM	4xD		120 (96-144)	Fz	0.0196	0.0258	0.0433	0.0504	0.0682	0.0809	0.0875
				≤ 0.1	≤ APMX		Feed (mm/min)	874	863	1158	1124	1140	1082	936
	STAINLESS STEELS (PH) 13-8 PH, 15-5PH, 17-4 PH, CUSTOM 450	≤ 325 Bhn or ≤ 35 HRc					RPM	6104	4578	3662	3052	2289	1831	1465
			HSM	2.5xD		124 (99-149)	Fz	0.0168	0.0221	0.0371	0.0432	0.0584	0.0693	0.0750
				≤ 0.2	≤ APMX		Feed (mm/min)	718	708	952	923	936	888	769
			HSM	3xD		129 (103-155)	Fz	0.0188	0.0248	0.0416	0.0484	0.0655	0.0777	0.0840
				≤ 0.15	≤ APMX		Feed (mm/min)	803	795	1066	1034	1050	996	861
			HSM	4xD		115 (92-138)	Fz	0.0196	0.0258	0.0433	0.0504	0.0682	0.0809	0.0875
				≤ 0.1	≤ APMX		Feed (mm/min)	837	827	1110	1077	1093	1037	897

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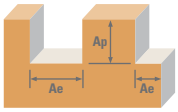
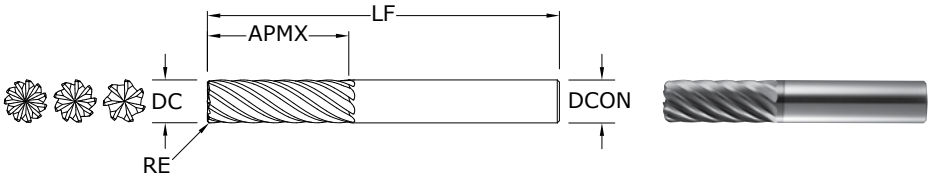
H-Carb



	Series 77M, 77MCR Metric	Hardness		Ae x DC	Ap x DC	Vc (m/min)		DC • mm 6	8	10	12	16	20	25
K	CAST IRONS (LOW & MEDIUM ALLOY) Gray, Malleable, Ductile	≤ 220 Bhn or ≤ 19 HRc					RPM	10722	8041	6433	5361	4021	3217	2573
			HSM	2.5xD		218 (174-262)	Fz	0.0239	0.0315	0.0474	0.0559	0.0762	0.0880	0.0925
				≤ 0.2	≤ APMX		Feed (mm/min)	1794	1773	2135	2098	2145	1981	1666
			HSM	3xD		225 (180-270)	Fz	0.0268	0.0353	0.0531	0.0626	0.0854	0.0986	0.1036
				≤ 0.15	≤ APMX		Feed (mm/min)	2011	1987	2391	2349	2404	2220	1866
			HSM	4xD		202 (162-242)	Fz	0.0279	0.0368	0.0553	0.0652	0.0889	0.1027	0.1079
				≤ 0.1	≤ APMX		Feed (mm/min)	2094	2071	2490	2447	2502	2312	1944
	CAST IRONS (HIGH ALLOY) Gray, Malleable, Ductile	≤ 260 Bhn or ≤ 26 HRc					RPM	6369	4777	3822	3185	2389	1911	1529
			HSM	2.5xD		130 (104-156)	Fz	0.0168	0.0221	0.0371	0.0432	0.0584	0.0693	0.0750
				≤ 0.2	≤ APMX		Feed (mm/min)	749	739	993	963	976	927	803
			HSM	3xD		134 (107-161)	Fz	0.0188	0.0248	0.0416	0.0484	0.0655	0.0777	0.0840
				≤ 0.15	≤ APMX		Feed (mm/min)	838	829	1113	1079	1095	1039	899
			HSM	4xD		120 (96-144)	Fz	0.0196	0.0258	0.0433	0.0504	0.0682	0.0809	0.0875
				≤ 0.1	≤ APMX		Feed (mm/min)	874	863	1158	1124	1140	1082	936
S	HIGH TEMP ALLOYS (NICKEL , COBALT, IRON BASE) Inconel 601, 617, 625, Incoloy, Monel 400	≤ 300 Bhn or ≤ 32 HRc					RPM	2017	1513	1210	1008	756	605	484
			HSM	2.5xD		41 (33-49)	Fz	0.0140	0.0183	0.0294	0.0356	0.0457	0.0560	0.0625
				≤ 0.2	≤ APMX		Feed (mm/min)	198	194	249	251	242	237	212
			HSM	3xD		43 (34-52)	Fz	0.0157	0.0205	0.0330	0.0398	0.0512	0.0627	0.0700
				≤ 0.15	≤ APMX		Feed (mm/min)	222	217	280	281	271	266	237
			HSM	4xD		38 (30-46)	Fz	0.0163	0.0213	0.0344	0.0415	0.0533	0.0653	0.0729
				≤ 0.1	≤ APMX		Feed (mm/min)	230	226	291	293	282	277	247
	HIGH TEMP ALLOYS (NICKEL, COBALT, IRON BASE) Inconel 718, X-750, Incoloy, Waspaloy, Hastelloy, Rene	≤ 400 Bhn or ≤ 43 HRc					RPM	1274	955	764	637	478	382	306
			HSM	2.5xD		26 (21-31)	Fz	0.0114	0.0152	0.0243	0.0305	0.0381	0.0480	0.0550
				≤ 0.2	≤ APMX		Feed (mm/min)	102	102	130	136	127	128	118
			HSM	3xD		27 (22-32)	Fz	0.0128	0.0171	0.0273	0.0342	0.0427	0.0538	0.0616
				≤ 0.15	≤ APMX		Feed (mm/min)	114	114	146	152	143	144	132
			HSM	4xD		24 (19-29)	Fz	0.0133	0.0178	0.0284	0.0356	0.0445	0.0560	0.0642
				≤ 0.1	≤ APMX		Feed (mm/min)	119	119	152	159	149	150	137
	TITANIUM ALLOYS Pure Ttanium, Ti6Al4V, Ti6Al2Sn4Zr2Mo, Ti4Al4Mo2Sn0.5Si	≤ 350 Bhn or ≤ 38 HRc					RPM	4352	3264	2611	2176	1632	1306	1045
			HSM	2.5xD		88 (70-106)	Fz	0.0191	0.0254	0.0397	0.0483	0.0635	0.0747	0.0800
				≤ 0.2	≤ APMX		Feed (mm/min)	582	580	726	736	725	683	585
			HSM	3xD		91 (73-109)	Fz	0.0213	0.0285	0.0445	0.0541	0.0711	0.0837	0.0896
				≤ 0.15	≤ APMX		Feed (mm/min)	649	651	813	824	812	765	655
			HSM	4xD		82 (66-98)	Fz	0.0222	0.0296	0.0463	0.0563	0.0741	0.0871	0.0933
				≤ 0.1	≤ APMX		Feed (mm/min)	676	676	846	858	847	796	682
	TITANIUM ALLOYS (DIFFICULT) Ti10V2Fe3Al, Ti5Al5V5Mo3Cr, Ti7Al4Mo, Ti3Al8V6Cr4Zr4Mo, Ti6Al6V6Sn, Ti15V3 Cr3Sn3Al	≤ 420 Bhn or ≤ 45 HRc					RPM	2548	1911	1529	1274	955	764	611
			HSM	2.5xD		52 (42-62)	Fz	0.0163	0.0254	0.0397	0.0483	0.0635	0.0747	0.0800
				≤ 0.2	≤ APMX		Feed (mm/min)	291	340	425	431	425	400	342
			HSM	3xD		54 (43-65)	Fz	0.0182	0.0285	0.0445	0.0541	0.0711	0.0837	0.0896
				≤ 0.15	≤ APMX		Feed (mm/min)	325	381	476	482	476	448	384
			HSM	4xD		48 (38-58)	Fz	0.0190	0.0296	0.0463	0.0563	0.0741	0.0871	0.0933
				≤ 0.1	≤ APMX		Feed (mm/min)	339	396	495	502	496	466	399

Bhn (Brinell) HRc (Rockwell C) HSM (High Speed Machining)
rpm = (Vc x 1000) / (DC x 3.14)
mm/min = Fz x 7 x rpm
reduce speed and feed for materials harder than listed
reduce feed and Ae when finish milling (.02 x DC maximum)
feed rates listed have chip thinning adjustments included where applicable
refer to the SGS Tool Wizard® for complete technical information (www.kyocera-sgstool.com)

MULTI Carb
HIGH PERFORMANCE FINISHING END MILLS



66M • 66MCR

METRIC SERIES

TOLERANCES (mm)

DC = +0,000/–0,050
DCON = h_6
RE = +0,000/–0,050

- STEELS
- STAINLESS STEELS
- CAST IRON
- HIGH TEMP ALLOYS

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mm							EDP NO.
CUTTING DIAMETER DC	LENGTH OF CUT APMX	OVERALL LENGTH LF	SHANK DIAMETER DCON	CORNER RADIUS RE	NON-CUTTING CENTER DIAMETER NCD	NO. OF FLUTES	Ti-NAMITE®-X (TX)
6,0	19,0	63,0	6,0	–	1,63	7	46620
6,0	19,0	63,0	8,0	0,5	1,63	7	46627
6,0	19,0	63,0	6,0	1,0	1,63	7	46628
8,0	20,0	63,0	8,0	–	1,78	7	46621
8,0	20,0	63,0	8,0	0,5	1,78	7	46629
8,0	20,0	63,0	8,0	1,0	1,78	7	46630
8,0	20,0	63,0	8,0	1,5	1,78	7	46631
10,0	22,0	75,0	10,0	–	2,03	7	46622
10,0	22,0	75,0	10,0	0,5	2,03	7	46632
10,0	22,0	75,0	10,0	1,0	2,03	7	46633
10,0	22,0	75,0	10,0	1,5	2,03	7	46634
10,0	22,0	75,0	10,0	2,0	2,03	7	46635
12,0	26,0	83,0	12,0	–	3,45	9	46623
12,0	26,0	83,0	12,0	1,0	3,45	9	46636
12,0	26,0	83,0	12,0	1,5	3,45	9	46637
12,0	26,0	83,0	12,0	2,0	3,45	9	46638
12,0	26,0	83,0	12,0	2,5	3,45	9	46639
12,0	26,0	83,0	12,0	3,0	3,45	9	46640
16,0	32,0	92,0	16,0	–	2,92	9	46624
16,0	32,0	92,0	16,0	1,0	2,92	9	46641
16,0	32,0	92,0	16,0	1,5	2,92	9	46642
16,0	32,0	92,0	16,0	2,0	2,92	9	46643
16,0	32,0	92,0	16,0	2,5	2,92	9	46644
16,0	32,0	92,0	16,0	3,0	2,92	9	46645
16,0	32,0v	92,0	16,0	4,0	2,92	9	46646
20,0	38,0	104,0	20,0	–	4,57	11	46625
20,0	38,0	104,0	20,0	1,0	4,57	11	46647
20,0	38,0	104,0	20,0	1,5	4,57	11	46648
20,0	38,0	104,0	20,0	2,0	4,57	11	46649
20,0	38,0	104,0	20,0	2,5	4,57	11	46650
20,0	38,0	104,0	20,0	3,0	4,57	11	46651
20,0	38,0	104,0	20,0	4,0	4,57	11	46652

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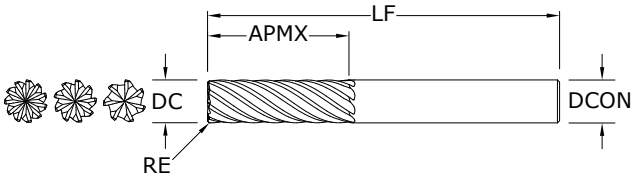
Neck Option Available

- Heavy core and rigid design allow for straight walls
- High flute count design results in smoother cutting performance and enhanced tool life in precise finishing applications
- Enhanced corner geometry with tight tolerance corner radii
- Recommended for materials ≤ 45 HRc (≤ 420 Bhn)

MULTI Carb
HIGH PERFORMANCE FINISHING END MILLS

66M • 66MCR

METRIC SERIES



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mm							EDP NO.
CUTTING DIAMETER DC	LENGTH OF CUT APMX	OVERALL LENGTH LF	SHANK DIAMETER DCON	CORNER RADIUS RE	NON-CUTTING CENTER DIAMETER NCD	NO. OF FLUTES	Ti-NAMITE®-X (TX)
20,0	38,0	104,0	20,0	5,0	4,57	11	46653
25,0	38,0	104,0	25,0	–	7,49	11	46626
25,0	38,0	104,0	25,0	1,0	7,49	11	46654
25,0	38,0	104,0	25,0	1,5	7,49	11	46655
25,0	38,0	104,0	25,0	2,0	7,49	11	46656
25,0	38,0	104,0	25,0	2,5	7,49	11	46657
25,0	38,0	104,0	25,0	3,0	7,49	11	46658
25,0	38,0	104,0	25,0	4,0	7,49	11	46659
25,0	38,0	104,0	25,0	5,0	7,49	11	46660

Neck Option Available

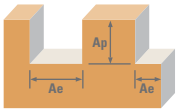
TOLERANCES (mm)

DC = +0,000/–0,050
DCON = h_6
RE = +0,000/–0,050

- STEELS
- STAINLESS STEELS
- CAST IRON
- HIGH TEMP ALLOYS

For patent information visit www.ksptpatents.com

Multi-Carb



	Series 66M, 66MCR Metric	Hardness		Ae x DC	Ap x DC	Vc (m/min)		DC • mm 6	8	10	12	16	20	25
P	CARBON STEELS 1018, 1040, 1080, 1090, 10L50, 1140, 1212, 12L15, 1525, 1536	≤ 275 Bhn or ≤ 28 HRc	Profile	≤ 0.05	≤ 1	194	RPM	10260	7695	6156	5130	3847	3078	2462
						(155-232)	Fz	0.029	0.047	0.059	0.072	0.095	0.101	0.105
							Feed (mm/min)	2068	2528	2528	3324	3280	3431	2844
			Finish	≤ 0.02	≤ 2	232	RPM	12312	9234	7387	6156	4617	3693	2955
						(186-279)	Fz	0.023	0.038	0.047	0.058	0.076	0.081	0.084
							Feed (mm/min)	1985	2427	2427	3191	3149	3294	2730
	ALLOY STEELS 4140, 4150, 4320, 5120, 5150, 8630, 86L20, 50100	≤ 375 Bhn or ≤ 40 HRc	Profile	≤ 0.05	≤ 1	110	RPM	5816	4362	3490	2908	2181	1745	1396
						(88-132)	Fz	0.022	0.036	0.045	0.055	0.074	0.080	0.080
							Feed (mm/min)	879	1108	1107	1445	1457	1536	1229
			Finish	≤ 0.02	≤ 2	132	RPM	6980	5235	4188	3490	2617	2094	1675
						(105-158)	Fz	0.017	0.029	0.036	0.044	0.059	0.064	0.064
							Feed (mm/min)	844	1063	1063	1387	1399	1474	1179
	TOOL STEELS A2, D2, H13, L2, M2, P20, S7, T15, W2	≤ 375 Bhn or ≤ 40 HRc	Profile	≤ 0.05	≤ 1	88	RPM	4686	3514	2811	2343	1757	1406	1125
						(71-106)	Fz	0.014	0.026	0.032	0.038	0.051	0.056	0.055
							Feed (mm/min)	472	630	630	810	810	866	680
			Finish	≤ 0.02	≤ 2	106	RPM	5623	4217	3374	2811	2108	1687	1349
						(85-127)	Fz	0.012	0.020	0.026	0.031	0.041	0.045	0.044
							Feed (mm/min)	453	605	605	777	777	831	653
M	STAINLESS STEELS (FREE MACHINING) 303, 416, 420F, 430F, 440F	≤ 275 Bhn or ≤ 28 HRc	Profile	≤ 0.05	≤ 1	171	RPM	9048	6786	5429	4524	3393	2714	2171
						(137-205)	Fz	0.022	0.036	0.045	0.055	0.074	0.080	0.080
							Feed (mm/min)	1368	1723	1723	2247	2267	2389	1911
			Finish	≤ 0.02	≤ 2	137	RPM	7238	5429	4343	3619	2714	2171	1737
						(109-164)	Fz	0.017	0.029	0.036	0.044	0.059	0.064	0.064
							Feed (mm/min)	875	1103	1103	1438	1451	1529	1223
	STAINLESS STEELS (DIFFICULT) 304, 304L, 316, 316L	≤ 275 Bhn or ≤ 28 HRc	Profile	≤ 0.05	≤ 1	117	RPM	6220	4665	3732	3110	2333	1866	1493
						(94-141)	Fz	0.017	0.030	0.037	0.043	0.059	0.064	0.065
							Feed (mm/min)	731	975	975	1209	1236	1314	1067
			Finish	≤ 0.02	≤ 2	141	RPM	7465	5598	4479	3732	2799	2239	1791
						(113-169)	Fz	0.013	0.024	0.030	0.035	0.047	0.051	0.052
							Feed (mm/min)	702	17	936	1161	1187	1261	1025
	STAINLESS STEELS (PH) 13-8 PH, 15-5 PH, 17-4 PH, Custom 450	≤ 325 Bhn or ≤ 35 HRc	Profile	≤ 0.05	≤ 1	108	RPM	5736	4302	3441	2868	2151	1721	1377
						(87-130)	Fz	0.017	0.030	0.037	0.043	0.059	0.064	0.065
							Feed (mm/min)	674	899	899	1115	1140	1211	984
			Finish	≤ 0.02	≤ 2	130	RPM	6883	5162	4130	3441	2581	2065	1652
						(104-156)	Fz	0.013	0.024	0.030	0.035	0.047	0.051	0.052
							Feed (mm/min)	647	863	863	1070	1094	1163	945

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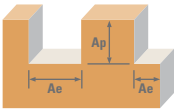
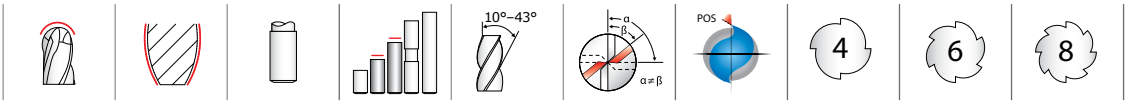
Multi-Carb

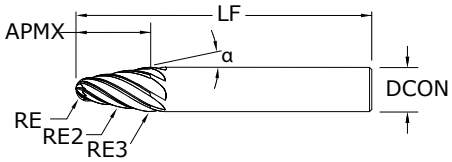


	Series 66M, 66MCR Metric	Hardness		Ae x DC	Ap x DC	Vc (m/min)		DC • mm 6	8	10	12	16	20	25
K	CAST IRONS (LOW & MEDIUM ALLOY) Gray, Malleable, Ductile	≤ 220 Bhn or ≤ 19 HRc	Profile	≤ 0.05	≤ 1	215	RPM	11391	8543	6834	5695	4271	3417	2734
						(172-258)	Fz	0.029	0.047	0.059	0.072	0.095	0.101	0.105
							Feed (mm/min)	2296	2807	2807	3690	3641	3809	3158
			Finish	≤ 0.02	≤ 2	258	RPM	13669	10252	8201	6834	5126	4101	3281
						(206-309)	Fz	0.023	0.038	0.047	0.058	0.076	0.081	0.084
							Feed (mm/min)	2204	2695	2694	3543	3496	3657	3031
	CAST IRONS (HIGH ALLOY) Gray, Malleable, Ductile	≤ 260 Bhn or ≤ 26 HRc	Profile	≤ 0.05	≤ 1	165	RPM	8725	6544	5235	4362	3272	2617	2094
						(132-198)	Fz	0.022	0.036	0.045	0.055	0.074	0.080	0.080
							Feed (mm/min)	1319	1661	1661	2167	2186	2303	1843
			Finish	≤ 0.02	≤ 2	198	RPM	10470	7852	6282	5235	3926	3141	2513
						(158-237)	Fz	0.017	0.029	0.036	0.044	0.059	0.064	0.064
							Feed (mm/min)	1266	1595	1595	2080	2099	2211	1769
S	HIGH TEMP ALLOYS (NICKEL, COBALT, IRON BASE) Inconel 601, 617, 625, Incoloy, Monel 400	≤ 300 Bhn or ≤ 32 HRc	Profile	≤ 0.05	≤ 1	32	RPM	1696	1272	1018	848	636	509	407
						(26-38)	Fz	0.017	0.030	0.037	0.043	0.059	0.064	0.065
							Feed (mm/min)	199	266	213	330	337	358	291
			Finish	≤ 0.02	≤ 2	38	RPM	2036	1527	1221	1018	763	611	489
						(31-46)	Fz	0.013	0.024	0.030	0.035	0.047	0.051	0.052
							Feed (mm/min)	192	255	255	317	324	344	279
	HIGH TEMP ALLOYS (NICKEL, COBALT, IRON BASE) Inconel 718, X-750, Incoloy, Waspaloy, Hastelloy, Rene	≤ 400 Bhn or ≤ 43 HRc	Profile	≤ 0.05	≤ 1	26	RPM	1373	1030	824	687	515	412	330
						(21-31)	Fz	0.012	0.019	0.024	0.026	0.036	0.040	0.040
							Feed (mm/min)	115	138	138	163	166	181	145
			Finish	≤ 0.02	≤ 2	31	RPM	1648	1236	989	824	618	494	396
						(25-37)	Fz	0.010	0.015	0.019	0.021	0.029	0.032	0.032
							Feed (mm/min)	111	133	133	157	159	174	139
	TITANIUM ALLOYS Pure Titanium, Ti6Al4V, Ti6Al2Sn4Zr2Mo, Ti4Al4Mo2Sn0.5Si	≤ 350 Bhn or ≤ 38 HRc	Profile	≤ 0.05	≤ 1	119	RPM	6301	4726	3781	3151	2363	1890	1512
						(95-143)	Fz	0.019	0.032	0.040	0.050	0.067	0.072	0.073
							Feed (mm/min)	847	1059	1059	1429	1415	1497	1206
			Finish	≤ 0.02	≤ 2	143	RPM	7561	5671	4537	3781	2836	2268	1815
						(114-171)	Fz	0.015	0.026	0.032	0.040	0.053	0.058	0.058
							Feed (mm/min)	813	1016	1016	1372	1359	1437	1158
	TITANIUM ALLOYS (DIFFICULT) Ti10V2Fe3Al, Ti5Al5V5Mo3Cr, Ti7Al4Mo, Ti3Al8V6Cr4Zr4Mo, Ti6Al6V6Sn, Ti15V3 Cr3Sn3Al	≤ 420 Bhn or ≤ 45 HRc	Profile	≤ 0.05	≤ 1	43	RPM	2262	1696	1357	1131	848	679	543
						(34-51)	Fz	0.019	0.032	0.040	0.050	0.067	0.072	0.073
							Feed (mm/min)	304	380	380	513	508	537	433
			Finish	≤ 0.02	≤ 2	51	RPM	2714	2036	1629	1357	1018	814	651
						(41-61)	Fz	0.015	0.026	0.032	0.040	0.053	0.058	0.058
							Feed (mm/min)	292	365	365	492	488	516	416

Bhn (Brinell) HRc (Rockwell C)
rpm = (Vc x 1000) / (DC x 3.14)
mm/min = Fz x number of flutes x rpm
reduce speed and feed for materials harder than listed
feed rates listed have chip thinning adjustments included where applicable
refer to the SGS Tool Wizard® for complete technical information (www.kyocera-sgstool.com)

Multi-Carb





67B
METRIC SERIES

TOLERANCES (mm)

DCON = h_6
RE = +0,010/–0,010

- STEELS
- STAINLESS STEELS
- CAST IRON
- HIGH TEMP ALLOYS

For patent information visit www.ksptpatents.com

mm								EDP NO.
SHANK DIAMETER DCON	LENGTH OF CUT APMX	OVERALL LENGTH LF	CENTERLINE ANGLE α	TIP RADIUS RE	TAPERED RADIUS RE2	BLENDED RADIUS RE3	NO. OF FLUTES	Ti-NAMITE®-H (TH)
6,0	9,5	58,0	17.5°	1,0	250,0	3,0	4	45700
6,0	8,0	58,0	17.5°	1,5	250,0	3,0	4	45701
8,0	10,5	80,0	20.0°	1,5	250,0	4,0	4	45702
8,0	9,5	80,0	20.0°	2,0	250,0	4,0	4	45703
10,0	12,5	89,0	20.0°	2,0	250,0	5,0	6	45704
10,0	11,5	89,0	20.0°	2,5	250,0	5,0	6	45705
12,0	13,5	100,0	20.0°	3,0	250,0	6,0	8	45706
12,0	14,4	100,0	20.0°	2,5	250,0	6,0	8	45707
12,0	20,0	100,0	14.0°	2,0	60,0	6,0	6	45708
16,0	31,0	109,0	12.5°	2,0	1000,0	5,0	6	45709
16,0	27,5	109,0	12.5°	3,0	1000,0	5,0	8	45710
16,0	24,0	109,0	12.5°	4,0	1000,0	5,0	8	45711
16,0	21,0	109,0	15.0°	4,0	1000,0	5,0	8	45712
16,0	18,5	109,0	20.0°	4,0	1500,0	8,0	8	45713
16,0	28,5	109,0	10.0°	4,0	1000,0	5,0	8	45714
16,0	19,0	109,0	20.0°	3,0	750,0	5,0	8	45715
16,0	15,0	109,0	30.0°	2,0	750,0	3,0	6	45716
16,0	18,5	109,0	20.0°	3,0	60,0	5,0	8	45717

- Designed to significantly improve traditional ball end applications
- Highly efficient at finishing and semi-finishing profiling
- Main application areas include profiling and pocket milling
- Especially suited to machining deep pockets and hard-to-reach areas without using long-reach tools
- Their versatility also allows for machining profiles and blends with one tool
- Recommended for materials ≤ 45 HRc (≤ 420 Bhn)

METRIC

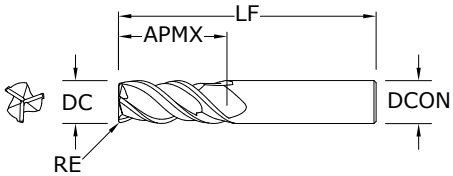
Multi-Carb

			DCON	6		8		10		12		16	
			Ae max	0,20	0,45	0,25	0,55	0,30	0,60	0,35	0,65	0,40	0,70
			Diameter	3,0	6,0	4,0	8,0	5,0	10,0	6,0	12,0	8,0	16,0
Metric	Hardness (HRc)	Vc (m/min)	Cut Zone	RE	RE2	RE	RE2	RE	RE2	RE	RE2	RE	RE2
P Alloy Steels	≤28	194	RPM	20583	10292	15438	7719	12350	6175	10292	5146	7719	3859
		(155-232)	Fz	0,013	0,030	0,017	0,040	0,021	0,050	0,025	0,060	0,033	0,080
			Feed (mm/min)	1029	1235	1029	1235	1544	1853	1544	1853	1544	1853
	≤40	110	RPM	11671	5836	8753	4377	7003	3501	5836	2918	4377	2188
		(88-132)	Fz	0,008	0,020	0,013	0,030	0,017	0,040	0,021	0,050	0,029	0,070
			Feed (mm/min)	389	467	438	525	700	840	729	875	766	919
P Tool Steels	≤35	93	RPM	9867	4934	7400	3700	5920	2960	4934	2467	3700	1850
		(69-118)	Fz	0,013	0,030	0,017	0,040	0,021	0,050	0,025	0,060	0,033	0,080
			Feed (mm/min)	493	592	493	592	740	888	740	888	740	888
	≤45	64	RPM	6790	3395	5093	2546	4074	2037	3395	1698	2546	1273
		(51-77)	Fz	0,008	0,020	0,013	0,030	0,017	0,040	0,021	0,050	0,025	0,060
			Feed (mm/min)	226	272	255	306	407	489	424	509	382	458
M Stainless Steels	≤28	117	RPM	12414	6207	9310	4655	7448	3724	6207	3103	4655	2328
		(94-141)	Fz	0,013	0,030	0,017	0,040	0,021	0,050	0,025	0,060	0,029	0,070
			Feed (mm/min)	621	745	621	745	931	1117	931	1117	815	978
	≤35	108	RPM	11459	5729	8594	4297	6875	3438	5729	2865	4297	2149
		(87-130)	Fz	0,008	0,020	0,013	0,030	0,017	0,040	0,021	0,050	0,025	0,060
			Feed (mm/min)	382	458	430	516	688	825	716	859	645	773
S High Temperature Alloys	≤32	32	RPM	3395	1698	2546	1273	2037	1019	1698	849	1273	637
		(26-38)	Fz	0,008	0,020	0,013	0,030	0,017	0,040	0,021	0,050	0,025	0,060
			Feed (mm/min)	113	136	127	153	204	244	212	255	191	229
	≤43	26	RPM	2759	1379	2069	1034	1655	828	1379	690	1034	517
		(21-31)	Fz	0,004	0,010	0,008	0,020	0,013	0,030	0,017	0,040	0,021	0,050
			Feed (mm/min)	46	55	69	83	124	149	138	166	129	155
S Titanium Alloys	≤35	109	RPM	11565	5782	8674	4337	6939	3469	5782	2891	4337	2168
		(85-133)	Fz	0,013	0,030	0,017	0,040	0,021	0,050	0,025	0,060	0,029	0,070
			Feed (mm/min)	578	694	578	694	867	1041	867	1041	759	911
	≤45	53	RPM	5623	2812	4217	2109	3374	1687	2812	1406	2109	1054
		(44-61)	Fz	0,008	0,020	0,013	0,030	0,017	0,040	0,021	0,050	0,025	0,060
			Feed (mm/min)	187	225	211	253	337	405	351	422	316	380

rpm= (Vc x 1000) / (DC x 3.14)
Feed= Fz x No. of teeth x rpm
Adjust speed and feed according to material hardness
Consider rpm according to cutting area of tool being utilized
Avoid using tip of the tool where possible due to reduced chip space

Be aware of max cut Ae, especially on the lower portion of the tool
Medical applications:
- Titanium can be cut dry while keeping cut size to a minimum and providing good chip evacuation (air blast)
- For cobalt chrome applications, a surface speed of 45M/min is a guide (It can also be cut dry as per colbalt)

Refer to the SGS Tool Wizard® for complete technical information (www.kyocera-sgstool.com)



33MCR
METRIC SERIES

TOLERANCES (mm)

3–6 DIAMETER
DC = +0,000/–0,030
DCON = h_6
RE = +0,000/–0,050

>6–10 DIAMETER
DC = +0,000/–0,040
DCON = h_6
RE = +0,000/–0,050

>10–20 DIAMETER
DC = +0,000/–0,050
DCON = h_6
RE = +0,000/–0,050

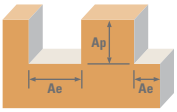
STEELS
STAINLESS STEELS
CAST IRON
HIGH TEMP ALLOYS

For patent information visit www.ksptpatents.com

mm					EDP NO.
CUTTING DIAMETER DC	LENGTH OF CUT APMX	OVERALL LENGTH LF	SHANK DIAMETER DCON	CORNER RADIUS RE	Ti-NAMITE®-A (AlTiN)
3,0	9,0	57,0	6,0	0,3	43445
3,0	9,0	57,0	6,0	0,5	43470
4,0	12,0	57,0	6,0	0,3	43446
4,0	12,0	57,0	6,0	0,5	43471
5,0	15,0	57,0	6,0	0,3	43447
5,0	15,0	57,0	6,0	0,5	43472
6,0	18,0	57,0	6,0	0,5	43448
6,0	18,0	57,0	6,0	1,0	43473
6,0	18,0	57,0	6,0	1,5	43474
6,0	18,0	57,0	6,0	2,0	43475
8,0	20,0	63,0	8,0	0,5	43449
8,0	20,0	63,0	8,0	1,0	43476
8,0	20,0	63,0	8,0	1,5	43477
8,0	20,0	63,0	8,0	2,0	43478
10,0	27,0	72,0	10,0	0,5	43450
10,0	27,0	72,0	10,0	1,0	43479
10,0	27,0	72,0	10,0	1,5	43480
10,0	27,0	72,0	10,0	2,0	43481
10,0	27,0	72,0	10,0	2,5	43482
12,0	30,0	83,0	12,0	0,5	43451
12,0	30,0	83,0	12,0	1,0	43483
12,0	30,0	83,0	12,0	1,5	43484
12,0	30,0	83,0	12,0	2,0	43485
12,0	30,0	83,0	12,0	2,5	43486
12,0	30,0	83,0	12,0	3,0	43487
12,0	30,0	83,0	12,0	4,0	43488
16,0	38,0	92,0	16,0	1,0	43452
16,0	38,0	92,0	16,0	1,5	43489
16,0	38,0	92,0	16,0	2,0	43490
16,0	38,0	92,0	16,0	2,5	43491
16,0	38,0	92,0	16,0	3,0	43492
16,0	38,0	92,0	16,0	4,0	43493
20,0	46,0	104,0	20,0	1,0	43453
20,0	46,0	104,0	20,0	2,0	43494
20,0	46,0	104,0	20,0	2,5	43495
20,0	46,0	104,0	20,0	3,0	43496
20,0	46,0	104,0	20,0	4,0	43497

- Specially engineered step core design provides stability for aggressive ramping and rigidity when flutes are completely engaged
- Open design at axial end accommodates material flow and load reduction during machining operations
- Enhanced corner geometry with tight tolerance corner radii
- Recommended for materials ≤ 45 HRc (≤ 420 Bhn)

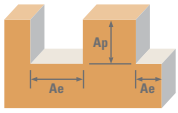
Series 33



	Series 33MCR Metric	Hardness		Ae x DC	Ap x DC	Vc (m/min)		DC • mm 3	6	8	10	12	16	20
P	CARBON STEELS 1018, 1040, 1080, 1090, 10L50, 1140, 1212, 12L15, 1525, 1536	≤ 275 Bhn or ≤ 28 HRc	Profile	≤ 0.5	≤ 1.5	168	RPM	17773	8886	6665	5332	4443	3332	2666
						(134-201)	Fz	0.012	0.029	0.049	0.061	0.074	0.100	0.107
							Feed (mm/min)	640	768	981	981	992	998	853
			Slot	1	≤ 1	134	RPM	14218	7109	5332	4265	3555	2666	2133
						(107-161)	Fz	0.012	0.029	0.049	0.061	0.074	0.100	0.107
							Feed (mm/min)	512	614	785	785	793	798	682
	ALLOY STEELS 4140, 4150, 4320, 5120, 5150, 8630, 86L20, 50100	≤ 375 Bhn or ≤ 40 HRc	Profile	≤ 0.5	≤ 1.5	96	RPM	10179	5089	3817	3054	2545	1909	1527
						(77-115)	Fz	0.010	0.022	0.036	0.045	0.055	0.074	0.080
							Feed (mm/min)	293	330	415	415	421	425	366
			Slot	1	≤ 1	76	RPM	8078	4039	3029	2424	2020	1515	1212
						(61-91)	Fz	0.010	0.022	0.036	0.045	0.055	0.074	0.080
							Feed (mm/min)	233	262	330	330	334	337	291
	TOOL STEELS A2, D2, H13, L2, M2, P20, S7, T15, W2	≤ 375 Bhn or ≤ 40 HRc	Profile	≤ 0.5	≤ 1.5	56	RPM	5978	2989	2242	1793	1495	1121	897
						(45-68)	Fz	0.007	0.017	0.030	0.037	0.043	0.059	0.064
							Feed (mm/min)	129	151	201	201	194	198	172
			Slot	1	≤ 1	44	RPM	4686	2343	1757	1406	1171	879	703
						(35-53)	Fz	0.007	0.017	0.030	0.037	0.043	0.059	0.064
							Feed (mm/min)	101	118	157	157	152	155	135
M	STAINLESS STEELS (FREE MACHINING) 303, 416, 420F, 430F, 440F	≤ 275 Bhn or ≤ 28 HRc	Profile	≤ 0.5	≤ 1.5	149	RPM	15834	7917	5938	4750	3958	2969	2375
						(119-179)	Fz	0.009	0.024	0.041	0.051	0.060	0.079	0.085
							Feed (mm/min)	433	570	722	722	712	707	608
			Slot	1	≤ 1	119	RPM	12602	6301	4726	3781	3151	2363	1890
						(95-143)	Fz	0.009	0.024	0.041	0.051	0.060	0.079	0.085
							Feed (mm/min)	345	454	575	575	567	563	484
	STAINLESS STEELS (DIFFICULT) 304, 304L, 316, 316L	≤ 275 Bhn or ≤ 28 HRc	Profile	≤ 0.5	≤ 1.5	104	RPM	10987	5493	4120	3296	2747	2060	1648
						(83-124)	Fz	0.007	0.019	0.032	0.040	0.048	0.064	0.069
							Feed (mm/min)	237	316	396	396	395	396	343
			Slot	1	≤ 1	82	RPM	8725	4362	3272	2617	2181	1636	1309
						(66-99)	Fz	0.007	0.019	0.032	0.040	0.048	0.064	0.069
							Feed (mm/min)	188	251	314	314	314	314	272
	STAINLESS STEELS (PH) 13-8 PH, 15-5 PH, 17-4 PH, Custom 450	≤ 325 Bhn or ≤ 35 HRc	Profile	≤ 0.5	≤ 1.5	94	RPM	10017	5009	3756	3005	2504	1878	1503
						(76-113)	Fz	0.007	0.019	0.032	0.040	0.048	0.064	0.069
							Feed (mm/min)	216	288	361	361	361	361	313
			Slot	1	≤ 1	76	RPM	8078	4039	3029	2424	2020	1515	1212
						(61-91)	Fz	0.007	0.019	0.032	0.040	0.048	0.064	0.069
							Feed (mm/min)	174	233	291	291	291	291	252

continued on next page

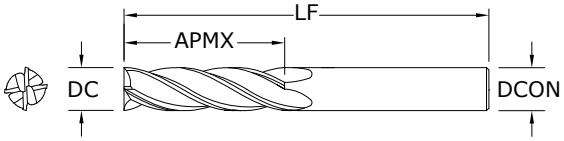
Series 33



	Series 33MCR Metric	Hardness		Ae x DC	Ap x DC	Vc (m/min)		DC • mm 3	6	8	10	12	16	20
K	CAST IRONS (LOW & MEDIUM ALLOY) Gray, Malleable, Ductile	≤ 220 Bhn or ≤ 19 HRc	Profile	≤ 0.5	≤ 1.5	136	RPM	14380	7190	5392	4314	3595	2696	2157
						(109-163)	Fz	0.008	0.026	0.045	0.056	0.067	0.090	0.096
							Feed (mm/min)	362	569	725	725	725	725	621
			Slot	1	≤ 1	108	RPM	11471	5736	4302	3441	2868	2151	1721
						(87-130)	Fz	0.008	0.026	0.045	0.056	0.067	0.090	0.096
							Feed (mm/min)	289	454	578	578	578	578	496
	CAST IRONS (HIGH ALLOY) Gray, Malleable, Ductile	≤ 260 Bhn or ≤ 26 HRc	Profile	≤ 0.5	≤ 1.5	104	RPM	10987	5493	4120	3296	2747	2060	1648
						(83-124)	Fz	0.007	0.019	0.034	0.043	0.050	0.067	0.072
							Feed (mm/min)	237	316	422	422	415	411	356
			Slot	1	≤ 1	82	RPM	8725	4362	3272	2617	2181	1636	1309
						(66-99)	Fz	0.007	0.019	0.034	0.043	0.050	0.067	0.072
							Feed (mm/min)	188	251	335	335	330	327	283
S	HIGH TEMP ALLOYS (NICKEL, COBALT, IRON BASE) Inconel 601, 617, 625, Incoloy, Monel 400	≤ 300 Bhn or ≤ 32 HRc	Profile	≤ 0.5	≤ 1.5	24	RPM	2585	1293	969	776	646	485	388
						(20-29)	Fz	0.006	0.017	0.028	0.035	0.041	0.054	0.059
							Feed (mm/min)	48	65	81	65	79	78	68
			Slot	1	≤ 1	20	RPM	2100	1050	788	630	525	394	315
						(16-24)	Fz	0.006	0.017	0.028	0.035	0.041	0.054	0.059
							Feed (mm/min)	39	53	66	66	64	64	55
	HIGH TEMP ALLOYS (NICKEL, COBALT, IRON BASE) Inconel 718, X-750, Incoloy, Waspaloy, Hastelloy, Rene	≤ 400 Bhn or ≤ 43 HRc	Profile	≤ 0.5	≤ 1.5	19	RPM	2003	1002	751	601	501	376	301
						(15-23)	Fz	0.005	0.012	0.019	0.024	0.029	0.038	0.043
							Feed (mm/min)	29	36	43	43	43	43	38
			Slot	1	≤ 1	15	RPM	1583	792	594	475	396	297	238
						(12-18)	Fz	0.005	0.012	0.019	0.024	0.029	0.038	0.043
							Feed (mm/min)	23	28	34	34	34	34	30
	TITANIUM ALLOYS Pure Titanium, Ti6Al4V, Ti6Al2Sn4Zr2Mo, Ti4Al4Mo2Sn0.5Si	≤ 350 Bhn or ≤ 38 HRc	Profile	≤ 0.5	≤ 1.5	66	RPM	6947	3474	2605	2084	1737	1303	1042
						(52-79)	Fz	0.007	0.019	0.032	0.040	0.048	0.064	0.069
							Feed (mm/min)	150	200	250	250	250	250	217
			Slot	1	≤ 1	52	RPM	5493	2747	2060	1648	1373	1030	824
						(41-62)	Fz	0.007	0.019	0.032	0.040	0.048	0.064	0.069
							Feed (mm/min)	119	158	198	198	198	198	171
	TITANIUM ALLOYS (DIFFICULT) Ti10V2Fe3Al, Ti5Al5V5Mo3Cr, Ti7Al4Mo, Ti3Al8V6Cr4Zr4Mo, Ti6Al6V6Sn, Ti15V3 Cr3Sn3Al	≤ 420 Bhn or ≤ 45 HRc	Profile	≤ 0.5	≤ 1.5	23	RPM	2424	1212	909	727	606	454	364
						(18-27)	Fz	0.007	0.019	0.032	0.040	0.048	0.064	0.069
							Feed (mm/min)	52	70	87	87	87	87	76
			Slot	1	≤ 1	18	RPM	1939	969	727	582	485	364	291
						(15-22)	Fz	0.007	0.019	0.032	0.040	0.048	0.064	0.069
							Feed (mm/min)	42	56	70	70	70	70	60

Bhn (Brinell) HRc (Rockwell C)
rpm = (Vc x 1000) / (DC x 3.14)
mm/min = Fz x 3 x rpm
reduce speed and feed for materials harder than listed
reduce feed and Ae when finish milling (.02 x DC maximum)
feed rates listed have chip thinning adjustments included where applicable
refer to the SGS Tool Wizard® for complete technical information (www.kyocera-sgstool.com)

7M
METRIC SERIES



- Variable pitch allows for improved chatter suppression along with improved surface finish and enhanced tool life
- Raised land and increased core diameter designed to enhance tool life and decrease tool deflection
- Recommended for materials ≤ 45 HRc (≤ 420 Bhn)

mm				EDP NO.
CUTTING DIAMETER DC	LENGTH OF CUT APMX	OVERALL LENGTH LF	SHANK DIAMETER DCON	Ti-NAMITE®-X (TX)
3,0	25,0	75,0	3,0	70551
4,0	25,0	75,0	4,0	70552
5,0	25,0	75,0	5,0	70553
6,0	25,0	75,0	6,0	70554
8,0	25,0	75,0	8,0	70555
10,0	38,0	100,0	10,0	70556
12,0	50,0	100,0	12,0	70557
12,0	75,0	150,0	12,0	70558
14,0	75,0	150,0	14,0	70559
16,0	75,0	150,0	16,0	70560
18,0	75,0	150,0	18,0	70561
20,0	75,0	150,0	20,0	70562
25,0	75,0	150,0	25,0	70563

TOLERANCES (mm)

DC = +0,000/+0,050
DCON = h_6

- STEELS
- STAINLESS STEELS
- CAST IRON
- HIGH TEMP ALLOYS

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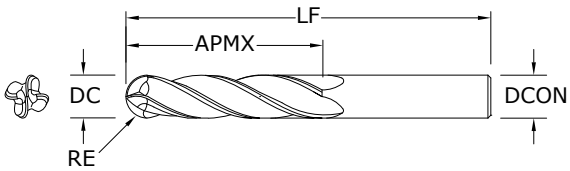
7MB
METRIC SERIES



- Variable pitch allows for improved chatter suppression along with improved surface finish and enhanced tool life
- Raised land and increased core diameter designed to enhance tool life and decrease tool deflection
- Ball end design ideal for finishing operations in complex workpieces
- Recommended for materials ≤ 45 HRc (≤ 420 Bhn)

mm				EDP NO.
CUTTING DIAMETER DC	LENGTH OF CUT APMX	OVERALL LENGTH LF	SHANK DIAMETER DCON	Ti-NAMITE®-X (TX)
3,0	25,0	75,0	3,0	70527
4,0	25,0	75,0	4,0	70529
5,0	25,0	75,0	5,0	70531
6,0	25,0	75,0	6,0	70533
8,0	25,0	75,0	8,0	70535
10,0	38,0	100,0	10,0	70537
12,0	50,0	100,0	12,0	70539
12,0	75,0	150,0	12,0	70540
14,0	75,0	150,0	14,0	70542
16,0	75,0	150,0	16,0	70544
18,0	75,0	150,0	18,0	70546
20,0	75,0	150,0	20,0	70548
25,0	75,0	150,0	25,0	70550

RE = 1/2 Cutting Diameter (DC)

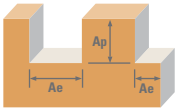
TOLERANCES (mm)

DC = +0,000/+0,050
DCON = h_6
RE = +0,000/–0,025

- STEELS
- STAINLESS STEELS
- CAST IRON
- HIGH TEMP ALLOYS

For patent information visit www.ksptpatents.com

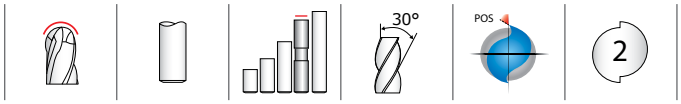
Series 7



	Series 7M, 7MB Metric	Hardness		Ae x DC	Ap x DC	Vc (m/min)		DC • mm 3	6	8	10	12	16	20	25
P	CARBON STEELS 1018, 1040, 1080, 1090, 10L50, 1140, 1212, 12L15, 1525, 1536	≤ 275 Bhn or ≤ 28 HRc	Finish	≤ 0.02	≤ 2	146	RPM	15511	7755	5816	4653	3878	2908	2327	1861
						(117-176)	Fz	0.0166	0.043	0.075	0.093	0.110	0.125	0.147	0.160
							Feed (mm/min)	1030	1334	1745	1731	1706	1454	1368	1191
	ALLOY STEELS 4140, 4150, 4320, 5120, 5150, 8630, 86L20, 50100	≤ 375 Bhn or ≤ 40 HRc	Finish	≤ 0.02	≤ 2	84	RPM	8886	4443	3332	2666	2222	1666	1333	1066
						(67-101)	Fz	0.0122	0.034	0.051	0.069	0.082	0.091	0.109	0.120
							Feed (mm/min)	434	604	680	736	729	606	581	512
	TOOL STEELS A2, D2, H13, L2, M2, P20, S7, T15, W2	≤ 375 Bhn or ≤ 40 HRc	Finish	≤ 0.02	≤ 2	70	RPM	7432	3716	2787	2230	1858	1394	1115	892
						(56-84)	Fz	0.0070	0.019	0.040	0.043	0.048	0.057	0.064	0.070
							Feed (mm/min)	208	282	446	384	357	318	285	250
M	STAINLESS STEELS (FREE MACHINING) 303, 416, 420F, 430F, 440F	≤ 275 Bhn or ≤ 28 HRc	Finish	≤ 0.02	≤ 2	128	RPM	13572	6786	5089	4072	3393	2545	2036	1629
						(102-154)	Fz	0.0086	0.024	0.040	0.048	0.058	0.065	0.077	0.087
							Feed (mm/min)	467	651	814	782	787	662	627	567
	STAINLESS STEELS (DIFFICULT) 304, 304L, 316, 316L	≤ 275 Bhn or ≤ 28 HRc	Finish	≤ 0.02	≤ 2	88	RPM	9371	4686	3514	2811	2343	1757	1406	1125
						(71-106)	Fz	0.0082	0.022	0.037	0.045	0.048	0.060	0.072	0.078
							Feed (mm/min)	307	412	520	506	450	422	405	351
	STAINLESS STEELS (PH) 13-8 PH, 15-5 PH, 17-4 PH, Custom 450	≤ 325 Bhn or ≤ 35 HRc	Finish	≤ 0.02	≤ 2	81	RPM	8563	4282	3211	2569	2141	1606	1284	1028
						(65-97)	Fz	0.0070	0.019	0.029	0.040	0.048	0.055	0.064	0.070
							Feed (mm/min)	240	325	372	411	411	353	329	288
K	CAST IRONS (LOW & MEDIUM ALLOY) Gray, Malleable, Ductile	≤ 220 Bhn or ≤ 19 HRc	Finish	≤ 0.02	≤ 2	184	RPM	19550	9775	7331	5865	4887	3666	2932	2346
						(148-221)	Fz	0.0132	0.036	0.052	0.075	0.089	0.099	0.117	0.130
							Feed (mm/min)	1032	1408	1525	1759	1740	1452	1372	1220
	CAST IRONS (HIGH ALLOY) Gray, Malleable, Ductile	≤ 260 Bhn or ≤ 26 HRc	Finish	≤ 0.02	≤ 2	142	RPM	15026	7513	5635	4508	3756	2817	2254	1803
						(113-170)	Fz	0.0132	0.036	0.052	0.075	0.089	0.099	0.117	0.130
							Feed (mm/min)	793	1082	1172	1352	1337	1116	1055	938
S	HIGH TEMP ALLOYS (NICKEL, COBALT, IRON BASE) Inconel 601, 617, 625, Incoloy, Monel 400	≤ 300 Bhn or ≤ 32 HRc	Finish	≤ 0.02	≤ 2	24	RPM	2585	1293	969	776	646	485	388	310
						(20-29)	Fz	0.0072	0.019	0.029	0.037	0.046	0.053	0.061	0.085
							Feed (mm/min)	74	98	112	90	119	103	95	105
	HIGH TEMP ALLOYS (NICKEL, COBALT, IRON BASE) Inconel 718, X-750, Incoloy, Waspaloy, Hastelloy, Rene	≤ 400 Bhn or ≤ 43 HRc	Finish	≤ 0.02	≤ 2	20	RPM	2100	1050	788	630	525	394	315	252
						(16-24)	Fz	0.0075	0.016	0.021	0.030	0.038	0.044	0.051	0.070
							Feed (mm/min)	63	67	66	76	80	69	64	71
	TITANIUM ALLOYS Pure Titanium, Ti6Al4V, Ti6Al2Sn4Zr2Mo, Ti4Al4Mo2Sn0.5Si	≤ 350 Bhn or ≤ 38 HRc	Finish	≤ 0.02	≤ 2	91	RPM	9694	4847	3635	2908	2424	1818	1454	1163
						(73-110)	Fz	0.0091	0.024	0.040	0.050	0.060	0.070	0.080	0.088
							Feed (mm/min)	353	465	51	59	582	509	465	409
	TITANIUM ALLOYS (DIFFICULT) Ti10V2Fe3Al, Ti5Al5V5Mo3Cr, Ti7Al4Mo, Ti3Al8V6Cr4Zr4Mo, Ti6Al6V6Sn, Ti15V3 Cr3Sn3Al	≤ 420 Bhn or ≤ 45 HRc	Finish	≤ 0.02	≤ 2	32	RPM	3393	1696	1272	1018	848	636	509	407
						(26-38)	Fz	0.0082	0.019	0.029	0.037	0.046	0.053	0.061	0.085
							Feed (mm/min)	111	129	148	151	156	135	124	138

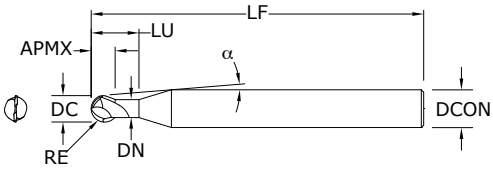
Bhn (Brinell) HRc (Rockwell C)
rpm = (Vc x 1000) / (DC x 3.14)
mm/min = Fz x 4 x rpm
reduce speed and feed for materials harder than listed
feed rates listed have chip thinning adjustments included where applicable
refer to the SGS Tool Wizard® for complete technical information (www.kyocera-sgstool.com)

Turbo-Carb



56MB

METRIC SERIES



- Short flute length and rigid design to reduce deflection
- S-Gash Ball geometry minimizes load and heat produced during the cutting process, ultimately enhancing tool life
- Ideal for machining complex contoured shapes in hardened steels
- Recommended for materials 35 to 60 HRc (327 to 654 Bhn)

mm							EDP NO.
CUTTING DIAMETER DC	LENGTH OF CUT APMX	OVERALL LENGTH LF	SHANK DIAMETER DCON	CENTER LINE ANGLE α	REACH LU	NECK DIAMETER DN	Ti-NAMITE®-X (TX)
1,0	1,0	76,0	6,0	8°10'	2,0	0,91	91349
1,5	1,5	76,0	6,0	7°45'	3,0	1,37	91350
2,0	2,0	76,0	6,0	7°10'	4,0	1,83	91351
2,5	2,5	76,0	6,0	6°35'	5,0	2,29	91352
3,0	3,0	76,0	6,0	6°	6,0	2,72	91353
4,0	4,0	76,0	6,0	4°30'	8,0	3,63	91354
5,0	5,0	89,0	6,0	2°30'	10,0	4,55	91355
6,0	6,0	89,0	6,0	–	12,0	5,49	91356
8,0	8,0	102,0	8,0	–	16,0	7,49	91357
10,0	10,0	102,0	10,0	–	20,0	9,47	91358
12,0	12,0	114,0	12,0	–	24,0	11,48	91359
16,0	16,0	140,0	16,0	–	32,0	15,62	91360
20,0	20,0	165,0	20,0	–	40,0	19,61	91361

Extended Neck Option Available, contact your local KSPT representative for more information.
RE = 1/2 Cutting Diameter (DC)

TOLERANCES (mm)

1–2,5 DIAMETER
DC = +0,000/–0,025
DCON = h_6
RE = +0,000/–0,0013

>2,5–6 DIAMETER
DC = +0,000/–0,030
DCON = h_6
RE = +0,000/–0,0013

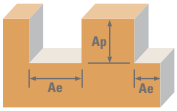
>6–10 DIAMETER
DC = +0,000/–0,040
DCON = h_6
RE = +0,000/–0,0020

>10–20 DIAMETER
DC = +0,000/–0,050
DCON = h_6
RE = +0,000/–0,0025

STEELS
HARDENED STEELS

For patent information visit www.ksptpatents.com

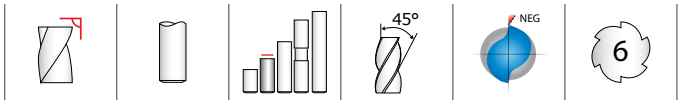
Turbo-Carb

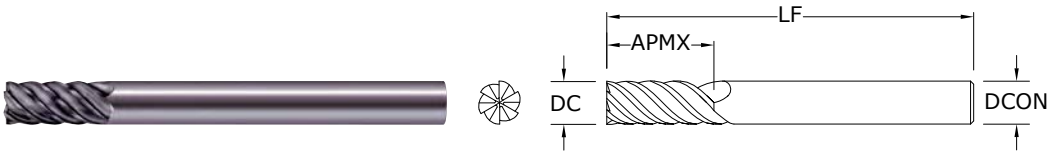


	Series 56MB Metric	Hardness		Ae x DC	Ap x DC	Vc (m/min)		DC • mm 1	1.5	3	5	6	10	12	20
P	TOOL STEELS MOLD AND DIE STEEL 300M, 4340, 52100, HP-9-4-20, M50, A2, D2, H13, L2, M2, P20, S7, T15, W2	≤ 375 Bhn or ≤ 40 HRc	Rough	≤ 0.4	≤ 0.1	191	RPM	60748	40498	20249	12150	10125	6075	5062	3037
						(153-229)	Fz	0.015	0.038	0.076	0.102	0.127	0.203	0.254	0.305
							Feed (mm/min)	1822	3078	3078	2479	2572	2466	2572	1853
			HSM	≤ 0.4	≤ 0.03	290	RPM	92235	61490	46117	18447	15372	9223	7686	4612
						(232-348)	Fz	0.018	0.043	0.084	0.112	0.117	0.224	0.279	0.330
							Feed (mm/min)	3320	5288	7748	4132	3597	4132	4289	3044
H	TOOL STEELS MOLD AND DIE STEEL 300M, 4340, 52100, HP-9-4-20, M50, A2, D2, H13, L2, M2, P20, S7, T15, W2	≤ 475 Bhn or ≤ 50 HRc	Rough	≤ 0.4	≤ 0.05	229	RPM	72833	48556	24278	14567	12139	7283	6069	3642
						(183-275)	Fz	0.013	0.028	0.058	0.076	0.097	0.152	0.191	0.216
							Feed (mm/min)	1894	2719	2816	2214	2355	2214	2319	1573
			HSM	≤ 0.4	≤ 0.02	351	RPM	111636	74424	37212	22327	18606	11164	9303	5582
						(281-421)	Fz	0.015	0.030	0.064	0.084	0.107	0.168	0.208	0.254
							Feed (mm/min)	3349	4465	4763	3751	3982	3751	3870	2836
	TOOL STEELS MOLD AND DIE STEEL 300M, 4340, 52100, HP-9-4-20, M50, A2, D2, H13, L2, M2, P20, S7, T15, W2	≤ 655 Bhn or ≤ 60 HRc	Rough	≤ 0.4	≤ 0.04	152	RPM	48344	32229	16115	9669	8057	4834	4029	2417
						(122-182)	Fz	0.010	0.020	0.043	0.058	0.074	0.114	0.145	0.160
							Feed (mm/min)	967	1289	1386	1122	1192	1102	1168	773
			HSM	≤ 0.4	≤ 0.01	305	RPM	97005	64670	32335	19401	16168	9701	8084	4850
						(244-366)	Fz	0.013	0.023	0.048	0.064	0.081	0.127	0.160	0.180
							Feed (mm/min)	2522	2975	3104	2483	2619	2464	2587	1746

Bhn (Brinell) HRc (Rockwell C) HSM (High Speed Machining)
rpm = (Vc x 1000) / (DC x 3.14)
mm/min = Fz x 2 x rpm
reduce speed and feed for materials harder than listed
reduce feed and Ae when finish milling (.02 x DC maximum)
feed rates listed have chip thinning adjustments included where applicable
refer to the SGS Tool Wizard® for complete technical information (www.kyocera-sgstool.com)

Power-Carb®





57M

METRIC SERIES

- Ideal in Trochoidal milling applications in hardened steels and dry machining
- Short flute length and large core design to reduce deflection
- Unsurpassed edge strength with extreme negative rake and eccentric relief
- Recommended for materials 45 to 65 HRc (421 to 739 Bhn)

mm				EDP NO.
CUTTING DIAMETER DC	LENGTH OF CUT APMX	OVERALL LENGTH LF	SHANK DIAMETER DCON	Ti-NAMITE®-X (TX)
6,0	13,0	89,0	6,0	46140
8,0	18,0	102,0	8,0	46141
10,0	22,0	102,0	10,0	46142
12,0	26,0	114,0	12,0	46143
16,0	32,0	140,0	16,0	46145
20,0	38,0	165,0	20,0	46147

Neck Option Available

TOLERANCES (mm)

6 DIAMETER
DC = +0,000/–0,030
DCON = h_6

8 DIAMETER
DC = +0,000/–0,040
DCON = h_6

10 DIAMETER
DC = +0,000/–0,040
DCON = h_6

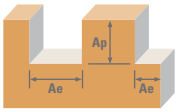
12–20 DIAMETER
DC = +0,000/–0,050
DCON = h_6

STEELS

HARDENED STEELS

For patent information visit www.ksptpatents.com

Power-Carb®

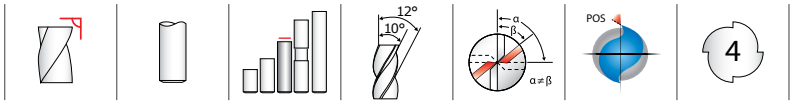


	Series 57M Metric	Hardness		Ae x DC	Ap x DC	Vc (m/min)		DC • mm 6	8	10	12	16	20
P	TOOL STEELS MOLD AND DIE STEEL 300M, 4340, 52100, HP-9-4-20, M50, A2, D2, H13, L2, M2, P20, S7, T15, W2	≤ 420 Bhn or ≤ 45 HRc	Slot	1	≤ 0.3	66	RPM	3499	2624	2099	1749	1312	1050
						(53-79)	Fz	0.032	0.048	0.064	0.079	0.094	0.109
							Feed (mm/min)	672	756	806	829	740	686
			Profile	≤ 0.1	≤ 1.5	81	RPM	4294	3220	2576	2147	1610	1288
						(65-97)	Fz	0.046	0.066	0.089	0.112	0.132	0.152
							Feed (mm/min)	1185	1275	1376	1443	1275	1175
			HSM	≤ 0.04	≤ 1.5	171	RPM	9064	6798	5439	4532	3399	2719
						(137-205)	Fz	0.056	0.084	0.112	0.140	0.170	0.200
							Feed (mm/min)	3046	3426	3655	3807	3467	3263
H	TOOL STEELS MOLD AND DIE STEEL 300M, 4340, 52100, HP-9-4-20, M50, A2, D2, H13, L2, M2, P20, S7, T15, W2	≤ 560 Bhn or ≤ 55 HRc	Slot	1	≤ 0.3	37	RPM	1961	1471	1177	981	735	588
						(30-44)	Fz	0.025	0.038	0.051	0.064	0.077	0.090
							Feed (mm/min)	294	335	360	377	340	318
			Profile	≤ 0.1	≤ 1.5	46	RPM	2438	1829	1463	1219	914	732
						(37-55)	Fz	0.036	0.053	0.071	0.089	0.107	0.125
							Feed (mm/min)	527	582	623	651	587	549
			HSM	≤ 0.04	≤ 1.5	149	RPM	7898	5924	4739	3949	2962	2369
						(119-179)	Fz	0.046	0.066	0.089	0.112	0.135	0.158
							Feed (mm/min)	2180	2346	2531	2654	2399	2246
	TOOL STEELS MOLD AND DIE STEEL 300M, 4340, 52100, HP-9-4-20, M50, A2, D2, H13, L2, M2, P20, S7, T15, W2	≤ 740 Bhn or ≤ 65 HRc	Slot	1	≤ 0.3	20	RPM	1060	795	636	530	398	318
						(16-24)	Fz	0.020	0.028	0.038	0.048	0.058	0.068
							Feed (mm/min)	127	134	145	153	138	130
			Profile	≤ 0.1	≤ 1.5	24	RPM	1272	954	763	636	477	382
						(19-29)	Fz	0.028	0.041	0.053	0.066	0.078	0.090
							Feed (mm/min)	214	235	243	252	223	206
			HSM	≤ 0.04	≤ 1.5	76	RPM	4029	3021	2417	2014	1511	1209
						(61-91)	Fz	0.033	0.048	0.064	0.079	0.094	0.109
							Feed (mm/min)	798	870	928	955	852	790

Bhn (Brinell) HRc (Rockwell C) HSM (High Speed Machining)
rpm = (Vc x 1000) / (DC x 3.14)
mm/min = Fz x 6 x rpm
reduce speed and feed for materials harder than listed
reduce feed and Ae when finish milling (.02 x DC maximum)
feed rates listed have chip thinning adjustments included where applicable
refer to the SGS Tool Wizard® for complete technical information (www.kyocera-sgstool.com)

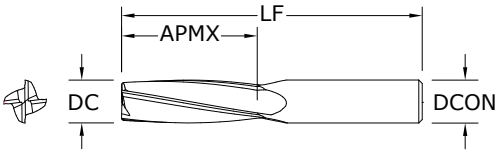
Series 27

Series27 HIGH PERFORMANCE END MILLS



27M

METRIC SERIES



- Slow helix design adds strength to the edge allowing ease for milling highly abrasive materials
- Two levels of chatter suppression: variable helix and indexing
- Excels at roughing (slotting, profiling) and finishing in a variety of plastics and composites

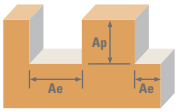
mm				EDP NO.	
CUTTING DIAMETER DC	LENGTH OF CUT APMX	OVERALL LENGTH LF	SHANK DIAMETER DCON	UNCOATED	Di-NAMITE® (Diamond)
6,0	25,0	63,0	6,0	83056	83057
8,0	25,0	63,0	8,0	83058	83059
10,0	28,0	63,0	10,0	83060	83061
12,0	38,0	89,0	12,0	83062	83063
16,0	48,0	115,0	16,0	83064	83065

TOLERANCES (mm)

DC = +0,000/–0,080
DCON = h_6

NON-FERROUS

For patent information visit www.ksptpatents.com



	Series 27M Metric		Ae x DC	Ap x DC	Vc (m/min)		DC • mm 6	8	10	12	16
N	CFRP, AFRP (CARBON FIBER, ARAMID FIBER)	Slot	1	≤ 1	120	RPM	6361	4771	3817	3181	2385
					(96-164)	Fz	0.040	0.065	0.075	0.100	0.120
						Feed (mm/min)	1018	1240	1145	1272	1145
		Profile	≤ 0.5	≤ 1.5	150	RPM	7951	5963	4771	3976	2982
					(120-180)	Fz	0.040	0.065	0.075	0.100	0.120
						Feed (mm/min)	1272	1550	1431	1590	1431
		HSM	≤ 0.5	≤ 2	250	RPM	13252	9939	7951	6626	4970
					(200-300)	Fz	0.095	0.145	0.175	0.235	0.280
						Feed (mm/min)	5036	5765	5566	6228	5566
	GFRP (FIBERGLASS)	Slot	1	≤ 1	100	RPM	5301	3976	3181	2650	1988
					(80-120)	Fz	0.040	0.065	0.075	0.100	0.120
						Feed (mm/min)	848	1034	954	1060	954
		Profile	≤ 0.5	≤ 1.5	120	RPM	6361	4771	3817	3181	2385
					(96-164)	Fz	0.040	0.065	0.075	0.100	0.120
						Feed (mm/min)	1018	1240	1145	1272	1145
		HSM	≤ 0.5	≤ 2	200	RPM	10602	7951	6361	5301	3976
					(160-240)	Fz	0.095	0.145	0.175	0.235	0.280
						Feed (mm/min)	4029	4612	4453	4983	4453
	CARBON, GRAPHITE	Slot	1	≤ 1	145	RPM	7686	5765	4612	3843	2882
					(116-174)	Fz	0.050	0.080	0.095	0.125	0.150
						Feed (mm/min)	1537	1845	1752	1922	1729
		Profile	≤ 0.5	≤ 1.5	185	RPM	9807	7355	5884	4903	3677
					(148-222)	Fz	0.050	0.080	0.095	0.125	0.150
						Feed (mm/min)	1961	2354	2236	2452	2206
		HSM	≤ 0.5	≤ 2	300	RPM	15903	11927	9542	7951	5963
					(240-360)	Fz	0.115	0.185	0.220	0.290	0.350
						Feed (mm/min)	7315	8826	8397	9223	8349
	PLASTICS	Slot	1	≤ 1	245	RPM	12987	9740	7792	6494	4870
					(196-294)	Fz	0.050	0.080	0.095	0.125	0.150
						Feed (mm/min)	2597	3117	2961	3247	2922
		Profile	≤ 0.5	≤ 1.5	305	RPM	16168	12126	9701	8084	6063
					(244-366)	Fz	0.050	0.080	0.095	0.125	0.150
						Feed (mm/min)	3234	3880	3686	4042	3638
		HSM	≤ 0.5	≤ 2	505	RPM	26769	20077	16062	13385	10038
					(404-606)	Fz	0.115	0.185	0.220	0.290	0.350
						Feed (mm/min)	12314	14857	14134	15526	14054
	MACHINABLE CERAMICS MACHINABLE GLASS	Slot	1	≤ 1	10	RPM	530	398	318	265	199
					(8-12)	Fz	0.020	0.035	0.045	0.050	0.060
						Feed (mm/min)	42	56	57	53	48
		Profile	≤ 0.5	≤ 1.5	15	RPM	795	596	477	398	298
					(12-18)	Fz	0.020	0.035	0.045	0.050	0.060
						Feed (mm/min)	64	83	86	80	72
		HSM	≤ 0.5	≤ 2	25	RPM	1325	994	795	663	497
					(20-30)	Fz	0.045	0.075	0.085	0.115	0.140
						Feed (mm/min)	239	298	270	305	278

HSM (High Speed Machining)
rpm = Vc x 3.82 / DC
mm/min = Fz x 4 x rpm
adjust parameters based on resin type and fiber structure
reduce speed when overheating causes melting or damage to resin
reduce feed if delamination or fraying occur
finish cuts typically required reduced feed and cutting depths

rates shown are for use without coolant; rates may be increased with coolant
dust collection is vital when machining dry
diamond coating will increase tool life in graphite and composite materials
feed rates listed have chip thinning adjustments included where applicable
refer to the SGS Tool Wizard® for complete technical information (www.kyocera-sgstool.com)

SGS Solid Carbide Tools

Keeping the world moving

High Performance Aluminum End Mills

Milling

HIGH PERFORMANCE ALUMINUM END MILLS	SERIES	DESCRIPTION	PAGE	S&F PAGE
S-Carb APR® & APF®	43APR-3	3 Flute Advanced Productivity Rougher Metric	81	83
	43APR-4	4 Flute Advanced Productivity Rougher Metric	82	83
	43MAPF	4 Flute Advanced Productivity Finisher Metric	84	85
S-Carb APF-B®	43APF-B	Multi-Flute Advanced Productivity Finisher Metric	86	87
S-Carb® (3 Flute)	43M	3 Flute Non-Ferrous Square End Metric (Unpolished Flutes)	88	89
	43M	3 Flute Non-Ferrous Square End Metric (Polished Flutes)	88	96
	43MCR	3 Flute Non-Ferrous Corner Radius Metric (Unpolished Flutes)	88	96
	43MCR	3 Flute Non-Ferrous Corner Radius Metric (Polished Flutes)	88	96
	43MCR	3 Flute Non-Ferrous Corner Radius 4xD Metric (Polished Flutes)	88	96
	43ML	3 Flute Non-Ferrous Square End Long Reach Metric	92	96
	43MLC	3 Flute Non-Ferrous Long Reach Corner Radius Metric (Unpolished Flutes)	92	96
	43MLC	3 Flute Non-Ferrous Long Reach Corner Radius Metric (Polished Flutes)	92	96
	43MB	3 Flute Non-Ferrous Ball End Metric (Polished Flutes)	93	96
S-Carb® Rougher (3 Flute)	43MCB	3 Flute Rougher Non-Ferrous Chip Breaker Metric	95	96
S-Carb® (2 Flute)	47M	2 Flute Non-Ferrous Square End Metric	97	99
	47ML	2 Flute Non-Ferrous Square End Long Reach Metric	97	99
	47MB	2 Flute Non-Ferrous Ball End Metric	98	99
	47MLB	2 Flute Non-Ferrous Ball End Long Reach Metric	98	99
Ski-Carb	44M	2 Flute Non-Ferrous Materials Square End Metric	100	101

Speed & Feed Recommendations listed after each series

Fresado

FRESAS DE ALTO RENDIMIENTO PARA ALUMINIO	SERIE	DESCRIPCIÓN	PÁGINA	S&F PÁGINA
S-Carb APR® y APF®	43APR-3	3 filos, productividad avanzada, desbastador, métrico	81	83
	43APR-4	4 filos, productividad avanzada, desbastador, métrico	82	83
	43MAPF	4 filos, productividad avanzada, acabador, métrico	84	85
S-Carb APF-B®	43APF-B	Fresa Cónica Circular Multi-Filos tipo Barril, métrica	86	87
S-Carb® (3 filos)	43M	3 filos, no férrico, punta cuadrada, métrico (filos no pulidos)	88	89
	43M	3 filos, no férrico, punta cuadrada, métrico (filos pulidos)	88	96
	43MCR	3 filos, no férrico, radio angulado, métrico (filos no pulidos)	88	96
	43MCR	3 filos, no férrico, radio angulado, métrico (filos pulidos)	88	96
	43MCR	3 filos, no férrico, radio angulado 4xD, métrico (filos pulidos)	88	96
	43ML	3 filos, no férrico, punta cuadrada, largo alcance, métrico	92	96
	43MLC	3 filos, no férrico, largo alcance, radio angulado, métrico (filos no pulidos)	92	96
	43MLC	3 filos, no férrico, largo alcance, radio angulado, métrico (filos pulidos)	92	96
	43MB	3 filos, no férrico, punta esférica, métrico (filos pulidos)	93	96
Desbastador S-Carb® (3 filos)	43MCB	3 filos, desbastador, no férrico, rompevirutas, métrico	95	96
S-Carb® (2 filos)	47M	2 filos, no férrico, punta cuadrada, métrico	97	99
	47ML	2 filos, no férrico, punta cuadrada, largo alcance, métrico	97	99
	47MB	2 filos, no férrico, punta esférica, métrico	98	99
	47MLB	2 filos, no férrico, punta esférica, largo alcance, métrico	98	99
Ski-Carb	44M	2 filos, materiales no férricos, punta cuadrada, métrico	100	101

Recomendaciones de velocidades y avances mostradas tras cada serie

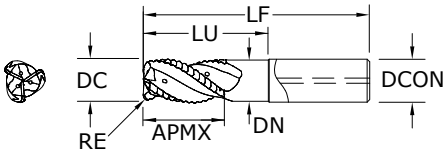
FRAISE HAUTE PERFORMANCE POUR ALUMINIUM	SÉRIES	DESCRIPTION	PAGE	S&F PAGE
S-Carb APR®/APF®	43APR-3	3 dents productivité avancée d'ébauche (métrique)	81	83
	43APR-4	4 dents productivité avancée d'ébauche (métrique)	82	83
	43MAPF	4 dents productivité avancée de finition (métrique)	84	85
S-Carb APF-B®	43APF-B	Fraise multi dents finition pour productivité avancée cotes (métrique)	86	87
S-Carb® (3 dents)	43M	3 dents non-ferreux non rayonné (métrique) (goujures non polies)	88	89
	43M	3 dents non-ferreux non rayonné (métrique) (goujures polies)	88	96
	43MCR	3 dents matériaux non-ferreux rayonné (métrique) (goujures non polies)	88	96
	43MCR	3 dents matériaux non-ferreux rayonné (métrique) (goujures polies)	88	96
	43MCR	3 dents matériaux non-ferreux rayonné 4xD (métrique) (goujures polies)	88	96
	43MLC	3 dents non-ferreux longue portée rayonné (métrique) (goujures non polies)	92	96
	43MLC	3 dents non-ferreux longue portée rayonné (métrique) (goujures polies)	92	96
	43ML	3 dents non-ferreux non rayonné longue portée (métrique)	92	96
	43MB	3 dents non-ferreux à bout hémisphérique (métrique) (goujures polies)	93	96
S-Carb® d'ébauche (3 dents)	43MCB	3 dents d'ébauche non-ferreux brise-copeaux (métrique)	95	96
S-Carb® (2 dents)	47M	2 dents non-ferreux non rayonné (métrique)	97	99
	47ML	2 dents non-ferreux non rayonné longue portée (métrique)	97	99
	47MB	2 dents non-ferreux à bout hémisphérique (métrique)	98	99
	47MLB	2 dents non-ferreux à bout hémisphérique longue portée (métrique)	98	99
Ski-Carb	44M	2 dents matériaux non-ferreux non rayonné (métrique)	100	101

Recommandations de vitesse et avance indiquées après chaque série

Fräsen

HOCHLEISTUNGSSCHAFTFRÄSER FÜR ALUMINIUM	SERIE	BESCHREIBUNG	SEITE	S&F SEITE
S-Carb APR® & APF®	43APR-3	Hochleistungs-Schruppfräser mit 3 Schneiden (Erweiterung)	81	83
	43APR-4	Hochleistungs-Schruppfräser mit 4 Schneiden	82	83
	43MAPF	Hochleistungs-Schlichtfräser mit 4 Schneiden	84	85
S-Carb APF-B®	43APF-B	Metrischer mehrschneidiger Hochleistungsschlichtfräser	86	87
S-Carb® (3 Schneiden)	43M	NE-Schaftfräser mit 3 unpolierten Schneiden ohne Eckenradien	88	89
	43M	NE-Schaftfräser mit 3 polierten Schneiden ohne Eckenradien	88	96
	43MCR	NE-Fräser mit 3 unpolierten Schneiden und Eckenradien	88	96
	43MCR	NE-Fräser mit 3 polierten Schneiden und Eckenradien	88	96
	43MCR	NE-Fräser 4xD mit 3 polierten Schneiden und Eckenradien	88	96
	43ML	NE-Langloch-Schaftfräser mit 3 Schneiden ohne Eckenradien	92	96
	43MLC	NE-Langlochfräser mit 3 unpolierten Schneiden und Eckenradien	92	96
	43MLC	NE-Langlochfräser mit 3 polierten Schneiden und Eckenradien	92	96
	43MB	NE-Radiusschaftfräser mit 3 polierten Schneiden	93	96
S-Carb® Schruppfräser (3 Schneiden)	43MCB	NE-Schruppfräser mit 3 Schneiden und Spanbrechern	95	96
S-Carb® (2 Schneiden)	47M	NE-Schaftfräser mit 2 Schneiden ohne Eckenradien	97	99
	47ML	NE-Langloch-Schaftfräser mit 2 Schneiden ohne Eckenradien	97	99
	47MB	NE-Radiusschaftfräser mit 2 Schneiden	98	99
	47MLB	NE-Langloch-Radiusschaftfräser mit 2 Schneiden	98	99
Ski-Carb	44M	NE-Schaftfräser mit 2 Schneiden ohne Eckenradien	100	101

Empfehlungen für Drehzahl & Vorschub im Anhang zu jeder Serie



43APR-3

METRIC SERIES

TOLERANCES (mm)

12–25 DIAMETER
DC = –0,010/–0,100
DCON = h_6
RE = +/–0,05

NON-FERROUS

For patent information visit www.ksptpatents.com

mm							EDP NO.
CUTTING DIAMETER DC	LENGTH OF CUT APMX	OVERALL LENGTH LF	SHANK DIAMETER DCON	REACH LU	NECK DIAMETER DN	CORNER RADIUS RE	Ti-NAMITE®-B (TiB_2)
12,0	26,0	83,0	12,0	39,0	11,40	1,0	44976*
12,0	26,0	83,0	12,0	39,0	11,40	2,0	44977*
12,0	26,0	83,0	12,0	39,0	11,40	3,0	44978*
12,0	26,0	83,0	12,0	39,0	11,40	4,0	44979*
12,0	26,0	95,0	12,0	–	–	–	44975*
16,0	35,0	92,0	16,0	–	–	–	44980*
16,0	35,0	92,0	16,0	51,0	15,20	2,0	44981*
16,0	35,0	92,0	16,0	51,0	15,20	3,0	44982*
16,0	35,0	92,0	16,0	51,0	15,20	4,0	44983*
16,0	35,0	108,0	16,0	67,0	15,20	2,0	44985*
16,0	35,0	108,0	16,0	67,0	15,20	3,0	44986*
16,0	35,0	108,0	16,0	67,0	15,20	4,0	44987*
16,0	35,0	124,0	16,0	–	–	–	44984*
20,0	35,0	86,0	20,0	–	–	–	44990
20,0	35,0	86,0	20,0	45,0	19,00	3,0	44991
20,0	35,0	86,0	20,0	45,0	19,00	4,0	44992
20,0	35,0	106,0	20,0	–	–	–	44993*
20,0	35,0	106,0	20,0	65,0	19,00	2,0	44994*
20,0	35,0	106,0	20,0	65,0	19,00	3,0	44995*
20,0	35,0	106,0	20,0	65,0	19,00	4,0	44996*
20,0	35,0	106,0	20,0	65,0	19,00	5,0	44997*
20,0	35,0	145,0	20,0	–	–	–	45020*
20,0	35,0	125,0	20,0	84,0	19,00	2,0	45021*
20,0	35,0	125,0	20,0	84,0	19,00	3,0	45022*
20,0	35,0	125,0	20,0	84,0	19,00	4,0	45023*
25,0	43,0	108,0	25,0	–	–	–	44998
25,0	43,0	108,0	25,0	60,0	23,75	2,0	44999
25,0	43,0	108,0	25,0	60,0	23,75	3,0	45000
25,0	43,0	108,0	25,0	60,0	23,75	4,0	45001
25,0	35,0	140,0	25,0	–	–	–	45002*
25,0	35,0	140,0	25,0	80,0	23,75	3,0	45003*
25,0	35,0	140,0	25,0	90,0	23,75	3,0	45004*
25,0	35,0	151,0	25,0	105,0	23,75	3,0	45025*
25,0	35,0	176,0	25,0	–	–	–	45024*

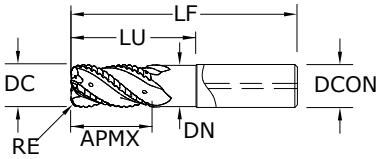
*Variable Helix

- Ultra high-productivity rougher for Aluminum alloys, specifically for aircraft components
- Designed for machine tools with capability of 12 L^3 per minute material removal rates
- New 3 flute variable geometry with side exit coolant holes
- Open fluting for deep slotting and profiling
- Recommended for materials ≤ 150 Bhn (≤ 7 HRc)

S-Carb APR®

43APR-4

METRIC SERIES



- Ultra high-productivity rougher for Aluminum alloys, specifically for aircraft components
- Designed for machine tools with capability of 12 L^3 per minute material removal rates
- 4 flute variable geometry with side exit coolant holes
- Open fluting for deep slotting and profiling
- Recommended for materials ≤ 150 Bhn (≤ 7 HRc)

mm							EDP NO.
CUTTING DIAMETER DC	LENGTH OF CUT APMX	OVERALL LENGTH LF	SHANK DIAMETER DCON	REACH LU	NECK DIAMETER DN	CORNER RADIUS RE	Ti-NAMITE®-B (TiB_2)
20,0	35,0	86,0	20,0	–	19,00	–	45005
20,0	35,0	86,0	20,0	45,0	19,00	3,0	45006
20,0	35,0	86,0	20,0	45,0	19,00	4,0	45007
20,0	35,0	106,0	20,0	–	19,00	–	45008
20,0	35,0	106,0	20,0	65,0	19,00	2,0	45009
20,0	35,0	106,0	20,0	65,0	19,00	3,0	45010
20,0	35,0	106,0	20,0	65,0	19,00	4,0	45011
20,0	35,0	106,0	20,0	65,0	19,00	5,0	45012
25,0	43,0	108,0	25,0	–	23,75	–	45013
25,0	43,0	108,0	25,0	60,0	23,75	2,0	45014
25,0	43,0	108,0	25,0	60,0	23,75	3,0	45015
25,0	43,0	108,0	25,0	60,0	23,75	4,0	45016
25,0	35,0	140,0	25,0	–	23,75	–	45017
25,0	35,0	140,0	25,0	80,0	23,75	3,0	45018
25,0	35,0	140,0	25,0	90,0	23,75	3,0	45019

TOLERANCES (mm)

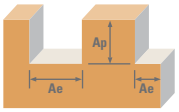
20–25 DIAMETER

DC = –0,010/–0,100
DCON = h_6
RE = ±0,050

NON-FERROUS

For patent information visit www.ksptpatents.com

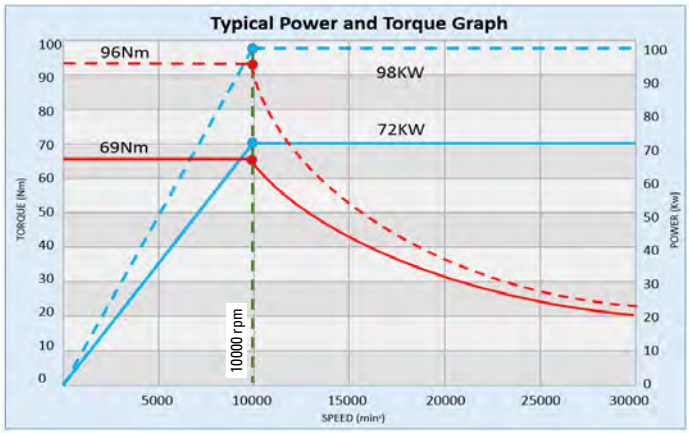
S-Carb APR®



Series 43APR-3 43APR-4 Metric			Ae x DC	Ap x DC	Vc (m/min)		DC • mm APR-3 20	APR-3 25	APR-4 20	APR-4 25
N	ALUMINIUM ALLOYS 6068, 7075	Slot	1	≤ 1	1600	RPM	25461	20369	25461	20369
					(300-2100)	Fz	0.14	0.15	0.12	0.13
						Feed (mm/min)	10694	9166	12222	10592
		Profile	≤ 0.5	≤ 1.5	1800	RPM	28644	22915	28644	22915
					(300-2100)	Fz	0.16	0.17	0.14	015
						Feed (mm/min)	13749	11687	16041	13749
		HSM	≤ 0.25	≤ 2	2100	RPM	33418	26735	33418	26735
					(300-2100)	Fz	0.19	0.20	0.16	0.17
						Feed (mm/min)	19048	16041	21388	18180

Series 43APR-3 43APR-4 Metric			Ae x DC	Ap x DC	Vc (m/min)		DC • mm APR-3 LONG 12	16	20	25
N	ALUMINIUM ALLOYS 6068, 7075	Slot	1	≤ 1	1600	RPM	26522	19892	15913	12731
					(300-2100)	Fz	0.10	0.11	0.12	0.13
						Feed (mm/min)	7957	6564	5729	4965
		Profile	≤ 0.5	≤ 1.5	1800	RPM	31827	23870	19096	15277
					(300-2100)	Fz	0.12	0.13	0.14	0.15
						Feed (mm/min)	11458	9309	8020	6875
		HSM	≤ 0.25	≤ 2	2100	RPM	37131	27849	22279	17823
					(300-2100)	Fz	0.14	0.15	0.16	0.17
						Feed (mm/min)	15595	12532	10694	9090

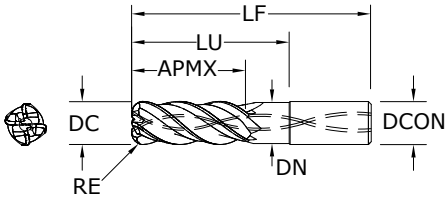
RPM stated may be outside of most machine tools in the smaller sizes, adjust the surface speed but maintain the Fz
For best results use the peak power of the specific machine torque chart.
Typically 10kw is required to remove 1 litre of material (MMR).
Eg. >> (Ae x Ap x Feed) / 1000000 >> Therefore Full slotting Ø25: 25 x 25 x 7333 = 4.58 Litres so it needs a min of 46Kw.
Larger cuts and chip load consume more power.
Review the power chart of each machine to determine MAX power for ultimate performance.
Example below shows peak power @ 10,000 rpm.
The APR-4 design is for ultimate metal removal but typicaly requires more power, and is also better suited to horizontal machines.
The new coolant supply is designed for MQL as well as normal emulsion coolant on the same data.
Ensure max MQL flow prior to cutting.
Refer to the SGS Tool Wizard® for complete technical information (www.kyocera-sgstool.com).



S-Carb APF®

43MAPF

METRIC SERIES



- Ultra high-productivity finisher for Aluminum alloys, specifically for aircraft components
- Two levels of chatter suppression: variable helix and indexing
- Designed for single axial pass semi-finishing and finishing
- Polished flutes maximize chip evacuation and provides enhanced finish
- Recommended for materials ≤ 150 Bhn (≤ 7 HRc)

mm							EDP NO.
CUTTING DIAMETER DC	LENGTH OF CUT APMX	OVERALL LENGTH LF	SHANK DIAMETER DCON	REACH LU	NECK DIAMETER DN	CORNER RADIUS RE	Ti-NAMITE®-B (TiB_2)
6,0	24,0	58,0	6,0	30,0	5,70	–	44627
8,0	32,0	64,0	8,0	40,0	7,60	–	44628
10,0	40,0	80,0	10,0	50,0	9,50	–	44629
12,0	30,0	83,0	12,0	40,0	11,40	–	44630
12,0	30,0	83,0	12,0	40,0	11,40	2,0	44745
12,0	30,0	83,0	12,0	40,0	11,40	3,0	44746
12,0	30,0	83,0	12,0	40,0	11,40	4,0	44747
12,0	30,0	83,0	12,0	50,0	11,40	0,5	44641
12,0	30,0	83,0	12,0	50,0	11,40	5,0	44642
12,0	48,0	100,0	12,0	62,0	11,40	–	44631
12,0	48,0	100,0	12,0	62,0	11,40	2,0	44748
12,0	48,0	100,0	12,0	62,0	11,40	3,0	44749
12,0	48,0	100,0	12,0	62,0	11,40	4,0	44750
16,0	40,0	92,0	16,0	51,0	15,20	–	44634
16,0	40,0	92,0	16,0	51,0	15,20	2,0	44751
16,0	40,0	92,0	16,0	51,0	15,20	3,0	44752
16,0	40,0	92,0	16,0	51,0	15,20	4,0	44753
16,0	42,0	93,0	16,0	51,0	15,20	5,0	44643
16,0	64,0	125,0	16,0	82,0	15,20	–	44635
16,0	64,0	125,0	16,0	82,0	15,20	2,0	44754
16,0	64,0	125,0	16,0	82,0	15,20	3,0	44755
16,0	64,0	125,0	16,0	82,0	15,20	4,0	44756
20,0	50,0	108,0	20,0	63,0	19,00	–	44636
20,0	50,0	108,0	20,0	63,0	19,00	3,0	44757
20,0	50,0	108,0	20,0	63,0	19,00	4,0	44758
20,0	50,0	108,0	20,0	63,0	19,00	5,0	44759
20,0	80,0	150,0	20,0	102,0	19,00	–	44637
20,0	80,0	150,0	20,0	102,0	19,00	3,0	44760
20,0	80,0	150,0	20,0	102,0	19,00	4,0	44761
20,0	80,0	150,0	20,0	102,0	19,00	5,0	44762
25,0	63,0	130,0	25,0	79,0	23,75	–	44638
25,0	63,0	130,0	25,0	79,0	23,75	3,0	44763
25,0	63,0	130,0	25,0	79,0	23,75	4,0	44764
25,0	63,0	130,0	25,0	79,0	23,75	5,0	44765
25,0	100,0	175,0	25,0	120,0	23,75	–	44639
25,0	100,0	175,0	25,0	120,0	23,75	3,0	44766
25,0	100,0	175,0	25,0	120,0	23,75	4,0	44767
25,0	100,0	175,0	25,0	120,0	23,75	5,0	44768

Available on request: • JetStream Technology

TOLERANCES (mm)

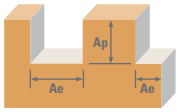
6–25 DIAMETER

DC = –0,010/–0,050
DCON = h_6
RE = +0,03/–0,03

NON-FERROUS

For patent information visit www.ksptpatents.com

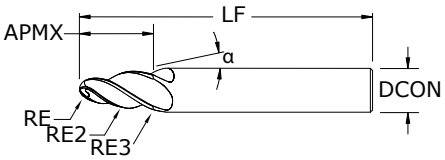
S-Carb APF®



	Series 43MAPF Metric	Hardness		Ae x DC	Ap x DC	Vc (m/min)		DC • mm 6	8	10	12	16	20	25
N	ALUMINUM ALLOYS 2024, 5052, 5086, 6061, 6063, 7075	≤ 150 Bhn or ≤ 88 HRb	Profile	≤ 0.1	≤ 2.5	800	RPM	42440	31830	25464	21220	15915	12732	10186
						(640-960)	Fz	0.050	0.055	0.060	0.070	0.100	0.140	0.170
							Feed (mm/min)	8488	7003	6111	5942	6366	7130	6926
			Profile	≤ 0.1	≤ 4	800	RPM	42440	31830	25464	21220	15915	12732	10186
						(640-960)	Fz	0.040	0.045	0.050	0.050	0.070	0.100	0.120
							Feed (mm/min)	6790	5729	5093	4244	4456	5093	4889
	ALUMINUM ALLOYS (LITHIUM)* 2090, 2091, 2099, 2195, 2199, 2297, 8090	≤ 150 Bhn or ≤ 88 HRb	Profile	≤ 0.1	≤ 2.5	600	RPM	31830	23873	19098	15915	11936	9549	7639
						(480-720)	Fz	0.050	0.055	0.060	0.070	0.100	0.140	0.170
							Feed (mm/min)	6366	5252	4584	4456	4774	5347	5195
			Profile	≤ 0.1	≤ 4	600	RPM	31830	23873	19098	15915	11936	9549	7639
						(480-720)	Fz	0.040	0.045	0.050	0.050	0.070	0.100	0.120
							Feed (mm/min)	5093	4297	3820	3183	3342	3820	3667

Bhn (Brinell) HRb (Rockwell B)
surface speed is dependent on machine spindle and fixturing
balancing is recommended at ultra high surface speeds
*tool life may be reduced when machining Lithium Alloys
rpm = (Vc x 1000) / (DC x 3.14)
mm/min = Fz x 4 x rpm
maximum recommended depths shown
reduce speed and feed for materials harder than listed
finish cuts typically require reduced feed and cutting depths of 0.02 X DC maximum
ramp angle = 6˚ (feed rate = 50%)
plunging not recommended
refer to the SGS Tool Wizard® for complete technical information (www.kyocera-sgstool.com)

S-Carb APF-B®



APF-B

METRIC SERIES

- Designed to significantly improve traditional ball end applications
- Highly efficient at finishing and semi-finishing profiling
- Main application areas include profiling and pocket milling
- Especially suited to machining deep pockets and hard-to-reach areas without using long-reach tools
- Their versatility also allows for machining profiles and blends with one tool
- Recommended for materials ≤ 150 Bhn (≤ 7 HRc)

mm								EDP NO.
SHANK DIAMETER DCON	LENGTH OF CUT APMX	OVERALL LENGTH LF	CENTERLINE ANGLE α	TIP RADIUS RE	TAPERED RADIUS RE2	BLENDED RADIUS RE3	NO. OF FLUTES	Ti-NAMITE®-B (TiB_2)
6,0	9,5	58,0	17.5°	1,0	250,0	3,0	3	45718
6,0	8,0	58,0	17.5°	1,5	250,0	3,0	3	45719
8,0	10,5	80,0	20°	1,5	250,0	4,0	3	45720
8,0	9,5	80,0	20°	2,0	250,0	4,0	3	45721
10,0	12,5	89,0	20°	2,0	250,0	5,0	3	45722
10,0	11,5	89,0	20°	2,5	250,0	5,0	3	45723
12,0	13,5	100,0	20°	3,0	250,0	6,0	4	45724
12,0	14,4	100,0	20°	2,5	250,0	6,0	4	45725
12,0	20,0	100,0	14°	2,0	60,0	6,0	4	45726
16,0	31,0	109,0	12.5°	2,0	1000,0	5,0	4	45727
16,0	27,5	109,0	12.5°	3,0	1000,0	5,0	4	45728
16,0	24,0	109,0	12.5°	4,0	1000,0	5,0	4	45729
16,0	21,0	109,0	15°	4,0	1000,0	5,0	4	45730
16,0	18,5	109,0	20°	4,0	1500,0	8,0	4	45731
16,0	28,5	109,0	10°	4,0	1000,0	5,0	4	45732
16,0	19,0	109,0	20°	3,0	750,0	5,0	4	45733
16,0	15,0	109,0	30°	2,0	750,0	3,0	4	45734
16,0	18,5	109,0	20°	3,0	60,0	5,0	4	45735

TOLERANCES (mm)

DCON = h_6

RE = –0,010/–0,010

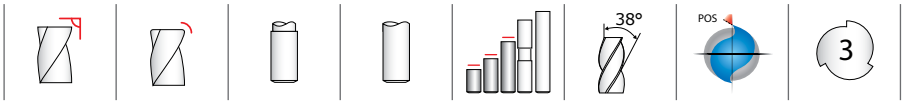
NON-FERROUS

For patent information visit www.ksptpatents.com

S-Carb APF-B®

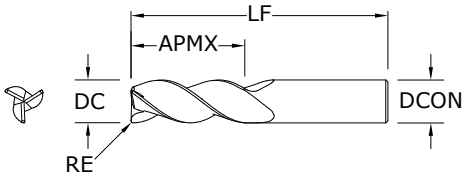
			DCON	6		8		10		12		16	
			Ae max	0,20	0,45	0,25	0,55	0,30	0,60	0,35	0,65	0,40	0,70
			Diameter	3,0	6,0	4,0	8,0	5,0	10,0	6,0	12,0	8,0	16,0
Metric	Hardness (HRb)	Vc (m/min)	Cut Zone	RE	RE2	RE	RE2	RE	RE2	RE	RE2	RE	RE2
N Aluminum	≤88	510	RPM	54111	27056	40583	20292	32467	16233	27056	13528	20292	10146
		(388-632)	Fz	0,017	0,040	0,021	0,050	0,025	0,060	0,033	0,080	0,042	0,100
			Feed (mm/min)	2706	3247	2536	3044	2435	2922	3607	4329	3382	4058
	≥88	330	RPM	35013	17507	26260	13130	21008	10504	17507	8753	13130	6565
		(284-376)	Fz	0,013	0,030	0,017	0,040	0,021	0,050	0,025	0,060	0,033	0,080
			Feed (mm/min)	1313	1576	1313	1576	1313	1576	1751	2101	1751	2101

rpm = (Vc x 1000) / (DC x 3.14)
Feed= Fz x No. of flutes x rpm
Adjust speed and feed cutting
Adjust rates according to cutting area of tool being used
Avoid using tip of the tool where possible due to reduced chip space
Be aware of max cut Ae, especially on the lower portion of the tool
Refer to the SGS Tool Wizard® for complete technical information (www.kyocera-sgstool.com)



43M • 43MCR

METRIC SERIES



- Circular land allows for increased control at various speed and feed rates and reduces chatter
- Symmetrical end gashing for excellent balance at high speeds and aggressive plunging capability
- Open fluting for deep slotting and profiling
- Enhanced corner geometry with tight tolerance corner radii
- Recommended for materials ≤ 150 Bhn (≤ 7 HRc)

mm					EDP NO.	
CUTTING DIAMETER DC	LENGTH OF CUT APMX	OVERALL LENGTH LF	SHANK DIAMETER DCON	CORNER RADIUS RE	UNCOATED	Ti-NAMITE®-B (TiB_2)
3,0	8,0	52,0	6,0	–	–	44890
4,0	11,0	55,0	6,0	–	–	44891
5,0	13,0	57,0	6,0	–	–	44892
6,0	13,0	57,0	6,0	–	44701	44715
6,0	13,0	57,0	6,0	1,5	–	44732
6,0	13,0	57,0	6,0	0,5	–	44902
6,0	13,0	57,0	6,0	1,0	–	44894
6,0	13,0	72,0	6,0	–	44702	44716
6,0	13,0	72,0	6,0	0,8	–	44842
6,0	13,0	72,0	6,0	1,2	–	44843
6,0	24,0	75,0	6,0	–	–	44893
6,0	24,0	75,0	6,0	0,5	–	44844
6,0	24,0	75,0	6,0	1,0	–	44845
8,0	19,0	63,0	8,0	–	44703	44717
8,0	19,0	63,0	8,0	0,3	–	44846
8,0	19,0	63,0	8,0	0,5	–	44847
8,0	19,0	63,0	8,0	1,0	–	44848
8,0	19,0	63,0	8,0	1,5	–	44849
8,0	32,0	75,0	8,0	–	–	44895
8,0	32,0	75,0	8,0	0,5	–	44850
8,0	32,0	75,0	8,0	1,0	–	44851
8,0	32,0	75,0	8,0	1,5	–	44852
8,0	32,0	75,0	8,0	2,0	–	44853
10,0	22,0	72,0	10,0	–	44705	44719
10,0	22,0	72,0	10,0	0,3	–	44854
10,0	22,0	72,0	10,0	0,5	–	44855
10,0	22,0	72,0	10,0	1,0	–	44856
10,0	22,0	72,0	10,0	1,5	–	44857
10,0	40,0	100,0	10,0	–	–	44896
10,0	40,0	100,0	10,0	0,5	–	44858
10,0	40,0	100,0	10,0	1,0	–	44859
10,0	40,0	100,0	10,0	1,5	–	44860

continued on next page

TOLERANCES (mm)

≤6 DIAMETER
DC = +0,000/–0,008
DCON = h_6
RE = +0,000/–0,050

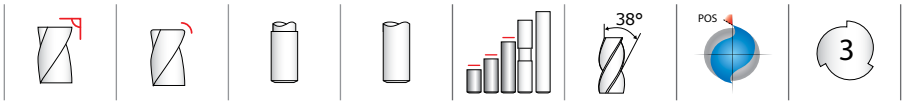
>6–10 DIAMETER
DC = +0,000/–0,009
DCON = h_6
RE = +0,000/–0,050

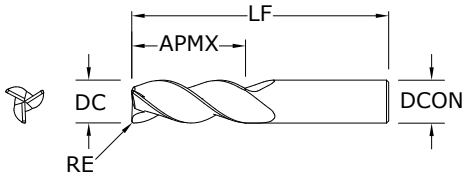
>10–18 DIAMETER
DC = +0,000/–0,011
DCON = h_6
RE = +0,000/–0,050

>18–20 DIAMETER
DC = +0,000/–0,013
DCON = h_6
RE = +0,000/–0,050

NON-FERROUS

For patent information visit www.ksptpatents.com





43M • 43MCR

METRIC SERIES

CONTINUED

TOLERANCES (mm)

≤6 DIAMETER
DC = +0,000/–0,008
DCON = h_6
RE = +0,000/–0,050

>6–10 DIAMETER
DC = +0,000/–0,009
DCON = h_6
RE = +0,000/–0,050

>10–18 DIAMETER
DC = +0,000/–0,011
DCON = h_6
RE = +0,000/–0,050

>18–20 DIAMETER
DC = +0,000/–0,013
DCON = h_6
RE = +0,000/–0,050

NON-FERROUS

For patent information visit www.ksptpatents.com

mm					EDP NO.	
CUTTING DIAMETER DC	LENGTH OF CUT APMX	OVERALL LENGTH LF	SHANK DIAMETER DCON	CORNER RADIUS RE	UNCOATED	Ti-NAMITE®-B (TiB_2)
10,0	40,0	100,0	10,0	2,0	–	44861
12,0	26,0	83,0	12,0	–	44708	44722
12,0	26,0	83,0	12,0	1,5	44814	44733
12,0	26,0	83,0	12,0	2,0	44815	44826
12,0	26,0	83,0	12,0	2,5	44816	44827
12,0	26,0	83,0	12,0	3,0	44817	44734
12,0	48,0	100,0	12,0	–	–	44897
12,0	48,0	100,0	12,0	0,5	–	44862
12,0	48,0	100,0	12,0	1,0	–	44863
12,0	48,0	100,0	12,0	1,5	–	44864
12,0	48,0	100,0	12,0	2,0	–	44865
12,0	48,0	100,0	12,0	2,5	–	44866
12,0	48,0	100,0	12,0	3,0	–	44867
14,0	30,0	89,0	14,0	–	–	44898
14,0	30,0	89,0	14,0	1,0	–	44868
14,0	30,0	89,0	14,0	2,0	–	44869
14,0	30,0	89,0	14,0	3,0	–	44870
16,0	32,0	92,0	16,0	–	44711	44725
16,0	32,0	92,0	16,0	1,5	44818	44735
16,0	32,0	92,0	16,0	2,0	44819	44828
16,0	32,0	92,0	16,0	2,5	44820	44829
16,0	32,0	92,0	16,0	3,0	44821	44736
16,0	32,0	92,0	16,0	4,0	–	44871
16,0	64,0	125,0	16,0	–	–	44900
16,0	64,0	125,0	16,0	0,5	–	44872
16,0	64,0	125,0	16,0	1,0	–	44873
16,0	64,0	125,0	16,0	1,5	–	44874
16,0	64,0	125,0	16,0	2,0	–	44875
16,0	64,0	125,0	16,0	2,5	–	44876
16,0	64,0	125,0	16,0	3,0	–	44877
16,0	64,0	125,0	16,0	4,0	–	44878
20,0	38,0	104,0	20,0	–	44714	44728
20,0	38,0	104,0	20,0	2,0	44822	44830

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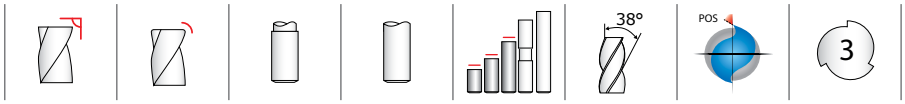
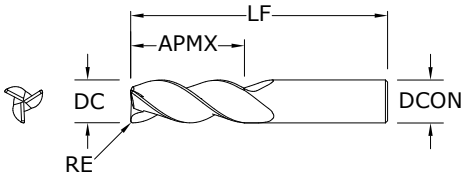


43M • 43MCR

METRIC SERIES



CONTINUED

mm					EDP NO.	
CUTTING DIAMETER DC	LENGTH OF CUT APMX	OVERALL LENGTH LF	SHANK DIAMETER DCON	CORNER RADIUS RE	UNCOATED	Ti-NAMITE®-B (TiB_2)
20,0	38,0	104,0	20,0	2,5	44823	44831
20,0	38,0	104,0	20,0	3,0	44824	44737
20,0	38,0	104,0	20,0	4,0	–	44879
20,0	80,0	150,0	20,0	–	–	44901
20,0	80,0	150,0	20,0	0,5	–	44880
20,0	80,0	150,0	20,0	1,0	–	44881
20,0	80,0	150,0	20,0	1,5	–	44882
20,0	80,0	150,0	20,0	2,0	–	44883
20,0	80,0	150,0	20,0	2,5	–	44884
20,0	80,0	150,0	20,0	3,0	–	44885
20,0	80,0	150,0	20,0	4,0	–	44886
25,0	50,0	125,0	25,0	–	–	44731

TOLERANCES (mm)

≤6 DIAMETER
DC = +0,000/–0,008
DCON = h_6
RE = +0,000/–0,050

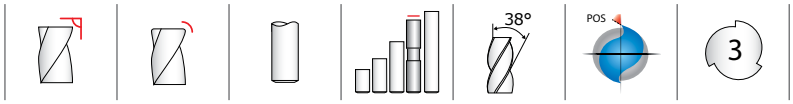
>6–10 DIAMETER
DC = +0,000/–0,009
DCON = h_6
RE = +0,000/–0,050

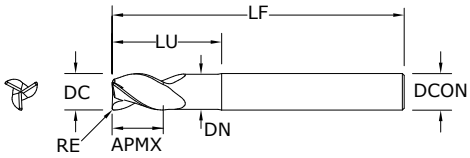
>10–18 DIAMETER
DC = +0,000/–0,011
DCON = h_6
RE = +0,000/–0,050

>18–20 DIAMETER
DC = +0,000/–0,013
DCON = h_6
RE = +0,000/–0,050

NON-FERROUS

For patent information visit www.ksptpatents.com





43ML • 43MLC

METRIC SERIES

TOLERANCES (mm)

6 DIAMETER
DC = +0,000/–0,008
DCON = h_6

>6–10 DIAMETER
DC = +0,000/–0,009
DCON = h_6
RE = +0,000/–0,050

>10–18 DIAMETER
DC = +0,000/–0,011
DCON = h_6
RE = +0,000/–0,050

>18–20 DIAMETER
DC = +0,000/–0,013
DCON = h_6
RE = +0,000/–0,050
RE = +0,000/–0,050

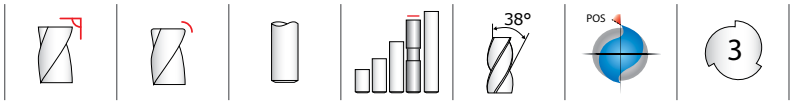
NON-FERROUS

For patent information visit www.ksptpatents.com

mm							EDP NO.	
CUTTING DIAMETER DC	LENGTH OF CUT APMX	OVERALL LENGTH LF	SHANK DIAMETER DCON	REACH LU	NECK DIAMETER DN	CORNER RADIUS RE	UNCOATED	Ti-NAMITE®-B (TiB_2)
6,0	10,0	63,0	6,0	20,0	5,49	0,5	44769	44789
6,0	10,0	63,0	6,0	20,0	5,49	1,0	44770	44790
6,0	10,0	75,0	6,0	20,0	5,49	–	–	42706
6,0	13,0	72,0	6,0	30,0	5,49	0,5	44771	44791
6,0	13,0	72,0	6,0	30,0	5,49	1,0	44772	44792
8,0	12,0	75,0	8,0	25,0	7,49	–	–	42707
8,0	12,0	75,0	8,0	25,0	7,49	0,3	44773	44793
8,0	12,0	75,0	8,0	25,0	7,49	0,5	44774	44794
8,0	12,0	75,0	8,0	25,0	7,49	0,8	–	44950
8,0	12,0	75,0	8,0	25,0	7,49	1,0	44775	44795
8,0	12,0	75,0	8,0	25,0	7,49	1,2	–	44951
8,0	12,0	75,0	8,0	25,0	7,49	1,5	44776	44796
8,0	12,0	75,0	8,0	25,0	7,49	1,6	–	44952
10,0	14,0	100,0	10,0	35,0	9,48	–	–	42708
10,0	14,0	100,0	10,0	35,0	9,48	0,3	44777	44797
10,0	14,0	100,0	10,0	35,0	9,48	0,5	44778	44798
10,0	14,0	100,0	10,0	35,0	9,48	1,0	44779	44799
10,0	14,0	100,0	10,0	35,0	9,48	1,5	44780	44800
10,0	14,0	100,0	10,0	35,0	9,50	0,8	–	44953
10,0	14,0	100,0	10,0	35,0	9,50	1,2	–	44954
10,0	14,0	100,0	10,0	35,0	9,50	1,6	–	44955
10,0	14,0	100,0	10,0	35,0	9,50	2,4	–	44956
12,0	16,0	100,0	12,0	40,0	11,48	–	–	42709
12,0	16,0	100,0	12,0	40,0	11,48	0,5	44781	44801
12,0	16,0	100,0	12,0	40,0	11,48	0,8	–	44957
12,0	16,0	100,0	12,0	40,0	11,48	1,0	44782	44802
12,0	16,0	100,0	12,0	40,0	11,48	1,2	–	44958
12,0	16,0	100,0	12,0	40,0	11,48	1,5	44783	44803
12,0	16,0	100,0	12,0	40,0	11,48	1,6	–	44959
12,0	16,0	100,0	12,0	40,0	11,48	2,0	44784	44804
12,0	16,0	100,0	12,0	40,0	11,48	2,4	–	44960
12,0	16,0	100,0	12,0	40,0	11,48	2,5	44832	44839
12,0	16,0	100,0	12,0	40,0	11,48	3,0	44833	44738
12,0	16,0	100,0	12,0	40,0	11,48	4,0	44834	44741
14,0	18,0	125,0	14,0	45,0	13,49	–	–	44899

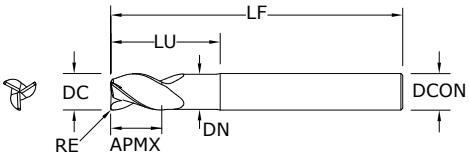
continued on next page

- Circular land allows for increased control at various speed and feed rates and reduces chatter
- Symmetrical end gashing for excellent balance at high speeds and aggressive plunging capability
- Open fluting for deep slotting and profiling
- Necked design with blended diameter transitions provide clearance to reach
- Enhanced corner geometry with tight tolerance corner radii
- Recommended for materials ≤ 150 Bhn (≤ 7 HRc)



43ML • 43MLC

METRIC SERIES



CONTINUED

mm							EDP NO.	
CUTTING DIAMETER DC	LENGTH OF CUT APMX	OVERALL LENGTH LF	SHANK DIAMETER DCON	REACH LU	NECK DIAMETER DN	CORNER RADIUS RE	UNCOATED	Ti-NAMITE®-B (TiB_2)
14,0	18,0	125,0	14,0	45,0	13,49	1,0	–	44961
14,0	18,0	125,0	14,0	45,0	13,49	2,0	–	44962
14,0	18,0	125,0	14,0	45,0	13,49	3,0	–	44963
14,0	18,0	125,0	14,0	45,0	13,49	4,0	–	44964
16,0	20,0	125,0	16,0	50,0	15,47	–	–	42710
16,0	20,0	125,0	16,0	50,0	15,47	2,0	44785	44805
16,0	20,0	125,0	16,0	50,0	15,47	2,5	44835	44840
16,0	20,0	125,0	16,0	50,0	15,47	3,0	44836	44739
16,0	20,0	125,0	16,0	50,0	15,47	4,0	44786	44806
16,0	20,0	125,0	16,0	50,0	15,49	0,8	–	44965
16,0	20,0	125,0	16,0	50,0	15,49	1,2	–	44966
16,0	20,0	125,0	16,0	50,0	15,49	1,6	–	44967
16,0	20,0	125,0	16,0	50,0	15,49	2,4	–	44968
16,0	20,0	125,0	16,0	50,0	15,49	3,2	–	44969
20,0	25,0	150,0	20,0	65,0	19,46	–	–	42711
20,0	25,0	150,0	20,0	65,0	19,46	2,0	44787	44807
20,0	25,0	150,0	20,0	65,0	19,46	2,4	–	44973
20,0	25,0	150,0	20,0	65,0	19,46	2,5	44837	44841
20,0	25,0	150,0	20,0	65,0	19,46	3,0	44838	44740
20,0	25,0	150,0	20,0	65,0	19,46	4,0	44788	44808
20,0	25,0	150,0	20,0	65,0	19,48	0,8	–	44970
20,0	25,0	150,0	20,0	65,0	19,48	1,2	–	44971
20,0	25,0	150,0	20,0	65,0	19,48	1,6	–	44972
20,0	25,0	150,0	20,0	65,0	19,48	3,2	–	44974

TOLERANCES (mm)

6 DIAMETER
DC = +0,000/–0,008
DCON = h_6

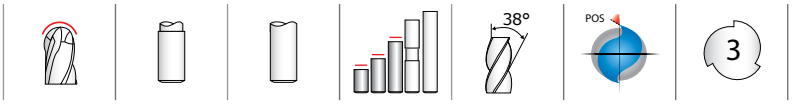
>6–10 DIAMETER
DC = +0,000/–0,009
DCON = h_6
RE = +0,000/–0,050

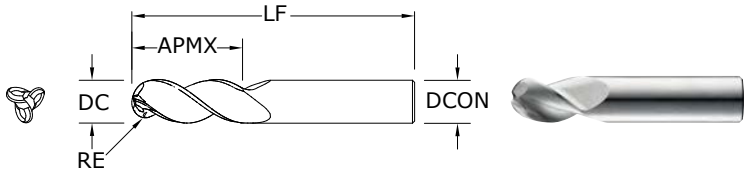
>10–18 DIAMETER
DC = +0,000/–0,011
DCON = h_6
RE = +0,000/–0,050

>18–20 DIAMETER
DC = +0,000/–0,013
DCON = h_6
RE = +0,000/–0,050

NON-FERROUS

For patent information visit www.ksptpatents.com





43MB
METRIC SERIES

TOLERANCES (mm)

3 DIAMETER
DC = +0,000/–0,006
DCON = h_6
RE = +0,0127/–0,0127

>3–6 DIAMETER
DC = +0,000/–0,008
DCON = h_6
RE = +0,0127/–0,0127

>6–10 DIAMETER
DC = +0,000/–0,009
DCON = h_6
RE = +0,0127/–0,0127

>10–18 DIAMETER
DC = +0,000/–0,011
DCON = h_6
RE = +0,0127/–0,0127

>18–25 DIAMETER
DC = +0,000/–0,013
DCON = h_6
RE = +0,0127/–0,0127

NON-FERROUS

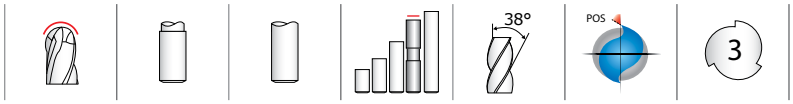
For patent information visit www.ksptpatents.com

mm				EDP NO.
CUTTING DIAMETER DC	LENGTH OF CUT APMX	OVERALL LENGTH LF	SHANK DIAMETER DCON	Ti-NAMITE®-B (TiB_2)
3,0	4,5	57,0	6,0	44916
4,0	6,0	57,0	6,0	44919
5,0	7,5	57,0	6,0	44922
6,0	9,0	57,0	6,0	44925
8,0	12,0	63,0	8,0	44928
10,0	15,0	75,0	10,0	44931
12,0	18,0	83,0	12,0	44934
16,0	24,0	100,0	16,0	44937
20,0	30,0	108,0	20,0	44940
25,0	37,5	127,0	25,0	44943

RE = 1/2 Cutting Diameter (DC)

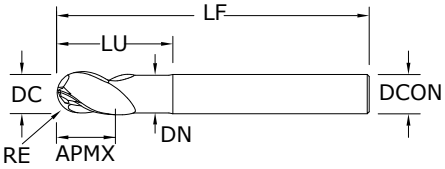
- Circular land allows for increased control at various speed and feed rates and reduces chatter
- Open fluting for deep slotting and profiling
- Ball end design ideal for finishing operations in complex workpieces
- Recommended for materials ≤ 150 Bhn (≤ 7 HRc)

S-Carb®



43MB

METRIC SERIES



- Circular land allows for increased control at various speed and feed rates and reduces chatter
- Open fluting for deep slotting and profiling
- Ball end design ideal for finishing operations in complex workpieces
- Recommended for materials ≤ 150 Bhn (≤ 7 HRc)

mm						EDP NO.
CUTTING DIAMETER DC	LENGTH OF CUT APMX	OVERALL LENGTH LF	SHANK DIAMETER DCON	REACH LU	NECK DIAMETER DN	Ti-NAMITE®-B (TiB_2)
3,0	6,0	57,0	6,0	10,0	2,74	44917
3,0	9,0	57,0	6,0	16,0	2,74	44918
4,0	8,0	57,0	6,0	13,0	3,73	44920
4,0	12,0	57,0	6,0	21,0	3,73	44921
5,0	10,0	63,0	6,0	16,0	4,50	44923
5,0	15,0	63,0	6,0	26,0	4,50	44924
6,0	12,0	63,0	6,0	19,0	5,49	44926
6,0	18,0	75,0	6,0	31,0	5,49	44927
8,0	16,0	75,0	8,0	25,0	7,49	44929
8,0	24,0	83,0	8,0	41,0	7,49	44930
10,0	20,0	83,0	10,0	31,0	9,50	44932
10,0	30,0	100,0	10,0	51,0	9,50	44933
12,0	24,0	100,0	12,0	37,0	11,48	44935
12,0	36,0	130,0	12,0	61,0	11,48	44936
16,0	32,0	130,0	16,0	49,0	15,49	44938
16,0	48,0	150,0	16,0	81,0	15,49	44939
20,0	40,0	130,0	20,0	61,0	19,48	44941
20,0	60,0	150,0	20,0	101,0	19,48	44942
25,0	50,0	152,0	25,0	76,0	24,49	44944
25,0	75,0	170,0	25,0	126,0	24,49	44945

RE = 1/2 Cutting Diameter (DC)

TOLERANCES (mm)

3 DIAMETER
DC = +0,000/–0,006
DCON = h_6
RE = +0,0127/–0,0127

>3–6 DIAMETER
DC = +0,000/–0,008
DCON = h_6
RE = +0,0127/–0,0127

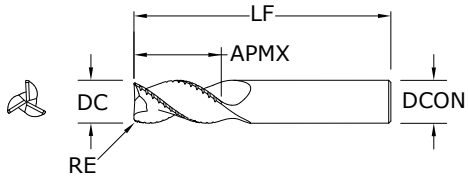
>6–10 DIAMETER
DC = +0,000/–0,009
DCON = h_6
RE = +0,0127/–0,0127

>10–18 DIAMETER
DC = +0,000/–0,011
DCON = h_6
RE = +0,0127/–0,0127

>18–25 DIAMETER
DC = +0,000/–0,013
DCON = h_6
RE = +0,0127/–0,0127

NON-FERROUS

For patent information visit www.ksptpatents.com



43MCB

METRIC SERIES

TOLERANCES (mm)

>6–10 DIAMETER
DC = +0,000/–0,009
DCON = h_6
RE = +0,000/–0,050

>10–18 DIAMETER
DC = +0,000/–0,011
DCON = h_6
RE = +0,000/–0,050

>18–20 DIAMETER
DC = +0,000/–0,013
DCON = h_6
RE = +0,000/–0,050

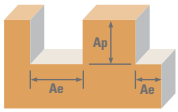
NON-FERROUS

For patent information visit www.ksptpatents.com

mm					EDP NO.	
CUTTING DIAMETER DC	LENGTH OF CUT APMX	OVERALL LENGTH LF	SHANK DIAMETER DCON	CORNER RADIUS RE	UNCOATED	Ti-NAMITE®-B (TiB_2)
6,0	19,0	63,0	6,0	0,5	44298	44299
8,0	19,0	63,0	8,0	0,3	44300	44305
10,0	22,0	72,0	10,0	0,3	44301	44306
12,0	26,0	83,0	12,0	1,0	44302	44307
16,0	32,0	92,0	16,0	1,0	44303	44308
20,0	38,0	104,0	20,0	1,0	44304	44309

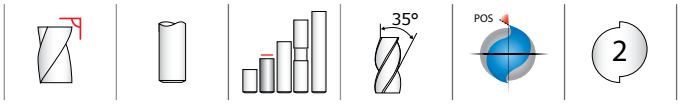
- Circular land allows for increased control at various speed and feed rates and reduces chatter
- Symmetrical end gashing for excellent balance at high speeds and aggressive plunging capability
- Chip breakers reduce machine loads up to 15% for increased roughing feed rate capability
- Open fluting for deep slotting and profiling
- Recommended for materials ≤ 150 Bhn (≤ 7 HRc)

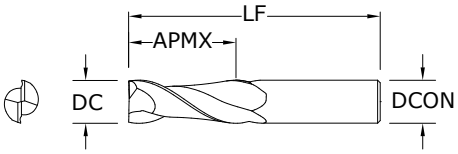
S-Carb®



	Series 43M, 43MB, 43MCR, 43ML, 43MLC, 43MCB Metric	Hardness		Ae x DC	Ap x DC	Vc (m/min)		DC • mm 3	6	10	12	16	20	25
N	ALUMINUM ALLOYS 2024, 5052, 5086, 6061, 6073, 7075	≤ 150 Bhn or ≤ 88 HRb	Slot	1	≤ 1	490	RPM	52022	26011	15607	13005	9754	7803	6243
						(392-588)	Fz	0.022	0.060	0.120	0.144	0.166	0.187	0.213
							Feed (mm/min)	3371	4682	5618	5618	4869	4370	3980
			Profile	≤ 0.5	≤ 1.5	610	RPM	64762	32381	19429	16190	12143	9714	7771
						(488-732)	Fz	0.022	0.060	0.120	0.144	0.166	0.187	0.213
							Feed (mm/min)	4196	5828	6994	6994	6061	5440	4955
			HSM	≤ 0.05	≤ 2	1005	RPM	106698	53349	32009	26674	20006	16005	12804
						(804-1206)	Fz	0.050	0.132	0.280	0.336	0.384	0.440	0.488
							Feed (mm/min)	16131	21124	26888	26885	23046	21126	18726
	ALUMINUM DIE CAST ALLOYS (HIGH SILICONE) A-390, A-392, B- 390	≤ 125 Bhn or ≤ 77 HRb	Slot	1	≤ 1	185	RPM	19641	9820	5892	4910	3683	2946	2357
						(148-222)	Fz	0.022	0.060	0.120	0.144	0.166	0.187	0.213
							Feed (mm/min)	1273	1768	2121	2121	1838	1650	1503
			Profile	≤ 0.5	≤ 1.5	230	RPM	24418	12209	7326	6105	4578	3663	2930
						(184-276)	Fz	0.022	0.060	0.120	0.144	0.166	0.187	0.213
							Feed (mm/min)	1582	2197	2637	2637	2285	2051	1868
			HSM	≤ 0.05	≤ 2	380	RPM	40343	20172	12103	10086	7564	6052	4841
						(304-456)	Fz	0.050	0.132	0.280	0.336	0.384	0.440	0.488
							Feed (mm/min)	6099	7987	10166	10166	8714	7988	7081
	COPPER ALLOYS Aluminum Bronze Brass Naval Brass Red Brass	≤ 140 Bhn or ≤ 3 HRc	Slot	1	≤ 1	265	RPM	28134	14067	8440	7034	5275	4220	3376
						(212-318)	Fz	0.019	0.048	0.107	0.120	0.141	0.160	0.175
							Feed (mm/min)	1620	2025	2701	2532	2228	2026	1773
			Profile	≤ 0.5	≤ 1.5	330	RPM	35035	17518	10511	8759	6569	5255	4204
						(264-396)	Fz	0.019	0.048	0.107	0.120	0.141	0.160	0.175
							Feed (mm/min)	2018	2522	3363	3153	2775	2523	2207
			HSM	≤ 0.05	≤ 2	545	RPM	57861	28930	17358	14465	10849	8679	6943
						(436-654)	Fz	0.041	0.108	0.227	0.276	0.320	0.373	0.400
							Feed (mm/min)	7082	9373	11804	11976	10415	9721	8332
	COPPER ALLOYS Beryllium Copper C110, Manganese Bronze, Tin Bronze	≤ 200 Bhn or ≤ 23 HRc	Slot	1	≤ 1	105	RPM	11148	5574	3344	2787	2090	1672	1338
						(84-126)	Fz	0.019	0.048	0.107	0.120	0.141	0.160	0.175
							Feed (mm/min)	642	803	1070	1003	883	803	702
			Profile	≤ 0.5	≤ 1.5	130	RPM	13802	6901	4141	3450	2588	2070	1656
						(104-156)	Fz	0.019	0.048	0.107	0.120	0.141	0.160	0.175
							Feed (mm/min)	795	994	1325	1242	1093	994	870
			HSM	≤ 0.05	≤ 2	215	RPM	22826	11413	6848	5706	4280	3424	2739
						(172-258)	Fz	0.041	0.108	0.227	0.276	0.320	0.373	0.400
							Feed (mm/min)	2794	3697	4656	4725	4109	3835	3287
	PLASTICS ABS, Polycarbonate, PVC, Polypropylene		Slot	1	≤ 1	490	RPM	52022	26011	15607	13005	9754	7803	6243
						(392-588)	Fz	0.036	0.096	0.200	0.240	0.282	0.320	0.350
							Feed (mm/min)	5618	7490	9364	9363	8240	7491	6555
			Profile	≤ 0.5	≤ 1.5	610	RPM	64762	32381	19429	16190	12143	9714	7771
						(488-732)	Fz	0.036	0.096	0.200	0.240	0.282	0.320	0.350
							Feed (mm/min)	6994	9325	11657	11656	10258	9326	8160
			HSM	≤ 0.05	≤ 2	1005	RPM	106698	53349	32009	26674	20006	16005	12804
						(804-1206)	Fz	0.082	0.216	0.453	0.552	0.640	0.733	0.800
							Feed (mm/min)	26117	34567	43532	44169	38410	35210	30730

Bhn (Brinell) HRc (Rockwell C) HRb (Rockwell B) HSM (High Speed Machining)
rpm = (Vc x 1000) / (DC x 3.14)
mm/min = Fz x 3 x rpm
reduce speed and feed for materials harder than listed
reduce cut depth and feed by 50% for long flute and long reach tools
reduce feed and Ae when finish milling (.02 x DC maximum)
refer to the SGS Tool Wizard® for complete technical information (www.kyocera-sgstool.com)





47M
METRIC SERIES

TOLERANCES (mm)

3 DIAMETER
DC = +0,000/–0,006
DCON = h_6

>3–6 DIAMETER
DC = +0,000/–0,008
DCON = h_6

>6–10 DIAMETER
DC = +0,000/–0,009
DCON = h_6

>10–18 DIAMETER
DC = +0,000/–0,012
DCON = h_6

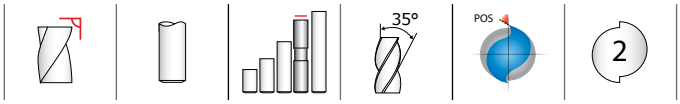
>18–25 DIAMETER
DC = +0,000/–0,013
DCON = h_6

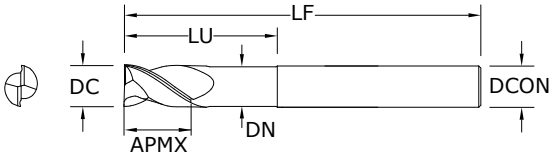
NON-FERROUS

For patent information visit www.ksptpatents.com

mm				EDP NO.	
CUTTING DIAMETER DC	LENGTH OF CUT APMX	OVERALL LENGTH LF	SHANK DIAMETER DCON	UNCOATED	Ti-NAMITE®-B (TiB_2)
3,0	8,0	38,0	3,0	44550	44587
4,0	11,0	50,0	4,0	44551	44588
5,0	13,0	50,0	5,0	44552	44589
6,0	13,0	57,0	6,0	44553	44590
8,0	19,0	63,0	8,0	44554	44591
10,0	22,0	72,0	10,0	44555	44592
12,0	26,0	83,0	12,0	44556	44593
14,0	26,0	83,0	14,0	44557	44594
16,0	32,0	92,0	16,0	44558	44595
20,0	38,0	104,0	20,0	44559	44596
25,0	38,0	104,0	25,0	44560	44597

- Circular land reduces edge aggressiveness for varied speed and feed rates
- 2 Flutes effectively manage the large size and volume of chips produced during the aggressive machining process
- Excellent balance at high speeds and aggressive plunging capability
- Recommended for materials ≤ 150 Bhn (≤ 7 HRc)





47ML
METRIC SERIES

TOLERANCES (mm)

6 DIAMETER
DC = +0,000/–0,008
DCON = h_6

>6–10 DIAMETER
DC = +0,000/–0,009
DCON = h_6

>10–18 DIAMETER
DC = +0,000/–0,011
DCON = h_6

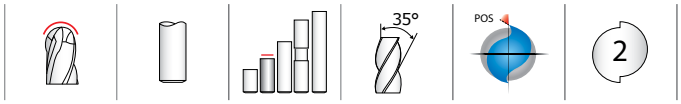
>18–20 DIAMETER
DC = +0,000/–0,013
DCON = h_6

NON-FERROUS

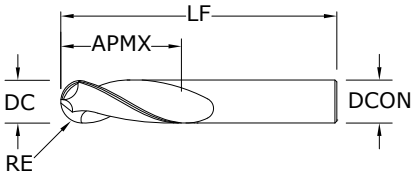
For patent information visit www.ksptpatents.com

mm						EDP NO.	
CUTTING DIAMETER DC	LENGTH OF CUT APMX	OVERALL LENGTH LF	SHANK DIAMETER DCON	REACH LU	NECK DIAMETER DN	UNCOATED	Ti-NAMITE®-B (TiB_2)
6,0	10,0	100,0	6,0	54,0	5,62	44561	44609
8,0	12,0	100,0	8,0	54,0	7,62	44562	44610
10,0	12,0	100,0	10,0	54,0	9,62	44563	44611
12,0	16,0	150,0	12,0	80,0	11,62	44564	44612
16,0	20,0	150,0	16,0	80,0	15,62	44565	44613
20,0	25,0	150,0	20,0	80,0	19,62	44566	44614

- Circular land reduces edge aggressiveness for varied speed and feed rates
- 2 Flutes effectively manage the large size and volume of chips produced during the aggressive machining process
- Excellent balance at high speeds and aggressive plunging capability
- Necked design with blended diameter transitions provide clearance to reach
- Recommended for materials ≤ 150 Bhn (≤ 7 HRc)



47MB
METRIC SERIES



- Circular land reduces edge aggressiveness for varied speed and feed rates
- 2 Flutes effectively manage the large size and volume of chips produced during the aggressive machining process
- Excellent balance at high speeds and aggressive plunging capability
- Ball end design ideal for finishing operations in complex workpieces
- Recommended for materials ≤ 150 Bhn (≤ 7 HRc)

mm				EDP NO.	
CUTTING DIAMETER DC	LENGTH OF CUT APMX	OVERALL LENGTH LF	SHANK DIAMETER DCON	UNCOATED	Ti-NAMITE®-B (TiB_2)
3,0	8,0	38,0	3,0	44570	44598
4,0	11,0	50,0	4,0	44571	44599
5,0	13,0	50,0	5,0	44572	44600
6,0	13,0	57,0	6,0	44573	44601
8,0	19,0	63,0	8,0	44574	44602
10,0	22,0	72,0	10,0	44575	44603
12,0	26,0	83,0	12,0	44576	44604
14,0	26,0	83,0	14,0	44577	44605
16,0	32,0	92,0	16,0	44578	44606
20,0	37,3	104,0	20,0	44579	44607
25,0	38,0	104,0	25,0	44580	44608

RE = 1/2 Cutting Diameter (DC)

TOLERANCES (mm)

3 DIAMETER
DC = +0,000/–0,006
DCON = h_6
RE = +0,0127/–0,0127

>3–6 DIAMETER
DC = +0,000/–0,008
DCON = h_6
RE = +0,0127/–0,0127

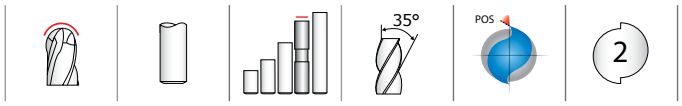
>6–10 DIAMETER
DC = +0,000/–0,009
DCON = h_6
RE = +0,0127/–0,0127

>10–18 DIAMETER
DC = +0,000/–0,012
DCON = h_6
RE = +0,0127/–0,0127

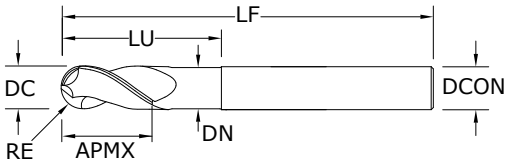
>18–25 DIAMETER
DC = +0,000/–0,013
DCON = h_6
RE = +0,0127/–0,0127

NON-FERROUS

For patent information visit www.ksptpatents.com



47MLB
METRIC SERIES



- Circular land reduces edge aggressiveness for varied speed and feed rates
- 2 Flutes effectively manage the large size and volume of chips produced during the aggressive machining process
- Excellent balance at high speeds and aggressive plunging capability
- Necked design with blended diameter transitions provide clearance to reach
- Ball end design ideal for finishing operations in complex workpieces
- Recommended for materials ≤ 150 Bhn (≤ 7 HRc)

mm						EDP NO.	
CUTTING DIAMETER DC	LENGTH OF CUT APMX	OVERALL LENGTH LF	SHANK DIAMETER DCON	REACH LU	NECK DIAMETER DN	UNCOATED	Ti-NAMITE®-B (TiB_2)
6,0	10,0	100,0	6,0	54,0	5,62	44581	44615
8,0	12,0	100,0	8,0	54,0	7,62	44582	44616
10,0	12,0	100,0	10,0	54,0	9,62	44583	44617
12,0	16,0	150,0	12,0	80,0	11,62	44584	44618
16,0	20,0	150,0	16,0	80,0	15,62	44585	44619
20,0	25,0	150,0	20,0	80,0	19,62	44586	44620

RE = 1/2 Cutting Diameter (DC)

TOLERANCES (mm)

6 DIAMETER
DC = +0,000/–0,008
DCON = h_6
RE = +0,0127/–0,0127

>6–10 DIAMETER
DC = +0,000/–0,009
DCON = h_6
RE = +0,0127/–0,0127

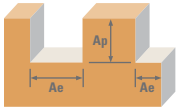
>10–18 DIAMETER
DC = +0,000/–0,011
DCON = h_6
RE = +0,0127/–0,0127

>18–20 DIAMETER
DC = +0,000/–0,013
DCON = h_6
RE = +0,0127/–0,0127

NON-FERROUS

For patent information visit www.ksptpatents.com

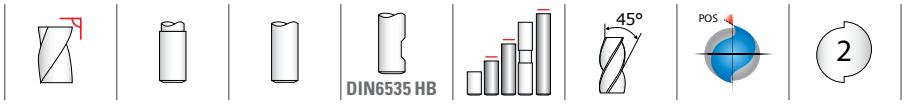
S-Carb®



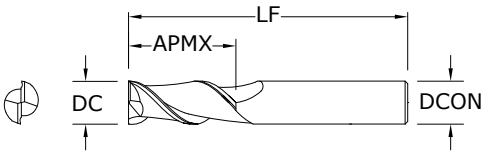
	Series 47M, 47MB, 47ML, 47MLB Metric	Hardness		Ae x DC	Ap x DC	Vc (m/min)		DC • mm 3	6	10	12	16	20	25
N	ALUMINUM ALLOYS 2024, 5052, 5086, 6061, 6073, 7075	≤ 150 Bhn or ≤ 88 HRb	Slot	1	≤ 1	490	RPM	52022	26011	15607	13005	9754	7803	6243
						(392-588)	Fz	0.022	0.060	0.120	0.144	0.166	0.187	0.213
							Feed (mm/min)	2247	3121	3746	3745	3246	2913	2653
			Profile	≤ 0.5	≤ 1.5	610	RPM	64762	32381	19429	16190	12143	9714	7771
						(488-732)	Fz	0.022	0.060	0.120	0.144	0.166	0.187	0.213
							Feed (mm/min)	2797	3885	4663	4662	4041	3627	3303
			HSM	≤ 0.05	≤ 2	1005	RPM	106698	53349	32009	26674	20006	16005	12804
						(804-1206)	Fz	0.050	0.132	0.280	0.336	0.384	0.440	0.488
							Feed (mm/min)	10754	14083	17925	17924	15364	14084	12484
	ALUMINUM DIE CAST ALLOYS (HIGH SILICONE) A-390, A-392, B- 390	≤ 125 Bhn or ≤ 77 HRb	Slot	1	≤ 1	185	RPM	19641	9820	5892	4910	3683	2946	2357
						(148-222)	Fz	0.022	0.060	0.120	0.144	0.166	0.187	0.213
							Feed (mm/min)	848	1178	1414	1414	1226	1100	1002
			Profile	≤ 0.5	≤ 1.5	230	RPM	24418	12209	7326	6105	4578	3663	2930
						(184-276)	Fz	0.022	0.060	0.120	0.144	0.166	0.187	0.213
							Feed (mm/min)	1055	1465	1758	1758	1524	1367	1245
			HSM	≤ 0.05	≤ 2	380	RPM	40343	20172	12103	10086	7564	6052	4841
						(304-456)	Fz	0.050	0.132	0.280	0.336	0.384	0.440	0.488
							Feed (mm/min)	4066	5325	6778	6777	5809	5325	4720
	COPPER ALLOYS Aluminum Bronze Brass Naval Brass Red Brass	≤ 140 Bhn or ≤ 3 HRc	Slot	1	≤ 1	265	RPM	28134	14067	8440	7034	5275	4220	3376
						(212-318)	Fz	0.019	0.048	0.107	0.120	0.141	0.160	0.175
							Feed (mm/min)	1080	1350	1801	1688	1485	1350	1182
			Profile	≤ 0.5	≤ 1.5	330	RPM	35035	17518	10511	8759	6569	5255	4204
						(264-396)	Fz	0.019	0.048	0.107	0.120	0.141	0.160	0.175
							Feed (mm/min)	1345	1682	2242	2102	1850	1682	1472
			HSM	≤ 0.05	≤ 2	545	RPM	57861	28930	17358	14465	10849	8679	6943
						(436-654)	Fz	0.041	0.108	0.227	0.276	0.320	0.373	0.400
							Feed (mm/min)	4721	6248	7869	7984	6943	6480	5555
	COPPER ALLOYS Beryllium Copper C110, Manganese Bronze, Tin Bronze	≤ 200 Bhn or ≤ 23 HRc	Slot	1	≤ 1	105	RPM	11148	5574	3344	2787	2090	1672	1338
						(84-126)	Fz	0.019	0.048	0.107	0.120	0.141	0.160	0.175
							Feed (mm/min)	428	535	713	669	589	535	468
			Profile	≤ 0.5	≤ 1.5	130	RPM	13802	6901	4141	3450	2588	2070	1656
						(104-156)	Fz	0.019	0.048	0.107	0.120	0.141	0.160	0.175
							Feed (mm/min)	530	662	883	828	729	662	580
			HSM	≤ 0.05	≤ 2	215	RPM	22826	11413	6848	5706	4280	3424	2739
						(172-258)	Fz	0.041	0.108	0.227	0.276	0.320	0.373	0.400
							Feed (mm/min)	1862	2465	3104	3150	2739	2556	2191
	PLASTICS ABS, Polycarbonate, PVC, Polypropylene		Slot	1	≤ 1	490	RPM	52022	26011	15607	13005	9754	7803	6243
						(392-588)	Fz	0.036	0.096	0.200	0.240	0.282	0.320	0.350
							Feed (mm/min)	3745	4994	6243	6242	5493	4994	4370
			Profile	≤ 0.5	≤ 1.5	610	RPM	64762	32381	19429	16190	12143	9714	7771
						(488-732)	Fz	0.036	0.096	0.200	0.240	0.282	0.320	0.350
							Feed (mm/min)	4662	6217	7771	7771	6839	6217	5440
			HSM	≤ 0.05	≤ 2	1005	RPM	106698	53349	32009	26674	20006	16005	12804
						(804-1206)	Fz	0.082	0.216	0.453	0.552	0.640	0.733	0.800
							Feed (mm/min)	17412	23045	29022	29446	25607	23473	20487

Bhn (Brinell) HRc (Rockwell C) HRb (Rockwell B) HSM (High Speed Machining)
rpm = (Vc x 1000) / (DC x 3.14)
mm/min = Fz x 2 x rpm
reduce speed and feed for materials harder than listed
reduce cut depth and feed by 50% for long flute and long reach tools
reduce feed and Ae when finish milling (.02 x DC maximum)
refer to the SGS Tool Wizard® for complete technical information (www.kyocera-sgstool.com)

Ski-Carb



44M
METRIC SERIES



- Polished ski land with primary and secondary flute wall design minimizes chip interference by directing chips away from secondary flute
- Circular land allows for increased control at various speed and feed rates ultimately reducing chatter
- Recommended for materials ≤ 150 Bhn (≤ 7 HRc)

mm				EDP NO.			
CUTTING DIAMETER DC	LENGTH OF CUT APMX	OVERALL LENGTH LF	SHANK DIAMETER DCON	UNCOATED W/FLAT	UNCOATED	Ti-NAMITE®-B (TiB_2) W/FLAT	Ti-NAMITE®-B (TiB_2)
3,0	8,0	52,0	6,0	44505	49663	44506	49674
4,0	11,0	55,0	6,0	44509	49664	44510	49675
5,0	13,0	57,0	6,0	44513	49665	44514	49676
6,0	13,0	57,0	6,0	44517	49666	44518	49677
8,0	19,0	69,0	10,0	44521	49667	44522	49678
10,0	22,0	72,0	10,0	44525	49668	44526	49679
12,0	26,0	83,0	12,0	44529	49669	44530	49680
14,0	26,0	83,0	14,0	44533	49670	44534	49681
16,0	32,0	92,0	16,0	44537	49671	44538	49682
18,0	32,0	92,0	18,0	44541	49672	44542	49683
20,0	38,0	104,0	20,0	44545	49673	44546	49684

Contact your KSPT Sales Representative for more information on Corner Radius options.

TOLERANCES (mm)

≤3 DIAMETER
DC = +0,000/–0,006
DCON = h_6

>3–6 DIAMETER
DC = +0,000/–0,008
DCON = h_6

>6–10 DIAMETER
DC = +0,000/–0,009
DCON = h_6

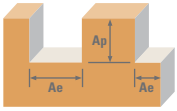
>10–18 DIAMETER
DC = +0,000/–0,011
DCON = h_6

>18–20 DIAMETER
DC = +0,000/–0,013
DCON = h_6

NON-FERROUS

For patent information visit www.ksptpatents.com

Ski-Carb



	Series 44M Metric	Hardness		Ae x DC	Ap x DC	Vc (m/min)		DC • mm 3	6	10	12	16	20	25
N	ALUMINUM ALLOYS 2024, 5052, 5086, 6061, 6073, 7075	≤ 150 Bhn or ≤ 88 HRb	Slot	1	≤ 1	490 (392-588)	RPM	52022	26011	15607	13005	9754	7803	6243
							Fz	0.022	0.060	0.120	0.144	0.166	0.187	0.213
							Feed (mm/min)	2247	3121	3746	3745	3246	2913	2653
			Profile	≤ 0.5	≤ 1.5	610 (488-732)	RPM	64762	32381	19429	16190	12143	9714	7771
							Fz	0.022	0.060	0.120	0.144	0.166	0.187	0.213
							Feed (mm/min)	2797	3885	4663	4662	4041	3627	3303
			HSM	≤ 0.05	≤ 2	1005 (804-1206)	RPM	106698	53349	32009	26674	20006	16005	12804
							Fz	0.050	0.132	0.280	0.336	0.384	0.440	0.488
							Feed (mm/min)	10754	14083	17925	17924	15364	14084	12484
	ALUMINUM DIE CAST ALLOYS (HIGH SILICONE) A-390, A-392, B- 390	≤ 125 Bhn or ≤ 77 HRb	Slot	1	≤ 1	185 (148-222)	RPM	19641	9820	5892	4910	3683	2946	2357
							Fz	0.022	0.060	0.120	0.144	0.166	0.187	0.213
							Feed (mm/min)	848	1178	1414	1414	1226	1100	1002
			Profile	≤ 0.5	≤ 1.5	230 (184-276)	RPM	24418	12209	7326	6105	4578	3663	2930
							Fz	0.022	0.060	0.120	0.144	0.166	0.187	0.213
							Feed (mm/min)	1055	1465	1758	1758	1524	1367	1245
			HSM	≤ 0.05	≤ 2	380 (304-456)	RPM	40343	20172	12103	10086	7564	6052	4841
							Fz	0.050	0.132	0.280	0.336	0.384	0.440	0.488
							Feed (mm/min)	4066	5325	6778	6777	5809	5325	4720
	COPPER ALLOYS Aluminum Bronze Brass Naval Brass Red Brass	≤ 140 Bhn or ≤ 3 HRc	Slot	1	≤ 1	265 (212-318)	RPM	28134	14067	8440	7034	5275	4220	3376
							Fz	0.019	0.048	0.107	0.120	0.141	0.160	0.175
							Feed (mm/min)	1080	1350	1801	1688	1485	1350	1182
			Profile	≤ 0.5	≤ 1.5	330 (264-396)	RPM	35035	17518	10511	8759	6569	5255	4204
							Fz	0.019	0.048	0.107	0.120	0.141	0.160	0.175
							Feed (mm/min)	1345	1682	2242	2102	1850	1682	1472
			HSM	≤ 0.05	≤ 2	545 (436-654)	RPM	57861	28930	17358	14465	10849	8679	6943
							Fz	0.041	0.108	0.227	0.276	0.320	0.373	0.400
							Feed (mm/min)	4721	6248	7869	7984	6943	6480	5555
	COPPER ALLOYS Beryllium Copper C110, Manganese Bronze, Tin Bronze	≤ 200 Bhn or ≤ 23 HRc	Slot	1	≤ 1	105 (84-126)	RPM	11148	5574	3344	2787	2090	1672	1338
							Fz	0.019	0.048	0.107	0.120	0.141	0.160	0.175
							Feed (mm/min)	428	535	713	669	589	535	468
			Profile	≤ 0.5	≤ 1.5	130 (104-156)	RPM	13802	6901	4141	3450	2588	2070	1656
							Fz	0.019	0.048	0.107	0.120	0.141	0.160	0.175
							Feed (mm/min)	530	662	883	828	729	662	580
			HSM	≤ 0.05	≤ 2	215 (172-258)	RPM	22826	11413	6848	5706	4280	3424	2739
							Fz	0.041	0.108	0.227	0.276	0.320	0.373	0.400
							Feed (mm/min)	1862	2465	3104	3150	2739	2556	2191
	PLASTICS ABS, Polycarbonate, PVC, Polypropylene		Slot	1	≤ 1	490 (392-588)	RPM	52022	26011	15607	13005	9754	7803	6243
							Fz	0.036	0.096	0.200	0.240	0.282	0.320	0.350
							Feed (mm/min)	3745	4994	6243	6242	5493	4994	4370
			Profile	≤ 0.5	≤ 1.5	610 (488-732)	RPM	64762	32381	19429	16190	12143	9714	7771
							Fz	0.036	0.096	0.200	0.240	0.282	0.320	0.350
							Feed (mm/min)	4662	6217	7771	7771	6839	6217	5440
			HSM	≤ 0.05	≤ 2	1005 (804-1206)	RPM	106698	53349	32009	26674	20006	16005	12804
							Fz	0.082	0.216	0.453	0.552	0.640	0.733	0.800
							Feed (mm/min)	17412	23045	29022	29446	25607	23473	20487

Bhn (Brinell) HRc (Rockwell C) HRb (Rockwell B) HSM (High Speed Machining)
rpm = (Vc x 1000) / (DC x 3.14)
mm/min = Fz x 2 x rpm
reduce speed and feed for materials harder than listed
reduce cut depth and feed by 50% for long flute and long reach tools
reduce feed and Ae when finish milling (.02 x DC maximum)
refer to the SGS Tool Wizard® for complete technical information (www.kyocera-sgstool.com)

SGS Solid Carbide Tools

Keeping the world moving

High Performance Drills

Hole Making

HIGH PERFORMANCE DRILLS	SERIES	DESCRIPTION	APPLICATION ● PREFERRED ○ ALTERNATE	PAGE	S&F PAGE
Hi-PerCarb®	142P (3XD)	2 Flute Internal Coolant 4 Margin 3XD	●	112	126
	142P (5XD)	2 Flute Internal Coolant 4 Margin 5XD	●	115	126
	142P (8XD)	2 Flute Internal Coolant 4 Margin 8XD	●	118	126
	142P (12XD)	2 Flute Internal Coolant 4 Margin 12XD	●	122	126
	143M-S (3XD)	2 Flute Internal Coolant 2 Margin 3XD	● ●	130	138
	143M-S (5XD)	2 Flute Internal Coolant 2 Margin 5XD	● ●	134	138
	141K (5xD)	3 Flute Internal Coolant 3 Margin 5xD	●	142	146
	131N (3xD)	3 Flute External Coolant 3 Margin 3xD	●	147	155
	131N (5xD)	3 Flute External Coolant 3 Margin 5xD	●	151	155
	135 (3xD)	2 Flute External Coolant 4 Margin 3xD	● ● ○ ○ ● ●	158	164
	135 (5xD)	2 Flute External Coolant 4 Margin 5xD	● ● ○ ○ ● ●	168	174
	146U (3xD)	2 Flute Internal Coolant 4 Margin 3xD	● ● ● ● ● ●	178	192
	146U (5xD)	2 Flute Internal Coolant 4 Margin 5xD	● ● ● ● ● ●	183	192
	136U (2xD)	2 Flute External Coolant 4 Margin 2xD	● ● ● ● ● ●	187	192
CFRP 8 Facet	120	2 Flute External Coolant 4 Margin CFRP	●	156	157

Speed & Feed Recommendations listed after each series

Taladrado

BROCAS DE ALTO RENDIMIENTO	SERIE	DESCRIPCIÓN	APLICACIÓN ● PREFERIDO ○ ALTERNATIVO	PÁGINA	S&F PÁGINA
Hi-PerCarb®	142P (3XD)	2 filos, refrigeración interna, 4 margen, 3XD	●	112	126
	142P (5XD)	2 filos, refrigeración interna, 4 margen, 5XD	●	115	126
	142P (8XD)	2 filos, refrigeración interna, 4 margen, 8XD	●	118	126
	142P (12XD)	2 filos, refrigeración interna, 4 margen, 12XD	●	122	126
	143M-S (3XD)	2 filos, refrigeracion interna, 2 margen, 3XD	● ●	130	138
	143M-S (5XD)	2 filos, refrigeracion interna, 2 margen, 5XD	● ●	134	138
	141K (5xD)	3 filos, refrigeración interna, 3 margen, 5xD	●	142	146
	131N (3xD)	3 filos, refrigeración externa, 3 margen, 3xD	●	147	155
	131N (5xD)	3 filos, refrigeración externa, 3 margen, 5xD	●	151	155
	135 (3xD)	2 filos, refrigeración externa, 4 margen, 3xD	● ● ○ ○ ● ●	158	164
	135 (5xD)	2 filos, refrigeración externa, 4 margen, 5xD	● ● ○ ○ ● ●	168	174
	146U (3xD)	2 filos, refrigeración interna, 4 margen, 3xD	● ● ● ● ● ●	178	192
	146U (5xD)	2 filos, refrigeración interna, 4 margen, 5xD	● ● ● ● ● ●	183	192
	136U (2xD)	2 filos, refrigeración externa, 4 margen, 2xD	● ● ● ● ● ●	187	192
De 8 caras CFRP	120	2 filos, refrigeración externa, 4 margen, CFRP	●	156	157

Recomendaciones de velocidades y avances mostradas tras cada serie

Outils de perçage

FORETS HAUTE PERFORMANCE	SÉRIES	DESCRIPTION	APPLICATION ● PRÉFÉRÉ ○ ALTERNER	PAGE	S&F PAGE
Hi-PerCarb®	142P (3XD)	2 dents trou d'huile 4 listel 3XD	●	112	126
	142P (5XD)	2 dents trou d'huile 4 listel 5XD	●	115	126
	142P (8XD)	2 dents trou d'huile 4 listel 8XD	●	118	126
	142P (12XD)	2 dents trou d'huile 4 listel 12XD	●	122	126
	143M-S (3XD)	2 dents trou d'huile 2 listel 3XD	● ●	130	138
	143M-S (5XD)	2 dents trou d'huile 2 listel 5XD	● ●	134	138
	141K (5xD)	3 dents refroidissement interne à 3 listel 5xD	●	142	146
	131N (3xD)	3 dents refroidissement externe à 3 listel 3xD	●	147	155
	131N (5xD)	3 dents refroidissement externe à 3 listel 5xD	●	151	155
	135 (3xD)	2 dents refroidissement externe à 4 listel 3xD	● ● ○ ○ ● ●	158	164
	135 (5xD)	2 dents refroidissement externe à 4 listel 5xD	● ● ○ ○ ● ●	168	174
	146U (3xD)	2 dents refroidissement interne à 4 listel 3xD	● ● ● ● ● ●	178	192
	146U (5xD)	2 dents refroidissement interne à 4 listel 5xD	● ● ● ● ● ●	183	192
	136U (2xD)	2 dents refroidissement externe à 4 listel 2xD	● ● ● ● ● ●	187	192
CFRP à 8 facettes	120	2 dents refroidissement externe à 4 listel CFRP	●	156	157

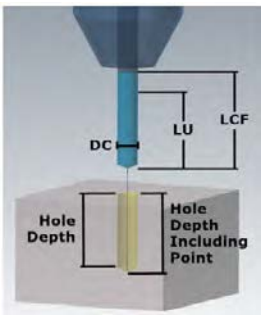
Recommandations de vitesse et avance indiquées après chaque série

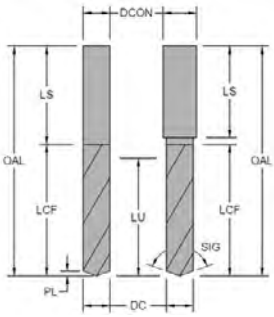
Bohren

HOCHLEISTUNGS-BOHRER	SERIE	BESCHREIBUNG	ANWENDUNG ● BEVORZUGT ○ WECHSELN	SEITE	S&F SEITE
Hi-PerCarb®	142P (3XD)	Doppelfasenbohrer mit 4 Schneiden und Innenkühlung, 3xD	●	112	126
	142P (3XD)	Doppelfasenbohrer mit 4 Schneiden und Innenkühlung, 5xD	●	115	126
	142P (3XD)	Doppelfasenbohrer mit 4 Schneiden und Innenkühlung, 8xD	●	118	126
	142P (12XD)	Doppelfasenbohrer mit 4 Schneiden und Innenkühlung, 12xD	●	122	126
	143M-S (3XD)	2 Einfasenbohrer mit 2 Schneiden und Innenkühlung, 3xD	● ●	130	138
	143M-S (5XD)	2 Einfasenbohrer mit 2 Schneiden und Innenkühlung, 5xD	● ●	134	138
	141K (5xD)	Dreifasenbohrer 5xD mit 3 Schneiden und Innenkühlung	●	142	146
	131N (3xD)	Dreifasenbohrer 3xD mit 3 Schneiden und Außenkühlung	●	147	155
	131N (5xD)	Dreifasenbohrer 5xD mit 3 Schneiden und Außenkühlung	●	151	155
	135 (3xD)	Doppelfasenbohrer 3xD mit 4 Schneiden und Außenkühlung	● ● ○ ○ ● ●	158	164
	135 (5xD)	Doppelfasenbohrer 5xD mit 4 Schneiden und Außenkühlung	● ● ○ ○ ● ●	168	174
	146U (3xD)	Doppelfasenbohrer 3xD mit 4 Schneiden und Innenkühlung	● ● ● ● ● ●	178	192
	146U (5xD)	Doppelfasenbohrer 5xD mit 4 Schneiden und Innenkühlung	● ● ● ● ● ●	183	192
	136U (2xD)	Doppelfasenbohrer 2xD mit 4 Schneiden und Außenkühlung	● ● ● ● ● ●	187	192
CFRP 8 Facet	120	Doppelfasenbohrer CFRP mit 4 Schneiden und Außenkühlung	●	156	157

Empfehlungen für Drehzahl & Vorschub im Anhang zu jeder Serie

Drill Matrix





Item

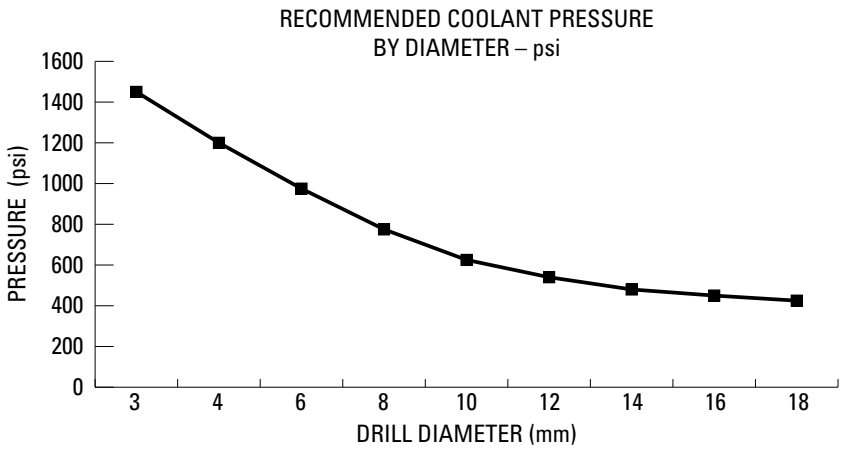
Preferred Cut Type for Series
★ Best ☆ Better ○ Good (blank) Not Recommended

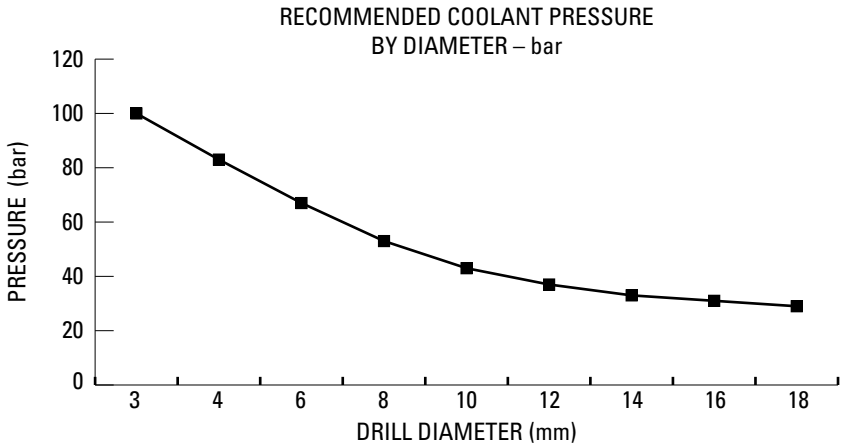
Name / Series	Tool Type	Coolant Delivery	Page	Steel			Stainless Steel			Cast Iron			Non Ferrous			HRSA			Hard Steel		
				Low Carbon ≤ 20 HRc	Medium Carbon, Alloy 20 to 35 HRc	High Carbon, Alloy 35 to 45 HRc	Ferritic & Martensitic ≤ 45 HRc	Austenitic & Duplex ≤ 25 HRc	Precipitation Hardened ≤ 45 HRc	Low Alloy, Grey, Ductile ≤ 25 HRc	Med-High Alloy, Nodular 25 to 35 HRc	High Alloy, Nodular ≥ 35 HRc	Aluminum Alloys	Copper Alloys	Plastics, Composites	Titanium Alloys ≤ 45 HRc	Iron, Nickel, Cobalt Alloys ≤ 45 HRc	Refractory Alloys, Mo, Ta, W ≤ 35 HRc	High Carbon, Med Alloy 45 to 50 HRc	Tool, Mold & Die 45 to 55 HRc	Tool, Mold & Die 55 to 65 HRc
Hi-PerCarb® 142P	High Performance Drill	Internal	112	★	★	★	☆	☆	☆	☆	☆	☆	☆	★		☆	☆	☆	★	☆	☆
Hi-PerCarb® 143M-S	High Performance Drill	Internal	130	☆			★	★	★	☆	☆	☆	○	★		★	★	★			
Hi-PerCarb® 141K	High Performance Drill	Internal	142	☆	☆	☆	○		○	★	★	★	☆	☆		○		○			
Hi-PerCarb® 131N	High Performance Drill	External	147							○			★	★	☆	○					
Series 120	High Performance Drill	External	156												★						
Hi-PerCarb® 135	High Performance Drill	External	158	★	★	★	★	☆	★	☆	☆	☆	○	○		☆	☆	☆	★	☆	☆
Hi-PerCarb® 146U	High Performance Drill	Internal	178	★	★	★	★	★	★	★	★	★	★	★	★	★	★	★	★	★	★
Hi-PerCarb® 136U	High Performance Drill	External	187	★	★	★	★	★	★	★	★	★	★	★	★	★	★	★	★	★	★
Series 106	General Application Drill	External	242	○	○	○						☆							★	★	☆
Series 101	General Application Drill	External	230	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○			
Series 103	General Application Drill	External	246	○	○	○	○	○	○	○	☆	☆	○			○	○	○			
Series 108	General Application Drill	External	235	★	☆	☆	☆	☆	☆	☆	☆	☆		○	○	☆	☆	☆			
Series 301, 301M	Drill & Countersink	External	252	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	○	○	☆	○	○
Series 601	Countersink	External	258	○	○	○	○	★	○	☆	☆	☆	★	☆	○	○	○	○			
Series 603	Countersink	External	261	☆	☆	☆	☆	★	☆	★	☆	☆	★	★	☆	☆	☆	☆	○		
Series 606	Countersink	External	264	★	★	★	★	★	★	★	★	★	○	★	★	★	★	★	☆	☆	○
Series 200	Reamer	External	268	★	★	★	★	★	★	★	★	★	★	★	★	★	★	★	★	★	○
Series 201M	Reamer	External	272	★	★	★	★	★	★	★	★	★	★	★	★	★	★	★	★	★	○

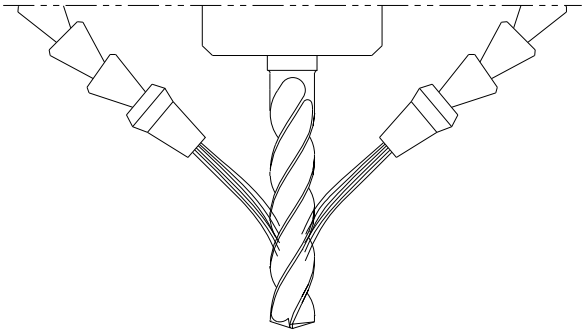
	Attributes										
	Material hardness and machinability affect speed, feed, and cut depths. For dimensional and finish quality, a low TIR of the tool-holder assembly in the machine is critical: less than 0.1% drill diameter is preferred. Spot drilling is not necessary in most situations if the drilling surface is machined flat ; spot drill point angle should be greater than drill point angle. Liquid coolant (internal or external) such as oil based or synthetic is highly recommended for all drilling applications. For proper cooling, lubrication and chip evacuation, ensure the coolant is supplied throughout the entire depth of the hole. When liquid coolant cannot be applied for applications such as plastics or composites, clear the swarf with air or vacuum. Depending on material machinability, a peck cycle may be neccesary for external coolant drills beyond 2x or 3x depths.										
	Diameter Range inch	Diameter Range mm	Tolerance	Length	Point Angle °	Self Centering	Flute Count	Margins	Helix Angle °	Shank	Coating
	0.1250 0.7500	3,00 16,00	DC + / +	3x, 5x, 8x, 12x	137	yes	2	4	30	Common	Ti-NAMITE®-X
	0.1250 0.7500	3,00 16,00	DC + / +	3x, 5x	136	yes	2	2	30	Common	Ti-NAMITE®-A
	0.1250 0.7500	3,00 16,00	DC + / +	5x	124	yes	3	3	30	Common	Ti-NAMITE®-X
	0.1250 0.7500	3,00 16,00	DC + / +	3x, 5x	124	yes	3	3	30	Common	Ti-NAMITE®-B
	0.0980 0.5000	2,70 12,00	DC 0 / –	3x	145, 90	yes	2	4	20	Common	Di-NAMITE®
	0.0156 0.9219	1,25 22,00	DC + / +	3x, 5x	145	yes	2	4	32	Common	Ti-NAMITE®-A
	0.1250 0.8125	3,00 20,50	DC + / +	3x, 5x	180	yes	2	4	15	Common	Ti-NAMITE®-X
	0.0625 0.8125	1,50 20,50	DC + / +	2x	180	yes	2	4	15	Common	Ti-NAMITE®-X
	0.0400 0.5000	1,00 12,00	DC 0 / –	3x	140	yes	2	2	0	Straight	Ti-NAMITE®-A or uncoated
	0.0135 0.5000	0,70 12,00	DC 0 / –	5x	118	no	2	2	20	Straight	Ti-NAMITE®-A or uncoated
	0.1065 0.7500	3,00 20,00	DC 0 / –	3x	150	yes	3	3	30	Straight	Ti-NAMITE®-A or uncoated
	–	0,50 16,00	DC 0 / –	3x	118	yes	2	2	20	Straight	Ti-NAMITE®-A or uncoated
	0.0250 0.2188	0,50 5,00	DC + / 0	spot	118, 60	yes	2	2	0	Straight	Ti-NAMITE®-A or uncoated
	0.1250 1.0000	–	DC + / –	spot	60, 82, or 90	yes	1	–	0	Common	uncoated
	0.1250 1.0000	–	DC + / –	spot	60, 82, or 90	yes	3	–	0	Common	uncoated
	0.1250 1.0000	–	DC + / –	spot	60, 82, or 90	yes	6	6	0	Common	uncoated
	0.0469 0.5000	–	DC + / 0	varies	–	–	4 or 6	4 or 6	0	Straight	uncoated
	–	1,00 10,00	DC + / 0	varies	–	–	4 or 6	4 or 6	0	Straight	uncoated

Drilling Operations
Coolant Recommendations

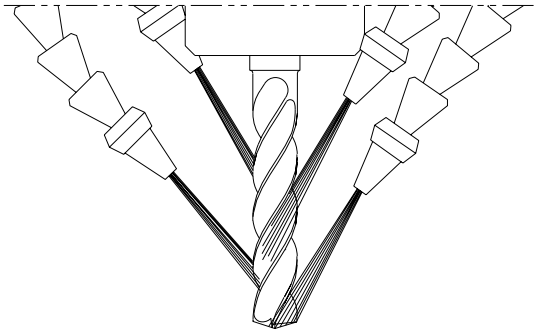
- Coolant works to mobilize chips away from the cut zone, reduce the heat created during the cutting process and minimise friction.
- It is important to optimise the coolant pressure and position in order to gain the full benefits coolant offers the cutting process.
- Proper coolant application promotes greater operating parameters, greater material removal rates, improved surface finishes, predictable tool life, reduced power consumption and reduced cycle times.
- Pressure is important, but more importantly is consistency of the pressure and application onto the tool; intermittent cooling of carbide leads to thermal stressing of the material and the formation of "microcracks."
- Proper cleanliness and filtration of coolants is important in order for the coolant to maintain its beneficial properties, and also to avoid a reduction in coolant pressure or the possibility of clogging the coolant channels in coolant through drills.







LARGE TIP – LOW VELOCITY
NO COVERAGE AT MAXIMUM DEPTH

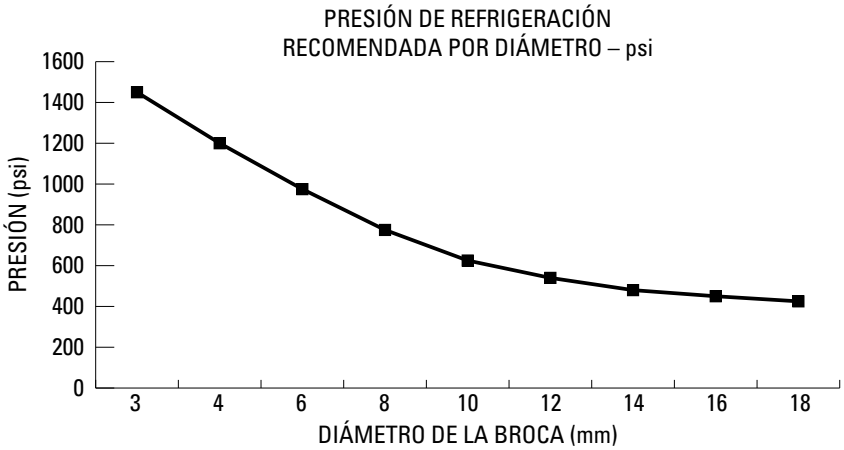


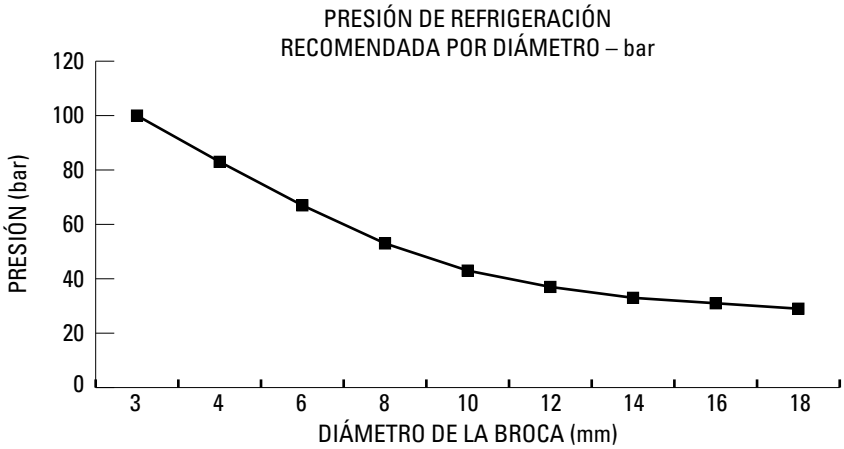
SMALL TIP – HIGH VELOCITY
COMPLETE COVERAGE

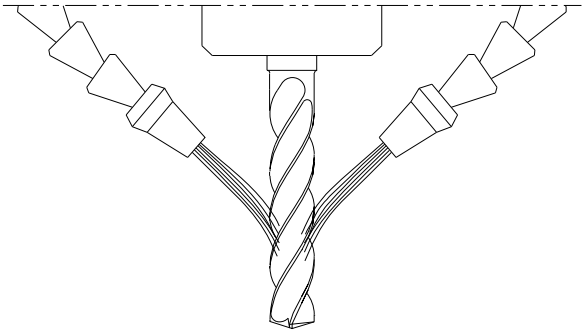
- Reducing the nozzle size helps maximise the cooling benefits of the unique double margin design on the Hi-PerCarb drill by increasing velocity. Aim the nozzles in line with the secondary flute located between the two margins as well as the flute for best results.

Recomendaciones en operacion de taladrado

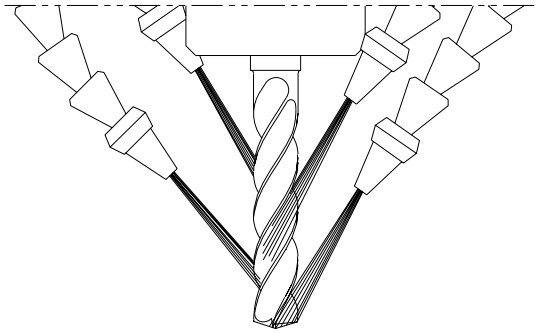
- El líquido de refrigeración actúa movilizando las virutas fuera de la zona de corte, disminuyendo el calor generado durante el proceso de corte y minimizando la fricción.
- Es importante optimizar la presión de la refrigeración y la posición para poder obtener todos los beneficios del refrigerante durante el proceso de corte.
- Una aplicación apropiada de la refrigeración fomenta mayores parámetros de operación, mayores índices de eliminación de material, acabados de superficie mejorados, una duración de la herramienta más predecible, bajo consumo de energía y un tiempo de ciclo reducido.
- La presión del refrigerante es importante, pero lo es más el flujo continuo aplicado a la herramienta; una refrigeración intermitente en el carburo puede ocasionar un estrés térmico en el material y la formación de "micro-fisuras".
- Una limpieza y filtración adecuadas son importantes para que el refrigerante mantenga sus propiedades y beneficios; por otra parte, se evita la reducción de la presión o la posibilidad de obstruir los canales de refrigeración de la broca.







PUNTA GRANDE – BAJA VELOCIDAD
SIN ALCANCE A PROFUNDIDAD MÁXIMA

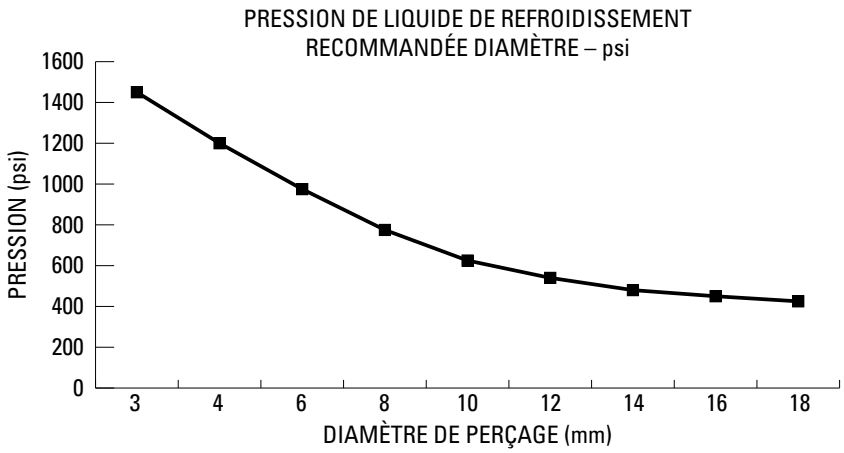


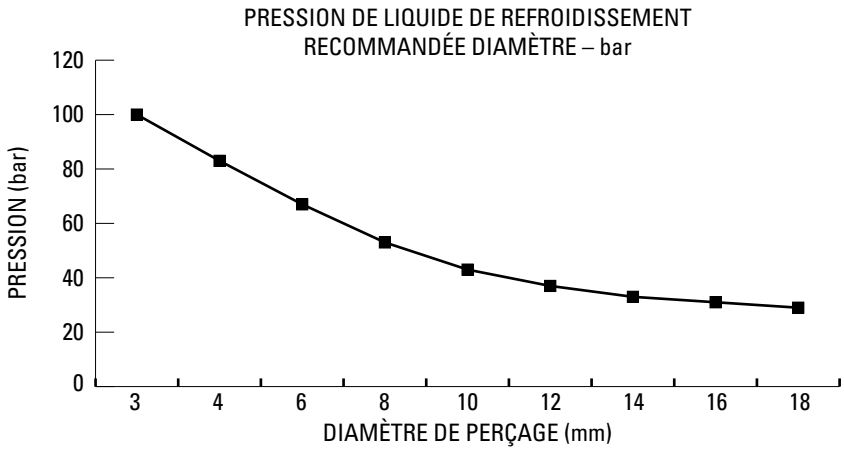
PUNTA PEQUEÑA – ALTA VELOCIDAD
COMPLETO ALCANCE

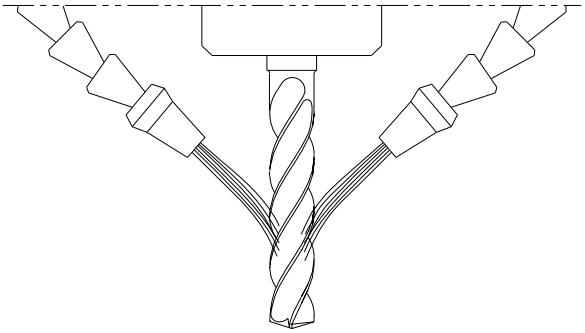
- Reducir el tamaño de la boquilla ayuda a maximizar los beneficios de refrigeración del exclusivo diseño de doble margen de la broca. Hi-PerCarb aumentando la velocidad. Coloque las boquillas en línea con el segundo filo que se encuentra entre los dos márgenes y también el filo para obtener mejores resultados.

Opérations de perçage
Recommandations en matière de refroidissement

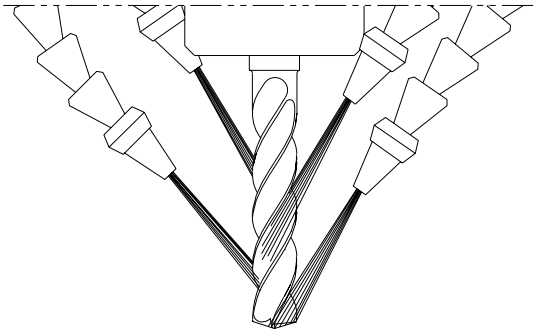
- Le liquide de refroidissement sert à éloigner les copeaux de la zone de coupe, à réduire la chaleur dégagée durant la coupe et à minimiser la friction.
- Il est important d'optimiser la pression et la position du réfrigérant pour en retirer les bénéfices maximums durant la coupe.
- L'application adéquate de réfrigérant se traduit par des paramètres opératoires supérieurs, des taux d'élimination supérieurs des matériaux, de plus belles finitions des surfaces, une durée de vie des outils prévisible, moins de consommation d'énergie et des temps de cycle réduits.
- La pression est importante, mais une pression régulière et l'application sur l'outil sont des facteurs encore plus importants ; le refroidissement intermittent du carbure se traduit par des contraintes thermiques pour le matériau et la formation de microfissures.
- La propreté et le filtrage adéquats des réfrigérants sont importants pour qu'ils conservent leur propriétés, mais aussi pour éviter la réduction de pression du réfrigérant ou le risque d'obturation des conduits à réfrigérant dans les perceuses à réfrigérant intégré.







POINTE LARGE – BASSE VITESSE
PAS DE COUVERTURE À LA PROFONDEUR MAXIMUM



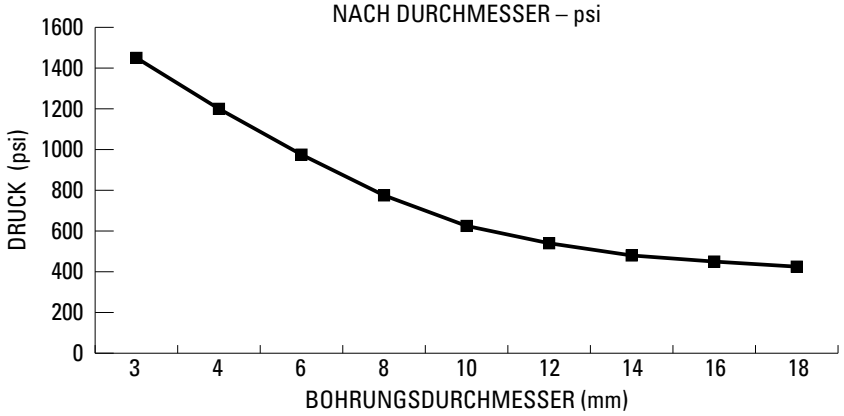
POINTE FINE – GRANDE VITESSE
COUVERTURE COMPLÈTE

- La réduction de la taille de l'embout permet de maximiser les bienfaits du refroidissement du concept à double listel original de la perceuse Hi-PerCarb en augmentant la vitesse. Pour les meilleurs résultats, orientez les embouts dans l'axe de la goujure secondaire située entre les deux listels, de même que la goujure primaire.

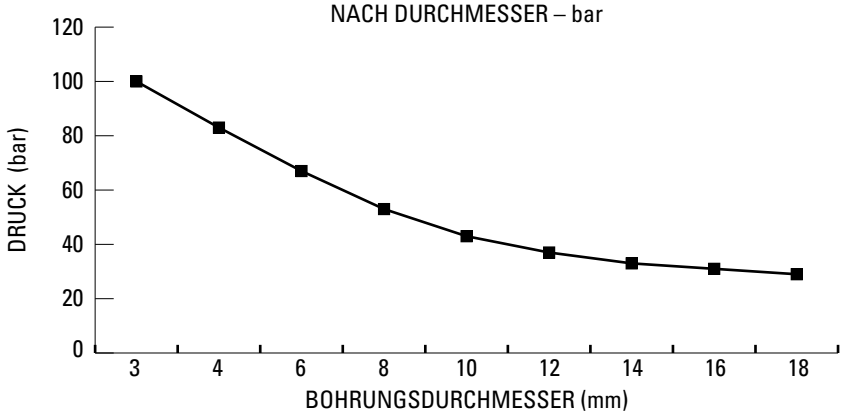
Bohrarbeiten
Kühlmittelempfehlungen

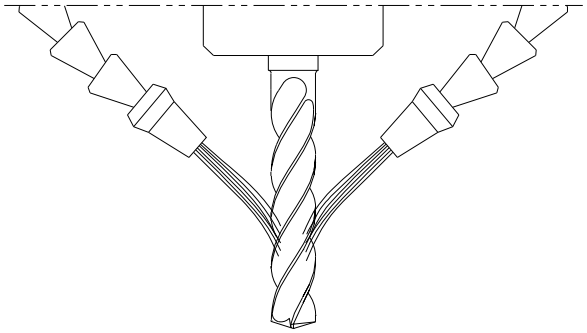
- Kühlmittel dienen dazu, die Späne aus dem Schneidenbereich zu entfernen, die beim Schneiden erzeugte Wärme abzutransportieren und die Reibung zu verringern.
- Es kommt darauf an, den Kühlschmiermitteldruck und die Zufuhr zu optimieren, um alle Vorteile beim Bohren nutzen zu können.
- Der richtige Kühlschmiermitteleinsatz ermöglicht höhere Schnittparameter, höheren Materialabtrag, bessere Oberflächengüte, vorhersehbare Standzeiten und geringere Leistungsaufnahme und Laufzeiten.
- Der Druck ist wichtig, aber wichtiger ist dessen Konstanz und die Zufuhr zum Werkzeug. Unterbrochene Kühlung des Hartmetalls führt zur thermischen Belastung und Bildung von "Mikrorissen".
- Kühlmitte sind sauber zu halten und zu filtern, damit die Qualität des Kühlmittels erhalten bleibt und der Kühlmitteldruck durch Verstopfung der Kühlmittelkanäle im Bohrer nicht absinkt.

EMPFOHLENER KÜHLSCHMIERMITTELDRUCK
NACH DURCHMESSER – psi

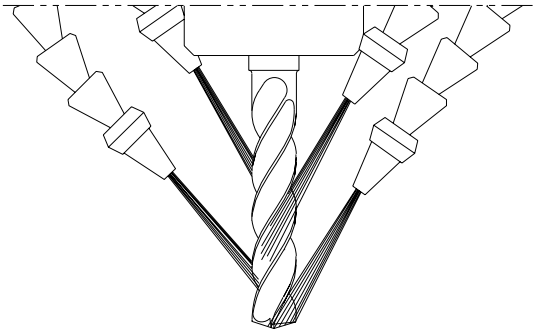


EMPFOHLENER KÜHLMITTELDRUCK
NACH DURCHMESSER – bar





BREITE QUERSCHNEIDE – GERINGE DREHZAHL
KEINE VOLLSTÄNDIGE BENETZUNG BEI MAX. BOHRUNGSTIEFE



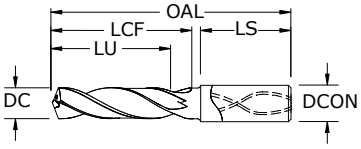
SCHMALE QUERSCHNEIDE – HOHE DREHZAHL
VOLLSTÄNDIGE BENETZUNG

- Durch Verringern der Düsengröße können die vorteilhaften Eigenschaften der Doppelfase genutzt werden, um die Drehzahl des Hi-PerCarb-Bohrers zu steigern. Richten Sie die Düsen auf die Nebennut zwischen beiden Fasen sowie auf die Schneiden aus, um beste Ergebnisse zu erzielen.

HI-PERCARB®
HIGH PERFORMANCE CARBIDE DRILLS

142P 3xD

FRACTIONAL & METRIC SERIES



- High-performance point design stabilizes on entry for exceptional hole size and cylindricity while also allowing for low thrust force and extended tool life
- Internal coolant hole improves coolant flow to extend tool life and aid in chip evacuation
- 4-margin design improves hole straightness and roundness while providing improved stability for difficult applications like cross holes and when exiting on angle
- Proprietary Ti-NAMITE®-X coating and industry leading carbide substrate provides exceptional wear resistance and toughness for demanding applications
- Recommended for materials ≤ 50HRc (475 Bhn)

		inch & mm						EDP NO.
DECIMAL DC	METRIC DC	FRACTIONAL/ LETTER/WIRE DC	SHANK DIAMETER DCON	OVERALL LENGTH OAL	FLUTE LENGTH LCF	USABLE LENGTH LU	SHANK LENGTH LS	Ti-NAMITE®-X (TX)
0.1181	3,000 mm		6,0	62,0	20,0	15,0	36,0	66400
0.1220	3,100 mm		6,0	62,0	20,0	15,0	36,0	66401
0.1250	3,175 mm	1/8	6,0	62,0	20,0	15,0	36,0	56400
0.1260	3,200 mm		6,0	62,0	20,0	15,0	36,0	66402
0.1299	3,300 mm		6,0	62,0	20,0	15,0	36,0	66403
0.1339	3,400 mm		6,0	62,0	20,0	15,0	36,0	66404
0.1360	3,454 mm	#29	6,0	62,0	20,0	15,0	36,0	56401
0.1378	3,500 mm		6,0	62,0	20,0	15,0	36,0	66405
0.1406	3,571 mm	9/64	6,0	62,0	20,0	15,0	36,0	56402
0.1417	3,600 mm		6,0	62,0	20,0	15,0	36,0	66406
0.1457	3,700 mm		6,0	62,0	20,0	15,0	36,0	66407
0.1496	3,800 mm		6,0	66,0	24,0	18,0	36,0	66408
0.1535	3,900 mm		6,0	66,0	24,0	18,0	36,0	66409
0.1562	3,967 mm	5/32	6,0	66,0	24,0	18,0	36,0	56403
0.1575	4,000 mm		6,0	66,0	24,0	18,0	36,0	66410
0.1590	4,039 mm	#21	6,0	66,0	24,0	18,0	36,0	56404
0.1614	4,100 mm		6,0	66,0	24,0	18,0	36,0	66411
0.1654	4,200 mm		6,0	66,0	24,0	18,0	36,0	66412
0.1693	4,300 mm		6,0	66,0	24,0	18,0	36,0	66413
0.1719	4,366 mm	11/64	6,0	66,0	24,0	17,0	36,0	56405
0.1732	4,400 mm		6,0	66,0	24,0	17,0	36,0	66414
0.1772	4,500 mm		6,0	66,0	24,0	17,0	36,0	66415
0.1811	4,600 mm		6,0	66,0	24,0	17,0	36,0	66416
0.1850	4,699 mm	#13	6,0	66,0	24,0	17,0	36,0	66417
0.1875	4,763 mm	3/16	6,0	66,0	28,0	21,0	36,0	56406
0.1890	4,801 mm	#12	6,0	66,0	28,0	21,0	36,0	66418
0.1929	4,900 mm		6,0	66,0	28,0	21,0	36,0	66419
0.1969	5,000 mm		6,0	66,0	28,0	20,0	36,0	66420
0.2008	5,100 mm		6,0	66,0	28,0	20,0	36,0	66421
0.2031	5,159 mm	13/64	6,0	66,0	28,0	20,0	36,0	56407
0.2047	5,200 mm		6,0	66,0	28,0	20,0	36,0	66422
0.2087	5,300 mm		6,0	66,0	28,0	20,0	36,0	66423
0.2126	5,400 mm		6,0	66,0	28,0	20,0	36,0	66424
0.2165	5,500 mm		6,0	66,0	28,0	20,0	36,0	66425
0.2188	5,558 mm	7/32	6,0	66,0	28,0	20,0	36,0	56408
0.2205	5,600 mm		6,0	66,0	28,0	20,0	36,0	66426
0.2244	5,700 mm		6,0	66,0	28,0	19,0	36,0	66427
0.2283	5,800 mm		6,0	66,0	28,0	19,0	36,0	66428
0.2323	5,900 mm		6,0	66,0	28,0	19,0	36,0	66429
0.2344	5,954 mm	15/64	6,0	66,0	28,0	19,0	36,0	56409
0.2362	6,000 mm		6,0	66,0	28,0	19,0	36,0	66430
0.2402	6,100 mm		8,0	79,0	34,0	25,0	36,0	66431
0.2441	6,200 mm		8,0	79,0	34,0	25,0	36,0	66432
0.2480	6,300 mm		8,0	79,0	34,0	25,0	36,0	66433

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TOLERANCES (inch)

≤.1181 DIAMETER
DC = +.00008/+.00047
DCON = h_6

>.1181–.2362 DIAMETER
DC = +.00016/+.00063
DCON = h_6

>.2362–.3937 DIAMETER
DC = +.00024/+.00083
DCON = h_6

>.3937–.7087 DIAMETER
DC = +.00028/+.00098
DCON = h_6

>.7087–1.1811 DIAMETER
DC = +.00031/+.00114
DCON = h_6

TOLERANCES (mm)

≤3 DIAMETER
DC = +0,002/+0,012
DCON = h_6

>3–6 DIAMETER
DC = +0,004/+0,016
DCON = h_6

>6–10 DIAMETER
DC = +0,006/+0,021
DCON = h_6

>10–18 DIAMETER
DC = +0,007/+0,025
DCON = h_6

>18–30 DIAMETER
DC = +0,008/+0,029
DCON = h_6

- STEELS
- STAINLESS STEELS
- CAST IRON
- NON-FERROUS
- HIGH TEMP ALLOYS
- HARDENED STEELS

For patent information visit www.ksptpatents.com

142P 3xD

FRACTIONAL & METRIC SERIES

CONTINUED

DECIMAL DC	METRIC DC	FRACTIONAL/ LETTER/WIRE DC	SHANK DIAMETER DCON (inch & mm)	OVERALL LENGTH OAL (inch & mm)	FLUTE LENGTH LCF (inch & mm)	USABLE LENGTH LU (inch & mm)	SHANK LENGTH LS (inch & mm)	EDP NO. Ti-NAMITE®-X (TX)
0.2500	6,350 mm	1/4 E	8,0	79,0	34,0	24,0	36,0	56410
0.2520	6,400 mm		8,0	79,0	34,0	24,0	36,0	66434
0.2559	6,500 mm		8,0	79,0	34,0	24,0	36,0	66435
0.2570	6,528 mm	F	8,0	79,0	34,0	24,0	36,0	56411
0.2598	6,600 mm		8,0	79,0	34,0	24,0	36,0	66436
0.2638	6,700 mm		8,0	79,0	34,0	24,0	36,0	66437
0.2656	6,746 mm	17/64	8,0	79,0	34,0	24,0	36,0	56412
0.2677	6,800 mm		8,0	79,0	34,0	24,0	36,0	66438
0.2717	6,900 mm		8,0	79,0	34,0	24,0	36,0	66439
0.2756	7,000 mm		8,0	79,0	34,0	24,0	36,0	66440
0.2795	7,100 mm		8,0	79,0	41,0	30,0	36,0	66441
0.2812	7,142 mm	9/32	8,0	79,0	41,0	30,0	36,0	56413
0.2835	7,200 mm		8,0	79,0	41,0	30,0	36,0	66442
0.2874	7,300 mm		8,0	79,0	41,0	30,0	36,0	66443
0.2913	7,400 mm		8,0	79,0	41,0	30,0	36,0	66444
0.2953	7,500 mm		8,0	79,0	41,0	30,0	36,0	66445
0.2969	7,541 mm	19/64	8,0	79,0	41,0	30,0	36,0	56414
0.2992	7,600 mm		8,0	79,0	41,0	30,0	36,0	66446
0.3031	7,700 mm		8,0	79,0	41,0	29,0	36,0	66447
0.3071	7,800 mm		8,0	79,0	41,0	29,0	36,0	66448
0.3110	7,900 mm		8,0	79,0	41,0	29,0	36,0	66449
0.3125	7,938 mm	5/16	8,0	79,0	41,0	29,0	36,0	56415
0.3150	8,000 mm		8,0	79,0	41,0	29,0	36,0	66450
0.3189	8,100 mm		10,0	89,0	47,0	35,0	40,0	66451
0.3228	8,200 mm		10,0	89,0	47,0	35,0	40,0	66452
0.3268	8,300 mm		10,0	89,0	47,0	35,0	40,0	66453
0.3281	8,334 mm	21/64	10,0	89,0	47,0	34,0	40,0	56416
0.3307	8,400 mm		10,0	89,0	47,0	34,0	40,0	66454
0.3320	8,433 mm	Q	10,0	89,0	47,0	34,0	40,0	56417
0.3346	8,500 mm		10,0	89,0	47,0	34,0	40,0	66455
0.3386	8,600 mm		10,0	89,0	47,0	34,0	40,0	66456
0.3425	8,700 mm		10,0	89,0	47,0	34,0	40,0	66457
0.3438	8,733 mm	11/32	10,0	89,0	47,0	34,0	40,0	56418
0.3465	8,800 mm		10,0	89,0	47,0	34,0	40,0	66458
0.3504	8,900 mm		10,0	89,0	47,0	34,0	40,0	66459
0.3543	9,000 mm		10,0	89,0	47,0	34,0	40,0	66460
0.3583	9,100 mm		10,0	89,0	47,0	33,0	40,0	66461
0.3594	9,129 mm	23/64	10,0	89,0	47,0	33,0	40,0	56419
0.3622	9,200 mm		10,0	89,0	47,0	33,0	40,0	66462
0.3661	9,300 mm		10,0	89,0	47,0	33,0	40,0	66463
0.3680	9,347 mm	U	10,0	89,0	47,0	33,0	40,0	56420
0.3701	9,400 mm		10,0	89,0	47,0	33,0	40,0	66464
0.3740	9,500 mm		10,0	89,0	47,0	33,0	40,0	66465
0.3750	9,525 mm	3/8	10,0	89,0	47,0	33,0	40,0	56421
0.3780	9,600 mm		10,0	89,0	47,0	33,0	40,0	66466
0.3819	9,700 mm		10,0	89,0	47,0	32,0	40,0	66467
0.3858	9,800 mm		10,0	89,0	47,0	32,0	40,0	66468
0.3898	9,900 mm		10,0	89,0	47,0	32,0	40,0	66469
0.3906	9,921 mm	25/64	10,0	89,0	47,0	32,0	40,0	56422
0.3937	10,000 mm		10,0	89,0	47,0	32,0	40,0	66470
0.3976	10,100 mm		12,0	102,0	55,0	40,0	45,0	66471
0.4016	10,200 mm		12,0	102,0	55,0	40,0	45,0	66472
0.4055	10,300 mm		12,0	102,0	55,0	40,0	45,0	66473
0.4062	10,317 mm	13/32	12,0	102,0	55,0	40,0	45,0	56423

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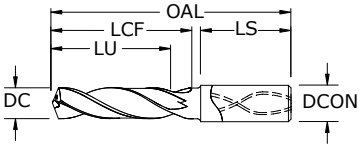
HI-PERCARB®
HIGH PERFORMANCE CARBIDE DRILLS

142P 3xD

FRACTIONAL & METRIC SERIES



- High-performance point design stabilizes on entry for exceptional hole size and cylindricity while also allowing for low thrust force and extended tool life
- Internal coolant hole improves coolant flow to extend tool life and aid in chip evacuation
- 4-margin design improves hole straightness and roundness while providing improved stability for difficult applications like cross holes and when exiting on angle
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- Recommended for materials ≤ 50HRc (475 Bhn)

		inch & mm						EDP NO.
DECIMAL DC	METRIC DC	FRACTIONAL/ LETTER/WIRE DC	SHANK DIAMETER DCON	OVERALL LENGTH OAL	FLUTE LENGTH LCF	USABLE LENGTH LU	SHANK LENGTH LS	Ti-NAMITE®-X (TX)
0.4095	10,400 mm		12,0	102,0	55,0	39,0	45,0	66474
0.4134	10,500 mm		12,0	102,0	55,0	39,0	45,0	66475
0.4173	10,600 mm		12,0	102,0	55,0	39,0	45,0	66476
0.4213	10,700 mm		12,0	102,0	55,0	39,0	45,0	66477
0.4219	10,716 mm	27/64	12,0	102,0	55,0	39,0	45,0	56424
0.4252	10,800 mm		12,0	102,0	55,0	39,0	45,0	66478
0.4291	10,900 mm		12,0	102,0	55,0	39,0	45,0	66479
0.4331	11,000 mm		12,0	102,0	55,0	39,0	45,0	66480
0.4370	11,100 mm		12,0	102,0	55,0	38,0	45,0	66481
0.4375	11,113 mm	7/16	12,0	102,0	55,0	38,0	45,0	56425
0.4409	11,200 mm		12,0	102,0	55,0	38,0	45,0	66482
0.4449	11,300 mm		12,0	102,0	55,0	38,0	45,0	66483
0.4488	11,400 mm		12,0	102,0	55,0	38,0	45,0	66484
0.4528	11,500 mm		12,0	102,0	55,0	38,0	45,0	66485
0.4567	11,600 mm		12,0	102,0	55,0	38,0	45,0	66486
0.4606	11,700 mm		12,0	102,0	55,0	37,0	45,0	66487
0.4646	11,800 mm		12,0	102,0	55,0	37,0	45,0	66488
0.4685	11,900 mm		12,0	102,0	55,0	37,0	45,0	66489
0.4688	11,908 mm	15/32	12,0	102,0	55,0	37,0	45,0	56426
0.4724	12,000 mm		12,0	102,0	55,0	37,0	45,0	66490
0.4844	12,304 mm	31/64	14,0	107,0	60,0	41,0	45,0	56427
0.4921	12,500 mm		14,0	107,0	60,0	41,0	45,0	66491
0.5000	12,700 mm	1/2	14,0	107,0	60,0	41,0	45,0	56428
0.5039	12,800 mm		14,0	107,0	60,0	41,0	45,0	66492
0.5118	13,000 mm		14,0	107,0	60,0	41,0	45,0	66493
0.5156	13,096 mm	33/64	14,0	107,0	60,0	40,0	45,0	56429
0.5315	13,500 mm		14,0	107,0	60,0	40,0	45,0	66494
0.5433	13,800 mm		14,0	107,0	60,0	39,0	45,0	66495
0.5512	14,000 mm		14,0	107,0	60,0	39,0	45,0	66496
0.5625	14,288 mm	9/16	16,0	115,0	65,0	43,0	48,0	56430
0.5709	14,500 mm		16,0	115,0	65,0	43,0	48,0	66497
0.5781	14,684 mm	37/64	16,0	115,0	65,0	43,0	48,0	56431
0.5827	14,800 mm		16,0	115,0	65,0	43,0	48,0	66498
0.5906	15,000 mm		16,0	115,0	65,0	42,0	48,0	66499
0.6102	15,500 mm		16,0	115,0	65,0	42,0	48,0	66500
0.6221	15,800 mm		16,0	115,0	65,0	41,0	48,0	66501
0.6250	15,875 mm	5/8	16,0	115,0	65,0	41,0	48,0	56432
0.6299	16,000 mm		16,0	115,0	65,0	41,0	48,0	66502
0.6562	16,667 mm	21/32	18,0	123,0	73,0	47,0	48,0	56433
0.6875	17,463 mm	11/16	18,0	123,0	73,0	47,0	48,0	56434
0.7500	19,050 mm	3/4	20,0	131,0	79,0	50,0	50,0	56435

TOLERANCES (inch)

≤.1181 DIAMETER
DC = +.00008/+.00047
DCON = h_6

>.1181–.2362 DIAMETER
DC = +.00016/+.00063
DCON = h_6

>.2362–.3937 DIAMETER
DC = +.00024/+.00083
DCON = h_6

>.3937–.7087 DIAMETER
DC = +.00028/+.00098
DCON = h_6

>.7087–1.1811 DIAMETER
DC = +.00031/+.00114
DCON = h_6

TOLERANCES (mm)

≤3 DIAMETER
DC = +0,002/+0,012
DCON = h_6

>3–6 DIAMETER
DC = +0,004/+0,016
DCON = h_6

>6–10 DIAMETER
DC = +0,006/+0,021
DCON = h_6

>10–18 DIAMETER
DC = +0,007/+0,025
DCON = h_6

>18–30 DIAMETER
DC = +0,008/+0,029
DCON = h_6

- STEELS
- STAINLESS STEELS
- CAST IRON
- NON-FERROUS
- HIGH TEMP ALLOYS
- HARDENED STEELS

For patent information visit www.ksptpatents.com

HI-PERCARB®
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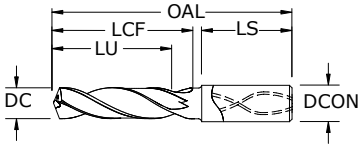

142P 5xD

FRACTIONAL & METRIC SERIES

TOLERANCES (inch)

≤.1181 DIAMETER
DC = +.00008/+.00047
DCON = h_6

>.1181–.2362 DIAMETER
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TOLERANCES (mm)

≤3 DIAMETER
DC = +0,002/+0,012
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DC = +0,008/+0,029
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		inch & mm						EDP NO.
DECIMAL DC	METRIC DC	FRACTIONAL/ LETTER/WIRE DC	SHANK DIAMETER DCON	OVERALL LENGTH OAL	FLUTE LENGTH LCF	USABLE LENGTH LU	SHANK LENGTH LS	Ti-NAMITE®-X (TX)
0.1181	3,000 mm		6,0	66,0	28,0	23,0	36,0	66503
0.1220	3,100 mm		6,0	66,0	28,0	23,0	36,0	66504
0.1250	3,175 mm	1/8	6,0	66,0	28,0	23,0	36,0	56436
0.1260	3,200 mm		6,0	66,0	28,0	23,0	36,0	66505
0.1299	3,300 mm		6,0	66,0	28,0	23,0	36,0	66506
0.1339	3,400 mm		6,0	66,0	28,0	23,0	36,0	66507
0.1360	3,454 mm	#29	6,0	66,0	28,0	23,0	36,0	56437
0.1378	3,500 mm		6,0	66,0	28,0	23,0	36,0	66508
0.1406	3,571 mm	9/64	6,0	66,0	28,0	23,0	36,0	56438
0.1417	3,600 mm		6,0	66,0	28,0	23,0	36,0	66509
0.1457	3,700 mm		6,0	66,0	28,0	23,0	36,0	66510
0.1496	3,800 mm		6,0	74,0	36,0	29,0	36,0	66511
0.1535	3,900 mm		6,0	74,0	36,0	29,0	36,0	66512
0.1562	3,967 mm	5/32	6,0	74,0	36,0	29,0	36,0	56439
0.1575	4,000 mm		6,0	74,0	36,0	29,0	36,0	66513
0.1590	4,039 mm	#21	6,0	74,0	36,0	29,0	36,0	56440
0.1614	4,100 mm		6,0	74,0	36,0	29,0	36,0	66514
0.1654	4,200 mm		6,0	74,0	36,0	29,0	36,0	66515
0.1693	4,300 mm		6,0	74,0	36,0	29,0	36,0	66516
0.1719	4,366 mm	11/64	6,0	74,0	36,0	29,0	36,0	56441
0.1732	4,400 mm		6,0	74,0	36,0	29,0	36,0	66517
0.1772	4,500 mm		6,0	74,0	36,0	29,0	36,0	66518
0.1811	4,600 mm		6,0	74,0	36,0	29,0	36,0	66519
0.1850	4,699 mm	#13	6,0	74,0	36,0	29,0	36,0	66520
0.1875	4,763 mm	3/16	6,0	82,0	44,0	37,0	36,0	56442
0.1890	4,801 mm	#12	6,0	82,0	44,0	37,0	36,0	66521
0.1929	4,900 mm		6,0	82,0	44,0	37,0	36,0	66522
0.1969	5,000 mm		6,0	82,0	44,0	36,0	36,0	66523
0.2008	5,100 mm		6,0	82,0	44,0	36,0	36,0	66524
0.2031	5,159 mm	13/64	6,0	82,0	44,0	36,0	36,0	56443
0.2047	5,200 mm		6,0	82,0	44,0	36,0	36,0	66525
0.2087	5,300 mm		6,0	82,0	44,0	36,0	36,0	66526
0.2126	5,400 mm		6,0	82,0	44,0	36,0	36,0	66527
0.2165	5,500 mm		6,0	82,0	44,0	36,0	36,0	66528
0.2188	5,558 mm	7/32	6,0	82,0	44,0	36,0	36,0	56444
0.2205	5,600 mm		6,0	82,0	44,0	36,0	36,0	66529
0.2244	5,700 mm		6,0	82,0	44,0	35,0	36,0	66530
0.2283	5,800 mm		6,0	82,0	44,0	35,0	36,0	66531
0.2323	5,900 mm		6,0	82,0	44,0	35,0	36,0	66532
0.2344	5,954 mm	15/64	6,0	82,0	44,0	35,0	36,0	56445
0.2362	6,000 mm		6,0	82,0	44,0	35,0	36,0	66533
0.2402	6,100 mm		8,0	91,0	53,0	44,0	36,0	66534
0.2441	6,200 mm		8,0	91,0	53,0	44,0	36,0	66535

continued on next page

- High-performance point design stabilizes on entry for exceptional hole size and cylindricity while also allowing for low thrust force and extended tool life
- Internal coolant hole improves coolant flow to extend tool life and aid in chip evacuation
- 4 margin design improves hole straightness and roundness while providing improved stability for difficult applications like cross holes and when exiting on angle
- Proprietary TI-NAMITE®-X coating and industry leading carbide substrate provides exceptional wear resistance and toughness for demanding applications
- Recommended for materials ≤50HRc (475 Bhn)

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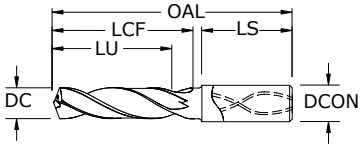
142P 5xD

FRACTIONAL & METRIC SERIES



- High-performance point design stabilizes on entry for exceptional hole size and cylindricity while also allowing for low thrust force and extended tool life
- Internal coolant hole improves coolant flow to extend tool life and aid in chip evacuation
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			inch & mm					EDP NO.
DECIMAL DC	METRIC DC	FRACTIONAL/ LETTER/WIRE DC	SHANK DIAMETER DCON	OVERALL LENGTH OAL	FLUTE LENGTH LCF	USABLE LENGTH LU	SHANK LENGTH LS	Ti-NAMITE®-X (TX)
0.2480	6,300 mm		8,0	91,0	53,0	44,0	36,0	66536
0.2500	6,350 mm	1/4 E	8,0	91,0	53,0	43,0	36,0	56446
0.2520	6,400 mm		8,0	91,0	53,0	43,0	36,0	66537
0.2559	6,500 mm		8,0	91,0	53,0	43,0	36,0	66538
0.2570	6,528 mm	F	8,0	91,0	53,0	43,0	36,0	56447
0.2598	6,600 mm		8,0	91,0	53,0	43,0	36,0	66539
0.2638	6,700 mm		8,0	91,0	53,0	43,0	36,0	66540
0.2656	6,746 mm	17/64	8,0	91,0	53,0	43,0	36,0	56448
0.2677	6,800 mm		8,0	91,0	53,0	43,0	36,0	66541
0.2717	6,900 mm		8,0	91,0	53,0	43,0	36,0	66542
0.2756	7,000 mm		8,0	91,0	53,0	42,0	36,0	66543
0.2795	7,100 mm		8,0	91,0	53,0	42,0	36,0	66544
0.2812	7,142 mm	9/32	8,0	91,0	53,0	42,0	36,0	56449
0.2835	7,200 mm		8,0	91,0	53,0	42,0	36,0	66545
0.2874	7,300 mm		8,0	91,0	53,0	42,0	36,0	66546
0.2913	7,400 mm		8,0	91,0	53,0	42,0	36,0	66547
0.2953	7,500 mm		8,0	91,0	53,0	42,0	36,0	66548
0.2969	7,541 mm	19/64	8,0	91,0	53,0	42,0	36,0	56450
0.2992	7,600 mm		8,0	91,0	53,0	42,0	36,0	66549
0.3031	7,700 mm		8,0	91,0	53,0	41,0	36,0	66550
0.3071	7,800 mm		8,0	91,0	53,0	41,0	36,0	66551
0.3110	7,900 mm		8,0	91,0	53,0	41,0	36,0	66552
0.3125	7,938 mm	5/16	8,0	91,0	53,0	41,0	36,0	56451
0.3150	8,000 mm		8,0	91,0	53,0	41,0	36,0	66553
0.3189	8,100 mm		10,0	103,0	61,0	49,0	40,0	66554
0.3228	8,200 mm		10,0	103,0	61,0	49,0	40,0	66555
0.3268	8,300 mm		10,0	103,0	61,0	49,0	40,0	66556
0.3281	8,334 mm	21/64	10,0	103,0	61,0	48,0	40,0	56452
0.3307	8,400 mm		10,0	103,0	61,0	48,0	40,0	66557
0.3320	8,433 mm	Q	10,0	103,0	61,0	48,0	40,0	56453
0.3346	8,500 mm		10,0	103,0	61,0	48,0	40,0	66558
0.3386	8,600 mm		10,0	103,0	61,0	48,0	40,0	66559
0.3425	8,700 mm		10,0	103,0	61,0	48,0	40,0	66560
0.3438	8,733 mm	11/32	10,0	103,0	61,0	48,0	40,0	56454
0.3465	8,800 mm		10,0	103,0	61,0	48,0	40,0	66561
0.3504	8,900 mm		10,0	103,0	61,0	48,0	40,0	66562
0.3543	9,000 mm		10,0	103,0	61,0	48,0	40,0	66563
0.3583	9,100 mm		10,0	103,0	61,0	47,0	40,0	66564
0.3594	9,129 mm	23/64	10,0	103,0	61,0	47,0	40,0	56455
0.3622	9,200 mm		10,0	103,0	61,0	47,0	40,0	66565
0.3661	9,300 mm		10,0	103,0	61,0	47,0	40,0	66566
0.3680	9,347 mm	U	10,0	103,0	61,0	47,0	40,0	56456
0.3701	9,400 mm		10,0	103,0	61,0	47,0	40,0	66567

continued on next page

TOLERANCES (inch)

≤.1181 DIAMETER
DC = +.00008/+.00047
DCON = h_6

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DCON = h_6

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DCON = h_6

>.3937–.7087 DIAMETER
DC = +.00028/+.00098
DCON = h_6

>.7087–1.1811 DIAMETER
DC = +.00031/+.00114
DCON = h_6

TOLERANCES (mm)

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DCON = h_6

>3–6 DIAMETER
DC = +0,004/+0,016
DCON = h_6

>6–10 DIAMETER
DC = +0,006/+0,021
DCON = h_6

>10–18 DIAMETER
DC = +0,007/+0,025
DCON = h_6

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DC = +0,008/+0,029
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For patent information visit www.ksptpatents.com

142P 5xD

FRACTIONAL & METRIC SERIES

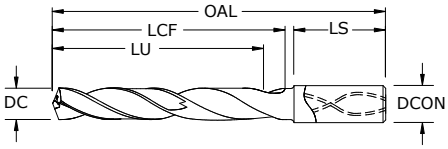
CONTINUED

DECIMAL DC	METRIC DC	FRACTIONAL/ LETTER/WIRE DC	SHANK DIAMETER DCON (inch & mm)	OVERALL LENGTH OAL (inch & mm)	FLUTE LENGTH LCF (inch & mm)	USABLE LENGTH LU (inch & mm)	SHANK LENGTH LS (inch & mm)	EDP NO. Ti-NAMITE®-X (TX)
0.3740	9,500 mm		10,0	103,0	61,0	47,0	40,0	66568
0.3750	9,525 mm	3/8	10,0	103,0	61,0	47,0	40,0	56457
0.3780	9,600 mm		10,0	103,0	61,0	47,0	40,0	66569
0.3819	9,700 mm		10,0	103,0	61,0	46,0	40,0	66570
0.3858	9,800 mm		10,0	103,0	61,0	46,0	40,0	66571
0.3898	9,900 mm		10,0	103,0	61,0	46,0	40,0	66572
0.3906	9,921 mm	25/64	10,0	103,0	61,0	46,0	40,0	56458
0.3937	10,000 mm		10,0	103,0	61,0	46,0	40,0	66573
0.3976	10,100 mm		12,0	118,0	71,0	56,0	45,0	66574
0.4016	10,200 mm		12,0	118,0	71,0	56,0	45,0	66575
0.4055	10,300 mm		12,0	118,0	71,0	56,0	45,0	66576
0.4062	10,317 mm	13/32	12,0	118,0	71,0	56,0	45,0	56459
0.4095	10,400 mm		12,0	118,0	71,0	55,0	45,0	66577
0.4134	10,500 mm		12,0	118,0	71,0	55,0	45,0	66578
0.4173	10,600 mm		12,0	118,0	71,0	55,0	45,0	66579
0.4213	10,700 mm		12,0	118,0	71,0	55,0	45,0	66580
0.4219	10,716 mm	27/64	12,0	118,0	71,0	55,0	45,0	56460
0.4252	10,800 mm		12,0	118,0	71,0	55,0	45,0	66581
0.4291	10,900 mm		12,0	118,0	71,0	55,0	45,0	66582
0.4331	11,000 mm		12,0	118,0	71,0	54,0	45,0	66583
0.4370	11,100 mm		12,0	118,0	71,0	54,0	45,0	66584
0.4375	11,113 mm	7/16	12,0	118,0	71,0	54,0	45,0	56461
0.4409	11,200 mm		12,0	118,0	71,0	54,0	45,0	66585
0.4449	11,300 mm		12,0	118,0	71,0	54,0	45,0	66586
0.4488	11,400 mm		12,0	118,0	71,0	54,0	45,0	66587
0.4528	11,500 mm		12,0	118,0	71,0	54,0	45,0	66588
0.4567	11,600 mm		12,0	118,0	71,0	54,0	45,0	66589
0.4606	11,700 mm		12,0	118,0	71,0	53,0	45,0	66590
0.4646	11,800 mm		12,0	118,0	71,0	53,0	45,0	66591
0.4685	11,900 mm		12,0	118,0	71,0	53,0	45,0	66592
0.4688	11,908 mm	15/32	12,0	118,0	71,0	53,0	45,0	56462
0.4724	12,000 mm		12,0	118,0	71,0	53,0	45,0	66593
0.4844	12,304 mm	31/64	14,0	124,0	77,0	58,0	45,0	56463
0.4921	12,500 mm		14,0	124,0	77,0	58,0	45,0	66594
0.5000	12,700 mm	1/2	14,0	124,0	77,0	58,0	45,0	56464
0.5039	12,800 mm		14,0	124,0	77,0	58,0	45,0	66595
0.5118	13,000 mm		14,0	124,0	77,0	58,0	45,0	66596
0.5156	13,096 mm	33/64	14,0	124,0	77,0	57,0	45,0	56465
0.5315	13,500 mm		14,0	124,0	77,0	57,0	45,0	66597
0.5433	13,800 mm		14,0	124,0	77,0	56,0	45,0	66598
0.5512	14,000 mm		14,0	124,0	77,0	56,0	45,0	66599
0.5625	14,288 mm	9/16	16,0	133,0	83,0	61,0	48,0	56466
0.5709	14,500 mm		16,0	133,0	83,0	61,0	48,0	66600
0.5781	14,684 mm	37/64	16,0	133,0	83,0	61,0	48,0	56467
0.5827	14,800 mm		16,0	133,0	83,0	61,0	48,0	66601
0.5906	15,000 mm		16,0	133,0	83,0	60,0	48,0	66602
0.6102	15,500 mm		16,0	133,0	83,0	60,0	48,0	66603
0.6221	15,800 mm		16,0	133,0	83,0	59,0	48,0	66604
0.6250	15,875 mm	5/8	16,0	133,0	83,0	59,0	48,0	56468
0.6299	16,000 mm		16,0	133,0	83,0	59,0	48,0	66605
0.6562	16,667 mm	21/32	18,0	143,0	93,0	68,0	48,0	56469
0.6875	17,463 mm	11/16	18,0	143,0	93,0	67,0	48,0	56470
0.7500	19,050 mm	3/4	20,0	153,0	101,0	72,0	50,0	56471

HI-PERCARB®
HIGH PERFORMANCE CARBIDE DRILLS

142P 8xD

FRACTIONAL & METRIC SERIES



- High-performance point design stabilizes on entry for exceptional hole size and cylindricity while also allowing for low thrust force and extended tool life
- Internal coolant hole improves coolant flow to extend tool life and aid in chip evacuation
- 4-margin design improves hole straightness and roundness while providing improved stability for difficult applications like cross holes and when exiting on angle
- Proprietary Ti-NAMITE®-X coating and industry leading carbide substrate provides exceptional wear resistance and toughness for demanding applications
- Recommended for materials ≤ 50HRc (475 Bhn)

		inch & mm						EDP NO.
DECIMAL DC	METRIC DC	FRACTIONAL/ LETTER/WIRE DC	SHANK DIAMETER DCON	OVERALL LENGTH OAL	FLUTE LENGTH LCF	USABLE LENGTH LU	SHANK LENGTH LS	Ti-NAMITE®-X (TX)
0.1181	3,000 mm		6,0	72,0	34,0	29,0	36,0	66606
0.1220	3,100 mm		6,0	72,0	34,0	29,0	36,0	66607
0.1250	3,175 mm	1/8	6,0	72,0	34,0	29,0	36,0	56472
0.1260	3,200 mm		6,0	72,0	34,0	29,0	36,0	66608
0.1299	3,300 mm		6,0	72,0	34,0	29,0	36,0	66609
0.1339	3,400 mm		6,0	72,0	34,0	29,0	36,0	66610
0.1360	3,454 mm	#29	6,0	72,0	34,0	29,0	36,0	56473
0.1378	3,500 mm		6,0	72,0	34,0	29,0	36,0	66611
0.1406	3,571 mm	9/64	6,0	72,0	34,0	29,0	36,0	56474
0.1417	3,600 mm		6,0	72,0	34,0	29,0	36,0	66612
0.1457	3,700 mm		6,0	72,0	34,0	29,0	36,0	66613
0.1496	3,800 mm		6,0	81,0	43,0	37,0	36,0	66614
0.1535	3,900 mm		6,0	81,0	43,0	37,0	36,0	66615
0.1562	3,967 mm	5/32	6,0	81,0	43,0	37,0	36,0	56475
0.1575	4,000 mm		6,0	81,0	43,0	37,0	36,0	66616
0.1590	4,039 mm	#21	6,0	81,0	43,0	37,0	36,0	56476
0.1614	4,100 mm		6,0	81,0	43,0	37,0	36,0	66617
0.1654	4,200 mm		6,0	81,0	43,0	37,0	36,0	66618
0.1693	4,300 mm		6,0	81,0	43,0	37,0	36,0	66619
0.1719	4,366 mm	11/64	6,0	81,0	43,0	36,0	36,0	56477
0.1732	4,400 mm		6,0	81,0	43,0	36,0	36,0	66620
0.1772	4,500 mm		6,0	81,0	43,0	36,0	36,0	66621
0.1811	4,600 mm		6,0	81,0	43,0	36,0	36,0	66622
0.1850	4,699 mm	#13	6,0	81,0	43,0	36,0	36,0	66623
0.1875	4,763 mm	3/16	6,0	95,0	57,0	50,0	36,0	56478
0.1890	4,801 mm	#12	6,0	95,0	57,0	50,0	36,0	66624
0.1929	4,900 mm		6,0	95,0	57,0	50,0	36,0	66625
0.1969	5,000 mm		6,0	95,0	57,0	49,0	36,0	66626
0.2008	5,100 mm		6,0	95,0	57,0	49,0	36,0	66627
0.2031	5,159 mm	13/64	6,0	95,0	57,0	49,0	36,0	56479
0.2047	5,200 mm		6,0	95,0	57,0	49,0	36,0	66628
0.2087	5,300 mm		6,0	95,0	57,0	49,0	36,0	66629
0.2126	5,400 mm		6,0	95,0	57,0	49,0	36,0	66630
0.2165	5,500 mm		6,0	95,0	57,0	49,0	36,0	66631
0.2188	5,558 mm	7/32	6,0	95,0	57,0	49,0	36,0	56480
0.2205	5,600 mm		6,0	95,0	57,0	49,0	36,0	66632

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TOLERANCES (inch)

≤.1181 DIAMETER
DC = +.00008/+.00047
DCON = h_6

>.1181–.2362 DIAMETER
DC = +.00016/+.00063
DCON = h_6

>.2362–.3937 DIAMETER
DC = +.00024/+.00083
DCON = h_6

>.3937–.7087 DIAMETER
DC = +.00028/+.00098
DCON = h_6

>.7087–1.1811 DIAMETER
DC = +.00031/+.00114
DCON = h_6

TOLERANCES (mm)

≤3 DIAMETER
DC = +0,002/+0,012
DCON = h_6

>3–6 DIAMETER
DC = +0,004/+0,016
DCON = h_6

>6–10 DIAMETER
DC = +0,006/+0,021
DCON = h_6

>10–18 DIAMETER
DC = +0,007/+0,025
DCON = h_6

>18–30 DIAMETER
DC = +0,008/+0,029
DCON = h_6

- STEELS
- STAINLESS STEELS
- CAST IRON
- NON-FERROUS
- HIGH TEMP ALLOYS
- HARDENED STEELS

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142P 8xD

FRACTIONAL & METRIC SERIES

CONTINUED

			inch & mm					EDP NO.
DECIMAL DC	METRIC DC	FRACTIONAL/ LETTER/WIRE DC	SHANK DIAMETER DCON	OVERALL LENGTH OAL	FLUTE LENGTH LCF	USABLE LENGTH LU	SHANK LENGTH LS	Ti-NAMITE®-X (TX)
0.2244	5,700 mm		6,0	95,0	57,0	48,0	36,0	66633
0.2283	5,800 mm		6,0	95,0	57,0	48,0	36,0	66634
0.2323	5,900 mm		6,0	95,0	57,0	48,0	36,0	66635
0.2344	5,954 mm	15/64	6,0	95,0	57,0	48,0	36,0	56481
0.2362	6,000 mm		6,0	95,0	57,0	48,0	36,0	66636
0.2402	6,100 mm		8,0	114,0	76,0	67,0	36,0	66637
0.2441	6,200 mm		8,0	114,0	76,0	67,0	36,0	66638
0.2480	6,300 mm		8,0	114,0	76,0	67,0	36,0	66639
0.2500	6,350 mm	1/4 E	8,0	114,0	76,0	66,0	36,0	56482
0.2520	6,400 mm		8,0	114,0	76,0	66,0	36,0	66640
0.2559	6,500 mm		8,0	114,0	76,0	66,0	36,0	66641
0.2570	6,528 mm	F	8,0	114,0	76,0	66,0	36,0	56483
0.2598	6,600 mm		8,0	114,0	76,0	66,0	36,0	66642
0.2638	6,700 mm		8,0	114,0	76,0	66,0	36,0	66643
0.2656	6,746 mm	17/64	8,0	114,0	76,0	66,0	36,0	56484
0.2677	6,800 mm		8,0	114,0	76,0	66,0	36,0	66644
0.2717	6,900 mm		8,0	114,0	76,0	66,0	36,0	66645
0.2756	7,000 mm		8,0	114,0	76,0	65,0	36,0	66646
0.2795	7,100 mm		8,0	114,0	76,0	65,0	36,0	66647
0.2812	7,142 mm	9/32	8,0	114,0	76,0	65,0	36,0	56485
0.2835	7,200 mm		8,0	114,0	76,0	65,0	36,0	66648
0.2874	7,300 mm		8,0	114,0	76,0	65,0	36,0	66649
0.2913	7,400 mm		8,0	114,0	76,0	65,0	36,0	66650
0.2953	7,500 mm		8,0	114,0	76,0	65,0	36,0	66651
0.2969	7,541 mm	19/64	8,0	114,0	76,0	65,0	36,0	56486
0.2992	7,600 mm		8,0	114,0	76,0	65,0	36,0	66652
0.3031	7,700 mm		8,0	114,0	76,0	64,0	36,0	66653
0.3071	7,800 mm		8,0	114,0	76,0	64,0	36,0	66654
0.3110	7,900 mm		8,0	114,0	76,0	64,0	36,0	66655
0.3125	7,938 mm	5/16	8,0	114,0	76,0	64,0	36,0	56487
0.3150	8,000 mm		8,0	114,0	76,0	64,0	36,0	66656
0.3189	8,100 mm		10,0	142,0	95,0	83,0	40,0	66657
0.3228	8,200 mm		10,0	142,0	95,0	83,0	40,0	66658
0.3268	8,300 mm		10,0	142,0	95,0	83,0	40,0	66659
0.3281	8,334 mm	21/64	10,0	142,0	95,0	83,0	40,0	56488
0.3307	8,400 mm		10,0	142,0	95,0	82,0	40,0	66660
0.3320	8,433 mm	Q	10,0	142,0	95,0	82,0	40,0	56489
0.3346	8,500 mm		10,0	142,0	95,0	82,0	40,0	66661
0.3386	8,600 mm		10,0	142,0	95,0	82,0	40,0	66662
0.3425	8,700 mm		10,0	142,0	95,0	82,0	40,0	66663
0.3438	8,733 mm	11/32	10,0	142,0	95,0	82,0	40,0	56490
0.3465	8,800 mm		10,0	142,0	95,0	82,0	40,0	66664
0.3504	8,900 mm		10,0	142,0	95,0	82,0	40,0	66665
0.3543	9,000 mm		10,0	142,0	95,0	82,0	40,0	66666

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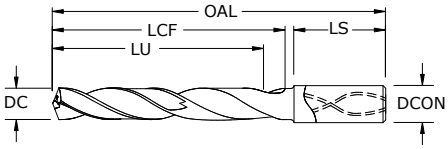
142P 8xD

FRACTIONAL & METRIC SERIES



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- Recommended for materials ≤ 50HRc (475 Bhn)

			inch & mm					EDP NO.
DECIMAL DC	METRIC DC	FRACTIONAL/ LETTER/WIRE DC	SHANK DIAMETER DCON	OVERALL LENGTH OAL	FLUTE LENGTH LCF	USABLE LENGTH LU	SHANK LENGTH LS	Ti-NAMITE®-X (TX)
0.3583	9,100 mm		10,0	142,0	95,0	81,0	40,0	66667
0.3594	9,129 mm	23/64	10,0	142,0	95,0	81,0	40,0	56491
0.3622	9,200 mm		10,0	142,0	95,0	81,0	40,0	66668
0.3661	9,300 mm		10,0	142,0	95,0	81,0	40,0	66669
0.3680	9,347 mm	U	10,0	142,0	95,0	81,0	40,0	56492
0.3701	9,400 mm		10,0	142,0	95,0	81,0	40,0	66670
0.3740	9,500 mm		10,0	142,0	95,0	81,0	40,0	66671
0.3750	9,525 mm	3/8	10,0	142,0	95,0	81,0	40,0	56493
0.3780	9,600 mm		10,0	142,0	95,0	81,0	40,0	66672
0.3819	9,700 mm		10,0	142,0	95,0	80,0	40,0	66673
0.3858	9,800 mm		10,0	142,0	95,0	80,0	40,0	66674
0.3898	9,900 mm		10,0	142,0	95,0	80,0	40,0	66675
0.3906	9,921 mm	25/64	10,0	142,0	95,0	80,0	40,0	56494
0.3937	10,000 mm		10,0	142,0	95,0	80,0	40,0	66676
0.3976	10,100 mm		12,0	162,0	114,0	99,0	45,0	66677
0.4016	10,200 mm		12,0	162,0	114,0	99,0	45,0	66678
0.4055	10,300 mm		12,0	162,0	114,0	99,0	45,0	66679
0.4062	10,317 mm	13/32	12,0	162,0	114,0	99,0	45,0	56495
0.4095	10,400 mm		12,0	162,0	114,0	98,0	45,0	66680
0.4134	10,500 mm		12,0	162,0	114,0	98,0	45,0	66681
0.4173	10,600 mm		12,0	162,0	114,0	98,0	45,0	66682
0.4213	10,700 mm		12,0	162,0	114,0	98,0	45,0	66683
0.4219	10,716 mm	27/64	12,0	162,0	114,0	98,0	45,0	56496
0.4252	10,800 mm		12,0	162,0	114,0	98,0	45,0	66684
0.4291	10,900 mm		12,0	162,0	114,0	98,0	45,0	66685
0.4331	11,000 mm		12,0	162,0	114,0	97,0	45,0	66686
0.4370	11,100 mm		12,0	162,0	114,0	97,0	45,0	66687
0.4375	11,113 mm	7/16	12,0	162,0	114,0	97,0	45,0	56497
0.4409	11,200 mm		12,0	162,0	114,0	97,0	45,0	66688
0.4449	11,300 mm		12,0	162,0	114,0	97,0	45,0	66689
0.4488	11,400 mm		12,0	162,0	114,0	97,0	45,0	66690
0.4528	11,500 mm		12,0	162,0	114,0	97,0	45,0	66691
0.4567	11,600 mm		12,0	162,0	114,0	97,0	45,0	66692
0.4606	11,700 mm		12,0	162,0	114,0	96,0	45,0	66693

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TOLERANCES (inch)

≤.1181 DIAMETER
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DCON = h_6

>.1181–.2362 DIAMETER
DC = +.00016/+.00063
DCON = h_6

>.2362–.3937 DIAMETER
DC = +.00024/+.00083
DCON = h_6

>.3937–.7087 DIAMETER
DC = +.00028/+.00098
DCON = h_6

>.7087–1.1811 DIAMETER
DC = +.00031/+.00114
DCON = h_6

TOLERANCES (mm)

≤3 DIAMETER
DC = +0,002/+0,012
DCON = h_6

>3–6 DIAMETER
DC = +0,004/+0,016
DCON = h_6

>6–10 DIAMETER
DC = +0,006/+0,021
DCON = h_6

>10–18 DIAMETER
DC = +0,007/+0,025
DCON = h_6

>18–30 DIAMETER
DC = +0,008/+0,029
DCON = h_6

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142P 8xD

FRACTIONAL & METRIC SERIES

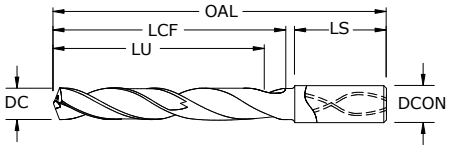
CONTINUED

inch & mm								EDP NO.
DECIMAL DC	METRIC DC	FRACTIONAL/ LETTER/WIRE DC	SHANK DIAMETER DCON	OVERALL LENGTH OAL	FLUTE LENGTH LCF	USABLE LENGTH LU	SHANK LENGTH LS	Ti-NAMITE®-X (TX)
0.4646	11,800 mm		12,0	162,0	114,0	96,0	45,0	66694
0.4685	11,900 mm		12,0	162,0	114,0	96,0	45,0	66695
0.4688	11,908 mm	15/32	12,0	162,0	114,0	96,0	45,0	56498
0.4724	12,000 mm		12,0	162,0	114,0	96,0	45,0	66696
0.4844	12,304 mm	31/64	14,0	178,0	133,0	114,0	45,0	56499
0.4921	12,500 mm		14,0	178,0	133,0	114,0	45,0	66697
0.5000	12,700 mm	1/2	14,0	178,0	133,0	114,0	45,0	56500
0.5039	12,800 mm		14,0	178,0	133,0	114,0	45,0	66698
0.5118	13,000 mm		14,0	178,0	133,0	114,0	45,0	66699
0.5156	13,096 mm	33/64	14,0	178,0	133,0	113,0	45,0	56501
0.5315	13,500 mm		14,0	178,0	133,0	113,0	45,0	66700
0.5433	13,800 mm		14,0	178,0	133,0	113,0	45,0	66701
0.5512	14,000 mm		14,0	178,0	133,0	113,0	45,0	66702
0.5625	14,288 mm	9/16	16,0	203,0	152,0	130,0	48,0	56502
0.5709	14,500 mm		16,0	203,0	152,0	130,0	48,0	66703
0.5781	14,684 mm	37/64	16,0	203,0	152,0	130,0	48,0	56503
0.5827	14,800 mm		16,0	203,0	152,0	130,0	48,0	66704
0.5906	15,000 mm		16,0	203,0	152,0	129,0	48,0	66705
0.6102	15,500 mm		16,0	203,0	152,0	129,0	48,0	66706
0.6221	15,800 mm		16,0	203,0	152,0	128,0	48,0	66707
0.6250	15,875 mm	5/8	16,0	203,0	152,0	128,0	48,0	56504
0.6299	16,000 mm		16,0	203,0	152,0	128,0	48,0	66708
0.6562	16,667 mm	21/32	18,0	222,0	171,0	145,0	48,0	56505
0.6875	17,463 mm	11/16	18,0	222,0	171,0	145,0	48,0	56506
0.7500	19,050 mm	3/4	20,0	243,0	190,0	161,0	50,0	56507

HI-PERCARB®
HIGH PERFORMANCE CARBIDE DRILLS

142P 12xD

FRACTIONAL & METRIC SERIES



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inch & mm								EDP NO.
DECIMAL DC	METRIC DC	FRACTIONAL/ LETTER/WIRE DC	SHANK DIAMETER DCON	OVERALL LENGTH OAL	FLUTE LENGTH LCF	USABLE LENGTH LU	SHANK LENGTH LS	Ti-NAMITE®-X (TX)
0.1181	3,000 mm		6,0	87,0	49,0	44,0	36,0	66709
0.1220	3,100 mm		6,0	87,0	49,0	44,0	36,0	66710
0.1250	3,175 mm	1/8	6,0	87,0	49,0	44,0	36,0	56508
0.1260	3,200 mm		6,0	87,0	49,0	44,0	36,0	66711
0.1299	3,300 mm		6,0	87,0	49,0	44,0	36,0	66712
0.1339	3,400 mm		6,0	87,0	49,0	44,0	36,0	66713
0.1360	3,454 mm	#29	6,0	87,0	49,0	44,0	36,0	56509
0.1378	3,500 mm		6,0	87,0	49,0	44,0	36,0	66714
0.1406	3,571 mm	9/64	6,0	87,0	49,0	43,0	36,0	56510
0.1417	3,600 mm		6,0	87,0	49,0	43,0	36,0	66715
0.1457	3,700 mm		6,0	87,0	49,0	43,0	36,0	66716
0.1496	3,800 mm		6,0	100,0	62,0	56,0	36,0	66717
0.1535	3,900 mm		6,0	100,0	62,0	56,0	36,0	66718
0.1562	3,967 mm	5/32	6,0	100,0	62,0	56,0	36,0	56511
0.1575	4,000 mm		6,0	100,0	62,0	56,0	36,0	66719
0.1590	4,039 mm	#21	6,0	100,0	62,0	56,0	36,0	56512
0.1614	4,100 mm		6,0	100,0	62,0	56,0	36,0	66720
0.1654	4,200 mm		6,0	100,0	62,0	55,0	36,0	66721
0.1693	4,300 mm		6,0	100,0	62,0	55,0	36,0	66722
0.1719	4,366 mm	11/64	6,0	100,0	62,0	55,0	36,0	56513
0.1732	4,400 mm		6,0	100,0	62,0	55,0	36,0	66723
0.1772	4,500 mm		6,0	100,0	62,0	55,0	36,0	66724
0.1811	4,600 mm		6,0	100,0	62,0	55,0	36,0	66725
0.1850	4,699 mm	#13	6,0	100,0	62,0	55,0	36,0	66726
0.1875	4,763 mm	3/16	6,0	119,0	81,0	74,0	36,0	56514
0.1890	4,801 mm	#12	6,0	119,0	81,0	74,0	36,0	66727
0.1929	4,900 mm		6,0	119,0	81,0	74,0	36,0	66728
0.1969	5,000 mm		6,0	119,0	81,0	73,0	36,0	66729
0.2008	5,100 mm		6,0	119,0	81,0	73,0	36,0	66730
0.2031	5,159 mm	13/64	6,0	119,0	81,0	73,0	36,0	56515
0.2047	5,200 mm		6,0	119,0	81,0	73,0	36,0	66731
0.2087	5,300 mm		6,0	119,0	81,0	73,0	36,0	66732
0.2126	5,400 mm		6,0	119,0	81,0	73,0	36,0	66733
0.2165	5,500 mm		6,0	119,0	81,0	73,0	36,0	66734

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TOLERANCES (inch)

≤.1181 DIAMETER
DC = +.00008/+.00047
DCON = h_6

>.1181–.2362 DIAMETER
DC = +.00016/+.00063
DCON = h_6

>.2362–.3937 DIAMETER
DC = +.00024/+.00083
DCON = h_6

>.3937–.7087 DIAMETER
DC = +.00028/+.00098
DCON = h_6

>.7087–1.1811 DIAMETER
DC = +.00031/+.00114
DCON = h_6

TOLERANCES (mm)

≤3 DIAMETER
DC = +0,002/+0,012
DCON = h_6

>3–6 DIAMETER
DC = +0,004/+0,016
DCON = h_6

>6–10 DIAMETER
DC = +0,006/+0,021
DCON = h_6

>10–18 DIAMETER
DC = +0,007/+0,025
DCON = h_6

>18–30 DIAMETER
DC = +0,008/+0,029
DCON = h_6

- STEELS
- STAINLESS STEELS
- CAST IRON
- NON-FERROUS
- HIGH TEMP ALLOYS
- HARDENED STEELS

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142P 12xD

FRACTIONAL & METRIC SERIES

CONTINUED

inch & mm								EDP NO.
DECIMAL DC	METRIC DC	FRACTIONAL/ LETTER/WIRE DC	SHANK DIAMETER DCON	OVERALL LENGTH OAL	FLUTE LENGTH LCF	USABLE LENGTH LU	SHANK LENGTH LS	Ti-NAMITE®-X (TX)
0.2188	5,558 mm	7/32	6,0	119,0	81,0	73,0	36,0	56516
0.2205	5,600 mm		6,0	119,0	81,0	73,0	36,0	66735
0.2244	5,700 mm		6,0	119,0	81,0	72,0	36,0	66736
0.2283	5,800 mm		6,0	119,0	81,0	72,0	36,0	66737
0.2323	5,900 mm		6,0	119,0	81,0	72,0	36,0	66738
0.2344	5,954 mm	15/64	6,0	119,0	81,0	72,0	36,0	56517
0.2362	6,000 mm		6,0	119,0	81,0	72,0	36,0	66739
0.2402	6,100 mm		8,0	146,0	108,0	99,0	36,0	66740
0.2441	6,200 mm		8,0	146,0	108,0	99,0	36,0	66741
0.2480	6,300 mm		8,0	146,0	108,0	99,0	36,0	66742
0.2500	6,350 mm	1/4 E	8,0	146,0	108,0	98,0	36,0	56518
0.2520	6,400 mm		8,0	146,0	108,0	98,0	36,0	66743
0.2559	6,500 mm		8,0	146,0	108,0	98,0	36,0	66744
0.2570	6,528 mm	F	8,0	146,0	108,0	98,0	36,0	56519
0.2598	6,600 mm		8,0	146,0	108,0	98,0	36,0	66745
0.2638	6,700 mm		8,0	146,0	108,0	98,0	36,0	66746
0.2656	6,746 mm	17/64	8,0	146,0	108,0	98,0	36,0	56520
0.2677	6,800 mm		8,0	146,0	108,0	98,0	36,0	66747
0.2717	6,900 mm		8,0	146,0	108,0	98,0	36,0	66748
0.2756	7,000 mm		8,0	146,0	108,0	97,0	36,0	66749
0.2795	7,100 mm		8,0	146,0	108,0	97,0	36,0	66750
0.2812	7,142 mm	9/32	8,0	146,0	108,0	97,0	36,0	56521
0.2835	7,200 mm		8,0	146,0	108,0	97,0	36,0	66751
0.2874	7,300 mm		8,0	146,0	108,0	97,0	36,0	66752
0.2913	7,400 mm		8,0	146,0	108,0	97,0	36,0	66753
0.2953	7,500 mm		8,0	146,0	108,0	97,0	36,0	66754
0.2969	7,541 mm	19/64	8,0	146,0	108,0	97,0	36,0	56522
0.2992	7,600 mm		8,0	146,0	108,0	97,0	36,0	66755
0.3031	7,700 mm		8,0	146,0	108,0	96,0	36,0	66756
0.3071	7,800 mm		8,0	146,0	108,0	96,0	36,0	66757
0.3110	7,900 mm		8,0	146,0	108,0	96,0	36,0	66758
0.3125	7,938 mm	5/16	8,0	146,0	108,0	96,0	36,0	56523
0.3150	8,000 mm		8,0	146,0	108,0	96,0	36,0	66759
0.3189	8,100 mm		10,0	182,0	135,0	123,0	40,0	66760
0.3228	8,200 mm		10,0	182,0	135,0	123,0	40,0	66761
0.3268	8,300 mm		10,0	182,0	135,0	123,0	40,0	66762
0.3281	8,334 mm	21/64	10,0	182,0	135,0	123,0	40,0	56524
0.3307	8,400 mm		10,0	182,0	135,0	122,0	40,0	66763
0.3320	8,433 mm	Q	10,0	182,0	135,0	122,0	40,0	56525
0.3346	8,500 mm		10,0	182,0	135,0	122,0	40,0	66764
0.3386	8,600 mm		10,0	182,0	135,0	122,0	40,0	66765
0.3425	8,700 mm		10,0	182,0	135,0	122,0	40,0	66766

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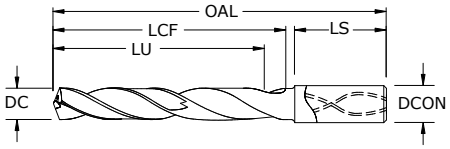
HI-PERCARB®
HIGH PERFORMANCE CARBIDE DRILLS

142P 12xD

FRACTIONAL & METRIC SERIES



- High-performance point design stabilizes on entry for exceptional hole size and cylindricity while also allowing for low thrust force and extended tool life
- Internal coolant hole improves coolant flow to extend tool life and aid in chip evacuation
- 4-margin design improves hole straightness and roundness while providing improved stability for difficult applications like cross holes and when exiting on angle
- Proprietary Ti-NAMITE®-X coating and industry leading carbide substrate provides exceptional wear resistance and toughness for demanding applications
- Recommended for materials ≤ 50HRc (475 Bhn)

			inch & mm						EDP NO.
DECIMAL DC	METRIC DC	FRACTIONAL/ LETTER/WIRE DC	SHANK DIAMETER DCON	OVERALL LENGTH OAL	FLUTE LENGTH LCF	USABLE LENGTH LU	SHANK LENGTH LS	Ti-NAMITE®-X (TX)
0.3438	8,733 mm	11/32	10,0	182,0	135,0	122,0	40,0	56526
0.3465	8,800 mm		10,0	182,0	135,0	122,0	40,0	66767
0.3504	8,900 mm		10,0	182,0	135,0	122,0	40,0	66768
0.3543	9,000 mm		10,0	182,0	135,0	122,0	40,0	66769
0.3583	9,100 mm		10,0	182,0	135,0	121,0	40,0	66770
0.3594	9,129 mm	23/64	10,0	182,0	135,0	121,0	40,0	56527
0.3622	9,200 mm		10,0	182,0	135,0	121,0	40,0	66771
0.3661	9,300 mm		10,0	182,0	135,0	121,0	40,0	66772
0.3680	9,347 mm	U	10,0	182,0	135,0	121,0	40,0	56528
0.3701	9,400 mm		10,0	182,0	135,0	121,0	40,0	66773
0.3740	9,500 mm		10,0	182,0	135,0	121,0	40,0	66774
0.3750	9,525 mm	3/8	10,0	182,0	135,0	121,0	40,0	56529
0.3780	9,600 mm		10,0	182,0	135,0	121,0	40,0	66775
0.3819	9,700 mm		10,0	182,0	135,0	120,0	40,0	66776
0.3858	9,800 mm		10,0	182,0	135,0	120,0	40,0	66777
0.3898	9,900 mm		10,0	182,0	135,0	120,0	40,0	66778
0.3906	9,921 mm	25/64	10,0	182,0	135,0	120,0	40,0	56530
0.3937	10,000 mm		10,0	182,0	135,0	120,0	40,0	66779
0.3976	10,100 mm		12,0	210,0	162,0	147,0	45,0	66780
0.4016	10,200 mm		12,0	210,0	162,0	147,0	45,0	66781
0.4055	10,300 mm		12,0	210,0	162,0	147,0	45,0	66782
0.4062	10,317 mm	13/32	12,0	210,0	162,0	147,0	45,0	56531
0.4095	10,400 mm		12,0	210,0	162,0	146,0	45,0	66783
0.4134	10,500 mm		12,0	210,0	162,0	146,0	45,0	66784
0.4173	10,600 mm		12,0	210,0	162,0	146,0	45,0	66785
0.4213	10,700 mm		12,0	210,0	162,0	146,0	45,0	66786
0.4219	10,716 mm	27/64	12,0	210,0	162,0	146,0	45,0	56532
0.4252	10,800 mm		12,0	210,0	162,0	146,0	45,0	66787
0.4291	10,900 mm		12,0	210,0	162,0	146,0	45,0	66788
0.4331	11,000 mm		12,0	210,0	162,0	145,0	45,0	66789
0.4370	11,100 mm		12,0	210,0	162,0	145,0	45,0	66790
0.4375	11,113 mm	7/16	12,0	210,0	162,0	145,0	45,0	56533
0.4409	11,200 mm		12,0	210,0	162,0	145,0	45,0	66791
0.4449	11,300 mm		12,0	210,0	162,0	145,0	45,0	66792

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TOLERANCES (inch)

≤.1181 DIAMETER
DC = +.00008/+.00047
DCON = h_6

>.1181–.2362 DIAMETER
DC = +.00016/+.00063
DCON = h_6

>.2362–.3937 DIAMETER
DC = +.00024/+.00083
DCON = h_6

>.3937–.7087 DIAMETER
DC = +.00028/+.00098
DCON = h_6

>.7087–1.1811 DIAMETER
DC = +.00031/+.00114
DCON = h_6

TOLERANCES (mm)

≤3 DIAMETER
DC = +0,002/+0,012
DCON = h_6

>3–6 DIAMETER
DC = +0,004/+0,016
DCON = h_6

>6–10 DIAMETER
DC = +0,006/+0,021
DCON = h_6

>10–18 DIAMETER
DC = +0,007/+0,025
DCON = h_6

>18–30 DIAMETER
DC = +0,008/+0,029
DCON = h_6

- STEELS
- STAINLESS STEELS
- CAST IRON
- NON-FERROUS
- HIGH TEMP ALLOYS
- HARDENED STEELS

For patent information visit www.ksptpatents.com

142P 12xD

FRACTIONAL & METRIC SERIES

CONTINUED

inch & mm								EDP NO.
DECIMAL DC	METRIC DC	FRACTIONAL/ LETTER/WIRE DC	SHANK DIAMETER DCON	OVERALL LENGTH OAL	FLUTE LENGTH LCF	USABLE LENGTH LU	SHANK LENGTH LS	Ti-NAMITE®-X (TX)
0.4488	11,400 mm		12,0	210,0	162,0	145,0	45,0	66793
0.4528	11,500 mm		12,0	210,0	162,0	145,0	45,0	66794
0.4567	11,600 mm		12,0	210,0	162,0	145,0	45,0	66795
0.4606	11,700 mm		12,0	210,0	162,0	144,0	45,0	66796
0.4646	11,800 mm		12,0	210,0	162,0	144,0	45,0	66797
0.4685	11,900 mm		12,0	210,0	162,0	144,0	45,0	66798
0.4688	11,908 mm	15/32	12,0	210,0	162,0	144,0	45,0	56534
0.4724	12,000 mm		12,0	210,0	162,0	144,0	45,0	66799
0.4844	12,304 mm	31/64	14,0	234,0	189,0	171,0	45,0	56535
0.4921	12,500 mm		14,0	234,0	189,0	170,0	45,0	66800
0.5000	12,700 mm	1/2	14,0	234,0	189,0	170,0	45,0	56536
0.5039	12,800 mm		14,0	234,0	189,0	170,0	45,0	66801
0.5118	13,000 mm		14,0	234,0	189,0	170,0	45,0	66802
0.5156	13,096 mm	33/64	14,0	234,0	189,0	169,0	45,0	56537
0.5315	13,500 mm		14,0	234,0	189,0	169,0	45,0	66803
0.5433	13,800 mm		14,0	234,0	189,0	168,0	45,0	66804
0.5512	14,000 mm		14,0	234,0	189,0	168,0	45,0	66805
0.5625	14,288 mm	9/16	16,0	267,0	216,0	195,0	48,0	56538
0.5709	14,500 mm		16,0	267,0	216,0	194,0	48,0	66806
0.5781	14,684 mm	37/64	16,0	267,0	216,0	194,0	48,0	56539
0.5827	14,800 mm		16,0	267,0	216,0	194,0	48,0	66807
0.5906	15,000 mm		16,0	267,0	216,0	193,0	48,0	66808
0.6102	15,500 mm		16,0	267,0	216,0	193,0	48,0	66809
0.6221	15,800 mm		16,0	267,0	216,0	192,0	48,0	66810
0.6250	15,875 mm	5/8	16,0	267,0	216,0	192,0	48,0	56540
0.6299	16,000 mm		16,0	267,0	216,0	192,0	48,0	66811
0.6562	16,667 mm	21/32	18,0	292,0	241,0	216,0	48,0	56541
0.6875	17,463 mm	11/16	18,0	292,0	241,0	215,0	48,0	56542
0.7500	19,050 mm	3/4	20,0	319,0	266,0	238,0	50,0	56543

FRACTIONAL

Hi-PerCarb®

	Series 142P Fractional	Hardness	Vc (sfm)		DC • in 1/8	3/16	1/4	3/8	1/2	5/8	3/4
P	CARBON STEELS 1018, 1040, 1080, 1090, 10L50, 1140, 1212, 12L15, 1525, 1536	≤ 175 Bhn or ≤ 7 HRc	425	RPM	12988	8659	6494	4329	3247	2598	2165
			(340-510)	Fr	0.0043	0.0065	0.0086	0.0129	0.0172	0.0216	0.0259
				Feed (ipm)	56.0	56.0	56.0	56.0	56.0	56.0	56.0
		≤ 275 Bhn or ≤ 28 HRc	380	RPM	11613	7742	5806	3871	2903	2323	1935
			(304-456)	Fr	0.0039	0.0058	0.0078	0.0116	0.0155	0.0194	0.0233
				Feed (ipm)	45.0	45.0	45.0	45.0	45.0	45.0	45.0
		≤ 425 Bhn or ≤ 45 HRc	220	RPM	6723	4482	3362	2241	1681	1345	1121
			(176-264)	Fr	0.0033	0.0049	0.0065	0.0098	0.0131	0.0164	0.0196
				Feed (ipm)	22.0	22.0	22.0	22.0	22.0	22.0	22.0
	ALLOY STEELS 4140, 4150, 4320, 5120, 5150, 8630, 86L20, 50100	≤ 275 Bhn or ≤ 28 HRc	330	RPM	10085	6723	5042	3362	2521	2017	1681
			(264-396)	Fr	0.0033	0.0049	0.0065	0.0098	0.0131	0.0164	0.0196
				Feed (ipm)	33.0	33.0	33.0	33.0	33.0	33.0	33.0
		≤ 375 Bhn or ≤ 40 HRc	200	RPM	6112	4075	3056	2037	1528	1222	1019
			(160-240)	Fr	0.0028	0.0042	0.0056	0.0083	0.0111	0.0139	0.0167
				Feed (ipm)	17.0	17.0	17.0	17.0	17.0	17.0	17.0
		≤ 425 Bhn or ≤ 45 HRc	140	RPM	4278	2852	2139	1426	1070	856	713
			(112-168)	Fr	0.0020	0.0030	0.0040	0.0060	0.0079	0.0099	0.0119
				Feed (ipm)	8.5	8.5	8.5	8.5	8.5	8.5	8.5
	TOOL STEELS A2, D2, H13, L2, M2, P20, S7, T15, W2	≤ 200 Bhn or ≤ 13 HRc	145	RPM	4431	2954	2216	1477	1108	886	739
			(116-174)	Fr	0.0028	0.0042	0.0056	0.0085	0.0113	0.0141	0.0169
				Feed (ipm)	12.5	12.5	12.5	12.5	12.5	12.5	12.5
		≤ 375 Bhn or ≤ 40 HRc	95	RPM	2903	1935	1452	968	726	581	484
			(76-114)	Fr	0.0013	0.0020	0.0027	0.0040	0.0054	0.0067	0.0081
				Feed (ipm)	3.9	3.9	3.9	3.9	3.9	3.9	3.9
M	STAINLESS STEELS (FREE MACHINING) 303, 416, 420F, 430F, 440F	≤ 185 Bhn or ≤ 9 HRc	305	RPM	9321	6214	4660	3107	2330	1864	1553
			(244-366)	Fr	0.0026	0.0039	0.0051	0.0077	0.0103	0.0129	0.0154
				Feed (ipm)	24.0	24.0	24.0	24.0	24.0	24.0	24.0
		≤ 275 Bhn or ≤ 28 HRc	195	RPM	5959	3973	2980	1986	1490	1192	993
			(156-234)	Fr	0.0020	0.0030	0.0040	0.0060	0.0081	0.0101	0.0121
				Feed (ipm)	12.0	12.0	12.0	12.0	12.0	12.0	12.0
	STAINLESS STEELS (DIFFICULT) 304, 316, 321, 13-8 PH, 15-5PH, 17-4 PH, Custom 450	≤ 275 Bhn or ≤ 28 HRc	150	RPM	4584	3056	2292	1528	1146	917	764
			(120-180)	Fr	0.0020	0.0030	0.0040	0.0060	0.0079	0.0099	0.0119
				Feed (ipm)	9.1	9.1	9.1	9.1	9.1	9.1	9.1
		≤ 375 Bhn or ≤ 40 HRc	110	RPM	3362	2241	1681	1121	840	672	560
			(88-132)	Fr	0.0018	0.0027	0.0036	0.0054	0.0071	0.0089	0.0107
				Feed (ipm)	6.0	6.0	6.0	6.0	6.0	6.0	6.0
K	CAST IRONS Gray, Malleable, Ductile	≤ 220 Bhn or ≤ 19 HRc	360	RPM	11002	7334	5501	3667	2750	2200	1834
			(288-432)	Fr	0.0045	0.0068	0.0091	0.0136	0.0182	0.0227	0.0273
				Feed (ipm)	50.0	50.0	50.0	50.0	50.0	50.0	50.0
		≤ 260 Bhn or ≤ 26 HRc	335	RPM	10238	6825	5119	3413	2559	2048	1706
			(268-402)	Fr	0.0045	0.0068	0.0091	0.0136	0.0182	0.0227	0.0273
				Feed (ipm)	46.5	46.5	46.5	46.5	46.5	46.5	46.5

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Hi-PerCarb®

	Series 142P Fractional	Hardness	Vc (sfm)		DC • in 1/8	3/16	1/4	3/8	1/2	5/8	3/4
N	ALUMINUM ALLOYS 2017, 2024, 356, 6061, 7075	≤ 80 Bhn or ≤ 47 HRb	770	RPM	23531	15687	11766	7844	5883	4706	3922
			(616-924)	Fr	0.0049	0.0073	0.0098	0.0147	0.0195	0.0244	0.0293
				Feed (ipm)	115.0	115.0	115.0	115.0	115.0	115.0	115.0
		≤ 150 Bhn or ≤ 8 HRb	660	RPM	20170	13446	10085	6723	5042	4034	3362
			(528-792)	Fr	0.0050	0.0074	0.0099	0.0149	0.0198	0.0248	0.0297
				Feed (ipm)	100.0	100.0	100.0	100.0	100.0	100.0	100.0
	COPPER ALLOYS Alum Bronze, C110, Muntz Brass	≤ 140 Bhn or ≤ 3 HRc	550	RPM	16808	11205	8404	5603	4202	3362	2801
			(440-660)	Fr	0.0020	0.0030	0.0040	0.0060	0.0080	0.0100	0.0120
				Feed (ipm)	33.5	33.5	33.5	33.5	33.5	33.5	33.5
		≤ 200 Bhn or ≤ 23 HRc	440	RPM	13446	8964	6723	4482	3362	2689	2241
			(352-528)	Fr	0.0020	0.0030	0.0040	0.0060	0.0080	0.0100	0.0120
				Feed (ipm)	27.0	27.0	27.0	27.0	27.0	27.0	27.0
S	HIGH TEMP ALLOYS (NICKEL , COBALT, IRON BASE) Inconel 601, 617, 625, Incoloy, Monel 400, Rene, Waspaloy	≤ 300 Bhn or ≤ 32 HRc	95	RPM	2903	1935	1452	968	726	581	484
			(76-114)	Fr	0.0008	0.0012	0.0016	0.0024	0.0032	0.0040	0.0048
				Feed (ipm)	2.3	2.3	2.3	2.3	2.3	2.3	2.3
		≤ 400 Bhn or ≤ 43 HRc	50	RPM	1528	1019	764	509	382	306	255
			(40-60)	Fr	0.0007	0.0010	0.0013	0.0020	0.0026	0.0033	0.0039
				Feed (ipm)	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	TITANIUM ALLOYS Pure Titanium, Ti6Al4V, Ti6Al2Sn4Zr2Mo, Ti4Al4Mo2Sn0.5Si, Ti-6Al4V	≤ 275 Bhn or ≤ 28 HRc	215	RPM	6570	4380	3285	2190	1643	1314	1095
			(172-258)	Fr	0.0018	0.0026	0.0035	0.0053	0.0070	0.0088	0.0105
				Feed (ipm)	11.5	11.5	11.5	11.5	11.5	11.5	11.5
		≤ 350 Bhn or ≤ 38 HRc	160	RPM	4890	3260	2445	1630	1222	978	815
			(128-192)	Fr	0.0016	0.0024	0.0032	0.0048	0.0064	0.0080	0.0096
				Feed (ipm)	7.8	7.8	7.8	7.8	7.8	7.8	7.8
		≤ 440 Bhn or ≤ 47 HRc	85	RPM	2598	1732	1299	866	649	520	433
			(68-102)	Fr	0.0012	0.0018	0.0024	0.0036	0.0048	0.0060	0.0072
				Feed (ipm)	3.1	3.1	3.1	3.1	3.1	3.1	3.1
H	TOOL STEELS A2, D2, H13, L2, M2, P20, S7, T15, W2	≤ 475 Bhn or ≤ 50 HRc	85	RPM	2598	1732	1299	866	649	520	433
			(68-102)	Fr	0.0008	0.0013	0.0017	0.0025	0.0034	0.0042	0.0051
				Feed (ipm)	2.2	2.2	2.2	2.2	2.2	2.2	2.2

Bhn (Brinell) HRc (Rockwell C) HRb (Rockwell B)
rpm = Vc x 3.82 / DC
ipm = Fr x RPM
reduce speed and feed for materials harder than listed
refer to the SGS Tool Wizard® for complete technical information (www.kyocera-sgstool.com)

Hi-PerCarb®

	Series 142P Metric	Hardness	Vc (m/min)		DC • mm 3	6	8	10	12	14	16
P	CARBON STEELS 1018, 1040, 1080, 1090, 10L50, 1140, 1212, 12L15, 1525, 1536	≤ 175 Bhn or ≤ 7 HRc	130	RPM	13733	6867	5150	4120	3433	2943	2575
			(104-155)	Fr	0.104	0.207	0.276	0.345	0.414	0.483	0.552
				Feed (mm/min)	1422	1422	1422	1422	1422	1422	1422
		≤ 275 Bhn or ≤ 28 HRc	116	RPM	12279	6140	4605	3684	3070	2631	2302
			(93-139)	Fr	0.093	0.186	0.248	0.310	0.372	0.434	0.496
				Feed (mm/min)	1143	1143	1143	1143	1143	1143	1143
		≤ 425 Bhn or ≤ 45 HRc	67	RPM	7109	3555	2666	2133	1777	1523	1333
			(54-80)	Fr	0.079	0.157	0.210	0.262	0.314	0.367	0.419
				Feed (mm/min)	559	559	559	559	559	559	559
	ALLOY STEELS 4140, 4150, 4320, 5120, 5150, 8630, 86L20, 50100	≤ 275 Bhn or ≤ 28 HRc	101	RPM	10664	5332	3999	3199	2666	2285	1999
			(80-121)	Fr	0.079	0.157	0.210	0.262	0.314	0.367	0.419
				Feed (mm/min)	838	838	838	838	838	838	838
		≤ 375 Bhn or ≤ 40 HRc	61	RPM	6463	3231	2424	1939	1616	1385	1212
			(49-73)	Fr	0.067	0.134	0.178	0.223	0.267	0.312	0.356
				Feed (mm/min)	432	432	432	432	432	432	432
		≤ 425 Bhn or ≤ 45 HRc	43	RPM	4524	2262	1696	1357	1131	969	848
			(34-51)	Fr	0.048	0.095	0.127	0.159	0.191	0.223	0.255
				Feed (mm/min)	216	216	216	216	216	216	216
	TOOL STEELS A2, D2, H13, L2, M2, P20, S7, T15, W2	≤ 200 Bhn or ≤ 13 HRc	44	RPM	4686	2343	1757	1406	1171	1004	879
			(35-53)	Fr	0.068	0.136	0.181	0.226	0.271	0.316	0.361
				Feed (mm/min)	318	318	318	318	318	318	318
		≤ 375 Bhn or ≤ 40 HRc	29	RPM	3070	1535	1151	921	767	658	576
			(23-35)	Fr	0.032	0.065	0.086	0.108	0.129	0.151	0.172
				Feed (mm/min)	99	99	99	99	99	99	99
M	STAINLESS STEELS (FREE MACHINING) 303, 416, 420F, 430F, 440F	≤ 185 Bhn or ≤ 9 HRc	93	9856	9856	4928	3696	2957	2464	2112	1848
			(74-112)	0.062	0.062	0.124	0.165	0.206	0.247	0.289	0.330
				610	610	610	610	610	610	610	610
		≤ 275 Bhn or ≤ 28 HRc	59	6301	6301	3151	2363	1890	1575	1350	1181
			(48-71)	0.048	0.048	0.097	0.129	0.161	0.193	0.226	0.258
				305	305	305	305	305	305	305	305
	STAINLESS STEELS (DIFFICULT) 304, 316, 321, 13-8 PH, 15-5PH, 17-4 PH, Custom 450	≤ 275 Bhn or ≤ 28 HRc	46	4847	4847	2424	1818	1454	1212	1039	909
			(37-55)	0.048	0.048	0.095	0.127	0.159	0.191	0.223	0.254
				231	231	231	231	231	231	231	231
		≤ 375 Bhn or ≤ 40 HRc	34	3555	3555	1777	1333	1066	889	762	666
			(27-40)	0.043	0.043	0.086	0.114	0.143	0.171	0.200	0.229
				152	152	152	152	152	152	152	152
K	CAST IRONS Gray, Malleable, Ductile	≤ 220 Bhn or ≤ 19 HRc	110	RPM	11633	5816	4362	3490	2908	2493	2181
			(88-132)	Fr	0.109	0.218	0.291	0.364	0.437	0.509	0.582
				Feed (mm/min)	1270	1270	1270	1270	1270	1270	1270
		≤ 260 Bhn or ≤ 26 HRc	102	RPM	10825	5413	4059	3248	2706	2320	2030
			(82-123)	Fr	0.109	0.218	0.291	0.364	0.436	0.509	0.582
				Feed (mm/min)	1181	1181	1181	1181	1181	1181	1181

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Hi-PerCarb®

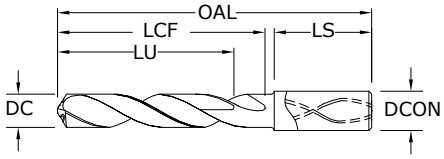
	Series 142P Metric	Hardness	Vc (m/min)		DC • mm 3	6	8	10	12	14	16
N	ALUMINUM ALLOYS 2017, 2024, 356, 6061, 7075	≤ 80 Bhn or ≤ 47 HRb	235	RPM	24882	12441	9331	7465	6220	5332	4665
			(188-282)	Fr	0.117	0.235	0.313	0.391	0.470	0.548	0.626
				Feed (mm/min)	2921	2921	2921	2921	2921	2921	2921
		≤ 150 Bhn or ≤ 88 HRb	201	RPM	21327	10664	7998	6398	5332	4570	3999
			(161-241)	Fr	0.119	0.238	0.318	0.397	0.476	0.556	0.635
				Feed (mm/min)	2540	2540	2540	2540	2540	2540	2540
	Copper Alloys Alum Bronze, C110, Muntz Brass	≤ 140 Bhn or ≤ 3 HRc	168	RPM	17773	8886	6665	5332	4443	3808	3332
			(134-201)	Fr	0.048	0.096	0.128	0.160	0.192	0.223	0.255
				Feed (mm/min)	851	851	851	851	851	851	851
		≤ 200 Bhn or ≤ 23 HRc	134	RPM	14218	7109	5332	4265	3555	3047	2666
			(107-161)	Fr	0.048	0.096	0.129	0.161	0.193	0.225	0.257
				Feed (mm/min)	686	686	686	686	686	686	686
S	HIGH TEMP ALLOYS (Nickel , Cobalt, Iron Base) Inconel 601, 617, 625, Incoloy, Monel 400, Rene, Waspaloy	≤ 300 Bhn or ≤ 32 HRc	29	RPM	3070	1535	1151	921	767	658	576
			(23-35)	Fr	0.019	0.038	0.051	0.063	0.076	0.089	0.101
				Feed (mm/min)	58	58	58	58	58	58	58
		≤ 400 Bhn or ≤ 43 HRc	15	RPM	1616	808	606	485	404	346	303
			(12-18)	Fr	0.016	0.031	0.042	0.052	0.063	0.073	0.084
				Feed (mm/min)	25	25	25	25	25	25	25
	TITANIUM ALLOYS Pure Titanium, Ti6Al4V, Ti6Al2Sn4Zr2Mo, Ti4Al4Mo2Sn0.5Si, Ti-6Al4V	≤ 275 Bhn or ≤ 28 HRc	66	RPM	6947	3474	2605	2084	1737	1489	1303
			(52-79)	Fr	0.042	0.084	0.112	0.140	0.168	0.196	0.224
				Feed (mm/min)	292	292	292	292	292	292	292
		≤ 350 Bhn or ≤ 38 HRc	49	RPM	5170	2585	1939	1551	1293	1108	969
			(39-59)	Fr	0.038	0.077	0.102	0.128	0.153	0.179	0.204
				Feed (mm/min)	198	198	198	198	198	198	198
		≤ 440 Bhn or ≤ 47 HRc	26	RPM	2747	1373	1030	824	687	589	515
			(21-31)	Fr	0.029	0.057	0.076	0.096	0.115	0.134	0.153
				Feed (mm/min)	79	79	79	79	79	79	79
H	TOOL STEELS A2, D2, H13, L2, M2, P20, S7, T15, W2	≤ 475 Bhn or ≤ 50 HRc	26	RPM	2747	1373	1030	824	687	589	515
			(21-31)	Fr	0.020	0.041	0.054	0.068	0.081	0.095	0.109
				Feed (mm/min)	56	56	56	56	56	56	56

(Brinell) HRc (Rockwell C) HRb (Rockwell B)
rpm = (Vc x 1000) / (DC x 3.14)
mm/min = Fr x RPM
reduce speed and feed for materials harder than listed
refer to the SGS Tool Wizard® for complete technical information (www.kyocera-sgstool.com)

HI-PERCARB®
HIGH PERFORMANCE CARBIDE DRILLS

143M-S 3xD

FRACTIONAL & METRIC SERIES



- Coolant through design improves coolant flow to extend tool life and aid in chip evacuation
- Eccentric 2-margin design reduces frictional heat and minimizes material adhesion to the margins without weakening the drill
- Computer controlled edge honing protects against chip damage
- High-performance point design stabilizes on contact for exceptional hole size and cylindricity allowing for low thrust force and extended tool life
- SGS Ti-NAMITE®-A coating provides exceptional wear and erosion resistance when drilling heat resisting alloys like Inconel, Stainless Steel, and Titanium Alloys
- Recommended for materials ≤ 50HRc (475 Bhn)

		inch & mm						EDP NO.
DECIMAL DC	METRIC DC	FRACTIONAL/ LETTER/WIRE DC	SHANK DIAMETER DCON	OVERALL LENGTH OAL	FLUTE LENGTH LCF	USABLE LENGTH LU	SHANK LENGTH LS	Ti-NAMITE®-A (AlTiN)
0.1181	3,000 mm		6,0	62,0	20,0	15,0	36,0	69120
0.1220	3,100 mm		6,0	62,0	20,0	15,0	36,0	69121
0.1250	3,175 mm	1/8	6,0	62,0	20,0	15,0	36,0	56800
0.1260	3,200 mm		6,0	62,0	20,0	15,0	36,0	69122
0.1299	3,300 mm		6,0	62,0	20,0	15,0	36,0	69123
0.1339	3,400 mm		6,0	62,0	20,0	15,0	36,0	69124
0.1360	3,454 mm	#29	6,0	62,0	20,0	15,0	36,0	56801
0.1378	3,500 mm		6,0	62,0	20,0	15,0	36,0	69125
0.1406	3,571 mm	9/64	6,0	62,0	20,0	15,0	36,0	56802
0.1417	3,600 mm		6,0	62,0	20,0	15,0	36,0	69126
0.1457	3,700 mm		6,0	62,0	20,0	15,0	36,0	69127
0.1496	3,800 mm		6,0	66,0	24,0	18,0	36,0	69128
0.1535	3,900 mm		6,0	66,0	24,0	18,0	36,0	69129
0.1562	3,967 mm	5/32	6,0	66,0	24,0	18,0	36,0	56803
0.1575	4,000 mm		6,0	66,0	24,0	18,0	36,0	69130
0.1590	4,039 mm	#21	6,0	66,0	24,0	18,0	36,0	56804
0.1614	4,100 mm		6,0	66,0	24,0	18,0	36,0	69131
0.1654	4,200 mm		6,0	66,0	24,0	18,0	36,0	69132
0.1693	4,300 mm		6,0	66,0	24,0	18,0	36,0	69133
0.1719	4,366 mm	11/64	6,0	66,0	24,0	17,0	36,0	56805
0.1732	4,400 mm		6,0	66,0	24,0	17,0	36,0	69134
0.1772	4,500 mm		6,0	66,0	24,0	17,0	36,0	69135
0.1811	4,600 mm		6,0	66,0	24,0	17,0	36,0	69136
0.1850	4,699 mm	#13	6,0	66,0	24,0	17,0	36,0	69137
0.1875	4,763 mm	3/16	6,0	66,0	28,0	21,0	36,0	56806
0.1890	4,801 mm	#12	6,0	66,0	28,0	21,0	36,0	69138
0.1929	4,900 mm		6,0	66,0	28,0	21,0	36,0	69139
0.1969	5,000 mm		6,0	66,0	28,0	20,0	36,0	69140
0.2008	5,100 mm		6,0	66,0	28,0	20,0	36,0	69141
0.2031	5,159 mm	13/64	6,0	66,0	28,0	20,0	36,0	56807
0.2047	5,200 mm		6,0	66,0	28,0	20,0	36,0	69142
0.2087	5,300 mm		6,0	66,0	28,0	20,0	36,0	69143
0.2126	5,400 mm		6,0	66,0	28,0	20,0	36,0	69144
0.2165	5,500 mm		6,0	66,0	28,0	20,0	36,0	69145
0.2188	5,558 mm	7/32	6,0	66,0	28,0	20,0	36,0	56808
0.2205	5,600 mm		6,0	66,0	28,0	20,0	36,0	69146

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TOLERANCES (inch)

≤.1181 DIAMETER
DC = +.00008/+.00047
DCON = h_6

>.1181–.2362 DIAMETER
DC = +.00016/+.00063
DCON = h_6

>.2362–.3937 DIAMETER
DC = +.00024/+.00083
DCON = h_6

>.3937–.7087 DIAMETER
DC = +.00028/+.00098
DCON = h_6

>.7087–1.1811 DIAMETER
DC = +.00031/+.00114
DCON = h_6

TOLERANCES (mm)

≤3 DIAMETER
DC = +0,002/+0,012
DCON = h_6

>3–6 DIAMETER
DC = +0,004/+0,016
DCON = h_6

>6–10 DIAMETER
DC = +0,006/+0,021
DCON = h_6

>10–18 DIAMETER
DC = +0,007/+0,025
DCON = h_6

>18–30 DIAMETER
DC = +0,008/+0,029
DCON = h_6

STEELS
STAINLESS STEELS
CAST IRON
HIGH TEMP ALLOYS

For patent information visit www.ksptpatents.com

143M-S 3xD

FRACTIONAL & METRIC SERIES

CONTINUED

inch & mm								EDP NO.
DECIMAL DC	METRIC DC	FRACTIONAL/ LETTER/WIRE DC	SHANK DIAMETER DCON	OVERALL LENGTH OAL	FLUTE LENGTH LCF	USABLE LENGTH LU	SHANK LENGTH LS	Ti-NAMITE®-A (AlTiN)
0.2244	5,700 mm		6,0	66,0	28,0	19,0	36,0	69147
0.2283	5,800 mm		6,0	66,0	28,0	19,0	36,0	69148
0.2323	5,900 mm		6,0	66,0	28,0	19,0	36,0	69149
0.2344	5,954 mm	15/64	6,0	66,0	28,0	19,0	36,0	56809
0.2362	6,000 mm		6,0	66,0	28,0	19,0	36,0	69150
0.2402	6,100 mm		8,0	79,0	34,0	25,0	36,0	69151
0.2441	6,200 mm		8,0	79,0	34,0	25,0	36,0	69152
0.2480	6,300 mm		8,0	79,0	34,0	25,0	36,0	69153
0.2500	6,350 mm	1/4 E	8,0	79,0	34,0	24,0	36,0	56810
0.2520	6,400 mm		8,0	79,0	34,0	24,0	36,0	69154
0.2559	6,500 mm		8,0	79,0	34,0	24,0	36,0	69155
0.2570	6,528 mm	F	8,0	79,0	34,0	24,0	36,0	56811
0.2598	6,600 mm		8,0	79,0	34,0	24,0	36,0	69156
0.2638	6,700 mm		8,0	79,0	34,0	24,0	36,0	69157
0.2656	6,746 mm	17/64	8,0	79,0	34,0	24,0	36,0	56812
0.2677	6,800 mm		8,0	79,0	34,0	24,0	36,0	69158
0.2717	6,900 mm		8,0	79,0	34,0	24,0	36,0	69159
0.2756	7,000 mm		8,0	79,0	34,0	24,0	36,0	69160
0.2795	7,100 mm		8,0	79,0	41,0	30,0	36,0	69161
0.2812	7,142 mm	9/32	8,0	79,0	41,0	30,0	36,0	56813
0.2835	7,200 mm		8,0	79,0	41,0	30,0	36,0	69162
0.2874	7,300 mm		8,0	79,0	41,0	30,0	36,0	69163
0.2913	7,400 mm		8,0	79,0	41,0	30,0	36,0	69164
0.2953	7,500 mm		8,0	79,0	41,0	30,0	36,0	69165
0.2969	7,541 mm	19/64	8,0	79,0	41,0	30,0	36,0	56814
0.2992	7,600 mm		8,0	79,0	41,0	30,0	36,0	69166
0.3031	7,700 mm		8,0	79,0	41,0	29,0	36,0	69167
0.3071	7,800 mm		8,0	79,0	41,0	29,0	36,0	69168
0.3110	7,900 mm		8,0	79,0	41,0	29,0	36,0	69169
0.3125	7,938 mm	5/16	8,0	79,0	41,0	29,0	36,0	56815
0.3150	8,000 mm		8,0	79,0	41,0	29,0	36,0	69170
0.3189	8,100 mm		10,0	89,0	47,0	35,0	40,0	69171
0.3228	8,200 mm		10,0	89,0	47,0	35,0	40,0	69172
0.3268	8,300 mm		10,0	89,0	47,0	35,0	40,0	69173
0.3281	8,334 mm	21/64	10,0	89,0	47,0	34,0	40,0	56816
0.3307	8,400 mm		10,0	89,0	47,0	34,0	40,0	69174
0.3320	8,433 mm	Q	10,0	89,0	47,0	34,0	40,0	56817
0.3346	8,500 mm		10,0	89,0	47,0	34,0	40,0	69175
0.3386	8,600 mm		10,0	89,0	47,0	34,0	40,0	69176
0.3425	8,700 mm		10,0	89,0	47,0	34,0	40,0	69177
0.3438	8,733 mm	11/32	10,0	89,0	47,0	34,0	40,0	56818
0.3465	8,800 mm		10,0	89,0	47,0	34,0	40,0	69178
0.3504	8,900 mm		10,0	89,0	47,0	34,0	40,0	69179
0.3543	9,000 mm		10,0	89,0	47,0	34,0	40,0	69180

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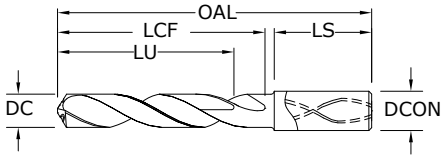
143M-S 3xD

FRACTIONAL & METRIC SERIES



- Coolant through design improves coolant flow to extend tool life and aid in chip evacuation
- Eccentric 2-margin design reduces frictional heat and minimizes material adhesion to the margins without weakening the drill
- Computer controlled edge honing protects against chip damage
- High-performance point design stabilizes on contact for exceptional hole size and cylindricity allowing for low thrust force and extended tool life
- SGS Ti-NAMITE®-A coating provides exceptional wear and erosion resistance when drilling heat resisting alloys like Inconel, Stainless Steel, and Titanium Alloys
- Recommended for materials ≤ 50HRc (475 Bhn)

			inch & mm					EDP NO.
DECIMAL DC	METRIC DC	FRACTIONAL/ LETTER/WIRE DC	SHANK DIAMETER DCON	OVERALL LENGTH OAL	FLUTE LENGTH LCF	USABLE LENGTH LU	SHANK LENGTH LS	Ti-NAMITE®-A (AlTiN)
0.3583	9,100 mm		10,0	89,0	47,0	33,0	40,0	69181
0.3594	9,129 mm	23/64	10,0	89,0	47,0	33,0	40,0	56819
0.3622	9,200 mm		10,0	89,0	47,0	33,0	40,0	69182
0.3661	9,300 mm		10,0	89,0	47,0	33,0	40,0	69183
0.3680	9,347 mm	U	10,0	89,0	47,0	33,0	40,0	56820
0.3701	9,400 mm		10,0	89,0	47,0	33,0	40,0	69184
0.3740	9,500 mm		10,0	89,0	47,0	33,0	40,0	69185
0.3750	9,525 mm	3/8	10,0	89,0	47,0	33,0	40,0	56821
0.3780	9,600 mm		10,0	89,0	47,0	33,0	40,0	69186
0.3819	9,700 mm		10,0	89,0	47,0	32,0	40,0	69187
0.3858	9,800 mm		10,0	89,0	47,0	32,0	40,0	69188
0.3898	9,900 mm		10,0	89,0	47,0	32,0	40,0	69189
0.3906	9,921 mm	25/64	10,0	89,0	47,0	32,0	40,0	56822
0.3937	10,000 mm		10,0	89,0	47,0	32,0	40,0	69190
0.3976	10,100 mm		12,0	102,0	55,0	40,0	45,0	69191
0.4016	10,200 mm		12,0	102,0	55,0	40,0	45,0	69192
0.4055	10,300 mm		12,0	102,0	55,0	40,0	45,0	69193
0.4062	10,317 mm	13/32	12,0	102,0	55,0	40,0	45,0	56823
0.4095	10,400 mm		12,0	102,0	55,0	39,0	45,0	69194
0.4134	10,500 mm		12,0	102,0	55,0	39,0	45,0	69195
0.4173	10,600 mm		12,0	102,0	55,0	39,0	45,0	69196
0.4213	10,700 mm		12,0	102,0	55,0	39,0	45,0	69197
0.4219	10,716 mm	27/64	12,0	102,0	55,0	39,0	45,0	56824
0.4252	10,800 mm		12,0	102,0	55,0	39,0	45,0	69198
0.4291	10,900 mm		12,0	102,0	55,0	39,0	45,0	69199
0.4331	11,000 mm		12,0	102,0	55,0	39,0	45,0	69200
0.4370	11,100 mm		12,0	102,0	55,0	38,0	45,0	69201
0.4375	11,113 mm	7/16	12,0	102,0	55,0	38,0	45,0	56825
0.4409	11,200 mm		12,0	102,0	55,0	38,0	45,0	69202
0.4449	11,300 mm		12,0	102,0	55,0	38,0	45,0	69203
0.4488	11,400 mm		12,0	102,0	55,0	38,0	45,0	69204
0.4528	11,500 mm		12,0	102,0	55,0	38,0	45,0	69205
0.4567	11,600 mm		12,0	102,0	55,0	38,0	45,0	69206
0.4606	11,700 mm		12,0	102,0	55,0	37,0	45,0	69207
0.4646	11,800 mm		12,0	102,0	55,0	37,0	45,0	69208
0.4685	11,900 mm		12,0	102,0	55,0	37,0	45,0	69209

continued on next page

TOLERANCES (inch)

≤.1181 DIAMETER
DC = +.00008/+.00047
DCON = h_6

>.1181–.2362 DIAMETER
DC = +.00016/+.00063
DCON = h_6

>.2362–.3937 DIAMETER
DC = +.00024/+.00083
DCON = h_6

>.3937–.7087 DIAMETER
DC = +.00028/+.00098
DCON = h_6

>.7087–1.1811 DIAMETER
DC = +.00031/+.00114
DCON = h_6

TOLERANCES (mm)

≤3 DIAMETER
DC = +0,002/+0,012
DCON = h_6

>3–6 DIAMETER
DC = +0,004/+0,016
DCON = h_6

>6–10 DIAMETER
DC = +0,006/+0,021
DCON = h_6

>10–18 DIAMETER
DC = +0,007/+0,025
DCON = h_6

>18–30 DIAMETER
DC = +0,008/+0,029
DCON = h_6

STEELS
STAINLESS STEELS
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HIGH TEMP ALLOYS

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143M-S 3xD

FRACTIONAL & METRIC SERIES

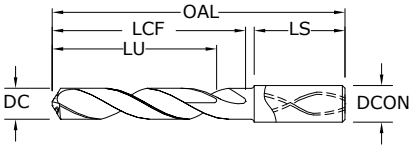
CONTINUED

inch & mm								EDP NO.
DECIMAL DC	METRIC DC	FRACTIONAL/ LETTER/WIRE DC	SHANK DIAMETER DCON	OVERALL LENGTH OAL	FLUTE LENGTH LCF	USABLE LENGTH LU	SHANK LENGTH LS	Ti-NAMITE®-A (AlTiN)
0.4688	11,908 mm	15/32	12,0	102,0	55,0	37,0	45,0	56826
0.4724	12,000 mm		12,0	102,0	55,0	37,0	45,0	69210
0.4844	12,304 mm	31/64	14,0	107,0	60,0	41,0	45,0	56827
0.4921	12,500 mm		14,0	107,0	60,0	41,0	45,0	69211
0.5000	12,700 mm	1/2	14,0	107,0	60,0	41,0	45,0	56828
0.5039	12,800 mm		14,0	107,0	60,0	41,0	45,0	69212
0.5118	13,000 mm		14,0	107,0	60,0	41,0	45,0	69213
0.5156	13,096 mm	33/64	14,0	107,0	60,0	40,0	45,0	56829
0.5315	13,500 mm		14,0	107,0	60,0	40,0	45,0	69214
0.5433	13,800 mm		14,0	107,0	60,0	39,0	45,0	69215
0.5512	14,000 mm		14,0	107,0	60,0	39,0	45,0	69216
0.5625	14,288 mm	9/16	16,0	115,0	65,0	43,0	48,0	56830
0.5709	14,500 mm		16,0	115,0	65,0	43,0	48,0	69217
0.5781	14,684 mm	37/64	16,0	115,0	65,0	43,0	48,0	56831
0.5827	14,800 mm		16,0	115,0	65,0	43,0	48,0	69218
0.5906	15,000 mm		16,0	115,0	65,0	42,0	48,0	69219
0.6102	15,500 mm		16,0	115,0	65,0	42,0	48,0	69220
0.6221	15,800 mm		16,0	115,0	65,0	41,0	48,0	69221
0.6250	15,875 mm	5/8	16,0	115,0	65,0	41,0	48,0	56832
0.6299	16,000 mm		16,0	115,0	65,0	41,0	48,0	69222
0.6562	16,667 mm	21/32	18,0	123,0	73,0	47,0	48,0	56833
0.6875	17,463 mm	11/16	18,0	123,0	73,0	47,0	48,0	56834
0.7500	19,050 mm	3/4	20,0	131,0	79,0	50,0	50,0	56835

HI-PERCARB®
HIGH PERFORMANCE CARBIDE DRILLS

143M-S 5xD

FRACTIONAL & METRIC SERIES



- Coolant through design improves coolant flow to extend tool life and aid in chip evacuation
- Eccentric 2-margin design reduces frictional heat and minimizes material adhesion to the margins without weakening the drill
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		inch & mm						EDP NO.
DECIMAL DC	METRIC DC	FRACTIONAL/ LETTER/WIRE DC	SHANK DIAMETER DCON	OVERALL LENGTH OAL	FLUTE LENGTH LCF	USABLE LENGTH LU	SHANK LENGTH LS	Ti-NAMITE®-A (AlTiN)
0.1181	3,000 mm		6,0	66,0	28,0	23,0	36,0	69223
0.1220	3,100 mm		6,0	66,0	28,0	23,0	36,0	69224
0.1250	3,175 mm	1/8	6,0	66,0	28,0	23,0	36,0	56836
0.1260	3,200 mm		6,0	66,0	28,0	23,0	36,0	69225
0.1299	3,300 mm		6,0	66,0	28,0	23,0	36,0	69226
0.1339	3,400 mm		6,0	66,0	28,0	23,0	36,0	69227
0.1360	3,454 mm	#29	6,0	66,0	28,0	23,0	36,0	56837
0.1378	3,500 mm		6,0	66,0	28,0	23,0	36,0	69228
0.1406	3,571 mm	9/64	6,0	66,0	28,0	23,0	36,0	56838
0.1417	3,600 mm		6,0	66,0	28,0	23,0	36,0	69229
0.1457	3,700 mm		6,0	66,0	28,0	23,0	36,0	69230
0.1496	3,800 mm		6,0	74,0	36,0	29,0	36,0	69231
0.1535	3,900 mm		6,0	74,0	36,0	29,0	36,0	69232
0.1562	3,967 mm	5/32	6,0	74,0	36,0	29,0	36,0	56839
0.1575	4,000 mm		6,0	74,0	36,0	29,0	36,0	69233
0.1590	4,039 mm	#21	6,0	74,0	36,0	29,0	36,0	56840
0.1614	4,100 mm		6,0	74,0	36,0	29,0	36,0	69234
0.1654	4,200 mm		6,0	74,0	36,0	29,0	36,0	69235
0.1693	4,300 mm		6,0	74,0	36,0	29,0	36,0	69236
0.1719	4,366 mm	11/64	6,0	74,0	36,0	29,0	36,0	56841
0.1732	4,400 mm		6,0	74,0	36,0	29,0	36,0	69237
0.1772	4,500 mm		6,0	74,0	36,0	29,0	36,0	69238
0.1811	4,600 mm		6,0	74,0	36,0	29,0	36,0	69239
0.1850	4,699 mm	#13	6,0	74,0	36,0	29,0	36,0	69240
0.1875	4,763 mm	3/16	6,0	82,0	44,0	37,0	36,0	56842
0.1890	4,801 mm	#12	6,0	82,0	44,0	37,0	36,0	69241
0.1929	4,900 mm		6,0	82,0	44,0	37,0	36,0	69242
0.1969	5,000 mm		6,0	82,0	44,0	36,0	36,0	69243
0.2008	5,100 mm		6,0	82,0	44,0	36,0	36,0	69244
0.2031	5,159 mm	13/64	6,0	82,0	44,0	36,0	36,0	56843
0.2047	5,200 mm		6,0	82,0	44,0	36,0	36,0	69245
0.2087	5,300 mm		6,0	82,0	44,0	36,0	36,0	69246
0.2126	5,400 mm		6,0	82,0	44,0	36,0	36,0	69247
0.2165	5,500 mm		6,0	82,0	44,0	36,0	36,0	69248
0.2188	5,558 mm	7/32	6,0	82,0	44,0	36,0	36,0	56844
0.2205	5,600 mm		6,0	82,0	44,0	36,0	36,0	69249

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STEELS
STAINLESS STEELS
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HIGH TEMP ALLOYS

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143M-S 5xD

FRACTIONAL & METRIC SERIES

CONTINUED

inch & mm								EDP NO.
DECIMAL DC	METRIC DC	FRACTIONAL/ LETTER/WIRE DC	SHANK DIAMETER DCON	OVERALL LENGTH OAL	FLUTE LENGTH LCF	USABLE LENGTH LU	SHANK LENGTH LS	Ti-NAMITE®-A (AlTiN)
0.2244	5,700 mm		6,0	82,0	44,0	35,0	36,0	69250
0.2283	5,800 mm		6,0	82,0	44,0	35,0	36,0	69251
0.2323	5,900 mm		6,0	82,0	44,0	35,0	36,0	69252
0.2344	5,954 mm	15/64	6,0	82,0	44,0	35,0	36,0	56845
0.2362	6,000 mm		6,0	82,0	44,0	35,0	36,0	69253
0.2402	6,100 mm		8,0	91,0	53,0	44,0	36,0	69254
0.2441	6,200 mm		8,0	91,0	53,0	44,0	36,0	69255
0.2480	6,300 mm		8,0	91,0	53,0	44,0	36,0	69256
0.2500	6,350 mm	1/4 E	8,0	91,0	53,0	43,0	36,0	56846
0.2520	6,400 mm		8,0	91,0	53,0	43,0	36,0	69257
0.2559	6,500 mm		8,0	91,0	53,0	43,0	36,0	69258
0.2570	6,528 mm	F	8,0	91,0	53,0	43,0	36,0	56847
0.2598	6,600 mm		8,0	91,0	53,0	43,0	36,0	69259
0.2638	6,700 mm		8,0	91,0	53,0	43,0	36,0	69260
0.2656	6,746 mm	17/64	8,0	91,0	53,0	43,0	36,0	56848
0.2677	6,800 mm		8,0	91,0	53,0	43,0	36,0	69261
0.2717	6,900 mm		8,0	91,0	53,0	43,0	36,0	69262
0.2756	7,000 mm		8,0	91,0	53,0	42,0	36,0	69263
0.2795	7,100 mm		8,0	91,0	53,0	42,0	36,0	69264
0.2812	7,142 mm	9/32	8,0	91,0	53,0	42,0	36,0	56849
0.2835	7,200 mm		8,0	91,0	53,0	42,0	36,0	69265
0.2874	7,300 mm		8,0	91,0	53,0	42,0	36,0	69266
0.2913	7,400 mm		8,0	91,0	53,0	42,0	36,0	69267
0.2953	7,500 mm		8,0	91,0	53,0	42,0	36,0	69268
0.2969	7,541 mm	19/64	8,0	91,0	53,0	42,0	36,0	56850
0.2992	7,600 mm		8,0	91,0	53,0	42,0	36,0	69269
0.3031	7,700 mm		8,0	91,0	53,0	41,0	36,0	69270
0.3071	7,800 mm		8,0	91,0	53,0	41,0	36,0	69271
0.3110	7,900 mm		8,0	91,0	53,0	41,0	36,0	69272
0.3125	7,938 mm	5/16	8,0	91,0	53,0	41,0	36,0	56851
0.3150	8,000 mm		8,0	91,0	53,0	41,0	36,0	69273
0.3189	8,100 mm		10,0	103,0	61,0	49,0	40,0	69274
0.3228	8,200 mm		10,0	103,0	61,0	49,0	40,0	69275
0.3268	8,300 mm		10,0	103,0	61,0	49,0	40,0	69276
0.3281	8,334 mm	21/64	10,0	103,0	61,0	48,0	40,0	56852
0.3307	8,400 mm		10,0	103,0	61,0	48,0	40,0	69277
0.3320	8,433 mm	Q	10,0	103,0	61,0	48,0	40,0	56853
0.3346	8,500 mm		10,0	103,0	61,0	48,0	40,0	69278
0.3386	8,600 mm		10,0	103,0	61,0	48,0	40,0	69279
0.3425	8,700 mm		10,0	103,0	61,0	48,0	40,0	69280
0.3438	8,733 mm	11/32	10,0	103,0	61,0	48,0	40,0	56854
0.3465	8,800 mm		10,0	103,0	61,0	48,0	40,0	69281
0.3504	8,900 mm		10,0	103,0	61,0	48,0	40,0	69282
0.3543	9,000 mm		10,0	103,0	61,0	48,0	40,0	69283

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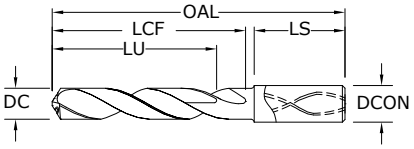
HI-PERCARB®
HIGH PERFORMANCE CARBIDE DRILLS

143M-S 5xD

FRACTIONAL & METRIC SERIES



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- Recommended for materials ≤ 50HRc (475 Bhn)

			inch & mm						EDP NO.
DECIMAL DC	METRIC DC	FRACTIONAL/ LETTER/WIRE DC	SHANK DIAMETER DCON	OVERALL LENGTH OAL	FLUTE LENGTH LCF	USABLE LENGTH LU	SHANK LENGTH LS	Ti-NAMITE®-A (AlTiN)
0.3583	9,100 mm		10,0	103,0	61,0	47,0	40,0	69284
0.3594	9,129 mm	23/64	10,0	103,0	61,0	47,0	40,0	56855
0.3622	9,200 mm		10,0	103,0	61,0	47,0	40,0	69285
0.3661	9,300 mm		10,0	103,0	61,0	47,0	40,0	69286
0.3680	9,347 mm	U	10,0	103,0	61,0	47,0	40,0	56856
0.3701	9,400 mm		10,0	103,0	61,0	47,0	40,0	69287
0.3740	9,500 mm		10,0	103,0	61,0	47,0	40,0	69288
0.3750	9,525 mm	3/8	10,0	103,0	61,0	47,0	40,0	56857
0.3780	9,600 mm		10,0	103,0	61,0	47,0	40,0	69289
0.3819	9,700 mm		10,0	103,0	61,0	46,0	40,0	69290
0.3858	9,800 mm		10,0	103,0	61,0	46,0	40,0	69291
0.3898	9,900 mm		10,0	103,0	61,0	46,0	40,0	69292
0.3906	9,921 mm	25/64	10,0	103,0	61,0	46,0	40,0	56858
0.3937	10,000 mm		10,0	103,0	61,0	46,0	40,0	69293
0.3976	10,100 mm		12,0	118,0	71,0	56,0	45,0	69294
0.4016	10,200 mm		12,0	118,0	71,0	56,0	45,0	69295
0.4055	10,300 mm		12,0	118,0	71,0	56,0	45,0	69296
0.4062	10,317 mm	13/32	12,0	118,0	71,0	56,0	45,0	56859
0.4095	10,400 mm		12,0	118,0	71,0	55,0	45,0	69297
0.4134	10,500 mm		12,0	118,0	71,0	55,0	45,0	69298
0.4173	10,600 mm		12,0	118,0	71,0	55,0	45,0	69299
0.4213	10,700 mm		12,0	118,0	71,0	55,0	45,0	69300
0.4219	10,716 mm	27/64	12,0	118,0	71,0	55,0	45,0	56860
0.4252	10,800 mm		12,0	118,0	71,0	55,0	45,0	69301
0.4291	10,900 mm		12,0	118,0	71,0	55,0	45,0	69302
0.4331	11,000 mm		12,0	118,0	71,0	54,0	45,0	69303
0.4370	11,100 mm		12,0	118,0	71,0	54,0	45,0	69304
0.4375	11,113 mm	7/16	12,0	118,0	71,0	54,0	45,0	56861
0.4409	11,200 mm		12,0	118,0	71,0	54,0	45,0	69305
0.4449	11,300 mm		12,0	118,0	71,0	54,0	45,0	69306
0.4488	11,400 mm		12,0	118,0	71,0	54,0	45,0	69307
0.4528	11,500 mm		12,0	118,0	71,0	54,0	45,0	69308
0.4567	11,600 mm		12,0	118,0	71,0	54,0	45,0	69309
0.4606	11,700 mm		12,0	118,0	71,0	53,0	45,0	69310
0.4646	11,800 mm		12,0	118,0	71,0	53,0	45,0	69311
0.4685	11,900 mm		12,0	118,0	71,0	53,0	45,0	69312

continued on next page

TOLERANCES (inch)

≤.1181 DIAMETER
DC = +.00008/+.00047
DCON = h_6

>.1181–.2362 DIAMETER
DC = +.00016/+.00063
DCON = h_6

>.2362–.3937 DIAMETER
DC = +.00024/+.00083
DCON = h_6

>.3937–.7087 DIAMETER
DC = +.00028/+.00098
DCON = h_6

>.7087–1.1811 DIAMETER
DC = +.00031/+.00114
DCON = h_6

TOLERANCES (mm)

≤3 DIAMETER
DC = +0,002/+0,012
DCON = h_6

>3–6 DIAMETER
DC = +0,004/+0,016
DCON = h_6

>6–10 DIAMETER
DC = +0,006/+0,021
DCON = h_6

>10–18 DIAMETER
DC = +0,007/+0,025
DCON = h_6

>18–30 DIAMETER
DC = +0,008/+0,029
DCON = h_6

STEELS
STAINLESS STEELS
CAST IRON
HIGH TEMP ALLOYS

For patent information visit www.ksptpatents.com

143M-S 5xD

FRACTIONAL & METRIC SERIES

CONTINUED

inch & mm								EDP NO.
DECIMAL DC	METRIC DC	FRACTIONAL/ LETTER/WIRE DC	SHANK DIAMETER DCON	OVERALL LENGTH OAL	FLUTE LENGTH LCF	USABLE LENGTH LU	SHANK LENGTH LS	Ti-NAMITE®-A (AlTiN)
0.4688	11,908 mm	15/32	12,0	118,0	71,0	53,0	45,0	56862
0.4724	12,000 mm		12,0	118,0	71,0	53,0	45,0	69313
0.4844	12,304 mm	31/64	14,0	124,0	77,0	58,0	45,0	56863
0.4921	12,500 mm		14,0	124,0	77,0	58,0	45,0	69314
0.5000	12,700 mm	1/2	14,0	124,0	77,0	58,0	45,0	56864
0.5039	12,800 mm		14,0	124,0	77,0	58,0	45,0	69315
0.5118	13,000 mm		14,0	124,0	77,0	58,0	45,0	69316
0.5156	13,096 mm	33/64	14,0	124,0	77,0	57,0	45,0	56865
0.5315	13,500 mm		14,0	124,0	77,0	57,0	45,0	69317
0.5433	13,800 mm		14,0	124,0	77,0	56,0	45,0	69318
0.5512	14,000 mm		14,0	124,0	77,0	56,0	45,0	69319
0.5625	14,288 mm	9/16	16,0	133,0	83,0	61,0	48,0	56866
0.5709	14,500 mm		16,0	133,0	83,0	61,0	48,0	69320
0.5781	14,684 mm	37/64	16,0	133,0	83,0	61,0	48,0	56867
0.5827	14,800 mm		16,0	133,0	83,0	61,0	48,0	69321
0.5906	15,000 mm		16,0	133,0	83,0	60,0	48,0	69322
0.6102	15,500 mm		16,0	133,0	83,0	60,0	48,0	69323
0.6221	15,800 mm		16,0	133,0	83,0	59,0	48,0	69324
0.6250	15,875 mm	5/8	16,0	133,0	83,0	59,0	48,0	56868
0.6299	16,000 mm		16,0	133,0	83,0	59,0	48,0	69325
0.6562	16,667 mm	21/32	18,0	143,0	93,0	68,0	48,0	56869
0.6875	17,463 mm	11/16	18,0	143,0	93,0	67,0	48,0	56870
0.7500	19,050 mm	3/4	20,0	153,0	101,0	72,0	50,0	56871

FRACTIONAL

Hi-PerCarb®

	Series 143M-S Fractional	Hardness	Vc (sfm)		DC • in 1/8	3/16	1/4	3/8	1/2	5/8	3/4
P	CARBON STEELS 1018, 1040, 1080, 1090, 10L50, 1140, 1212, 12L15, 1525, 1536	≤ 175 Bhn or ≤ 7 HRc	425	RPM	12988	8659	6494	4329	3247	2598	2165
			(340-510)	Fr	0.0039	0.0059	0.0079	0.0118	0.0157	0.0196	0.0236
				Feed (ipm)	51.0	51.0	51.0	51.0	51.0	51.0	51.0
		≤ 275 Bhn or ≤ 28 HRc	380	RPM	11613	7742	5806	3871	2903	2323	1935
			(304-456)	Fr	0.0035	0.0053	0.0071	0.0106	0.0141	0.0177	0.0212
				Feed (ipm)	41.0	41.0	41.0	41.0	41.0	41.0	41.0
		≤ 425 Bhn or ≤ 45 HRc	220	RPM	6723	4482	3362	2241	1681	1345	1121
			(176-264)	Fr	0.0030	0.0045	0.0059	0.0089	0.0119	0.0149	0.0178
				Feed (ipm)	20.0	20.0	20.0	20.0	20.0	20.0	20.0
	ALLOY STEELS 4140, 4150, 4320, 5120, 5150, 8630, 86L20, 50100	≤ 275 Bhn or ≤ 28 HRc	330	RPM	10085	6723	5042	3362	2521	2017	1681
			(264-396)	Fr	0.0030	0.0045	0.0059	0.0089	0.0119	0.0149	0.0178
				Feed (ipm)	30.0	30.0	30.0	30.0	30.0	30.0	30.0
		≤ 375 Bhn or ≤ 40 HRc	200	RPM	6112	4075	3056	2037	1528	1222	1019
			(160-240)	Fr	0.0025	0.0038	0.0051	0.0076	0.0101	0.0127	0.0152
				Feed (ipm)	15.5	15.5	15.5	15.5	15.5	15.5	15.5
		≤ 425 Bhn or ≤ 45 HRc	140	RPM	4278	2852	2139	1426	1070	856	713
			(112-168)	Fr	0.0018	0.0027	0.0036	0.0054	0.0072	0.0090	0.0108
				Feed (ipm)	7.7	7.7	7.7	7.7	7.7	7.7	7.7
	TOOL STEELS A2, D2, H13, L2, M2, P20, S7, T15, W2	≤ 200 Bhn or ≤ 13 HRc	145	RPM	4431	2954	2216	1477	1108	886	739
			(116-174)	Fr	0.0026	0.0039	0.0052	0.0078	0.0104	0.0130	0.0156
				Feed (ipm)	11.5	11.5	11.5	11.5	11.5	11.5	11.5
		≤ 375 Bhn or ≤ 40 HRc	95	RPM	2903	1935	1452	968	726	581	484
			(76-114)	Fr	0.0012	0.0018	0.0024	0.0036	0.0048	0.0060	0.0072
				Feed (ipm)	3.5	3.5	3.5	3.5	3.5	3.5	3.5
M	STAINLESS STEELS (FREE MACHINING) 303, 416, 420F, 430F, 440F	≤ 185 Bhn or ≤ 9 HRc	325	RPM	9932	6621	4966	3311	2483	1986	1655
			(260-390)	Fr	0.0030	0.0045	0.0060	0.0091	0.0121	0.0151	0.0181
				Feed (ipm)	30.0	30.0	30.0	30.0	30.0	30.0	30.0
		≤ 275 Bhn or ≤ 28 HRc	210	RPM	6418	4278	3209	2139	1604	1284	1070
			(168-252)	Fr	0.0023	0.0035	0.0047	0.0070	0.0093	0.0117	0.0140
				Feed (ipm)	15.0	15.0	15.0	15.0	15.0	15.0	15.0
	STAINLESS STEELS (DIFFICULT) 304, 316, 321, 13-8 PH, 15-5PH, 17-4 PH, Custom 450	≤ 275 Bhn or ≤ 28 HRc	160	RPM	4890	3260	2445	1630	1222	978	815
			(128-192)	Fr	0.0023	0.0035	0.0047	0.0070	0.0093	0.0117	0.0140
				Feed (ipm)	11.4	11.4	11.4	11.4	11.4	11.4	11.4
		≤ 375 Bhn or ≤ 40 HRc	115	RPM	3514	2343	1757	1171	879	703	586
			(92-138)	Fr	0.0021	0.0031	0.0042	0.0062	0.0083	0.0104	0.0125
				Feed (ipm)	7.3	7.3	7.3	7.3	7.3	7.3	7.3

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Hi-PerCarb®

	Series 143M-S Fractional	Hardness	Vc (sfm)		DC • in 1/8	3/16	1/4	3/8	1/2	5/8	3/4
K	CAST IRONS Gray, Malleable, Ductile	≤ 220 Bhn or ≤ 19 HRc	360	RPM	11002	7334	5501	3667	2750	2200	1834
			(288-432)	Fr	0.0045	0.0068	0.0091	0.0136	0.0182	0.0227	0.0273
				Feed (ipm)	50.0	50.0	50.0	50.0	50.0	50.0	50.0
		≤ 260 Bhn or ≤ 26 HRc	335	RPM	10238	6825	5119	3413	2559	2048	1706
			(268-402)	Fr	0.0045	0.0068	0.0091	0.0136	0.0182	0.0227	0.0273
				Feed (ipm)	46.5	46.5	46.5	46.5	46.5	46.5	46.5
S	HIGH TEMP ALLOYS (NICKEL , COBALT, IRON BASE) Inconel 601, 617, 625, Incoloy, Monel 400, Rene, Waspaloy	≤ 300 Bhn or ≤ 32 HRc	130	RPM	3973	2649	1986	1324	993	795	662
			(104-156)	Fr	0.0014	0.0022	0.0029	0.0043	0.0057	0.0072	0.0086
				Feed (ipm)	5.7	5.7	5.7	5.7	5.7	5.7	5.7
		≤ 400 Bhn or ≤ 43 HRc	70	RPM	2139	1426	1070	713	535	428	357
			(56-84)	Fr	0.0012	0.0018	0.0024	0.0036	0.0049	0.0061	0.0073
				Feed (ipm)	2.6	2.6	2.6	2.6	2.6	2.6	2.6
	TITANIUM ALLOYS Pure Titanium, Ti6Al4V, Ti6Al2Sn4Zr2Mo, Ti4Al4Mo2Sn0.5Si, Ti-6Al4V	≤ 275 Bhn or ≤ 28 HRc	215	RPM	6570	4380	3285	2190	1643	1314	1095
			(172-258)	Fr	0.0018	0.0026	0.0035	0.0053	0.0070	0.0088	0.0105
				Feed (ipm)	11.5	11.5	11.5	11.5	11.5	11.5	11.5
		≤ 350 Bhn or ≤ 38 HRc	160	RPM	4890	3260	2445	1630	1222	978	815
			(128-192)	Fr	0.0016	0.0024	0.0032	0.0048	0.0064	0.0080	0.0096
				Feed (ipm)	7.8	7.8	7.8	7.8	7.8	7.8	7.8
		≤ 440 Bhn or ≤ 47 HRc	85	RPM	2598	1732	1299	866	649	520	433
			(68-102)	Fr	0.0012	0.0018	0.0024	0.0036	0.0048	0.0060	0.0072
				Feed (ipm)	3.1	3.1	3.1	3.1	3.1	3.1	3.1

Bhn (Brinell) HRc (Rockwell C) HRb (Rockwell B)
rpm = Vc x 3.82 / DC
ipm = Fr x RPM
reduce speed and feed for materials harder than listed
refer to the SGS Tool Wizard® for complete technical information (www.kyocera-sgstool.com)

METRIC

Hi-PerCarb®

	Series 143M-S Metric	Hardness	Vc (m/min)		DC • mm 3	6	8	10	12	14	16
P	CARBON STEELS 1018, 1040, 1080, 1090, 10L50, 1140, 1212, 12L15, 1525, 1536	≤ 175 Bhn or ≤ 7 HRc	130	RPM	13733	6867	5150	4120	3433	2943	2575
			(104-155)	Fr	0.094	0.189	0.252	0.314	0.377	0.440	0.503
				Feed (mm/min)	1295	1295	1295	1295	1295	1295	1295
		≤ 275 Bhn or ≤ 28 HRc	116	RPM	12279	6140	4605	3684	3070	2631	2302
			(93-139)	Fr	0.085	0.170	0.226	0.283	0.339	0.396	0.452
				Feed (mm/min)	1041	1041	1041	1041	1041	1041	1041
		≤ 425 Bhn or ≤ 45 HRc	67	RPM	7109	3555	2666	2133	1777	1523	1333
			(54-80)	Fr	0.071	0.143	0.191	0.238	0.286	0.333	0.381
				Feed (mm/min)	508	508	508	508	508	508	508
	ALLOY STEELS 4140, 4150, 4320, 5120, 5150, 8630, 86L20, 50100	≤ 275 Bhn or ≤ 28 HRc	101	RPM	10664	5332	3999	3199	2666	2285	1999
			(80-121)	Fr	0.071	0.143	0.191	0.238	0.286	0.333	0.381
				Feed (mm/min)	762	762	762	762	762	762	762
		≤ 375 Bhn or ≤ 40 HRc	61	RPM	6463	3231	2424	1939	1616	1385	1212
			(49-73)	Fr	0.061	0.122	0.162	0.203	0.244	0.284	0.325
				Feed (mm/min)	394	394	394	394	394	394	394
		≤ 425 Bhn or ≤ 45 HRc	43	RPM	4524	2262	1696	1357	1131	969	848
			(34-51)	Fr	0.043	0.086	0.115	0.144	0.173	0.202	0.231
				Feed (mm/min)	196	196	196	196	196	196	196
	TOOL STEELS A2, D2, H13, L2, M2, P20, S7, T15, W2	≤ 200 Bhn or ≤ 13 HRc	44	RPM	4686	2343	1757	1406	1171	1004	879
			(35-53)	Fr	0.062	0.125	0.166	0.208	0.249	0.291	0.332
				Feed (mm/min)	292	292	292	292	292	292	292
		≤ 375 Bhn or ≤ 40 HRc	29	RPM	3070	1535	1151	921	767	658	576
			(23-35)	Fr	0.029	0.058	0.077	0.097	0.116	0.135	0.154
				Feed (mm/min)	89	89	89	89	89	89	89
M	STAINLESS STEELS (FREE MACHINING) 303, 416, 420F, 430F, 440F	≤ 185 Bhn or ≤ 9 HRc	99	RPM	10502	5251	3938	3151	2626	2250	1969
			(79-119)	Fr	0.073	0.145	0.193	0.242	0.290	0.339	0.387
				Feed (mm/min)	762	762	762	762	762	762	762
		≤ 275 Bhn or ≤ 28 HRc	64	RPM	6786	3393	2545	2036	1696	1454	1272
			(51-77)	Fr	0.056	0.112	0.150	0.187	0.225	0.262	0.299
				Feed (mm/min)	381	381	381	381	381	381	381
	STAINLESS STEELS (DIFFICULT) 304, 316, 321, 13-8 PH, 15-5PH, 17-4 PH, Custom 450	≤ 275 Bhn or ≤ 28 HRc	49	RPM	5170	2585	1939	1551	1293	1108	969
			(39-59)	Fr	0.056	0.112	0.149	0.187	0.224	0.261	0.299
				Feed (mm/min)	290	290	290	290	290	290	290
		≤ 375 Bhn or ≤ 40 HRc	35	RPM	3716	1858	1394	1115	929	796	697
			(28-42)	Fr	0.050	0.100	0.133	0.166	0.200	0.233	0.266
				Feed (mm/min)	185	185	185	185	185	185	185

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Hi-PerCarb®

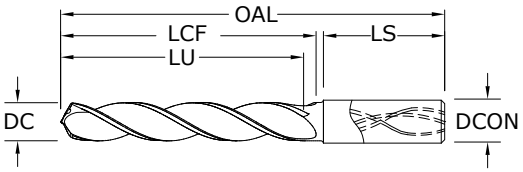
	Series 143M-S Metric	Hardness	Vc (m/min)		DC • mm 3	6	8	10	12	14	16
K	CAST IRONS Gray, Malleable, Ductile	≤ 220 Bhn or ≤ 19 HRc	110	RPM	11633	5816	4362	3490	2908	2493	2181
			(88-132)	Fr	0.109	0.218	0.291	0.364	0.437	0.509	0.582
				Feed (mm/min)	1270	1270	1270	1270	1270	1270	1270
		≤ 260 Bhn or ≤ 26 HRc	102	RPM	10825	5413	4059	3248	2706	2320	2030
			(82-123)	Fr	0.109	0.218	0.291	0.364	0.436	0.509	0.582
				Feed (mm/min)	1181	1181	1181	1181	1181	1181	1181
S	HIGH TEMP ALLOYS (Nickel , Cobalt, Iron Base) Inconel 601, 617, 625, Incoloy, Monel 400, Rene, Waspaloy	≤ 300 Bhn or ≤ 32 HRc	40	RPM	4201	2100	1575	1260	1050	900	788
			(32-48)	Fr	0.034	0.069	0.092	0.115	0.138	0.161	0.184
				Feed (mm/min)	145	145	145	145	145	145	145
		≤ 400 Bhn or ≤ 43 HRc	21	RPM	2262	1131	848	679	565	485	424
			(17-26)	Fr	0.029	0.058	0.078	0.097	0.117	0.136	0.156
				Feed (mm/min)	66	66	66	66	66	66	66
	TITANIUM ALLOYS Pure Titanium, Ti6Al4V, Ti6Al2Sn4Zr2Mo, Ti4Al4Mo2Sn0.5Si, Ti-6Al4V	≤ 275 Bhn or ≤ 28 HRc	66	RPM	6947	3474	2605	2084	1737	1489	1303
			(52-79)	Fr	0.042	0.084	0.112	0.140	0.168	0.196	0.224
				Feed (mm/min)	292	292	292	292	292	292	292
		≤ 350 Bhn or ≤ 38 HRc	49	RPM	5170	2585	1939	1551	1293	1108	969
			(39-59)	Fr	0.038	0.077	0.102	0.128	0.153	0.179	0.204
				Feed (mm/min)	198	198	198	198	198	198	198
		≤ 440 Bhn or ≤ 47 HRc	26	RPM	2747	1373	1030	824	687	589	515
			(21-31)	Fr	0.029	0.057	0.076	0.096	0.115	0.134	0.153
				Feed (mm/min)	79	79	79	79	79	79	79

Bhn (Brinell) HRc (Rockwell C) HRb (Rockwell B)
rpm = (Vc x 1000) / (DC x 3.14)
mm/min = Fr x RPM
reduce speed and feed for materials harder than listed
refer to the SGS Tool Wizard® for complete technical information (www.kyocera-sgstool.com)

HI-PERCARB®
HIGH PERFORMANCE CARBIDE DRILLS

141K 5xD

FRACTIONAL & METRIC SERIES



- 3-margin design improves hole stability and size control while providing superior finish, roundness and cylindricity
- Self-stabilizing pyramid point design stabilizes the drill on contact with the workpiece
- Open flute structure efficiently transports chips while maintaining strength at high feed rates
- Sculpted gash allows chips to easily flow away from the drill center
- Recommended for materials ≤ 43 HRc (≤ 400 Bhn)

		inch & mm						EDP NO.
DECIMAL DC	METRIC DC	FRACTIONAL/ LETTER/WIRE DC	SHANK DIAMETER DCON	OVERALL LENGTH OAL	FLUTE LENGTH LCF	USABLE LENGTH LU	SHANK LENGTH LS	Ti-NAMITE®-M (TM)
0.1181	3,000 mm		6,0	66,0	28,0	23,0	36,0	65160
0.1220	3,100 mm		6,0	66,0	28,0	23,0	36,0	65161
0.1250	3,175 mm	1/8	6,0	66,0	28,0	23,0	36,0	55160
0.1260	3,200 mm		6,0	66,0	28,0	23,0	36,0	65162
0.1299	3,300 mm		6,0	66,0	28,0	23,0	36,0	65163
0.1339	3,400 mm		6,0	66,0	28,0	23,0	36,0	65164
0.1360	3,454 mm	#29	6,0	66,0	28,0	23,0	36,0	55161
0.1378	3,500 mm		6,0	66,0	28,0	23,0	36,0	65165
0.1406	3,571 mm	9/64	6,0	66,0	28,0	23,0	36,0	55162
0.1417	3,600 mm		6,0	66,0	28,0	23,0	36,0	65166
0.1457	3,700 mm		6,0	66,0	28,0	23,0	36,0	65167
0.1496	3,800 mm		6,0	74,0	36,0	29,0	36,0	65168
0.1535	3,900 mm		6,0	74,0	36,0	29,0	36,0	65169
0.1562	3,967 mm	5/32	6,0	74,0	36,0	29,0	36,0	55163
0.1575	4,000 mm		6,0	74,0	36,0	29,0	36,0	65170
0.1590	4,039 mm	#21	6,0	74,0	36,0	29,0	36,0	55164
0.1614	4,100 mm		6,0	74,0	36,0	29,0	36,0	65171
0.1654	4,200 mm		6,0	74,0	36,0	29,0	36,0	65172
0.1693	4,300 mm		6,0	74,0	36,0	29,0	36,0	65173
0.1719	4,366 mm	11/64	6,0	74,0	36,0	29,0	36,0	55165
0.1732	4,400 mm		6,0	74,0	36,0	29,0	36,0	65174
0.1772	4,500 mm		6,0	74,0	36,0	29,0	36,0	65175
0.1811	4,600 mm		6,0	74,0	36,0	29,0	36,0	65176
0.1850	4,699 mm	#13	6,0	74,0	36,0	29,0	36,0	65177
0.1875	4,763 mm	3/16	6,0	82,0	44,0	37,0	36,0	55166
0.1890	4,801 mm	#12	6,0	82,0	44,0	37,0	36,0	65178
0.1929	4,900 mm		6,0	82,0	44,0	37,0	36,0	65179
0.1969	5,000 mm		6,0	82,0	44,0	36,0	36,0	65180
0.2008	5,100 mm		6,0	82,0	44,0	36,0	36,0	65181
0.2031	5,159 mm	13/64	6,0	82,0	44,0	36,0	36,0	55167
0.2047	5,200 mm		6,0	82,0	44,0	36,0	36,0	65182
0.2087	5,300 mm		6,0	82,0	44,0	36,0	36,0	65183
0.2126	5,400 mm		6,0	82,0	44,0	36,0	36,0	65184
0.2165	5,500 mm		6,0	82,0	44,0	36,0	36,0	65185
0.2188	5,558 mm	7/32	6,0	82,0	44,0	36,0	36,0	55168
0.2205	5,600 mm		6,0	82,0	44,0	36,0	36,0	65186

continued on next page

TOLERANCES (inch)

≤.1181 DIAMETER
DC = +.00008/+.00047
DCON = h_6

>.1181–.2362 DIAMETER
DC = +.00016/+.00063
DCON = h_6

>.2362–.3937 DIAMETER
DC = +.00024/+.00083
DCON = h_6

>.3937–.7087 DIAMETER
DC = +.00028/+.00098
DCON = h_6

>.7087–1.1811 DIAMETER
DC = +.00031/+.00114
DCON = h_6

TOLERANCES (mm)

≤3 DIAMETER
DC = +0,002/+0,012
DCON = h_6

>3–6 DIAMETER
DC = +0,004/+0,016
DCON = h_6

>6–10 DIAMETER
DC = +0,006/+0,021
DCON = h_6

>10–18 DIAMETER
DC = +0,007/+0,025
DCON = h_6

CAST IRON

For patent information visit www.ksptpatents.com

141K 5xD

FRACTIONAL & METRIC SERIES

CONTINUED

inch & mm								EDP NO.
DECIMAL DC	METRIC DC	FRACTIONAL/ LETTER/WIRE DC	SHANK DIAMETER DCON	OVERALL LENGTH OAL	FLUTE LENGTH LCF	USABLE LENGTH LU	SHANK LENGTH LS	Ti-NAMITE®-M (TM)
0.2244	5,700 mm		6,0	82,0	44,0	35,0	36,0	65187
0.2283	5,800 mm		6,0	82,0	44,0	35,0	36,0	65188
0.2323	5,900 mm		6,0	82,0	44,0	35,0	36,0	65189
0.2344	5,954 mm	15/64	6,0	82,0	44,0	35,0	36,0	55169
0.2362	6,000 mm		6,0	82,0	44,0	35,0	36,0	65190
0.2402	6,100 mm		8,0	91,0	53,0	44,0	36,0	65191
0.2441	6,200 mm		8,0	91,0	53,0	44,0	36,0	65192
0.2480	6,300 mm		8,0	91,0	53,0	44,0	36,0	65193
0.2500	6,350 mm	1/4 E	8,0	91,0	53,0	43,0	36,0	55170
0.2520	6,400 mm		8,0	91,0	53,0	43,0	36,0	65194
0.2559	6,500 mm		8,0	91,0	53,0	43,0	36,0	65195
0.2570	6,528 mm	F	8,0	91,0	53,0	43,0	36,0	55171
0.2598	6,600 mm		8,0	91,0	53,0	43,0	36,0	65196
0.2638	6,700 mm		8,0	91,0	53,0	43,0	36,0	65197
0.2656	6,746 mm	17/64	8,0	91,0	53,0	43,0	36,0	55172
0.2677	6,800 mm		8,0	91,0	53,0	43,0	36,0	65198
0.2717	6,900 mm		8,0	91,0	53,0	43,0	36,0	65199
0.2756	7,000 mm		8,0	91,0	53,0	42,0	36,0	65200
0.2795	7,100 mm		8,0	91,0	53,0	42,0	36,0	65201
0.2812	7,142 mm	9/32	8,0	91,0	53,0	42,0	36,0	55173
0.2835	7,200 mm		8,0	91,0	53,0	42,0	36,0	65202
0.2874	7,300 mm		8,0	91,0	53,0	42,0	36,0	65203
0.2913	7,400 mm		8,0	91,0	53,0	42,0	36,0	65204
0.2953	7,500 mm		8,0	91,0	53,0	42,0	36,0	65205
0.2969	7,541 mm	19/64	8,0	91,0	53,0	42,0	36,0	55174
0.2992	7,600 mm		8,0	91,0	53,0	42,0	36,0	65206
0.3031	7,700 mm		8,0	91,0	53,0	41,0	36,0	65207
0.3071	7,800 mm		8,0	91,0	53,0	41,0	36,0	65208
0.3110	7,900 mm		8,0	91,0	53,0	41,0	36,0	65209
0.3125	7,938 mm	5/16	8,0	91,0	53,0	41,0	36,0	55175
0.3150	8,000 mm		8,0	91,0	53,0	41,0	36,0	65210
0.3189	8,100 mm		10,0	103,0	61,0	49,0	40,0	65211
0.3228	8,200 mm		10,0	103,0	61,0	49,0	40,0	65212
0.3268	8,300 mm		10,0	103,0	61,0	49,0	40,0	65213
0.3281	8,334 mm	21/64	10,0	103,0	61,0	48,0	40,0	55176
0.3307	8,400 mm		10,0	103,0	61,0	48,0	40,0	65214
0.3320	8,433 mm	Q	10,0	103,0	61,0	48,0	40,0	55177
0.3346	8,500 mm		10,0	103,0	61,0	48,0	40,0	65215
0.3386	8,600 mm		10,0	103,0	61,0	48,0	40,0	65216
0.3425	8,700 mm		10,0	103,0	61,0	48,0	40,0	65217
0.3438	8,733 mm	11/32	10,0	103,0	61,0	48,0	40,0	55178
0.3465	8,800 mm		10,0	103,0	61,0	48,0	40,0	65218
0.3504	8,900 mm		10,0	103,0	61,0	48,0	40,0	65219
0.3543	9,000 mm		10,0	103,0	61,0	48,0	40,0	65220
0.3583	9,100 mm		10,0	103,0	61,0	47,0	40,0	65221
0.3594	9,129 mm	23/64	10,0	103,0	61,0	47,0	40,0	55179

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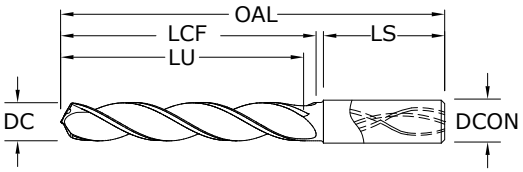
HI-PERCARB®
HIGH PERFORMANCE CARBIDE DRILLS

141K 5xD

FRACTIONAL & METRIC SERIES



- 3-margin design improves hole stability and size control while providing superior finish, roundness and cylindricity
- Self-stabilizing pyramid point design stabilizes the drill on contact with the workpiece
- Open flute structure efficiently transports chips while maintaining strength at high feed rates
- Sculpted gash allows chips to easily flow away from the drill center
- Recommended for materials ≤ 43 HRc (≤ 400 Bhn)

			inch & mm					EDP NO.
DECIMAL DC	METRIC DC	FRACTIONAL/ LETTER/WIRE DC	SHANK DIAMETER DCON	OVERALL LENGTH OAL	FLUTE LENGTH LCF	USABLE LENGTH LU	SHANK LENGTH LS	Ti-NAMITE®-M (TM)
0.3622	9,200 mm		10,0	103,0	61,0	47,0	40,0	65222
0.3661	9,300 mm		10,0	103,0	61,0	47,0	40,0	65223
0.3680	9,347 mm	U	10,0	103,0	61,0	47,0	40,0	55180
0.3701	9,400 mm		10,0	103,0	61,0	47,0	40,0	65224
0.3740	9,500 mm		10,0	103,0	61,0	47,0	40,0	65225
0.3750	9,525 mm	3/8	10,0	103,0	61,0	47,0	40,0	55181
0.3780	9,600 mm		10,0	103,0	61,0	47,0	40,0	65226
0.3819	9,700 mm		10,0	103,0	61,0	46,0	40,0	65227
0.3858	9,800 mm		10,0	103,0	61,0	46,0	40,0	65228
0.3898	9,900 mm		10,0	103,0	61,0	46,0	40,0	65229
0.3906	9,921 mm	25/64	10,0	103,0	61,0	46,0	40,0	55182
0.3937	10,000 mm		10,0	103,0	61,0	46,0	40,0	65230
0.3976	10,100 mm		12,0	118,0	71,0	56,0	45,0	65231
0.4016	10,200 mm		12,0	118,0	71,0	56,0	45,0	65232
0.4055	10,300 mm		12,0	118,0	71,0	56,0	45,0	65233
0.4062	10,317 mm	13/32	12,0	118,0	71,0	56,0	45,0	55183
0.4095	10,400 mm		12,0	118,0	71,0	55,0	45,0	65234
0.4134	10,500 mm		12,0	118,0	71,0	55,0	45,0	65235
0.4173	10,600 mm		12,0	118,0	71,0	55,0	45,0	65236
0.4213	10,700 mm		12,0	118,0	71,0	55,0	45,0	65237
0.4219	10,716 mm	27/64	12,0	118,0	71,0	55,0	45,0	55184
0.4252	10,800 mm		12,0	118,0	71,0	55,0	45,0	65238
0.4291	10,900 mm		12,0	118,0	71,0	55,0	45,0	65239
0.4331	11,000 mm		12,0	118,0	71,0	54,0	45,0	65240
0.4370	11,100 mm		12,0	118,0	71,0	54,0	45,0	65241
0.4375	11,113 mm	7/16	12,0	118,0	71,0	54,0	45,0	55185
0.4409	11,200 mm		12,0	118,0	71,0	54,0	45,0	65242
0.4449	11,300 mm		12,0	118,0	71,0	54,0	45,0	65243
0.4488	11,400 mm		12,0	118,0	71,0	54,0	45,0	65244
0.4528	11,500 mm		12,0	118,0	71,0	54,0	45,0	65245
0.4567	11,600 mm		12,0	118,0	71,0	54,0	45,0	65246
0.4606	11,700 mm		12,0	118,0	71,0	53,0	45,0	65247
0.4646	11,800 mm		12,0	118,0	71,0	53,0	45,0	65248
0.4685	11,900 mm		12,0	118,0	71,0	53,0	45,0	65249
0.4688	11,908 mm	15/32	12,0	118,0	71,0	53,0	45,0	55186
0.4724	12,000 mm		12,0	118,0	71,0	53,0	45,0	65250

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TOLERANCES (inch)

≤.1181 DIAMETER
DC = +.00008/+.00047
DCON = h_6

>.1181–.2362 DIAMETER
DC = +.00016/+.00063
DCON = h_6

>.2362–.3937 DIAMETER
DC = +.00024/+.00083
DCON = h_6

>.3937–.7087 DIAMETER
DC = +.00028/+.00098
DCON = h_6

>.7087–1.1811 DIAMETER
DC = +.00031/+.00114
DCON = h_6

TOLERANCES (mm)

≤3 DIAMETER
DC = +0,002/+0,012
DCON = h_6

>3–6 DIAMETER
DC = +0,004/+0,016
DCON = h_6

>6–10 DIAMETER
DC = +0,006/+0,021
DCON = h_6

>10–18 DIAMETER
DC = +0,007/+0,025
DCON = h_6

CAST IRON

For patent information visit www.ksptpatents.com

141K 5xD

FRACTIONAL & METRIC SERIES

CONTINUED

inch & mm								EDP NO.
DECIMAL DC	METRIC DC	FRACTIONAL/ LETTER/WIRE DC	SHANK DIAMETER DCON	OVERALL LENGTH OAL	FLUTE LENGTH LCF	USABLE LENGTH LU	SHANK LENGTH LS	Ti-NAMITE®-M (TM)
0.4844	12,304 mm	31/64	14,0	124,0	77,0	58,0	45,0	55187
0.4921	12,500 mm		14,0	124,0	77,0	58,0	45,0	65251
0.5000	12,700 mm	1/2	14,0	124,0	77,0	58,0	45,0	55188
0.5039	12,800 mm		14,0	124,0	77,0	58,0	45,0	65252
0.5118	13,000 mm		14,0	124,0	77,0	58,0	45,0	65253
0.5156	13,096 mm	33/64	14,0	124,0	77,0	57,0	45,0	55189
0.5315	13,500 mm		14,0	124,0	77,0	57,0	45,0	65254
0.5433	13,800 mm		14,0	124,0	77,0	56,0	45,0	65255
0.5512	14,000 mm		14,0	124,0	77,0	56,0	45,0	65256
0.5625	14,288 mm	9/16	16,0	133,0	83,0	61,0	48,0	55190
0.5709	14,500 mm		16,0	133,0	83,0	61,0	48,0	65257
0.5781	14,684 mm	37/64	16,0	133,0	83,0	61,0	48,0	55191
0.5827	14,800 mm		16,0	133,0	83,0	61,0	48,0	65258
0.5906	15,000 mm		16,0	133,0	83,0	60,0	48,0	65259
0.6102	15,500 mm		16,0	133,0	83,0	60,0	48,0	65260
0.6221	15,800 mm		16,0	133,0	83,0	59,0	48,0	65261
0.6250	15,875 mm	5/8	16,0	133,0	83,0	59,0	48,0	55192
0.6299	16,000 mm		16,0	133,0	83,0	59,0	48,0	65262
0.6562	16,667 mm	21/32	18,0	143,0	93,0	68,0	48,0	55193
0.6875	17,463 mm	11/16	18,0	143,0	93,0	67,0	48,0	55194
0.7500	19,050 mm	3/4	20,0	153,0	101,0	72,0	50,0	55195

FRACTIONAL
Hi-PerCarb®

	Series 141K 5D Fractional	Hardness	Vc (sfm)		DC • in 1/8	3/16	1/4	3/8	1/2	5/8	3/4
K	GRAY CAST IRON FERRITIC ASTM A48: CLASS 20 SAE J431C: GRADE 1800	≤ 150 Bhn or ≤ 1 HRc	450	RPM	13752	9168	6876	4584	3438	2750	2292
			(360-540)	Fr	0.0049	0.0074	0.0099	0.0148	0.0198	0.0247	0.0297
				Feed (ipm)	68	68	68	68	68	68	68
	GRAY CAST IRON PEARLITIC ASTM A48: CLASS 30, 35, 40 SAE J431C: GRADE 3000	≤ 220 Bhn or ≤ 19 HRc	375	RPM	11460	7640	5730	3820	2865	2292	1910
			(300-450)	Fr	0.0039	0.0059	0.0079	0.0118	0.0157	0.0196	0.0236
				Feed (ipm)	45	45	45	45	45	45	45
	COMPACTED GRAPHITE IRON	≤ 250 Bhn or ≤ 25 HRc	325	RPM	9932	6621	4966	3311	2483	1986	1655
			(260-390)	Fr	0.0039	0.0059	0.0079	0.0118	0.0157	0.0196	0.0236
				Feed (ipm)	39	39	39	39	39	39	39
	MALLEABLE CAST IRON FERRITIC ASTM A220: GRADE 40010 SAE J158: GRADE M4504	≤ 160 Bhn or ≤ 3 HRc	450	RPM	13752	9168	6876	4584	3438	2750	2292
			(360-540)	Fr	0.0049	0.0074	0.0099	0.0148	0.0198	0.0247	0.0297
				Feed (ipm)	68	68	68	68	68	68	68
	MALLEABLE CAST IRON MARTENSITE ASTM A220: GRADE 90001 SAE J158: GRADE M8501	≤ 320 Bhn or ≤ 34 HRc	250	RPM	7640	5093	3820	2547	1910	1528	1273
			(200-300)	Fr	0.0031	0.0047	0.0063	0.0094	0.0126	0.0157	0.0188
				Feed (ipm)	24	24	24	24	24	24	24

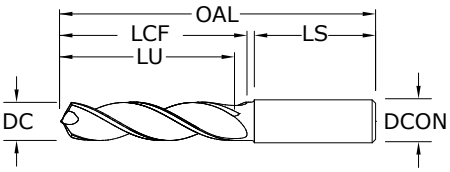
Bhn (Brinell) HRc (Rockwell C)
rpm = Vc x 3.82 / DC
ipm = Fr x rpm
reduce speed and feed for materials harder than listed
refer to the SGS Tool Wizard® for complete technical information (www.kyocera-sgstool.com)

METRIC
Hi-PerCarb®

	Series 141K 5D Metric	Hardness	Vc (m/min)		DC • mm 3	6	8	10	12	14	16
K	GRAY CAST IRON FERRITIC ASTM A48: CLASS 20 SAE J431C: GRADE 1800	≤ 150 Bhn or ≤ 1 HRc	137	RPM	14541	7271	5453	4362	3635	3116	2726
			(110-165)	Fr	0.119	0.237	0.316	0.395	0.475	0.554	0.633
				Feed (mm/min)	1725	1725	1725	1725	1725	1725	1725
	GRAY CAST IRON PEARLITIC ASTM A48: CLASS 30, 35, 40 SAE J431C: GRADE 3000	≤ 220 Bhn or ≤ 19 HRc	114	RPM	12118	6059	4544	3635	3029	2597	2272
			(91-137)	Fr	0.094	0.189	0.252	0.315	0.378	0.441	0.504
				Feed (mm/min)	1145	1145	1145	1145	1145	1145	1145
	COMPACTED GRAPHITE IRON	≤ 250 Bhn or ≤ 25 HRc	99	RPM	10502	5251	3938	3151	2626	2250	1969
			(79-119)	Fr	0.094	0.189	0.251	0.314	0.377	0.440	0.503
				Feed (mm/min)	990	990	990	990	990	990	990
	MALLEABLE CAST IRON FERRITIC ASTM A220: GRADE 40010 SAE J158: GRADE M4504	≤ 160 Bhn or ≤ 3 HRc	137	RPM	14541	7271	5453	4362	3635	3116	2726
			(110-165)	Fr	0.119	0.237	0.316	0.395	0.475	0.554	0.633
				Feed (mm/min)	1725	1725	1725	1725	1725	1725	1725
	MALLEABLE CAST IRON MARTENSITE ASTM A220: GRADE 90001 SAE J158: GRADE M8501	≤ 320 Bhn or ≤ 34 HRc	76	RPM	8078	4039	3029	2424	2020	1731	1515
			(61-91)	Fr	0.076	0.151	0.201	0.252	0.302	0.352	0.403
				Feed (mm/min)	610	610	610	610	610	610	610

(Brinell) HRc (Rockwell C)
rpm = (Vc x 1000) / (DC x 3.14)
mm/min = Fr x rpm
reduce speed and feed for materials harder than listed
refer to the SGS Tool Wizard® for complete technical information (www.kyocera-sgstool.com)

HI-PERCARB®
HIGH PERFORMANCE CARBIDE DRILLS



131N 3xD

FRACTIONAL & METRIC SERIES

TOLERANCES (inch)

≤.1181 DIAMETER
DC = +.00008/+.00047
DCON = h_6

>.1181–.2362 DIAMETER
DC = +.00016/+.00063
DCON = h_6

>.2362–.3937 DIAMETER
DC = +.00024/+.00083
DCON = h_6

>.3937–.7087 DIAMETER
DC = +.00028/+.00098
DCON = h_6

>.7087–1.1811 DIAMETER
DC = +.00031/+.00114
DCON = h_6

TOLERANCES (mm)

≤3 DIAMETER
DC = +0,002/+0,012
DCON = h_6

>3–6 DIAMETER
DC = +0,004/+0,016
DCON = h_6

>6–10 DIAMETER
DC = +0,006/+0,021
DCON = h_6

>10–18 DIAMETER
DC = +0,007/+0,025
DCON = h_6

NON-FERROUS

For patent information visit www.ksptpatents.com

inch & mm								EDP NO.	
DECIMAL DC	METRIC DC	FRACTIONAL/ LETTER/WIRE DC	SHANK DIAMETER DCON	OVERALL LENGTH OAL	FLUTE LENGTH LCF	USABLE LENGTH LU	SHANK LENGTH LS	UNCOATED	Ti-NAMITE®-B (TiB_2)
0.1181	3,000 mm		6,0	62,0	20,0	15,0	36,0	64600	67600
0.1220	3,100 mm		6,0	62,0	20,0	15,0	36,0	64601	67601
0.1250	3,175 mm	1/8	6,0	62,0	20,0	15,0	36,0	54600	54700
0.1260	3,200 mm		6,0	62,0	20,0	15,0	36,0	64602	67602
0.1299	3,300 mm		6,0	62,0	20,0	15,0	36,0	64603	67603
0.1339	3,400 mm		6,0	62,0	20,0	15,0	36,0	64604	67604
0.1360	3,454 mm	#29	6,0	62,0	20,0	15,0	36,0	54601	54701
0.1378	3,500 mm		6,0	62,0	20,0	15,0	36,0	64605	67605
0.1406	3,571 mm	9/64	6,0	62,0	20,0	15,0	36,0	54602	54702
0.1417	3,600 mm		6,0	62,0	20,0	15,0	36,0	64606	67606
0.1457	3,700 mm		6,0	62,0	20,0	15,0	36,0	64607	67607
0.1496	3,800 mm		6,0	66,0	24,0	18,0	36,0	64608	67608
0.1535	3,900 mm		6,0	66,0	24,0	18,0	36,0	64609	67609
0.1562	3,967 mm	5/32	6,0	66,0	24,0	18,0	36,0	54603	54703
0.1575	4,000 mm		6,0	66,0	24,0	18,0	36,0	64610	67610
0.1590	4,039 mm	#21	6,0	66,0	24,0	18,0	36,0	54604	54704
0.1614	4,100 mm		6,0	66,0	24,0	18,0	36,0	64611	67611
0.1654	4,200 mm		6,0	66,0	24,0	18,0	36,0	64612	67612
0.1693	4,300 mm		6,0	66,0	24,0	18,0	36,0	64613	67613
0.1719	4,366 mm	11/64	6,0	66,0	24,0	17,0	36,0	54605	54705
0.1732	4,400 mm		6,0	66,0	24,0	17,0	36,0	64614	67614
0.1772	4,500 mm		6,0	66,0	24,0	17,0	36,0	64615	67615
0.1811	4,600 mm		6,0	66,0	24,0	17,0	36,0	64616	67616
0.1850	4,699 mm	#13	6,0	66,0	24,0	17,0	36,0	64617	67617
0.1875	4,763 mm	3/16	6,0	66,0	28,0	21,0	36,0	54606	54706
0.1890	4,801 mm	#12	6,0	66,0	28,0	21,0	36,0	64618	67618
0.1929	4,900 mm		6,0	66,0	28,0	21,0	36,0	64619	67619
0.1969	5,000 mm		6,0	66,0	28,0	20,0	36,0	64620	67620
0.2008	5,100 mm		6,0	66,0	28,0	20,0	36,0	64621	67621
0.2031	5,159 mm	13/64	6,0	66,0	28,0	20,0	36,0	54607	54707
0.2047	5,200 mm		6,0	66,0	28,0	20,0	36,0	64622	67622
0.2087	5,300 mm		6,0	66,0	28,0	20,0	36,0	64623	67623
0.2126	5,400 mm		6,0	66,0	28,0	20,0	36,0	64624	67624
0.2165	5,500 mm		6,0	66,0	28,0	20,0	36,0	64625	67625
0.2188	5,558 mm	7/32	6,0	66,0	28,0	20,0	36,0	54608	54708
0.2205	5,600 mm		6,0	66,0	28,0	20,0	36,0	64626	67626

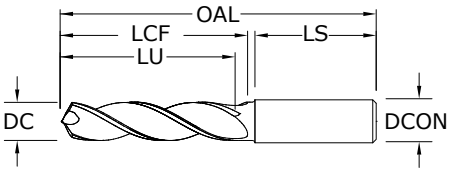
continued on next page

- 3-margin design improves hole stability and size control while providing superior finish, roundness and cylindricity
- Self-stabilizing pyramid point design stabilizes the drill on contact with the workpiece
- Open flute structure efficiently transports chips while maintaining strength at high feed rates
- Sculpted gash allows chips to easily flow away from the drill center
- Recommended for materials ≤ 175 Bhn (≤ 16 HRc)

HI-PERCARB®
HIGH PERFORMANCE CARBIDE DRILLS

131N 3xD

FRACTIONAL & METRIC SERIES



- 3-margin design improves hole stability and size control while providing superior finish, roundness and cylindricity
- Self-stabilizing pyramid point design stabilizes the drill on contact with the workpiece
- Open flute structure efficiently transports chips while maintaining strength at high feed rates
- Sculpted gash allows chips to easily flow away from the drill center
- Recommended for materials ≤ 175 Bhn (≤ 16 HRc)

inch & mm								EDP NO.	
DECIMAL DC	METRIC DC	FRACTIONAL/ LETTER/WIRE DC	SHANK DIAMETER DCON	OVERALL LENGTH OAL	FLUTE LENGTH LCF	USABLE LENGTH LU	SHANK LENGTH LS	UNCOATED	Ti-NAMITE®-B (TiB_2)
0.2244	5,700 mm		6,0	66,0	28,0	19,0	36,0	64627	67627
0.2283	5,800 mm		6,0	66,0	28,0	19,0	36,0	64628	67628
0.2323	5,900 mm		6,0	66,0	28,0	19,0	36,0	64629	67629
0.2344	5,954 mm	15/64	6,0	66,0	28,0	19,0	36,0	54609	54709
0.2362	6,000 mm		6,0	66,0	28,0	19,0	36,0	64630	67630
0.2402	6,100 mm		8,0	79,0	34,0	25,0	36,0	64631	67631
0.2441	6,200 mm		8,0	79,0	34,0	25,0	36,0	64632	67632
0.2480	6,300 mm		8,0	79,0	34,0	25,0	36,0	64633	67633
0.2500	6,350 mm	1/4 E	8,0	79,0	34,0	24,0	36,0	54610	54710
0.2520	6,400 mm		8,0	79,0	34,0	24,0	36,0	64634	67634
0.2559	6,500 mm		8,0	79,0	34,0	24,0	36,0	64635	67635
0.2570	6,528 mm	F	8,0	79,0	34,0	24,0	36,0	54611	54711
0.2598	6,600 mm		8,0	79,0	34,0	24,0	36,0	64636	67636
0.2638	6,700 mm		8,0	79,0	34,0	24,0	36,0	64637	67637
0.2656	6,746 mm	17/64	8,0	79,0	34,0	24,0	36,0	54612	54712
0.2677	6,800 mm		8,0	79,0	34,0	24,0	36,0	64638	67638
0.2717	6,900 mm		8,0	79,0	34,0	24,0	36,0	64639	67639
0.2756	7,000 mm		8,0	79,0	34,0	24,0	36,0	64640	67640
0.2795	7,100 mm		8,0	79,0	41,0	30,0	36,0	64641	67641
0.2812	7,142 mm	9/32	8,0	79,0	41,0	30,0	36,0	54613	54713
0.2835	7,200 mm		8,0	79,0	41,0	30,0	36,0	64642	67642
0.2874	7,300 mm		8,0	79,0	41,0	30,0	36,0	64643	67643
0.2913	7,400 mm		8,0	79,0	41,0	30,0	36,0	64644	67644
0.2953	7,500 mm		8,0	79,0	41,0	30,0	36,0	64645	67645
0.2969	7,541 mm	19/64	8,0	79,0	41,0	30,0	36,0	54614	54714
0.2992	7,600 mm		8,0	79,0	41,0	30,0	36,0	64646	67646
0.3031	7,700 mm		8,0	79,0	41,0	29,0	36,0	64647	67647
0.3071	7,800 mm		8,0	79,0	41,0	29,0	36,0	64648	67648
0.3110	7,900 mm		8,0	79,0	41,0	29,0	36,0	64649	67649
0.3125	7,938 mm	5/16	8,0	79,0	41,0	29,0	36,0	54615	54715
0.3150	8,000 mm		8,0	79,0	41,0	29,0	36,0	64650	67650
0.3189	8,100 mm		10,0	89,0	47,0	35,0	40,0	64651	67651
0.3228	8,200 mm		10,0	89,0	47,0	35,0	40,0	64652	67652
0.3268	8,300 mm		10,0	89,0	47,0	35,0	40,0	64653	67653
0.3281	8,334 mm	21/64	10,0	89,0	47,0	34,0	40,0	54616	54716
0.3307	8,400 mm		10,0	89,0	47,0	34,0	40,0	64654	67654

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TOLERANCES (inch)

≤.1181 DIAMETER
DC = +.00008/+.00047
DCON = h_6

>.1181–.2362 DIAMETER
DC = +.00016/+.00063
DCON = h_6

>.2362–.3937 DIAMETER
DC = +.00024/+.00083
DCON = h_6

>.3937–.7087 DIAMETER
DC = +.00028/+.00098
DCON = h_6

>.7087–1.1811 DIAMETER
DC = +.00031/+.00114
DCON = h_6

TOLERANCES (mm)

≤3 DIAMETER
DC = +0,002/+0,012
DCON = h_6

>3–6 DIAMETER
DC = +0,004/+0,016
DCON = h_6

>6–10 DIAMETER
DC = +0,006/+0,021
DCON = h_6

>10–18 DIAMETER
DC = +0,007/+0,025
DCON = h_6

NON-FERROUS

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131N 3xD

FRACTIONAL & METRIC SERIES

CONTINUED

inch & mm								EDP NO.	
DECIMAL DC	METRIC DC	FRACTIONAL/ LETTER/WIRE DC	SHANK DIAMETER DCON	OVERALL LENGTH OAL	FLUTE LENGTH LCF	USABLE LENGTH LU	SHANK LENGTH LS	UNCOATED	Ti-NAMITE®-B (TiB_2)
0.3320	8,433 mm	Q	10,0	89,0	47,0	34,0	40,0	54617	54717
0.3346	8,500 mm		10,0	89,0	47,0	34,0	40,0	64655	67655
0.3386	8,600 mm		10,0	89,0	47,0	34,0	40,0	64656	67656
0.3425	8,700 mm		10,0	89,0	47,0	34,0	40,0	64657	67657
0.3438	8,733 mm	11/32	10,0	89,0	47,0	34,0	40,0	54618	54718
0.3465	8,800 mm		10,0	89,0	47,0	34,0	40,0	64658	67658
0.3504	8,900 mm		10,0	89,0	47,0	34,0	40,0	64659	67659
0.3543	9,000 mm		10,0	89,0	47,0	34,0	40,0	64660	67660
0.3583	9,100 mm		10,0	89,0	47,0	33,0	40,0	64661	67661
0.3594	9,129 mm	23/64	10,0	89,0	47,0	33,0	40,0	54619	54719
0.3622	9,200 mm		10,0	89,0	47,0	33,0	40,0	64662	67662
0.3661	9,300 mm		10,0	89,0	47,0	33,0	40,0	64663	67663
0.3680	9,347 mm	U	10,0	89,0	47,0	33,0	40,0	54620	54720
0.3701	9,400 mm		10,0	89,0	47,0	33,0	40,0	64664	67664
0.3740	9,500 mm		10,0	89,0	47,0	33,0	40,0	64665	67665
0.3750	9,525 mm	3/8	10,0	89,0	47,0	33,0	40,0	54621	54721
0.3780	9,600 mm		10,0	89,0	47,0	33,0	40,0	64666	67666
0.3819	9,700 mm		10,0	89,0	47,0	32,0	40,0	64667	67667
0.3858	9,800 mm		10,0	89,0	47,0	32,0	40,0	64668	67668
0.3898	9,900 mm		10,0	89,0	47,0	32,0	40,0	64669	67669
0.3906	9,921 mm	25/64	10,0	89,0	47,0	32,0	40,0	54622	54722
0.3937	10,000 mm		10,0	89,0	47,0	32,0	40,0	64670	67670
0.3976	10,100 mm		12,0	102,0	55,0	40,0	45,0	64671	67671
0.4016	10,200 mm		12,0	102,0	55,0	40,0	45,0	64672	67672
0.4055	10,300 mm		12,0	102,0	55,0	40,0	45,0	64673	67673
0.4062	10,317 mm	13/32	12,0	102,0	55,0	40,0	45,0	54623	54723
0.4095	10,400 mm		12,0	102,0	55,0	39,0	45,0	64674	67674
0.4134	10,500 mm		12,0	102,0	55,0	39,0	45,0	64675	67675
0.4173	10,600 mm		12,0	102,0	55,0	39,0	45,0	64676	67676
0.4213	10,700 mm		12,0	102,0	55,0	39,0	45,0	64677	67677
0.4219	10,716 mm	27/64	12,0	102,0	55,0	39,0	45,0	54624	54724
0.4252	10,800 mm		12,0	102,0	55,0	39,0	45,0	64678	67678
0.4291	10,900 mm		12,0	102,0	55,0	39,0	45,0	64679	67679
0.4331	11,000 mm		12,0	102,0	55,0	39,0	45,0	64680	67680
0.4370	11,100 mm		12,0	102,0	55,0	38,0	45,0	64681	67681
0.4375	11,113 mm	7/16	12,0	102,0	55,0	38,0	45,0	54625	54725
0.4409	11,200 mm		12,0	102,0	55,0	38,0	45,0	64682	67682
0.4449	11,300 mm		12,0	102,0	55,0	38,0	45,0	64683	67683
0.4488	11,400 mm		12,0	102,0	55,0	38,0	45,0	64684	67684
0.4528	11,500 mm		12,0	102,0	55,0	38,0	45,0	64685	67685
0.4567	11,600 mm		12,0	102,0	55,0	38,0	45,0	64686	67686
0.4606	11,700 mm		12,0	102,0	55,0	37,0	45,0	64687	67687
0.4646	11,800 mm		12,0	102,0	55,0	37,0	45,0	64688	67688
0.4685	11,900 mm		12,0	102,0	55,0	37,0	45,0	64689	67689

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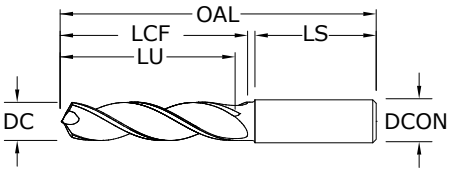
131N 3xD

FRACTIONAL & METRIC SERIES



- 3-margin design improves hole stability and size control while providing superior finish, roundness and cylindricity
- Self-stabilizing pyramid point design stabilizes the drill on contact with the workpiece
- Open flute structure efficiently transports chips while maintaining strength at high feed rates
- Sculpted gash allows chips to easily flow away from the drill center
- Recommended for materials ≤ 175 Bhn (≤ 16 HRc)

inch & mm								EDP NO.	
DECIMAL DC	METRIC DC	FRACTIONAL/ LETTER/WIRE DC	SHANK DIAMETER DCON	OVERALL LENGTH OAL	FLUTE LENGTH LCF	USABLE LENGTH LU	SHANK LENGTH LS	UNCOATED	Ti-NAMITE®-B (TiB_2)
0.4688	11,908 mm	15/32	12,0	102,0	55,0	37,0	45,0	54626	54726
0.4724	12,000 mm		12,0	102,0	55,0	37,0	45,0	64690	67690
0.4844	12,304 mm	31/64	14,0	107,0	60,0	41,0	45,0	54627	54727
0.4921	12,500 mm		14,0	107,0	60,0	41,0	45,0	64691	67691
0.5000	12,700 mm	1/2	14,0	107,0	60,0	41,0	45,0	54628	54728
0.5039	12,800 mm		14,0	107,0	60,0	41,0	45,0	64692	67692
0.5118	13,000 mm		14,0	107,0	60,0	41,0	45,0	64693	67693
0.5156	13,096 mm	33/64	14,0	107,0	60,0	40,0	45,0	54629	54729
0.5315	13,500 mm		14,0	107,0	60,0	40,0	45,0	64694	67694
0.5433	13,800 mm		14,0	107,0	60,0	39,0	45,0	64695	67695
0.5512	14,000 mm		14,0	107,0	60,0	39,0	45,0	64696	67696
0.5625	14,288 mm	9/16	16,0	115,0	65,0	43,0	48,0	54630	54730
0.5709	14,500 mm		16,0	115,0	65,0	43,0	48,0	64697	67697
0.5781	14,684 mm	37/64	16,0	115,0	65,0	43,0	48,0	54631	54731
0.5827	14,800 mm		16,0	115,0	65,0	43,0	48,0	64698	67698
0.5906	15,000 mm		16,0	115,0	65,0	42,0	48,0	64699	67699
0.6102	15,500 mm		16,0	115,0	65,0	42,0	48,0	64700	67700
0.6221	15,800 mm		16,0	115,0	65,0	41,0	48,0	64701	67701
0.6250	15,875 mm	5/8	16,0	115,0	65,0	41,0	48,0	54632	54732
0.6299	16,000 mm		16,0	115,0	65,0	41,0	48,0	64702	67702
0.6562	16,667 mm	21/32	18,0	123,0	73,0	47,0	48,0	54633	54733
0.6875	17,463 mm	11/16	18,0	123,0	73,0	47,0	48,0	54634	54734
0.7500	19,050 mm	3/4	20,0	131,0	79,0	50,0	50,0	54635	54735

TOLERANCES (inch)

≤.1181 DIAMETER
DC = +.00008/+.00047
DCON = h_6

>.1181–.2362 DIAMETER
DC = +.00016/+.00063
DCON = h_6

>.2362–.3937 DIAMETER
DC = +.00024/+.00083
DCON = h_6

>.3937–.7087 DIAMETER
DC = +.00028/+.00098
DCON = h_6

>.7087–1.1811 DIAMETER
DC = +.00031/+.00114
DCON = h_6

TOLERANCES (mm)

≤3 DIAMETER
DC = +0,002/+0,012
DCON = h_6

>3–6 DIAMETER
DC = +0,004/+0,016
DCON = h_6

>6–10 DIAMETER
DC = +0,006/+0,021
DCON = h_6

>10–18 DIAMETER
DC = +0,007/+0,025
DCON = h_6

NON-FERROUS

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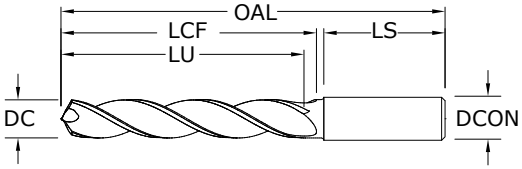


131N 5xD

FRACTIONAL & METRIC SERIES

TOLERANCES (inch)

≤.1181 DIAMETER
DC = +.00008/+.00047
DCON = h_6

>.1181–.2362 DIAMETER
DC = +.00016/+.00063
DCON = h_6

>.2362–.3937 DIAMETER
DC = +.00024/+.00083
DCON = h_6

>.3937–.7087 DIAMETER
DC = +.00028/+.00098
DCON = h_6

>.7087–1.1811 DIAMETER
DC = +.00031/+.00114
DCON = h_6

TOLERANCES (mm)

≤3 DIAMETER
DC = +0,002/+0,012
DCON = h_6

>3–6 DIAMETER
DC = +0,004/+0,016
DCON = h_6

>6–10 DIAMETER
DC = +0,006/+0,021
DCON = h_6

>10–18 DIAMETER
DC = +0,007/+0,025
DCON = h_6

NON-FERROUS

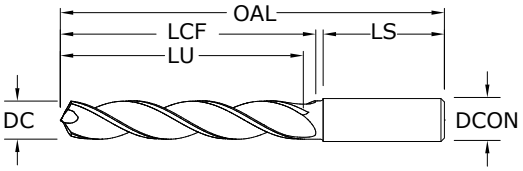
For patent information visit www.ksptpatents.com

inch & mm								EDP NO.	
DECIMAL DC	METRIC DC	FRACTIONAL/ LETTER/WIRE DC	SHANK DIAMETER DCON	OVERALL LENGTH OAL	FLUTE LENGTH LCF	USABLE LENGTH LU	SHANK LENGTH LS	UNCOATED	Ti-NAMITE®-B (TiB_2)
0.1181	3,000 mm		6,0	66,0	28,0	23,0	36,0	65000	64800
0.1220	3,100 mm		6,0	66,0	28,0	23,0	36,0	65001	64801
0.1250	3,175 mm	1/8	6,0	66,0	28,0	23,0	36,0	55000	54800
0.1260	3,200 mm		6,0	66,0	28,0	23,0	36,0	65002	64802
0.1299	3,300 mm		6,0	66,0	28,0	23,0	36,0	65003	64803
0.1339	3,400 mm		6,0	66,0	28,0	23,0	36,0	65004	64804
0.1360	3,454 mm	#29	6,0	66,0	28,0	23,0	36,0	55001	54801
0.1378	3,500 mm		6,0	66,0	28,0	23,0	36,0	65005	64805
0.1406	3,571 mm	9/64	6,0	66,0	28,0	23,0	36,0	55002	54802
0.1417	3,600 mm		6,0	66,0	28,0	23,0	36,0	65006	64806
0.1457	3,700 mm		6,0	66,0	28,0	23,0	36,0	65007	64807
0.1496	3,800 mm		6,0	74,0	36,0	29,0	36,0	65008	64808
0.1535	3,900 mm		6,0	74,0	36,0	29,0	36,0	65009	64809
0.1562	3,967 mm	5/32	6,0	74,0	36,0	29,0	36,0	55003	54803
0.1575	4,000 mm		6,0	74,0	36,0	29,0	36,0	65010	64810
0.1590	4,039 mm	#21	6,0	74,0	36,0	29,0	36,0	55004	54804
0.1614	4,100 mm		6,0	74,0	36,0	29,0	36,0	65011	64811
0.1654	4,200 mm		6,0	74,0	36,0	29,0	36,0	65012	64812
0.1693	4,300 mm		6,0	74,0	36,0	29,0	36,0	65013	64813
0.1719	4,366 mm	11/64	6,0	74,0	36,0	29,0	36,0	55005	54805
0.1732	4,400 mm		6,0	74,0	36,0	29,0	36,0	65014	64814
0.1772	4,500 mm		6,0	74,0	36,0	29,0	36,0	65015	64815
0.1811	4,600 mm		6,0	74,0	36,0	29,0	36,0	65016	64816
0.1850	4,699 mm	#13	6,0	74,0	36,0	29,0	36,0	65017	64817
0.1875	4,763 mm	3/16	6,0	82,0	44,0	37,0	36,0	55006	54806
0.1890	4,801 mm	#12	6,0	82,0	44,0	37,0	36,0	65018	64818
0.1929	4,900 mm		6,0	82,0	44,0	37,0	36,0	65019	64819
0.1969	5,000 mm		6,0	82,0	44,0	36,0	36,0	65020	64820
0.2008	5,100 mm		6,0	82,0	44,0	36,0	36,0	65021	64821
0.2031	5,159 mm	13/64	6,0	82,0	44,0	36,0	36,0	55007	54807
0.2047	5,200 mm		6,0	82,0	44,0	36,0	36,0	65022	64822
0.2087	5,300 mm		6,0	82,0	44,0	36,0	36,0	65023	64823
0.2126	5,400 mm		6,0	82,0	44,0	36,0	36,0	65024	64824
0.2165	5,500 mm		6,0	82,0	44,0	36,0	36,0	65025	64825
0.2188	5,558 mm	7/32	6,0	82,0	44,0	36,0	36,0	55008	54808
0.2205	5,600 mm		6,0	82,0	44,0	36,0	36,0	65026	64826

continued on next page

- 3-margin design improves hole stability and size control while providing superior finish, roundness and cylindricity
- Self-stabilizing pyramid point design stabilizes the drill on contact with the workpiece
- Open flute structure efficiently transports chips while maintaining strength at high feed rates
- Sculpted gash allows chips to easily flow away from the drill center
- Recommended for materials ≤ 175 Bhn (≤ 16 HRc)

HI-PERCARB®
HIGH PERFORMANCE CARBIDE DRILLS



131N 5xD

FRACTIONAL & METRIC SERIES

- 3-margin design improves hole stability and size control while providing superior finish, roundness and cylindricity
- Self-stabilizing pyramid point design stabilizes the drill on contact with the workpiece
- Open flute structure efficiently transports chips while maintaining strength at high feed rates
- Sculpted gash allows chips to easily flow away from the drill center
- Recommended for materials ≤ 175 Bhn (≤ 16 HRc)

inch & mm								EDP NO.	
DECIMAL DC	METRIC DC	FRACTIONAL/ LETTER/WIRE DC	SHANK DIAMETER DCON	OVERALL LENGTH OAL	FLUTE LENGTH LCF	USABLE LENGTH LU	SHANK LENGTH LS	UNCOATED	Ti-NAMITE®-B (TiB_2)
0.2244	5,700 mm		6,0	82,0	44,0	35,0	36,0	65027	64827
0.2283	5,800 mm		6,0	82,0	44,0	35,0	36,0	65028	64828
0.2323	5,900 mm		6,0	82,0	44,0	35,0	36,0	65029	64829
0.2344	5,954 mm	15/64	6,0	82,0	44,0	35,0	36,0	55009	54809
0.2362	6,000 mm		6,0	82,0	44,0	35,0	36,0	65030	64830
0.2402	6,100 mm		8,0	91,0	53,0	44,0	36,0	65031	64831
0.2441	6,200 mm		8,0	91,0	53,0	44,0	36,0	65032	64832
0.2480	6,300 mm		8,0	91,0	53,0	44,0	36,0	65033	64833
0.2500	6,350 mm	1/4 E	8,0	91,0	53,0	43,0	36,0	55010	54810
0.2520	6,400 mm		8,0	91,0	53,0	43,0	36,0	65034	64834
0.2559	6,500 mm		8,0	91,0	53,0	43,0	36,0	65035	64835
0.2570	6,528 mm	F	8,0	91,0	53,0	43,0	36,0	55011	54811
0.2598	6,600 mm		8,0	91,0	53,0	43,0	36,0	65036	64836
0.2638	6,700 mm		8,0	91,0	53,0	43,0	36,0	65037	64837
0.2656	6,746 mm	17/64	8,0	91,0	53,0	43,0	36,0	55012	54812
0.2677	6,800 mm		8,0	91,0	53,0	43,0	36,0	65038	64838
0.2717	6,900 mm		8,0	91,0	53,0	43,0	36,0	65039	64839
0.2756	7,000 mm		8,0	91,0	53,0	42,0	36,0	65040	64840
0.2795	7,100 mm		8,0	91,0	53,0	42,0	36,0	65041	64841
0.2812	7,142 mm	9/32	8,0	91,0	53,0	42,0	36,0	55013	54813
0.2835	7,200 mm		8,0	91,0	53,0	42,0	36,0	65042	64842
0.2874	7,300 mm		8,0	91,0	53,0	42,0	36,0	65043	64843
0.2913	7,400 mm		8,0	91,0	53,0	42,0	36,0	65044	64844
0.2953	7,500 mm		8,0	91,0	53,0	42,0	36,0	65045	64845
0.2969	7,541 mm	19/64	8,0	91,0	53,0	42,0	36,0	55014	54814
0.2992	7,600 mm		8,0	91,0	53,0	42,0	36,0	65046	64846
0.3031	7,700 mm		8,0	91,0	53,0	41,0	36,0	65047	64847
0.3071	7,800 mm		8,0	91,0	53,0	41,0	36,0	65048	64848
0.3110	7,900 mm		8,0	91,0	53,0	41,0	36,0	65049	64849
0.3125	7,938 mm	5/16	8,0	91,0	53,0	41,0	36,0	55015	54815
0.3150	8,000 mm		8,0	91,0	53,0	41,0	36,0	65050	64850
0.3189	8,100 mm		10,0	103,0	61,0	49,0	40,0	65051	64851
0.3228	8,200 mm		10,0	103,0	61,0	49,0	40,0	65052	64852
0.3268	8,300 mm		10,0	103,0	61,0	49,0	40,0	65053	64853
0.3281	8,334 mm	21/64	10,0	103,0	61,0	48,0	40,0	55016	54816
0.3307	8,400 mm		10,0	103,0	61,0	48,0	40,0	65054	64854

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TOLERANCES (inch)

≤.1181 DIAMETER
DC = +.00008/+.00047
DCON = h_6

>.1181–.2362 DIAMETER
DC = +.00016/+.00063
DCON = h_6

>.2362–.3937 DIAMETER
DC = +.00024/+.00083
DCON = h_6

>.3937–.7087 DIAMETER
DC = +.00028/+.00098
DCON = h_6

>.7087–1.1811 DIAMETER
DC = +.00031/+.00114
DCON = h_6

TOLERANCES (mm)

≤3 DIAMETER
DC = +0,002/+0,012
DCON = h_6

>3–6 DIAMETER
DC = +0,004/+0,016
DCON = h_6

>6–10 DIAMETER
DC = +0,006/+0,021
DCON = h_6

>10–18 DIAMETER
DC = +0,007/+0,025
DCON = h_6

NON-FERROUS

For patent information visit www.ksptpatents.com

131N 5xD

FRACTIONAL & METRIC SERIES

CONTINUED

inch & mm								EDP NO.	
DECIMAL DC	METRIC DC	FRACTIONAL/ LETTER/WIRE DC	SHANK DIAMETER DCON	OVERALL LENGTH OAL	FLUTE LENGTH LCF	USABLE LENGTH LU	SHANK LENGTH LS	UNCOATED	Ti-NAMITE®-B (TiB_2)
0.3320	8,433 mm	Q	10,0	103,0	61,0	48,0	40,0	55017	54817
0.3346	8,500 mm		10,0	103,0	61,0	48,0	40,0	65055	64855
0.3386	8,600 mm		10,0	103,0	61,0	48,0	40,0	65056	64856
0.3425	8,700 mm		10,0	103,0	61,0	48,0	40,0	65057	64857
0.3438	8,733 mm	11/32	10,0	103,0	61,0	48,0	40,0	55018	54818
0.3465	8,800 mm		10,0	103,0	61,0	48,0	40,0	65058	64858
0.3504	8,900 mm		10,0	103,0	61,0	48,0	40,0	65059	64859
0.3543	9,000 mm		10,0	103,0	61,0	48,0	40,0	65060	64860
0.3583	9,100 mm		10,0	103,0	61,0	47,0	40,0	65061	64861
0.3594	9,129 mm	23/64	10,0	103,0	61,0	47,0	40,0	55019	54819
0.3622	9,200 mm		10,0	103,0	61,0	47,0	40,0	65062	64862
0.3661	9,300 mm		10,0	103,0	61,0	47,0	40,0	65063	64863
0.3680	9,347 mm	U	10,0	103,0	61,0	47,0	40,0	55020	54820
0.3701	9,400 mm		10,0	103,0	61,0	47,0	40,0	65064	64864
0.3740	9,500 mm		10,0	103,0	61,0	47,0	40,0	65065	64865
0.3750	9,525 mm	3/8	10,0	103,0	61,0	47,0	40,0	55021	54821
0.3780	9,600 mm		10,0	103,0	61,0	47,0	40,0	65066	64866
0.3819	9,700 mm		10,0	103,0	61,0	46,0	40,0	65067	64867
0.3858	9,800 mm		10,0	103,0	61,0	46,0	40,0	65068	64868
0.3898	9,900 mm		10,0	103,0	61,0	46,0	40,0	65069	64869
0.3906	9,921 mm	25/64	10,0	103,0	61,0	46,0	40,0	55022	54822
0.3937	10,000 mm		10,0	103,0	61,0	46,0	40,0	65070	64870
0.3976	10,100 mm		12,0	118,0	71,0	56,0	45,0	65071	64871
0.4016	10,200 mm		12,0	118,0	71,0	56,0	45,0	65072	64872
0.4055	10,300 mm		12,0	118,0	71,0	56,0	45,0	65073	64873
0.4062	10,317 mm	13/32	12,0	118,0	71,0	56,0	45,0	55023	54823
0.4095	10,400 mm		12,0	118,0	71,0	55,0	45,0	65074	64874
0.4134	10,500 mm		12,0	118,0	71,0	55,0	45,0	65075	64875
0.4173	10,600 mm		12,0	118,0	71,0	55,0	45,0	65076	64876
0.4213	10,700 mm		12,0	118,0	71,0	55,0	45,0	65077	64877
0.4219	10,716 mm	27/64	12,0	118,0	71,0	55,0	45,0	55024	54824
0.4252	10,800 mm		12,0	118,0	71,0	55,0	45,0	65078	64878
0.4291	10,900 mm		12,0	118,0	71,0	55,0	45,0	65079	64879
0.4331	11,000 mm		12,0	118,0	71,0	54,0	45,0	65080	64880
0.4370	11,100 mm		12,0	118,0	71,0	54,0	45,0	65081	64881
0.4375	11,113 mm	7/16	12,0	118,0	71,0	54,0	45,0	55025	54825
0.4409	11,200 mm		12,0	118,0	71,0	54,0	45,0	65082	64882
0.4449	11,300 mm		12,0	118,0	71,0	54,0	45,0	65083	64883
0.4488	11,400 mm		12,0	118,0	71,0	54,0	45,0	65084	64884
0.4528	11,500 mm		12,0	118,0	71,0	54,0	45,0	65085	64885
0.4567	11,600 mm		12,0	118,0	71,0	54,0	45,0	65086	64886
0.4606	11,700 mm		12,0	118,0	71,0	53,0	45,0	65087	64887
0.4646	11,800 mm		12,0	118,0	71,0	53,0	45,0	65088	64888
0.4685	11,900 mm		12,0	118,0	71,0	53,0	45,0	65089	64889
0.4688	11,908 mm	15/32	12,0	118,0	71,0	53,0	45,0	55026	54826
0.4724	12,000 mm		12,0	118,0	71,0	53,0	45,0	65090	64890

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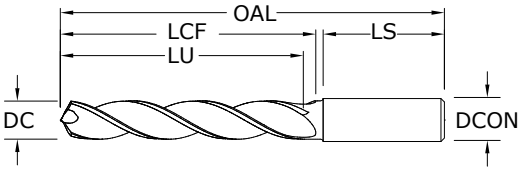
HI-PERCARB®
HIGH PERFORMANCE CARBIDE DRILLS

131N 5xD

FRACTIONAL & METRIC SERIES



- 3-margin design improves hole stability and size control while providing superior finish, roundness and cylindricity
- Self-stabilizing pyramid point design stabilizes the drill on contact with the workpiece
- Open flute structure efficiently transports chips while maintaining strength at high feed rates
- Sculpted gash allows chips to easily flow away from the drill center
- Recommended for materials ≤ 175 Bhn (≤ 16 HRc)

inch & mm								EDP NO.	
DECIMAL DC	METRIC DC	FRACTIONAL/ LETTER/WIRE DC	SHANK DIAMETER DCON	OVERALL LENGTH OAL	FLUTE LENGTH LCF	USABLE LENGTH LU	SHANK LENGTH LS	UNCOATED	Ti-NAMITE®-B (TiB_2)
0.4844	12,304 mm	31/64	14,0	124,0	77,0	58,0	45,0	55027	54827
0.4921	12,500 mm		14,0	124,0	77,0	58,0	45,0	65091	64891
0.5000	12,700 mm	1/2	14,0	124,0	77,0	58,0	45,0	55028	54828
0.5039	12,800 mm		14,0	124,0	77,0	58,0	45,0	65092	64892
0.5118	13,000 mm		14,0	124,0	77,0	58,0	45,0	65093	64893
0.5156	13,096 mm	33/64	14,0	124,0	77,0	57,0	45,0	55029	54829
0.5315	13,500 mm		14,0	124,0	77,0	57,0	45,0	65094	64894
0.5433	13,800 mm		14,0	124,0	77,0	56,0	45,0	65095	64895
0.5512	14,000 mm		14,0	124,0	77,0	56,0	45,0	65096	64896
0.5625	14,288 mm	9/16	16,0	133,0	83,0	61,0	48,0	55030	54830
0.5709	14,500 mm		16,0	133,0	83,0	61,0	48,0	65097	64897
0.5781	14,684 mm	37/64	16,0	133,0	83,0	61,0	48,0	55031	54831
0.5827	14,800 mm		16,0	133,0	83,0	61,0	48,0	65098	64898
0.5906	15,000 mm		16,0	133,0	83,0	60,0	48,0	65099	64899
0.6102	15,500 mm		16,0	133,0	83,0	60,0	48,0	65100	64900
0.6221	15,800 mm		16,0	133,0	83,0	59,0	48,0	65101	64901
0.6250	15,875 mm	5/8	16,0	133,0	83,0	59,0	48,0	55032	54832
0.6299	16,000 mm		16,0	133,0	83,0	59,0	48,0	65102	64902
0.6562	16,667 mm	21/32	18,0	143,0	93,0	68,0	48,0	55033	54833
0.6875	17,463 mm	11/16	18,0	143,0	93,0	67,0	48,0	55034	54834
0.7500	19,050 mm	3/4	20,0	153,0	101,0	72,0	50,0	55035	54835

TOLERANCES (inch)

≤.1181 DIAMETER
DC = +.00008/+.00047
DCON = h_6

>.1181–.2362 DIAMETER
DC = +.00016/+.00063
DCON = h_6

>.2362–.3937 DIAMETER
DC = +.00024/+.00083
DCON = h_6

>.3937–.7087 DIAMETER
DC = +.00028/+.00098
DCON = h_6

>.7087–1.1811 DIAMETER
DC = +.00031/+.00114
DCON = h_6

TOLERANCES (mm)

≤3 DIAMETER
DC = +0,002/+0,012
DCON = h_6

>3–6 DIAMETER
DC = +0,004/+0,016
DCON = h_6

>6–10 DIAMETER
DC = +0,006/+0,021
DCON = h_6

>10–18 DIAMETER
DC = +0,007/+0,025
DCON = h_6

NON-FERROUS

For patent information visit www.ksptpatents.com

	Series 131N 3D & 5D Fractional	Hardness	Vc (sfm)		DC • in 1/8	3/16	1/4	3/8	1/2	5/8	3/4
N	ALUMINUM ALLOYS < 12% SI 6061, 2024, 7075	≤ 150 Bhn or ≤ 88 HRb	800	RPM	24448	16299	12224	8149	6112	4890	4075
			(640-960)	Fr	0.0055	0.0083	0.0110	0.0166	0.0221	0.0276	0.0331
				Feed (ipm)	135	135	135	135	135	135	135
	ALUMINUM ALLOYS > 12% SI A356.0, 390.0, 319.0	≤ 125 Bhn or ≤ 77 HRb	600	RPM	18336	12224	9168	6112	4584	3667	3056
			(480-720)	Fr	0.0055	0.0082	0.0109	0.0164	0.0218	0.0273	0.0327
				Feed (ipm)	100	100	100	100	100	100	100
	COPPER ALLOYS Alum Bronze, Muntz Brass, Navel Brass	≤ 175 Bhn or ≤ 16 HRc	550	RPM	16808	11205	8404	5603	4202	3362	2801
			(440-660)	Fr	0.0020	0.0030	0.0040	0.0061	0.0081	0.0101	0.0121
				Feed (ipm)	34	34	34	34	34	34	34
	PLASTICS Acrylic, PVC, Polypropylene		450	RPM	13752	9168	6876	4584	3438	2750	2292
			(360-540)	Fr	0.0025	0.0037	0.0049	0.0074	0.0099	0.0124	0.0148
				Feed (ipm)	34	34	34	34	34	34	34

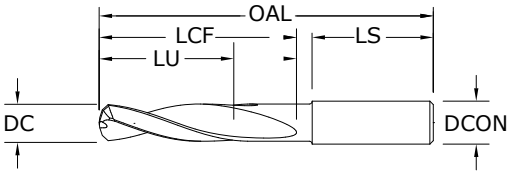
Bhn (Brinell) HRc (Rockwell C) HRb (Rockwell B)
rpm = Vc x 3.82 / DC
ipm = Fr x rpm
reduce speed and feed for materials harder than listed
refer to the SGS Tool Wizard® for complete technical information (www.kyocera-sgstool.com)

	Series 131N 3D & 5D Metric	Hardness	Vc (m/min)		DC • mm 3	6	8	10	12	14	16
N	ALUMINUM ALLOYS < 12% SI 6061, 2024, 7075	≤ 150 Bhn or ≤ 88 HRb	244	RPM	25851	12926	9694	7755	6463	5540	4847
			(195-293)	Fr	0.133	0.265	0.354	0.442	0.531	0.619	0.708
				Feed (mm/min)	3430	3430	3430	3430	3430	3430	3430
	ALUMINUM ALLOYS > 12% SI A356.0, 390.0, 319.0	≤ 125 Bhn or ≤ 77 HRb	183	RPM	19388	9694	7271	5816	4847	4155	3635
			(146-219)	Fr	0.131	0.262	0.349	0.437	0.524	0.611	0.699
				Feed (mm/min)	2540	2540	2540	2540	2540	2540	2540
	COPPER ALLOYS Alum Bronze, Muntz Brass, Navel Brass	≤ 175 Bhn or ≤ 16 HRc	168	RPM	17773	8886	6665	5332	4443	3808	3332
			(134-201)	Fr	0.049	0.097	0.130	0.162	0.194	0.227	0.259
				Feed (mm/min)	864	864	864	864	864	864	864
	PLASTICS Acrylic, PVC, Polypropylene		137	RPM	14541	7271	5453	4362	3635	3116	2726
			(110-165)	Fr	0.059	0.119	0.158	0.198	0.238	0.277	0.317
				Feed (mm/min)	864	864	864	864	864	864	864

Bhn (Brinell) HRc (Rockwell C) HRb (Rockwell B)
rpm = (Vc x 1000) / (DC x 3.14)
mm/min = Fr x rpm
reduce speed and feed for materials harder than listed
refer to the SGS Tool Wizard® for complete technical information (www.kyocera-sgstool.com)

FRACTIONAL & METRIC

Series 120



120

FRACTIONAL & METRIC SERIES

- Double margin design stabilizes the drill for greater hole accuracy and improved surface finish
- Notched point reduces thrust force over conventional designs
- 8 facet point reduces fiber breakout and delamination on exit
- 90 degree secondary chamfer angle improves hole entrance and exit quality

		inch & mm						EDP NO.
DECIMAL DC	METRIC DC	FRACTIONAL/ LETTER/WIRE DC	SHANK DIAMETER DCON	OVERALL LENGTH OAL	FLUTE LENGTH LCF	USABLE LENGTH LU	SHANK LENGTH LS	Di-NAMITE® (Diamond)
0.0980	2,489 mm	#40	1/8	2	9/16	7/16	1-1/4	50000
0.1063	2,700 mm		6,0	63,0	20,0	16,0	32,0	50001
0.1181	3,000 mm		6,0	63,0	20,0	16,0	36,0	50002
0.1250	3,175 mm	1/8	1/4	2-1/2	3/4	9/16	1-7/16	50003
0.1260	3,200 mm		6,0	63,0	20,0	15,0	36,0	50004
0.1285	3,264 mm	#30	1/4	2-1/2	3/4	9/16	1-7/16	50005
0.1405	3,569 mm	#28	1/4	2-1/2	3/4	9/16	1-7/16	50006
0.1570	3,988 mm	#22	1/4	2-5/8	7/8	5/8	1-7/16	50007
0.1590	4,039 mm	#21	1/4	2-5/8	7/8	5/8	1-7/16	50008
0.1614	4,100 mm		6,0	66,0	24,0	18,0	36,0	50009
0.1660	4,216 mm	#19	1/4	2-5/8	7/8	5/8	1-7/16	50010
0.1719	4,366 mm	11/64	1/4	2-5/8	7/8	5/8	1-7/16	50011
0.1875	4,763 mm	3/16	1/4	2-5/8	1	23/32	1-7/16	50012
0.1910	4,851 mm	#11	1/4	2-5/8	1	23/32	1-7/16	50013
0.1990	5,055 mm	#8	1/4	2-5/8	1	23/32	1-7/16	50014
0.2010	5,105 mm	#7	1/4	2-5/8	1	23/32	1-7/16	50015
0.2210	5,613 mm	#2	1/4	2-5/8	1	21/32	1-7/16	50016
0.2362	6,000 mm		6,0	66,0	28,0	19,0	36,0	50017
0.2500	6,350 mm	1/4 E	1/4	3-1/8	1-5/16	15/16	1-7/16	50018
0.2510	6,380 mm		5/16	3-1/8	1-5/16	15/16	1-7/16	50019
0.2570	6,528 mm	F	5/16	3-1/8	1-5/16	15/16	1-7/16	50020
0.2720	6,909 mm	I	5/16	3-1/8	1-5/16	29/32	1-7/16	50021
0.2770	7,036 mm	J	5/16	3-1/8	1-5/16	29/32	1-7/16	50022
0.2810	7,137 mm	K	5/16	3-1/8	1-9/16	1-9/64	1-7/16	50023
0.3125	7,938 mm	5/16	5/16	3-1/8	1-9/16	1-3/32	1-7/16	50024
0.3150	8,000 mm		8,0	79,0	41,0	29,0	36,0	50025
0.3750	9,525 mm	3/8	3/8	3-1/2	1-27/32	1-9/32	1-9/16	50026
0.3770	9,576 mm	V	1/2	3-1/2	1-27/32	1-9/32	1-9/16	50027
0.3937	10,000 mm		10,0	89,0	47,0	32,0	40,0	50028
0.4375	11,113 mm	7/16	1/2	4-1/16	2-3/16	1-17/32	1-9/16	50029
0.4724	12,000 mm		12,0	102,0	55,0	37,0	45,0	50030
0.5000	12,700 mm	1/2	1/2	4-1/4	2-5/16	1-9/16	1-3/4	50031

TOLERANCES (inch)

DC = +.0000/+.0005
DCON = h_6

TOLERANCES (mm)

DC = +0,000/+0,013
DCON = h_6

NON-FERROUS

For patent information visit www.ksptpatents.com

Series 120

	Series 120 Fractional	Vc (sfm)		DC • in						
				1/8	3/16	1/4	5/16	3/8	7/16	1/2
N	CFRP, AFRP (Carbon Fiber, Aramid Fiber)	320	RPM	9779	6519	4890	3912	3260	2794	2445
		(256-384)	Fr	0.0006	0.0009	0.0012	0.0015	0.0018	0.0021	0.0024
			Feed (ipm)	5.9	5.9	5.9	5.9	5.9	5.9	5.9
	GFRP (Fiberglass)	240	RPM	7334	4890	3667	2934	2445	2096	1834
		(192-288)	Fr	0.0006	0.0009	0.0012	0.0015	0.0018	0.0021	0.0024
			Feed (ipm)	4.4	4.4	4.4	4.4	4.4	4.4	4.4
	CARBON, GRAPHITE	400	RPM	12224	8149	6112	4890	4075	3493	3056
		(320-480)	Fr	0.0008	0.0012	0.0016	0.0020	0.0024	0.0028	0.0032
			Feed (ipm)	9.8	9.8	9.8	9.8	9.8	9.8	9.8

rpm = Vc x 3.82 / DC
ipm = Fr x rpm
adjust speed and / or feed based on resin type and / or fiber structure
refer to the SGS Tool Wizard® for complete technical information (www.kyocera-sgstool.com)

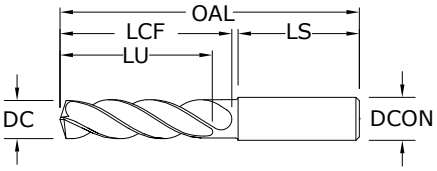
	Series 120 Metric	Vc (m/min)		DC • mm						
				2.5	3	4	6	8	10	12
N	CFRP, AFRP (Carbon Fiber, Aramid Fiber)	100	RPM	12722	10602	7951	5301	3976	3181	2650
		(80-120)	Fr	0.012	0.014	0.019	0.028	0.038	0.047	0.057
			Feed (mm/min)	150	150	150	150	150	150	150
	GFRP (Fiberglass)	75	RPM	9542	7951	5963	3976	2982	2385	1988
		(65-90)	Fr	0.012	0.014	0.019	0.029	0.039	0.048	0.058
			Feed (mm/min)	115	115	115	115	115	115	115
	CARBON, GRAPHITE	120	RPM	15266	12722	9542	6361	4771	3817	3181
		(96-144)	Fr	0.015	0.018	0.025	0.037	0.049	0.062	0.074
			Feed (mm/min)	235	235	235	235	235	235	235

rpm = (Vc x 1000) / (DC x 3.14)
mm/min = Fr x rpm
adjust speed and / or feed based on resin type and / or fiber structure
refer to the SGS Tool Wizard® for complete technical information (www.kyocera-sgstool.com)

HI-PER CARB®
HIGH PERFORMANCE CARBIDE DRILLS

135 3xD

FRACTIONAL & METRIC SERIES



- 4-margin design improves accuracy and surface finish along with increased strength for aggressive drilling
- Specialized self-centering notched point eliminates the need for spot drilling decreasing thrust and deflection
- Engineered edge protection improves edge strength and reduces edge fatigue allowing for increased feed rates
- Recommended for materials ≤ 50 HRc (≤ 475 Bhn)

			inch & mm					EDP NO.
DECIMAL DC	METRIC DC	FRACTIONAL/ LETTER/WIRE DC	SHANK DIAMETER DCON	OVERALL LENGTH OAL	FLUTE LENGTH LCF	USABLE LENGTH LU	SHANK LENGTH LS	Ti-NAMITE-A (AlTiN)
0.0156	0,396 mm	1/64	1/8	1-1/2	1/8	7/64	1	51752*
0.0312	0,792 mm	1/32	1/8	1-1/2	1/4	13/64	1	51269*
0.0469	1,191 mm	3/64	1/8	1-1/2	3/8	5/16	1	51270*
0.0492	1,250 mm		3,0	38,0	9,5	8,0	25,0	64500*
0.0571	1,450 mm		3,0	38,0	9,5	7,0	25,0	64501*
0.0595	1,511 mm	#53	1/8	1-1/2	3/8	9/32	1	64502*
0.0625	1,588 mm	1/16	1/8	2	7/16	11/32	1-1/4	51271*
0.0630	1,600 mm		3,0	50,0	11,0	9,0	32,0	64503*
0.0689	1,750 mm		3,0	50,0	11,0	8,0	32,0	64504*
0.0700	1,778 mm	#50	1/8	2	7/16	21/64	1-1/4	64505*
0.0781	1,984 mm	5/64	1/8	2	1/2	25/64	1-1/4	51272*
0.0785	1,994 mm	#47	1/8	2	1/2	25/64	1-1/4	64506*
0.0807	2,050 mm		3,0	50,0	12,0	9,0	32,0	64507*
0.0810	2,057 mm	#46	1/8	2	1/2	3/8	1-1/4	64508*
0.0890	2,261 mm	#43	1/8	2	1/2	3/8	1-1/4	64509*
0.0935	2,375 mm	#42	1/8	2	1/2	23/64	1-1/4	64510*
0.0938	2,383 mm	3/32	1/8	2	1/2	23/64	1-1/4	51273
0.0980	2,489 mm	#40	1/8	2	9/16	27/64	1-1/4	51274
0.0984	2,500 mm		3,0	50,0	14,0	10,0	32,0	64511
0.0995	2,527 mm	#39	1/8	2	9/16	27/64	1-1/4	51753
0.1015	2,578 mm	#38	1/8	2	9/16	27/64	1-1/4	51754
0.1040	2,642 mm	#37	1/8	2	9/16	13/32	1-1/4	51755
0.1065	2,705 mm	#36	1/8	2	9/16	13/32	1-1/4	51756
0.1094	2,779 mm	7/64	1/8	2	5/8	15/32	1-1/4	51275
0.1100	2,794 mm	#35	1/8	2	5/8	15/32	1-1/4	51276
0.1110	2,819 mm	#34	1/8	2	5/8	15/32	1-1/4	51277
0.1130	2,870 mm	#33	1/8	2	5/8	29/64	1-1/4	51757
0.1142	2,900 mm		3,0	50,0	16,0	12,0	32,0	64512
0.1160	2,946 mm	#32	1/8	2	5/8	29/64	1-1/4	51758
0.1181	3,000 mm		6,0	62,0	20,0	16,0	36,0	63155
0.1200	3,048 mm	#31	1/8	2	5/8	29/64	1-1/4	51759
0.1220	3,100 mm		6,0	62,0	20,0	15,0	36,0	63741
0.1250	3,175 mm	1/8	1/4	2-1/2	3/4	9/16	1-7/16	51330
0.1260	3,200 mm		6,0	62,0	20,0	15,0	36,0	63156
0.1285	3,264 mm	#30	1/4	2-1/2	3/4	9/16	1-7/16	51278
0.1299	3,300 mm		6,0	62,0	20,0	15,0	36,0	63157

*Single Margin

continued on next page

TOLERANCES (inch)

≤.1181 DIAMETER
DC = +.00008/+.00047
DCON = h_6

>.1181–.2362 DIAMETER
DC = +.00016/+.00063
DCON = h_6

>.2362–.3937 DIAMETER
DC = +.00024/+.00083
DCON = h_6

>.3937–.7087 DIAMETER
DC = +.00028/+.00098
DCON = h_6

>.7087–1.1811 DIAMETER
DC = +.00031/+.00114
DCON = h_6

TOLERANCES (mm)

≤3 DIAMETER
DC = +0,002/+0,012
DCON = h_6

>3–6 DIAMETER
DC = +0,004/+0,016
DCON = h_6

>6–10 DIAMETER
DC = +0,006/+0,021
DCON = h_6

>10–18 DIAMETER
DC = +0,007/+0,025
DCON = h_6

>18–30 DIAMETER
DC = +0,008/+0,029
DCON = h_6

- STEELS
- STAINLESS STEELS
- CAST IRON
- NON-FERROUS
- HIGH TEMP ALLOYS
- HARDENED STEELS

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135 3xD

FRACTIONAL & METRIC SERIES

CONTINUED

inch & mm								EDP NO.
DECIMAL DC	METRIC DC	FRACTIONAL/ LETTER/WIRE DC	SHANK DIAMETER DCON	OVERALL LENGTH OAL	FLUTE LENGTH LCF	USABLE LENGTH LU	SHANK LENGTH LS	Ti-NAMITE-A (AlTiN)
0.1339	3,400 mm		6,0	62,0	20,0	15,0	36,0	63158
0.1360	3,454 mm	#29	1/4	2-1/2	3/4	9/16	1-7/16	51331
0.1378	3,500 mm		6,0	62,0	20,0	15,0	36,0	63159
0.1405	3,569 mm	#28	1/4	2-1/2	3/4	35/64	1-7/16	51760
0.1406	3,571 mm	9/64	1/4	2-1/2	3/4	9/16	1-7/16	51332
0.1417	3,600 mm		6,0	62,0	20,0	15,0	36,0	63160
0.1440	3,658 mm	#27	1/4	2-1/2	3/4	35/64	1-7/16	51761
0.1457	3,700 mm		6,0	62,0	20,0	14,0	36,0	63161
0.1470	3,734 mm	#26	1/4	2-1/2	3/4	17/32	1-7/16	51762
0.1495	3,797 mm	#25	1/4	2-5/8	7/8	21/32	1-7/16	51333
0.1496	3,800 mm		6,0	66,0	24,0	18,0	36,0	63742
0.1520	3,861 mm	#24	1/4	2-5/8	7/8	21/32	1-7/16	51763
0.1535	3,900 mm		6,0	66,0	24,0	18,0	36,0	63743
0.1540	3,912 mm	#23	1/4	2-5/8	7/8	21/32	1-7/16	51764
0.1562	3,967 mm	5/32	1/4	2-5/8	7/8	41/64	1-7/16	51334
0.1570	3,988 mm	#22	1/4	2-5/8	7/8	41/64	1-7/16	51765
0.1575	4,000 mm		6,0	66,0	24,0	18,0	36,0	63162
0.1590	4,039 mm	#21	1/4	2-5/8	7/8	41/64	1-7/16	51335
0.1610	4,089 mm	#20	1/4	2-5/8	7/8	5/8	1-7/16	51279
0.1614	4,100 mm		6,0	66,0	24,0	18,0	36,0	63744
0.1654	4,200 mm		6,0	66,0	24,0	18,0	36,0	63163
0.1660	4,216 mm	#19	1/4	2-5/8	7/8	5/8	1-7/16	51766
0.1693	4,300 mm		6,0	66,0	24,0	18,0	36,0	63164
0.1695	4,305 mm	#18	1/4	2-5/8	7/8	5/8	1-7/16	51767
0.1719	4,366 mm	11/64	1/4	2-5/8	7/8	39/64	1-7/16	51336
0.1730	4,394 mm	#17	1/4	2-5/8	7/8	5/8	1-7/16	51768
0.1732	4,400 mm		6,0	66,0	24,0	17,0	36,0	63745
0.1770	4,496 mm	#16	1/4	2-5/8	7/8	39/64	1-7/16	51769
0.1772	4,500 mm		6,0	66,0	24,0	17,0	36,0	63165
0.1800	4,572 mm	#15	1/4	2-5/8	7/8	39/64	1-7/16	51770
0.1811	4,600 mm		6,0	66,0	24,0	17,0	36,0	63166
0.1820	4,623 mm	#14	1/4	2-5/8	7/8	39/64	1-7/16	51771
0.1850	4,700 mm	#13	1/4	2-5/8	7/8	39/64	1-7/16	51772
0.1850	4,700 mm	#13	6,0	66,0	24,0	17,0	36,0	63746
0.1875	4,763 mm	3/16	1/4	2-5/8	1	23/32	1-7/16	51337
0.1890	4,800 mm	#12	1/4	2-5/8	1	23/32	1-7/16	51773
0.1890	4,800 mm	#12	6,0	66,0	28,0	21,0	36,0	63167
0.1910	4,851 mm	#11	1/4	2-5/8	1	23/32	1-7/16	51774
0.1929	4,900 mm		6,0	66,0	28,0	21,0	36,0	63747
0.1935	4,915 mm	#10	1/4	2-5/8	1	23/32	1-7/16	51775
0.1960	4,978 mm	#9	1/4	2-5/8	1	23/32	1-7/16	51776
0.1969	5,000 mm		6,0	66,0	28,0	20,0	36,0	63168
0.1990	5,055 mm	#8	1/4	2-5/8	1	45/64	1-7/16	51777
0.2008	5,100 mm		6,0	66,0	28,0	20,0	36,0	63748
0.2010	5,105 mm	#7	1/4	2-5/8	1	45/64	1-7/16	51338
0.2031	5,159 mm	13/64	1/4	2-5/8	1	45/64	1-7/16	51339

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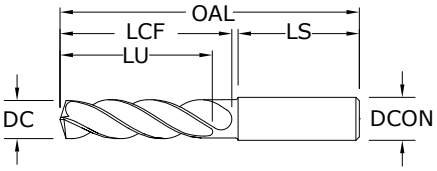
HI-PER CARB®
HIGH PERFORMANCE CARBIDE DRILLS

135 3xD

FRACTIONAL & METRIC SERIES



- 4-margin design improves accuracy and surface finish along with increased strength for aggressive drilling
- Specialized self-centering notched point eliminates the need for spot drilling decreasing thrust and deflection
- Engineered edge protection improves edge strength and reduces edge fatigue allowing for increased feed rates
- Recommended for materials ≤ 50 HRc (≤ 475 Bhn)

			inch & mm					EDP NO.
DECIMAL DC	METRIC DC	FRACTIONAL/ LETTER/WIRE DC	SHANK DIAMETER DCON	OVERALL LENGTH OAL	FLUTE LENGTH LCF	USABLE LENGTH LU	SHANK LENGTH LS	Ti-NAMITE-A (AlTiN)
0.2040	5,182 mm	#6	1/4	2-5/8	1	45/64	1-7/16	51778
0.2047	5,200 mm		6,0	66,0	28,0	20,0	36,0	63749
0.2055	5,220 mm	#5	1/4	2-5/8	1	45/64	1-7/16	51779
0.2067	5,250 mm		6,0	66,0	28,0	20,0	36,0	63169
0.2087	5,300 mm		6,0	66,0	28,0	20,0	36,0	63170
0.2090	5,309 mm	#4	1/4	2-5/8	1	11/16	1-7/16	51780
0.2126	5,400 mm		6,0	66,0	28,0	20,0	36,0	63750
0.2130	5,410 mm	#3	1/4	2-5/8	1	11/16	1-7/16	51340
0.2165	5,500 mm		6,0	66,0	28,0	20,0	36,0	63171
0.2188	5,558 mm	7/32	1/4	2-5/8	1	43/64	1-7/16	51341
0.2205	5,600 mm		6,0	66,0	28,0	20,0	36,0	63751
0.2210	5,613 mm	#2	1/4	2-5/8	1	11/16	1-7/16	51781
0.2244	5,700 mm		6,0	66,0	28,0	19,0	36,0	63752
0.2280	5,791 mm	#1	1/4	2-5/8	1	21/32	1-7/16	51782
0.2283	5,800 mm		6,0	66,0	28,0	19,0	36,0	63172
0.2323	5,900 mm		6,0	66,0	28,0	19,0	36,0	63753
0.2340	5,944 mm	A	1/4	2-5/8	1	21/32	1-7/16	51601
0.2344	5,954 mm	15/64	1/4	2-5/8	1	21/32	1-7/16	51342
0.2362	6,000 mm		6,0	66,0	28,0	19,0	36,0	63173
0.2380	6,045 mm	B	1/4	3-1/8	1-5/16	31/32	1-7/16	51602
0.2402	6,100 mm		8,0	79,0	34,0	25,0	36,0	63754
0.2420	6,147 mm	C	1/4	3-1/8	1-5/16	61/64	1-7/16	51603
0.2441	6,200 mm		8,0	79,0	34,0	25,0	36,0	63755
0.2460	6,248 mm	D	1/4	3-1/8	1-5/16	61/64	1-7/16	51604
0.2461	6,250 mm		8,0	79,0	34,0	25,0	36,0	63174
0.2480	6,300 mm		8,0	79,0	34,0	25,0	36,0	63756
0.2500	6,350 mm	1/4 E	1/4	3-1/8	1-5/16	15/16	1-7/16	51343
0.2520	6,400 mm		8,0	79,0	34,0	24,0	36,0	63175
0.2559	6,500 mm		8,0	79,0	34,0	24,0	36,0	63213
0.2570	6,528 mm	F	5/16	3-1/8	1-5/16	59/64	1-7/16	51344
0.2598	6,600 mm		8,0	79,0	34,0	24,0	36,0	63757
0.2610	6,629 mm	G	5/16	3-1/8	1-5/16	59/64	1-7/16	51606
0.2638	6,700 mm		8,0	79,0	34,0	24,0	36,0	63758
0.2656	6,746 mm	17/64	5/16	3-1/8	1-5/16	59/64	1-7/16	51345
0.2660	6,756 mm	H	5/16	3-1/8	1-5/16	59/64	1-7/16	51607
0.2677	6,800 mm		8,0	79,0	34,0	24,0	36,0	63176
0.2717	6,900 mm		8,0	79,0	34,0	24,0	36,0	63759
0.2720	6,909 mm	I	5/16	3-1/8	1-5/16	29/32	1-7/16	51346

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TOLERANCES (inch)

≤.1181 DIAMETER
DC = +.00008/+.00047
DCON = h_6

>.1181–.2362 DIAMETER
DC = +.00016/+.00063
DCON = h_6

>.2362–.3937 DIAMETER
DC = +.00024/+.00083
DCON = h_6

>.3937–.7087 DIAMETER
DC = +.00028/+.00098
DCON = h_6

>.7087–1.1811 DIAMETER
DC = +.00031/+.00114
DCON = h_6

TOLERANCES (mm)

≤3 DIAMETER
DC = +0,002/+0,012
DCON = h_6

>3–6 DIAMETER
DC = +0,004/+0,016
DCON = h_6

>6–10 DIAMETER
DC = +0,006/+0,021
DCON = h_6

>10–18 DIAMETER
DC = +0,007/+0,025
DCON = h_6

>18–30 DIAMETER
DC = +0,008/+0,029
DCON = h_6

- STEELS
- STAINLESS STEELS
- CAST IRON
- NON-FERROUS
- HIGH TEMP ALLOYS
- HARDENED STEELS

For patent information visit www.ksptpatents.com

135 3xD

FRACTIONAL & METRIC SERIES

CONTINUED

inch & mm								EDP NO.
DECIMAL DC	METRIC DC	FRACTIONAL/ LETTER/WIRE DC	SHANK DIAMETER DCON	OVERALL LENGTH OAL	FLUTE LENGTH LCF	USABLE LENGTH LU	SHANK LENGTH LS	Ti-NAMITE-A (AlTiN)
0.2756	7,000 mm		8,0	79,0	34,0	24,0	36,0	63177
0.2770	7,036 mm	J	5/16	3-1/8	1-5/16	29/32	1-7/16	51608
0.2795	7,100 mm		8,0	79,0	41,0	30,0	36,0	63760
0.2810	7,137 mm	K	5/16	3-1/8	1-9/16	1-9/64	1-7/16	51609
0.2812	7,142 mm	9/32	5/16	3-1/8	1-9/16	1-9/64	1-7/16	51347
0.2835	7,200 mm		8,0	79,0	41,0	30,0	36,0	63761
0.2854	7,250 mm		8,0	79,0	41,0	30,0	36,0	63178
0.2874	7,300 mm		8,0	79,0	41,0	30,0	36,0	63762
0.2900	7,366 mm	L	5/16	3-1/8	1-9/16	1-1/8	1-7/16	51610
0.2913	7,400 mm		8,0	79,0	41,0	30,0	36,0	63763
0.2950	7,493 mm	M	5/16	3-1/8	1-9/16	1-1/8	1-7/16	51611
0.2953	7,500 mm		8,0	79,0	41,0	30,0	36,0	63179
0.2969	7,541 mm	19/64	5/16	3-1/8	1-9/16	1-7/64	1-7/16	51348
0.2992	7,600 mm		8,0	79,0	41,0	30,0	36,0	63764
0.3020	7,671 mm	N	5/16	3-1/8	1-9/16	1-7/64	1-7/16	51612
0.3031	7,700 mm		8,0	79,0	41,0	29,0	36,0	63765
0.3071	7,800 mm		8,0	79,0	41,0	29,0	36,0	63180
0.3110	7,900 mm		8,0	79,0	41,0	29,0	36,0	63766
0.3125	7,938 mm	5/16	5/16	3-1/8	1-9/16	1-3/32	1-7/16	51349
0.3150	8,000 mm		8,0	79,0	41,0	29,0	36,0	63181
0.3160	8,026 mm	O	3/8	3-1/2	1-27/32	1-3/8	1-9/16	51613
0.3189	8,100 mm		10,0	89,0	47,0	35,0	40,0	63767
0.3228	8,200 mm		10,0	89,0	47,0	35,0	40,0	63768
0.3230	8,204 mm	P	3/8	3-1/2	1-27/32	1-23/64	1-9/16	51614
0.3268	8,300 mm		10,0	89,0	47,0	35,0	40,0	63769
0.3281	8,334 mm	21/64	3/8	3-1/2	1-27/32	1-23/64	1-9/16	51350
0.3307	8,400 mm		10,0	89,0	47,0	34,0	40,0	63182
0.3320	8,433 mm	Q	3/8	3-1/2	1-27/32	1-11/32	1-9/16	51351
0.3346	8,500 mm		10,0	89,0	47,0	34,0	40,0	63183
0.3386	8,600 mm		10,0	89,0	47,0	34,0	40,0	63770
0.3390	8,611 mm	R	3/8	3-1/2	1-27/32	1-11/32	1-9/16	51615
0.3425	8,700 mm		10,0	89,0	47,0	34,0	40,0	63771
0.3438	8,733 mm	11/32	3/8	3-1/2	1-27/32	1-21/64	1-9/16	51352
0.3465	8,800 mm		10,0	89,0	47,0	34,0	40,0	63184
0.3480	8,839 mm	S	3/8	3-1/2	1-27/32	1-21/64	1-9/16	51616
0.3504	8,900 mm		10,0	89,0	47,0	34,0	40,0	63772
0.3543	9,000 mm		10,0	89,0	47,0	34,0	40,0	63185
0.3580	9,093 mm	T	3/8	3-1/2	1-27/32	1-5/16	1-9/16	51617
0.3583	9,100 mm		10,0	89,0	47,0	33,0	40,0	63773
0.3594	9,129 mm	23/64	3/8	3-1/2	1-27/32	1-21/64	1-9/16	51353
0.3622	9,200 mm		10,0	89,0	47,0	33,0	40,0	63774
0.3642	9,250 mm		10,0	89,0	47,0	33,0	40,0	63186
0.3661	9,300 mm		10,0	89,0	47,0	33,0	40,0	63775
0.3680	9,347 mm	U	3/8	3-1/2	1-27/32	1-19/64	1-9/16	51354
0.3701	9,400 mm		10,0	89,0	47,0	33,0	40,0	63776
0.3740	9,500 mm		10,0	89,0	47,0	33,0	40,0	63187

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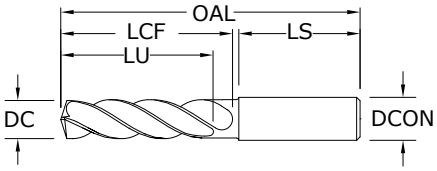
HI-PER CARB®
HIGH PERFORMANCE CARBIDE DRILLS

135 3xD

FRACTIONAL & METRIC SERIES



- 4-margin design improves accuracy and surface finish along with increased strength for aggressive drilling
- Specialized self-centering notched point eliminates the need for spot drilling decreasing thrust and deflection
- Engineered edge protection improves edge strength and reduces edge fatigue allowing for increased feed rates
- Recommended for materials ≤ 50 HRc (≤ 475 Bhn)

			inch & mm					EDP NO.
DECIMAL DC	METRIC DC	FRACTIONAL/ LETTER/WIRE DC	SHANK DIAMETER DCON	OVERALL LENGTH OAL	FLUTE LENGTH LCF	USABLE LENGTH LU	SHANK LENGTH LS	Ti-NAMITE-A (AlTiN)
0.3750	9,525 mm	3/8	3/8	3-1/2	1-27/32	1-9/32	1-9/16	51355
0.3770	9,576 mm	V	1/2	3-1/2	1-27/32	1-9/32	1-9/16	51618
0.3780	9,600 mm		10,0	89,0	47,0	33,0	40,0	63777
0.3819	9,700 mm		10,0	89,0	47,0	32,0	40,0	63778
0.3858	9,800 mm		10,0	89,0	47,0	32,0	40,0	63779
0.3860	9,804 mm	W	1/2	3-1/2	1-27/32	1-17/64	1-9/16	51619
0.3898	9,900 mm		10,0	89,0	47,0	40,0	40,0	63780
0.3906	9,921 mm	25/64	1/2	3-1/2	1-27/32	1-37/64	1-9/16	51356
0.3937	10,000 mm		10,0	89,0	47,0	40,0	40,0	63188
0.3970	10,083 mm	X	1/2	4-1/16	2-3/16	1-51/64	1-49/64	51620
0.3976	10,100 mm		12,0	102,0	55,0	45,0	45,0	63781
0.4016	10,200 mm		12,0	102,0	55,0	45,0	45,0	63189
0.4040	10,261 mm	Y	1/2	4-1/16	2-3/16	1-51/64	1-49/64	51621
0.4055	10,300 mm		12,0	102,0	55,0	45,0	45,0	63782
0.4062	10,317 mm	13/32	1/2	4-1/16	2-3/16	1-51/64	1-49/64	51357
0.4095	10,400 mm		12,0	102,0	55,0	45,0	45,0	63783
0.4130	10,490 mm	Z	1/2	4-1/16	2-3/16	1-51/64	1-49/64	51622
0.4134	10,500 mm		12,0	102,0	55,0	40,0	45,0	63190
0.4173	10,600 mm		12,0	102,0	55,0	40,0	45,0	63784
0.4213	10,700 mm		12,0	102,0	55,0	40,0	45,0	63785
0.4219	10,716 mm	27/64	1/2	4-1/16	2-3/16	1-19/32	1-49/64	51358
0.4252	10,800 mm		12,0	102,0	55,0	40,0	45,0	63191
0.4291	10,900 mm		12,0	102,0	55,0	40,0	45,0	63786
0.4331	11,000 mm		12,0	102,0	55,0	39,0	45,0	63192
0.4370	11,100 mm		12,0	102,0	55,0	39,0	45,0	63787
0.4375	11,113 mm	7/16	1/2	4-1/16	2-3/16	1-37/64	1-49/64	51359
0.4409	11,200 mm		12,0	102,0	55,0	39,0	45,0	63788
0.4429	11,250 mm		12,0	102,0	55,0	39,0	45,0	63193
0.4449	11,300 mm		12,0	102,0	55,0	39,0	45,0	63789
0.4488	11,400 mm		12,0	102,0	55,0	38,0	45,0	63790
0.4528	11,500 mm		12,0	102,0	55,0	38,0	45,0	63194
0.4531	11,509 mm	29/64	1/2	4-1/16	2-3/16	1-33/64	1-49/64	51360
0.4567	11,600 mm		12,0	102,0	55,0	38,0	45,0	63791
0.4606	11,700 mm		12,0	102,0	55,0	37,0	45,0	63792
0.4646	11,800 mm		12,0	102,0	55,0	37,0	45,0	63793
0.4685	11,900 mm		12,0	102,0	55,0	37,0	45,0	63794

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TOLERANCES (inch)

≤.1181 DIAMETER
DC = +.00008/+.00047
DCON = h_6

>.1181–.2362 DIAMETER
DC = +.00016/+.00063
DCON = h_6

>.2362–.3937 DIAMETER
DC = +.00024/+.00083
DCON = h_6

>.3937–.7087 DIAMETER
DC = +.00028/+.00098
DCON = h_6

>.7087–1.1811 DIAMETER
DC = +.00031/+.00114
DCON = h_6

TOLERANCES (mm)

≤3 DIAMETER
DC = +0,002/+0,012
DCON = h_6

>3–6 DIAMETER
DC = +0,004/+0,016
DCON = h_6

>6–10 DIAMETER
DC = +0,006/+0,021
DCON = h_6

>10–18 DIAMETER
DC = +0,007/+0,025
DCON = h_6

>18–30 DIAMETER
DC = +0,008/+0,029
DCON = h_6

- STEELS
- STAINLESS STEELS
- CAST IRON
- NON-FERROUS
- HIGH TEMP ALLOYS
- HARDENED STEELS

For patent information visit www.ksptpatents.com

135 3xD

FRACTIONAL & METRIC SERIES

CONTINUED

inch & mm								EDP NO.
DECIMAL DC	METRIC DC	FRACTIONAL/ LETTER/WIRE DC	SHANK DIAMETER DCON	OVERALL LENGTH OAL	FLUTE LENGTH LCF	USABLE LENGTH LU	SHANK LENGTH LS	Ti-NAMITE-A (AlTiN)
0.4688	11,908 mm	15/32	1/2	4-1/16	2-3/16	1-31/64	1-49/64	51361
0.4724	12,000 mm		12,0	102,0	55,0	37,0	45,0	63195
0.4844	12,304 mm	31/64	1/2	4-1/4	2-5/16	1-19/32	1-49/64	51362
0.4921	12,500 mm		14,0	107,0	60,0	41,0	45,0	63196
0.5000	12,700 mm	1/2	1/2	4-1/4	2-5/16	1-9/16	1-49/64	51363
0.5039	12,800 mm		14,0	107,0	60,0	41,0	45,0	63197
0.5118	13,000 mm		14,0	107,0	60,0	41,0	45,0	63198
0.5156	13,096 mm	33/64	5/8	4-1/4	2-5/16	1-35/64	1-49/64	51364
0.5312	13,492 mm	17/32	5/8	4-1/4	2-5/16	1-33/64	1-49/64	51365
0.5315	13,500 mm		14,0	107,0	60,0	40,0	45,0	63199
0.5469	13,891 mm	35/64	5/8	4-1/4	2-5/16	1-1/2	1-49/64	51783
0.5512	14,000 mm		14,0	107,0	60,0	39,0	45,0	63200
0.5625	14,288 mm	9/16	5/8	4-9/16	2-1/2	1-21/32	1-57/64	51366
0.5709	14,500 mm		16,0	115,0	65,0	43,0	48,0	63201
0.5781	14,684 mm	37/64	5/8	4-9/16	2-1/2	1-41/64	1-57/64	51367
0.5906	15,000 mm		16,0	115,0	65,0	42,0	48,0	63202
0.5938	15,083 mm	19/32	5/8	4-9/16	2-1/2	1-39/64	1-57/64	51784
0.6094	15,479 mm	39/64	5/8	4-9/16	2-1/2	1-19/32	1-57/64	51785
0.6102	15,500 mm		16,0	115,0	65,0	42,0	48,0	63203
0.6250	15,875 mm	5/8	5/8	4-9/16	2-1/2	1-9/16	1-57/64	51368
0.6299	16,000 mm		16,0	115,0	65,0	41,0	48,0	63204
0.6406	16,271 mm	41/64	3/4	4-7/8	2-3/4	1-51/64	1-57/64	51786
0.6496	16,500 mm		18,0	123,0	73,0	48,0	48,0	63205
0.6562	16,667 mm	21/32	3/4	4-7/8	2-3/4	1-25/32	1-57/64	51369
0.6693	17,000 mm		18,0	123,0	73,0	47,0	48,0	63206
0.6719	17,066 mm	43/64	3/4	4-7/8	2-3/4	1-3/4	1-57/64	51787
0.6875	17,463 mm	11/16	3/4	4-7/8	2-3/4	1-47/64	1-57/64	51370
0.6890	17,500 mm		18,0	123,0	73,0	47,0	48,0	63207
0.7031	17,859 mm	45/64	3/4	4-7/8	2-3/4	1-45/64	1-57/64	51788
0.7087	18,000 mm		18,0	123,0	73,0	46,0	48,0	63208
0.7188	18,258 mm	23/32	3/4	4-7/8	2-3/4	1-43/64	1-57/64	51789
0.7283	18,500 mm		20,0	131,0	79,0	51,0	50,0	63209
0.7344	18,654 mm	47/64	3/4	4-7/8	2-3/4	1-21/32	1-57/64	51790
0.7480	19,000 mm		20,0	131,0	79,0	51,0	50,0	63210
0.7500	19,050 mm	3/4	3/4	5-1/4	3-1/16	1-15/16	1-31/32	51371
0.7656	19,446 mm	49/64	7/8	5-1/4	3-1/16	1-59/64	1-31/32	51372
0.7677	19,500 mm		20,0	131,0	79,0	50,0	50,0	63211
0.7812	19,842 mm	25/32	7/8	6	3-11/16	2-33/64	2-1/8	51791
0.7874	20,000 mm		20,0	131,0	79,0	49,0	50,0	63212
0.7969	20,241 mm	51/64	7/8	6	3-11/16	2-1/2	2-1/8	51792
0.8071	20,500 mm		22,0	150,0	93,0	62,0	53,0	64513
0.8125	20,638 mm	13/16	7/8	6	3-11/16	2-15/32	2-1/8	51373
0.8268	21,000 mm		22,0	150,0	93,0	61,0	53,0	64514
0.8661	22,000 mm		22,0	150,0	93,0	60,0	53,0	64515
0.8750	22,225 mm	7/8	7/8	6	3-11/16	2-3/8	2-1/8	51374
0.9219	23,416 mm	59/64	1	6	3-11/16	2-5/16	2-1/8	51375

FRACTIONAL

Hi-PerCarb®

	Series 135 3D Fractional	Hardness	Vc (sfm)		DC • in 1/32	1/8	1/4	3/8	1/2	5/8	7/8
P	CARBON STEELS 1018, 1040, 1080, 1090, 10L50, 1140, 1212, 12L15, 1525, 1536	≤ 175 Bhn or ≤ 7 HRc	385	RPM	47062	11766	5883	3922	2941	2353	1681
			(308-462)	Fr	0.0010	0.0038	0.0076	0.0115	0.0153	0.0191	0.0268
				Feed (ipm)	45.0	45.0	45.0	45.0	45.0	45.0	45.0
		≤ 275 Bhn or ≤ 28 HRc	350	RPM	42784	10696	5348	3565	2674	2139	1528
			(280-420)	Fr	0.0009	0.0036	0.0071	0.0107	0.0142	0.0178	0.0249
				Feed (ipm)	38.0	38.0	38.0	38.0	38.0	38.0	38.0
		≤ 425 Bhn or ≤ 45 HRc	200	RPM	24448	6112	3056	2037	1528	1222	873
			(160-240)	Fr	0.0007	0.0029	0.0059	0.0088	0.0118	0.0147	0.0206
				Feed (ipm)	18.0	18.0	18.0	18.0	18.0	18.0	18.0
	ALLOY STEELS 4140, 4150, 4320, 5120, 5150, 8630, 86L20, 50100	≤ 275 Bhn or ≤ 28 HRc	300	RPM	36672	9168	4584	3056	2292	1834	1310
			(240-360)	Fr	0.0007	0.0029	0.0059	0.0088	0.0118	0.0147	0.0206
				Feed (ipm)	27.0	27.0	27.0	27.0	27.0	27.0	27.0
		≤ 375 Bhn or ≤ 40 HRc	185	RPM	22614	5654	2827	1885	1413	1131	808
			(148-222)	Fr	0.0006	0.0026	0.0051	0.0077	0.0103	0.0128	0.0180
				Feed (ipm)	14.5	14.5	14.5	14.5	14.5	14.5	14.5
		≤ 425 Bhn or ≤ 45 HRc	130	RPM	15891	3973	1986	1324	993	795	568
			(104-156)	Fr	0.0004	0.0018	0.0035	0.0053	0.0070	0.0088	0.0123
				Feed (ipm)	7.0	7.0	7.0	7.0	7.0	7.0	7.0
	TOOL STEELS A2, D2, H13, L2, M2, P20, S7, T15, W2	≤ 200 Bhn or ≤ 13 HRc	130	RPM	15891	3973	1986	1324	993	795	568
			(104-156)	Fr	0.0007	0.0026	0.0053	0.0079	0.0106	0.0132	0.0185
				Feed (ipm)	10.5	10.5	10.5	10.5	10.5	10.5	10.5
		≤ 375 Bhn or ≤ 40 HRc	90	RPM	11002	2750	1375	917	688	550	393
			(72-108)	Fr	0.0003	0.0012	0.0023	0.0035	0.0047	0.0058	0.0081
				Feed (ipm)	3.2	3.2	3.2	3.2	3.2	3.2	3.2
M	STAINLESS STEELS (FREE MACHINING) 303, 416, 420F, 430F, 440F	≤ 185 Bhn or ≤ 9 HRc	275	RPM	33616	8404	4202	2801	2101	1681	1201
			(220-330)	Fr	0.0006	0.0026	0.0051	0.0077	0.0102	0.0128	0.0179
				Feed (ipm)	21.5	21.5	21.5	21.5	21.5	21.5	21.5
		≤ 275 Bhn or ≤ 28 HRc	170	RPM	20781	5195	2598	1732	1299	1039	742
			(136-204)	Fr	0.0005	0.0020	0.0040	0.0061	0.0081	0.0101	0.0141
				Feed (ipm)	10.5	10.5	10.5	10.5	10.5	10.5	10.5
	STAINLESS STEELS (DIFFICULT) 304, 316, 321, 13-8 PH, 15-5PH, 17-4 PH, Custom 450	≤ 275 Bhn or ≤ 28 HRc	90	RPM	11002	2750	1375	917	688	550	393
			(72-108)	Fr	0.0005	0.0020	0.0040	0.0060	0.0080	0.0100	0.0140
				Feed (ipm)	5.5	5.5	5.5	5.5	5.5	5.5	5.5
		≤ 375 Bhn or ≤ 40 HRc	65	RPM	7946	1986	993	662	497	397	284
			(52-78)	Fr	0.0004	0.0018	0.0035	0.0053	0.0070	0.0088	0.0123
				Feed (ipm)	3.5	3.5	3.5	3.5	3.5	3.5	3.5
K	CAST IRONS Gray, Malleable, Ductile	≤ 220 Bhn or ≤ 19 HRc	320	RPM	39117	9779	4890	3260	2445	1956	1397
			(256-384)	Fr	0.0012	0.0046	0.0092	0.0138	0.0184	0.0230	0.0322
				Feed (ipm)	45.0	45.0	45.0	45.0	45.0	45.0	45.0
		≤ 260 Bhn or ≤ 26 HRc	285	RPM	34838	8710	4355	2903	2177	1742	1244
			(228-342)	Fr	0.0011	0.0046	0.0092	0.0138	0.0184	0.0230	0.0321
				Feed (ipm)	40.0	40.0	40.0	40.0	40.0	40.0	40.0

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	Series 135 3D Fractional	Hardness	Vc (sfm)		DC • in 1/32	1/8	1/4	3/8	1/2	5/8	7/8
N	ALUMINUM ALLOYS 2017, 2024, 356, 6061, 7075	≤ 80 Bhn or ≤ 47 HRb	700	RPM	85568	21392	10696	7131	5348	4278	3056
			(560-840)	Fr	0.0012	0.0049	0.0098	0.0147	0.0196	0.0245	0.0344
				Feed (ipm)	105.0	105.0	105.0	105.0	105.0	105.0	105.0
		≤ 150 Bhn or ≤ 88 HRb	600	RPM	73344	18336	9168	6112	4584	3667	2619
			(480-720)	Fr	0.0012	0.0050	0.0099	0.0149	0.0199	0.0248	0.0347
				Feed (ipm)	91.0	91.0	91.0	91.0	91.0	91.0	91.0
	COPPER ALLOYS Alum Bronze, C110, Muntz Brass	≤ 140 Bhn or ≤ 3 HRc	500	RPM	61120	15280	7640	5093	3820	3056	2183
			(400-600)	Fr	0.0005	0.0020	0.0039	0.0059	0.0079	0.0098	0.0137
				Feed (ipm)	30.0	30.0	30.0	30.0	30.0	30.0	30.0
		≤ 200 Bhn or ≤ 23 HRc	400	RPM	48896	12224	6112	4075	3056	2445	1746
			(320-480)	Fr	0.0005	0.0020	0.0040	0.0060	0.0080	0.0100	0.0140
				Feed (ipm)	24.5	24.5	24.5	24.5	24.5	24.5	24.5
S	HIGH TEMP ALLOYS (NICKEL , COBALT, IRON BASE) Inconel 601, 617, 625, Incoloy, Monel 400, Rene, Waspaloy	≤ 300 Bhn or ≤ 32 HRc	55	RPM	6723	1681	840	560	420	336	240
			(44-66)	Fr	0.0002	0.0008	0.0015	0.0023	0.0031	0.0039	0.0054
				Feed (ipm)	1.3	1.3	1.3	1.3	1.3	1.3	1.3
		≤ 400 Bhn or ≤ 43 HRc	30	RPM	3667	917	458	306	229	183	131
			(24-36)	Fr	0.0002	0.0007	0.0013	0.0020	0.0026	0.0033	0.0046
				Feed (ipm)	0.6	0.6	0.6	0.6	0.6	0.6	0.6
	TITANIUM ALLOYS Pure Titanium, Ti6Al4V, Ti6Al2Sn4Zr2Mo, Ti4Al4Mo2Sn0.5Si, Ti-6Al4V	≤ 275 Bhn or ≤ 28 HRc	135	RPM	16502	4126	2063	1375	1031	825	589
			(108-162)	Fr	0.0004	0.0018	0.0035	0.0053	0.0071	0.0088	0.0124
				Feed (ipm)	7.3	7.3	7.3	7.3	7.3	7.3	7.3
		≤ 350 Bhn or ≤ 38 HRc	100	RPM	12224	3056	1528	1019	764	611	437
			(80-120)	Fr	0.0004	0.0016	0.0033	0.0049	0.0065	0.0082	0.0115
				Feed (ipm)	5.0	5.0	5.0	5.0	5.0	5.0	5.0
		≤ 440 Bhn or ≤ 47 HRc	55	RPM	6723	1681	840	560	420	336	240
			(44-66)	Fr	0.0003	0.0012	0.0024	0.0036	0.0048	0.0059	0.0083
				Feed (ipm)	2.0	2.0	2.0	2.0	2.0	2.0	2.0
H	TOOL STEELS A2, D2, H13, L2, M2, P20, S7, T15, W2	≤ 475 Bhn or ≤ 50 HRc	75	RPM	9168	2292	1146	764	573	458	327
			(60-90)	Fr	0.0002	0.0008	0.0016	0.0024	0.0031	0.0039	0.0055
				Feed (ipm)	1.8	1.8	1.8	1.8	1.8	1.8	1.8

Bhn (Brinell) HRc (Rockwell C) HRb (Rockwell B)
rpm = Vc x 3.82 / DC
ipm = Fr x rpm
reduce speed and feed for materials harder than listed
refer to the SGS Tool Wizard® for complete technical information (www.kyocera-sgstool.com)

METRIC

Hi-PerCarb®

	Series 135 3D Metric	Hardness	Vc (m/min)		DC • mm 1.5	3	6	8	10	12	16	20
P	CARBON STEELS 1018, 1040, 1080, 1090, 10L50, 1140, 1212, 12L15, 1525, 1536	≤ 175 Bhn or ≤ 7 HRc	117	RPM	24882	12441	6220	4665	3732	3110	2333	1866
			(94-141)	Fr	0.047	0.094	0.189	0.252	0.315	0.378	0.504	0.630
				Feed (mm/min)	1175	1175	1175	1175	1175	1175	1175	1175
		≤ 275 Bhn or ≤ 28 HRc	107	RPM	22620	11310	5655	4241	3393	2827	2121	1696
			(85-128)	Fr	0.043	0.086	0.172	0.229	0.286	0.343	0.457	0.572
				Feed (mm/min)	970	970	970	970	970	970	970	970
		≤ 475 Bhn or ≤ 45 HRc	61	RPM	12926	6463	3231	2424	1939	1616	1212	969
			(49-73)	Fr	0.036	0.071	0.142	0.190	0.237	0.285	0.380	0.475
				Feed (mm/min)	460	460	460	460	460	460	460	460
	ALLOY STEELS 4140, 4150, 4320, 5120, 5150, 8630, 86L20, 50100	≤ 275 Bhn or ≤ 28 HRc	91	RPM	19388	9694	4847	3635	2908	2424	1818	1454
			(73-110)	Fr	0.036	0.071	0.142	0.190	0.237	0.285	0.380	0.475
				Feed (mm/min)	690	690	690	690	690	690	690	690
		≤ 375 Bhn or ≤ 40 HRc	56	RPM	11956	5978	2989	2242	1793	1495	1121	897
			(45-68)	Fr	0.031	0.061	0.122	0.163	0.204	0.244	0.326	0.407
				Feed (mm/min)	365	365	365	365	365	365	365	365
		≤ 425 Bhn or ≤ 45 HRc	40	RPM	8402	4201	2100	1575	1260	1050	788	630
			(32-48)	Fr	0.021	0.042	0.083	0.111	0.139	0.167	0.222	0.278
				Feed (mm/min)	175	175	175	175	175	175	175	175
	TOOL STEELS A2, D2, H13, L2, M2, P20, S7, T15, W2	≤ 200 Bhn or ≤ 13 HRc	40	RPM	8402	4201	2100	1575	1260	1050	788	630
			(32-48)	Fr	0.032	0.063	0.126	0.168	0.210	0.252	0.336	0.421
				Feed (mm/min)	265	265	265	265	265	265	265	265
		≤ 375 Bhn or ≤ 40 HRc	27	RPM	5816	2908	1454	1091	872	727	545	436
			(22-33)	Fr	0.014	0.028	0.055	0.073	0.092	0.110	0.147	0.183
				Feed (mm/min)	80	80	80	80	80	80	80	80
M	STAINLESS STEELS (FREE MACHINING) 303, 416, 420F, 430F, 440F	≤ 185 Bhn or ≤ 9 HRc	84	RPM	17773	8886	4443	3332	2666	2222	1666	1333
			(67-101)	Fr	0.031	0.061	0.123	0.164	0.204	0.245	0.327	0.409
				Feed (mm/min)	545	545	545	545	545	545	545	545
		≤ 275 Bhn or ≤ 28 HRc	52	RPM	10987	5493	2747	2060	1648	1373	1030	824
			(41-62)	Fr	0.024	0.047	0.095	0.126	0.158	0.189	0.252	0.316
				Feed (mm/min)	260	260	260	260	260	260	260	260
	STAINLESS STEELS (DIFFICULT) 304, 316, 321, 13-8 PH, 15-5PH, 17-4 PH, Custom 450	≤ 275 Bhn or ≤ 28 HRc	27	RPM	5816	2908	1454	1091	872	727	545	436
			(22-33)	Fr	0.023	0.046	0.093	0.124	0.155	0.186	0.248	0.309
				Feed (mm/min)	135	135	135	135	135	135	135	135
		≤ 375 Bhn or ≤ 40 HRc	20	RPM	4201	2100	1050	788	630	525	394	315
			(16-24)	Fr	0.020	0.040	0.081	0.108	0.135	0.162	0.216	0.270
				Feed (mm/min)	85	85	85	85	85	85	85	85
K	CAST IRONS Gray, Malleable, Ductile	≤ 220 Bhn or ≤ 19 HRc	98	RPM	20681	10340	5170	3878	3102	2585	1939	1551
			(78-117)	Fr	0.055	0.110	0.220	0.293	0.366	0.439	0.585	0.732
				Feed (mm/min)	1135	1135	1135	1135	1135	1135	1135	1135
		≤ 260 Bhn or ≤ 26 HRc	87	RPM	18419	9209	4605	3454	2763	2302	1727	1381
			(69-104)	Fr	0.055	0.110	0.219	0.292	0.366	0.439	0.585	0.731
				Feed (mm/min)	1010	1010	1010	1010	1010	1010	1010	1010

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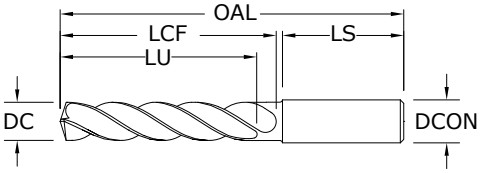
Hi-PerCarb®

	Series 135 3D Metric	Hardness	Vc (m/min)		DC • mm 1.5	3	6	8	10	12	16	20
N	ALUMINUM ALLOYS 2017, 2024, 356, 6061, 7075	≤ 80 Bhn or ≤ 47 HRb	213	RPM	45239	22620	11310	8482	6786	5655	4241	3393
			(171-256)	Fr	0.059	0.119	0.238	0.317	0.396	0.476	0.634	0.793
				Feed (mm/min)	2690	2690	2690	2690	2690	2690	2690	2690
		≤ 150 Bhn or ≤ 8 HRb	183	RPM	38777	19388	9694	7271	5816	4847	3635	2908
			(146-219)	Fr	0.060	0.120	0.240	0.320	0.400	0.480	0.640	0.799
				Feed (mm/min)	2325	2325	2325	2325	2325	2325	2325	2325
	COPPER ALLOYS Alum Bronze, C110, Muntz Brass	≤ 140 Bhn or ≤ 3 HRc	152	RPM	32314	16157	8078	6059	4847	4039	3029	2424
			(122-183)	Fr	0.024	0.048	0.096	0.128	0.160	0.192	0.256	0.320
				Feed (mm/min)	776	776	776	776	776	776	776	776
		≤ 200 Bhn or ≤ 23 HRc	122	RPM	25851	12926	6463	4847	3878	3231	2424	1939
			(98-146)	Fr	0.024	0.049	0.097	0.130	0.162	0.195	0.260	0.325
				Feed (mm/min)	630	630	630	630	630	630	630	630
S	HIGH TEMP ALLOYS (NICKEL , COBALT, IRON BASE) Inconel 601, 617, 625, Incoloy, Monel 400, Rene, Waspaloy	≤ 300 Bhn or ≤ 32 HRc	17	RPM	3555	1777	889	666	533	444	333	267
			(13-20)	Fr	0.010	0.020	0.039	0.053	0.066	0.079	0.105	0.131
				Feed (mm/min)	35	35	35	35	35	35	35	35
		≤ 400 Bhn or ≤ 43 HRc	9	RPM	1939	969	485	364	291	242	182	145
			(7-11)	Fr	0.008	0.015	0.031	0.041	0.052	0.062	0.083	0.103
				Feed (mm/min)	15	15	15	15	15	15	15	15
	TITANIUM ALLOYS Pure Titanium, Ti6Al4V, Ti6Al2Sn4Zr2Mo, Ti4Al4Mo2Sn0.5Si, Ti-6Al4V	≤ 275 Bhn or ≤ 28 HRc	41	RPM	8725	4362	2181	1636	1309	1091	818	654
			(33-49)	Fr	0.021	0.042	0.085	0.113	0.141	0.170	0.226	0.283
				Feed (mm/min)	185	185	185	185	185	185	185	185
		≤ 350 Bhn or ≤ 38 HRc	30	RPM	6463	3231	1616	1212	969	808	606	485
			(24-37)	Fr	0.019	0.039	0.077	0.103	0.129	0.155	0.206	0.258
				Feed (mm/min)	125	125	125	125	125	125	125	125
		≤ 440 Bhn or ≤ 47 HRc	17	RPM	3555	1777	889	666	533	444	333	267
			(13-20)	Fr	0.014	0.028	0.056	0.075	0.094	0.113	0.150	0.188
				Feed (mm/min)	50	50	50	50	50	50	50	50
H	TOOL STEELS A2, D2, H13, L2, M2, P20, S7, T15, W2	≤ 475 Bhn or ≤ 50 HRc	23	RPM	4847	2424	1212	909	727	606	454	364
			(18-27)	Fr	0.009	0.019	0.037	0.050	0.062	0.074	0.099	0.124
				Feed (mm/min)	45	45	45	45	45	45	45	45

Bhn (Brinell) HRc (Rockwell C) HRb (Rockwell B)
rpm = (Vc x 1000) / (DC x 3.14)
mm/min = Fr x rpm
reduce speed and feed for materials harder than listed
refer to the SGS Tool Wizard® for complete technical information (www.kyocera-sgstool.com)

HI-PER CARB®
HIGH PERFORMANCE CARBIDE DRILLS



135 5xD

FRACTIONAL & METRIC SERIES

- 4-margin design improves accuracy and surface finish along with increased strength for aggressive drilling
- Specialized self-centering notched point eliminates the need for spot drilling decreasing thrust and deflection
- Engineered edge protection improves edge strength and reduces edge fatigue allowing for increased feed rates
- Recommended for materials ≤ 56 HRc (≤ 577 Bhn)

inch & mm								EDP NO.
DECIMAL DC	METRIC DC	FRACTIONAL/ LETTER/WIRE DC	SHANK DIAMETER DCON	OVERALL LENGTH OAL	FLUTE LENGTH LCF	USABLE LENGTH LU	SHANK LENGTH LS	Ti-NAMITE-A (AlTiN)
0.0156	0,396 mm	1/64	1/8	1 1/2	5/32	1/8	1	52300*
0.0312	0,792 mm	1/32	1/8	1 1/2	5/16	17/64	1	52301*
0.0469	1,191 mm	3/64	1/8	1 1/2	25/64	21/64	1	52302*
0.0492	1,250 mm		3,0	38,0	10,0	8,0	25,0	64520*
0.0571	1,450 mm		3,0	38,0	10,0	8,0	25,0	64521*
0.0595	1,511 mm	#53	1/8	1-1/2	25/64	5/16	1	64522*
0.0625	1,588 mm	1/16	1/8	2	15/32	3/8	1-1/4	52303*
0.0630	1,600 mm		3,0	50,0	12,0	10,0	32,0	64523*
0.0689	1,750 mm		3,0	50,0	12,0	9,0	32,0	64524*
0.0700	1,778 mm	#50	1/8	2	15/32	23/64	1-1/4	64525*
0.0781	1,984 mm	5/64	1/8	2	35/64	7/16	1-1/4	52304*
0.0785	1,994 mm	#47	1/8	2	35/64	7/16	1-1/4	64526*
0.0807	2,050 mm		3,0	50,0	14,0	11,0	32,0	64527*
0.0810	2,057 mm	#46	1/8	2	35/64	27/64	1-1/4	64528*
0.0890	2,261 mm	#43	1/8	2	19/32	15/32	1-1/4	64529*
0.0935	2,375 mm	#42	1/8	2	5/8	31/64	1-1/4	64530*
0.0938	2,383 mm	3/32	1/8	2	5/8	31/64	1-1/4	52305
0.0980	2,489 mm	#40	1/8	2	43/64	17/32	1-1/4	52306
0.0984	2,500 mm		3,0	50,0	17,0	13,0	32,0	64531
0.0995	2,527 mm	#39	1/8	2	43/64	17/32	1-1/4	52307
0.1015	2,578 mm	#38	1/8	2	43/64	17/32	1-1/4	52308
0.1040	2,642 mm	#37	1/8	2	45/64	35/64	1-1/4	52309
0.1065	2,705 mm	#36	1/8	2	45/64	35/64	1-1/4	52310
0.1094	2,779 mm	7/64	1/8	2	3/4	19/32	1-1/4	52311
0.1100	2,794 mm	#35	1/8	2	3/4	19/32	1-1/4	52312
0.1110	2,819 mm	#34	1/8	2	3/4	19/32	1-1/4	52313
0.1130	2,870 mm	#33	1/8	2	3/4	19/32	1-1/4	52314
0.1142	2,900 mm		3,0	50,0	19,0	15,0	32,0	64532
0.1160	2,946 mm	#32	1/8	2	3/4	37/64	1-1/4	52315
0.1181	3,000 mm		6,0	66,0	28,0	24,0	36,0	64100
0.1200	3,048 mm	#31	1/8	2	3/4	37/64	1-1/4	52316
0.1220	3,100 mm		6,0	66,0	28,0	23,0	36,0	64101
0.1250	3,175 mm	1/8	1/4	3	1	13/16	1-7/16	51580
0.1260	3,200 mm		6,0	66,0	28,0	23,0	36,0	64102
0.1285	3,264 mm	#30	1/4	3	1	13/16	1-7/16	51581
0.1299	3,300 mm		6,0	66,0	28,0	23,0	36,0	64103

*Single Margin

continued on next page

TOLERANCES (inch)

≤.1181 DIAMETER
DC = +.00008/+.00047
DCON = h_6

>.1181–.2362 DIAMETER
DC = +.00016/+.00063
DCON = h_6

>.2362–.3937 DIAMETER
DC = +.00024/+.00083
DCON = h_6

>.3937–.7087 DIAMETER
DC = +.00028/+.00098
DCON = h_6

>.7087–1.1811 DIAMETER
DC = +.00031/+.00114
DCON = h_6

TOLERANCES (mm)

≤3 DIAMETER
DC = +0,002/+0,012
DCON = h_6

>3–6 DIAMETER
DC = +0,004/+0,016
DCON = h_6

>6–10 DIAMETER
DC = +0,006/+0,021
DCON = h_6

>10–18 DIAMETER
DC = +0,007/+0,025
DCON = h_6

>18–30 DIAMETER
DC = +0,008/+0,029
DCON = h_6

- STEELS
- STAINLESS STEELS
- CAST IRON
- NON-FERROUS
- HIGH TEMP ALLOYS
- HARDENED STEELS

For patent information visit www.ksptpatents.com

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FRACTIONAL & METRIC SERIES

CONTINUED

inch & mm								EDP NO.
DECIMAL DC	METRIC DC	FRACTIONAL/ LETTER/WIRE DC	SHANK DIAMETER DCON	OVERALL LENGTH OAL	FLUTE LENGTH LCF	USABLE LENGTH LU	SHANK LENGTH LS	Ti-NAMITE-A (AlTiN)
0.1339	3,400 mm		6,0	66,0	28,0	23,0	36,0	64104
0.1360	3,454 mm	#29	1/4	3	1	51/64	1-7/16	51582
0.1378	3,500 mm		6,0	66,0	28,0	23,0	36,0	64105
0.1405	3,569 mm	#28	1/4	3	1	51/64	1- 7/16	52317
0.1406	3,571 mm	9/64	1/4	3	1	51/64	1-7/16	51583
0.1417	3,600 mm		6,0	66,0	28,0	23,0	36,0	64106
0.1440	3,658 mm	#27	1/4	3	1	51/64	1-7/16	52318
0.1457	3,700 mm		6,0	66,0	28,0	22,0	36,0	64107
0.1470	3,734 mm	#26	1/4	3	1	25/32	1-7/16	52319
0.1495	3,797 mm	#25	1/4	3-1/4	1-1/4	1-1/32	1-7/16	51584
0.1496	3,800 mm		6,0	74,0	36,0	30,0	36,0	64108
0.1520	3,861 mm	#24	1/4	3-1/4	1-1/4	1-1/32	1-7/16	52321
0.1535	3,900 mm		6,0	74,0	36,0	30,0	36,0	64109
0.1540	3,912 mm	#23	1/4	3-1/4	1-1/4	1-1/32	1-7/16	52322
0.1562	3,967 mm	5/32	1/4	3-1/4	1-1/4	1-1/64	1-7/16	51585
0.1570	3,988 mm	#22	1/4	3-1/4	1-1/4	1-1/64	1-7/16	52323
0.1575	4,000 mm		6,0	74,0	36,0	30,0	36,0	64110
0.1590	4,039 mm	#21	1/4	3-1/4	1-1/4	1-1/64	1-7/16	51586
0.1610	4,089 mm	#20	1/4	3-1/4	1-1/4	1	1-7/16	51587
0.1614	4,100 mm		6,0	74,0	36,0	30,0	36,0	64111
0.1654	4,200 mm		6,0	74,0	36,0	30,0	36,0	64112
0.1660	4,216 mm	#19	1/4	3-1/4	1-1/4	1	1-7/16	52324
0.1693	4,300 mm		6,0	74,0	36,0	30,0	36,0	64113
0.1695	4,305 mm	#18	1/4	3-1/4	1-1/4	1	1-7/16	52325
0.1719	4,366 mm	11/64	1/4	3-1/4	1-1/4	1	1-7/16	51588
0.1730	4,394 mm	#17	1/4	3-1/4	1-1/4	1	1-7/16	52326
0.1732	4,400 mm		6,0	74,0	36,0	29,0	36,0	64114
0.1772	4,500 mm		6,0	74,0	36,0	29,0	36,0	64115
0.1800	4,572 mm	#15	1/4	3-1/4	1-1/4	63/64	1-7/16	52327
0.1811	4,600 mm		6,0	74,0	36,0	29,0	36,0	64116
0.1820	4,623 mm	#14	1/4	3-1/4	1-1/4	63/64	1-7/16	52328
0.1850	4,699 mm	#13	1/4	3-1/4	1-1/4	63/64	1-7/16	52329
0.1850	4,699 mm	#13	6,0	74,0	36,0	29,0	36,0	64117
0.1875	4,763 mm	3/16	1/4	3-1/4	1-3/4	1-15/32	1-7/16	51589
0.1890	4,801 mm	#12	1/4	3-1/4	1-3/4	1-15/32	1-7/16	52330
0.1890	4,801 mm	#12	6,0	82,0	44,0	37,0	36,0	64118
0.1929	4,900 mm		6,0	82,0	44,0	37,0	36,0	64119
0.1935	4,915 mm	#10	1/4	3-1/4	1-3/4	1-15/32	1-7/16	52331
0.1960	4,978 mm	#9	1/4	3-1/4	1-3/4	1-15/32	1-7/16	52332
0.1969	5,000 mm		6,0	82,0	44,0	36,0	36,0	64120
0.1990	5,055 mm	#8	1/4	3-1/4	1-3/4	1-15/32	1-7/16	52333
0.2008	5,100 mm		6,0	82,0	44,0	36,0	36,0	64121
0.2010	5,105 mm	#7	1/4	3-1/4	1-3/4	1-29/64	1-7/16	51506
0.2031	5,159 mm	13/64	1/4	3-1/4	1-3/4	1-29/64	1-7/16	51507
0.2040	5,182 mm	#6	1/4	3 1/4	1 3/4	1-29/64	1 7/16	52334
0.2047	5,200 mm		6,0	82,0	44,0	36,0	36,0	64122

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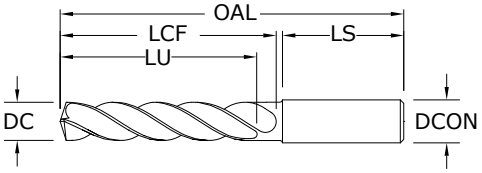
HI-PER CARB®
HIGH PERFORMANCE CARBIDE DRILLS

135 5xD

FRACTIONAL & METRIC SERIES



- 4-margin design improves accuracy and surface finish along with increased strength for aggressive drilling
- Specialized self-centering notched point eliminates the need for spot drilling decreasing thrust and deflection
- Engineered edge protection improves edge strength and reduces edge fatigue allowing for increased feed rates
- Recommended for materials ≤ 56 HRc (≤ 577 Bhn)

			inch & mm					EDP NO.
DECIMAL DC	METRIC DC	FRACTIONAL/ LETTER/WIRE DC	SHANK DIAMETER DCON	OVERALL LENGTH OAL	FLUTE LENGTH LCF	USABLE LENGTH LU	SHANK LENGTH LS	Ti-NAMITE-A (AlTiN)
0.2055	5,220 mm	#5	1/4	3-1/4	1-3/4	1-29/64	1-7/16	51590
0.2067	5,250 mm		6,0	82,0	44,0	36,0	36,0	64123
0.2087	5,300 mm		6,0	82,0	44,0	36,0	36,0	64124
0.2090	5,309 mm	#4	1/4	3-1/4	1-3/4	1-7/16	1-7/16	51508
0.2126	5,400 mm		6,0	82,0	44,0	36,0	36,0	64125
0.2130	5,410 mm	#3	1/4	3-1/4	1-3/4	1-7/16	1-7/16	51509
0.2165	5,500 mm		6,0	82,0	44,0	36,0	36,0	64126
0.2188	5,558 mm	7/32	1/4	3-1/4	1-3/4	1-27/64	1-7/16	51510
0.2205	5,600 mm		6,0	82,0	44,0	36,0	36,0	64127
0.2210	5,613 mm	#2	1/4	3-1/4	1-3/4	1-27/64	1-7/16	52335
0.2244	5,700 mm		6,0	82,0	44,0	35,0	36,0	64128
0.2280	5,791 mm	#1	1/4	3-1/4	1-3/4	1-13/32	1-7/16	52336
0.2283	5,800 mm		6,0	82,0	44,0	35,0	36,0	64129
0.2323	5,900 mm		6,0	82,0	44,0	35,0	36,0	64130
0.2340	5,944 mm	A	1/4	3-1/4	1-3/4	1-13/32	1-7/16	52337
0.2344	5,954 mm	15/64	1/4	3-1/4	1-3/4	1-13/32	1-7/16	51591
0.2362	6,000 mm		6,0	82,0	44,0	35,0	36,0	64131
0.2380	6,045 mm	B	1/4	3 5/8	2-5/64	1-13/32	1-7/16	52338
0.2402	6,100 mm		8,0	91,0	53,0	44,0	36,0	64132
0.2420	6,147 mm	C	1/4	3 5/8	2-5/64	1-13/32	1-7/16	52339
0.2441	6,200 mm		8,0	91,0	53,0	44,0	36,0	64133
0.2460	6,248 mm	D	1/4	3 5/8	2-5/64	1-13/32	1-7/16	52340
0.2461	6,250 mm		8,0	91,0	53,0	44,0	36,0	64134
0.2480	6,300 mm		8,0	91,0	53,0	44,0	36,0	64135
0.2500	6,350 mm	1/4 E	1/4	3-5/8	2-5/64	1-45/64	1-7/16	51511
0.2520	6,400 mm		8,0	91,0	53,0	43,0	36,0	64136
0.2559	6,500 mm		8,0	91,0	53,0	43,0	36,0	64137
0.2570	6,528 mm	F	5/16	3-5/8	2-5/64	1-45/64	1-7/16	51512
0.2598	6,600 mm		8,0	91,0	53,0	43,0	36,0	64138
0.2610	6,629 mm	G	5/16	3 5/8	2 5/64	1-11/16	1 7/16	52341
0.2638	6,700 mm		8,0	91,0	53,0	43,0	36,0	64139
0.2656	6,746 mm	17/64	5/16	3-5/8	2-5/64	1-11/16	1-7/16	51513
0.2660	6,756 mm	H	5/16	3-5/8	2-5/64	1-11/16	1-7/16	52342
0.2677	6,800 mm		8,0	91,0	53,0	43,0	36,0	64140
0.2717	6,900 mm		8,0	91,0	53,0	43,0	36,0	64141
0.2720	6,909 mm	I	5/16	3-5/8	2-5/64	1-43/64	1-7/16	51514

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TOLERANCES (inch)

≤.1181 DIAMETER
DC = +.00008/+.00047
DCON = h_6

>.1181–.2362 DIAMETER
DC = +.00016/+.00063
DCON = h_6

>.2362–.3937 DIAMETER
DC = +.00024/+.00083
DCON = h_6

>.3937–.7087 DIAMETER
DC = +.00028/+.00098
DCON = h_6

>.7087–1.1811 DIAMETER
DC = +.00031/+.00114
DCON = h_6

TOLERANCES (mm)

≤3 DIAMETER
DC = +0,002/+0,012
DCON = h_6

>3–6 DIAMETER
DC = +0,004/+0,016
DCON = h_6

>6–10 DIAMETER
DC = +0,006/+0,021
DCON = h_6

>10–18 DIAMETER
DC = +0,007/+0,025
DCON = h_6

>18–30 DIAMETER
DC = +0,008/+0,029
DCON = h_6

- STEELS
- STAINLESS STEELS
- CAST IRON
- NON-FERROUS
- HIGH TEMP ALLOYS
- HARDENED STEELS

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135 5xD

FRACTIONAL & METRIC SERIES

CONTINUED

inch & mm								EDP NO.
DECIMAL DC	METRIC DC	FRACTIONAL/ LETTER/WIRE DC	SHANK DIAMETER DCON	OVERALL LENGTH OAL	FLUTE LENGTH LCF	USABLE LENGTH LU	SHANK LENGTH LS	Ti-NAMITE-A (AlTiN)
0.2756	7,000 mm		8,0	91,0	53,0	42,0	36,0	64142
0.2770	7,036 mm	J	5/16	3 5/8	2-5/64	1-43/64	1-7/16	52343
0.2795	7,100 mm		8,0	91,0	53,0	42,0	36,0	64143
0.2810	7,137 mm	K	5/16	3 5/8	2-5/64	1-21/32	1-7/16	52344
0.2812	7,142 mm	9/32	5/16	3-5/8	2-5/64	1-21/32	1-7/16	51515
0.2835	7,200 mm		8,0	91,0	53,0	42,0	36,0	64144
0.2854	7,250 mm		8,0	91,0	53,0	42,0	36,0	64145
0.2874	7,300 mm		8,0	91,0	53,0	42,0	36,0	64146
0.2900	7,366 mm	L	5/16	3-5/8	2-5/64	1-41/64	1-7/16	52345
0.2913	7,400 mm		8,0	91,0	53,0	42,0	36,0	64147
0.2950	7,493 mm	M	5/16	3-5/8	2-5/64	1-41/64	1-7/16	52346
0.2953	7,500 mm		8,0	91,0	53,0	42,0	36,0	64148
0.2969	7,541 mm	19/64	5/16	3-5/8	2-5/64	1-41/64	1-7/16	51516
0.2992	7,600 mm		8,0	91,0	53,0	42,0	36,0	64149
0.3020	7,671 mm	N	5/16	3-5/8	2-5/64	1-5/8	1-7/16	52347
0.3031	7,700 mm		8,0	91,0	53,0	41,0	36,0	64150
0.3071	7,800 mm		8,0	91,0	53,0	41,0	36,0	64151
0.3110	7,900 mm		8,0	91,0	53,0	41,0	36,0	64152
0.3125	7,938 mm	5/16	5/16	3-5/8	2-5/64	1-39/64	1-7/16	51517
0.3150	8,000 mm		8,0	91,0	53,0	41,0	36,0	64153
0.3160	8,026 mm	O	3/8	4	2-13/32	1-15/16	1-9/16	52348
0.3189	8,100 mm		10,0	103,0	61,0	49,0	40,0	64154
0.3228	8,200 mm		10,0	103,0	61,0	49,0	40,0	64155
0.3230	8,204 mm	P	3/8	4	2-13/32	1-59/64	1-9/16	51518
0.3268	8,300 mm		10,0	103,0	61,0	49,0	40,0	64156
0.3281	8,334 mm	21/64	3/8	4	2-13/32	1-59/64	1-9/16	51519
0.3307	8,400 mm		10,0	103,0	61,0	48,0	40,0	64157
0.3320	8,433 mm	Q	3/8	4	2-13/32	1-59/64	1-9/16	51520
0.3346	8,500 mm		10,0	103,0	61,0	48,0	40,0	64158
0.3386	8,600 mm		10,0	103,0	61,0	48,0	40,0	64159
0.3390	8,611 mm	R	3/8	4	2-13/32	1-29/32	1-9/16	52349
0.3425	8,700 mm		10,0	103,0	61,0	48,0	40,0	64160
0.3438	8,733 mm	11/32	3/8	4	2-13/32	1-57/64	1-9/16	51521
0.3465	8,800 mm		10,0	103,0	61,0	48,0	40,0	64161
0.3480	8,839 mm	S	3/8	4	2-13/32	1-57/64	1-9/16	51522
0.3504	8,900 mm		10,0	103,0	61,0	48,0	40,0	64162
0.3543	9,000 mm		10,0	103,0	61,0	48,0	40,0	64163
0.3580	9,093 mm	T	3/8	4	2 13/32	1-7/8	1 9/16	52350
0.3583	9,100 mm		10,0	103,0	61,0	47,0	40,0	64164
0.3594	9,129 mm	23/64	3/8	4	2-13/32	1-7/8	1-9/16	51523
0.3622	9,200 mm		10,0	103,0	61,0	47,0	40,0	64165
0.3642	9,250 mm		10,0	103,0	61,0	47,0	40,0	64166
0.3661	9,300 mm		10,0	103,0	61,0	47,0	40,0	64167
0.3680	9,347 mm	U	3/8	4	2-13/32	1-55/64	1-9/16	51524
0.3701	9,400 mm		10,0	103,0	61,0	47,0	40,0	64168
0.3740	9,500 mm		10,0	103,0	61,0	47,0	40,0	64169

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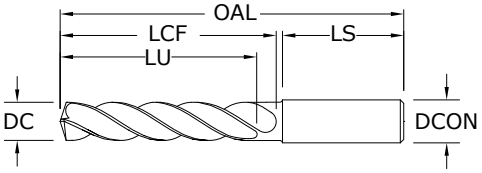
HI-PER CARB®
HIGH PERFORMANCE CARBIDE DRILLS



135 5xD

FRACTIONAL & METRIC SERIES

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			inch & mm					EDP NO.
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0.3750	9,525 mm	3/8	3/8	4	2-13/32	1-27/32	1-9/16	51525
0.3770	9,576 mm	V	1/2	4	2-13/32	1-27/32	1-9/16	52351
0.3780	9,600 mm		10,0	103,0	61,0	47,0	40,0	64170
0.3819	9,700 mm		10,0	103,0	61,0	46,0	40,0	64171
0.3858	9,800 mm		10,0	103,0	61,0	46,0	40,0	64172
0.3860	9,804 mm	W	1/2	4	2-13/32	1-53/64	1-9/16	51526
0.3898	9,900 mm		10,0	103,0	61,0	46,0	40,0	64173
0.3906	9,921 mm	25/64	1/2	4	2-13/32	1-53/64	1-9/16	51527
0.3937	10,000 mm		10,0	103,0	61,0	46,0	40,0	64174
0.3970	10,084 mm	X	1/2	4-11/16	2-3/4	2-5/32	1-49/64	52352
0.3976	10,100 mm		12,0	118,0	71,0	56,0	45,0	64175
0.4016	10,200 mm		12,0	118,0	71,0	56,0	45,0	64176
0.4040	10,262 mm	Y	1/2	4-11/16	2-3/4	2-5/32	1-49/64	52353
0.4055	10,300 mm		12,0	118,0	71,0	56,0	45,0	64177
0.4062	10,317 mm	13/32	1/2	4-11/16	2-3/4	2-9/64	1-49/64	51528
0.4095	10,400 mm		12,0	118,0	71,0	55,0	45,0	64178
0.4130	10,490 mm	Z	1/2	4-11/16	2-3/4	2-9/64	1-49/64	52354
0.4134	10,500 mm		12,0	118,0	71,0	55,0	45,0	64179
0.4173	10,600 mm		12,0	118,0	71,0	55,0	45,0	64180
0.4213	10,700 mm		12,0	118,0	71,0	55,0	45,0	64181
0.4219	10,716 mm	27/64	1/2	4-11/16	2-3/4	2-1/8	1-49/64	51529
0.4252	10,800 mm		12,0	118,0	71,0	55,0	45,0	64182
0.4291	10,900 mm		12,0	118,0	71,0	55,0	45,0	64183
0.4331	11,000 mm		12,0	118,0	71,0	54,0	45,0	64184
0.4370	11,100 mm		12,0	118,0	71,0	54,0	45,0	64185
0.4375	11,113 mm	7/16	1/2	4-11/16	2-3/4	2-3/32	1-49/64	51530
0.4409	11,200 mm		12,0	118,0	71,0	54,0	45,0	64186
0.4429	11,250 mm		12,0	118,0	71,0	54,0	45,0	64187
0.4449	11,300 mm		12,0	118,0	71,0	54,0	45,0	64188
0.4488	11,400 mm		12,0	118,0	71,0	54,0	45,0	64189
0.4528	11,500 mm		12,0	118,0	71,0	54,0	45,0	64190
0.4531	11,509 mm	29/64	1/2	4-11/16	2-3/4	2-5/64	1-49/64	51531
0.4567	11,600 mm		12,0	118,0	71,0	54,0	45,0	64191
0.4606	11,700 mm		12,0	118,0	71,0	53,0	45,0	64192
0.4646	11,800 mm		12,0	118,0	71,0	53,0	45,0	64193
0.4685	11,900 mm		12,0	118,0	71,0	53,0	45,0	64194

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DCON = h_6

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DCON = h_6

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DC = +.00028/+.00098
DCON = h_6

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DC = +.00031/+.00114
DCON = h_6

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DCON = h_6

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DCON = h_6

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DC = +0,006/+0,021
DCON = h_6

>10–18 DIAMETER
DC = +0,007/+0,025
DCON = h_6

>18–30 DIAMETER
DC = +0,008/+0,029
DCON = h_6

- STEELS
- STAINLESS STEELS
- CAST IRON
- NON-FERROUS
- HIGH TEMP ALLOYS
- HARDENED STEELS

For patent information visit www.ksptpatents.com

135 5xD

FRACTIONAL & METRIC SERIES

CONTINUED

inch & mm								EDP NO.
DECIMAL DC	METRIC DC	FRACTIONAL/ LETTER/WIRE DC	SHANK DIAMETER DCON	OVERALL LENGTH OAL	FLUTE LENGTH LCF	USABLE LENGTH LU	SHANK LENGTH LS	Ti-NAMITE-A (AlTiN)
0.4688	11,908 mm	15/32	1/2	4-11/16	2-3/4	2-3/64	1-49/64	51532
0.4724	12,000 mm		12,0	118,0	71,0	53,0	45,0	64195
0.4844	12,304 mm	31/64	1/2	4-7/8	3-1/32	1-5/16	1-49/64	51533
0.4921	12,500 mm		14,0	124,0	77,0	58,0	45,0	64196
0.5000	12,700 mm	1/2	1/2	4-7/8	3-1/32	2-9/32	1-49/64	51534
0.5039	12,800 mm		14,0	124,0	77,0	58,0	45,0	64197
0.5118	13,000 mm		14,0	124,0	77,0	58,0	45,0	64198
0.5156	13,096 mm	33/64	5/8	4-7/8	3-1/32	2-17/64	1-49/64	51535
0.5312	13,492 mm	17/32	5/8	4-7/8	3-1/32	2-15/64	1-49/64	51536
0.5315	13,500 mm		14,0	124,0	77,0	57,0	45,0	64199
0.5469	13,800 mm	35/64	5/8	4-7/8	3-1/32	2-7/32	1-49/64	51537
0.5512	14,000 mm		14,0	124,0	77,0	56,0	45,0	64200
0.5625	14,288 mm	9/16	5/8	5-1/4	3-1/4	2-13/32	1-57/64	51538
0.5709	14,500 mm		16,0	133,0	83,0	61,0	48,0	64201
0.5781	14,684 mm	37/64	5/8	5-1/4	3-1/4	2-25/64	1-57/64	51539
0.5906	15,000 mm		16,0	133,0	83,0	60,0	48,0	64202
0.5938	15,083 mm	19/32	5/8	5-1/4	3-1/4	2-23/64	1-57/64	51592
0.6094	15,479 mm	39/64	5/8	5-1/4	3-1/4	2-11/32	1-57/64	51593
0.6102	15,500 mm		16,0	133,0	83,0	60,0	48,0	64203
0.6250	15,875 mm	5/8	5/8	5-1/4	3-1/4	2-5/16	1-57/64	51540
0.6299	16,000 mm		16,0	133,0	83,0	59,0	48,0	64204
0.6406	16,271 mm	41/64	3/4	5-5/8	3-5/8	2-43/64	1-57/64	51594
0.6496	16,500 mm		18,0	143,0	93,0	68,0	48,0	64205
0.6562	16,667 mm	21/32	3/4	5-5/8	3-5/8	2-41/64	1-57/64	51541
0.6693	17,000 mm		18,0	143,0	93,0	67,0	48,0	64206
0.6719	17,066 mm	43/64	3/4	5-5/8	3-5/8	2-5/8	1-57/64	51595
0.6875	17,463 mm	11/16	3/4	5-5/8	3-5/8	2-19/32	1-57/64	51542
0.6890	17,500 mm		18,0	143,0	93,0	67,0	48,0	64207
0.7031	17,859 mm	45/64	3/4	5-5/8	3-5/8	2-37/64	1-57/64	51543
0.7087	18,000 mm		18,0	143,0	93,0	66,0	48,0	64208
0.7188	18,258 mm	23/32	3/4	6	4	2-59/64	1-31/32	51596
0.7283	18,500 mm		20,0	153,0	101,0	73,0	50,0	64209
0.7344	18,654 mm	47/64	3/4	6	4	2-29/32	1-31/32	51544
0.7480	19,000 mm		20,0	153,0	101,0	73,0	50,0	64210
0.7500	19,050 mm	3/4	3/4	6	4	2-7/8	1-31/32	51545
0.7656	19,446 mm	49/64	7/8	6	4	2-55/64	1-31/32	52355
0.7677	19,500 mm		20,0	153,0	101,0	72,0	50,0	64211
0.7812	19,842 mm	25/32	7/8	6	4	2-55/64	1-31/32	52356
0.7874	20,000 mm		20,0	153,0	101,0	71,0	50,0	64212
0.7969	20,241 mm	51/64	7/8	6	4	2-13/16	1-31/32	52357
0.8071	20,500 mm		22,0	153,0	101,0	70,0	50,0	64533
0.8125	20,638 mm	13/16	7/8	6-1/2	4-1/2	3-3/32	1-31/32	52358
0.8268	21,000 mm		22,0	153,0	101,0	69,0	50,0	64534
0.8661	22,000 mm		22,0	178,0	127,0	94,0	50,0	64535
0.8750	22,225 mm	7/8	7/8	6-1/2	4-1/2	3-3/16	1-31/32	52359
0.9219	23,416 mm	59/64	1	7	5	3-5/8	2-1/8	52360

FRACTIONAL

Hi-PerCarb®

	Series 135 5D Fractional	Hardness	Vc (sfm)		DC • in 1/32	1/8	1/4	3/8	1/2	5/8	7/8
P	CARBON STEELS 1018, 1040, 1080, 1090, 10L50, 1140, 1212, 12L15, 1525, 1536	≤ 175 Bhn or ≤ 7 HRc	345	RPM	42173	10543	5272	3514	2636	2109	1506
			(276-414)	Fr	0.0010	0.0040	0.0080	0.0120	0.0159	0.0199	0.0279
				Feed (ipm)	42.0	42.0	42.0	42.0	42.0	42.0	42.0
		≤ 275 Bhn or ≤ 28 HRc	310	RPM	37894	9474	4737	3158	2368	1895	1353
			(248-372)	Fr	0.0009	0.0036	0.0072	0.0108	0.0144	0.0179	0.0251
				Feed (ipm)	34.0	34.0	34.0	34.0	34.0	34.0	34.0
		≤ 425 Bhn or ≤ 45 HRc	180	RPM	22003	5501	2750	1834	1375	1100	786
			(144-216)	Fr	0.0007	0.0030	0.0060	0.0090	0.0120	0.0150	0.0210
				Feed (ipm)	16.5	16.5	16.5	16.5	16.5	16.5	16.5
	ALLOY STEELS 4140, 4150, 4320, 5120, 5150, 8630, 86L20, 50100	≤ 275 Bhn or ≤ 28 HRc	270	RPM	33005	8251	4126	2750	2063	1650	1179
			(216-324)	Fr	0.0008	0.0030	0.0061	0.0091	0.0121	0.0151	0.0212
				Feed (ipm)	25.0	25.0	25.0	25.0	25.0	25.0	25.0
		≤ 375 Bhn or ≤ 40 HRc	165	RPM	20170	5042	2521	1681	1261	1008	720
			(132-198)	Fr	0.0006	0.0026	0.0052	0.0077	0.0103	0.0129	0.0180
				Feed (ipm)	13.0	13.0	13.0	13.0	13.0	13.0	13.0
		≤ 425 Bhn or ≤ 45 HRc	115	RPM	14058	3514	1757	1171	879	703	502
			(92-138)	Fr	0.0004	0.0018	0.0035	0.0053	0.0071	0.0088	0.0123
				Feed (ipm)	6.2	6.2	6.2	6.2	6.2	6.2	6.2
	TOOL STEELS A2, D2, H13, L2, M2, P20, S7, T15, W2	≤ 200 Bhn or ≤ 13 HRc	120	RPM	14669	3667	1834	1222	917	733	524
			(96-144)	Fr	0.0006	0.0026	0.0051	0.0077	0.0103	0.0128	0.0179
				Feed (ipm)	9.4	9.4	9.4	9.4	9.4	9.4	9.4
		≤ 375 Bhn or ≤ 40 HRc	80	RPM	9779	2445	1222	815	611	489	349
			(64-96)	Fr	0.0003	0.0012	0.0024	0.0036	0.0047	0.0059	0.0083
				Feed (ipm)	2.9	2.9	2.9	2.9	2.9	2.9	2.9
M	STAINLESS STEELS (FREE MACHINING) 303, 416, 420F, 430F, 440F	≤ 185 Bhn or ≤ 9 HRc	250	RPM	30560	7640	3820	2547	1910	1528	1091
			(200-300)	Fr	0.0006	0.0026	0.0051	0.0077	0.0102	0.0128	0.0179
				Feed (ipm)	19.5	19.5	19.5	19.5	19.5	19.5	19.5
		≤ 275 Bhn or ≤ 28 HRc	150	RPM	18336	4584	2292	1528	1146	917	655
			(120-180)	Fr	0.0005	0.0020	0.0039	0.0059	0.0079	0.0098	0.0137
				Feed (ipm)	9.0	9.0	9.0	9.0	9.0	9.0	9.0
	STAINLESS STEELS (DIFFICULT) 304, 316, 321, 13-8 PH, 15-5PH, 17-4 PH, Custom 450	≤ 275 Bhn or ≤ 28 HRc	80	RPM	9779	2445	1222	815	611	489	349
			(64-96)	Fr	0.0005	0.0020	0.0039	0.0059	0.0079	0.0098	0.0137
				Feed (ipm)	4.8	4.8	4.8	4.8	4.8	4.8	4.8
		≤ 375 Bhn or ≤ 40 HRc	55	RPM	6723	1681	840	560	420	336	240
			(44-66)	Fr	0.0004	0.0018	0.0036	0.0054	0.0071	0.0089	0.0125
				Feed (ipm)	3.0	3.0	3.0	3.0	3.0	3.0	3.0
K	CAST IRONS Gray, Malleable, Ductile	≤ 220 Bhn or ≤ 19 HRc	300	RPM	36672	9168	4584	3056	2292	1834	1310
			(240-360)	Fr	0.0011	0.0045	0.0089	0.0134	0.0179	0.0224	0.0313
				Feed (ipm)	41.0	41.0	41.0	41.0	41.0	41.0	41.0
		≤ 260 Bhn or ≤ 26 HRc	265	RPM	32394	8098	4049	2699	2025	1620	1157
			(212-318)	Fr	0.0011	0.0046	0.0091	0.0137	0.0183	0.0228	0.0320
				Feed (ipm)	37.0	37.0	37.0	37.0	37.0	37.0	37.0

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Hi-PerCarb®

	Series 135 5D Fractional	Hardness	Vc (sfm)		DC • in 1/32	1/8	1/4	3/8	1/2	5/8	7/8
N	ALUMINUM ALLOYS 2017, 2024, 356, 6061, 7075	≤ 80 Bhn or ≤ 47 HRb	635	RPM	77622	19406	9703	6469	4851	3881	2772
			(508-762)	Fr	0.0012	0.0049	0.0099	0.0148	0.0198	0.0247	0.0346
				Feed (ipm)	96.0	96.0	96.0	96.0	96.0	96.0	96.0
		≤ 150 Bhn or ≤ 88 HRc	540	RPM	66010	16502	8251	5501	4126	3300	2357
			(432-648)	Fr	0.0012	0.0050	0.0099	0.0149	0.0199	0.0248	0.0348
				Feed (ipm)	82.0	82.0	82.0	82.0	82.0	82.0	82.0
	COPPER ALLOYS Alum Bronze, C110, Muntz Brass	≤ 140 Bhn or ≤ 3 HRc	450	RPM	55008	13752	6876	4584	3438	2750	1965
			(360-540)	Fr	0.0005	0.0020	0.0040	0.0060	0.0080	0.0100	0.0140
				Feed (ipm)	27.5	27.5	27.5	27.5	27.5	27.5	27.5
		≤ 200 Bhn or ≤ 23 HRc	360	RPM	44006	11002	5501	3667	2750	2200	1572
			(288-432)	Fr	0.0005	0.0020	0.0040	0.0060	0.0080	0.0100	0.0140
				Feed (ipm)	22.0	22.0	22.0	22.0	22.0	22.0	22.0
S	HIGH TEMP ALLOYS (Nickel , Cobalt, Iron Base) Inconel 601, 617, 625, Incoloy, Monel 400, Rene, Waspaloy	≤ 300 Bhn or ≤ 32 HRc	40	RPM	4890	1222	611	407	306	244	175
			(32-48)	Fr	0.0002	0.0008	0.0016	0.0025	0.0033	0.0041	0.0057
				Feed (ipm)	1.0	1.0	1.0	1.0	1.0	1.0	1.0
		≤ 400 Bhn or ≤ 43 HRc	20	RPM	2445	611	306	204	153	122	87
			(16-24)	Fr	0.0002	0.0007	0.0013	0.0020	0.0026	0.0033	0.0046
				Feed (ipm)	0.4	0.4	0.4	0.4	0.4	0.4	0.4
	TITANIUM ALLOYS Pure Titanium, Ti6Al4V, Ti6Al2Sn4Zr2Mo, Ti4Al4Mo2Sn0.5Si, Ti-6Al4V	≤ 275 Bhn or ≤ 28 HRc	105	RPM	12835	3209	1604	1070	802	642	458
			(84-126)	Fr	0.0005	0.0018	0.0036	0.0054	0.0072	0.0090	0.0127
				Feed (ipm)	5.8	5.8	5.8	5.8	5.8	5.8	5.8
		≤ 350 Bhn or ≤ 38 HRc	80	RPM	9779	2445	1222	815	611	489	349
			(64-96)	Fr	0.0004	0.0016	0.0032	0.0048	0.0064	0.0080	0.0112
				Feed (ipm)	3.9	3.9	3.9	3.9	3.9	3.9	3.9
		≤ 440 Bhn or ≤ 47 HRc	42	RPM	5134	1284	642	428	321	257	183
			(34-50)	Fr	0.0003	0.0012	0.0025	0.0037	0.0050	0.0062	0.0087
				Feed (ipm)	1.6	1.6	1.6	1.6	1.6	1.6	1.6
H	TOOL STEELS A2, D2, H13, L2, M2, P20, S7, T15, W2	≤ 475 Bhn or ≤ 50 HRc	70	RPM	8557	2139	1070	713	535	428	306
			(56-84)	Fr	0.0002	0.0008	0.0016	0.0024	0.0032	0.0040	0.0056
				Feed (ipm)	1.7	1.7	1.7	1.7	1.7	1.7	1.7

Bhn (Brinell) HRc (Rockwell C) HRb (Rockwell B)
rpm = Vc x 3.82 / DC
ipm = Fr x rpm
reduce speed and feed for materials harder than listed
refer to the SGS Tool Wizard® for complete technical information (www.kyocera-sgstool.com)

Hi-PerCarb®

	Series 135M 5D Metric	Hardness	Vc (m/min)		DC • mm 1.5	3	6	8	10	12	16	20
P	CARBON STEELS 1018, 1040, 1080, 1090, 10L50, 1140, 1212, 12L15, 1525, 1536	≤ 175 Bhn or ≤ 7 HRc	105	RPM	22297	11148	5574	4181	3344	2787	2090	1672
			(84-126)	Fr	0.048	0.095	0.190	0.254	0.317	0.380	0.507	0.634
				Feed (mm/min)	1060	1060	1060	1060	1060	1060	1060	1060
		≤ 275 Bhn or ≤ 28 HRc	94	RPM	20035	10017	5009	3756	3005	2504	1878	1503
			(76-113)	Fr	0.043	0.085	0.171	0.228	0.285	0.341	0.455	0.569
				Feed (mm/min)	855	855	855	855	855	855	855	855
		≤ 425 Bhn or ≤ 45 HRc	55	RPM	11633	5816	2908	2181	1745	1454	1091	872
			(44-66)	Fr	0.036	0.071	0.143	0.190	0.238	0.285	0.381	0.476
				Feed (mm/min)	415	415	415	415	415	415	415	415
	ALLOY STEELS 4140, 4150, 4320, 5120, 5150, 8630, 86L20, 50100	≤ 275 Bhn or ≤ 28 HRc	82	RPM	17449	8725	4362	3272	2617	2181	1636	1309
			(66-99)	Fr	0.036	0.072	0.143	0.191	0.239	0.287	0.382	0.478
				Feed (mm/min)	625	625	625	625	625	625	625	625
		≤ 375 Bhn or ≤ 40 HRc	50	RPM	10664	5332	2666	1999	1600	1333	1000	800
			(40-60)	Fr	0.031	0.062	0.124	0.165	0.206	0.248	0.330	0.413
				Feed (mm/min)	330	330	330	330	330	330	330	330
		≤ 425 Bhn or ≤ 45 HRc	35	RPM	7432	3716	1858	1394	1115	929	697	557
			(28-42)	Fr	0.022	0.043	0.086	0.115	0.144	0.172	0.230	0.287
				Feed (mm/min)	160	160	160	160	160	160	160	160
	TOOL STEELS A2, D2, H13, L2, M2, P20, S7, T15, W2	≤ 200 Bhn or ≤ 13 HRc	37	RPM	7755	3878	1939	1454	1163	969	727	582
			(29-44)	Fr	0.031	0.062	0.124	0.165	0.206	0.248	0.330	0.413
				Feed (mm/min)	240	240	240	240	240	240	240	240
		≤ 375 Bhn or ≤ 40 HRc	24	RPM	5170	2585	1293	969	776	646	485	388
			(20-29)	Fr	0.015	0.029	0.058	0.077	0.097	0.116	0.155	0.193
				Feed (mm/min)	75	75	75	75	75	75	75	75
M	STAINLESS STEELS (FREE MACHINING) 303, 416, 420F, 430F, 440F	≤ 185 Bhn or ≤ 9 HRc	76	RPM	16157	8078	4039	3029	2424	2020	1515	1212
			(61-91)	Fr	0.031	0.061	0.123	0.163	0.204	0.245	0.327	0.408
				Feed (mm/min)	495	495	495	495	495	495	495	495
		≤ 275 Bhn or ≤ 28 HRc	46	RPM	9694	4847	2424	1818	1454	1212	909	727
			(37-55)	Fr	0.024	0.047	0.095	0.127	0.158	0.190	0.253	0.316
				Feed (mm/min)	230	230	230	230	230	230	230	230
	STAINLESS STEELS (DIFFICULT) 304, 316, 321, 13-8 PH, 15-5PH, 17-4 PH, Custom 450	≤ 275 Bhn or ≤ 28 HRc	24	RPM	5170	2585	1293	969	776	646	485	388
			(20-29)	Fr	0.023	0.046	0.093	0.124	0.155	0.186	0.248	0.309
				Feed (mm/min)	120	120	120	120	120	120	120	120
		≤ 375 Bhn or ≤ 40 HRc	17	RPM	3555	1777	889	666	533	444	333	267
			(13-20)	Fr	0.021	0.042	0.084	0.113	0.141	0.169	0.225	0.281
				Feed (mm/min)	75	75	75	75	75	75	75	75
K	CAST IRONS Gray, Malleable, Ductile	≤ 220 Bhn or ≤ 19 HRc	91	RPM	19388	9694	4847	3635	2908	2424	1818	1454
			(73-110)	Fr	0.054	0.108	0.217	0.289	0.361	0.433	0.578	0.722
				Feed (mm/min)	1050	1050	1050	1050	1050	1050	1050	1050
		≤ 260 Bhn or ≤ 26 HRc	81	RPM	17126	8563	4282	3211	2569	2141	1606	1284
			(65-97)	Fr	0.055	0.109	0.218	0.291	0.364	0.437	0.582	0.728
				Feed (mm/min)	935	935	935	935	935	935	935	935

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Hi-PerCarb®

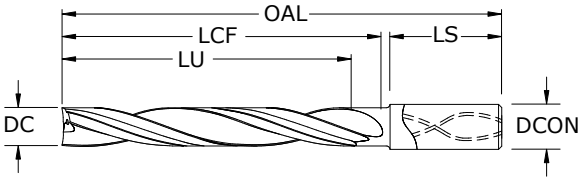
	Series 135M 5D Metric	Hardness	Vc (m/min)		DC • mm 1.5	3	6	8	10	12	16	20
N	ALUMINUM ALLOYS 2017, 2024, 356, 6061, 7075	≤ 80 Bhn or ≤ 47 HRb	194	RPM	41039	20519	10260	7695	6156	5130	3847	3078
			(155-232)	Fr	0.059	0.118	0.237	0.316	0.395	0.474	0.632	0.790
				Feed (mm/min)	2430	2430	2430	2430	2430	2430	2430	2430
		≤ 150 Bhn or ≤ 88 HRc	165	RPM	34899	17449	8725	6544	5235	4362	3272	2617
			(132-198)	Fr	0.059	0.118	0.237	0.316	0.394	0.473	0.631	0.789
				Feed (mm/min)	2065	2065	2065	2065	2065	2065	2065	2065
	Copper Alloys Alum Bronze, C110, Muntz Brass	≤ 140 Bhn or ≤ 3 HRc	137	RPM	29082	14541	7271	5453	4362	3635	2726	2181
			(110-165)	Fr	0.027	0.053	0.107	0.142	0.178	0.213	0.284	0.355
				Feed (mm/min)	775	775	775	775	775	775	775	775
		≤ 200 Bhn or ≤ 23 HRc	110	RPM	23266	11633	5816	4362	3490	2908	2181	1745
			(88-132)	Fr	0.027	0.054	0.108	0.144	0.181	0.217	0.289	0.361
				Feed (mm/min)	630	630	630	630	630	630	630	630
S	HIGH TEMP ALLOYS (Nickel , Cobalt, Iron Base) Inconel 601, 617, 625, Incoloy, Monel 400, Rene, Waspaloy	≤ 300 Bhn or ≤ 32 HRc	12	RPM	2585	1293	646	485	388	323	242	194
			(10-15)	Fr	0.010	0.019	0.039	0.052	0.064	0.077	0.103	0.129
				Feed (mm/min)	25	25	25	25	25	25	25	25
		≤ 400 Bhn or ≤ 43 HRc	6	RPM	1293	646	323	242	194	162	121	97
			(5-7)	Fr	0.007	0.014	0.028	0.037	0.046	0.056	0.074	0.093
				Feed (mm/min)	9	9	9	9	9	9	9	9
	TITANIUM ALLOYS Pure Titanium, Ti6Al4V, Ti6Al2Sn4Zr2Mo, Ti4Al4Mo2Sn0.5Si, Ti-6Al4V	≤ 275 Bhn or ≤ 28 HRc	32	RPM	6786	3393	1696	1272	1018	848	636	509
			(26-38)	Fr	0.021	0.043	0.085	0.114	0.142	0.171	0.228	0.285
				Feed (mm/min)	145	145	145	145	145	145	145	145
		≤ 350 Bhn or ≤ 38 HRc	24	RPM	5170	2585	1293	969	776	646	485	388
			(20-29)	Fr	0.019	0.039	0.077	0.103	0.129	0.155	0.206	0.258
				Feed (mm/min)	100	100	100	100	100	100	100	100
		≤ 440 Bhn or ≤ 47 HRc	13	RPM	2714	1357	679	509	407	339	254	204
			(10-15)	Fr	0.015	0.029	0.059	0.079	0.098	0.118	0.157	0.196
				Feed (mm/min)	40	40	40	40	40	40	40	40
H	TOOL STEELS A2, D2, H13, L2, M2, P20, S7, T15, W2	≤ 475 Bhn or ≤ 50 HRc	21	RPM	4524	2262	1131	848	679	565	424	339
			(17-26)	Fr	0.010	0.019	0.038	0.051	0.064	0.076	0.102	0.127
				Feed (mm/min)	43	43	43	43	43	43	43	43

Bhn (Brinell) HRc (Rockwell C) HRb (Rockwell B)
rpm = (Vc x 1000) / (DC x 3.14)
mm/min = Fr x rpm
reduce speed and feed for materials harder than listed
refer to the SGS Tool Wizard® for complete technical information (www.kyocera-sgstool.com)

HI-PERCARB®
HIGH PERFORMANCE CARBIDE DRILLS

146U 3xD

FRACTIONAL & METRIC SERIES



- 4-margin design improves accuracy and surface finish along with increased strength for aggressive drilling
- Specialized self-centering notched point eliminates the need for spot drilling decreasing thrust and deflection
- Engineered edge protection improves edge strength and reduces edge fatigue allowing for increased feed rates
- Recommended for materials ≤ 56 HRc (≤ 577 Bhn)

			inch & mm					EDP NO.
DECIMAL DC	METRIC DC	FRACTIONAL/ LETTER/WIRE DC	SHANK DIAMETER DCON	OVERALL LENGTH OAL	FLUTE LENGTH LCF	USABLE LENGTH LU	SHANK LENGTH LS	Ti-NAMITE®-X (TX)
0.1181	3,000 mm		6,0	55,0	13,0	9,0	34,0	67705
0.1220	3,100 mm		6,0	55,0	14,0	9,0	34,0	67706
0.1250	3,175 mm	1/8	6,0	55,0	14,0	10,0	34,0	58800
0.1260	3,200 mm		6,0	55,0	14,0	10,0	34,0	67707
0.1299	3,300 mm		6,0	55,0	15,0	10,0	34,0	67708
0.1339	3,400 mm		6,0	55,0	15,0	10,0	34,0	67709
0.1360	3,454 mm	#29	6,0	55,0	16,0	10,0	34,0	58801
0.1378	3,500 mm		6,0	55,0	16,0	11,0	34,0	67710
0.1405	3,569 mm	#28	6,0	55,0	16,0	11,0	34,0	58802
0.1406	3,571 mm	9/64	6,0	55,0	16,0	11,0	34,0	58803
0.1417	3,600 mm		6,0	55,0	16,0	11,0	34,0	67711
0.1457	3,700 mm		6,0	60,0	17,0	11,0	34,0	67712
0.1470	3,734 mm	#26	6,0	60,0	17,0	11,0	34,0	58804
0.1495	3,797 mm	#25	6,0	60,0	17,0	11,0	34,0	58805
0.1496	3,800 mm		6,0	60,0	17,0	11,0	34,0	67713
0.1520	3,861 mm	#24	6,0	60,0	17,0	12,0	34,0	58806
0.1535	3,900 mm		6,0	60,0	18,0	12,0	34,0	67714
0.1562	3,967 mm	5/32	6,0	60,0	18,0	12,0	34,0	58807
0.1570	3,988 mm	#22	6,0	60,0	18,0	12,0	34,0	58808
0.1575	4,000 mm		6,0	60,0	18,0	12,0	34,0	67715
0.1590	4,039 mm	#21	6,0	60,0	18,0	12,0	34,0	58809
0.1610	4,089 mm	#20	6,0	60,0	18,0	12,0	34,0	58810
0.1614	4,100 mm		6,0	60,0	18,0	12,0	34,0	67716
0.1654	4,200 mm		6,0	60,0	19,0	13,0	34,0	67717
0.1693	4,300 mm		6,0	60,0	19,0	13,0	34,0	67718
0.1719	4,366 mm	11/64	6,0	60,0	20,0	13,0	34,0	58811
0.1732	4,400 mm		6,0	60,0	20,0	13,0	34,0	67719
0.1770	4,496 mm	#16	6,0	60,0	20,0	13,0	34,0	58812
0.1772	4,500 mm		6,0	60,0	20,0	14,0	34,0	67720
0.1811	4,600 mm		6,0	60,0	21,0	14,0	34,0	67721
0.1850	4,699 mm	#13	6,0	60,0	21,0	14,0	34,0	58813
0.1875	4,763 mm	3/16	6,0	60,0	21,0	14,0	34,0	58814
0.1890	4,801 mm	#12	6,0	65,0	22,0	14,0	33,0	58815
0.1929	4,900 mm		6,0	65,0	22,0	15,0	33,0	67724
0.1935	4,915 mm	#10	6,0	65,0	22,0	15,0	33,0	58816
0.1969	5,000 mm		6,0	65,0	23,0	15,0	33,0	67725

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TOLERANCES (inch)

≤.1181 DIAMETER
DC = +.00008/+.00047
DCON = h_6

>.1181–.2362 DIAMETER
DC = +.00016/+.00063
DCON = h_6

>.2362–.3937 DIAMETER
DC = +.00024/+.00083
DCON = h_6

>.3937–.7087 DIAMETER
DC = +.00028/+.00098
DCON = h_6

>.7087–1.1811 DIAMETER
DC = +.00031/+.00114
DCON = h_6

TOLERANCES (mm)

≤3 DIAMETER
DC = +0,002/+0,012
DCON = h_6

>3–6 DIAMETER
DC = +0,004/+0,016
DCON = h_6

>6–10 DIAMETER
DC = +0,006/+0,021
DCON = h_6

>10–18 DIAMETER
DC = +0,007/+0,025
DCON = h_6

>18–30 DIAMETER
DC = +0,008/+0,029
DCON = h_6

- STEELS
- STAINLESS STEELS
- CAST IRON
- NON-FERROUS
- HIGH TEMP ALLOYS
- HARDENED STEELS

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146U 3xD

FRACTIONAL & METRIC SERIES

CONTINUED

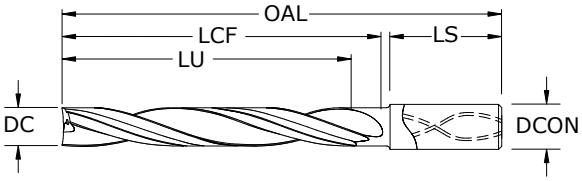
inch & mm								EDP NO.
DECIMAL DC	METRIC DC	FRACTIONAL/ LETTER/WIRE DC	SHANK DIAMETER DCON	OVERALL LENGTH OAL	FLUTE LENGTH LCF	USABLE LENGTH LU	SHANK LENGTH LS	Ti-NAMITE®-X (TX)
0.2008	5,100 mm		6,0	65,0	23,0	15,0	33,0	67726
0.2010	5,105 mm	#7	6,0	65,0	23,0	15,0	33,0	58817
0.2031	5,159 mm	13/64	6,0	65,0	23,0	15,0	33,0	58818
0.2047	5,200 mm		6,0	65,0	23,0	16,0	33,0	67727
0.2087	5,300 mm		6,0	65,0	24,0	16,0	33,0	67728
0.2090	5,309 mm	#4	6,0	65,0	24,0	16,0	33,0	58819
0.2126	5,400 mm		6,0	65,0	24,0	16,0	33,0	67729
0.2130	5,410 mm	#3	6,0	65,0	24,0	16,0	33,0	58820
0.2165	5,500 mm		6,0	65,0	25,0	16,0	33,0	67730
0.2188	5,558 mm	7/32	6,0	65,0	25,0	17,0	33,0	58821
0.2205	5,600 mm		6,0	65,0	25,0	17,0	33,0	67731
0.2244	5,700 mm		6,0	65,0	26,0	17,0	33,0	67732
0.2283	5,800 mm		6,0	65,0	26,0	17,0	33,0	67733
0.2323	5,900 mm		6,0	65,0	27,0	18,0	33,0	67734
0.2344	5,954 mm	15/64	6,0	65,0	27,0	18,0	33,0	58822
0.2362	6,000 mm		6,0	65,0	27,0	18,0	33,0	67735
0.2402	6,100 mm		8,0	70,0	28,0	19,0	34,0	67736
0.2441	6,200 mm		8,0	70,0	28,0	19,0	34,0	67737
0.2461	6,250 mm		8,0	70,0	28,0	19,0	34,0	67738
0.2480	6,300 mm		8,0	70,0	28,0	19,0	34,0	67739
0.2500	6,350 mm	1/4 E #0	8,0	70,0	29,0	19,0	34,0	58823
0.2520	6,400 mm		8,0	70,0	29,0	19,0	34,0	67740
0.2559	6,500 mm		8,0	70,0	29,0	19,0	34,0	67741
0.2570	6,528 mm	F	8,0	70,0	29,0	20,0	34,0	58824
0.2598	6,600 mm		8,0	70,0	30,0	20,0	34,0	67742
0.2638	6,700 mm		8,0	70,0	30,0	20,0	34,0	67743
0.2656	6,746 mm	17/64	8,0	70,0	30,0	20,0	34,0	58825
0.2677	6,800 mm		8,0	70,0	31,0	20,0	34,0	67744
0.2717	6,900 mm		8,0	70,0	31,0	21,0	34,0	67745
0.2720	6,909 mm	I	8,0	70,0	31,0	21,0	34,0	58826
0.2756	7,000 mm		8,0	75,0	32,0	21,0	34,0	67746
0.2795	7,100 mm		8,0	75,0	32,0	21,0	34,0	67747
0.2812	7,142 mm	9/32	8,0	75,0	32,0	21,0	34,0	58827
0.2835	7,200 mm		8,0	75,0	32,0	22,0	34,0	67748
0.2854	7,250 mm		8,0	75,0	33,0	22,0	34,0	67749
0.2874	7,300 mm		8,0	75,0	33,0	22,0	34,0	67750
0.2913	7,400 mm		8,0	75,0	33,0	22,0	34,0	67751
0.2953	7,500 mm		8,0	75,0	34,0	23,0	34,0	67752
0.2969	7,541 mm	19/64	8,0	75,0	34,0	23,0	34,0	58828
0.2992	7,600 mm		8,0	75,0	34,0	23,0	34,0	67753
0.3031	7,700 mm		8,0	75,0	35,0	23,0	34,0	67754
0.3071	7,800 mm		8,0	75,0	35,0	23,0	34,0	67755
0.3110	7,900 mm		8,0	75,0	36,0	24,0	34,0	67756
0.3125	7,938 mm	5/16	8,0	75,0	36,0	24,0	34,0	58829
0.3150	8,000 mm		8,0	75,0	36,0	24,0	34,0	67757
0.3189	8,100 mm		10,0	80,0	36,0	24,0	34,0	67758

continued on next page

HIGH PERFORMANCE CARBIDE DRILLS

146U 3xD

FRACTIONAL & METRIC SERIES



- 4-margin design improves accuracy and surface finish along with increased strength for aggressive drilling
- Specialized self-centering notched point eliminates the need for spot drilling decreasing thrust and deflection
- Engineered edge protection improves edge strength and reduces edge fatigue allowing for increased feed rates
- Recommended for materials ≤ 56 HRc (≤ 577 Bhn)

			inch & mm					EDP NO.
DECIMAL DC	METRIC DC	FRACTIONAL/ LETTER/WIRE DC	SHANK DIAMETER DCON	OVERALL LENGTH OAL	FLUTE LENGTH LCF	USABLE LENGTH LU	SHANK LENGTH LS	Ti-NAMITE®-X (TX)
0.3228	8,200 mm		10,0	80,0	37,0	25,0	34,0	67759
0.3268	8,300 mm		10,0	80,0	37,0	25,0	34,0	67760
0.3281	8,334 mm	21/64	10,0	80,0	38,0	25,0	34,0	58830
0.3307	8,400 mm		10,0	80,0	38,0	25,0	34,0	67761
0.3320	8,433 mm	Q	10,0	80,0	38,0	25,0	34,0	58831
0.3346	8,500 mm		10,0	80,0	38,0	25,0	34,0	67762
0.3386	8,600 mm		10,0	80,0	39,0	26,0	34,0	67763
0.3425	8,700 mm		10,0	80,0	39,0	26,0	34,0	67764
0.3438	8,733 mm	11/32	10,0	80,0	39,0	26,0	34,0	58832
0.3465	8,800 mm		10,0	80,0	40,0	26,0	34,0	67765
0.3504	8,900 mm		10,0	80,0	40,0	27,0	34,0	67766
0.3543	9,000 mm		10,0	80,0	40,0	27,0	34,0	67767
0.3583	9,100 mm		10,0	80,0	41,0	27,0	34,0	67768
0.3594	9,129 mm	23/64	10,0	80,0	41,0	27,0	34,0	58833
0.3622	9,200 mm		10,0	80,0	41,0	28,0	35,0	67769
0.3661	9,300 mm		10,0	85,0	42,0	28,0	35,0	67770
0.3680	9,347 mm	U	10,0	85,0	42,0	28,0	35,0	58834
0.3701	9,400 mm		10,0	85,0	42,0	28,0	35,0	67771
0.3740	9,500 mm		10,0	85,0	43,0	28,0	35,0	67772
0.3750	9,525 mm	3/8	10,0	85,0	43,0	29,0	35,0	58835
0.3780	9,600 mm		10,0	85,0	43,0	29,0	35,0	67773
0.3819	9,700 mm		10,0	85,0	44,0	29,0	35,0	67774
0.3858	9,800 mm		10,0	85,0	44,0	29,0	35,0	67775
0.3898	9,900 mm		10,0	85,0	45,0	30,0	35,0	67776
0.3906	9,921 mm	25/64	10,0	85,0	45,0	30,0	35,0	58836
0.3937	10,000 mm		10,0	85,0	45,0	30,0	35,0	67777
0.3970	10,084 mm	X	12,0	90,0	46,0	31,0	36,0	58837
0.3976	10,100 mm		12,0	90,0	46,0	31,0	36,0	67778
0.4016	10,200 mm		12,0	90,0	46,0	31,0	36,0	67779
0.4040	10,262 mm	Y	12,0	90,0	46,0	31,0	36,0	58838
0.4055	10,300 mm		12,0	90,0	46,0	31,0	36,0	67780
0.4062	10,317 mm	13/32	12,0	90,0	46,0	31,0	36,0	58839
0.4094	10,400 mm		12,0	90,0	47,0	31,0	36,0	67781
0.4134	10,500 mm		12,0	90,0	47,0	32,0	36,0	67782
0.4173	10,600 mm		12,0	90,0	48,0	32,0	36,0	67783
0.4213	10,700 mm		12,0	90,0	48,0	32,0	36,0	67784

continued on next page

TOLERANCES (inch)

≤.1181 DIAMETER
DC = +.00008/+.00047
DCON = h_6

>.1181–.2362 DIAMETER
DC = +.00016/+.00063
DCON = h_6

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DC = +.00024/+.00083
DCON = h_6

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DC = +.00028/+.00098
DCON = h_6

>.7087–1.1811 DIAMETER
DC = +.00031/+.00114
DCON = h_6

TOLERANCES (mm)

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DC = +0,002/+0,012
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>3–6 DIAMETER
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DCON = h_6

>6–10 DIAMETER
DC = +0,006/+0,021
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>10–18 DIAMETER
DC = +0,007/+0,025
DCON = h_6

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DC = +0,008/+0,029
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- CAST IRON
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146U 3xD

FRACTIONAL & METRIC SERIES

CONTINUED

inch & mm								EDP NO.
DECIMAL DC	METRIC DC	FRACTIONAL/ LETTER/WIRE DC	SHANK DIAMETER DCON	OVERALL LENGTH OAL	FLUTE LENGTH LCF	USABLE LENGTH LU	SHANK LENGTH LS	Ti-NAMITE®-X (TX)
0.4219	10,716 mm	27/64	12,0	90,0	48,0	32,0	36,0	58840
0.4252	10,800 mm		12,0	90,0	49,0	32,0	36,0	67785
0.4291	10,900 mm		12,0	90,0	49,0	33,0	36,0	67786
0.4331	11,000 mm		12,0	95,0	50,0	33,0	36,0	67787
0.4370	11,100 mm		12,0	95,0	50,0	33,0	36,0	67788
0.4375	11,113 mm	7/16	12,0	95,0	50,0	33,0	36,0	58841
0.4409	11,200 mm		12,0	95,0	50,0	34,0	36,0	67789
0.4449	11,300 mm		12,0	95,0	51,0	34,0	36,0	67790
0.4488	11,400 mm		12,0	95,0	51,0	34,0	36,0	67791
0.4528	11,500 mm		12,0	95,0	52,0	35,0	36,0	67792
0.4531	11,509 mm	29/64	12,0	95,0	52,0	35,0	36,0	58842
0.4567	11,600 mm		12,0	95,0	52,0	35,0	36,0	67793
0.4606	11,700 mm		12,0	95,0	53,0	35,0	36,0	67794
0.4646	11,800 mm		12,0	95,0	53,0	35,0	36,0	67795
0.4685	11,900 mm		12,0	95,0	54,0	36,0	36,0	67796
0.4688	11,908 mm	15/32	12,0	95,0	54,0	36,0	36,0	58843
0.4724	12,000 mm		12,0	95,0	54,0	36,0	36,0	67797
0.4844	12,304 mm	31/64	14,0	105,0	55,0	37,0	37,0	58844
0.4921	12,500 mm		14,0	105,0	56,0	37,0	37,0	67798
0.5000	12,700 mm	1/2	14,0	105,0	57,0	38,0	37,0	58845
0.5039	12,800 mm		14,0	105,0	58,0	38,0	37,0	67799
0.5118	13,000 mm		14,0	105,0	58,0	39,0	37,0	67800
0.5156	13,096 mm	33/64	14,0	105,0	59,0	39,0	37,0	58846
0.5312	13,492 mm	17/32	14,0	105,0	61,0	40,0	37,0	58847
0.5315	13,500 mm		14,0	105,0	61,0	41,0	37,0	67801
0.5469	13,891 mm	35/64	14,0	105,0	63,0	42,0	37,0	58848
0.5512	14,000 mm		14,0	105,0	63,0	42,0	37,0	67802
0.5625	14,288 mm	9/16	16,0	115,0	64,0	43,0	38,0	58849
0.5709	14,500 mm		16,0	115,0	65,0	44,0	38,0	67803
0.5781	14,684 mm	37/64	16,0	115,0	66,0	44,0	38,0	58850
0.5906	15,000 mm		16,0	115,0	68,0	45,0	38,0	67804
0.5938	15,083 mm	19/32	16,0	115,0	68,0	45,0	38,0	58851
0.6094	15,479 mm	39/64	16,0	115,0	70,0	46,0	38,0	58852
0.6102	15,500 mm		16,0	115,0	70,0	46,0	38,0	67805
0.6250	15,875 mm	5/8	16,0	115,0	71,0	48,0	38,0	58853
0.6299	16,000 mm		16,0	115,0	72,0	48,0	38,0	67806
0.6406	16,271 mm	41/64	18,0	130,0	73,0	49,0	44,0	58854
0.6496	16,500 mm		18,0	130,0	74,0	49,0	44,0	67807
0.6562	16,667 mm	21/32	18,0	130,0	75,0	50,0	44,0	58855
0.6693	17,000 mm		18,0	130,0	77,0	51,0	44,0	67808
0.6719	17,066 mm	43/64	18,0	130,0	77,0	51,0	44,0	58856
0.6875	17,463 mm	11/16	18,0	130,0	79,0	52,0	44,0	58857
0.6890	17,500 mm		18,0	130,0	79,0	53,0	44,0	67809
0.7031	17,859 mm	45/64	18,0	130,0	80,0	54,0	44,0	58858

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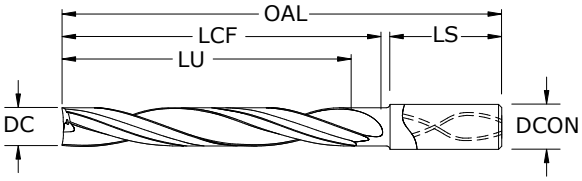
HIGH PERFORMANCE CARBIDE DRILLS

146U 3xD

FRACTIONAL & METRIC SERIES



- 4-margin design improves accuracy and surface finish along with increased strength for aggressive drilling
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inch & mm								EDP NO.
DECIMAL DC	METRIC DC	FRACTIONAL/ LETTER/WIRE DC	SHANK DIAMETER DCON	OVERALL LENGTH OAL	FLUTE LENGTH LCF	USABLE LENGTH LU	SHANK LENGTH LS	Ti-NAMITE®-X (TX)
0.7087	18,000 mm		18,0	130,0	81,0	54,0	44,0	67810
0.7188	18,258 mm	23/32	20,0	140,0	82,0	55,0	45,0	58859
0.7283	18,500 mm		20,0	140,0	83,0	55,0	45,0	67811
0.7344	18,654 mm	47/64	20,0	140,0	84,0	56,0	45,0	58860
0.7480	19,000 mm		20,0	140,0	85,0	57,0	45,0	67812
0.7500	19,050 mm	3/4	20,0	140,0	86,0	57,0	45,0	58861
0.7656	19,446 mm	49/64	20,0	140,0	88,0	58,0	45,0	58862
0.7677	19,500 mm		20,0	140,0	88,0	58,0	45,0	67813
0.7812	19,842 mm	25/32	20,0	140,0	89,0	60,0	45,0	58863
0.7874	20,000 mm		20,0	140,0	90,0	60,0	45,0	67814
0.7969	20,241 mm	51/64	22,0	150,0	91,0	61,0	52,0	58864
0.8071	20,500 mm		22,0	150,0	92,0	62,0	52,0	67815
0.8125	20,638 mm	13/16	22,0	150,0	93,0	62,0	52,0	58865

TOLERANCES (inch)

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- STAINLESS STEELS
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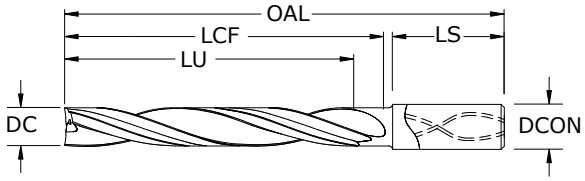

146U 5xD

FRACTIONAL & METRIC SERIES

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inch & mm								EDP NO.
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0.1181	3,000 mm		6,0	75,0	19,0	15,0	51,0	67816
0.1220	3,100 mm		6,0	80,0	20,0	15,0	49,0	67817
0.1250	3,175 mm	1/8	6,0	80,0	21,0	16,0	49,0	58866
0.1260	3,200 mm		6,0	80,0	21,0	16,0	49,0	67818
0.1299	3,300 mm		6,0	80,0	21,0	16,0	49,0	67819
0.1339	3,400 mm		6,0	80,0	22,0	17,0	49,0	67820
0.1360	3,454 mm	#29	6,0	80,0	22,0	17,0	49,0	58867
0.1378	3,500 mm		6,0	80,0	23,0	18,0	49,0	67821
0.1405	3,569 mm	#28	6,0	80,0	23,0	18,0	49,0	58868
0.1406	3,571 mm	9/64	6,0	80,0	23,0	18,0	49,0	58869
0.1417	3,600 mm		6,0	80,0	23,0	18,0	49,0	67822
0.1457	3,700 mm		6,0	80,0	24,0	19,0	49,0	67823
0.1470	3,734 mm	#26	6,0	80,0	24,0	19,0	49,0	58870
0.1495	3,797 mm	#25	6,0	80,0	25,0	19,0	49,0	58871
0.1496	3,800 mm		6,0	80,0	25,0	19,0	49,0	67824
0.1520	3,861 mm	#24	6,0	80,0	25,0	19,0	49,0	58872
0.1535	3,900 mm		6,0	80,0	25,0	19,0	49,0	67825
0.1562	3,967 mm	5/32	6,0	80,0	26,0	20,0	49,0	58873
0.1570	3,988 mm	#22	6,0	80,0	26,0	20,0	49,0	58874
0.1575	4,000 mm		6,0	80,0	26,0	20,0	49,0	67826
0.1590	4,039 mm	#21	6,0	80,0	26,0	20,0	49,0	58875
0.1610	4,089 mm	#20	6,0	90,0	27,0	20,0	53,0	58876
0.1614	4,100 mm		6,0	90,0	27,0	20,0	53,0	67827
0.1654	4,200 mm		6,0	90,0	27,0	21,0	53,0	67828
0.1693	4,300 mm		6,0	90,0	28,0	22,0	53,0	67829
0.1719	4,366 mm	11/64	6,0	90,0	28,0	22,0	53,0	58877
0.1732	4,400 mm		6,0	90,0	29,0	22,0	53,0	67830
0.1770	4,496 mm	#16	6,0	90,0	29,0	22,0	53,0	58878
0.1772	4,500 mm		6,0	90,0	29,0	23,0	53,0	67831
0.1811	4,600 mm		6,0	90,0	30,0	23,0	53,0	67832
0.1850	4,699 mm	#13	6,0	90,0	31,0	23,0	53,0	58879
0.1875	4,763 mm	3/16	6,0	90,0	31,0	24,0	53,0	58880
0.1890	4,801 mm	#12	6,0	90,0	31,0	24,0	53,0	58881
0.1929	4,900 mm		6,0	90,0	32,0	24,0	53,0	67835
0.1935	4,915 mm	#10	6,0	90,0	32,0	25,0	53,0	58882
0.1969	5,000 mm		6,0	95,0	33,0	25,0	51,0	67836
0.2008	5,100 mm		6,0	95,0	33,0	26,0	51,0	67837
0.2010	5,105 mm	#7	6,0	95,0	33,0	26,0	51,0	58883
0.2031	5,159 mm	13/64	6,0	95,0	34,0	26,0	51,0	58884
0.2047	5,200 mm		6,0	95,0	34,0	26,0	51,0	67838
0.2087	5,300 mm		6,0	95,0	34,0	27,0	51,0	67839
0.2090	5,309 mm	#4	6,0	95,0	35,0	27,0	51,0	58885

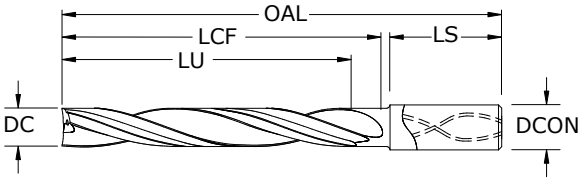
continued on next page

- 4-margin design improves accuracy and surface finish along with increased strength for aggressive drilling
- Specialized self-centering notched point reduces the need for spot drilling decreasing thrust and deflection
- Engineered edge protection improves edge strength and reduces edge fatigue allowing for increased feed rates
- Recommended for materials ≤ 56 HRc (≤ 577 Bhn)

HI-PERCARB®
HIGH PERFORMANCE CARBIDE DRILLS

146U 5xD

FRACTIONAL & METRIC SERIES



- 4-margin design improves accuracy and surface finish along with increased strength for aggressive drilling
- Specialized self-centering notched point reduces the need for spot drilling decreasing thrust and deflection
- Engineered edge protection improves edge strength and reduces edge fatigue allowing for increased feed rates
- Recommended for materials ≤ 56 HRc (≤ 577 Bhn)

		inch & mm						EDP NO.
DECIMAL DC	METRIC DC	FRACTIONAL/ LETTER/WIRE DC	SHANK DIAMETER DCON	OVERALL LENGTH OAL	FLUTE LENGTH LCF	USABLE LENGTH LU	SHANK LENGTH LS	Ti-NAMITE®-X (TX)
0.2126	5,400 mm		6,0	95,0	35,0	27,0	51,0	67840
0.2130	5,410 mm	#3	6,0	95,0	35,0	27,0	51,0	58886
0.2165	5,500 mm		6,0	95,0	36,0	27,0	51,0	67841
0.2188	5,558 mm	7/32	6,0	95,0	36,0	28,0	51,0	58887
0.2205	5,600 mm		6,0	95,0	36,0	28,0	51,0	67842
0.2244	5,700 mm		6,0	95,0	37,0	28,0	51,0	67843
0.2283	5,800 mm		6,0	95,0	38,0	29,0	51,0	67844
0.2323	5,900 mm		6,0	95,0	38,0	30,0	51,0	67845
0.2344	5,954 mm	15/64	6,0	95,0	39,0	30,0	51,0	58888
0.2362	6,000 mm		6,0	95,0	39,0	30,0	51,0	67846
0.2402	6,100 mm		8,0	100,0	40,0	31,0	49,0	67847
0.2441	6,200 mm		8,0	100,0	40,0	31,0	49,0	67848
0.2461	6,250 mm		8,0	100,0	41,0	31,0	49,0	67849
0.2480	6,300 mm		8,0	100,0	41,0	31,0	49,0	67850
0.2500	6,350 mm	1/4 E #0	8,0	100,0	41,0	32,0	49,0	58889
0.2520	6,400 mm		8,0	100,0	42,0	32,0	49,0	67851
0.2559	6,500 mm		8,0	100,0	42,0	32,0	49,0	67852
0.2570	6,528 mm	F	8,0	100,0	42,0	33,0	49,0	58890
0.2598	6,600 mm		8,0	100,0	43,0	33,0	49,0	67853
0.2638	6,700 mm		8,0	100,0	44,0	34,0	49,0	67854
0.2656	6,746 mm	17/64	8,0	100,0	44,0	34,0	49,0	58891
0.2677	6,800 mm		8,0	100,0	44,0	34,0	49,0	67855
0.2717	6,900 mm		8,0	100,0	45,0	35,0	49,0	67856
0.2720	6,909 mm	I	8,0	100,0	45,0	35,0	49,0	58892
0.2756	7,000 mm		8,0	100,0	46,0	35,0	49,0	67857
0.2795	7,100 mm		8,0	100,0	46,0	35,0	49,0	67858
0.2812	7,142 mm	9/32	8,0	100,0	46,0	36,0	49,0	58893
0.2835	7,200 mm		8,0	110,0	47,0	36,0	53,0	67859
0.2854	7,250 mm		8,0	110,0	47,0	36,0	53,0	67860
0.2874	7,300 mm		8,0	110,0	47,0	36,0	53,0	67861
0.2913	7,400 mm		8,0	110,0	48,0	37,0	53,0	67862
0.2953	7,500 mm		8,0	110,0	49,0	38,0	53,0	67863
0.2969	7,541 mm	19/64	8,0	110,0	49,0	38,0	53,0	58894
0.2992	7,600 mm		8,0	110,0	49,0	38,0	53,0	67864
0.3031	7,700 mm		8,0	110,0	50,0	38,0	53,0	67865
0.3071	7,800 mm		8,0	110,0	51,0	39,0	53,0	67866
0.3110	7,900 mm		8,0	110,0	51,0	39,0	53,0	67867
0.3125	7,938 mm	5/16	8,0	110,0	52,0	40,0	53,0	58895
0.3150	8,000 mm		8,0	110,0	52,0	40,0	53,0	67868
0.3189	8,100 mm		10,0	115,0	53,0	41,0	51,0	67869
0.3228	8,200 mm		10,0	115,0	53,0	41,0	51,0	67870
0.3268	8,300 mm		10,0	115,0	54,0	42,0	51,0	67871

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TOLERANCES (inch)

≤.1181 DIAMETER
DC = +.00008/+.00047
DCON = h_6

>.1181–.2362 DIAMETER
DC = +.00016/+.00063
DCON = h_6

>.2362–.3937 DIAMETER
DC = +.00024/+.00083
DCON = h_6

>.3937–.7087 DIAMETER
DC = +.00028/+.00098
DCON = h_6

>.7087–1.1811 DIAMETER
DC = +.00031/+.00114
DCON = h_6

TOLERANCES (mm)

≤3 DIAMETER
DC = +0,002/+0,012
DCON = h_6

>3–6 DIAMETER
DC = +0,004/+0,016
DCON = h_6

>6–10 DIAMETER
DC = +0,006/+0,021
DCON = h_6

>10–18 DIAMETER
DC = +0,007/+0,025
DCON = h_6

>18–30 DIAMETER
DC = +0,008/+0,029
DCON = h_6

- STEELS
- STAINLESS STEELS
- CAST IRON
- NON-FERROUS
- HIGH TEMP ALLOYS
- HARDENED STEELS

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146U 5xD

FRACTIONAL & METRIC SERIES

CONTINUED

inch & mm								EDP NO.
DECIMAL DC	METRIC DC	FRACTIONAL/ LETTER/WIRE DC	SHANK DIAMETER DCON	OVERALL LENGTH OAL	FLUTE LENGTH LCF	USABLE LENGTH LU	SHANK LENGTH LS	Ti-NAMITE®-X (TX)
0.3281	8,334 mm	21/64	10,0	115,0	54,0	42,0	51,0	58896
0.3307	8,400 mm		10,0	115,0	55,0	42,0	51,0	67872
0.3320	8,433 mm	Q	10,0	115,0	55,0	42,0	51,0	58897
0.3346	8,500 mm		10,0	115,0	55,0	42,0	51,0	67873
0.3386	8,600 mm		10,0	115,0	56,0	43,0	51,0	67874
0.3425	8,700 mm		10,0	115,0	57,0	43,0	51,0	67875
0.3438	8,733 mm	11/32	10,0	115,0	57,0	44,0	51,0	58898
0.3465	8,800 mm		10,0	115,0	57,0	44,0	51,0	67876
0.3504	8,900 mm		10,0	115,0	58,0	45,0	51,0	67877
0.3543	9,000 mm		10,0	115,0	58,0	45,0	51,0	67878
0.3583	9,100 mm		10,0	115,0	59,0	46,0	51,0	67879
0.3594	9,129 mm	23/64	10,0	115,0	59,0	46,0	51,0	58899
0.3622	9,200 mm		10,0	125,0	60,0	46,0	55,0	67880
0.3661	9,300 mm		10,0	125,0	60,0	46,0	55,0	67881
0.3680	9,347 mm	U	10,0	125,0	61,0	47,0	55,0	58900
0.3701	9,400 mm		10,0	125,0	61,0	47,0	55,0	67882
0.3740	9,500 mm		10,0	125,0	62,0	47,0	55,0	67883
0.3750	9,525 mm	3/8	10,0	125,0	62,0	48,0	55,0	58901
0.3780	9,600 mm		10,0	125,0	62,0	48,0	55,0	67884
0.3819	9,700 mm		10,0	125,0	63,0	49,0	55,0	67885
0.3858	9,800 mm		10,0	125,0	64,0	49,0	55,0	67886
0.3898	9,900 mm		10,0	125,0	64,0	50,0	55,0	67887
0.3906	9,921 mm	25/64	10,0	125,0	64,0	50,0	55,0	58902
0.3937	10,000 mm		10,0	125,0	65,0	50,0	55,0	67888
0.3970	10,084 mm	X	12,0	135,0	66,0	50,0	57,0	58903
0.3976	10,100 mm		12,0	135,0	66,0	50,0	57,0	67889
0.4016	10,200 mm		12,0	135,0	66,0	51,0	57,0	67890
0.4040	10,262 mm	Y	12,0	135,0	67,0	51,0	57,0	58904
0.4055	10,300 mm		12,0	135,0	67,0	51,0	57,0	67891
0.4062	10,317 mm	13/32	12,0	135,0	67,0	52,0	57,0	58905
0.4094	10,400 mm		12,0	135,0	68,0	52,0	57,0	67892
0.4134	10,500 mm		12,0	135,0	68,0	53,0	57,0	67893
0.4173	10,600 mm		12,0	135,0	69,0	53,0	57,0	67894
0.4213	10,700 mm		12,0	135,0	70,0	54,0	57,0	67895
0.4219	10,716 mm	27/64	12,0	135,0	70,0	54,0	57,0	58906
0.4252	10,800 mm		12,0	135,0	70,0	54,0	57,0	67896
0.4291	10,900 mm		12,0	135,0	71,0	54,0	57,0	67897
0.4331	11,000 mm		12,0	135,0	72,0	55,0	57,0	67898
0.4370	11,100 mm		12,0	135,0	72,0	55,0	57,0	67899
0.4375	11,113 mm	7/16	12,0	135,0	72,0	56,0	57,0	58907
0.4409	11,200 mm		12,0	135,0	73,0	56,0	57,0	67900
0.4449	11,300 mm		12,0	135,0	73,0	57,0	57,0	67901
0.4488	11,400 mm		12,0	145,0	74,0	57,0	62,0	67902
0.4528	11,500 mm		12,0	145,0	75,0	58,0	62,0	67903
0.4531	11,509 mm	29/64	12,0	145,0	75,0	58,0	62,0	58908
0.4567	11,600 mm		12,0	145,0	75,0	58,0	62,0	67904
0.4606	11,700 mm		12,0	145,0	76,0	58,0	62,0	67905
0.4646	11,800 mm		12,0	145,0	77,0	59,0	62,0	67906
0.4685	11,900 mm		12,0	145,0	77,0	59,0	62,0	67907
0.4688	11,908 mm	15/32	12,0	145,0	77,0	60,0	62,0	58909

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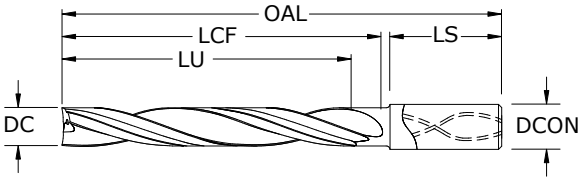
HIGH PERFORMANCE CARBIDE DRILLS

146U 5xD

FRACTIONAL & METRIC SERIES



- 4-margin design improves accuracy and surface finish along with increased strength for aggressive drilling
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- Engineered edge protection improves edge strength and reduces edge fatigue allowing for increased feed rates
- Recommended for materials ≤ 56 HRc (≤ 577 Bhn)

		inch & mm						EDP NO.
DECIMAL DC	METRIC DC	FRACTIONAL/ LETTER/WIRE DC	SHANK DIAMETER DCON	OVERALL LENGTH OAL	FLUTE LENGTH LCF	USABLE LENGTH LU	SHANK LENGTH LS	Ti-NAMITE®-X (TX)
0.4724	12,000 mm		12,0	145,0	78,0	60,0	62,0	67908
0.4844	12,304 mm	31/64	14,0	155,0	80,0	62,0	59,0	58910
0.4921	12,500 mm		14,0	155,0	81,0	62,0	59,0	67909
0.5000	12,700 mm	1/2	14,0	155,0	83,0	64,0	59,0	58911
0.5039	12,800 mm		14,0	155,0	83,0	64,0	59,0	67910
0.5118	13,000 mm		14,0	155,0	84,0	65,0	59,0	67911
0.5156	13,096 mm	33/64	14,0	155,0	85,0	65,0	59,0	58912
0.5312	13,492 mm	17/32	14,0	155,0	88,0	67,0	59,0	58913
0.5315	13,500 mm		14,0	155,0	88,0	68,0	59,0	67912
0.5469	13,891 mm	35/64	14,0	155,0	90,0	69,0	59,0	58914
0.5512	14,000 mm		14,0	155,0	91,0	70,0	59,0	67913
0.5625	14,288 mm	9/16	16,0	175,0	93,0	71,0	66,0	58915
0.5709	14,500 mm		16,0	175,0	94,0	73,0	66,0	67914
0.5781	14,684 mm	37/64	16,0	175,0	95,0	73,0	66,0	58916
0.5906	15,000 mm		16,0	175,0	98,0	75,0	66,0	67915
0.5938	15,083 mm	19/32	16,0	175,0	98,0	75,0	66,0	58917
0.6094	15,479 mm	39/64	16,0	175,0	101,0	77,0	66,0	58918
0.6102	15,500 mm		16,0	175,0	101,0	77,0	66,0	67916
0.6250	15,875 mm	5/8	16,0	175,0	103,0	79,0	66,0	58919
0.6299	16,000 mm		16,0	175,0	104,0	80,0	66,0	67917
0.6406	16,271 mm	41/64	18,0	195,0	106,0	81,0	73,0	58920
0.6496	16,500 mm		18,0	195,0	107,0	82,0	73,0	67918
0.6562	16,667 mm	21/32	18,0	195,0	108,0	83,0	73,0	58921
0.6693	17,000 mm		18,0	195,0	111,0	85,0	73,0	67919
0.6719	17,066 mm	43/64	18,0	195,0	111,0	85,0	73,0	58922
0.6875	17,463 mm	11/16	18,0	195,0	114,0	87,0	73,0	58923
0.6890	17,500 mm		18,0	195,0	114,0	88,0	73,0	67920
0.7031	17,859 mm	45/64	18,0	195,0	116,0	89,0	73,0	58924
0.7087	18,000 mm		18,0	195,0	117,0	90,0	73,0	67921
0.7188	18,258 mm	23/32	20,0	215,0	119,0	91,0	80,0	58925
0.7283	18,500 mm		20,0	215,0	120,0	92,0	80,0	67922
0.7344	18,654 mm	47/64	20,0	215,0	121,0	93,0	80,0	58926
0.7480	19,000 mm		20,0	215,0	123,0	95,0	80,0	67923
0.7500	19,050 mm	3/4	20,0	215,0	124,0	95,0	80,0	58927
0.7656	19,446 mm	49/64	20,0	215,0	126,0	97,0	80,0	58928
0.7677	19,500 mm		20,0	215,0	127,0	97,0	80,0	67924
0.7812	19,842 mm	25/32	20,0	215,0	129,0	99,0	80,0	58929
0.7874	20,000 mm		20,0	215,0	130,0	100,0	80,0	67925
0.7969	20,241 mm	51/64	22,0	220,0	132,0	101,0	81,0	58930
0.8071	20,500 mm		22,0	220,0	133,0	103,0	81,0	67926
0.8125	20,638 mm	13/16	22,0	220,0	134,0	103,0	81,0	58931

TOLERANCES (inch)

≤.1181 DIAMETER
DC = +.00008/+.00047
DCON = h_6

>.1181–.2362 DIAMETER
DC = +.00016/+.00063
DCON = h_6

>.2362–.3937 DIAMETER
DC = +.00024/+.00083
DCON = h_6

>.3937–.7087 DIAMETER
DC = +.00028/+.00098
DCON = h_6

>.7087–1.1811 DIAMETER
DC = +.00031/+.00114
DCON = h_6

TOLERANCES (mm)

≤3 DIAMETER
DC = +0,002/+0,012
DCON = h_6

>3–6 DIAMETER
DC = +0,004/+0,016
DCON = h_6

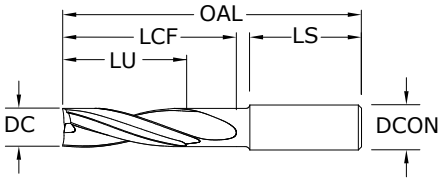
>6–10 DIAMETER
DC = +0,006/+0,021
DCON = h_6

>10–18 DIAMETER
DC = +0,007/+0,025
DCON = h_6

>18–30 DIAMETER
DC = +0,008/+0,029
DCON = h_6

- STEELS
- STAINLESS STEELS
- CAST IRON
- NON-FERROUS
- HIGH TEMP ALLOYS
- HARDENED STEELS

For patent information visit www.ksptpatents.com



136U 2xD

FRACTIONAL & METRIC SERIES

TOLERANCES (inch)

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DCON = h_6

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TOLERANCES (mm)

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DCON = h_6

>6–10 DIAMETER
DC = +0,006/+0,021
DCON = h_6

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DC = +0,007/+0,025
DCON = h_6

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DC = +0,008/+0,029
DCON = h_6

- STEELS
- STAINLESS STEELS
- CAST IRON
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inch & mm								EDP NO.
DECIMAL DC	METRIC DC	FRACTIONAL/ LETTER/WIRE DC	SHANK DIAMETER DCON	OVERALL LENGTH OAL	FLUTE LENGTH LCF	USABLE LENGTH LU	SHANK LENGTH LS	Ti-NAMITE®-X (TX)
0.0591	1,500 mm		6,0	45,0	5,0	3,0	33,0	67060
0.0625	1,588 mm	1/16	6,0	45,0	6,0	3,0	33,0	58480
0.0630	1,600 mm		6,0	45,0	6,0	3,0	33,0	67061
0.0669	1,700 mm		6,0	45,0	6,0	3,0	33,0	67062
0.0709	1,800 mm		6,0	45,0	6,0	4,0	33,0	67063
0.0748	1,900 mm		6,0	45,0	7,0	4,0	33,0	67064
0.0781	1,984 mm	5/64	6,0	45,0	7,0	4,0	33,0	58481
0.0787	2,000 mm		6,0	45,0	7,0	4,0	33,0	67065
0.0827	2,100 mm		6,0	45,0	7,0	4,0	33,0	67066
0.0866	2,200 mm		6,0	50,0	8,0	4,0	31,0	67067
0.0906	2,300 mm		6,0	50,0	8,0	5,0	31,0	67068
0.0938	2,383 mm	3/32	6,0	50,0	8,0	5,0	31,0	58482
0.0945	2,400 mm		6,0	50,0	8,0	5,0	31,0	67069
0.0984	2,500 mm		6,0	50,0	9,0	5,0	31,0	67070
0.1015	2,578 mm	#38	6,0	50,0	9,0	5,0	31,0	58483
0.1024	2,600 mm		6,0	50,0	9,0	5,0	31,0	67071
0.1040	2,642 mm	#37	6,0	50,0	9,0	5,0	31,0	58484
0.1063	2,700 mm		6,0	50,0	9,0	5,0	31,0	67072
0.1065	2,705 mm	#36	6,0	50,0	9,0	5,0	31,0	58485
0.1094	2,779 mm	7/64	6,0	50,0	10,0	6,0	31,0	58486
0.1102	2,800 mm		6,0	50,0	10,0	6,0	31,0	67073
0.1130	2,870 mm	#33	6,0	50,0	10,0	6,0	31,0	58487
0.1142	2,900 mm		6,0	50,0	10,0	6,0	31,0	67074
0.1181	3,000 mm		6,0	50,0	10,0	6,0	31,0	67075
0.1220	3,100 mm		6,0	50,0	11,0	6,0	31,0	67076
0.1250	3,175 mm	1/8	6,0	50,0	11,0	6,0	31,0	58488
0.1260	3,200 mm		6,0	50,0	11,0	6,0	31,0	67077
0.1299	3,300 mm		6,0	50,0	12,0	7,0	31,0	67078
0.1339	3,400 mm		6,0	50,0	12,0	7,0	31,0	67079
0.1360	3,454 mm	#29	6,0	50,0	12,0	7,0	31,0	58489
0.1378	3,500 mm		6,0	50,0	12,0	7,0	31,0	67080
0.1405	3,569 mm	#28	6,0	50,0	12,0	7,0	31,0	58490
0.1406	3,571 mm	9/64	6,0	50,0	12,0	7,0	31,0	58491
0.1417	3,600 mm		6,0	50,0	13,0	7,0	31,0	67081
0.1457	3,700 mm		6,0	50,0	13,0	7,0	31,0	67082
0.1470	3,734 mm	#26	6,0	50,0	13,0	7,0	31,0	58492
0.1495	3,797 mm	#25	6,0	50,0	13,0	8,0	31,0	58493
0.1496	3,800 mm		6,0	50,0	13,0	8,0	31,0	67083

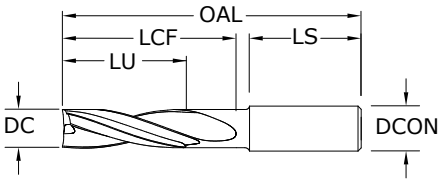
continued on next page

- 4-margin design improves accuracy and surface finish along with increased strength for aggressive drilling
- Specialized self-centering notched point eliminates the need for spot drilling decreasing thrust and deflection
- Engineered edge protection improves edge strength and reduces edge fatigue allowing for increased feed rates
- Recommended for materials ≤ 56 HRc (≤ 577 Bhn)

HIGH PERFORMANCE CARBIDE DRILLS

136U 2xD

FRACTIONAL & METRIC SERIES



- 4-margin design improves accuracy and surface finish along with increased strength for aggressive drilling
- Specialized self-centering notched point eliminates the need for spot drilling decreasing thrust and deflection
- Engineered edge protection improves edge strength and reduces edge fatigue allowing for increased feed rates
- Recommended for materials ≤ 56 HRc (≤ 577 Bhn)

inch & mm								EDP NO.
DECIMAL DC	METRIC DC	FRACTIONAL/ LETTER/WIRE DC	SHANK DIAMETER DCON	OVERALL LENGTH OAL	FLUTE LENGTH LCF	USABLE LENGTH LU	SHANK LENGTH LS	Ti-NAMITE®-X (TX)
0.1520	3,861 mm	#24	6,0	50,0	14,0	8,0	31,0	58494
0.1535	3,900 mm		6,0	50,0	14,0	8,0	31,0	67084
0.1562	3,967 mm	5/32	6,0	50,0	14,0	8,0	31,0	58495
0.1570	3,988 mm	#22	6,0	50,0	14,0	8,0	31,0	58496
0.1575	4,000 mm		6,0	50,0	14,0	8,0	31,0	67085
0.1590	4,039 mm	#21	6,0	50,0	14,0	8,0	31,0	58497
0.1610	4,089 mm	#20	6,0	50,0	14,0	8,0	31,0	58498
0.1614	4,100 mm		6,0	50,0	14,0	8,0	31,0	67086
0.1654	4,200 mm		6,0	60,0	15,0	8,0	34,0	67087
0.1693	4,300 mm		6,0	60,0	15,0	9,0	34,0	67088
0.1719	4,366 mm	11/64	6,0	60,0	15,0	9,0	34,0	58499
0.1732	4,400 mm		6,0	60,0	15,0	9,0	34,0	67089
0.1770	4,496 mm	#16	6,0	60,0	16,0	9,0	34,0	58500
0.1772	4,500 mm		6,0	60,0	16,0	9,0	34,0	67090
0.1811	4,600 mm		6,0	60,0	16,0	9,0	34,0	67091
0.1850	4,699 mm	#13	6,0	60,0	16,0	9,0	34,0	58501
0.1875	4,763 mm	3/16	6,0	60,0	17,0	10,0	34,0	58502
0.1890	4,801 mm	#12	6,0	60,0	17,0	10,0	34,0	58503
0.1929	4,900 mm		6,0	60,0	17,0	10,0	34,0	67094
0.1935	4,915 mm	#10	6,0	60,0	17,0	10,0	34,0	58504
0.1969	5,000 mm		6,0	60,0	18,0	10,0	34,0	67095
0.2008	5,100 mm		6,0	60,0	18,0	10,0	34,0	67096
0.2010	5,105 mm	#7	6,0	60,0	18,0	10,0	34,0	58505
0.2031	5,159 mm	13/64	6,0	60,0	18,0	10,0	34,0	58506
0.2047	5,200 mm		6,0	60,0	18,0	10,0	34,0	67097
0.2087	5,300 mm		6,0	60,0	19,0	11,0	34,0	67098
0.2090	5,309 mm	#4	6,0	60,0	19,0	11,0	34,0	58507
0.2126	5,400 mm		6,0	60,0	19,0	11,0	34,0	67099
0.2130	5,410 mm	#3	6,0	60,0	19,0	11,0	34,0	58508
0.2165	5,500 mm		6,0	60,0	19,0	11,0	34,0	67100
0.2188	5,558 mm	7/32	6,0	60,0	19,0	11,0	34,0	58509
0.2205	5,600 mm		6,0	60,0	20,0	11,0	34,0	67101
0.2244	5,700 mm		6,0	60,0	20,0	11,0	34,0	67102
0.2283	5,800 mm		6,0	60,0	20,0	12,0	34,0	67103
0.2323	5,900 mm		6,0	60,0	21,0	12,0	34,0	67104
0.2344	5,954 mm	15/64	6,0	60,0	21,0	12,0	34,0	58510
0.2362	6,000 mm		6,0	60,0	21,0	12,0	34,0	67105
0.2402	6,100 mm		8,0	70,0	22,0	13,0	37,0	67106

continued on next page

TOLERANCES (inch)

≤.1181 DIAMETER
DC = +.00008/+.00047
DCON = h_6

>.1181–.2362 DIAMETER
DC = +.00016/+.00063
DCON = h_6

>.2362–.3937 DIAMETER
DC = +.00024/+.00083
DCON = h_6

>.3937–.7087 DIAMETER
DC = +.00028/+.00098
DCON = h_6

>.7087–1.1811 DIAMETER
DC = +.00031/+.00114
DCON = h_6

TOLERANCES (mm)

≤3 DIAMETER
DC = +0,002/+0,012
DCON = h_6

>3–6 DIAMETER
DC = +0,004/+0,016
DCON = h_6

>6–10 DIAMETER
DC = +0,006/+0,021
DCON = h_6

>10–18 DIAMETER
DC = +0,007/+0,025
DCON = h_6

>18–30 DIAMETER
DC = +0,008/+0,029
DCON = h_6

- STEELS
- STAINLESS STEELS
- CAST IRON
- NON-FERROUS
- HIGH TEMP ALLOYS
- HARDENED STEELS

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FRACTIONAL & METRIC SERIES

CONTINUED

			inch & mm					EDP NO.
DECIMAL DC	METRIC DC	FRACTIONAL/ LETTER/WIRE DC	SHANK DIAMETER DCON	OVERALL LENGTH OAL	FLUTE LENGTH LCF	USABLE LENGTH LU	SHANK LENGTH LS	Ti-NAMITE®-X (TX)
0.2441	6,200 mm		8,0	70,0	22,0	12,0	37,0	67107
0.2461	6,250 mm		8,0	70,0	22,0	13,0	37,0	67108
0.2480	6,300 mm		8,0	70,0	22,0	13,0	37,0	67109
0.2500	6,350 mm	1/4 E #0	8,0	70,0	22,0	13,0	37,0	58511
0.2520	6,400 mm		8,0	70,0	22,0	13,0	37,0	67110
0.2559	6,500 mm		8,0	70,0	23,0	13,0	37,0	67111
0.2570	6,528 mm	F	8,0	70,0	23,0	13,0	37,0	58512
0.2598	6,600 mm		8,0	70,0	23,0	13,0	37,0	67112
0.2638	6,700 mm		8,0	70,0	23,0	13,0	37,0	67113
0.2656	6,746 mm	17/64	8,0	70,0	24,0	13,0	37,0	58513
0.2677	6,800 mm		8,0	70,0	24,0	14,0	37,0	67114
0.2717	6,900 mm		8,0	70,0	24,0	14,0	37,0	67115
0.2720	6,909 mm	I	8,0	70,0	24,0	14,0	37,0	58514
0.2756	7,000 mm		8,0	70,0	25,0	14,0	37,0	67116
0.2795	7,100 mm		8,0	70,0	25,0	14,0	37,0	67117
0.2812	7,142 mm	9/32	8,0	70,0	25,0	14,0	37,0	58515
0.2835	7,200 mm		8,0	70,0	25,0	14,0	37,0	67118
0.2854	7,250 mm		8,0	70,0	25,0	14,0	37,0	67119
0.2874	7,300 mm		8,0	70,0	26,0	15,0	37,0	67120
0.2913	7,400 mm		8,0	70,0	26,0	15,0	37,0	67121
0.2953	7,500 mm		8,0	70,0	26,0	15,0	37,0	67122
0.2969	7,541 mm	19/64	8,0	70,0	26,0	15,0	37,0	58516
0.2992	7,600 mm		8,0	70,0	27,0	15,0	37,0	67123
0.3031	7,700 mm		8,0	70,0	27,0	15,0	37,0	67124
0.3071	7,800 mm		8,0	70,0	27,0	16,0	37,0	67125
0.3110	7,900 mm		8,0	70,0	28,0	16,0	37,0	67126
0.3125	7,938 mm	5/16	8,0	70,0	28,0	16,0	37,0	58517
0.3150	8,000 mm		8,0	70,0	28,0	16,0	37,0	67127
0.3189	8,100 mm		10,0	80,0	29,0	17,0	40,0	67128
0.3228	8,200 mm		10,0	80,0	29,0	16,0	40,0	67129
0.3268	8,300 mm		10,0	80,0	29,0	17,0	40,0	67130
0.3281	8,334 mm	21/64	10,0	80,0	29,0	17,0	40,0	58518
0.3307	8,400 mm		10,0	80,0	29,0	17,0	40,0	67131
0.3320	8,433 mm	Q	10,0	80,0	30,0	17,0	40,0	58519
0.3346	8,500 mm		10,0	80,0	30,0	17,0	40,0	67132
0.3386	8,600 mm		10,0	80,0	30,0	17,0	40,0	67133
0.3425	8,700 mm		10,0	80,0	30,0	17,0	40,0	67134
0.3438	8,733 mm	11/32	10,0	80,0	31,0	17,0	40,0	58520
0.3465	8,800 mm		10,0	80,0	31,0	18,0	40,0	67135
0.3504	8,900 mm		10,0	80,0	31,0	18,0	40,0	67136
0.3543	9,000 mm		10,0	80,0	31,0	18,0	40,0	67137
0.3583	9,100 mm		10,0	80,0	32,0	18,0	40,0	67138
0.3594	9,129 mm	23/64	10,0	80,0	32,0	18,0	40,0	58521
0.3622	9,200 mm		10,0	80,0	32,0	18,0	40,0	67139
0.3661	9,300 mm		10,0	80,0	33,0	19,0	40,0	67140
0.3680	9,347 mm	U	10,0	80,0	33,0	19,0	40,0	58522

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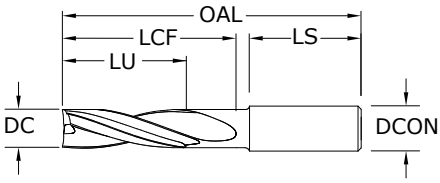
HIGH PERFORMANCE CARBIDE DRILLS

136U 2xD

FRACTIONAL & METRIC SERIES



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- Recommended for materials ≤ 56 HRc (≤ 577 Bhn)

			inch & mm					EDP NO.
DECIMAL DC	METRIC DC	FRACTIONAL/ LETTER/WIRE DC	SHANK DIAMETER DCON	OVERALL LENGTH OAL	FLUTE LENGTH LCF	USABLE LENGTH LU	SHANK LENGTH LS	Ti-NAMITE®-X (TX)
0.3701	9,400 mm		10,0	80,0	33,0	19,0	40,0	67141
0.3740	9,500 mm		10,0	80,0	33,0	19,0	40,0	67142
0.3750	9,525 mm	3/8	10,0	80,0	33,0	19,0	40,0	58523
0.3780	9,600 mm		10,0	80,0	34,0	19,0	40,0	67143
0.3819	9,700 mm		10,0	80,0	34,0	19,0	40,0	67144
0.3858	9,800 mm		10,0	80,0	34,0	20,0	40,0	67145
0.3898	9,900 mm		10,0	80,0	35,0	20,0	40,0	67146
0.3906	9,921 mm	25/64	10,0	80,0	35,0	20,0	40,0	58524
0.3937	10,000 mm		10,0	80,0	35,0	20,0	40,0	67147
0.3970	10,084 mm	X	12,0	90,0	36,0	21,0	43,0	58525
0.3976	10,100 mm		12,0	90,0	36,0	21,0	43,0	67148
0.4016	10,200 mm		12,0	90,0	36,0	20,0	43,0	67149
0.4040	10,262 mm	Y	12,0	90,0	36,0	21,0	43,0	58526
0.4055	10,300 mm		12,0	90,0	36,0	21,0	43,0	67150
0.4062	10,317 mm	13/32	12,0	90,0	36,0	21,0	43,0	58527
0.4094	10,400 mm		12,0	90,0	36,0	21,0	43,0	67151
0.4134	10,500 mm		12,0	90,0	37,0	21,0	43,0	67152
0.4173	10,600 mm		12,0	90,0	37,0	21,0	43,0	67153
0.4213	10,700 mm		12,0	90,0	37,0	21,0	43,0	67154
0.4219	10,716 mm	27/64	12,0	90,0	38,0	21,0	43,0	58528
0.4252	10,800 mm		12,0	90,0	38,0	22,0	43,0	67155
0.4291	10,900 mm		12,0	90,0	38,0	22,0	43,0	67156
0.4331	11,000 mm		12,0	90,0	39,0	22,0	43,0	67157
0.4370	11,100 mm		12,0	90,0	39,0	22,0	43,0	67158
0.4375	11,113 mm	7/16	12,0	90,0	39,0	22,0	43,0	58529
0.4409	11,200 mm		12,0	90,0	39,0	22,0	43,0	67159
0.4449	11,300 mm		12,0	90,0	40,0	23,0	43,0	67160
0.4488	11,400 mm		12,0	90,0	40,0	23,0	43,0	67161
0.4528	11,500 mm		12,0	90,0	40,0	23,0	43,0	67162
0.4531	11,509 mm	29/64	12,0	90,0	40,0	23,0	43,0	58530
0.4567	11,600 mm		12,0	90,0	41,0	23,0	43,0	67163
0.4606	11,700 mm		12,0	90,0	41,0	23,0	43,0	67164
0.4646	11,800 mm		12,0	90,0	41,0	24,0	43,0	67165
0.4685	11,900 mm		12,0	90,0	42,0	24,0	43,0	67166
0.4688	11,908 mm	15/32	12,0	90,0	42,0	24,0	43,0	58531
0.4724	12,000 mm		12,0	90,0	42,0	24,0	43,0	67167
0.4844	12,304 mm	31/64	14,0	100,0	43,0	25,0	46,0	58532
0.4921	12,500 mm		14,0	100,0	44,0	25,0	46,0	67168

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TOLERANCES (inch)

≤.1181 DIAMETER
DC = +.00008/+.00047
DCON = h_6

>.1181–.2362 DIAMETER
DC = +.00016/+.00063
DCON = h_6

>.2362–.3937 DIAMETER
DC = +.00024/+.00083
DCON = h_6

>.3937–.7087 DIAMETER
DC = +.00028/+.00098
DCON = h_6

>.7087–1.1811 DIAMETER
DC = +.00031/+.00114
DCON = h_6

TOLERANCES (mm)

≤3 DIAMETER
DC = +0,002/+0,012
DCON = h_6

>3–6 DIAMETER
DC = +0,004/+0,016
DCON = h_6

>6–10 DIAMETER
DC = +0,006/+0,021
DCON = h_6

>10–18 DIAMETER
DC = +0,007/+0,025
DCON = h_6

>18–30 DIAMETER
DC = +0,008/+0,029
DCON = h_6

- STEELS
- STAINLESS STEELS
- CAST IRON
- NON-FERROUS
- HIGH TEMP ALLOYS
- HARDENED STEELS

For patent information visit www.ksptpatents.com

136U 2xD

FRACTIONAL & METRIC SERIES

CONTINUED

inch & mm								EDP NO.
DECIMAL DC	METRIC DC	FRACTIONAL/ LETTER/WIRE DC	SHANK DIAMETER DCON	OVERALL LENGTH OAL	FLUTE LENGTH LCF	USABLE LENGTH LU	SHANK LENGTH LS	Ti-NAMITE®-X (TX)
0.5000	12,700 mm	1/2	14,0	100,0	44,0	25,0	46,0	58533
0.5039	12,800 mm		14,0	100,0	45,0	26,0	46,0	67169
0.5118	13,000 mm		14,0	100,0	45,0	26,0	46,0	67170
0.5156	13,096 mm	33/64	14,0	100,0	46,0	26,0	46,0	58534
0.5312	13,492 mm	17/32	14,0	100,0	47,0	27,0	46,0	58535
0.5315	13,500 mm		14,0	100,0	47,0	27,0	46,0	67171
0.5469	13,891 mm	35/64	14,0	100,0	49,0	28,0	46,0	58536
0.5512	14,000 mm		14,0	100,0	49,0	28,0	46,0	67172
0.5625	14,288 mm	9/16	16,0	110,0	50,0	29,0	49,0	58537
0.5709	14,500 mm		16,0	110,0	51,0	29,0	49,0	67173
0.5781	14,684 mm	37/64	16,0	110,0	51,0	29,0	49,0	58538
0.5906	15,000 mm		16,0	110,0	53,0	30,0	49,0	67174
0.5938	15,083 mm	19/32	16,0	110,0	53,0	30,0	49,0	58539
0.6094	15,479 mm	39/64	16,0	110,0	54,0	31,0	49,0	58540
0.6102	15,500 mm		16,0	110,0	54,0	31,0	49,0	67175
0.6250	15,875 mm	5/8	16,0	110,0	56,0	32,0	49,0	58541
0.6299	16,000 mm		16,0	110,0	56,0	32,0	49,0	67176
0.6406	16,271 mm	41/64	18,0	125,0	57,0	33,0	57,0	58542
0.6496	16,500 mm		18,0	125,0	58,0	33,0	57,0	67177
0.6562	16,667 mm	21/32	18,0	125,0	58,0	33,0	57,0	58543
0.6693	17,000 mm		18,0	125,0	60,0	34,0	57,0	67178
0.6719	17,066 mm	43/64	18,0	125,0	60,0	34,0	57,0	58544
0.6875	17,463 mm	11/16	18,0	125,0	61,0	35,0	57,0	58545
0.6890	17,500 mm		18,0	125,0	61,0	35,0	57,0	67179
0.7031	17,859 mm	45/64	18,0	125,0	63,0	36,0	57,0	58546
0.7087	18,000 mm		18,0	125,0	63,0	36,0	57,0	67180
0.7188	18,258 mm	23/32	20,0	135,0	64,0	37,0	60,0	58547
0.7283	18,500 mm		20,0	135,0	65,0	37,0	60,0	67181
0.7344	18,654 mm	47/64	20,0	135,0	65,0	37,0	60,0	58548
0.7480	19,000 mm		20,0	135,0	66,0	38,0	60,0	67182
0.7500	19,050 mm	3/4	20,0	135,0	67,0	38,0	60,0	58549
0.7656	19,446 mm	49/64	20,0	135,0	68,0	39,0	60,0	58550
0.7677	19,500 mm		20,0	135,0	68,0	39,0	60,0	67183
0.7812	19,842 mm	25/32	20,0	135,0	69,0	40,0	60,0	58551
0.7874	20,000 mm		20,0	135,0	70,0	40,0	60,0	67184
0.7969	20,241 mm	51/64	22,0	145,0	71,0	40,0	68,0	58552
0.8071	20,500 mm		22,0	145,0	72,0	41,0	68,0	67185
0.8125	20,638 mm	13/16	22,0	145,0	72,0	41,0	68,0	58553

FRACTIONAL

Hi-PerCarb®

	Series 146U, 136U Fractional	Hardness	Vc (sfm)		DC • in 1/16	1/8	1/4	3/8	1/2	5/8	3/4	13/16
P	CARBON STEELS 1018, 1040, 1080, 1090, 10L50, 1140, 1212, 12L15, 1525, 1536	≤ 175 Bhn or ≤ 7 HRc	285	RPM	17419	8710	4355	2903	2177	1742	1452	1340
			(228-342)	Fr	0.0016	0.0031	0.0062	0.0093	0.0124	0.0155	0.0186	0.0202
				Feed (ipm)	27.0	27.0	27.0	27.0	27.0	27.0	27.0	27.0
		≤ 275 Bhn or ≤ 28 HRc	255	RPM	15586	7793	3896	2598	1948	1559	1299	1199
			(204-306)	Fr	0.0013	0.0027	0.0054	0.0081	0.0108	0.0135	0.0162	0.0175
				Feed (ipm)	21.0	21.0	21.0	21.0	21.0	21.0	21.0	21.0
		≤ 425 Bhn or ≤ 45 HRc	145	RPM	8862	4431	2216	1477	1108	886	739	682
			(116-174)	Fr	0.0011	0.0023	0.0045	0.0068	0.0090	0.0113	0.0135	0.0147
				Feed (ipm)	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
	ALLOY STEELS 4140, 4150, 4320, 5120, 5150, 8630, 86L20, 50100	≤ 275 Bhn or ≤ 28 HRc	220	RPM	13446	6723	3362	2241	1681	1345	1121	1034
			(176-264)	Fr	0.0015	0.0030	0.0059	0.0089	0.0119	0.0149	0.0178	0.0193
				Feed (ipm)	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0
		≤ 375 Bhn or ≤ 40 HRc	135	RPM	8251	4126	2063	1375	1031	825	688	635
			(108-162)	Fr	0.0013	0.0027	0.0053	0.0080	0.0107	0.0133	0.0160	0.0173
				Feed (ipm)	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0
	TOOL STEELS A2, D2, H13, L2, M2, P20, S7, T15, W2	≤ 200 Bhn or ≤ 13 HRc	125	RPM	7640	3820	1910	1273	955	764	637	**588**
			(100-150)	Fr	0.0012	0.0025	0.0050	0.0075	0.0099	0.0124	0.0149	**0.0162**
				Feed (ipm)	9.5	9.5	9.5	9.5	9.5	9.5	9.5	**9.5**
		≤ 375 Bhn or ≤ 40 HRc	90	RPM	5501	2750	1375	917	688	550	458	**423**
			(72-108)	Fr	0.0005	0.0011	0.0022	0.0033	0.0044	0.0055	0.0065	**0.0071**
				Feed (ipm)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	**3.0**
M	STAINLESS STEELS (FREE MACHINING) 303, 416, 420F, 430F, 440F	≤ 185 Bhn or ≤ 9 HRc	265	RPM	16197	8098	4049	2699	2025	1620	1350	1246
			(212-318)	Fr	0.0008	0.0016	0.0032	0.0048	0.0064	0.0080	0.0096	0.0104
				Feed (ipm)	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0
		≤ 275 Bhn or ≤ 28 HRc	170	RPM	10390	5195	2598	1732	1299	1039	866	799
			(136-204)	Fr	0.0006	0.0013	0.0025	0.0038	0.0050	0.0063	0.0075	0.0081
				Feed (ipm)	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5
	STAINLESS STEELS (DIFFICULT) 304, 316, 321, 13-8 PH, 15-5PH, 17-4 PH, Custom 450	≤ 275 Bhn or ≤ 28 HRc	130	RPM	7946	3973	1986	1324	993	795	662	611
			(104-156)	Fr	0.0006	0.0013	0.0025	0.0038	0.0050	0.0063	0.0076	0.0082
				Feed (ipm)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
		≤ 375 Bhn or ≤ 40 HRc	95	RPM	5806	2903	1452	968	726	581	484	447
			(76-114)	Fr	0.0006	0.0011	0.0023	0.0034	0.0045	0.0057	0.0068	0.0074
				Feed (ipm)	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3
K	GRAY CAST IRONS	≤ 220 Bhn or ≤ 19 HRc	250	RPM	15280	7640	3820	2547	1910	1528	1273	1175
			(200-300)	Fr	0.0016	0.0031	0.0063	0.0094	0.0126	0.0157	0.0188	0.0204
				Feed (ipm)	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0
	DUCTILE CAST IRONS	≤ 260 Bhn or ≤ 26 HRc	220	RPM	13446	6723	3362	2241	1681	1345	1121	1034
			(176-264)	Fr	0.0015	0.0030	0.0059	0.0089	0.0119	0.0149	0.0178	0.0193
				Feed (ipm)	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0

continued on next page

	Series 146U, 136U Fractional	Hardness	Vc (sfm)		DC • in 1/16	1/8	1/4	3/8	1/2	5/8	3/4	13/16
N	ALUMINUM ALLOYS (WROUGHT) 2024, 6061, 7075	≤ 150 Bhn or ≤ 88 HRb	475	RPM	29032	14516	7258	4839	3629	2903	2419	2233
			(380-570)	Fr	0.0016	0.0031	0.0062	0.0093	0.0124	0.0155	0.0186	0.0202
				Feed (ipm)	45.0	45.0	45.0	45.0	45.0	45.0	45.0	45.0
	ALUMINUM ALLOYS (CAST) A356, A380, 390	≤ 140 Bhn or ≤ 3 HRc	380	RPM	23226	11613	5806	3871	2903	2323	1935	1787
			(304-456)	Fr	0.0014	0.0028	0.0055	0.0083	0.0110	0.0138	0.0165	0.0179
				Feed (ipm)	32.0	32.0	32.0	32.0	32.0	32.0	32.0	32.0
S	TITANIUM ALLOYS Pure Titanium, Ti6Al4V, Ti6Al2Sn4Zr2Mo, Ti4Al4Mo2Sn0.5Si, Ti-6Al4V	≤ 275 Bhn or ≤ 28 HRc	175	RPM	10696	5348	2674	1783	1337	1070	891	823
			(140-210)	Fr	0.0007	0.0014	0.0028	0.0042	0.0055	0.0069	0.0083	0.0090
				Feed (ipm)	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4
		≤ 350 Bhn or ≤ 38 HRc	130	RPM	7946	3973	1986	1324	993	795	662	611
			(104-156)	Fr	0.0006	0.0013	0.0025	0.0038	0.0050	0.0063	0.0076	0.0082
				Feed (ipm)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
		≤ 440 Bhn or ≤ 47 HRc	70	RPM	4278	2139	1070	713	535	428	357	329
			(56-84)	Fr	0.0005	0.0009	0.0019	0.0028	0.0037	0.0047	0.0056	0.0061
				Feed (ipm)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
H	ALLOY STEELS 4140, 4150, 4320, 5120, 5150, 8630, 86L20, 50100	≤ 450 Bhn or ≤ 48 HRc	95	RPM	5806	2903	1452	968	726	581	484	447
			(76-114)	Fr	0.0008	0.0016	0.0031	0.0047	0.0062	0.0078	0.0093	0.0101
				Feed (ipm)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
	TOOL STEELS A2, D2, H13, L2, M2, P20, S7, T15, W2	≤ 475 Bhn or ≤ 50 HRc	80	RPM	4890	2445	1222	815	611	489	407	376
			(64-96)	Fr	0.0007	0.0014	0.0029	0.0043	0.0057	0.0072	0.0086	0.0093
				Feed (ipm)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5

reduce rates when material is harder than listed, when drilling conditions are not optimum, or coolant is not available
rates shown are for drilling into a flat surface and should be lowered using the reducion multiplier when the workpiece is angled or curved
reduce rates 10 to 20 percent when using drills without internal coolant
always use the shortest overhang possible
longer drills may require a spot drill operation to avoid walking on entry
internal coolant required in ISO S and M material groups or when drilling depth exceeds 3xD
Bhn (Brinell) HRc (Rockwell C) HRb (Rockwell B)
rpm = Vc x 3.82 / DC
ipm = Fr x rpm
speed and feed for materials harder than listed
refer to the SGS Tool Wizard® for complete technical information (www.kyocera-sgstool.com)

	reduction multiplier	
angle °	speed x	feed x
up to 30	1.0	0.6
over 30	0.7	0.4

Hi-PerCarb®

	Series 146U, 136U Metric	Hardness	Vc (m/mm)		DC • mm 1.5	3	6	8	10	12	16	20
P	CARBON STEELS 1018, 1040, 1080, 1090, 10L50, 1140, 1212, 12L15, 1525, 1536	≤ 175 Bhn or ≤ 7 HRc	87	RPM	18419	9209	4605	3454	2763	2302	1727	1381
			(69-104)	Fr	0.037	0.074	0.149	0.199	0.248	0.298	0.397	0.496
				Feed (mm/min)	686	686	686	686	686	686	686	686
		≤ 275 Bhn or ≤ 28 HRc	78	RPM	16480	8240	4120	3090	2472	2060	1545	1236
			(62-93)	Fr	0.032	0.065	0.129	0.173	0.216	0.259	0.345	0.432
				Feed (mm/min)	533	533	533	533	533	533	533	533
		≤ 425 Bhn or ≤ 45 HRc	44	RPM	9371	4686	2343	1757	1406	1171	879	703
			(35-53)	Fr	0.027	0.054	0.108	0.145	0.181	0.217	0.289	0.361
				Feed (mm/min)	254	254	254	254	254	254	254	254
	ALLOY STEELS 4140, 4150, 4320, 5120, 5150, 8630, 86L20, 50100	≤ 275 Bhn or ≤ 28 HRc	67	RPM	14218	7109	3555	2666	2133	1777	1333	1066
			(54-80)	Fr	0.036	0.071	0.143	0.191	0.238	0.286	0.381	0.476
				Feed (mm/min)	508	508	508	508	508	508	508	508
		≤ 375 Bhn or ≤ 40 HRc	41	RPM	8725	4362	2181	1636	1309	1091	818	654
			(33-49)	Fr	0.032	0.064	0.128	0.171	0.213	0.256	0.342	0.427
				Feed (mm/min)	279	279	279	279	279	279	279	279
	TOOL STEELS A2, D2, H13, L2, M2, P20, S7, T15, W2	≤ 200 Bhn or ≤ 13 HRc	38	RPM	8078	4039	2020	1515	1212	1010	757	606
			(30-46)	Fr	0.030	0.060	0.119	0.159	0.199	0.239	0.319	0.398
				Feed (mm/min)	241	241	241	241	241	241	241	241
		≤ 375 Bhn or ≤ 40 HRc	27	RPM	5816	2908	1454	1091	872	727	545	436
			(22-33)	Fr	0.013	0.026	0.052	0.070	0.087	0.105	0.140	0.175
				Feed (mm/min)	76	76	76	76	76	76	76	76
M	STAINLESS STEELS (FREE MACHINING) 303, 416, 420F, 430F, 440F	≤ 185 Bhn or ≤ 9 HRc	81	RPM	17126	8563	4282	3211	2569	2141	1606	1284
			(65-97)	Fr	0.019	0.039	0.077	0.103	0.129	0.154	0.206	0.257
				Feed (mm/min)	330	330	330	330	330	330	330	330
		≤ 275 Bhn or ≤ 28 HRc	52	RPM	10987	5493	2747	2060	1648	1373	1030	824
			(41-62)	Fr	0.015	0.030	0.060	0.080	0.100	0.120	0.160	0.200
				Feed (mm/min)	165	165	165	165	165	165	165	165
	STAINLESS STEELS (DIFFICULT) 304, 316, 321, 13-8 PH, 15-5PH, 17-4 PH, Custom 450	≤ 275 Bhn or ≤ 28 HRc	40	RPM	8402	4201	2100	1575	1260	1050	788	630
			(32-48)	Fr	0.015	0.030	0.060	0.081	0.101	0.121	0.161	0.202
				Feed (mm/min)	127	127	127	127	127	127	127	127
		≤ 375 Bhn or ≤ 40 HRc	29	RPM	6140	3070	1535	1151	921	767	576	460
			(23-35)	Fr	0.014	0.027	0.055	0.073	0.091	0.109	0.146	0.182
				Feed (mm/min)	84	84	84	84	84	84	84	84
K	GRAY CAST IRONS	≤ 220 Bhn or ≤ 19 HRc	76	RPM	16157	8078	4039	3029	2424	2020	1515	1212
			(61-91)	Fr	0.038	0.075	0.151	0.201	0.252	0.302	0.402	0.503
				Feed (mm/min)	610	610	610	610	610	610	610	610
	DUCTILE CAST IRONS	≤ 260 Bhn or ≤ 26 HRc	67	RPM	14218	7109	3555	2666	2133	1777	1333	1066
			(54-80)	Fr	0.036	0.071	0.143	0.191	0.238	0.286	0.381	0.476
				Feed (mm/min)	508	508	508	508	508	508	508	508

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Hi-PerCarb®

	Series 146U, 136U Metric	Hardness	Vc (m/mm)		DC • mm 1.5	3	6	8	10	12	16	20
N	ALUMINUM ALLOYS (WROUGHT) 2024, 6061, 7075	≤ 150 Bhn or ≤ 88 HRb	145	RPM	30698	15349	7675	5756	4605	3837	2878	2302
			(116-174)	Fr	0.037	0.074	0.149	0.199	0.248	0.298	0.397	0.496
				Feed (mm/min)	1143	1143	1143	1143	1143	1143	1143	1143
	ALUMINUM ALLOYS (CAST) A356, A380, 390	≤ 140 Bhn or ≤ 3 HRc	116	RPM	24559	12279	6140	4605	3684	3070	2302	1842
			(93-139)	Fr	0.033	0.066	0.132	0.177	0.221	0.265	0.353	0.441
				Feed (mm/min)	813	813	813	813	813	813	813	813
S	TITANIUM ALLOYS Pure Titanium, Ti6Al4V, Ti6Al2Sn4Zr2Mo, Ti4Al4Mo2Sn0.5Si, Ti-6Al4V	≤ 275 Bhn or ≤ 28 HRc	53	RPM	11310	5655	2827	2121	1696	1414	1060	848
			(43-64)	Fr	0.017	0.033	0.066	0.089	0.111	0.133	0.177	0.222
				Feed (mm/min)	188	188	188	188	188	188	188	188
		≤ 350 Bhn or ≤ 38 HRc	40	RPM	8402	4201	2100	1575	1260	1050	788	630
			(32-48)	Fr	0.015	0.030	0.060	0.081	0.101	0.121	0.161	0.202
				Feed (mm/min)	127	127	127	127	127	127	127	127
		≤ 440 Bhn or ≤ 47 HRc	21	RPM	4524	2262	1131	848	679	565	424	339
			(17-26)	Fr	0.011	0.022	0.045	0.060	0.075	0.090	0.120	0.150
				Feed (mm/min)	51	51	51	51	51	51	51	51
H	ALLOY STEELS 4140, 4150, 4320, 5120, 5150, 8630, 86L20, 50100	≤ 450 Bhn or ≤ 48 HRc	29	RPM	6140	3070	1535	1151	921	767	576	460
			(23-35)	Fr	0.019	0.037	0.074	0.099	0.124	0.149	0.199	0.248
				Feed (mm/min)	114	114	114	114	114	114	114	114
	TOOL STEELS A2, D2, H13, L2, M2, P20, S7, T15, W2	≤ 475 Bhn or ≤ 50 HRc	24	RPM	5170	2585	1293	969	776	646	485	388
			(20-29)	Fr	0.017	0.034	0.069	0.092	0.115	0.138	0.183	0.229
				Feed (mm/min)	89	89	89	89	89	89	89	89

reduce rates when material is harder than listed, when drilling conditions are not optimum, or coolant is not available
rates shown are for drilling into a flat surface and should be lowered using the reducion multiplier when the workpiece is angled or curved
reduce rates 10 to 20 percent when using drills without internal coolant
always use the shortest overhang possible
longer drills may require a spot drill operation to avoid walking on entry
internal coolant required in ISO S and M material groups or when drilling depth exceeds 3xD
Bhn (Brinell) HRc (Rockwell C) HRb (Rockwell B)
rpm = (Vc x 1000) / (DC x 3.14)
mm/min = Fr x rpm
speed and feed for materials harder than listed
refer to the SGS Tool Wizard® for complete technical information (www.kyocera-sgstool.com)

	reduction multiplier	
angle °	speed x	feed x
up to 30	1.0	0.6
over 30	0.7	0.4

SGS Solid Carbide Tools

Keeping the world moving

General Purpose End Mills

Milling

SERIES	GENERAL APPLICATION END MILLS DESCRIPTION	PAGE	S&F PAGE
3M	2 Flute Square End Standard Length Metric	201	220
3XLM	2 Flute Square End Extra Long Reach Metric	201	220
3MB	2 Flute Ball End Standard Length Metric	202	220
3XLMB	2 Flute Ball End Extra Long Reach Metric	202	220
15M	2 Flute Double End Square Stub Metric	203	220
15MB	2 Flute Double End Ball Stub Metric	204	220
17M	2 Flute Square End Stub Metric	205	220
52M	2 Flute High Shear Square End Standard Length Metric	206	222
59M	2 Flute Square End Long Reach Metric	207	220
59MB	2 Flute Ball End Long Reach Metric	208	221
5M	3 Flute Square End Standard Length Metric	209	220
5XLM	3 Flute Square End Extra Long Reach Metric	209	220
5MB	3 Flute Ball End Standard Length Metric	210	220
5XLMB	3 Flute Ball End Extra Long Reach Metric	210	220
1M	4 Flute Square End Standard Length Metric	211	220
1XLM	4 Flute Square End Extra Long Reach Metric	211	220
1MCR	4 Flute Corner Radius Standard Length Metric	211	220
1MB	4 Flute Ball End Standard Length Metric	214	220
1XLMB	4 Flute Ball End Extra Long Reach Metric	214	220
14M	4 Flute Double End Square Stub Metric	215	220
14MB	4 Flute Double End Ball Stub Metric	215	220
16M	4 Flute Square End Stub Metric	211	220
54M	4 Flute High Shear Square End Standard Length Metric	217	222
61M	Multi-Flute Coarse Pitch Rougher Metric	218	224
62M	Multi-Flute Fine Pitch Rougher Metric	219	225

Speed & Feed Recommendations listed at the end of this section

Fresado

SERIE	DESCRIPCIÓN DE FRESAS DE USO GENERAL	PÁGINA	S&F PÁGINA
3M	2 filos, punta cuadrada, longitud estándar, métrico	201	220
3XLM	2 filos, punta cuadrada, alcance extralargo, métrico	201	220
3MB	2 filos, punta esférica, longitud estándar, métrico	202	220
3XLMB	2 filos, punta esférica, alcance extralargo, métrico	202	220
15M	2 filos, pieza doble de punta cuadrada, métrico	203	220
15MB	2 filos, pieza doble de punta esférica, métrico	204	220
17M	2 filos, pieza de punta cuadrada, métrico	205	220
52M	2 filos, alto rendimiento, punta cuadrada, longitud estándar, métrico	206	222
59M	2 filos, punta cuadrada, largo alcance, métrico	207	220
59MB	2 filos, punta esférica, largo alcance, métrico	208	221
5M	3 filos, punta cuadrada, longitud estándar, métrico	209	220
5XLM	3 filos, punta cuadrada, alcance extralargo, métrico	209	220
5MB	3 filos, punta esférica, longitud estándar, métrico	210	220
5XLMB	3 filos, punta esférica, alcance extralargo, métrico	210	220
1M	4 filos, punta cuadrada, longitud estándar, métrico	211	220
1XLM	4 filos, punta cuadrada, alcance extralargo, métrico	211	220
1MCR	4 filos, radio angulado, longitud estándar, métrico	211	220
1MB	4 filos, punta esférica, longitud estándar, métrico	214	220
1XLMB	4 filos, punta esférica, alcance extralargo, métrico	214	220
14M	4 filos, pieza doble de punta cuadrada, métrico	215	220
14MB	4 filos, pieza doble de punta esférica, métrico	215	220
16M	4 filos, pieza de punta cuadrada, métrico	211	220
54M	4 filos, alto rendimiento, punta cuadrada, longitud estándar, métrico	217	222
61M	Filo múltiple, paso grueso, desbastador, métrico	218	224
62M	Filo múltiple, paso fino, desbastador, métrico	219	225

Recomendaciones de Velocidad y Avance mostrados al final de esta sección.

Fraisage

SÈRIES	DESCRIPTION DE FRAISES À USAGE GÉNÉRAL	PAGE	S&F PAGE
3M	2 dents non rayonné longueur standard (métrique)	201	220
3XLM	2 dents non rayonné portée extra-longue (métrique)	201	220
3MB	2 dents à bout hémisphérique longueur standard (métrique)	202	220
3XLMB	2 dents à bout hémisphérique portée extra-longue (métrique)	202	220
15M	2 dents à double bouts plats court (métrique)	203	220
15MB	2 dents à double bouts hémisphériques court (métrique)	204	220
17M	2 dents non rayonné court (métrique)	205	220
52M	2 dents cisaillement élevé non rayonné longueur standard (métrique)	206	222
59M	2 dents non rayonné longue portée (métrique)	207	220
59MB	2 dents à bout hémisphérique longue portée (métrique)	208	221
5M	3 dents non rayonné longueur standard (métrique)	209	220
5XLM	3 dents non rayonné portée extra-longue (métrique)	209	220
5MB	3 dents à bout hémisphérique longueur standard (métrique)	210	220
5XLMB	3 dents à bout hémisphérique portée extra-longue (métrique)	210	220
1M	4 dents non rayonné longueur standard (métrique)	211	220
1XLM	4 dents non rayonné portée extra-longue (métrique)	211	220
1MCR	4 dents rayonné longueur standard (métrique)	211	220
1MB	4 dents à bout hémisphérique longueur standard (métrique)	214	220
1XLMB	4 dents à bout hémisphérique portée extra-longue (métrique)	214	220
14M	4 dents à double bouts plats court (métrique)	215	220
14MB	4 dents à double bouts hémisphériques court (métrique)	215	220
16M	4 dents non rayonné court (métrique)	211	220
54M	4 dents cisaillement élevé non rayonné longueur standard (métrique)	217	222
61M	Multi-dents à pas gros d'ébauche (métrique)	218	224
62M	Multi-dents à pas fin d'ébauche (métrique)	219	225

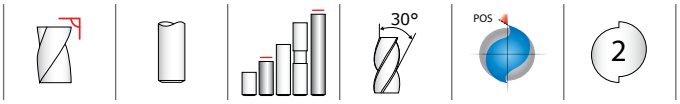
Les avances et les vitesses recommandées se trouvent à la fin du chapitre.

Fräsen

SERIE	BESCHREIBUNG DER STANDARD-SCHAFTFRÄSER	SEITE	S&F SEITE
3M	Schaftfräser mit 2 Schneiden ohne Eckenradien, Standardlänge	201	220
3XLM	Langloch-Schaftfräser mit 2 Schneiden ohne Eckenradien	201	220
3MB	Schaftfräser mit 2 Schneiden, Standardlänge	202	220
3XLMB	Superlangloch-Schaftfräser mit 2 Schneiden	202	220
15M	Schaftfräser mit 2 Schneiden, kurze Ausführung	203	220
15MB	Doppelend-Radiusschaftfräser mit 2 Schneiden, kurze Ausführung	204	220
17M	Schaftfräser mit 2 Schneiden ohne Eckenradien, kurze Ausführung	205	220
52M	Schaftfräser hoher Scherfestigkeit mit 2 Schneiden ohne Eckenradien, Standardlänge	206	222
59M	Langloch-Schaftfräser mit 2 Schneiden ohne Eckenradien	207	220
59MB	Langloch-Radiusschaftfräser mit 2 Schneiden	208	221
5M	Schaftfräser mit 3 Schneiden ohne Eckenradien, Standardlänge	209	220
5XLM	Langloch-Schaftfräser mit 3 Schneiden ohne Eckenradien	209	220
5MB	Schaftfräser mit 3 Schneiden, Standardlänge	210	220
5XLMB	Langloch-Schaftfräser mit 3 Schneiden	210	220
1M	Schaftfräser mit 4 Schneiden ohne Eckenradien, Standardlänge	211	220
1XLM	Superlangloch-Schaftfräser mit 4 Schneiden ohne Eckenradien	211	220
1MCR	Schaftfräser mit 4 Schneiden mit Eckenradien, Standardlänge	211	220
1MB	Schaftfräser mit 4 Schneiden, Standardlänge	214	220
1XLMB	Langloch-Radiusschaftfräser mit 4 Schneiden	214	220
14M	Schaftfräser mit 4 Schneiden, kurze Ausführung	215	220
14MB	Doppelend-Radiusschaftfräser mit 4 Schneiden, kurze Ausführung	215	220
16M	Schaftfräser mit 4 Schneiden ohne Eckenradien, kurze Ausführung	211	220
54M	Schaftfräser hoher Scherfestigkeit mit 4 Schneiden ohne Eckenradien, Standardlänge	217	222
61M	Mehrschneidiger fein verzahnter Schruppfräser	218	224
62M	Mehrschneidiger fein verzahnter Schruppfräser	219	225

Schnittwertempfehlungen finden Sie am Ende dieses Abschnitts

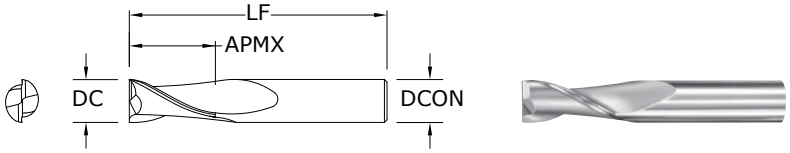
2 Flute Square End



TOLERANCES (mm)

<3 DIAMETER
DC = +0,0000/–0.0254
DCON = h_6

≥3 DIAMETER
DC = +0,0000/–0.0508
DCON = h_6
RE = +0,0000/–0.0508



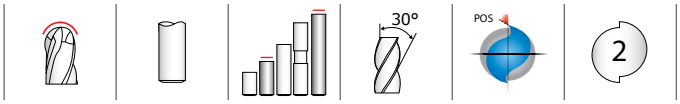
3M• 3XLM
METRIC SERIES

mm				EDP NO.				SERIES
CUTTING DIAMETER DC	LENGTH OF CUT APMX	OVERALL LENGTH LF	SHANK DIAMETER DCON	UNCOATED	Ti-NAMITE® (TiN)	Ti-NAMITE®-C (TiCN)	Ti-NAMITE®-A (AlTiN)	
1,0	4,0	38,0	3,0	40305	48628	48650	48671	3M
1,5	4,5	38,0	3,0	40309	48629	48651	48672	3M
2,0	6,3	38,0	3,0	40313	48630	48652	48673	3M
2,5	9,5	38,0	3,0	40317	48631	48653	48674	3M
3,0	12,0	38,0	3,0	40321	48632	48654	48675	3M
3,0	25,0	75,0	3,0	43301	49427	49440	49453	3XLM
3,5	12,0	50,0	4,0	40325	48633	48655	48676	3M
4,0	14,0	50,0	4,0	40329	48634	48656	48677	3M
4,0	25,0	75,0	4,0	43303	49428	49441	49454	3XLM
4,5	16,0	50,0	6,0	40333	48635	48657	48678	3M
5,0	16,0	50,0	6,0	40337	48636	48658	48679	3M
5,0	25,0	75,0	5,0	43307	49430	49443	49456	3XLM
6,0	19,0	50,0	6,0	40341	48637	48659	48680	3M
6,0	25,0	75,0	6,0	43305	49429	49442	49455	3XLM
7,0	19,0	63,0	8,0	40345	48638	48660	48681	3M
8,0	20,0	63,0	8,0	40349	48639	48661	48682	3M
8,0	25,0	75,0	8,0	43315	49431	49444	49457	3XLM
9,0	22,0	75,0	10,0	40353	48640	48662	48683	3M
10,0	22,0	75,0	10,0	40357	48641	48663	48684	3M
10,0	38,0	100,0	10,0	43325	49432	49445	49458	3XLM
11,0	25,0	75,0	12,0	40361	48642	48664	48685	3M
12,0	25,0	75,0	12,0	40365	48643	48665	48686	3M
12,0	50,0	100,0	12,0	43335	49433	49446	49459	3XLM
12,0	75,0	150,0	12,0	43345	49434	49447	49460	3XLM
14,0	32,0	89,0	14,0	40369	48644	48666	48687	3M
14,0	75,0	150,0	14,0	43355	49435	49448	49461	3XLM
16,0	32,0	89,0	16,0	40373	48645	48667	48688	3M
16,0	75,0	150,0	16,0	43365	49436	49449	49462	3XLM
18,0	38,0	100,0	18,0	40377	48646	48668	48689	3M
18,0	75,0	150,0	18,0	43375	49437	49450	49463	3XLM
20,0	38,0	100,0	20,0	40381	48647	48669	48690	3M
20,0	75,0	150,0	20,0	43385	49438	49451	49464	3XLM
25,0	38,0	100,0	25,0	40385	48648	48670	48691	3M
25,0	75,0	150,0	25,0	43395	49439	49452	49465	3XLM

STEELS
STAINLESS STEELS
CAST IRON
NON-FERROUS
HIGH TEMP ALLOYS

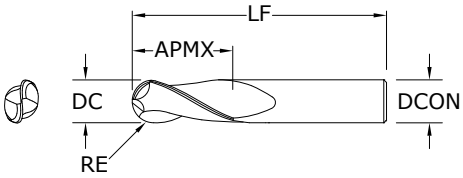
For patent information visit www.ksptpatents.com

2 Flute Ball End



3MB • 3XLMB

METRIC SERIES



TOLERANCES (mm)

<3 DIAMETER

DC = +0,0000 / –0,0254
DCON = h_6
RE = +0,0000 / –0,0127

≥3 DIAMETER

DC = +0,0000 / –0,0508
DCON = h_6
RE = +0,0000 / –0,0254

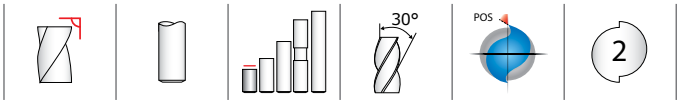
mm				EDP NO.				SERIES
CUTTING DIAMETER DC	LENGTH OF CUT APMX	OVERALL LENGTH LF	SHANK DIAMETER DCON	UNCOATED	Ti-NAMITE® (TiN)	Ti-NAMITE®-C (TiCN)	Ti-NAMITE®-A (AlTiN)	
1,0	4,0	38,0	3,0	40306	48692	48714	48735	3MB
1,5	4,5	38,0	3,0	40310	48693	48715	48736	3MB
2,0	6,3	38,0	3,0	40314	48694	48716	48737	3MB
2,5	9,5	38,0	3,0	40318	48695	48717	48738	3MB
3,0	12,0	38,0	3,0	40322	48696	48718	48739	3MB
3,0	25,0	75,0	3,0	43302	49544	49557	49570	3XLMB
3,5	12,0	50,0	4,0	40326	48697	48719	48740	3MB
4,0	14,0	50,0	4,0	40330	48698	48720	48741	3MB
4,0	25,0	75,0	4,0	43304	49545	49558	49571	3XLMB
4,5	16,0	50,0	6,0	40334	48699	48721	48742	3MB
5,0	16,0	50,0	6,0	40338	48700	48722	48743	3MB
5,0	25,0	75,0	5,0	43308	49547	49560	49573	3XLMB
6,0	19,0	50,0	6,0	40342	48701	48723	48744	3MB
6,0	25,0	75,0	6,0	43306	49546	49559	49572	3XLMB
7,0	19,0	63,0	8,0	40346	48702	48724	48745	3MB
8,0	20,0	63,0	8,0	40350	48703	48725	48746	3MB
8,0	25,0	75,0	8,0	43316	49548	49561	49574	3XLMB
9,0	22,0	75,0	10,0	40354	48704	48726	48747	3MB
10,0	22,0	75,0	10,0	40358	48705	48727	48748	3MB
10,0	38,0	100,0	10,0	43326	49549	49562	49575	3XLMB
11,0	25,0	75,0	12,0	40362	48706	48728	48749	3MB
12,0	25,0	75,0	12,0	40366	48707	48729	48750	3MB
12,0	50,0	100,0	12,0	43336	49550	49563	49576	3XLMB
12,0	75,0	150,0	12,0	43346	49551	49564	49577	3XLMB
14,0	32,0	89,0	14,0	40370	48708	48730	48751	3MB
14,0	75,0	150,0	14,0	43356	49552	49565	49578	3XLMB
16,0	32,0	89,0	16,0	40374	48709	48731	48752	3MB
16,0	75,0	150,0	16,0	43366	49553	49566	49579	3XLMB
18,0	38,0	100,0	18,0	40378	48710	48732	48753	3MB
18,0	75,0	150,0	18,0	43376	49554	49567	49580	3XLMB
20,0	38,0	100,0	20,0	40382	48711	48733	48754	3MB
20,0	75,0	150,0	20,0	43386	49555	49568	49581	3XLMB
25,0	38,0	100,0	25,0	40386	48712	48734	48755	3MB
25,0	75,0	150,0	25,0	43396	49556	49569	49582	3XLMB

RE = 1/2 Cutting Diameter (DC)

- STEELS
- STAINLESS STEELS
- CAST IRON
- NON-FERROUS
- HIGH TEMP ALLOYS

For patent information visit www.ksptpatents.com

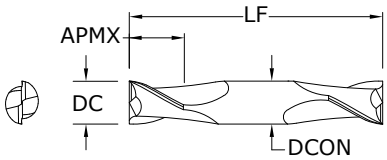
2 Flute Double End



TOLERANCES (mm)

<3 DIAMETER
DC = +0,0000 / –0,0254
DCON = h_6

≥3 DIAMETER
DC = +0,0000 / –0,0508
DCON = h_6



15M
METRIC SERIES

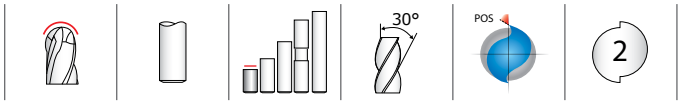
mm				EDP NO.			
CUTTING DIAMETER DC	LENGTH OF CUT APMX	OVERALL LENGTH LF	SHANK DIAMETER DCON	UNCOATED	Ti-NAMITE® (TiN)	Ti-NAMITE®-C (TiCN)	Ti-NAMITE®-A (AlTiN)
1,0	2,0	38,0	3,0	41505	49010	49031	49052
1,5	3,0	38,0	3,0	41509	49011	49032	49053
2,0	4,0	38,0	3,0	41513	49012	49033	49054
2,5	5,0	38,0	3,0	41517	49013	49034	49055
3,0	6,0	38,0	3,0	41521	49014	49035	49056
3,5	7,0	50,0	4,0	41525	49015	49036	49057
4,0	8,0	50,0	4,0	41529	49016	49037	49058
4,5	9,5	63,0	4,5	41533	49017	49038	49059
5,0	10,0	63,0	5,0	41537	49018	49039	49060
6,0	12,0	63,0	6,0	41541	49019	49040	49061
7,0	12,0	63,0	8,0	41545	49020	49041	49062
8,0	12,0	63,0	8,0	41549	49021	49042	49063
9,0	14,0	75,0	9,0	41553	49022	49043	49064
10,0	14,0	75,0	10,0	41557	49023	49044	49065
11,0	14,0	75,0	12,0	41561	49024	49045	49066
12,0	16,0	75,0	12,0	41565	49025	49046	49067

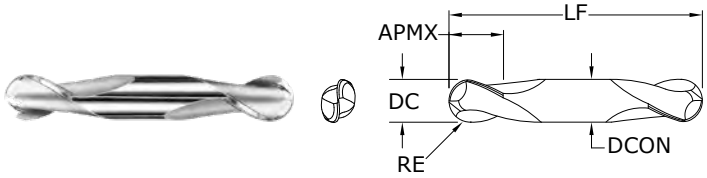
- STEELS
- STAINLESS STEELS
- CAST IRON
- NON-FERROUS
- HIGH TEMP ALLOYS

For patent information visit www.ksptpatents.com

METRIC

2 Flute Double End Ball End





15MB
METRIC SERIES

TOLERANCES (mm)

<3 DIAMETER
DC = +0,0000 /–0.0254
DCON = h_6
RE = +0,0000 /–0.0127

≥3 DIAMETER
DC = +0,0000 /–0.0508
DCON = h_6
RE = +0,0000 /–0.0254

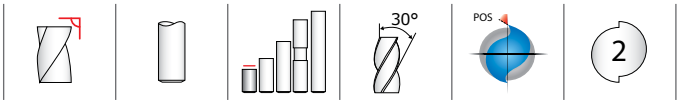
STEELS
STAINLESS STEELS
CAST IRON
NON-FERROUS
HIGH TEMP ALLOYS

For patent information visit www.ksptpatents.com

mm				EDP NO.			
CUTTING DIAMETER DC	LENGTH OF CUT APMX	OVERALL LENGTH LF	SHANK DIAMETER DCON	UNCOATED	Ti-NAMITE® (TiN)	Ti-NAMITE®-C (TiCN)	Ti-NAMITE®-A (AlTiN)
1,0	2,0	38,0	3,0	41506	49073	49094	49115
1,5	3,0	38,0	3,0	41510	49074	49095	49116
2,0	4,0	38,0	3,0	41514	49075	49096	49117
2,5	5,0	38,0	3,0	41518	49076	49097	49118
3,0	6,0	38,0	3,0	41522	49077	49098	49119
3,5	7,0	50,0	4,0	41526	49078	49099	49120
4,0	8,0	50,0	4,0	41530	49079	49100	49121
4,5	9,5	63,0	4,5	41534	49080	49101	49122
5,0	10,0	63,0	5,0	41538	49081	49102	49123
6,0	12,0	63,0	6,0	41542	49082	49103	49124
7,0	12,0	63,0	8,0	41546	49083	49104	49125
8,0	12,0	63,0	8,0	41550	49084	49105	49126
9,0	14,0	75,0	9,0	41554	49085	49106	49127
10,0	14,0	75,0	10,0	41558	49086	49107	49128
11,0	14,0	75,0	12,0	41562	49087	49108	49129
12,0	16,0	75,0	12,0	41566	49088	49109	49130

RE = 1/2 Cutting Diameter (DC)

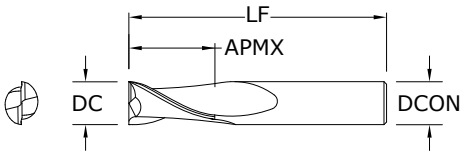
2 Flute Square End Stub



TOLERANCES (mm)

<3 DIAMETER
DC = +0,0000 / –0.0254
DCON = h_6

≥3 DIAMETER
DC = +0,0000 / –0.0508
DCON = h_6



17M
METRIC SERIES

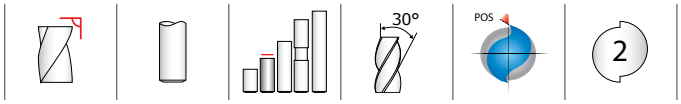
mm				EDP NO.			
CUTTING DIAMETER DC	LENGTH OF CUT APMX	OVERALL LENGTH LF	SHANK DIAMETER DCON	UNCOATED	Ti-NAMITE® (TiN)	Ti-NAMITE®-C (TiCN)	Ti-NAMITE®-A (AlTiN)
1,0	2,0	38,0	3,0	41705	49262	49283	49304
1,5	3,0	38,0	3,0	41709	49263	49284	49305
2,0	4,0	38,0	3,0	41713	49264	49285	49306
2,5	5,0	38,0	3,0	41717	49265	49286	49307
3,0	6,0	38,0	3,0	41721	49266	49287	49308
3,5	7,0	50,0	4,0	41725	49267	49288	49309
4,0	8,0	50,0	4,0	41729	49268	49289	49310
4,5	9,5	50,0	4,5	41733	49269	49290	49311
5,0	10,0	50,0	5,0	41737	49270	49291	49312
6,0	12,0	50,0	6,0	41741	49271	49292	49313
7,0	12,0	50,0	8,0	41745	49272	49293	49314
8,0	12,0	50,0	8,0	41749	49273	49294	49315
9,0	14,0	50,0	9,0	41753	49274	49295	49316
10,0	16,0	50,0	10,0	41757	49275	49296	49317
11,0	19,0	63,0	12,0	41761	49276	49297	49318
12,0	19,0	63,0	12,0	41765	49277	49298	49319

- STEELS
- STAINLESS STEELS
- CAST IRON
- NON-FERROUS
- HIGH TEMP ALLOYS

For patent information visit www.ksptpatents.com

METRIC

2 Flute High Shear



TOLERANCES (mm)

<3 DIAMETER

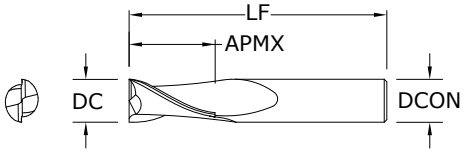
DC = +0,0000 /–0,0254
DCON = h_6

≥3 DIAMETER

DC = +0.0000 /–0,0508
DCON = h_6

52M

METRIC SERIES

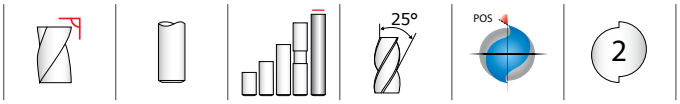


mm				EDP NO.	
CUTTING DIAMETER DC	LENGTH OF CUT APMX	OVERALL LENGTH LF	SHANK DIAMETER DCON	UNCOATED	Ti-NAMITE®-C (TiCN)
3,0	7,0	38,0	3,0	45277	49829
3,5	7,0	57,0	6,0	45279	49830
4,0	8,0	57,0	6,0	45281	49831
4,5	8,0	57,0	6,0	45283	49832
5,0	10,0	57,0	6,0	45285	49833
6,0	10,0	57,0	6,0	45287	49834
8,0	16,0	63,0	8,0	45289	49835
10,0	19,0	72,0	10,0	45291	49836
12,0	22,0	83,0	12,0	45293	49837
14,0	22,0	83,0	14,0	45295	49838
16,0	26,0	92,0	16,0	45297	49839
20,0	32,0	104,0	20,0	45299	49840

NON-FERROUS

For patent information visit www.ksptpatents.com

2 Flute Square End Long Reach

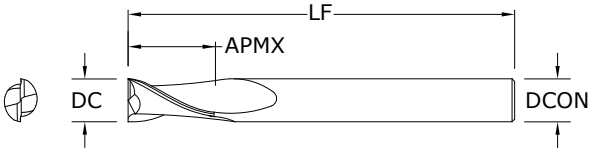


TOLERANCES (mm)

3–6 DIAMETER
DC = +0,0000 / –0,0254
DCON = h_6

>6–10 DIAMETER
DC = +0,0000 / –0,0406
DCON = h_6

>10–20 DIAMETER
DC = +0,0000 / –0,0508
DCON = h_6



59M
METRIC SERIES

mm				EDP NO.			
CUTTING DIAMETER DC	LENGTH OF CUT APMX	OVERALL LENGTH LF	SHANK DIAMETER DCON	UNCOATED	Ti-NAMITE® (TiN)	Ti-NAMITE®-C (TiCN)	Ti-NAMITE®-A (AlTiN)
3,0	9,0	60,0	6,0	43910	43920	43930	43950
4,0	12,0	70,0	6,0	43911	43921	43931	43951
6,0	15,0	80,0	6,0	43912	43922	43932	43952
8,0	20,0	89,0	8,0	43913	43923	43933	43953
10,0	25,0	100,0	10,0	43914	43924	43934	43954
12,0	30,0	110,0	12,0	43915	43925	43935	43955
14,0	35,0	120,0	16,0	43916	43926	43936	43956
16,0	40,0	120,0	16,0	43917	43927	43937	43957
18,0	40,0	130,0	20,0	43918	43928	43938	43958
20,0	45,0	130,0	20,0	43919	43929	43939	43959

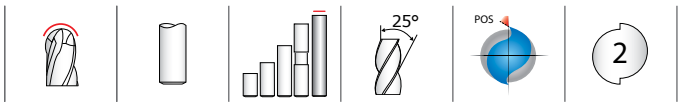
Neck Option Available

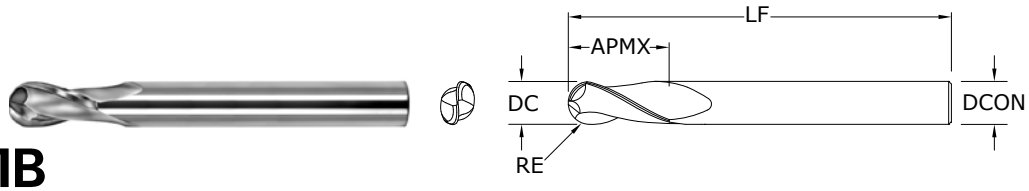
- STEELS
- STAINLESS STEELS
- CAST IRON
- NON-FERROUS
- HIGH TEMP ALLOYS

For patent information visit www.ksptpatents.com

METRIC

2 Flute Ball End Long Reach





59MB

METRIC SERIES

TOLERANCES (mm)

3–6 DIAMETER
DC = +0,0000 / –0,0254
DCON = h_6
RE = +0,0000 / –0,0127

>6–10 DIAMETER
DC = +0,0000 / –0,0406
DCON = h_6
RE = +0,0000 / –0,0203

>10–20 DIAMETER
DC = +0,0000 / –0,0508
DCON = h_6
RE = +0,0000 / –0,0254

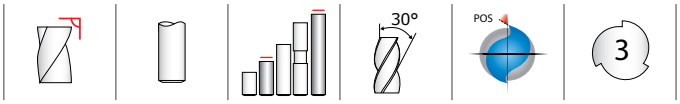
STEELS
STAINLESS STEELS
CAST IRON
NON-FERROUS
HIGH TEMP ALLOYS

For patent information visit www.ksptpatents.com

mm				EDP NO.			
CUTTING DIAMETER DC	LENGTH OF CUT APMX	OVERALL LENGTH LF	SHANK DIAMETER DCON	UNCOATED	Ti-NAMITE® (TiN)	Ti-NAMITE®-C (TiCN)	Ti-NAMITE®-A (AlTiN)
3,0	9,0	60,0	6,0	43900	49622	49632	49642
4,0	12,0	70,0	6,0	43901	49623	49633	49643
6,0	15,0	80,0	6,0	43902	49624	49634	49644
8,0	20,0	89,0	8,0	43903	49625	49635	49645
10,0	25,0	100,0	10,0	43904	49626	49636	49646
12,0	30,0	110,0	12,0	43905	49627	49637	49647
14,0	35,0	120,0	16,0	43906	49628	49638	49648
16,0	40,0	120,0	16,0	43907	49629	49639	49649
18,0	40,0	130,0	20,0	43908	49630	49640	49650
20,0	45,0	130,0	20,0	43909	49631	49641	49651

Neck Option Available
RE = 1/2 Cutting Diameter (DC)

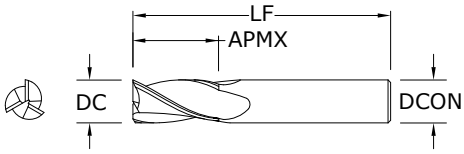
3 Flute Square End



TOLERANCES (mm)

<3 DIAMETER
DC = +0,0000/–0,0254
DCON = h_6

≥3 DIAMETER
DC = +0,0000/–0,0508
DCON = h_6



5M• 5XLM
METRIC SERIES

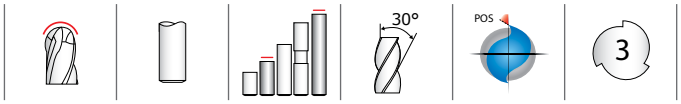
mm				EDP NO.				SERIES
CUTTING DIAMETER DC	LENGTH OF CUT APMX	OVERALL LENGTH LF	SHANK DIAMETER DCON	UNCOATED	Ti-NAMITE® (TiN)	Ti-NAMITE®-C (TiCN)	Ti-NAMITE®-A (AlTiN)	
1,0	4,0	38,0	3,0	40505	48756	48778	48799	5M
1,5	4,5	38,0	3,0	40509	48757	48779	48800	5M
2,0	6,3	38,0	3,0	40513	48758	48780	48801	5M
2,5	9,5	38,0	3,0	40517	48759	48781	48802	5M
3,0	12,0	38,0	3,0	40521	48760	48782	48803	5M
3,0	25,0	75,0	3,0	43501	49466	49479	49492	5XLM
3,5	12,0	50,0	4,0	40525	48761	48783	48804	5M
4,0	14,0	50,0	4,0	40529	48762	48784	48805	5M
4,0	25,0	75,0	4,0	43503	49467	49480	49493	5XLM
4,5	16,0	50,0	6,0	40533	48763	48785	48806	5M
5,0	16,0	50,0	6,0	40537	48764	48786	48807	5M
5,0	25,0	75,0	5,0	43507	49469	49482	49495	5XLM
6,0	19,0	50,0	6,0	40541	48765	48787	48808	5M
6,0	25,0	75,0	6,0	43505	49468	49481	49494	5XLM
7,0	19,0	63,0	8,0	40545	48766	48788	48809	5M
8,0	20,0	63,0	8,0	40549	48767	48789	48810	5M
8,0	25,0	75,0	8,0	43515	49470	49483	49496	5XLM
9,0	22,0	75,0	10,0	40553	48768	48790	48811	5M
10,0	22,0	75,0	10,0	40557	48769	48791	48812	5M
10,0	38,0	100,0	10,0	43525	49471	49484	49497	5XLM
11,0	25,0	75,0	12,0	40561	48770	48792	48813	5M
12,0	25,0	75,0	12,0	40565	48771	48793	48814	5M
12,0	50,0	100,0	12,0	43535	49472	49485	49498	5XLM
12,0	75,0	150,0	12,0	43545	49473	49486	49499	5XLM
14,0	32,0	89,0	14,0	40569	48772	48794	48815	5M
14,0	75,0	150,0	14,0	43555	49474	49487	49500	5XLM
16,0	32,0	89,0	16,0	40573	48773	48795	48816	5M
16,0	75,0	150,0	16,0	43565	49475	49488	49501	5XLM
18,0	38,0	100,0	18,0	40577	48774	48796	48817	5M
18,0	75,0	150,0	18,0	43575	49476	49489	49502	5XLM
20,0	38,0	100,0	20,0	40581	48775	48797	48818	5M
20,0	75,0	150,0	20,0	43585	49477	49490	49503	5XLM
25,0	38,0	100,0	25,0	40585	48776	48798	48819	5M
25,0	75,0	150,0	25,0	43595	49478	49491	49504	5XLM

- STEELS
- STAINLESS STEELS
- CAST IRON
- NON-FERROUS
- HIGH TEMP ALLOYS

For patent information visit www.ksptpatents.com

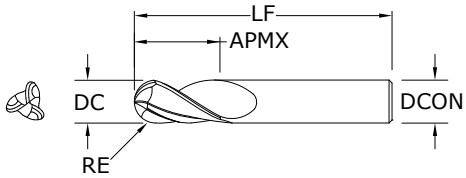
METRIC

3 Flute Ball End



5MB • 5XLMB

METRIC SERIES



TOLERANCES (mm)

<3 DIAMETER
DC = +0,0000 / –0.0254
DCON = h_6
RE = +0,0000 / –0.0127

≥3 DIAMETER
DC = +0,0000 / –0.0508
DCON = h_6
RE = +0,0000 / –0.0254

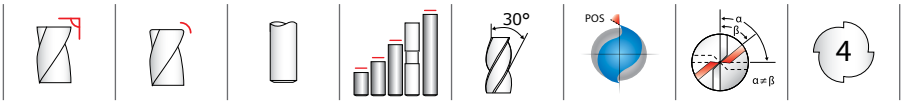
mm				EDP NO.				SERIES
CUTTING DIAMETER DC	LENGTH OF CUT APMX	OVERALL LENGTH LF	SHANK DIAMETER DCON	UNCOATED	Ti-NAMITE® (TiN)	Ti-NAMITE®-C (TiCN)	Ti-NAMITE®-A (AlTiN)	
1,0	4,0	38,0	3,0	40506	48820	48842	48863	5MB
1,5	4,5	38,0	3,0	40510	48821	48843	48864	5MB
2,0	6,3	38,0	3,0	40514	48822	48844	48865	5MB
2,5	9,5	38,0	3,0	40518	48823	48845	48866	5MB
3,0	12,0	38,0	3,0	40522	48824	48846	48867	5MB
3,0	25,0	75,0	3,0	43502	49583	49596	49609	5XLMB
3,5	12,0	50,0	4,0	40526	48825	48847	48868	5MB
4,0	14,0	50,0	4,0	40530	48826	48848	48869	5MB
4,0	25,0	75,0	4,0	43504	49584	49597	49610	5XLMB
4,5	16,0	50,0	6,0	40534	48827	48849	48870	5MB
5,0	16,0	50,0	6,0	40538	48828	48850	48871	5MB
5,0	25,0	75,0	5,0	43508	49586	49599	49612	5XLMB
6,0	19,0	50,0	6,0	40542	48829	48851	48872	5MB
6,0	25,0	75,0	6,0	43506	49585	49598	49611	5XLMB
7,0	19,0	63,0	8,0	40546	48830	48852	48873	5MB
8,0	20,0	63,0	8,0	40550	48831	48853	48874	5MB
8,0	25,0	75,0	8,0	43516	49587	49600	49613	5XLMB
9,0	22,0	75,0	10,0	40554	48832	48854	48875	5MB
10,0	22,0	75,0	10,0	40558	48833	48855	48876	5MB
10,0	38,0	100,0	10,0	43526	49588	49601	49614	5XLMB
11,0	25,0	75,0	12,0	40562	48834	48856	48877	5MB
12,0	25,0	75,0	12,0	40566	48835	48857	48878	5MB
12,0	50,0	100,0	12,0	43536	49589	49602	49615	5XLMB
12,0	75,0	150,0	12,0	43546	49590	49603	49616	5XLMB
14,0	32,0	89,0	14,0	40570	48836	48858	48879	5MB
14,0	75,0	150,0	14,0	43556	49591	49604	49617	5XLMB
16,0	32,0	89,0	16,0	40574	48837	48859	48880	5MB
16,0	75,0	150,0	16,0	43566	49592	49605	49618	5XLMB
18,0	38,0	100,0	18,0	40578	48838	48860	48881	5MB
18,0	75,0	150,0	18,0	43576	49593	49606	49619	5XLMB
20,0	38,0	100,0	20,0	40582	48839	48861	48882	5MB
20,0	75,0	150,0	20,0	43586	49594	49607	49620	5XLMB
25,0	38,0	100,0	25,0	40586	48840	48862	48883	5MB
25,0	75,0	150,0	25,0	43596	49595	49608	49621	5XLMB

RE = 1/2 Cutting Diameter (DC)

STEELS
STAINLESS STEELS
CAST IRON
NON-FERROUS
HIGH TEMP ALLOYS

For patent information visit www.ksptpatents.com

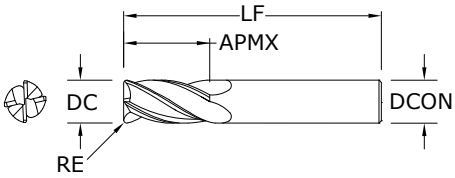
4 Flute Square End • 4 Flute Corner Radius



TOLERANCES (mm)

<3 DIAMETER
DC = +0,0000 / –0,0254
DCON = h_6

≥3 DIAMETER
DC = +0,0000 / –0,0508
DCON = h_6
RE = +0,0000 / –0,0508



1M • 1XLM • 1MCR • 16M

METRIC SERIES

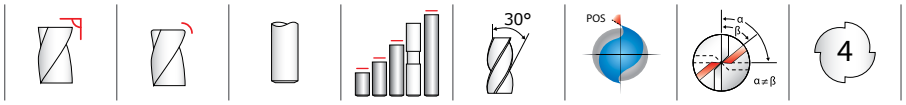
mm					EDP NO.				SERIES
CUTTING DIAMETER DC	LENGTH OF CUT APMX	OVERALL LENGTH LF	CORNER RADIUS RE	SHANK DIAMETER DCON	UNCOATED	Ti-NAMITE® (TiN)	Ti-NAMITE®-C (TiCN)	Ti-NAMITE®-A (AlTiN)	
1,0	2,0	38,0	–	3,0	41605	49136	49157	49178	16M
1,0	4,0	38,0	–	3,0	40105	48500	48522	48543	1M
1,5	3,0	38,0	–	3,0	41609	49137	49158	49179	16M
1,5	4,5	38,0	–	3,0	40109	48501	48523	48544	1M
2,0	4,0	38,0	–	3,0	41613	49138	49159	49180	16M
2,0	6,3	38,0	–	3,0	40113	48502	48524	48545	1M
2,5	5,0	38,0	–	3,0	41617	49139	49160	49181	16M
2,5	9,5	38,0	–	3,0	40117	48503	48525	48546	1M
3,0	6,0	38,0	–	3,0	41621	49140	49161	49182	16M
3,0	12,0	38,0	–	3,0	40121	48504	48526	48547	1M
3,0	25,0	75,0	–	3,0	43101	49388	49401	49414	1XLM
3,5	7,0	50,0	–	4,0	41625	49141	49162	49183	16M
3,5	12,0	50,0	–	4,0	40125	48505	48527	48548	1M
4,0	8,0	50,0	–	4,0	41629	49142	49163	49184	16M
4,0	14,0	50,0	–	4,0	40129	48506	48528	48549	1M
4,0	14,0	50,0	0,25	4,0	–	–	–	40000	1MCR
4,0	14,0	50,0	0,50	4,0	–	–	–	40001	1MCR
4,0	14,0	50,0	1,00	4,0	–	–	–	40003	1MCR
4,0	25,0	75,0	–	4,0	43103	49389	49402	49415	1XLM
4,5	9,5	50,0	–	4,5	41633	49143	49164	49185	16M
4,5	16,0	50,0	–	6,0	40133	48507	48529	48550	1M
5,0	10,0	50,0	–	5,0	41637	49144	49165	49186	16M
5,0	16,0	50,0	–	6,0	40137	48508	48530	48551	1M
5,0	16,0	50,0	0,25	6,0	–	–	–	40004	1MCR
5,0	16,0	50,0	0,50	6,0	–	–	–	40005	1MCR
5,0	16,0	50,0	1,00	6,0	–	–	–	40007	1MCR
5,0	25,0	75,0	–	5,0	43107	49391	49404	49417	1XLM
6,0	12,0	50,0	–	6,0	41641	49145	49166	49187	16M
6,0	19,0	50,0	–	6,0	40141	48509	48531	48552	1M
6,0	19,0	50,0	0,25	6,0	–	–	–	40009	1MCR
6,0	19,0	50,0	0,50	6,0	–	–	–	40010	1MCR
6,0	19,0	50,0	0,75	6,0	–	–	–	40011	1MCR

continued on next page

- STEELS
- STAINLESS STEELS
- CAST IRON
- NON-FERROUS
- HIGH TEMP ALLOYS

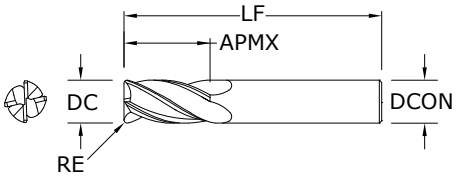
For patent information visit www.ksptpatents.com

4 Flute Square End • 4 Flute Corner Radius



1M • 1XLM • 1MCR • 16M

METRIC SERIES



TOLERANCES (mm)

<3 DIAMETER
DC = +0,0000 / –0,0254
DCON = h_6

≥3 DIAMETER
DC = +0,0000 / –0,0508
DCON = h_6

RE = +0,0000 / –0,0508

CONTINUED

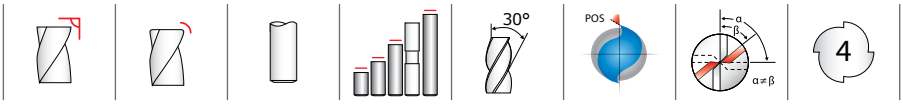
mm					EDP NO.				SERIES
CUTTING DIAMETER DC	LENGTH OF CUT APMX	OVERALL LENGTH LF	CORNER RADIUS RE	SHANK DIAMETER DCON	UNCOATED	Ti-NAMITE® (TiN)	Ti-NAMITE®-C (TiCN)	Ti-NAMITE®-A (AlTiN)	
6,0	19,0	50,0	1,00	6,0	–	–	–	40012	1MCR
6,0	25,0	75,0	–	6,0	43105	49390	49403	49416	1XLM
7,0	12,0	50,0		8,0	41645	49146	49167	49188	16M
7,0	19,0	63,0	–	8,0	40145	48510	48532	48553	1M
8,0	12,0	50,0		8,0	41649	49147	49168	49189	16M
8,0	20,0	63,0	–	8,0	40149	48511	48533	48554	1M
8,0	20,0	63,0	0,50	8,0	–	–	–	40015	1MCR
8,0	20,0	63,0	0,75	8,0	–	–	–	40016	1MCR
8,0	20,0	63,0	1,00	8,0	–	–	–	40017	1MCR
8,0	20,0	63,0	1,50	8,0	–	–	–	40019	1MCR
8,0	20,0	63,0	2,00	8,0	–	–	–	40020	1MCR
8,0	25,0	75,0	–	8,0	43115	49392	49405	49418	1XLM
9,0	14,0	50,0		9,0	41653	49148	49169	49190	16M
9,0	22,0	75,0	–	10,0	40153	48512	48534	48555	1M
10,0	16,0	50,0		10,0	41657	49149	49170	49191	16M
10,0	22,0	75,0	–	10,0	40157	48513	48535	48556	1M
10,0	22,0	75,0	0,50	10,0	–	–	–	40021	1MCR
10,0	22,0	75,0	1,00	10,0	–	–	–	40023	1MCR
10,0	22,0	75,0	1,50	10,0	–	–	–	40024	1MCR
10,0	22,0	75,0	2,00	10,0	–	–	–	40025	1MCR
10,0	38,0	100,0	–	10,0	43125	49393	49406	49419	1XLM
11,0	19,0	63,0		12,0	41661	49150	49171	49192	16M
11,0	25,0	75,0	–	12,0	40161	48514	48536	48557	1M
12,0	19,0	63,0		12,0	40165	49151	49172	49193	16M
12,0	25,0	75,0	–	12,0	41665	48515	48537	48558	1M
12,0	25,0	75,0	0,50	12,0	–	–	–	40028	1MCR
12,0	25,0	75,0	1,00	12,0	–	–	–	40030	1MCR
12,0	25,0	75,0	1,50	12,0	–	–	–	40031	1MCR
12,0	25,0	75,0	2,00	12,0	–	–	–	40032	1MCR
12,0	50,0	100,0	–	12,0	43135	49394	49407	49420	1XLM
12,0	75,0	150,0	–	12,0	43145	49395	49408	49421	1XLM
14,0	32,0	89,0	–	14,0	40169	48516	48538	48559	1M
14,0	75,0	150,0	–	14,0	43155	49396	49409	49422	1XLM
16,0	32,0	89,0	–	16,0	40173	48517	48539	48560	1M
16,0	32,0	89,0	0,50	16,0	–	–	–	40035	1MCR
16,0	32,0	89,0	1,00	16,0	–	–	–	40037	1MCR

continued on next page

- STEELS
- STAINLESS STEELS
- CAST IRON
- NON-FERROUS
- HIGH TEMP ALLOYS

For patent information visit www.ksptpatents.com

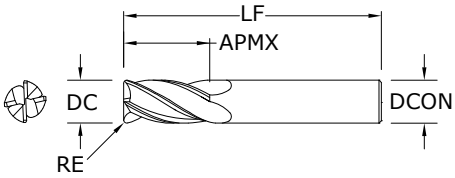
4 Flute Square End • 4 Flute Corner Radius



TOLERANCES (mm)

<3 DIAMETER
DC = +0,0000 / –0,0254
DCON = h_6

≥3 DIAMETER
DC = +0,0000 / –0,0508
DCON = h_6
RE = +0,0000 / –0,0508



1M • 1XLM • 1MCR • 16M

METRIC SERIES

CONTINUED

mm					EDP NO.				SERIES
CUTTING DIAMETER DC	LENGTH OF CUT APMX	OVERALL LENGTH LF	CORNER RADIUS RE	SHANK DIAMETER DCON	UNCOATED	Ti-NAMITE® (TiN)	Ti-NAMITE®-C (TiCN)	Ti-NAMITE®-A (AlTiN)	
16,0	32,0	89,0	1,50	16,0	–	–	–	40038	1MCR
16,0	32,0	89,0	2,00	16,0	–	–	–	40039	1MCR
16,0	75,0	150,0	–	16,0	43165	49397	49410	49423	1XLM
18,0	38,0	100,0	–	18,0	40177	48518	48540	48561	1M
18,0	75,0	150,0	–	18,0	43175	49398	49411	49424	1XLM
20,0	38,0	100,0	–	20,0	40181	48519	48541	48562	1M
20,0	75,0	150,0	–	20,0	43185	49399	49412	49425	1XLM
25,0	38,0	100,0	–	25,0	40185	48520	48542	48563	1M
25,0	75,0	150,0	–	25,0	43195	49400	49413	49426	1XLM

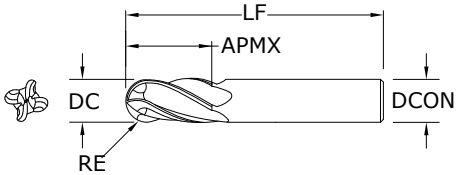
- STEELS
- STAINLESS STEELS
- CAST IRON
- NON-FERROUS
- HIGH TEMP ALLOYS

For patent information visit www.ksptpatents.com

4 Flute Ball End

1MB • 1XLMB

METRIC SERIES



TOLERANCES (mm)

<3 DIAMETER
DC = +0,0000 / –0.0254
DCON = h_6
RE = +0,0000 / –0.0127

≥3 DIAMETER
DC = +0,0000 / –0.0508
DCON = h_6
RE = +0,0000 / –0.0254

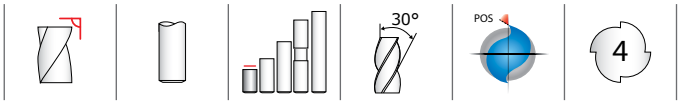
mm				EDP NO.				SERIES
CUTTING DIAMETER DC	LENGTH OF CUT APMX	OVERALL LENGTH LF	SHANK DIAMETER DCON	UNCOATED	Ti-NAMITE® (TiN)	Ti-NAMITE®-C (TiCN)	Ti-NAMITE®-A (AlTiN)	
1,0	4,0	38,0	3,0	40106	48564	48586	48607	1MB
1,5	4,5	38,0	3,0	40110	48565	48587	48608	1MB
2,0	6,3	38,0	3,0	40114	48566	48588	48609	1MB
2,5	9,5	38,0	3,0	40118	48567	48589	48610	1MB
3,0	12,0	38,0	3,0	40122	48568	48590	48611	1MB
3,0	25,0	75,0	3,0	43102	49505	49518	49531	1XLMB
3,5	12,0	50,0	4,0	40126	48569	48591	48612	1MB
4,0	14,0	50,0	4,0	40130	48570	48592	48613	1MB
4,0	25,0	75,0	4,0	43104	49506	49519	49532	1XLMB
4,5	16,0	50,0	6,0	40134	48571	48593	48614	1MB
5,0	16,0	50,0	6,0	40138	48572	48594	48615	1MB
5,0	25,0	75,0	5,0	43108	49508	49521	49534	1XLMB
6,0	19,0	50,0	6,0	40142	48573	48595	48616	1MB
6,0	25,0	75,0	6,0	43106	49507	49520	49533	1XLMB
7,0	19,0	63,0	8,0	40146	48574	48596	48617	1MB
8,0	20,0	63,0	8,0	40150	48575	48597	48618	1MB
8,0	25,0	75,0	8,0	43116	49509	49522	49535	1XLMB
9,0	22,0	75,0	10,0	40154	48576	48598	48619	1MB
10,0	22,0	75,0	10,0	40158	48577	48599	48620	1MB
10,0	38,0	100,0	10,0	43126	49510	49523	49536	1XLMB
11,0	25,0	75,0	12,0	40162	48578	48600	48621	1MB
12,0	25,0	75,0	12,0	40166	48579	48601	48622	1MB
12,0	50,0	100,0	12,0	43136	49511	49524	49537	1XLMB
12,0	75,0	150,0	12,0	43146	49512	49525	49538	1XLMB
14,0	32,0	89,0	14,0	40170	48580	48602	48623	1MB
14,0	75,0	150,0	14,0	43156	49513	49526	49539	1XLMB
16,0	32,0	89,0	16,0	40174	48581	48603	48624	1MB
16,0	75,0	150,0	16,0	43166	49514	49527	49540	1XLMB
18,0	38,0	100,0	18,0	40178	48582	48604	48625	1MB
18,0	75,0	150,0	18,0	43176	49515	49528	49541	1XLMB
20,0	38,0	100,0	20,0	40182	48583	48605	48626	1MB
20,0	75,0	150,0	20,0	43186	49516	49529	49542	1XLMB
25,0	38,0	100,0	25,0	40186	48584	48606	48627	1MB
25,0	75,0	150,0	25,0	43196	49517	49530	49543	1XLMB

RE = 1/2 Cutting Diameter (DC)

- STEELS
- STAINLESS STEELS
- CAST IRON
- NON-FERROUS
- HIGH TEMP ALLOYS

For patent information visit www.ksptpatents.com

4 Flute Double End



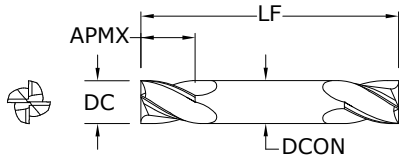
TOLERANCES (mm)

<3 DIAMETER

DC = +0,0000 / –0,0254
DCON = h_6

≥3 DIAMETER

DC = +0,0000 / –0,0508
DCON = h_6



14M
METRIC SERIES

mm				EDP NO.			
CUTTING DIAMETER DC	LENGTH OF CUT APMX	OVERALL LENGTH LF	SHANK DIAMETER DCON	UNCOATED	Ti-NAMITE® (TiN)	Ti-NAMITE®-C (TiCN)	Ti-NAMITE®-A (AlTiN)
1,0	2,0	38,0	3,0	41405	48884	48905	48926
1,5	3,0	38,0	3,0	41409	48885	48906	48927
2,0	4,0	38,0	3,0	41413	48886	48907	48928
2,5	5,0	38,0	3,0	41417	48887	48908	48929
3,0	6,0	38,0	3,0	41421	48888	48909	48930
3,5	7,0	50,0	4,0	41425	48889	48910	48931
4,0	8,0	50,0	4,0	41429	48890	48911	48932
4,5	9,5	63,0	4,5	41433	48891	48912	48933
5,0	10,0	63,0	5,0	41437	48892	48913	48934
6,0	12,0	63,0	6,0	41441	48893	48914	48935
7,0	12,0	63,0	8,0	41445	48894	48915	48936
8,0	12,0	63,0	8,0	41449	48895	48916	48937
9,0	14,0	75,0	9,0	41453	48896	48917	48938
10,0	14,0	75,0	10,0	41457	48897	48918	48939
11,0	14,0	75,0	12,0	41461	48898	48919	48940
12,0	16,0	75,0	12,0	41465	48899	48920	48941

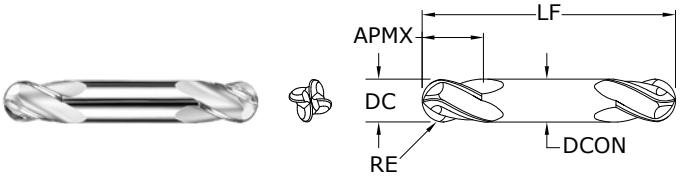
- STEELS
- STAINLESS STEELS
- CAST IRON
- NON-FERROUS
- HIGH TEMP ALLOYS

For patent information visit www.ksptpatents.com

METRIC

4 Flute Double End Ball End

14MB
METRIC SERIES



TOLERANCES (mm)

<3 DIAMETER
DC = +0,0000 /–0,0254
DCON = h_6
RE = +0,0000 /–0,0127

≥3 DIAMETER
DC = +0,0000 /–0,0508
DCON = h_6
RE = +0,0000 /–0,0254

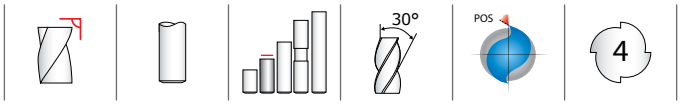
STEELS
STAINLESS STEELS
CAST IRON
NON-FERROUS
HIGH TEMP ALLOYS

For patent information visit www.ksptpatents.com

mm				EDP NO.			
CUTTING DIAMETER DC	LENGTH OF CUT APMX	OVERALL LENGTH LF	SHANK DIAMETER DCON	UNCOATED	Ti-NAMITE® (TiN)	Ti-NAMITE®-C (TiCN)	Ti-NAMITE®-A (AlTiN)
1,0	2,0	38,0	3,0	41406	48947	48968	48989
1,5	3,0	38,0	3,0	41410	48948	48969	48990
2,0	4,0	38,0	3,0	41414	48949	48970	48991
2,5	5,0	38,0	3,0	41418	48950	48971	48992
3,0	6,0	38,0	3,0	41422	48951	48972	48993
3,5	7,0	50,0	4,0	41426	48952	48973	48994
4,0	8,0	50,0	4,0	41430	48953	48974	48995
4,5	9,5	63,0	4,5	41434	48954	48975	48996
5,0	10,0	63,0	5,0	41438	48955	48976	48997
6,0	12,0	63,0	6,0	41442	48956	48977	48998
7,0	12,0	63,0	8,0	41446	48957	48978	48999
8,0	12,0	63,0	8,0	41450	48958	48979	49000
9,0	14,0	75,0	9,0	41454	48959	48980	49001
10,0	14,0	75,0	10,0	41458	48960	48981	49002
11,0	14,0	75,0	12,0	41462	48961	48982	49003
12,0	16,0	75,0	12,0	41466	48962	48983	49004

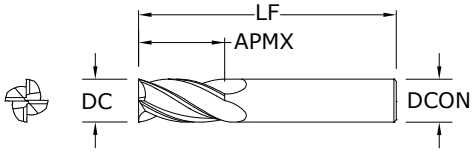
RE = 1/2 Cutting Diameter (DC)

4 Flute High Shear



TOLERANCES (mm)

<3 DIAMETER
DC = +0,0000 / –0,0254
DCON = h_6
≥3 DIAMETER
DC = +0,0000 / –0,0508
DCON = h_6



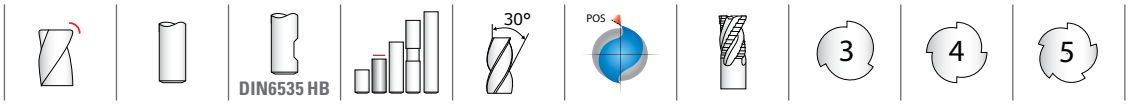
54M
METRIC SERIES

mm				EDP NO.	
CUTTING DIAMETER DC	LENGTH OF CUT APMX	OVERALL LENGTH LF	SHANK DIAMETER DCON	UNCOATED	Ti-NAMITE®-C (TiCN)
3,0	8,0	38,0	3,0	45477	45478
3,5	10,0	57,0	6,0	45479	45480
4,0	11,0	57,0	6,0	45481	45482
4,5	11,0	57,0	6,0	45483	45484
5,0	13,0	57,0	6,0	45485	45486
6,0	13,0	57,0	6,0	45487	45488
8,0	19,0	63,0	8,0	45489	45490
10,0	22,0	72,0	10,0	45491	45492
12,0	26,0	83,0	12,0	45493	45494
14,0	26,0	83,0	14,0	45495	45496
16,0	32,0	92,0	16,0	45497	45498
20,0	38,0	104,0	20,0	45499	45500

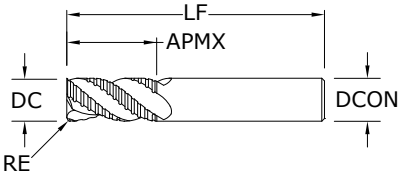
NON-FERROUS

For patent information visit www.ksptpatents.com

Single End Roughers (Coarse Pitch)



61M
METRIC SERIES



TOLERANCES (mm)

DC = +0,000 / –0,100
DCON = h_6
RE = +0,127/–0,127

STEELS

CAST IRON

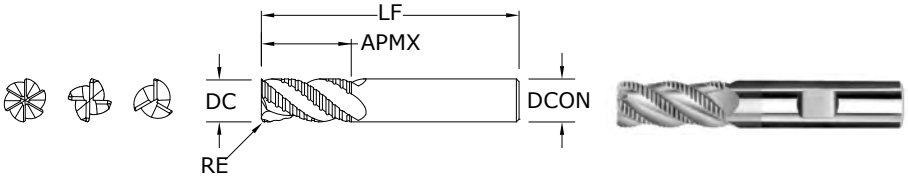
For patent information visit www.ksptpatents.com

mm						EDP NO.		
CUTTING DIAMETER DC	LENGTH OF CUT APMX	OVERALL LENGTH LF	SHANK DIAMETER DCON	CORNER RADIUS RE	NO. OF FLUTES	Ti-NAMITE® (TiN)	Ti-NAMITE®-C (TiCN)	Ti-NAMITE®-A (AlTiN)
6,0	19,0	63,0	6,0	1,14	3	46107	46106	46110
8,0	19,0	63,0	8,0	1,14	3	46109	46108	46111
10,0	22,0	72,0	10,0	1,52	3	46113	46112	46114
12,0	26,0	83,0	12,0	1,52	4	46117	46116	46118
16,0	32,0	92,0	16,0	1,52	4	46121	46120	46122
20,0	38,0	104,0	20,0	1,52	4	46129	46128	46132
25,0	44,0	104,0	25,0	1,52	5	46131	46130	46133

Single End Roughers (Fine Pitch)

TOLERANCES (mm)

DC = +0,000 / –0,100
DCON = h_6
RE = +0,127/–0,127



62M
METRIC SERIES

mm						EDP NO.		
CUTTING DIAMETER DC	LENGTH OF CUT APMX	OVERALL LENGTH LF	SHANK DIAMETER DCON	CORNER RADIUS RE	NO. OF FLUTES	Ti-NAMITE® (TiN)	Ti-NAMITE®-C (TiCN)	Ti-NAMITE®-A (AlTiN)
6,0	19,0	63,0	6,0	1,14	3	46207	46206	46210
8,0	19,0	63,0	8,0	1,14	3	46209	46208	46211
10,0	22,0	72,0	10,0	1,52	3	46213	46212	46214
12,0	26,0	83,0	12,0	1,52	4	46217	46216	46218
16,0	32,0	92,0	16,0	1,52	4	46221	46220	46222
20,0	38,0	104,0	20,0	1,52	4	46229	46228	46232
25,0	44,0	104,0	25,0	1,52	5	46231	46230	46233

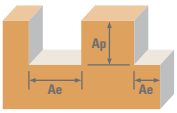
STAINLESS STEELS

HIGH TEMP ALLOYS

For patent information visit www.ksptpatents.com

METRIC

2 Flute: Square, Double, Stub, Long Reach, Ball
3 Flute: Square, Long Reach, Ball
4 Flute: Square, Double, Stub, Long Reach, Ball, Corner Radius



	Series 1M, 3M, 5M, 14M, 15M, 16M, 17M, 59M Metric	Hardness		Flutes	Ae x DC	Ap x DC	Vc (m/min)		DC • mm 0.4	0.75	1.5	3	6	10	12	20	25
P	CARBON STEELS 1018, 1040, 1080, 1090, 10L50, 1140, 1212, 12L15, 1525, 1536	≤ 175 Bhn or ≤ 7 HRc	Profile				140	RPM	111483	59458	29729	14864	7432	4459	3716	2230	1784
							(112-168)	Fz	0.0008	0.0015	0.0031	0.007	0.019	0.040	0.048	0.064	0.070
				2	≤ 0.50	≤ 1.5		Feed (mm/min)	178	178	184	208	282	357	357	285	250
				3	≤ 0.25	≤ 1.5			268	268	276	312	424	535	535	428	375
				4	≤ 0.25	≤ 1.5			357	357	369	416	565	713	713	571	499
			Slot				102	RPM	81189	43301	21650	10825	5413	3248	2706	1624	1299
							(82-123)	Fz	0.0008	0.0015	0.0031	0.007	0.019	0.040	0.048	0.064	0.070
				2	1	≤ 1		Feed (mm/min)	130	130	134	152	206	260	260	208	182
				3	1	≤ 0.5			195	195	201	227	309	390	390	312	273
				4	1	≤ 0.4			260	260	268	303	411	520	520	416	364
	ALLOY STEELS 4140, 4150, 4320, 5120, 5150, 8630, 86L20, 50100	≤ 275 Bhn or ≤ 28 HRc	Profile				102	RPM	81189	43301	21650	10825	5413	3248	2706	1624	1299
							(82-123)	Fz	0.0005	0.0012	0.0022	0.006	0.014	0.029	0.036	0.048	0.052
				2	≤ 0.50	≤ 1.5		Feed (mm/min)	81	104	95	130	152	188	195	156	135
				3	≤ 0.25	≤ 1.5			122	156	143	195	227	283	292	234	203
				4	≤ 0.25	≤ 1.5			162	208	191	260	303	377	390	312	270
			Slot				75	RPM	59377	31668	15834	7917	3958	2375	1979	1188	950
							(60-90)	Fz	0.0005	0.0012	0.0022	0.006	0.014	0.029	0.036	0.048	0.052
				2	1	≤ 1		Feed (mm/min)	59	76	70	95	111	138	143	114	99
				3	1	≤ 0.5			119	152	139	190	222	276	285	228	198
				4	1	≤ 0.4			119	152	139	190	222	276	285	228	198
	TOOL STEELS A2, D2, H13, L2, M2, P20, S7, T15, W2	≤ 250 Bhn or ≤ 24 HRc	Profile				96	RPM	76342	40715	20358	10179	5089	3054	2545	1527	1221
							(77-115)	Fz	0.0005	0.0012	0.0022	0.006	0.014	0.029	0.036	0.048	0.052
				2	≤ 0.50	≤ 1.5		Feed (mm/min)	76	98	90	122	143	177	183	147	127
				3	≤ 0.25	≤ 1.5			115	147	134	183	214	266	275	220	191
				4	≤ 0.25	≤ 1.5			153	195	179	244	285	354	366	293	254
			Slot				70	RPM	55741	29729	14864	7432	3716	2230	1858	1115	892
							(56-84)	Fz	0.0005	0.0012	0.0022	0.006	0.014	0.029	0.036	0.048	0.052
				2	1	≤ 1		Feed (mm/min)	56	71	65	89	104	129	134	107	93
				3	1	≤ 0.5			84	107	98	134	156	194	201	161	139
				4	1	≤ 0.4			111	143	131	178	208	259	268	214	186
M	STAINLESS STEELS (FREE MACHINING) 303, 416, 420F, 430F 440F	≤ 275 Bhn or ≤ 28 HRc	Profile				113	RPM	89671	47825	23912	11956	5978	3587	2989	1793	1435
							(90-135)	Fz	0.0005	0.0012	0.0022	0.006	0.014	0.029	0.036	0.048	0.052
				2	≤ 0.50	≤ 1.5		Feed (mm/min)	90	115	105	143	167	208	215	172	149
				3	≤ 0.25	≤ 1.5			135	172	158	215	251	312	323	258	224
				4	≤ 0.25	≤ 1.5			179	230	210	287	335	416	430	344	298
			Slot				82	RPM	65436	34899	17449	8725	4362	2617	2181	1309	1047
							(66-99)	Fz	0.0005	0.0012	0.0022	0.006	0.014	0.029	0.036	0.048	0.052
				2	1	≤ 1		Feed (mm/min)	65	84	77	105	122	152	157	126	109
				3	1	≤ 0.5			98	126	115	157	183	228	236	188	163
				4	1	≤ 0.4			131	168	154	209	244	304	314	251	218
	STAINLESS STEELS (DIFFICULT) 304, 304L, 316, 316L, 17-4 PH, 15-5, 13-4, Custom 450	≤ 275 Bhn or ≤ 28 HRc	Profile				78	RPM	61800	32960	16480	8240	4120	2472	2060	1236	989
							(62-93)	Fz	0.0005	0.0010	0.0019	0.004	0.012	0.024	0.029	0.037	0.042
				2	≤ 0.50	≤ 1.5		Feed (mm/min)	62	66	63	66	99	119	119	91	83
				3	≤ 0.25	≤ 1.5			93	99	94	99	148	178	179	137	125
				4	≤ 0.25	≤ 1.5			124	132	125	132	198	237	239	183	166
			Slot				56	RPM	44836	23912	11956	5978	2989	1793	1495	897	717
							(45-68)	Fz	0.0005	0.0010	0.0019	0.004	0.012	0.024	0.029	0.037	0.042
				2	1	≤ 1		Feed (mm/min)	45	48	45	48	72	86	87	66	60
				3	1	≤ 0.5			67	72	68	72	108	129	130	100	90
				4	1	≤ 0.4			90	96	91	96	143	172	173	133	121
K	CAST IRONS Gray, Malleable, Ductile	≤ 220 Bhn or ≤ 19 HRc	Profile				102	RPM	81189	43301	21650	10825	5413	3248	2706	1624	1299
							(82-123)	Fz	0.0008	0.0015	0.0031	0.007	0.019	0.040	0.048	0.064	0.070
				2	≤ 0.50	≤ 1.5		Feed (mm/min)	130	130	134	152	206	260	260	208	182
				3	≤ 0.25	≤ 1.5			195	195	201	227	309	390	390	312	273
				4	≤ 0.25	≤ 1.5			260	260	268	303	411	520	520	416	364
			Slot				75	RPM	59377	31668	15834	7917	3958	2375	1979	1188	950
							(60-90)	Fz	0.0008	0.0015	0.0031	0.007	0.019	0.040	0.048	0.064	0.070
				2	1	≤ 1		Feed (mm/min)	95	95	98	111	150	190	190	152	133
				3	1	≤ 0.5			143	143	147	166	226	285	285	228	200
				4	1	≤ 0.4			190	190	196	222	301	380	380	304	266

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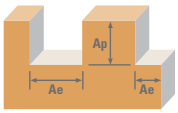
2 Flute: Square, Double, Stub, Long Reach, Ball
3 Flute: Square, Long Reach, Ball
4 Flute: Square, Double, Stub, Long Reach, Ball, Corner Radius

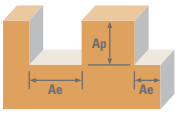


	Series 1M, 3M, 5M, 14M, 15M, 16M, 17M, 59M Metric	Hardness		Flutes	Ae x DC	Ap x DC	Vc (m/min)		DC • mm 0.4	0.75	1.5	3	6	10	12	20	25
N	ALUMINUM ALLOYS 2017, 2024, 356, 6061, 7075	≤ 150 Bhn or ≤ 88 HRb	Profile				268	RPM	213272	113745	56872	28436	14218	8531	7109	4265	3412
								Fz	0.0015	0.0032	0.0060	0.014	0.038	0.080	0.096	0.128	0.140
				2	≤ 0.50	≤ 1.5	(215-322)	Feed (mm/min)	640	728	682	796	1081	1365	1365	1092	955
				3	≤ 0.25	≤ 1.5			960	1092	1024	1194	1621	2047	2047	1638	1433
			Slot				195	RPM	155107	82724	41362	20681	10340	6204	5170	3102	2482
								Fz	0.0015	0.0032	0.0060	0.014	0.038	0.080	0.096	0.128	0.140
				2	1	≤ 1	(156-234)	Feed (mm/min)	465	529	496	579	786	993	993	794	695
				3	1	≤ 0.5			698	794	745	869	1179	1489	1489	1191	1042
	COPPER ALLOYS Alum Bronze, C110, Muntz Brass	≤ 140 Bhn or ≤ 3 HRc	Profile				148	RPM	117542	62689	31344	15672	7836	4702	3918	2351	1881
								Fz	0.0008	0.0015	0.0031	0.007	0.019	0.040	0.048	0.064	0.070
				2	≤ 0.50	≤ 1.5	(118-177)	Feed (mm/min)	188	188	194	219	298	376	376	301	263
				3	≤ 0.25	≤ 1.5			282	282	292	329	447	564	564	451	395
				4	≤ 0.25	≤ 1.5			376	376	389	439	596	752	752	602	527
			Slot					RPM	84824	45239	22620	11310	5655	3393	2827	1696	1357
								Fz	0.0008	0.0015	0.0031	0.007	0.019	0.040	0.048	0.064	0.070
				2	1	≤ 1		Feed (mm/min)	136	136	140	158	215	271	271	217	190
				3	1	≤ 0.5			204	204	210	238	322	407	407	326	285
				4	1	≤ 0.4			271	271	280	317	430	543	543	434	380
	PLASTICS Polycarbonate, PVC, Polypropylene		Profile				268	RPM	213272	113745	56872	28436	14218	8531	7109	4265	3412
								Fz	0.0015	0.0032	0.0060	0.014	0.038	0.080	0.096	0.128	0.140
				2	≤ 0.50	≤ 1.5	(215-322)	Feed (mm/min)	640	728	682	796	1081	1365	1365	1092	955
				3	≤ 0.25	≤ 1.5			960	1092	1024	1194	1621	2047	2047	1638	1433
				4	≤ 0.25	≤ 1.5			1280	1456	1365	1592	2161	2730	2730	2184	1911
			Slot				195	RPM	155107	82724	41362	20681	10340	6204	5170	3102	2482
								Fz	0.0015	0.0032	0.0060	0.014	0.038	0.080	0.096	0.128	0.140
				2	1	≤ 1	(156-234)	Feed (mm/min)	465	529	496	579	786	993	993	794	695
				3	1	≤ 0.5			698	794	745	869	1179	1489	1489	1191	1042
				4	1	≤ 0.4			931	1059	993	1158	1572	1985	1985	1588	1390
	GRAPHITE		Profile				201	RPM	159954	85309	42654	21327	10664	6398	5332	3199	2559
								Fz	0.0015	0.0032	0.0060	0.014	0.038	0.080	0.096	0.128	0.140
				2	≤ 0.50	≤ 1.5	(161-241)	Feed (mm/min)	480	546	512	597	810	1024	1024	819	717
				3	≤ 0.25	≤ 1.5			720	819	768	896	1216	1536	1536	1228	1075
				4	≤ 0.25	≤ 1.5			960	1092	1024	1194	1621	2047	2047	1638	1433
			Slot				146	RPM	116330	62043	31021	15511	7755	4653	3878	2327	1861
								Fz	0.0015	0.0032	0.0060	0.014	0.038	0.080	0.096	0.128	0.140
				2	1	≤ 1	(117-176)	Feed (mm/min)	349	397	372	434	589	745	745	596	521
				3	1	≤ 0.5			523	596	558	651	884	1117	1117	893	782
				4	1	≤ 0.4			698	794	745	869	1179	1489	1489	1191	1042
S	HIGH TEMP ALLOYS (NICKEL, COBALT, IRON BASE) Inconel 601, 617, 625, 718, Incoloy 800, Monel 400,Rene, Waspalloy	≤ 300 Bhn or ≤ 32 HRc	Profile				20	RPM	15753	8402	4201	2100	1050	630	525	315	252
								Fz	0.0005	0.0007	0.0014	0.004	0.010	0.021	0.024	0.032	0.035
				2	≤ 0.50	≤ 1.5	(16-24)	Feed (mm/min)	16	12	12	17	21	26	25	20	18
				3	≤ 0.25	≤ 1.5			24	18	18	25	32	40	38	30	26
				4	≤ 0.25	≤ 1.5			32	24	24	34	42	53	50	40	35
			Slot				14	RPM	10906	5816	2908	1454	727	436	364	218	174
								Fz	0.0005	0.0007	0.0014	0.004	0.010	0.021	0.024	0.032	0.035
				2	1	≤ 1	(11-16)	Feed (mm/min)	11	8	8	12	15	18	17	14	12
				3	1	≤ 0.5			16	12	12	17	22	27	26	21	18
				4	1	≤ 0.4			22	16	16	23	29	37	35	28	24
	TITANIUM ALLOYS Ti6Al4V, Ti6Al2Sn4Zr2Mo, Ti4Al4Mo2Sn0.5Si, Ti10V2Fe3Al, Ti5Al53Mo3Cr, Ti7Al4Mo, Ti3Al8V6Cr4Zr4Mo, Ti6Al6V6Sn, Ti152 Cr3Sn3Al	≤ 350 Bhn or ≤ 38 HRc	Profile				55	RPM	43624	23266	11633	5816	2908	1745	1454	872	698
								Fz	0.0005	0.0010	0.0019	0.004	0.012	0.024	0.029	0.037	0.042
				2	≤ 0.50	≤ 1.5	(44-66)	Feed (mm/min)	44	47	44	47	70	84	84	65	59
				3	≤ 0.25	≤ 1.5			65	70	66	70	105	126	127	97	88
				4	≤ 0.25	≤ 1.5			87	93	88	93	140	168	169	129	117
			Slot				40	RPM	31506	16803	8402	4201	2100	1260	1050	630	504
								Fz	0.0005	0.0010	0.0019	0.004	0.012	0.024	0.029	0.037	0.042
				2	1	≤ 1	(32-48)	Feed (mm/min)	32	34	32	34	50	60	61	47	42
				3	1	≤ 0.5			47	50	48	50	76	91	91	70	64
				4	1	≤ 0.4			63	67	64	67	101	121	122	93	85

Bhn (Brinell) HRc (Rockwell C)
rpm = (Vc x 1000) / (DC x 3.14)
mm/min = Fz x number of flutes x rpm
reduce speed and feed for materials harder than listed

limit cut depths of long and extra long flute mills to .05 x DC when slotting or profiling
reduce feed and Ae when finish milling (.02 x DC maximum)
refer to the SGS Tool Wizard® for complete technical information (www.kyocera-sgstool.com)

2 Flute: High Shear
4 Flute: High Shear



	Series 52M, 54M Metric	Hardness		Flutes	Ae x DC	Ap x DC	Vc (m/min)		DC • mm 3	6	10	12	20	25
N	ALUMINUM ALLOYS 2024, 5052, 5086, 6061, 6063, 7075	≤ 150 Bhn or ≤ 88 HRb	Profile				415	RPM	43947	21973	13184	10987	6592	5274
							(332-497)	Fz	0.0166	0.043	0.091	0.110	0.147	0.160
				2	≤ 0.3	≤ 1.5		Feed (mm/min)	1459	1890	2399	2417	1938	1688
				4	≤ 0.3	≤ 1.5			2918	3779	4799	4834	3876	3375
			Slot				332	RPM	35222	17611	10567	8806	5283	4227
							(266-399)	Fz	0.0151	0.041	0.085	0.101	0.133	0.148
				2	1	≤ 1		Feed (mm/min)	1064	1444	1796	1779	1405	1251
				4	1	≤ 0.25			2127	2888	3593	3557	2811	2502
	ALUMINUM DIE CAST ALLOYS (HIGH SILICON) A-390, A-392, B-390	≤ 125 Bhn or ≤ 77 HRb	Profile				155	RPM	16480	8240	4944	4120	2472	1978
							(124-187)	Fz	0.0166	0.043	0.091	0.110	0.147	0.160
				2	≤ 0.3	≤ 1.5		Feed (mm/min)	547	709	900	906	727	633
				4	≤ 0.3	≤ 1.5			1094	1417	1800	1813	1454	1266
			Slot				125	RPM	13249	6624	3975	3312	1987	1590
							(100-150)	Fz	0.0151	0.041	0.085	0.101	0.133	0.148
				2	1	≤ 1		Feed (mm/min)	400	543	676	669	529	471
				4	1	≤ 0.25			800	1086	1351	1338	1057	941
	COPPER ALLOYS Aluminum Bronze, Muntz Brass, Naval, Brass, Red Brass	≤ 140 Bhn or ≤ 3 HRc	Profile				180	RPM	19065	9533	5720	4766	2860	2288
							(144-216)	Fz	0.0094	0.024	0.053	0.062	0.083	0.093
				2	≤ 0.3	≤ 1.5		Feed (mm/min)	358	458	606	591	475	426
				4	≤ 0.3	≤ 1.5			717	915	1213	1182	949	851
			Slot				145	RPM	15349	7675	4605	3837	2302	1842
							(116-174)	Fz	0.0086	0.024	0.048	0.058	0.077	0.085
				2	1	≤ 1		Feed (mm/min)	264	368	442	445	355	313
				4	1	≤ 0.25			528	737	884	890	709	626
	COPPER ALLOYS Beryllium Copper, C110, Manganese Bronze, Tin Bronze	≤ 200 Bhn or ≤ 23 HRc	Profile				72	RPM	7594	3797	2278	1898	1139	911
							(57-86)	Fz	0.0094	0.024	0.053	0.062	0.083	0.093
				2	≤ 0.3	≤ 1.5		Feed (mm/min)	143	182	241	235	189	169
				4	≤ 0.3	≤ 1.5			286	365	483	471	378	339
			Slot				58	RPM	6140	3070	1842	1535	921	737
							(46-69)	Fz	0.0086	0.024	0.048	0.058	0.077	0.085
				2	1	≤ 1		Feed (mm/min)	106	147	177	178	142	125
				4	1	≤ 0.25			211	295	354	356	284	250

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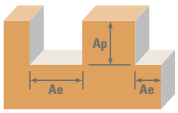
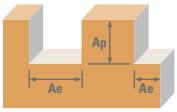
2 Flute: High Shear
4 Flute: High Shear



	Series 52M, 54M Metric	Hardness		Flutes	Ae x DC	Ap x DC	Vc (m/min)		DC • mm 3	6	10	12	20	25
N	PLASTICS ABS, Polycarbonate, PVC, Polypropylene		Profile				488	RPM	51702	25851	15511	12926	7755	6204
							(390-585)	Fz	0.0264	0.072	0.149	0.178	0.237	0.250
				2	≤ 0.3	≤ 1.5		Feed (mm/min)	2730	3723	4622	4601	3676	3102
				4	≤ 0.3	≤ 1.5			5460	7445	9244	9203	7352	6204
			Slot				390	RPM	41362	20681	12409	10340	6204	4963
							(312-468)	Fz	0.0240	0.065	0.136	0.163	0.210	0.238
				2	1	≤ 1		Feed (mm/min)	1985	2689	3375	3371	2606	2363
				4	1	≤ 0.25			3971	5377	6750	6742	5212	4725
	PLASTICS Fiberglass, Glass Filled		Profile				219	RPM	23266	11633	6980	5816	3490	2792
							(176-263)	Fz	0.0197	0.053	0.109	0.132	0.173	0.190
				2	≤ 0.3	≤ 1.5		Feed (mm/min)	917	1233	1522	1536	1208	1061
				4	≤ 0.3	≤ 1.5			1833	2466	3043	3071	2415	2122
			Slot				175	RPM	18580	9290	5574	4645	2787	2230
							(140-210)	Fz	0.0180	0.048	0.101	0.120	0.160	0.175
				2	1	≤ 1		Feed (mm/min)	669	892	1126	1115	892	780
				4	1	≤ 0.25			1338	1784	2252	2230	1784	1561

Bhn (Brinell) HRc (Rockwell C) HRb (Rockwell B)
rpm = (Vc x 1000) / (DC x 3.14)
mm/min = Fz x number of flutes x rpm
reduce speed and feed for materials harder than listed
reduce feed and Ae when finish milling (.02 x DC maximum)
refer to the SGS Tool Wizard® for complete technical information (www.kyocera-sgstool.com)

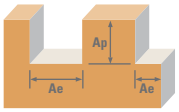
Single End Roughers (Coarse Pitch)



	Series 61M Metric	Hardness		Ae x DC	Ap x DC	Vc (m/min)		DC • mm 6	10	12	20	25
P	CARBON STEELS 1018, 1040, 1080, 1090, 10L50, 1140, 1212, 12L15, 1525, 1536	≤ 175 Bhn or ≤ 7 HRc	Profile	≤ 0.5	≤ 1.5	152	RPM	8078	4847	4039	2424	1939
						(122-183)	Fz	0.014	0.029	0.034	0.045	0.050
							Feed (mm/min)	339	422	549	436	485
			Slot	1	≤ 1	122	RPM	6463	3878	3231	1939	1551
						(98-146)	Fz	0.014	0.029	0.034	0.045	0.050
							Feed (mm/min)	271	337	439	349	388
	ALLOY STEELS 4140, 4150, 4320, 5120, 5150, 8630, 86L20, 50100	≤ 275 Bhn or ≤ 28 HRc	Profile	≤ 0.5	≤ 1.5	111	RPM	5897	3538	2949	1769	1415
						(89-134)	Fz	0.010	0.021	0.026	0.035	0.038
							Feed (mm/min)	177	223	307	248	269
			Slot	1	≤ 1	90	RPM	4766	2860	2383	1430	1144
						(72-108)	Fz	0.010	0.021	0.026	0.035	0.038
							Feed (mm/min)	143	180	248	200	217
	TOOL STEELS A2, D2, H13, L2, M2, P20, S7, T15, W2	≤ 250 Bhn or ≤ 24 HRc	Profile	≤ 0.5	≤ 1.5	105	RPM	5574	3344	2787	1672	1338
						(84-126)	Fz	0.014	0.024	0.036	0.048	0.053
							Feed (mm/min)	234	241	401	321	355
			Slot	1	≤ 1	84	RPM	4443	2666	2222	1333	1066
						(67-101)	Fz	0.014	0.024	0.036	0.048	0.053
							Feed (mm/min)	187	192	320	256	283
K	CAST IRONS Gray, Malleable, Ductile	≤ 220 Bhn or ≤ 19 HRc	Profile	≤ 0.5	≤ 1.5	111	RPM	5897	3538	2949	1769	1415
						(89-134)	Fz	0.019	0.040	0.048	0.064	0.070
							Feed (mm/min)	336	425	566	453	495
			Slot	1	≤ 1	90	RPM	4766	2860	2383	1430	1144
						(72-108)	Fz	0.019	0.040	0.048	0.064	0.070
							Feed (mm/min)	272	343	458	366	400

Bhn (Brinell) HRc (Rockwell C)
rpm = (Vc x 1000) / (DC x 3.14)
mm/min = Fz x number of flutes x rpm
reduce speed and feed for materials harder than listed
refer to the SGS Tool Wizard® for complete technical information (www.kyocera-sgstool.com)

Single End Roughers (Fine Pitch)



	Series 62M Metric	Hardness		Ae x DC	Ap x DC	Vc (m/min)		DC • mm 6	10	12	20	25
M	STAINLESS STEELS (FREE MACHINING) 303, 416, 420F, 430F, 440F	≤ 275 Bhn or ≤ 28 HRc	Profile	≤ 0.5	≤ 1.5	123	RPM	6544	3926	3272	1963	1570
						(99-148)	Fz	0.014	0.029	0.036	0.051	0.053
							Feed (mm/min)	283	345	471	398	495
			Slot	1	≤ 1	99	RPM	5251	3151	2626	1575	1260
						(79-119)	Fz	0.014	0.029	0.036	0.051	0.053
							Feed (mm/min)	227	277	378	319	397
	STAINLESS STEELS (DIFFICULT) 304, 304L, 316, 316L, 17-4PH, 15-5PH, 13-4PH, Custom 450	≤ 275 Bhn or ≤ 28 HRc	Profile	≤ 0.5	≤ 1.5	85	RPM	4524	2714	2262	1357	1086
						(68-102)	Fz	0.012	0.024	0.029	0.040	0.043
							Feed (mm/min)	163	195	261	217	277
			Slot	1	≤ 1	69	RPM	3635	2181	1818	1091	872
						(55-82)	Fz	0.012	0.024	0.029	0.040	0.043
							Feed (mm/min)	131	157	209	174	222
S	HIGH TEMP ALLOYS (NICKEL, COBALT, IRON BASE) Inconel 601, 617, 625, Incoloy 800, Monel 400, Rene, Waspalloy	≤ 300 Bhn or ≤ 32 HRc	Profile	≤ 0.5	≤ 1.5	21	RPM	1131	679	565	339	271
						(17-26)	Fz	0.010	0.021	0.024	0.035	0.035
							Feed (mm/min)	33	43	54	47	57
			Slot	1	≤ 1	17	RPM	905	543	452	271	217
						(14-20)	Fz	0.010	0.021	0.024	0.035	0.035
							Feed (mm/min)	26	35	43	38	46
	TITANIUM ALLOYS Ti6Al4V, Ti6Al2Sn4Zr2Mo, Ti4Al4Mo2Sn0.5Si, Ti10V2Fe3Al, Ti5Al53Mo3Cr, Ti7Al4Mo, Ti3Al8V6Cr4Zr4Mo, Ti6Al6V6Sn, Ti152 Cr3Sn3Al	≤ 350 Bhn or ≤ 38 HRc	Profile	≤ 0.5	≤ 1.5	47	RPM	2504	1503	1252	751	601
						(38-57)	Fz	0.012	0.024	0.029	0.040	0.043
							Feed (mm/min)	90	108	144	120	153
			Slot	1	≤ 1	59	RPM	3151	1890	1575	945	756
						(48-71)	Fz	0.012	0.024	0.029	0.040	0.043
							Feed (mm/min)	113	136	181	151	193

Bhn (Brinell) HRc (Rockwell C)
rpm = (Vc x 1000) / (DC x 3.14)
mm/min = Fz x number of flutes x rpm
reduce speed and feed for materials harder than listed
refer to the SGS Tool Wizard® for complete technical information (www.kyocera-sgstool.com)

SGS Solid Carbide Tools

Keeping the world moving

General Application Drills

Hole Making

GENERAL APPLICATION DRILLS	SERIES	DESCRIPTION	PAGE	S&F PAGE
2 Flute	101	2 Flute Slow Spiral	230	238
Short Length Self Centering (DIN6539)	108M Plus	2 Flute Short Length DIN 6539	235	239
Straight Flute	106	Straight Flute 140 Point Geometry	242	245
3 Flute with 150 Point Geometry	103	3 Flute 150 Point Geometry	246	250

GENERAL APPLICATION COUNTERSINKS	SERIES	DESCRIPTION	PAGE	S&F PAGE
Combined Drill & Countersink	301	2 Flute Straight Flute Combined Drill and Countersink Fractional	252	254
	301M	2 Flute Straight Flute Combined Drill and Countersink Metric	253	256
Single Flute Countersink	601	Single Flute Fractional	258	259
3 Flute Countersink	603	3 Flute Fractional	261	262
6 Flute Countersink	606	6 Flute Fractional	264	265

GENERAL APPLICATION REAMERS	SERIES	DESCRIPTION	PAGE	S&F PAGE
Straight Flute Accu-Reamer	200	Accu-Reamer	268	270
Straight Flute Reamer	201M	Metric Reamer	272	273

Speed & Feed Recommendations listed after each series

Taladrado

BROCAS DE USO GENERAL	SERIE	DESCRIPCIÓN	PÁGINA	S&F PÁGINA
2 filos	101	2 filos, espiral de avance lento	230	238
Autocentrante de longitud corta (DIN6539)	108M Plus	2 filos, longitud corta, DIN 6539	235	239
Filo recto	106	Filo recto, geometría de 140 puntos	242	245
3 filos con geometría de 150 puntos	103	3 filos, geometría de 150 puntos	246	250

BROCAS DE USO AVELLANADORES	SERIE	DESCRIPCIÓN	PÁGINA	S&F PÁGINA
Broca y avellanador combinados	301	2 filos, filo recto, broca y avellanador combinados, fraccional	252	254
	301M	2 filos, filo recto, broca y avellanador combinados, métrico	253	256
Avellanador de filo único	601	Filo único, fraccional	258	259
Avellanador de 3 filos	603	3 filos, fraccional	261	262
Avellanador de 6 filos	606	6 filos, fraccional	264	265

BROCAS DE USO ESCARIADORES	SERIE	DESCRIPCIÓN	PÁGINA	S&F PÁGINA
Escariador Accu de filo recto	200	Escariador Accu	268	270
Escariador de filo recto	201M	Escariador métrico	272	273

Recomendaciones de velocidades y avances mostradas tras cada serie

Outils de perçage

FORETS UNIVERSELS	SÈRIES	DESCRIPTION	PAGE	S&F PAGE
2 dents	101	2 dents à spirale lente	230	238
Court autocentrant (DIN 6539)	108M Plus	2 dents court DIN 6539	235	239
Denture droite	106	Denture droite à angle de pointe 140º	242	245
3 dents à angle de pointe 150º	103	3 dents à angle de pointe 150º	246	250

FORETS À FRAISER	SÈRIES	DESCRIPTION	PAGE	S&F PAGE
Foret et foret à fraiser combinés	301	2 dents denture droite foret et foret à fraiser combinés (fractionnel)	252	254
	301M	2 dents denture droite foret et foret à fraiser combinés (métrique)	253	256
Foret à fraiser à dent simple	601	Foret à dent simple (fractionnel)	258	259
Foret à fraiser 3 dents	603	3 dents (fractionnel)	261	262
Foret à fraiser 6 dents	606	6 dents (fractionnel)	264	265

FORETS À ALÉSOIRS	SÈRIES	DESCRIPTION	PAGE	S&F PAGE
Alésoir denture droite Accu-Reamer	200	Alésoir Accu-Reamer	268	270
Alésoir denture droite	201M	Alésoir (métrique)	272	273

Recommandations de vitesse et avance indiquées après chaque série

STANDARD-BOHRER	SERIE	BESCHREIBUNG	SEITE	S&F SEITE
2 Schneiden	101	2 Schneiden mit kleinem Spanwinkel	230	238
Kurze Bauform Selbstzentrierung (DIN 6539)	108M Plus	2 Schneiden Kurze Bauform DIN 6539	235	239
Gerade Schneiden	106	Gerade Schneiden Spitzengeometrie 140	242	245
3 Schneiden mit Spitzengeometrie 150	103	3 Schneiden Spitzengeometrie 150	246	250

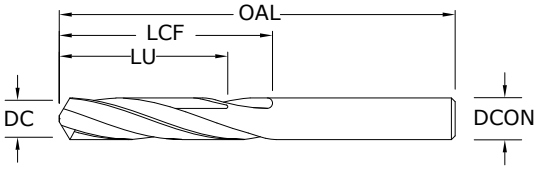
STANDARD-BOHRER	SERIE	BESCHREIBUNG	SEITE	S&F SEITE
Senkbohrer	301	Zölliger Senkbohrer mit 2 geraden Schneiden	252	254
	301M	Metrischer Senkbohrer mit 2 geraden Schneiden	253	256
Senker mit 1 Schneide	601	Zölliger Bohrer mit 1 Schneide	258	259
Senkbohrer mit 1 Schneide	603	Zölliger Bohrer mit 3 Schneiden	261	262
Senkbohrer mit 6 Schneiden	606	Zölliger Bohrer mit 6 Schneiden	264	265

STANDARD-BOHRER	SERIE	BESCHREIBUNG	SEITE	S&F SEITE
Reibahlen mit gerader Schneide	200	Accu-Reamer	268	270
Reibahle mit gerader Schneide	201M	Metrische Reibahle	272	273

Empfehlungen für Drehzahl & Vorschub im Anhang zu jeder Serie

2 Flute Drills • Metric: DIN 338

Pictured:
Series 101 Drill Set



101
FRACTIONAL & METRIC SERIES

DECIMAL DC/DCON	METRIC DC/DCON	FRACTIONAL/ LETTER/WIRE DC	OVERALL LENGTH OAL	FLUTE LENGTH LCF	USABLE LENGTH LU	EDP NO. UNCOATED	EDP NO. Ti-NAMITE®-A (AlTiN)
		inch & mm					
0.0135	0,340 mm	#80	3/4	3/16	–	51080	57076
0.0145	0,370 mm	#79	3/4	3/16	–	51079	57077
0.0156	0,400 mm	1/64	3/4	3/16	–	51101	57078
0.0160	0,410 mm	#78	3/4	3/16	–	51078	57079
0.0180	0,460 mm	#77	3/4	3/16	–	51077	57080
0.0200	0,510 mm	#76	7/8	1/4	–	51076	57081
0.0210	0,530 mm	#75	7/8	1/4	–	51075	57082
0.0225	0,570 mm	#74	7/8	1/4	–	51074	57083
0.0240	0,610 mm	#73	7/8	1/4	–	51073	57084
0.0250	0,640 mm	#72	1	5/16	–	51072	57085
0.0260	0,660 mm	#71	1	5/16	–	51071	57086
0.0276	0,700 mm		28,0	9,0	–	61001	68268
0.0280	0,710 mm	#70	1-1/4	1/2	–	51070	57087
0.0292	0,740 mm	#69	1-1/4	1/2	–	51069	57088
0.0310	0,790 mm	#68	1-1/4	1/2	–	51068	57089
0.0312	0,790 mm	1/32	1-1/4	1/2	–	51102	57090
0.0315	0,800 mm		30,0	10,0	–	61003	68269
0.0320	0,810 mm	#67	1-1/4	1/2	–	51067	57091
0.0330	0,840 mm	#66	1-1/4	1/2	–	51066	57092
0.0350	0,890 mm	#65	1-3/8	5/8	1/2	51065	57093
0.0354	0,900 mm		32,0	11,0	8,0	61005	68270
0.0360	0,910 mm	#64	1-3/8	5/8	1/2	51064	57094
0.0370	0,940 mm	#63	1-3/8	5/8	1/2	51063	57095
0.0380	0,970 mm	#62	1-3/8	5/8	1/2	51062	57096
0.0390	0,990 mm	#61	1-3/8	5/8	1/2	51061	57097
0.0394	1,000 mm		34,0	12,0	9,0	61007	68271
0.0400	1,020 mm	#60	1-1/2	3/4	39/64	51060	57098
0.0410	1,040 mm	#59	1-1/2	3/4	39/64	51059	57099
0.0420	1,070 mm	#58	1-1/2	3/4	39/64	51058	57100
0.0430	1,090 mm	#57	1-1/2	3/4	39/64	51057	57101
0.0433	1,000 mm		36,0	14,0	11,0	61052	68294
0.0465	1,180 mm	#56	1-1/2	3/4	39/64	51056	57102
0.0469	1,190 mm	3/64	1-1/2	3/4	39/64	51103	57103
0.0472	1,200 mm		38,0	16,0	12,0	61053	68295
0.0512	1,300 mm		38,0	16,0	12,0	61054	68296
0.0520	1,320 mm	#55	1-1/2	3/4	39/64	51055	57104
0.0550	1,400 mm	#54	1-1/2	3/4	39/64	51054	57105
0.0551	1,400 mm		40,0	18,0	14,0	61055	68297
0.0591	1,500 mm		40,0	18,0	14,0	61009	68272
0.0595	1,510 mm	#53	1-1/2	3/4	39/64	51053	57106
0.0625	1,590 mm	*1/16	1-1/2	3/4	39/64	51104	57107
0.0630	1,600 mm		43,0	20,0	16,0	61056	68298
0.0635	1,610 mm	#52	1-1/2	3/4	39/64	51052	57108
0.0669	1,700 mm		43,0	20,0	17,0	61057	68299

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TOLERANCES (inch)

DC = +0.0000/–0.0005

TOLERANCES (mm)

DC = +0,0000/–0,0127

- STEELS
- STAINLESS STEELS
- CAST IRON
- NON-FERROUS
- HIGH TEMP ALLOYS
- HARDENED STEELS

For patent information visit www.ksptpatents.com

2 Flute Drills • Metric: DIN 338

CONTINUED

DECIMAL DC / DCON	METRIC DC / DCON	FRACTIONAL/ LETTER/WIRE DC	OVERALL LENGTH OAL	FLUTE LENGTH LCF	USABLE LENGTH LU	EDP NO. UNCOATED	EDP NO. Ti-NAMITE®-A (AlTiN)
		inch & mm					
0.0670	1,700 mm	#51	1-1/2	3/4	39/64	51051	57109
0.0700	1,780 mm	#50	1-3/4	7/8	45/64	51050	57110
0.0709	1,800 mm		46,0	22,0	17,0	61058	68300
0.0730	1,850 mm	#49	1-3/4	7/8	45/64	51049	57111
0.0748	1,900 mm		46,0	22,0	17,0	61059	68301
0.0760	1,930 mm	#48	1-3/4	7/8	45/64	51048	57112
0.0781	1,980 mm	5/64	1-3/4	7/8	45/64	51105	57113
0.0785	1,990 mm	#47	1-3/4	7/8	45/64	51047	57114
0.0787	2,000 mm		49,0	24,0	19,0	61011	68273
0.0810	2,060 mm	#46	1-3/4	7/8	45/64	51046	57115
0.0820	2,080 mm	#45	1-3/4	7/8	45/64	51045	57116
0.0827	2,100 mm		49,0	24,0	19,0	61060	68302
0.0860	2,180 mm	#44	2	1	51/64	51044	57117
0.0866	2,200 mm		53,0	27,0	21,0	61061	68303
0.0890	2,260 mm	#43	2	1	51/64	51043	57118
0.0906	2,300 mm		53,0	27,0	21,0	61062	68304
0.0935	2,370 mm	#42	2	1	51/64	51042	57119
0.0938	2,380 mm	3/32	2	1	51/64	51106	57120
0.0945	2,400 mm		57,0	30,0	24,0	61063	68305
0.0960	2,440 mm	#41	2	1	51/64	51041	57121
0.0980	2,490 mm	#40	2	1	51/64	51040	57122
0.0984	2,500 mm		57,0	30,0	24,0	61013	68274
0.0995	2,530 mm	#39	2-1/4	1-1/4	1	51039	57123
0.1015	2,580 mm	#38	2-1/4	1-1/4	1	51038	57124
0.1024	2,600 mm		57,0	30,0	24,0	61064	68306
0.1040	2,640 mm	#37	2-1/4	1-1/4	1	51037	57125
0.1063	2,700 mm		61,0	33,0	26,0	61065	68307
0.1065	2,710 mm	#36	2-1/4	1-1/4	1	51036	57126
0.1094	2,780 mm	7/64	2-1/4	1-1/4	1	51107	57127
0.1100	2,790 mm	#35	2-1/4	1-1/4	1	51035	57128
0.1102	2,800 mm		61,0	33,0	26,0	61066	68308
0.1110	2,820 mm	#34	2-1/4	1-1/4	1	51034	57129
0.1130	2,870 mm	#33	2-1/4	1-1/4	1	51033	57130
0.1142	2,900 mm		61,0	33,0	26,0	61067	68309
0.1160	2,950 mm	#32	2-1/4	1-1/4	1	51032	57131
0.1181	3,000 mm		61,0	33,0	26,0	61015	68275
0.1200	3,050 mm	#31	2-1/4	1-1/4	1	51031	57132
0.1220	3,100 mm		65,0	36,0	28,0	61068	68310
0.1250	3,180 mm	*1/8	2-1/4	1-1/4	1	51108	57133
0.1260	3,200 mm		65,0	36,0	28,0	61069	68311
0.1285	3,260 mm	#30	2-1/4	1-1/4	1	51030	57134
0.1299	3,300 mm		65,0	36,0	28,0	61070	68312
0.1339	3,400 mm		70,0	39,0	31,0	61071	68313
0.1360	3,450 mm	#29	2-1/2	1-3/8	1-7/64	51029	57135
0.1378	3,500 mm		70,0	39,0	31,0	61017	68276
0.1405	3,570 mm	#28	2-1/2	1-3/8	1-7/64	51028	57136
0.1406	3,570 mm	9/64	2-1/2	1-3/8	1-7/64	51109	57137
0.1417	3,600 mm		70,0	39,0	31,0	61072	68314
0.1440	3,660 mm	#27	2-1/2	1-3/8	1-7/64	51027	57138
0.1457	3,700 mm		70,0	39,0	31,0	61073	68315
0.1470	3,730 mm	#26	2-1/2	1-3/8	1-7/64	51026	57139
0.1495	3,800 mm	#25	2-1/2	1-3/8	1-7/64	51025	57140
0.1496	3,800 mm		75,0	43,0	34,0	61074	68316
0.1520	3,860 mm	#24	2-1/2	1-3/8	1-7/64	51024	57141

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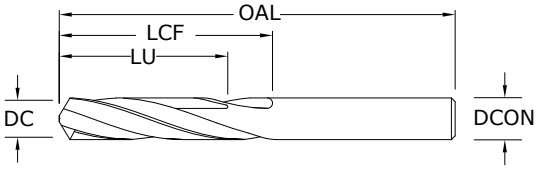
2 Flute Drills • Metric: DIN 338

Pictured:
Series 101 Drill Set



101

FRACTIONAL & METRIC SERIES

CONTINUED

DECIMAL DC/DCON	METRIC DC/DCON	FRACTIONAL/ LETTER/WIRE DC	OVERALL LENGTH OAL	FLUTE LENGTH LCF	USABLE LENGTH LU	EDP NO. UNCOATED	EDP NO. Ti-NAMITE®-A (AlTiN)
	inch & mm						
0.1535	3,900 mm		75,0	43,0	34,0	61075	68317
0.1540	3,910 mm	#23	2-1/2	1-3/8	1-7/64	51023	57142
0.1562	3,970 mm	5/32	2-1/2	1-3/8	1-7/64	51110	57143
0.1570	3,990 mm	#22	2-1/2	1-3/8	1-7/64	51022	57144
0.1575	4,000 mm		75,0	43,0	34,0	61019	68277
0.1590	4,040 mm	#21	2-1/2	1-3/8	1-7/64	51021	57145
0.1610	4,090 mm	#20	2-1/2	1-3/8	1-7/64	51020	57146
0.1614	4,100 mm		75,0	43,0	34,0	61076	68318
0.1654	4,200 mm		75,0	43,0	34,0	61077	68319
0.1660	4,220 mm	#19	2-3/4	1-5/8	1-19/64	51019	57147
0.1693	4,300 mm		80,0	47,0	37,0	61078	68320
0.1695	4,310 mm	#18	2-3/4	1-5/8	1-19/64	51018	57148
0.1719	4,370 mm	11/64	2-3/4	1-5/8	1-19/64	51111	57149
0.1730	4,390 mm	#17	2-3/4	1-5/8	1-19/64	51017	57150
0.1732	4,400 mm		80,0	47,0	37,0	61079	68321
0.1770	4,500 mm	#16	2-3/4	1-5/8	1-19/64	51016	57151
0.1772	4,500 mm		80,0	47,0	37,0	61021	68278
0.1800	4,570 mm	#15	2-3/4	1-5/8	1-19/64	51015	57152
0.1811	4,600 mm		80,0	47,0	37,0	61080	68322
0.1820	4,620 mm	#14	2-3/4	1-5/8	1-19/64	51014	57153
0.1850	4,700 mm		80,0	47,0	37,0	61081	68323
0.1850	4,700 mm	#13	2-3/4	1-5/8	1-19/64	51013	57154
0.1875	4,760 mm	*3/16	2-3/4	1-5/8	1-19/64	51112	57155
0.1890	4,800 mm		86,0	52,0	41,0	61082	68324
0.1890	4,800 mm	#12	2-3/4	1-5/8	1-19/64	51012	57156
0.1910	4,850 mm	#11	2-3/4	1-5/8	1-19/64	51011	57157
0.1929	4,900 mm		86,0	52,0	41,0	61083	68325
0.1935	4,910 mm	#10	2-3/4	1-5/8	1-19/64	51010	57158
0.1960	4,980 mm	#9	3	1-3/4	1-13/32	51009	57159
0.1969	5,000 mm		86,0	52,0	41,0	61023	68279
0.1990	5,050 mm	#8	3	1-3/4	1-13/32	51008	57160
0.2008	5,010 mm		86,0	52,0	41,0	61084	68326
0.2010	5,110 mm	#7	3	1-3/4	1-13/32	51007	57161
0.2031	5,160 mm	13/64	3	1-3/4	1-13/32	51113	57162
0.2040	5,180 mm	#6	3	1-3/4	1-13/32	51006	57163
0.2047	5,200 mm		86,0	52,0	41,0	61085	68327
0.2055	5,220 mm	#5	3	1-3/4	1-13/32	51005	57164
0.2087	5,300 mm		86,0	52,0	41,0	61086	68328
0.2090	5,310 mm	#4	3	1-3/4	1-13/32	51004	57165
0.2126	5,400 mm		93,0	57,0	45,0	61087	68329
0.2130	5,410 mm	#3	3	1-3/4	1-13/32	51003	57166
0.2165	5,500 mm		93,0	57,0	1-13/32	61025	68280
0.2188	5,560 mm	7/32	3	1-3/4	1-13/32	51114	57167
0.2205	5,600 mm		93,0	57,0	45,0	61088	68330

continued on next page

TOLERANCES (inch)

DC = +0.0000/–0.0005

TOLERANCES (mm)

DC = +0,0000/–0,0127

- STEELS
- STAINLESS STEELS
- CAST IRON
- NON-FERROUS
- HIGH TEMP ALLOYS
- HARDENED STEELS

For patent information visit www.ksptpatents.com

2 Flute Drills • Metric: DIN 338

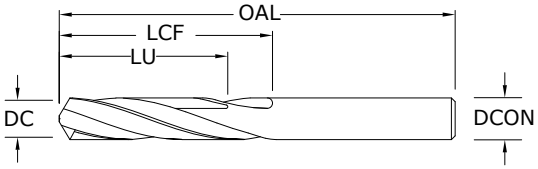
CONTINUED

DECIMAL DC / DCON	METRIC DC / DCON	FRACTIONAL/ LETTER/WIRE DC	OVERALL LENGTH OAL	FLUTE LENGTH LCF	USABLE LENGTH LU	EDP NO. UNCOATED	EDP NO. Ti-NAMITE®-A (AlTiN)
		inch & mm					
0.2210	5,610 mm	#2	3	1-3/4	1-13/32	51002	57168
0.2244	5,700 mm		93,0	57,0	45,0	61089	68331
0.2280	5,790 mm	#1	3	1-3/4	1-13/32	51001	57169
0.2283	5,800 mm		93,0	57,0	45,0	61090	68332
0.2323	5,900 mm		93,0	57,0	45,0	61091	68333
0.2340	5,940 mm	A	3-1/4	2	1-39/64	51201	57170
0.2344	5,950 mm	15/64	3-1/4	2	1-39/64	51115	57171
0.2362	6,000 mm		93,0	57,0	45,0	61027	68281
0.2380	6,050 mm	B	3-1/4	2	1-39/64	51202	57172
0.2402	6,100 mm		101,0	63,0	50,0	61092	68334
0.2420	6,150 mm	C	3-1/4	2	1-39/64	51203	57173
0.2441	6,200 mm		101,0	63,0	50,0	61093	68335
0.2460	6,250 mm	D	3-1/4	2	1-39/64	51204	57174
0.2480	6,300 mm		101,0	63,0	50,0	61094	68336
0.2500	6,350 mm	*1/4	3-1/4	2	1-39/64	51116	57176
0.2520	6,400 mm		101,0	63,0	50,0	61095	68337
0.2559	6,500 mm		101,0	63,0	50,0	61029	68282
0.2570	6,530 mm	F	3-1/4	2	1-39/64	51206	57177
0.2598	6,600 mm		101,0	63,0	50,0	61096	68338
0.2610	6,630 mm	G	3-1/2	2-1/8	1-45/64	51207	57178
0.2638	6,700 mm		101,0	63,0	50,0	61097	68339
0.2656	6,750 mm	17/64	3-1/2	2-1/8	1-45/64	51117	57179
0.2660	6,760 mm	H	3-1/2	2-1/8	1-45/64	51208	57180
0.2677	6,800 mm		109,0	69,0	55,0	61098	68340
0.2717	6,900 mm		109,0	69,0	55,0	61099	68341
0.2720	6,910 mm	I	3-1/2	2-1/8	1-45/64	51209	57181
0.2756	7,000 mm		109,0	69,0	55,0	61031	68283
0.2770	7,040 mm	J	3-1/2	2-1/8	1-45/64	51210	57182
0.2795	7,100 mm		109,0	69,0	55,0	61100	68342
0.2810	7,140 mm	K	3-1/2	2-1/8	1-45/64	51211	57183
0.2812	7,140 mm	9/32	3-1/2	2-1/8	1-45/64	51118	57184
0.2835	7,200 mm		109,0	69,0	55,0	61101	68343
0.2874	7,300 mm		109,0	69,0	55,0	61102	68344
0.2900	7,370 mm	L	3-1/2	2-1/8	1-45/64	51212	57185
0.2913	7,400 mm		109,0	69,0	55,0	61103	68345
0.2950	7,490 mm	M	3-3/4	2-3/8	1-29/32	51213	57186
0.2953	7,500 mm		109,0	69,0	55,0	61033	68284
0.2969	7,540 mm	19/64	3-3/4	2-3/8	1-29/32	51119	57187
0.2992	7,600 mm		117,0	75,0	60,0	61104	68346
0.3020	7,670 mm	N	3-3/4	2-3/8	1-29/32	51214	57188
0.3031	7,700 mm		117,0	75,0	60,0	61105	68347
0.3071	7,800 mm		117,0	75,0	60,0	61106	68348
0.3110	7,900 mm		117,0	75,0	60,0	61107	68349
0.3125	7,940 mm	*5/16	3-3/4	2-3/8	1-29/32	51120	57189
0.3150	8,000 mm		117,0	75,0	60,0	61035	68285
0.3160	8,030 mm	O	3-3/4	2-3/8	1-29/32	51215	57190
0.3189	8,100 mm		117,0	75,0	60,0	61108	68350
0.3228	8,200 mm		117,0	75,0	60,0	61109	68351
0.3230	8,200 mm	P	3-3/4	2-3/8	1-29/32	51216	57191
0.3268	8,300 mm		117,0	75,0	60,0	61110	68352
0.3281	8,330 mm	21/64	4	2-1/2	2	51121	57192
0.3307	8,400 mm		117,0	75,0	60,0	61111	68353
0.3320	8,430 mm	Q	4	2-1/2	2	51217	57193
0.3346	8,500 mm		117,0	75,0	60,0	61037	68286

continued on next page

2 Flute Drills • Metric: DIN 338

Pictured:
Series 101 Drill Set



101

FRACTIONAL & METRIC SERIES

CONTINUED

DECIMAL DC/DCON	METRIC DC/DCON	FRACTIONAL/ LETTER/WIRE DC	OVERALL LENGTH OAL	FLUTE LENGTH LCF	USABLE LENGTH LU	EDP NO. UNCOATED	EDP NO. Ti-NAMITE®-A (AlTiN)
		inch & mm					
0.3386	8,600 mm		125,0	81,0	64,0	61112	68354
0.3390	8,610 mm	R	4	2-1/2	2	51218	57194
0.3425	8,700 mm		125,0	81,0	64,0	61113	68355
0.3438	8,730 mm	11/32	4	2-1/2	2	51122	57195
0.3465	8,800 mm		125,0	81,0	64,0	61114	68356
0.3480	8,840 mm	S	4	2-1/2	2	51219	57196
0.3504	8,900 mm		125,0	81,0	64,0	61115	68357
0.3543	9,000 mm		125,0	81,0	64,0	61039	68287
0.3580	9,090 mm	T	4-1/4	2-3/4	2-13/64	51220	57197
0.3583	9,100 mm		125,0	81,0	64,0	61116	68358
0.3594	9,130 mm	23/64	4-1/4	2-3/4	2-13/64	51123	57198
0.3622	9,200 mm		125,0	81,0	64,0	61117	68359
0.3661	9,300 mm		125,0	81,0	64,0	61118	68360
0.3680	9,350 mm	U	4-1/4	2-3/4	2-13/64	51221	57199
0.3701	9,400 mm		125,0	81,0	64,0	61119	68361
0.3740	9,500 mm		125,0	81,0	64,0	61041	68288
0.3750	9,530 mm	*3/8	4-1/4	2-3/4	2-13/64	51124	57200
0.3770	9,580 mm	V	4-1/4	2-3/4	2-13/64	51222	57201
0.3780	9,600 mm		133,0	87,0	69,0	61120	68362
0.3819	9,700 mm		133,0	87,0	69,0	61121	68363
0.3858	9,800 mm		133,0	87,0	69,0	61122	68364
0.3860	9,800 mm	W	4-1/2	2-7/8	2-19/64	51223	57202
0.3898	9,00 mm		133,0	87,0	69,0	61123	68365
0.3906	9,920 mm	25/64	4-1/2	2-7/8	2-19/64	51125	57203
0.3937	10,000 mm		133,0	87,0	69,0	61043	68289
0.3970	10,080 mm	X	4-1/2	2-7/8	2-19/64	51224	57204
0.4016	10,010 mm		133,0	87,0	69,0	61124	68366
0.4040	10,260 mm	Y	4-1/2	2-7/8	2-19/64	51225	57205
0.4062	10,320 mm	13/32	4-1/2	2-7/8	2-19/64	51126	57206
0.4130	10,490 mm	Z	4-1/2	2-7/8	2-19/64	51226	57207
0.4134	10,500 mm		133,0	87,0	69,0	61045	68290
0.4219	10,720 mm	27/64	4-1/2	2-7/8	2-19/64	51127	57208
0.4331	11,000 mm		142,0	94,0	75,0	61047	68291
0.4375	11,110 mm	7/16	4-1/2	2-7/8	2-19/64	51128	57209
0.4528	11,500 mm		142,0	94,0	75,0	61049	68292
0.4531	11,510 mm	29/64	4-3/4	3	2-13/32	51129	57210
0.4688	11,910 mm	15/32	4-3/4	3	2-13/32	51130	57211
0.4724	12,000 mm		151,0	101,0	80,0	61051	68293
0.4844	12,300 mm	31/64	4-3/4	3	2-13/32	51131	57212
0.5000	12,700 mm	1/2	4-3/4	3	2-13/32	51132	57213
*Series 101 Set						61175	57351

TOLERANCES (inch)

DC = +0.0000/–0.0005

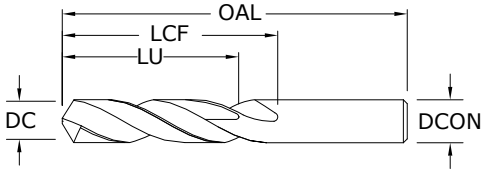
TOLERANCES (mm)

DC = +0,0000/–0,0127

- STEELS
- STAINLESS STEELS
- CAST IRON
- NON-FERROUS
- HIGH TEMP ALLOYS
- HARDENED STEELS

For patent information visit www.ksptpatents.com

Short Length Self Centering Drills • DIN 6539



108M Plus
METRIC SERIES

TOLERANCES (mm)

≤3 DIAMETER
DC = +0,000/–0,010
DCON = h_6

>3–6 DIAMETER
DC = +0,000/–0,012
DCON = h_6

>6–10 DIAMETER
DC = +0,000/–0,015
DCON = h_6

>10–16 DIAMETER
DC = +0,000/–0,018
DCON = h_6

- STEELS
- STAINLESS STEELS
- CAST IRON
- NON-FERROUS
- HIGH TEMP ALLOYS
- HARDENED STEELS

For patent information visit www.ksptpatents.com

mm						EDP NO,	
DECIMAL DC/DCON	METRIC DC/DCON	LETTER/WIRE DC	OVERALL LENGTH OAL	FLUTE LENGTH LCF	USABLE LENGTH LU	UNCOATED	Ti-NAMITE®-A (AlTiN)
0.0197	0,500 mm		20,0	3,0	–	62001	68643
0.0217	0,550 mm		21,0	3,5	–	62003	68644
0.0236	0,600 mm		21,0	3,5	–	62005	68645
0.0256	0,650 mm		22,0	4,0	–	62007	68646
0.0276	0,700 mm		23,0	4,5	–	62009	68647
0.0295	0,750 mm		23,0	4,5	–	62011	68648
0.0315	0,800 mm		24,0	5,0	–	62013	68649
0.0335	0,850 mm		24,0	5,0	–	62015	68650
0.0354	0,900 mm		25,0	5,5	4,0	62017	68651
0.0374	0,950 mm		25,0	5,5	4,0	62019	68652
0.0394	1,000 mm		26,0	6,0	4,7	62021	68653
0.0413	1,050 mm		26,0	6,0	4,7	62023	68654
0.0433	1,100 mm		28,0	7,0	5,4	62025	68655
0.0453	1,150 mm		28,0	7,0	5,4	62027	68656
0.0472	1,200 mm		30,0	8,0	6,0	62029	68657
0.0492	1,250 mm		30,0	8,0	6,0	62031	68658
0.0512	1,300 mm		30,0	8,0	6,0	62033	68659
0.0531	1,350 mm		32,0	9,0	7,0	62035	68660
0.0551	1,400 mm		32,0	9,0	7,0	62037	68661
0.0571	1,450 mm		32,0	9,0	7,0	62039	68662
0.0591	1,500 mm		32,0	9,0	7,0	62041	68663
0.0630	1,600 mm		34,0	10,0	7,0	62043	68664
0.0669	1,700 mm		34,0	10,0	7,0	62045	68665
0.0709	1,800 mm		36,0	11,0	8,0	62047	68666
0.0748	1,900 mm		36,0	11,0	8,0	62049	68667
0.0748	2,000 mm		38,0	12,0	9,0	62051	68668
0.0827	2,100 mm		38,0	12,0	9,0	62053	68669
0.0866	2,200 mm		40,0	13,0	10,0	62055	68670
0.0906	2,300 mm		40,0	13,0	10,0	62057	68671
0.0945	2,400 mm		43,0	14,0	11,0	62059	68672
0.0984	2,500 mm		43,0	14,0	11,0	62061	68673
0.1024	2,600 mm		43,0	14,0	11,0	62063	68674
0.1063	2,700 mm		46,0	16,0	12,0	62065	68675
0.1102	2,800 mm		46,0	16,0	12,0	62067	68676

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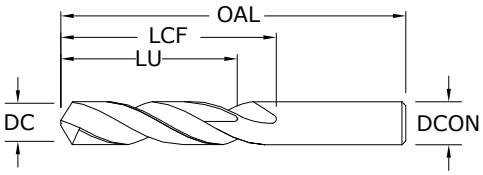
Short Length Self Centering Drills • DIN 6539

108M Plus

METRIC SERIES



CONTINUED

mm						EDP NO,	
DECIMAL DC/DCON	METRIC DC/DCON	LETTER/WIRE DC	OVERALL LENGTH OAL	FLUTE LENGTH LCF	USABLE LENGTH LU	UNCOATED	Ti-NAMITE®-A (AlTiN)
0.1142	2,900 mm		46,0	16,0	12,0	62069	68677
0.1181	3,000 mm		46,0	16,0	12,0	62071	68678
0.1220	3,100 mm		49,0	18,0	14,0	62073	68679
0.1260	3,200 mm		49,0	18,0	14,0	62075	68680
0.1299	3,300 mm		49,0	18,0	14,0	62077	68681
0.1339	3,400 mm		52,0	20,0	15,0	62079	68682
0.1378	3,500 mm		52,0	20,0	15,0	62081	68683
0.1417	3,600 mm		52,0	20,0	15,0	62083	68684
0.1457	3,700 mm		52,0	20,0	15,0	62085	68685
0.1496	3,800 mm		55,0	22,0	17,0	62087	68686
0.1535	3,900 mm		55,0	22,0	17,0	62089	68687
0.1575	4,000 mm		55,0	22,0	17,0	62091	68688
0.1614	4,100 mm		55,0	22,0	17,0	62093	68689
0.1654	4,200 mm		55,0	22,0	17,0	62095	68690
0.1693	4,300 mm		58,0	24,0	18,0	62097	68691
0.1732	4,400 mm		58,0	24,0	18,0	62099	68692
0.1772	4,500 mm		58,0	24,0	18,0	62101	68693
0.1811	4,600 mm		58,0	24,0	18,0	62103	68694
0.1850	4,700 mm	#13	58,0	24,0	18,0	62105	68695
0.1890	4,800 mm	#12	62,0	26,0	20,0	62107	68696
0.1929	4,900 mm		62,0	26,0	20,0	62109	68697
0.1969	5,000 mm		62,0	26,0	20,0	62111	68698
0.2008	5,100 mm		62,0	26,0	20,0	62113	68699
0.2047	5,200 mm		62,0	26,0	20,0	62115	68700
0.2087	5,300 mm		62,0	26,0	20,0	62117	68701
0.2126	5,400 mm		66,0	28,0	21,0	62119	68702
0.2165	5,500 mm		66,0	28,0	21,0	62121	68703
0.2205	5,600 mm		66,0	28,0	21,0	62123	68704
0.2244	5,700 mm		66,0	28,0	21,0	62125	68705
0.2283	5,800 mm		66,0	28,0	21,0	62127	68706
0.2323	5,900 mm		66,0	28,0	21,0	62129	68707
0.2362	6,000 mm		66,0	28,0	21,0	62131	68708

continued on next page

TOLERANCES (mm)

≤3 DIAMETER
DC = +0,000/–0,010
DCON = h_6

>3–6 DIAMETER
DC = +0,000/–0,012
DCON = h_6

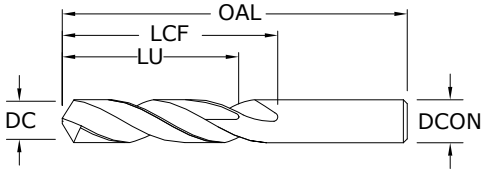
>6–10 DIAMETER
DC = +0,000/–0,015
DCON = h_6

>10–16 DIAMETER
DC = +0,000/–0,018
DCON = h_6

- STEELS
- STAINLESS STEELS
- CAST IRON
- NON-FERROUS
- HIGH TEMP ALLOYS
- HARDENED STEELS

For patent information visit www.ksptpatents.com

Short Length Self Centering Drills • DIN 6539



108M Plus

METRIC SERIES

CONTINUED

TOLERANCES (mm)

≤3 DIAMETER
DC = +0,000/–0,010
DCON = h_6

>3–6 DIAMETER
DC = +0,000/–0,012
DCON = h_6

>6–10 DIAMETER
DC = +0,000/–0,015
DCON = h_6

>10–16 DIAMETER
DC = +0,000/–0,018
DCON = h_6

- STEELS
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mm						EDP NO,	
DECIMAL DC/DCON	METRIC DC/DCON	LETTER/WIRE DC	OVERALL LENGTH OAL	FLUTE LENGTH LCF	USABLE LENGTH LU	UNCOATED	Ti-NAMITE®-A (AlTiN)
0.2402	6,100 mm		70,0	31,0	23,0	62133	68709
0.2441	6,200 mm		70,0	31,0	23,0	62135	68710
0.2480	6,300 mm		70,0	31,0	23,0	62137	68711
0.2520	6,400 mm		70,0	31,0	23,0	62139	68712
0.2559	6,500 mm		70,0	31,0	23,0	62141	68713
0.2598	6,800 mm		70,0	31,0	23,0	62142	68603
0.2756	7,000 mm		74,0	34,0	25,0	62143	68718
0.2953	7,500 mm		74,0	34,0	25,0	62145	68723
0.3071	7,800 mm		79,0	37,0	27,0	62146	68604
0.3150	8,000 mm		79,0	37,0	27,0	62147	68728
0.3346	8,500 mm		79,0	37,0	27,0	62149	68733
0.3543	9,000 mm		84,0	40,0	29,0	62151	68738
0.3740	9,500 mm		84,0	40,0	29,0	62153	68743
0.3858	9,800 mm		89,0	43,0	31,0	62154	68606
0.3937	10,000 mm		89,0	43,0	31,0	62155	68748
0.4016	10,200 mm		89,0	43,0	31,0	62156	68607
0.4134	10,500 mm		89,0	43,0	31,0	62066	68753
0.4331	11,000 mm		95,0	47,0	33,0	62157	68758
0.4528	11,500 mm		95,0	47,0	33,0	62084	68763
0.4646	11,800 mm		102,0	51,0	35,0	62158	68608
0.4724	12,000 mm		102,0	51,0	35,0	62159	68768
0.4921	12,500 mm		102,0	51,0	35,0	62102	68773
0.5118	13,000 mm		102,0	51,0	35,0	62112	68778
0.5433	13,800 mm		107,0	54,0	37,0	62164	68609
0.5512	14,000 mm		107,0	54,0	37,0	62116	68780
0.5709	14,500 mm		111,0	56,0	38,0	62166	68611
0.5827	14,800 mm		111,0	56,0	38,0	62167	68612
0.5906	15,000 mm		111,0	56,0	38,0	62168	68613
0.6221	15,800 mm		115,0	58,0	38,0	62170	68614
0.6299	16,000 mm		115,0	58,0	38,0	62171	68616

FRACTIONAL

2 Flute Drills

	Series 101 Fractional	Hardness	Vc (sfm)		DC • in 1/64	1/32	1/16	1/8	1/4	3/8	1/2
P	CARBON STEELS 1018, 1040, 1080, 1090, 10L50, 1140, 1212, 12L15, 1525, 1536	≤ 175 Bhn or ≤ 7 HRc	265	RPM	64787	32394	16197	8098	4049	2699	2025
			(212-318)	Fr	0.00021	0.0004	0.0008	0.0017	0.0033	0.0050	0.0067
				Feed (ipm)	13.5	13.5	13.5	13.5	13.5	13.5	13.5
		≤ 300 Bhn or ≤ 32 HRc	125	RPM	30560	15280	7640	3820	1910	1273	955
			(100-150)	Fr	0.00020	0.0004	0.0008	0.0016	0.0031	0.0047	0.0063
				Feed (ipm)	6.0	6.0	6.0	6.0	6.0	6.0	6.0
		≤ 425 Bhn or ≤ 45 HRc	85	RPM	20781	10390	5195	2598	1299	866	649
			(68-102)	Fr	0.00011	0.0002	0.0004	0.0008	0.0017	0.0025	0.0034
				Feed (ipm)	2.2	2.2	2.2	2.2	2.2	2.2	2.2
	ALLOY STEELS 4140, 4150, 4320, 5120, 5150, 8630, 86L20, 50100	≤ 275 Bhn or ≤ 28 HRc	230	RPM	56230	28115	14058	7029	3514	2343	1757
			(184-276)	Fr	0.00019	0.0004	0.0007	0.0015	0.0030	0.0045	0.0060
				Feed (ipm)	10.5	10.5	10.5	10.5	10.5	10.5	10.5
		≤ 375 Bhn or ≤ 40 HRc	145	RPM	35450	17725	8862	4431	2216	1477	1108
			(116-174)	Fr	0.00019	0.0004	0.0007	0.0015	0.0030	0.0045	0.0060
				Feed (ipm)	6.6	6.6	6.6	6.6	6.6	6.6	6.6
		≤ 425 Bhn or ≤ 45 HRc	60	RPM	14669	7334	3667	1834	917	611	458
			(48-72)	Fr	0.00008	0.0002	0.0003	0.0007	0.0013	0.0020	0.0026
				Feed (ipm)	1.2	1.2	1.2	1.2	1.2	1.2	1.2
	TOOL STEELS A2, D2, H13, L2, M2, P20, S7, T15, W2	≤ 250 Bhn or ≤ 24 HRc	85	RPM	20781	10390	5195	2598	1299	866	649
			(68-102)	Fr	0.00011	0.0002	0.0004	0.0009	0.0018	0.0027	0.0035
				Feed (ipm)	2.3	2.3	2.3	2.3	2.3	2.3	2.3
		≤ 375 Bhn or ≤ 40 HRc	55	RPM	13446	6723	3362	1681	840	560	420
			(44-66)	Fr	0.00005	0.0001	0.0002	0.0004	0.0008	0.0012	0.0017
				Feed (ipm)	0.7	0.7	0.7	0.7	0.7	0.7	0.7
M	STAINLESS STEELS (FREE MACHINING) 303, 416, 420F, 430F 440F	≤ 250 Bhn or ≤ 24 HRc	210	RPM	51341	25670	12835	6418	3209	2139	1604
			(168-252)	Fr	0.00015	0.0003	0.0006	0.0012	0.0024	0.0036	0.0048
				Feed (ipm)	7.7	7.7	7.7	7.7	7.7	7.7	7.7
		≤ 330 Bhn or ≤ 36 HRc	110	RPM	26893	13446	6723	3362	1681	1121	840
			(88-132)	Fr	0.00009	0.0002	0.0004	0.0007	0.0015	0.0022	0.0030
				Feed (ipm)	2.5	2.5	2.5	2.5	2.5	2.5	2.5
	STAINLESS STEELS (DIFFICULT) 304, 316, 321, 13-8 PH, 15-5PH, 17-4 PH, Custom 450	≤ 275 Bhn or ≤ 28 HRc	65	RPM	15891	7946	3973	1986	993	662	497
			(52-78)	Fr	0.00010	0.0002	0.0005	0.0009	0.0018	0.0025	0.0035
				Feed (ipm)	1.7	1.7	1.7	1.7	1.7	1.7	1.7
		≤ 375 Bhn or ≤ 40 HRc	55	RPM	13446	6723	3362	1681	840	560	420
			(44-66)	Fr	0.00010	0.0002	0.0004	0.0008	0.0015	0.0023	0.0031
				Feed (ipm)	1.3	1.3	1.3	1.3	1.3	1.3	1.3
K	CAST IRONS Gray, Malleable, Ductile	≤ 220 Bhn or ≤ 19 HRc	280	RPM	68454	34227	17114	8557	4278	2852	2139
			(224-336)	Fr	0.00026	0.0005	0.0010	0.0020	0.0041	0.0061	0.0082
				Feed (ipm)	17.5	17.5	17.5	17.5	17.5	17.5	17.5
		≤ 330 Bhn or ≤ 36 HRc	250	RPM	61120	30560	15280	7640	3820	2547	1910
			(200-300)	Fr	0.00025	0.0005	0.0010	0.0020	0.0041	0.0061	0.0081
				Feed (ipm)	15.5	15.5	15.5	15.5	15.5	15.5	15.5

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2 Flute Drills

	Series 101 Fractional	Hardness	Vc (sfm)		DC • in 1/64	1/32	1/16	1/8	1/4	3/8	1/2
N	ALUMINUM ALLOYS 2017, 2024, 356, 6061, 7075	≤ 80 Bhn or ≤ 47 HRb	540	RPM	132019	66010	33005	16502	8251	5501	4126
			(432-648)	Fr	0.00030	0.0006	0.0012	0.0024	0.0048	0.0073	0.0097
				Feed (ipm)	40.0	40.0	40.0	40.0	40.0	40.0	40.0
		≤ 150 Bhn or ≤ 88 HRb	455	RPM	111238	55619	27810	13905	6952	4635	3476
			(364-546)	Fr	0.00031	0.0006	0.0013	0.0025	0.0050	0.0076	0.0101
				Feed (ipm)	35.0	35.0	35.0	35.0	35.0	35.0	35.0
	COPPER ALLOYS Alum Bronze, C110, Muntz Brass	≤ 140 Bhn or ≤ 3 HRc	190	RPM	46451	23226	11613	5806	2903	1935	1452
			(152-228)	Fr	0.00015	0.0003	0.0006	0.0012	0.0024	0.0036	0.0048
				Feed (ipm)	7.0	7.0	7.0	7.0	7.0	7.0	7.0
		≤ 200 Bhn or ≤ 23 HRc	175	RPM	42784	21392	10696	5348	2674	1783	1337
			(140-210)	Fr	0.00015	0.0003	0.0006	0.0012	0.0024	0.0036	0.0048
				Feed (ipm)	6.4	6.4	6.4	6.4	6.4	6.4	6.4
	PLASTICS Polycarbonate, PVC		500	RPM	122240	61120	30560	15280	7640	5093	3820
			(400-600)	Fr	0.00031	0.0006	0.0012	0.0025	0.0050	0.0075	0.0099
				Feed (ipm)	38.0	38.0	38.0	38.0	38.0	38.0	38.0
S	HIGH TEMP ALLOYS (NICKEL, COBALT, IRON BASE) Inconel 601, 617, 625, Incoloy 800, Monel 400, Rene, Waspaloy	≤ 220 Bhn or ≤ 19 HRc	40	RPM	9779	4890	2445	1222	611	407	306
			(32-48)	Fr	0.00010	0.0002	0.0004	0.0008	0.0016	0.0025	0.0033
				Feed (ipm)	1.0	1.0	1.0	1.0	1.0	1.0	1.0
		≤ 320 Bhn or ≤ 34 HRc	25	RPM	6112	3056	1528	764	382	255	191
			(20-30)	Fr	0.00010	0.0002	0.0004	0.0008	0.0016	0.0024	0.0031
				Feed (ipm)	0.6	0.6	0.6	0.6	0.6	0.6	0.6
		≤ 425 Bhn or ≤ 45 HRc	20	RPM	4890	2445	1222	611	306	204	153
			(16-24)	Fr	0.00004	0.0001	0.0002	0.0003	0.0007	0.0010	0.0013
				Feed (ipm)	0.2	0.2	0.2	0.2	0.2	0.2	0.2
	TITANIUM ALLOYS (DIFFICULT) Pure Titanium, Ti6Al4V, Ti6Al2Sn4Zr2Mo, Ti4Al4Mo2Sn0.5Si, Ti-6Al4V	≤ 275 Bhn or ≤ 28 HRc	85	RPM	20781	10390	5195	2598	1299	866	649
			(68-102)	Fr	0.00020	0.0004	0.0008	0.0016	0.0032	0.0049	0.0065
				Feed (ipm)	4.2	4.2	4.2	4.2	4.2	4.2	4.2
		≤ 350 Bhn or ≤ 38 HRc	65	RPM	15891	7946	3973	1986	993	662	497
			(52-78)	Fr	0.00011	0.0002	0.0004	0.0009	0.0017	0.0026	0.0034
				Feed (ipm)	1.7	1.7	1.7	1.7	1.7	1.7	1.7
		≤ 440 Bhn or ≤ 47 HRc	55	RPM	13446	6723	3362	1681	840	560	420
			(44-66)	Fr	0.00010	0.0002	0.0004	0.0008	0.0015	0.0023	0.0031
				Feed (ipm)	1.3	1.3	1.3	1.3	1.3	1.3	1.3
H	TOOL STEELS A2, D2, H13, L2, M2, P20, S7, T15, W2	≤ 475 Bhn or ≤ 50 HRc	40	RPM	9779	4890	2445	1222	611	407	306
			(32-48)	Fr	0.00005	0.0001	0.0002	0.0004	0.0008	0.0012	0.0016
				Feed (ipm)	0.5	0.5	0.5	0.5	0.5	0.5	0.5

Bhn (Brinell) HRc (Rockwell C) HRb (Rockwell B)
rpm = Vc x 3.82 / DC
ipm = Fr x rpm
reduce speed and feed 30 percent when using uncoated drills
reduce speed and feed for materials harder than listed
refer to the SGS Tool Wizard® for complete technical information (www.kyocera-sgstool.com)

METRIC

2 Flute Drills
Short Length Self Centering Drills • DIN 6539

	Series 101M, 108M Metric	Hardness	Vc (m/min)		DC • mm 1	3	6	8	10	12	16
P	CARBON STEELS 1018, 1040, 1080, 1090, 10L50, 1140, 1212, 12L15, 1525, 1536	≤ 175 Bhn or ≤ 7 HRc	81	RPM	25690	8563	4282	3211	2569	2141	1606
			(65-97)	Fr	0.014	0.041	0.082	0.109	0.136	0.163	0.218
				Feed (mm/min)	350	350	350	350	350	350	350
		≤ 300 Bhn or ≤ 32 HRc	38	RPM	12118	4039	2020	1515	1212	1010	757
			(30-46)	Fr	0.012	0.036	0.072	0.096	0.120	0.144	0.191
				Feed (mm/min)	145	145	145	145	145	145	145
		≤ 425 Bhn or ≤ 45 HRc	26	RPM	8240	2747	1373	1030	824	687	515
			(21-31)	Fr	0.007	0.020	0.040	0.053	0.067	0.080	0.107
				Feed (mm/min)	55	55	55	55	55	55	55
	ALLOY STEELS 4140, 4150, 4320, 5120, 5150, 8630, 86L20, 50100	≤ 275 Bhn or ≤ 28 HRc	70	RPM	22297	7432	3716	2787	2230	1858	1394
			(56-84)	Fr	0.012	0.036	0.073	0.097	0.121	0.145	0.194
				Feed (mm/min)	270	270	270	270	270	270	270
		≤ 375 Bhn or ≤ 40 HRc	44	RPM	14057	4686	2343	1757	1406	1171	879
			(35-53)	Fr	0.012	0.036	0.073	0.097	0.121	0.145	0.194
				Feed (mm/min)	170	170	170	170	170	170	170
		≤ 425 Bhn or ≤ 45 HRc	18	RPM	5816	1939	969	727	582	485	364
			(15-22)	Fr	0.005	0.015	0.030	0.040	0.050	0.060	0.080
				Feed (mm/min)	29	29	29	29	29	29	29
	TOOL STEELS A2, D2, H13, L2, M2, P20, S7, T15, W2	≤ 250 Bhn or ≤ 24 HRc	26	RPM	8240	2747	1373	1030	824	687	515
			(21-31)	Fr	0.007	0.020	0.040	0.053	0.067	0.080	0.107
				Feed (mm/min)	55	55	55	55	55	55	55
		≤ 375 Bhn or ≤ 40 HRc	17	RPM	5332	1777	889	666	533	444	333
			(13-20)	Fr	0.003	0.010	0.020	0.027	0.034	0.041	0.054
				Feed (mm/min)	18	18	18	18	18	18	18
M	STAINLESS STEELS (FREE MACHINING) 303, 416, 420F, 430F 440F	≤ 250 Bhn or ≤ 24 HRc	64	RPM	20358	6786	3393	2545	2036	1696	1272
			(51-77)	Fr	0.010	0.029	0.059	0.079	0.098	0.118	0.157
				Feed (mm/min)	200	200	200	200	200	200	200
		≤ 330 Bhn or ≤ 36 HRc	34	RPM	10664	3555	1777	1333	1066	889	666
			(27-40)	Fr	0.006	0.017	0.034	0.045	0.056	0.068	0.090
				Feed (mm/min)	60	60	60	60	60	60	60
	STAINLESS STEELS (DIFFICULT) 304, 316, 321, 13-8 PH, 15-5PH, 17-4 PH, Custom 450	≤ 275 Bhn or ≤ 28 HRc	20	RPM	6301	2100	1050	788	630	525	394
			(16-24)	Fr	0.007	0.021	0.043	0.057	0.071	0.086	0.114
				Feed (mm/min)	45	45	45	45	45	45	45
		≤ 375 Bhn or ≤ 40 HRc	17	RPM	5332	1777	889	666	533	444	333
			(13-20)	Fr	0.007	0.020	0.039	0.053	0.066	0.079	0.105
				Feed (mm/min)	35	35	35	35	35	35	35
K	CAST IRONS Gray, Malleable, Ductile	≤ 220 Bhn or ≤ 19 HRc	85	RPM	27144	9048	4524	3393	2714	2262	1696
			(68-102)	Fr	0.016	0.049	0.097	0.130	0.162	0.195	0.259
				Feed (mm/min)	440	440	440	440	440	440	440
		≤ 330 Bhn or ≤ 36 HRc	76	RPM	24235	8078	4039	3029	2424	2020	1515
			(61-91)	Fr	0.017	0.050	0.099	0.132	0.165	0.198	0.264
				Feed (mm/min)	400	400	400	400	400	400	400

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2 Flute Drills
Short Length Self Centering Drills • DIN 6539

	Series 101M, 108M Metric	Hardness	Vc (m/min)		DC • mm 1	3	6	8	10	12	16
N	ALUMINUM ALLOYS 2017, 2024, 356, 6061, 7075	≤ 80 Bhn or ≤ 47 HRb	165	RPM	52348	17449	8725	6544	5235	4362	3272
			(132-198)	Fr	0.020	0.060	0.120	0.160	0.200	0.240	0.319
				Feed (mm/min)	1045	1045	1045	1045	1045	1045	1045
		≤ 150 Bhn or ≤ 88 HRb	139	RPM	44108	14703	7351	5514	4411	3676	2757
			(111-166)	Fr	0.020	0.060	0.120	0.160	0.200	0.239	0.319
				Feed (mm/min)	880	880	880	880	880	880	880
	COPPER ALLOYS Alum Bronze, C110, Muntz Brass	≤ 140 Bhn or ≤ 3 HRc	58	RPM	18419	6140	3070	2302	1842	1535	1151
			(46-69)	Fr	0.010	0.030	0.060	0.080	0.100	0.121	0.161
				Feed (mm/min)	185	185	185	185	185	185	185
		≤ 200 Bhn or ≤ 23 HRc	53	RPM	16965	5655	2827	2121	1696	1414	1060
			(43-64)	Fr	0.010	0.030	0.060	0.080	0.100	0.120	0.160
				Feed (mm/min)	170	170	170	170	170	170	170
	PLASTICS Polycarbonate, PVC		152	RPM	48471	16157	8078	6059	4847	4039	3029
			(122-183)	Fr	0.020	0.060	0.120	0.160	0.200	0.240	0.320
				Feed (mm/min)	970	970	970	970	970	970	970
S	HIGH TEMP ALLOYS (NICKEL, COBALT, IRON BASE) Inconel 601, 617, 625, Incoloy 800, Monel 400, Rene, Waspaloy	≤ 220 Bhn or ≤ 19 HRc	12	RPM	3878	1293	646	485	388	323	242
			(10-15)	Fr	0.006	0.019	0.039	0.052	0.064	0.077	0.103
				Feed (mm/min)	25	25	25	25	25	25	25
		≤ 320 Bhn or ≤ 34 HRc	8	RPM	2424	808	404	303	242	202	151
			(6-9)	Fr	0.006	0.019	0.037	0.050	0.062	0.074	0.099
				Feed (mm/min)	15	15	15	15	15	15	15
		≤ 425 Bhn or ≤ 45 HRc	6	RPM	1939	646	323	242	194	162	121
			(5-7)	Fr	0.005	0.015	0.031	0.041	0.052	0.062	0.083
				Feed (mm/min)	10	10	10	10	10	10	10
	TITANIUM ALLOYS (DIFFICULT) Pure Titanium, Ti6Al4V, Ti6Al2Sn4Zr2Mo, Ti4Al4Mo2Sn0.5Si, Ti-6Al4V	≤ 275 Bhn or ≤ 28 HRc	26	RPM	8240	2747	1373	1030	824	687	515
			(21-31)	Fr	0.013	0.040	0.080	0.107	0.133	0.160	0.214
				Feed (mm/min)	110	110	110	110	110	110	110
		≤ 350 Bhn or ≤ 38 HRc	20	RPM	6301	2100	1050	788	630	525	394
			(16-24)	Fr	0.007	0.021	0.043	0.057	0.071	0.086	0.114
				Feed (mm/min)	45	45	45	45	45	45	45
		≤ 440 Bhn or ≤ 47 HRc	17	RPM	5332	1777	889	666	533	444	333
			(13-20)	Fr	0.007	0.020	0.039	0.053	0.066	0.079	0.105
				Feed (mm/min)	35	35	35	35	35	35	35
H	TOOL STEELS A2, D2, H13, L2, M2, P20, S7, T15, W2	≤ 475 Bhn or ≤ 50 HRc	12	RPM	3878	1293	646	485	388	323	242
			(10-15)	Fr	0.003	0.009	0.019	0.025	0.031	0.037	0.050
				Feed (mm/min)	12	12	12	12	12	12	12

Bhn (Brinell) HRc (Rockwell C) HRb (Rockwell B)
rpm = (Vc x 1000) / (DC x 3.14)
mm/min = Fr x rpm
reduce speed and feed 30 percent when using uncoated drills
reduce speed and feed for materials harder than listed
refer to the SGS Tool Wizard® for complete technical information (www.kyocera-sgstool.com)

Straight Flute Drills • Metric: DIN 6539

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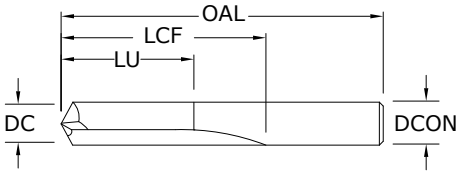
FRACTIONAL & METRIC SERIES



		inch & mm				EDP NO.	
DECIMAL DC / DCON	METRIC DC / DCON	FRACTIONAL/ LETTER/WIRE DC	OVERALL LENGTH OAL	FLUTE LENGTH LCF	USABLE LENGTH LU	UNCOATED	Ti-NAMITE®-A (AlTiN)
0.0394	1,000 mm		26,0	6,0	4,5	66001	66002
0.0400	1,020 mm	#60	1-1/2	1/2	13/32	56060	56269
0.0410	1,040 mm	#59	1-1/2	1/2	13/32	56059	56268
0.0420	1,070 mm	#58	1-1/2	1/2	13/32	56058	56267
0.0430	1,090 mm	#57	1-1/2	1/2	13/32	56057	56266
0.0465	1,180 mm	#56	1-1/2	1/2	13/32	56056	56265
0.0469	1,190 mm	3/64	1-1/2	1/2	13/32	56103	56135
0.0520	1,320 mm	#55	1-1/2	1/2	13/32	56055	56264
0.0550	1,400 mm	#54	1-1/2	1/2	13/32	56054	56263
0.0591	1,500 mm		32,0	9,0	7,0	66003	66004
0.0595	1,510 mm	#53	1-1/2	1/2	13/32	56053	56262
0.0625	1,590 mm	1/16	1-1/2	5/8	1/2	56104	56136
0.0635	1,610 mm	#52	1-11/16	11/16	35/64	56052	56261
0.0670	1,700 mm	#51	1-11/16	11/16	35/64	56051	56260
0.0700	1,780 mm	#50	1-11/16	11/16	35/64	56050	56259
0.0730	1,850 mm	#49	1-11/16	11/16	35/64	56049	56258
0.0760	1,930 mm	#48	1-11/16	11/16	35/64	56048	56257
0.0781	1,980 mm	5/64	1-11/16	11/16	35/64	56105	56137
0.0785	1,990 mm	#47	1-3/4	3/4	39/64	56047	56256
0.0787	2,000 mm		38,0	12,0	9,0	66005	66006
0.0810	2,060 mm	#46	1-3/4	3/4	39/64	56046	56255
0.0820	2,080 mm	#45	1-3/4	3/4	39/64	56045	56254
0.0860	2,180 mm	#44	1-3/4	3/4	39/64	56044	56253
0.0890	2,260 mm	#43	1-3/4	3/4	39/64	56043	56252
0.0935	2,370 mm	#42	1-3/4	3/4	39/64	56042	56251
0.0938	2,380 mm	3/32	1-3/4	3/4	39/64	56106	56138
0.0960	2,440 mm	#41	1-13/16	13/16	21/32	56041	56250
0.0980	2,490 mm	#40	1-13/16	13/16	21/32	56040	56249
0.0984	2,500 mm		43,0	14,0	11,0	66007	66008
0.0995	2,530 mm	#39	1-13/16	13/16	21/32	56039	56248
0.1015	2,580 mm	#38	1-13/16	13/16	21/32	56038	56247
0.1040	2,640 mm	#37	1-13/16	13/16	21/32	56037	56246
0.1065	2,710 mm	#36	1-13/16	13/16	21/32	56036	56245
0.1094	2,780 mm	7/64	1-13/16	13/16	21/32	56107	56139
0.1100	2,790 mm	#35	1-7/8	7/8	45/64	56035	56244
0.1110	2,820 mm	#34	1-7/8	7/8	45/64	56034	56243

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TOLERANCES (inch)

DC = +0.0000/–0.0005
DCON = h_6

TOLERANCES (mm)

DC = +0,0000/–0,0127
DCON = h_6

STEELS
CAST IRON
HARDENED STEELS

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Straight Flute Drills • Metric: DIN 6539

CONTINUED

inch & mm						EDP NO.	
DECIMAL DC / DCON	METRIC DC / DCON	FRACTIONAL/ LETTER/WIRE DC	OVERALL LENGTH OAL	FLUTE LENGTH LCF	USABLE LENGTH LU	UNCOATED	Ti-NAMITE®-A (AlTiN)
0.1130	2,870 mm	#33	1-7/8	7/8	45/64	56033	56242
0.1160	2,950 mm	#32	1-7/8	7/8	45/64	56032	56241
0.1181	3,000 mm		46,0	16,0	12,0	66009	66010
0.1200	3,050 mm	#31	1-7/8	7/8	45/64	56031	56240
0.1250	3,180 mm	1/8	1-7/8	7/8	45/64	56108	56140
0.1285	3,260 mm	#30	1-15/16	15/16	3/4	56030	56239
0.1360	3,450 mm	#29	1-15/16	15/16	3/4	56029	56238
0.1378	3,500 mm		52,0	20,0	15,0	66011	66012
0.1405	3,570 mm	#28	1-15/16	15/16	3/4	56028	56237
0.1406	3,570 mm	9/64	1-15/16	15/16	3/4	56109	56141
0.1440	3,660 mm	#27	2-1/16	1	51/64	56027	56236
0.1470	3,730 mm	#26	2-1/16	1	51/64	56026	56235
0.1495	3,800 mm	#25	2-1/16	1	51/64	56025	56234
0.1520	3,860 mm	#24	2-1/16	1	51/64	56024	56233
0.1540	3,910 mm	#23	2-1/16	1	51/64	56023	56232
0.1562	3,970 mm	5/32	2-1/16	1	51/64	56110	56142
0.1570	3,990 mm	#22	2-1/8	1-1/16	55/64	56022	56231
0.1575	4,000 mm		55,0	22,0	17,0	66013	66014
0.1590	4,040 mm	#21	2-1/8	1-1/16	55/64	56021	56230
0.1610	4,090 mm	#20	2-1/8	1-1/16	55/64	56020	56229
0.1660	4,220 mm	#19	2-1/8	1-1/16	55/64	56019	56228
0.1695	4,310 mm	#18	2-1/8	1-1/16	55/64	56018	56227
0.1719	4,370 mm	11/64	2-1/8	1-1/16	55/64	56111	56143
0.1730	4,390 mm	#17	2-3/16	1-1/8	29/32	56017	56226
0.1770	4,500 mm	#16	2-3/16	1-1/8	29/32	56016	56225
0.1772	4,500 mm		58,0	24,0	18,0	66015	66016
0.1800	4,570 mm	#15	2-3/16	1-1/8	29/32	56015	56224
0.1820	4,620 mm	#14	2-3/16	1-1/8	29/32	56014	56223
0.1850	4,700 mm	#13	2-3/16	1-1/8	29/32	56013	56222
0.1875	4,760 mm	3/16	2-3/16	1-1/8	29/32	56112	56144
0.1890	4,800 mm	#12	2-3/16	1-1/8	29/32	56012	56221
0.1910	4,850 mm	#11	2-3/16	1-1/8	29/32	56011	56220
0.1935	4,910 mm	#10	2-3/16	1-1/8	29/32	56010	56219
0.1960	4,980 mm	#9	2-1/4	1-3/16	61/64	56009	56218
0.1969	5,000 mm		62,0	26,0	20,0	66017	66018
0.1990	5,050 mm	#8	2-1/4	1-3/16	61/64	56008	56217
0.2010	5,110 mm	#7	2-1/4	1-3/16	61/64	56007	56216
0.2031	5,160 mm	13/64	2-1/4	1-3/16	61/64	56113	56145
0.2040	5,180 mm	#6	2-3/8	1-1/4	1	56006	56215
0.2055	5,220 mm	#5	2-3/8	1-1/4	1	56005	56214
0.2090	5,310 mm	#4	2-3/8	1-1/4	1	56004	56213
0.2130	5,410 mm	#3	2-3/8	1-1/4	1	56003	56212
0.2165	5,500 mm		66,0	28,0	21,0	66019	66020
0.2188	5,560 mm	7/32	2-3/8	1-1/4	1	56114	56146
0.2210	5,610 mm	#2	2-7/16	1-5/16	1-3/64	56002	56211
0.2280	5,790 mm	#1	2-7/16	1-5/16	1-3/64	56001	56210

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Straight Flute Drills • Metric: DIN 6539

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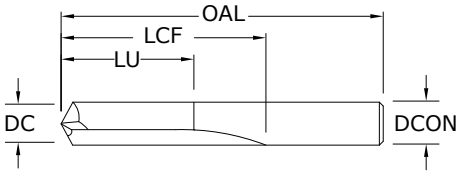
FRACTIONAL & METRIC SERIES



DECIMAL DC / DCON	METRIC DC / DCON	FRACTIONAL/ LETTER/WIRE DC	OVERALL LENGTH OAL	FLUTE LENGTH LCF	USABLE LENGTH LU	EDP NO. UNCOATED	EDP NO. Ti-NAMITE®-A (AlTiN)
	inch & mm						
0.2344	5,950 mm	15/64	2-7/16	1-5/16	1-3/64	56115	56147
0.2362	6,000 mm		66,0	28,0	21,0	66021	66045
0.2500	6,350 mm	1/4	2-1/2	1-3/8	1-7/64	56116	56148
0.2559	6,500 mm		70,0	31,0	23,0	66022	66046
0.2656	6,750 mm	17/64	2-5/8	1-7/16	1-7/64	56117	56149
0.2756	7,000 mm		74,0	34,0	25,0	66023	66024
0.2812	7,140 mm	9/32	2-11/16	1-1/2	1-13/64	56118	56150
0.2953	7,500 mm		74,0	34,0	25,0	66025	66026
0.2969	7,540 mm	19/64	2-3/4	1-9/16	1-1/4	56119	56151
0.3125	7,940 mm	5/16	2-13/16	1-5/8	1-19/64	56120	56152
0.3150	8,000 mm		79,0	37,0	27,0	66027	66028
0.3281	8,330 mm	21/64	2-15/16	1-11/16	1-23/64	56121	56153
0.3346	8,500 mm		79,0	37,0	27,0	66029	66030
0.3438	8,730 mm	11/32	3	1-11/16	1-23/64	56122	56154
0.3543	9,000 mm		84,0	40,0	29,0	66031	66032
0.3594	9,130 mm	23/64	3-1/16	1-3/4	1-13/32	56123	56155
0.3740	9,500 mm		84,0	40,0	29,0	66033	66034
0.3750	9,530 mm	3/8	3-1/8	1-13/16	1-29/64	56124	56156
0.3906	9,920 mm	25/64	3-1/4	1-7/8	1-1/2	56125	56157
0.3937	10,000 mm		89,0	43,0	31,0	66035	66036
0.4062	10,320 mm	13/32	3-5/16	1-15/16	1-35/64	56126	56158
0.4134	10,500 mm		89,0	43,0	31,0	66037	66038
0.4219	10,720 mm	27/64	3-3/8	2	1-39/64	56127	56159
0.4331	11,000 mm		95,0	47,0	33,0	66039	66040
0.4375	11,110 mm	7/16	3-7/16	2-1/16	1-21/32	56128	56160
0.4528	11,500 mm		95,0	47,0	33,0	66041	66042
0.4531	11,510 mm	29/64	3-9/16	2-1/8	1-45/64	56129	56161
0.4688	11,910 mm	15/32	3-5/8	2-1/8	1-45/64	56130	56162
0.4724	12,000 mm		102,0	51,0	35,0	66043	66044
0.4844	12,300 mm	31/64	3-11/16	2-3/16	1-3/4	56131	56163
0.5000	12,700 mm	1/2	3-3/4	2-1/4	1-51/64	56132	56164

TOLERANCES (inch)

DC = +0.0000/–0.0005
DCON = h_6

TOLERANCES (mm)

DC = +0,0000/–0,0127
DCON = h_6

STEELS
CAST IRON
HARDENED STEELS

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Straight Flute Drills

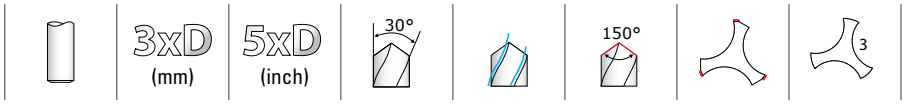
	Series 106 Fractional	Hardness	Vc (sfm)		DC • in 1/16	1/8	3/16	1/4	3/8	1/2
P	ALLOY STEELS 4140, 4150, 4320, 5120, 5150, 8630, 86L20, 50100	≤ 500 Bhn or ≤ 52 HRc	60	RPM	3667	1834	1222	917	611	458
			(48-72)	Fr	0.0004	0.0007	0.0011	0.0014	0.0021	0.0028
				Feed (ipm)	1.3	1.3	1.3	1.3	1.3	1.3
		≤ 615 Bhn or ≤ 58 HRc	50	RPM	3056	1528	1019	764	509	382
			(40-60)	Fr	0.0004	0.0008	0.0012	0.0016	0.0024	0.0031
				Feed (ipm)	1.2	1.2	1.2	1.2	1.2	1.2
K	CAST IRONS Gray, Malleable, Ductile	≤ 220 Bhn or ≤ 19 HRc	250	RPM	15280	7640	5093	3820	2547	1910
			(200-300)	Fr	0.0010	0.0020	0.0030	0.0041	0.0061	0.0081
				Feed (ipm)	15.5	15.5	15.5	15.5	15.5	15.5
		≤ 330 Bhn or ≤ 36 HRc	195	RPM	11918	5959	3973	2980	1986	1490
			(156-234)	Fr	0.0010	0.0020	0.0030	0.0040	0.0060	0.0081
				Feed (ipm)	12.0	12.0	12.0	12.0	12.0	12.0
H	TOOL STEELS A2, D2, H13, L2, M2, P20, S7, T15, W2	≤ 500 Bhn or ≤ 52 HRc	60	RPM	3667	1834	1222	917	611	458
			(48-72)	Fr	0.0004	0.0007	0.0011	0.0014	0.0021	0.0028
				Feed (ipm)	1.3	1.3	1.3	1.3	1.3	1.3
		≤ 615 Bhn or ≤ 58 HRc	50	RPM	3056	1528	1019	764	509	382
			(40-60)	Fr	0.0004	0.0008	0.0012	0.0016	0.0024	0.0031
				Feed (ipm)	1.2	1.2	1.2	1.2	1.2	1.2

Bhn (Brinell) HRc (Rockwell C)
rpm = Vc x 3.82 / DC
ipm = Fr x rpm
reduce speed and feed 30 percent when using uncoated drills
refer to the SGS Tool Wizard® for complete technical information (www.kyocera-sgstool.com)

	Series 106M Metric	Hardness	Vc (m/min)		DC • mm 1	3	6	8	10	12
P	ALLOY STEELS 4140, 4150, 4320, 5120, 5150, 8630, 86L20, 50100	≤ 500 Bhn or ≤ 52 HRc	18	RPM	5816	1939	969	727	582	485
			(15-22)	Fr	0.006	0.018	0.035	0.047	0.058	0.070
				Feed (mm/min)	34	34	34	34	34	34
		≤ 615 Bhn or ≤ 58 HRc	15	RPM	4847	1616	808	606	485	404
			(12-18)	Fr	0.006	0.017	0.033	0.045	0.056	0.067
				Feed (mm/min)	27	27	27	27	27	27
K	CAST IRONS Gray, Malleable, Ductile	≤ 220 Bhn or ≤ 19 HRc	76	RPM	24235	8078	4039	3029	2424	2020
			(61-91)	Fr	0.016	0.048	0.096	0.128	0.160	0.192
				Feed (mm/min)	395	395	395	395	395	395
		≤ 330 Bhn or ≤ 36 HRc	59	RPM	18904	6301	3151	2363	1890	1575
			(48-71)	Fr	0.016	0.048	0.096	0.128	0.160	0.192
				Feed (mm/min)	305	305	305	305	305	305
H	TOOL STEELS A2, D2, H13, L2, M2, P20, S7, T15, W2	≤ 500 Bhn or ≤ 52 HRc	18	RPM	5816	1939	969	727	582	485
			(15-22)	Fr	0.006	0.018	0.035	0.047	0.058	0.070
				Feed (mm/min)	34	34	34	34	34	34
		≤ 615 Bhn or ≤ 58 HRc	15	RPM	4847	1616	808	606	485	404
			(12-18)	Fr	0.006	0.017	0.033	0.045	0.056	0.067
				Feed (mm/min)	27	27	27	27	27	27

Bhn (Brinell) HRc (Rockwell C)
rpm = (Vc x 1000) / (DC x 3.14)
mm/min = Fr x rpm
reduce speed and feed 30 percent when using uncoated drills
refer to the SGS Tool Wizard® for complete technical information (www.kyocera-sgstool.com)

3 Flute Drills • Metric: DIN 6539



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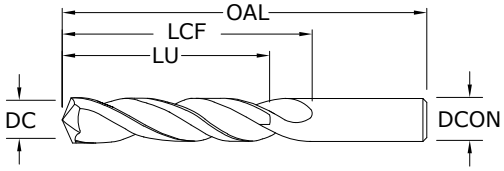
FRACTIONAL & METRIC SERIES



DECIMAL DC / DCON	METRIC DC / DCON	FRACTIONAL/ LETTER/WIRE DC	OVERALL LENGTH OAL	FLUTE LENGTH LCF	USABLE LENGTH LU	EDP NO. UNCOATED	EDP NO. Ti-NAMITE®-A (AlTiN)
	inch & mm						
0.1065	2,710 mm	#36	2-1/4	1-1/4	1	53036	58011
0.1094	2,780 mm	7/64	2-1/4	1-1/4	1	53107	58012
0.1100	2,790 mm	#35	2-1/4	1-1/4	1	53035	58013
0.1110	2,820 mm	#34	2-1/4	1-1/4	1	53034	58014
0.1130	2,870 mm	#33	2-1/4	1-1/4	1	53033	58015
0.1160	2,950 mm	#32	2-1/4	1-1/4	1	53032	58016
0.1181	3,000 mm		46,0	16,0	12,0	63000	68965
0.1200	3,050 mm	#31	2-1/4	1-1/4	1	53031	58017
0.1220	3,100 mm		49,0	18,0	14,0	63044	68966
0.1250	3,180 mm	1/8	2-1/4	1-1/4	1	53108	58018
0.1260	3,200 mm		49,0	18,0	14,0	63045	68967
0.1285	3,260 mm	#30	2-1/4	1-1/4	1	53030	58019
0.1299	3,300 mm		49,0	18,0	14,0	63001	68968
0.1339	3,400 mm		52,0	20,0	15,0	63046	68969
0.1360	3,450 mm	#29	2-1/2	1-3/8	1-7/64	53029	58020
0.1378	3,500 mm		52,0	20,0	15,0	63002	68970
0.1405	3,570 mm	#28	2-1/2	1-3/8	1-7/64	53028	58021
0.1406	3,570 mm	9/64	2-1/2	1-3/8	1-7/64	53109	58022
0.1417	3,600 mm		52,0	20,0	15,0	63047	68971
0.1440	3,660 mm	#27	2-1/2	1-3/8	1-7/64	53027	58023
0.1457	3,700 mm		52,0	20,0	15,0	63003	68972
0.1470	3,730 mm	#26	2-1/2	1-3/8	1-7/64	53026	58024
0.1495	3,800 mm	#25	2-1/2	1-3/8	1-7/64	53025	58025
0.1496	3,800 mm		55,0	22,0	17,0	63048	68973
0.1520	3,860 mm	#24	2-1/2	1-3/8	1-7/64	53024	58026
0.1535	3,900 mm		55,0	22,0	17,0	63049	68974
0.1540	3,910 mm	#23	2-1/2	1-3/8	1-7/64	53023	58027
0.1562	3,970 mm	5/32	2-1/2	1-3/8	1-7/64	53110	58028
0.1570	3,990 mm	#22	2-1/2	1-3/8	1-7/64	53022	58029
0.1575	4,000 mm		55,0	22,0	17,0	63004	68975
0.1590	4,040 mm	#21	2-1/2	1-3/8	1-7/64	53021	58030
0.1610	4,090 mm	#20	2-1/2	1-3/8	1-7/64	53020	58031
0.1614	4,100 mm		55,0	22,0	17,0	63050	68976
0.1654	4,200 mm		55,0	22,0	17,0	63005	68977
0.1660	4,220 mm	#19	2-3/4	1-5/8	1-19/64	53019	58032
0.1693	4,300 mm		58,0	24,0	18,0	63051	68978
0.1695	4,310 mm	#18	2-3/4	1-5/8	1-19/64	53018	58033
0.1719	4,370 mm	11/64	2-3/4	1-5/8	1-19/64	53111	58034
0.1730	4,390 mm	#17	2-3/4	1-5/8	1-19/64	53017	58035
0.1732	4,400 mm		58,0	24,0	18,0	63052	68979

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TOLERANCES (inch)

DC = +0.0000/–0.0005
DCON = h_6

TOLERANCES (mm)

DC = +0,0000/–0,0127
DCON = h_6

- STEELS
- CAST IRON
- NON-FERROUS
- HARDENED STEELS

For patent information visit www.ksptpatents.com

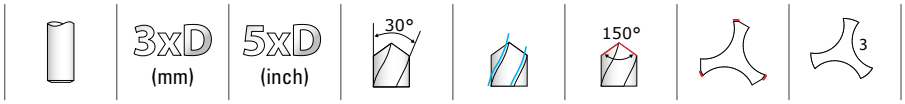
3 Flute Drills • Metric: DIN 6539

CONTINUED

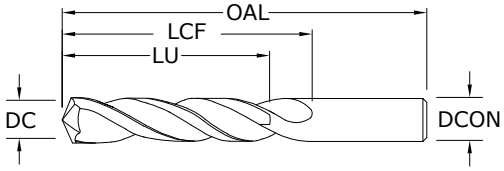
		inch & mm				EDP NO.	
DECIMAL DC / DCON	METRIC DC / DCON	FRACTIONAL/ LETTER/WIRE DC	OVERALL LENGTH OAL	FLUTE LENGTH LCF	USABLE LENGTH LU	UNCOATED	Ti-NAMITE®-A (AlTiN)
0.1770	4,500 mm	#16	2-3/4	1-5/8	1-19/64	53016	58036
0.1772	4,500 mm		58,0	24,0	18,0	63006	68980
0.1800	4,570 mm	#15	2-3/4	1-5/18	1-19/64	53015	58037
0.1811	4,600 mm		58,0	24,0	18,0	63053	68981
0.1820	4,620 mm	#14	2-3/4	1-5/8	1-19/64	53014	58038
0.1850	4,700 mm	#13	2-3/4	1-5/8	1-19/64	53013	58039
0.1850	4,700 mm		58,0	24,0	18,0	63054	68982
0.1875	4,760 mm	3/16	2-3/4	1-5/8	1-19/64	53112	58040
0.1890	4,800 mm	#12	2-3/4	1-5/8	1-19/64	53012	58041
0.1890	4,800 mm		62,0	26,0	20,0	63055	68983
0.1910	4,850 mm	#11	2-3/4	1-5/8	1-19/64	53011	58042
0.1929	4,900 mm		62,0	26,0	20,0	63056	68984
0.1935	4,910 mm	#10	2-3/4	1-5/8	1-19/64	53010	58043
0.1960	4,980 mm	#9	3	1-3/4	1-13/32	53009	58044
0.1969	5,000 mm		62,0	26,0	20,0	63007	68985
0.1990	5,050 mm	#8	3	1-3/4	1-13/32	53008	58045
0.2008	5,100 mm		62,0	26,0	20,0	63057	68986
0.2010	5,110 mm	#7	3	1-3/4	1-13/32	53007	58046
0.2031	5,160 mm	13/64	3	1-3/4	1-13/32	53113	58047
0.2040	5,180 mm	#6	3	1-3/4	1-13/32	53006	58048
0.2047	5,200 mm		62,0	26,0	20,0	63008	68987
0.2055	5,220 mm	#5	3	1-3/4	1-13/32	53005	58049
0.2087	5,300 mm		62,0	26,0	20,0	63058	68988
0.2090	5,310 mm	#4	3	1-3/4	1-13/32	53004	58050
0.2126	5,400 mm		66,0	28,0	21,0	63059	68989
0.2130	5,410 mm	#3	3	1-3/4	1-13/32	53003	58051
0.2165	5,500 mm		66,0	28,0	21,0	63009	68990
0.2188	5,560 mm	7/32	3	1-3/4	1-13/32	53114	58052
0.2205	5,600 mm		66,0	28,0	21,0	63060	68991
0.2210	5,610 mm	#2	3	1-3/4	1-13/32	53002	58053
0.2244	5,700 mm		66,0	28,0	21,0	63061	68992
0.2280	5,790 mm	#1	3	1-3/4	1-13/32	53001	58054
0.2283	5,800 mm		66,0	28,0	21,0	63062	68993
0.2323	5,900 mm		66,0	28,0	21,0	63063	68994
0.2340	5,940 mm	A	3-1/4	2	1-39/64	53201	58055
0.2344	5,950 mm	15/64	3-1/4	2	1-39/64	53115	58056
0.2362	6,000 mm		66,0	28,0	21,0	63010	68995
0.2380	6,050 mm	B	3-1/4	2	1-39/64	53202	58057
0.2402	6,100 mm		70,0	31,0	23,0	63064	68996
0.2420	6,150 mm	C	3-1/4	2	1-39/64	53203	58058
0.2441	6,200 mm		70,0	31,0	23,0	63011	68997
0.2460	6,250 mm	D	3-1/4	2	1-39/64	53204	58059
0.2480	6,300 mm		70,0	31,0	23,0	63065	68998
0.2500	6,350 mm	1/4	3-1/4	2	1-39/64	53116	58061
0.2520	6,400 mm		70,0	31,0	23,0	63066	68999
0.2559	6,500 mm		70,0	31,0	23,0	63012	69000
0.2570	6,530 mm	F	3-1/4	2	1-39/64	53206	58062
0.2598	6,600 mm		70,0	31,0	23,0	63067	69001
0.2610	6,630 mm	G	3-1/2	2-1/8	1-45/64	53207	58063
0.2638	6,700 mm		70,0	31,0	23,0	63068	69002

continued on next page

3 Flute Drills • Metric: DIN 6539



103
FRACTIONAL & METRIC SERIES



DECIMAL DC / DCON	METRIC DC / DCON	FRACTIONAL/ LETTER/WIRE DC	OVERALL LENGTH OAL	FLUTE LENGTH LCF	USABLE LENGTH LU	EDP NO. UNCOATED	EDP NO. Ti-NAMITE®-A (AlTiN)
	inch & mm						
0.2656	6,750 mm	17/64	3-1/2	2-1/8	1-45/64	53117	58064
0.2660	6,760 mm	H	3-1/2	2-1/8	1-45/64	53208	58065
0.2677	6,800 mm		74,0	34,0	25,0	63013	69003
0.2717	6,900 mm		74,0	34,0	25,0	63069	69004
0.2720	6,910 mm	I	3-1/2	2-1/8	1-45/64	53209	58066
0.2756	7,000 mm		74,0	34,0	25,0	63014	69005
0.2770	7,040 mm	J	3-1/2	2-1/8	1-45/64	53210	58067
0.2795	7,100 mm		74,0	34,0	25,0	63070	69006
0.2810	7,140 mm	K	3-1/2	2-1/8	1-45/64	53211	58068
0.2812	7,140 mm	9/32	3-1/2	2-1/8	1-45/64	53118	58069
0.2835	7,200 mm		74,0	34,0	25,0	63015	69007
0.2874	7,300 mm		74,0	34,0	25,0	63071	69008
0.2900	7,370 mm	L	3-1/2	2-1/8	1-45/64	53212	58070
0.2913	7,400 mm		74,0	34,0	25,0	63072	69009
0.2950	7,490 mm	M	3-3/4	2-3/8	1-29/32	53213	58071
0.2953	7,500 mm		74,0	34,0	25,0	63016	69010
0.2969	7,540 mm	19/64	3-3/4	2-3/8	1-29/32	53119	58072
0.2992	7,600 mm		79,0	37,0	27,0	63073	69011
0.3020	7,670 mm	N	2-3/8	2-3/8	1-29/32	53214	58073
0.3031	7,700 mm		79,0	37,0	27,0	63074	69012
0.3071	7,800 mm		79,0	37,0	27,0	63075	69013
0.3110	7,900 mm		79,0	37,0	27,0	63076	69014
0.3125	7,940 mm	5/16	3-3/4	2-3/8	1-29/32	53120	58074
0.3150	8,000 mm		79,0	37,0	27,0	63017	69015
0.3160	8,030 mm	O	3-3/4	2-3/8	1-29/32	53215	58075
0.3189	8,100 mm		79,0	37,0	27,0	63077	69016
0.3228	8,200 mm		79,0	37,0	27,0	63018	69017
0.3230	8,200 mm	P	3-3/4	2-3/8	1-29/32	53216	58076
0.3268	8,300 mm		79,0	37,0	27,0	63078	69018
0.3281	8,330 mm	21/64	4	2-1/2	2	53121	58077
0.3307	8,400 mm		79,0	37,0	27,0	63019	69019
0.3320	8,430 mm	Q	4	2-1/2	2	53217	58078
0.3346	8,500 mm		79,0	37,0	27,0	63020	69020
0.3386	8,600 mm		84,0	40,0	29,0	63021	69021
0.3390	8,610 mm	R	4	2-1/2	2	53218	58079
0.3425	8,700 mm		84,0	40,0	29,0	63079	69022
0.3438	8,730 mm	11/32	4	2-1/2	2	53122	58080
0.3465	8,800 mm		84,0	40,0	29,0	63022	69023
0.3480	8,840 mm	S	4	2-1/2	2	53219	58081
0.3504	8,900 mm		84,0	40,0	29,0	63080	69024
0.3543	9,000 mm		84,0	40,0	29,0	63023	69025
0.3580	9,090 mm	T	4-1/4	2-3/4	2-13/64	53220	58082

continued on next page

TOLERANCES (inch)

DC = +0.0000/–0.0005
DCON = h_6

TOLERANCES (mm)

DC = +0,0000/–0,0127
DCON = h_6

- STEELS
- CAST IRON
- NON-FERROUS
- HARDENED STEELS

For patent information visit www.ksptpatents.com

3 Flute Drills • Metric: DIN 6539

CONTINUED

		inch & mm				EDP NO.	
DECIMAL DC / DCON	METRIC DC / DCON	FRACTIONAL/ LETTER/WIRE DC	OVERALL LENGTH OAL	FLUTE LENGTH LCF	USABLE LENGTH LU	UNCOATED	Ti-NAMITE®-A (AlTiN)
0.3583	9,100 mm		84,0	40,0	29,0	63081	69026
0.3594	9,130 mm	23/64	4-1/4	2-3/4	2-13/64	53123	58083
0.3622	9,200 mm		84,0	40,0	29,0	63024	69027
0.3661	9,300 mm		84,0	40,0	29,0	63082	69028
0.3680	9,350 mm	U	4-1/4	2-3/4	2-13/64	53221	58084
0.3701	9,400 mm		84,0	40,0	29,0	63083	69029
0.3740	9,500 mm		84,0	40,0	29,0	63025	69030
0.3750	9,530 mm	3/8	4-1/4	2-3/4	2-13/64	53124	58085
0.3770	9,580 mm	V	4-1/4	2-3/4	2-13/64	53222	58086
0.3780	9,600 mm		89,0	43,0	31,0	63084	69031
0.3819	9,700 mm		89,0	43,0	31,0	63085	69032
0.3858	9,800 mm		89,0	43,0	31,0	63086	69033
0.3860	9,800 mm	W	4-1/2	2-7/8	2-19/64	53223	58087
0.3898	9,900 mm		89,0	43,0	31,0	63087	69034
0.3906	9,920 mm	25/64	4-1/2	2-7/8	2-19/64	53125	58088
0.3937	10,000 mm		89,0	43,0	31,0	63026	69035
0.3970	10,080 mm	X	4-1/2	2-7/8	2-19/64	53224	58089
0.3976	10,100 mm		89,0	43,0	31,0	63088	69036
0.4016	10,200 mm		89,0	43,0	31,0	63027	69037
0.4040	10,260 mm	Y	4-1/2	2-7/8	2-19/64	53225	58090
0.4062	10,320 mm	13/32	4-1/2	2-7/8	2-19/64	53126	58091
0.4094	10,400 mm		89,0	43,0	31,0	63028	69038
0.4130	10,490 mm	Z	4-1/2	2-7/8	2-19/64	53226	58092
0.4134	10,500 mm		89,0	43,0	31,0	63029	69039
0.4213	10,700 mm		95,0	47,0	33,0	63030	69040
0.4219	10,720 mm	27/64	4-1/2	2-7/8	2-19/64	53127	58093
0.4252	10,800 mm		95,0	47,0	33,0	63031	69041
0.4331	11,000 mm		95,0	47,0	33,0	63032	69042
0.4375	11,110 mm	7/16	4-1/2	2-7/8	2-19/64	53128	58094
0.4528	11,500 mm		95,0	47,0	33,0	63033	69043
0.4531	11,510 mm	29/64	4-3/4	3	2-13/32	53129	58095
0.4688	11,910 mm	15/32	4-3/4	3	2-13/32	53130	58096
0.4724	12,000 mm		102,0	51,0	35,0	63034	69044
0.4844	12,300 mm	31/64	4-3/4	3	2-13/32	53131	58097
0.4921	12,500 mm		102,0	51,0	35,0	63035	69045
0.5000	12,700 mm	1/2	4-3/4	3	2-13/32	53132	58098
0.5039	12,800 mm		102,0	51,0	35,0	63036	69046
0.5118	13,000 mm		102,0	51,0	35,0	63089	69047
0.5156	13,100 mm	33/64	4-3/4	3	2-13/32	53135	58099
0.5157	13,100 mm		102,0	51,0	35,0	63037	69048
0.5315	13,500 mm		107,0	54,0	37,0	63090	69049
0.5512	14,000 mm		107,0	54,0	37,0	63038	69050
0.5625	14,290 mm	9/16	4-3/4	3	2-13/32	53136	58100
0.5630	14,300 mm		111,0	56,0	38,0	63039	69051
0.5709	14,500 mm		111,0	56,0	38,0	63040	69052
0.5906	15,000 mm		111,0	56,0	38,0	63091	69053
0.6250	15,880 mm	5/8	5-3/4	3-1/2	2-51/64	53133	58101
0.6875	17,460 mm	11/16	5-3/4	3-1/2	2-51/64	53137	58102
0.6890	17,500 mm		123,0	62,0	40,0	63041	69054
0.7500	19,050 mm	3/4	5-3/4	4-1/4	3 13/32	53134	58103
0.7677	19,500 mm		131,0	66,0	42,0	63042	69055
0.7874	20,000 mm		131,0	66,0	42,0	63043	69056

FRACTIONAL

3 Flute Drills

	Series 103 Fractional	Hardness	Vc (sfm)		DC • in 1/8	1/4	3/8	1/2	5/8	3/4
P	CARBON STEELS 1018, 1040, 1080, 1090, 10L50, 1140, 1212, 12L15, 1525, 1536	≤ 175 Bhn or ≤ 7 HRc	295	RPM	9015	4508	3005	2254	1803	1503
			(236-354)	Fr	0.0026	0.0051	0.0077	0.0102	0.0128	0.0153
				Feed (ipm)	23.0	23.0	23.0	23.0	23.0	23.0
		≤ 300 Bhn or ≤ 32 HRc	260	RPM	7946	3973	2649	1986	1589	1324
			(208-312)	Fr	0.0023	0.0045	0.0068	0.0091	0.0113	0.0136
				Feed (ipm)	18.0	18.0	18.0	18.0	18.0	18.0
		≤ 425 Bhn or ≤ 45 HRc	150	RPM	4584	2292	1528	1146	917	764
			(120-180)	Fr	0.0013	0.0026	0.0039	0.0052	0.0065	0.0079
				Feed (ipm)	6.0	6.0	6.0	6.0	6.0	6.0
	ALLOY STEELS 4140, 4150, 4320, 5120, 5150, 8630, 86L20, 50100	≤ 275 Bhn or ≤ 28 HRc	230	RPM	7029	3514	2343	1757	1406	1171
			(184-276)	Fr	0.0019	0.0038	0.0058	0.0077	0.0096	0.0115
				Feed (ipm)	13.5	13.5	13.5	13.5	13.5	13.5
		≤ 375 Bhn or ≤ 40 HRc	145	RPM	4431	2216	1477	1108	886	739
			(116-174)	Fr	0.0019	0.0038	0.0058	0.0077	0.0096	0.0115
				Feed (ipm)	8.5	8.5	8.5	8.5	8.5	8.5
		≤ 425 Bhn or ≤ 45 HRc	115	RPM	3514	1757	1171	879	703	586
			(92-138)	Fr	0.0005	0.0010	0.0015	0.0020	0.0026	0.0031
				Feed (ipm)	1.8	1.8	1.8	1.8	1.8	1.8
	TOOL STEELS A2, D2, H13, L2, M2, P20, S7, T15, W2	≤ 250 Bhn or ≤ 24 HRc	85	RPM	2598	1299	866	649	520	433
			(68-102)	Fr	0.0013	0.0026	0.0039	0.0052	0.0065	0.0079
				Feed (ipm)	3.4	3.4	3.4	3.4	3.4	3.4
		≤ 375 Bhn or ≤ 40 HRc	65	RPM	1986	993	662	497	397	331
			(52-78)	Fr	0.0007	0.0013	0.0020	0.0026	0.0033	0.0039
				Feed (ipm)	1.3	1.3	1.3	1.3	1.3	1.3
K	CAST IRONS Gray, Malleable, Ductile	≤ 220 Bhn or ≤ 19 HRc	250	RPM	7640	3820	2547	1910	1528	1273
			(200-300)	Fr	0.0026	0.0052	0.0079	0.0105	0.0131	0.0157
				Feed (ipm)	20.0	20.0	20.0	20.0	20.0	20.0
		≤ 330 Bhn or ≤ 36 HRc	195	RPM	5959	2980	1986	1490	1192	993
			(156-234)	Fr	0.0026	0.0052	0.0078	0.0104	0.0130	0.0156
				Feed (ipm)	15.5	15.5	15.5	15.5	15.5	15.5
N	ALUMINUM ALLOYS 2017, 2024, 356, 6061, 7075	≤ 80 Bhn or ≤ 47 HRb	540	RPM	16502	8251	5501	4126	3300	2750
			(432-648)	Fr	0.0032	0.0064	0.0096	0.0128	0.0161	0.0193
				Feed (ipm)	53.0	53.0	53.0	53.0	53.0	53.0
		≤ 150 Bhn or ≤ 88 HRb	455	RPM	13905	6952	4635	3476	2781	2317
			(364-546)	Fr	0.0032	0.0065	0.0097	0.0129	0.0162	0.0194
				Feed (ipm)	45.0	45.0	45.0	45.0	45.0	45.0
	COPPER ALLOYS Alum Bronze, C110, Muntz Brass	≤ 140 Bhn or ≤ 3 HRc	305	RPM	9321	4660	3107	2330	1864	1553
			(244-366)	Fr	0.0019	0.0039	0.0058	0.0077	0.0097	0.0116
				Feed (ipm)	18.0	18.0	18.0	18.0	18.0	18.0
		≤ 200 Bhn or ≤ 23 HRc	160	RPM	4890	2445	1630	1222	978	815
			(128-192)	Fr	0.0016	0.0033	0.0049	0.0065	0.0082	0.0098
				Feed (ipm)	8.0	8.0	8.0	8.0	8.0	8.0
H	TOOL STEELS A2, D2, H13, L2, M2, P20, S7, T15, W2			Feed (ipm)	1.3	1.3	1.3	1.3	1.3	1.3
		≤ 475 Bhn or ≤ 50 HRc	50	RPM	1528	764	509	382	306	255
			(40-60)	Fr	0.0007	0.0013	0.0020	0.0026	0.0033	0.0039
				Feed (ipm)	1.0	1.0	1.0	1.0	1.0	1.0

Bhn (Brinell) HRc (Rockwell C) HRb (Rockwell B)
rpm = Vc x 3.82 / DC
ipm = Fr x rpm
reduce speed and feed 30 percent when using uncoated drills
reduce speed and feed for materials harder than listed
refer to the SGS Tool Wizard® for complete technical information (www.kyocera-sgstool.com)

3 Flute Drills

	Series 103M Metric	Hardness	Vc (m/min)		DC • mm 3	6	10	12	16	20
P	CARBON STEELS 1018, 1040, 1080, 1090, 10L50, 1140, 1212, 12L15, 1525, 1536	≤ 175 Bhn or ≤ 7 HRc	90	RPM	9533	4766	2860	2383	1787	1430
			(72-108)	Fr	0.062	0.124	0.206	0.248	0.330	0.413
				Feed (mm/min)	590	590	590	590	590	590
		≤ 300 Bhn or ≤ 32 HRc	79	RPM	8402	4201	2520	2100	1575	1260
			(63-95)	Fr	0.055	0.110	0.183	0.219	0.292	0.365
				Feed (mm/min)	460	460	460	460	460	460
		≤ 425 Bhn or ≤ 45 HRc	46	RPM	4847	2424	1454	1212	909	727
			(37-55)	Fr	0.032	0.064	0.107	0.128	0.171	0.213
				Feed (mm/min)	155	155	155	155	155	155
	ALLOY STEELS 4140, 4150, 4320, 5120, 5150, 8630, 86L20, 50100	≤ 275 Bhn or ≤ 28 HRc	70	RPM	7432	3716	2230	1858	1394	1115
			(56-84)	Fr	0.046	0.093	0.155	0.186	0.248	0.309
				Feed (mm/min)	345	345	345	345	345	345
		≤ 375 Bhn or ≤ 40 HRc	44	RPM	4686	2343	1406	1171	879	703
			(35-53)	Fr	0.046	0.092	0.153	0.184	0.245	0.306
				Feed (mm/min)	215	215	215	215	215	215
		≤ 450 Bhn or ≤ 48 HRc	35	RPM	3716	1858	1115	929	697	557
			(28-42)	Fr	0.012	0.024	0.040	0.048	0.065	0.081
				Feed (mm/min)	45	45	45	45	45	45
	TOOL STEELS A2, D2, H13, L2, M2, P20, S7, T15, W2	≤ 250 Bhn or ≤ 24 HRc	26	RPM	2747	1373	824	687	515	412
			(21-31)	Fr	0.031	0.062	0.103	0.124	0.165	0.206
				Feed (mm/min)	85	85	85	85	85	85
		≤ 375 Bhn or ≤ 40 HRc	20	RPM	2100	1050	630	525	394	315
			(16-24)	Fr	0.017	0.033	0.056	0.067	0.089	0.111
				Feed (mm/min)	35	35	35	35	35	35
K	CAST IRONS Gray, Malleable, Ductile	≤ 220 Bhn or ≤ 19 HRc	76	RPM	8078	4039	2424	2020	1515	1212
			(61-91)	Fr	0.063	0.126	0.210	0.253	0.337	0.421
				Feed (mm/min)	510	510	510	510	510	510
		≤ 330 Bhn or ≤ 36 HRc	59	RPM	6301	3151	1890	1575	1181	945
			(48-71)	Fr	0.052	0.105	0.175	0.209	0.279	0.349
				Feed (mm/min)	330	330	330	330	330	330
N	ALUMINUM ALLOYS 2017, 2024, 356, 6061, 7075	≤ 80 Bhn or ≤ 47 HRb	165	RPM	17449	8725	5235	4362	3272	2617
			(132-198)	Fr	0.078	0.156	0.260	0.312	0.416	0.520
				Feed (mm/min)	1360	1360	1360	1360	1360	1360
		≤ 150 Bhn or ≤ 7 HRc	139	RPM	14703	7351	4411	3676	2757	2205
			(111-166)	Fr	0.078	0.156	0.261	0.313	0.417	0.521
				Feed (mm/min)	1150	1150	1150	1150	1150	1150
	COPPER ALLOYS Alum Bronze, C110, Muntz Brass	≤ 140 Bhn or ≤ 3 HRc	93	RPM	9856	4928	2957	2464	1848	1478
			(74-112)	Fr	0.047	0.094	0.157	0.189	0.252	0.315
				Feed (mm/min)	465	465	465	465	465	465
		≤ 200 Bhn or ≤ 23 HRc	49	RPM	5170	2585	1551	1293	969	776
			(39-59)	Fr	0.039	0.077	0.129	0.155	0.206	0.258
				Feed (mm/min)	200	200	200	200	200	200
H	TOOL STEELS A2, D2, H13, L2, M2, P20, S7, T15, W2	≤ 475 Bhn or ≤ 50 HRc	15	RPM	1616	808	485	404	303	242
			(12-18)	Fr	0.015	0.031	0.052	0.062	0.083	0.103
				Feed (mm/min)	25	25	25	25	25	25

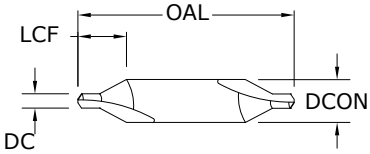
Bhn (Brinell) HRc (Rockwell C) HRb (Rockwell B)
rpm = (Vc x 1000) / (DC x 3.14)
mm/min = Fr x rpm
reduce speed and feed 30 percent when using uncoated drills
reduce speed and feed for materials harder than listed
refer to the SGS Tool Wizard® for complete technical information (www.kyocera-sgstool.com)

FRACTIONAL

Combined Drill & Countersink

Pictured:
Series 301 Set

301
FRACTIONAL SERIES



	inch				EDP NO.	
SIZE	DRILL DIAMETER DC	BODY DIAMETER DCON	OVERALL LENGTH OAL	FLUTE LENGTH LCF	UNCOATED	Ti-NAMITE®-A (AlTiN)
*00	.025	1/8	1-1/2	.312	57005	57015
*0	1/32	1/8	1-1/2	.312	57006	57016
*1	3/64	1/8	1-1/2	.375	57007	57017
*2	5/64	3/16	1-7/8	.562	57008	57018
*3	7/64	1/4	2	.625	57009	57019
*4	1/8	5/16	2-1/8	.750	57010	57020
*5	3/16	7/16	2-3/4	.875	57011	57021
*6	7/32	1/2	3	.938	57012	57022
*Series 301 Set	–	–	–	–	57075	–

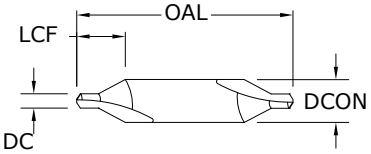
TOLERANCES (inch)

DC = +0.003/–0.000
DCON = –0.0001/–0.0005

- STEELS
- STAINLESS STEELS
- CAST IRON
- NON-FERROUS
- HIGH TEMP ALLOYS
- HARDENED STEELS

For patent information visit www.ksptpatents.com

Combined Drill & Countersink



301M
METRIC SERIES

TOLERANCES (mm)

DC = +0,076/–0,000
DCON = –0,0025/–0,0127

- STEELS
- STAINLESS STEELS
- CAST IRON
- NON-FERROUS
- HIGH TEMP ALLOYS
- HARDENED STEELS

For patent information visit www.ksptpatents.com

mm				EDP NO.	
DRILL DIAMETER DC	BODY DIAMETER DCON	OVERALL LENGTH OAL	FLUTE LENGTH LCF	UNCOATED	Ti-NAMITE®-A (AlTiN)
0,5	3,15	20,0	7,1	67005	67035
0,8	3,15	20,0	7,1	67007	67037
1	3,15	31,5	8,3	67009	67039
1,25	3,15	31,5	9,9	67011	67041
1,6	4,0	35,5	12,7	67013	67043
2	5,0	40,0	14,7	67015	67045
2,5	6,3	45,0	15,9	67017	67047
3,15	8,0	50,0	19,4	67019	67049
4	10,0	56,0	21,4	67021	67051
5	12,5	63,0	23,0	67023	67053

FRACTIONAL

Combined Drill & Countersink

	Series 301 Fractional	Hardness	Vc (sfm)		DC • in 1/32	5/64	1/8	3/16	7/32
P	CARBON STEELS 1018, 1040, 1080, 1090, 10L50, 1140, 1212, 12L15, 1525, 1536	≤ 175 Bhn or ≤ 7 HRc	265	RPM	8098	5399	3239	2314	2025
			(212-318)	Fr	0.00068	0.0010	0.0017	0.0024	0.0027
				Feed (ipm)	5.5	5.5	5.5	5.5	5.5
		≤ 300 Bhn or ≤ 32 HRc	125	RPM	3820	2547	1528	1091	955
			(100-150)	Fr	0.00065	0.0010	0.0016	0.0023	0.0026
				Feed (ipm)	2.5	2.5	2.5	2.5	2.5
		≤ 425 Bhn or ≤ 45 HRc	85	RPM	2598	1732	1039	742	649
			(68-102)	Fr	0.00038	0.0006	0.0010	0.0013	0.0015
				Feed (ipm)	1.0	1.0	1.0	1.0	1.0
	ALLOY STEELS 4140, 4150, 4320, 5120, 5150, 8630, 86L20, 50100	≤ 275 Bhn or ≤ 28 HRc	230	RPM	7029	4686	2812	2008	1757
			(184-276)	Fr	0.00064	0.0010	0.0016	0.0022	0.0026
				Feed (ipm)	4.5	4.5	4.5	4.5	4.5
		≤ 375 Bhn or ≤ 40 HRc	145	RPM	4431	2954	1772	1266	1108
			(116-174)	Fr	0.00059	0.0009	0.0015	0.0021	0.0023
				Feed (ipm)	2.6	2.6	2.6	2.6	2.6
		≤ 425 Bhn or ≤ 45 HRc	60	RPM	1834	1222	733	524	458
			(48-72)	Fr	0.00027	0.0004	0.0007	0.0010	0.0011
				Feed (ipm)	0.5	0.5	0.5	0.5	0.5
	TOOL STEELS A2, D2, H13, L2, M2, P20, S7, T15, W2	≤ 250 Bhn or ≤ 24 HRc	85	RPM	2598	1732	1039	742	649
			(68-102)	Fr	0.00035	0.0005	0.0009	0.0012	0.0014
				Feed (ipm)	0.9	0.9	0.9	0.9	0.9
		≤ 375 Bhn or ≤ 40 HRc	55	RPM	1681	1121	672	480	420
			(44-66)	Fr	0.00016	0.0002	0.0004	0.0006	0.0006
				Feed (ipm)	0.3	0.3	0.3	0.3	0.3
M	STAINLESS STEELS (FREE MACHINING) 303, 416, 420F, 430F 440F	≤ 250 Bhn or ≤ 24 HRc	210	RPM	6418	4278	2567	1834	1604
			(168-252)	Fr	0.00048	0.0007	0.0012	0.0017	0.0019
				Feed (ipm)	3.1	3.1	3.1	3.1	3.1
		≤ 330 Bhn or ≤ 36 HRc	110	RPM	3362	2241	1345	960	840
			(88-132)	Fr	0.00028	0.0004	0.0007	0.0010	0.0011
				Feed (ipm)	0.9	0.9	0.9	0.9	0.9
	STAINLESS STEELS (DIFFICULT) 304, 316, 321, 13-8 PH, 15-5PH, 17-4 PH, Custom 450	≤ 275 Bhn or ≤ 28 HRc	65	RPM	1986	1324	795	568	497
			(52-78)	Fr	0.00036	0.0005	0.0009	0.0013	0.0014
				Feed (ipm)	0.7	0.7	0.7	0.7	0.7
		≤ 375 Bhn or ≤ 40 HRc	55	RPM	1681	1121	672	480	420
			(44-66)	Fr	0.00032	0.0005	0.0008	0.0011	0.0013
				Feed (ipm)	0.5	0.5	0.5	0.5	0.5
K	CAST IRONS Gray, Malleable, Ductile	≤ 220 Bhn or ≤ 19 HRc	280	RPM	8557	5705	3423	2445	2139
			(224-336)	Fr	0.00084	0.0013	0.0021	0.0029	0.0034
				Feed (ipm)	7.2	7.2	7.2	7.2	7.2
		≤ 330 Bhn or ≤ 36 HRc	250	RPM	7640	5093	3056	2183	1910
			(200-300)	Fr	0.00084	0.0013	0.0021	0.0029	0.0034
				Feed (ipm)	6.4	6.4	6.4	6.4	6.4

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Combined Drill & Countersink

	Series 301 Fractional	Hardness	Vc (sfm)		DC • in 1/32	5/64	1/8	3/16	7/32
N	ALUMINUM ALLOYS 2017, 2024, 356, 6061, 7075	≤ 80 Bhn or ≤ 47 HRb	540	RPM	16502	11002	6601	4715	4126
			(432-648)	Fr	0.00100	0.0015	0.0025	0.0035	0.0040
				Feed (ipm)	16.5	16.5	16.5	16.5	16.5
		≤ 150 Bhn or ≤ 88 HRb	455	RPM	13905	9270	5562	3973	3476
			(364-546)	Fr	0.00100	0.0015	0.0025	0.0035	0.0040
				Feed (ipm)	13.9	13.9	13.9	13.9	13.9
	COPPER ALLOYS Alum Bronze, C110, Muntz Brass	≤ 140 Bhn or ≤ 3 HRc	190	RPM	5806	3871	2323	1659	1452
			(152-228)	Fr	0.00048	0.0007	0.0012	0.0017	0.0019
				Feed (ipm)	2.8	2.8	2.8	2.8	2.8
		≤ 200 Bhn or ≤ 23 HRc	175	RPM	5348	3565	2139	1528	1337
			(140-210)	Fr	0.00048	0.0007	0.0012	0.0017	0.0019
				Feed (ipm)	2.6	2.6	2.6	2.6	2.6
	PLASTICS Polycarbonate, PVC		500	RPM	15280	10187	6112	4366	3820
			(400-600)	Fr	0.00100	0.0015	0.0025	0.0035	0.0040
				Feed (ipm)	15.3	15.3	15.3	15.3	15.3
S	HIGH TEMP ALLOYS (NICKEL, COBALT, IRON BASE) Inconel 601, 617, 625, Incoloy 800, Monel 400, Rene, Waspaloy	≤ 220 Bhn or ≤ 19 HRc	40	RPM	1222	815	489	349	306
			(32-48)	Fr	0.00036	0.0005	0.0009	0.0013	0.0014
				Feed (ipm)	0.4	0.4	0.4	0.4	0.4
		≤ 320 Bhn or ≤ 34 HRc	25	RPM	764	509	306	218	191
			(20-30)	Fr	0.00033	0.0005	0.0008	0.0011	0.0013
				Feed (ipm)	0.3	0.3	0.3	0.3	0.3
		≤ 425 Bhn or ≤ 45 HRc	20	RPM	611	407	244	175	153
			(16-24)	Fr	0.00016	0.0002	0.0004	0.0006	0.0007
				Feed (ipm)	0.1	0.1	0.1	0.1	0.1
	TITANIUM ALLOYS Pure Titanium, Ti6Al4V, Ti6Al2Sn4Zr2Mo, Ti4Al4Mo2Sn0.5Si, Ti-6Al4V	≤ 275 Bhn or ≤ 28 HRc	85	RPM	2598	1732	1039	742	649
			(68-102)	Fr	0.00064	0.0010	0.0016	0.0022	0.0026
				Feed (ipm)	1.7	1.7	1.7	1.7	1.7
		≤ 350 Bhn or ≤ 38 HRc	65	RPM	1986	1324	795	568	497
			(52-78)	Fr	0.00036	0.0005	0.0009	0.0013	0.0014
				Feed (ipm)	0.7	0.7	0.7	0.7	0.7
		≤ 440 Bhn or ≤ 47 HRc	55	RPM	1681	1121	672	480	420
			(44-66)	Fr	0.00032	0.0005	0.0008	0.0011	0.0013
				Feed (ipm)	0.5	0.5	0.5	0.5	0.5
H	TOOL STEELS A2, D2, H13, L2, M2, P20, S7, T15, W2	≤ 475 Bhn or ≤ 50 HRc	40	RPM	1222	815	489	349	306
			(32-48)	Fr	0.00016	0.0002	0.0004	0.0006	0.0007
				Feed (ipm)	0.2	0.2	0.2	0.2	0.2

Bhn (Brinell) HRc (Rockwell C) HRb (Rockwell B)
rpm = Vc x 3.82 / DCON
ipm = Fr x rpm
reduce speed and feed 30 percent when using uncoated drills
reduce speed and feed for materials harder than listed
refer to the SGS Tool Wizard® for complete technical information (www.kyocera-sgstool.com)

Combined Drill & Countersink

	Series 301M Metric	Hardness	Vc (m/min)		DC • mm 1	1.6	2.5	4	5
P	CARBON STEELS 1018, 1040, 1080, 1090, 10L50, 1140, 1212, 12L15, 1525, 1536	≤ 175 Bhn or ≤ 7 HRc	81	RPM	8155	6422	4078	2569	2055
			(65-97)	Fr	0.017	0.022	0.034	0.054	0.068
				Feed (mm/min)	139	139	139	139	139
		≤ 300 Bhn or ≤ 32 HRc	38	RPM	3847	3029	1923	1212	969
			(30-46)	Fr	0.016	0.020	0.032	0.051	0.064
				Feed (mm/min)	62	62	62	62	62
		≤ 425 Bhn or ≤ 45 HRc	26	RPM	2616	2060	1308	824	659
			(21-31)	Fr	0.010	0.013	0.020	0.032	0.039
				Feed (mm/min)	26	26	26	26	26
	ALLOY STEELS 4140, 4150, 4320, 5120, 5150, 8630, 86L20, 50100	≤ 275 Bhn or ≤ 28 HRc	70	RPM	7078	5574	3539	2230	1784
			(56-84)	Fr	0.016	0.020	0.032	0.051	0.063
				Feed (mm/min)	113	113	113	113	113
		≤ 375 Bhn or ≤ 40 HRc	44	RPM	4462	3514	2231	1406	1125
			(35-53)	Fr	0.015	0.019	0.030	0.048	0.060
				Feed (mm/min)	67	67	67	67	67
		≤ 425 Bhn or ≤ 45 HRc	18	RPM	1847	1454	923	582	465
			(15-22)	Fr	0.007	0.009	0.014	0.022	0.028
				Feed (mm/min)	13	13	13	13	13
	TOOL STEELS A2, D2, H13, L2, M2, P20, S7, T15, W2	≤ 250 Bhn or ≤ 24 HRc	26	RPM	2616	2060	1308	824	659
			(21-31)	Fr	0.009	0.012	0.018	0.029	0.036
				Feed (mm/min)	24	24	24	24	24
		≤ 375 Bhn or ≤ 40 HRc	17	RPM	1693	1333	846	533	427
			(13-20)	Fr	0.004	0.005	0.008	0.013	0.016
				Feed (mm/min)	7	7	7	7	7
M	STAINLESS STEELS (FREE MACHINING) 303, 416, 420F, 430F 440F	≤ 250 Bhn or ≤ 24 HRc	64	RPM	6463	5089	3231	2036	1629
			(51-77)	Fr	0.012	0.015	0.024	0.038	0.048
				Feed (mm/min)	78	78	78	78	78
		≤ 330 Bhn or ≤ 36 HRc	34	RPM	3385	2666	1693	1066	853
			(27-40)	Fr	0.007	0.009	0.014	0.023	0.028
				Feed (mm/min)	24	24	24	24	24
	STAINLESS STEELS (DIFFICULT) 304, 316, 321, 13-8 PH, 15-5PH, 17-4 PH, Custom 450	≤ 275 Bhn or ≤ 28 HRc	20	RPM	2000	1575	1000	630	504
			(16-24)	Fr	0.009	0.011	0.018	0.029	0.036
				Feed (mm/min)	18	18	18	18	18
		≤ 375 Bhn or ≤ 40 HRc	17	RPM	1693	1333	846	533	427
			(13-20)	Fr	0.008	0.011	0.017	0.026	0.033
				Feed (mm/min)	14	14	14	14	14
K	CAST IRONS Gray, Malleable, Ductile	≤ 220 Bhn or ≤ 19 HRc	85	RPM	8617	6786	4309	2714	2171
			(68-102)	Fr	0.021	0.027	0.042	0.067	0.083
				Feed (mm/min)	181	181	181	181	181
		≤ 330 Bhn or ≤ 36 HRc	76	RPM	7694	6059	3847	2424	1939
			(61-91)	Fr	0.021	0.027	0.042	0.067	0.084
				Feed (mm/min)	162	162	162	162	162

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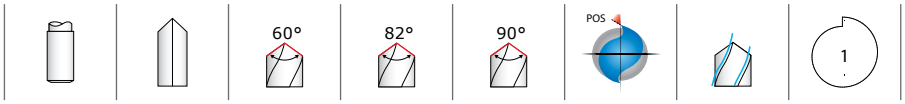
Combined Drill & Countersink

	Series 301M Metric	Hardness	Vc (m/min)		DC • mm 1	1.6	2.5	4	5
N	ALUMINUM ALLOYS 2017, 2024, 356, 6061, 7075	≤ 80 Bhn or ≤ 47 HRb	165	RPM	16619	13087	8309	5235	4188
			(132-198)	Fr	0.025	0.032	0.050	0.079	0.099
				Feed (mm/min)	415	415	415	415	415
		≤ 150 Bhn or ≤ 88 HRc	139	RPM	14003	11027	7001	4411	3529
			(111-166)	Fr	0.025	0.032	0.050	0.079	0.099
				Feed (mm/min)	350	350	350	350	350
	COPPER ALLOYS Alum Bronze, C110, Muntz Brass	≤ 140 Bhn or ≤ 3 HRc	58	RPM	5847	4605	2924	1842	1474
			(46-69)	Fr	0.012	0.015	0.024	0.038	0.048
				Feed (mm/min)	70	70	70	70	70
		≤ 200 Bhn or ≤ 23 HRc	53	RPM	5386	4241	2693	1696	1357
			(43-64)	Fr	0.012	0.015	0.024	0.038	0.048
				Feed (mm/min)	65	65	65	65	65
	PLASTICS Polycarbonate, PVC		152	RPM	15388	12118	7694	4847	3878
			(122-183)	Fr	0.025	0.032	0.050	0.079	0.099
				Feed (mm/min)	385	385	385	385	385
S	HIGH TEMP ALLOYS (NICKEL, COBALT, IRON BASE) Inconel 601, 617, 625, Incoloy 800, Monel 400, Rene, Waspaloy	≤ 220 Bhn or ≤ 19 HRc	12	RPM	1231	969	616	388	310
			(10-15)	Fr	0.009	0.011	0.018	0.028	0.035
				Feed (mm/min)	11	11	11	11	11
		≤ 320 Bhn or ≤ 34 HRc	8	RPM	769	606	385	242	194
			(6-9)	Fr	0.008	0.010	0.016	0.025	0.031
				Feed (mm/min)	6	6	6	6	6
		≤ 425 Bhn or ≤ 45 HRc	6	RPM	616	485	308	194	155
			(5-7)	Fr	0.003	0.004	0.006	0.010	0.013
				Feed (mm/min)	2	2	2	2	2
	TITANIUM ALLOYS Pure Titanium, Ti6Al4V, Ti6Al2Sn4Zr2Mo, Ti4Al4Mo2Sn0.5Si, Ti-6Al4V	≤ 275 Bhn or ≤ 28 HRc	26	RPM	2616	2060	1308	824	659
			(21-31)	Fr	0.016	0.020	0.032	0.051	0.064
				Feed (mm/min)	42	42	42	42	42
		≤ 350 Bhn or ≤ 38 HRc	20	RPM	2000	1575	1000	630	504
			(16-24)	Fr	0.009	0.011	0.018	0.029	0.036
				Feed (mm/min)	18	18	18	18	18
		≤ 440 Bhn or ≤ 47 HRc	17	RPM	1693	1333	846	533	427
			(13-20)	Fr	0.008	0.011	0.017	0.026	0.033
				Feed (mm/min)	14	14	14	14	14
H	TOOL STEELS A2, D2, H13, L2, M2, P20, S7, T15, W2	≤ 475 Bhn or ≤ 50 HRc	12	RPM	1231	969	616	388	310
			(10-15)	Fr	0.004	0.005	0.008	0.013	0.016
				Feed (mm/min)	5	5	5	5	5

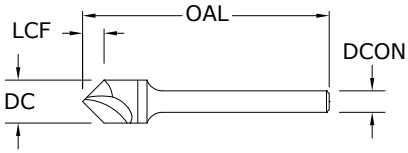
Bhn (Brinell) HRc (Rockwell C) HRb (Rockwell B)
rpm = (Vc x 1000) / (DCON x 3.14)
mm/min = Fr x rpm
reduce speed and feed 30 percent when using uncoated drills
reduce speed and feed for materials harder than listed
refer to the SGS Tool Wizard® for complete technical information (www.kyocera-sgstool.com)

FRACTIONAL

Single Flute Countersink



601
FRACTIONAL SERIES



inch				EDP NO.		
CUTTING DIAMETER DC	SHANK DIAMETER DCON	OVERALL LENGTH OAL	FLUTE LENGTH LCF	UNCOATED 60°	UNCOATED 82°	UNCOATED 90°
1/8	1/8	1-1/2	.062	–	–	74201
1/8	1/8	1-1/2	.072	–	74101	–
1/8	1/8	1-1/2	.108	74001	–	–
3/16	3/16	2	.094	–	–	74204
3/16	3/16	2	.108	–	74104	–
3/16	3/16	2	.163	74004	–	–
1/4	1/4	2	.125	–	–	74207
1/4	1/4	2	.144	–	74107	–
1/4	1/4	2	.217	74007	–	–
*3/8	1/4	2-13/16	.188	–	–	74210
*3/8	1/4	2-13/16	.216	–	74110	–
*3/8	1/4	2-13/16	.325	74010	–	–
*1/2	1/4	2-7/8	.250	–	–	74213
*1/2	1/4	2-7/8	.288	–	74113	–
*1/2	1/4	2-7/8	.433	74013	–	–
*5/8	3/8	3	.313	–	–	74216
*5/8	3/8	3	.360	–	74116	–
*5/8	3/8	3	.541	74016	–	–
*3/4	1/2	3	.375	–	–	74219
*3/4	1/2	3	.431	–	74119	–
*3/4	1/2	3	.650	74019	–	–
*1	1/2	3-1/4	.500	–	–	74222
*1	1/2	3-1/4	.575	–	74122	–
*1	1/2	3-1/4	.866	74022	–	–

*Steel Shank / Con mango de acero / Avec queue en acier / Mit Stahlschaft

TOLERANCES (inch)

1/8–1/4 DIAMETER
DC = +0.0000/–0.0005

3/8–1 DIAMETER
DC = +0.003/–0.000

Included Angle +1°/–1°

- STEELS
- STAINLESS STEELS
- CAST IRON
- NON-FERROUS
- HIGH TEMP ALLOYS
- HARDENED STEELS

For patent information visit www.ksptpatents.com

Single Flute Countersink

	Series 601 Fractional	Hardness	Vc (sfm)		DC • in 1/8	3/16	1/4	3/8	1/2	3/4	1
P	CARBON STEELS 1018, 1040, 1080, 1090, 10L50, 1140, 1212, 12L15, 1525, 1536	≤ 175 Bhn or ≤ 7 HRc	125	RPM	3820	2547	1910	1273	955	637	478
			(100-150)	Fr	0.0005	0.0008	0.0010	0.0016	0.0021	0.0031	0.0042
				Feed (ipm)	2.0	2.0	2.0	2.0	2.0	2.0	2.0
		≤ 300 Bhn or ≤ 32 HRc	60	RPM	1834	1222	917	611	458	306	229
			(48-72)	Fr	0.0005	0.0007	0.0010	0.0015	0.0020	0.0029	0.0039
				Feed (ipm)	0.9	0.9	0.9	0.9	0.9	0.9	0.9
		≤ 425 Bhn or ≤ 45 HRc	45	RPM	1375	917	688	458	344	229	172
			(36-54)	Fr	0.0003	0.0004	0.0006	0.0009	0.0012	0.0017	0.0023
				Feed (ipm)	0.4	0.4	0.4	0.4	0.4	0.4	0.4
	ALLOY STEELS 4140, 4150, 4320, 5120, 5150, 8630, 86L20, 50100	≤ 275 Bhn or ≤ 28 HRc	95	RPM	2903	1935	1452	968	726	484	363
			(76-114)	Fr	0.0004	0.0007	0.0009	0.0013	0.0018	0.0027	0.0036
				Feed (ipm)	1.3	1.3	1.3	1.3	1.3	1.3	1.3
		≤ 375 Bhn or ≤ 40 HRc	60	RPM	1834	1222	917	611	458	306	229
			(48-72)	Fr	0.0004	0.0007	0.0009	0.0013	0.0017	0.0026	0.0035
				Feed (ipm)	0.8	0.8	0.8	0.8	0.8	0.8	0.8
		≤ 425 Bhn or ≤ 45 HRc	35	RPM	1070	713	535	357	267	178	134
			(28-42)	Fr	0.0003	0.0004	0.0006	0.0008	0.0011	0.0017	0.0022
				Feed (ipm)	0.3	0.3	0.3	0.3	0.3	0.3	0.3
	TOOL STEELS A2, D2, H13, L2, M2, P20, S7, T15, W2	≤ 250 Bhn or ≤ 24 HRc	35	RPM	1070	713	535	357	267	178	134
			(28-42)	Fr	0.0003	0.0004	0.0006	0.0008	0.0011	0.0017	0.0022
				Feed (ipm)	0.3	0.3	0.3	0.3	0.3	0.3	0.3
		≤ 375 Bhn or ≤ 40 HRc	25	RPM	764	509	382	255	191	127	96
			(20-30)	Fr	0.0001	0.0002	0.0003	0.0004	0.0005	0.0008	0.0010
				Feed (ipm)	0.1	0.1	0.1	0.1	0.1	0.1	0.1
M	STAINLESS STEELS (FREE MACHINING) 303, 416, 420F, 430F 440F	≤ 250 Bhn or ≤ 24 HRc	53	RPM	1620	1080	810	540	405	270	202
			(42-64)	Fr	0.0003	0.0005	0.0006	0.0009	0.0012	0.0019	0.0025
				Feed (ipm)	0.5	0.5	0.5	0.5	0.5	0.5	0.5
		≤ 330 Bhn or ≤ 36 HRc	46	RPM	1406	937	703	469	351	234	176
			(37-55)	Fr	0.0002	0.0003	0.0004	0.0006	0.0009	0.0013	0.0017
				Feed (ipm)	0.3	0.3	0.3	0.3	0.3	0.3	0.3
	STAINLESS STEELS (DIFFICULT) 304, 316, 321, 13-8 PH, 15-5PH, 17-4 PH, Custom 450	≤ 275 Bhn or ≤ 28 HRc	28	RPM	856	570	428	285	214	143	107
			(22-34)	Fr	0.0004	0.0005	0.0007	0.0011	0.0014	0.0021	0.0028
				Feed (ipm)	0.3	0.3	0.3	0.3	0.3	0.3	0.3
		≤ 375 Bhn or ≤ 40 HRc	21	RPM	642	428	321	214	160	107	80
			(17-25)	Fr	0.0002	0.0002	0.0003	0.0005	0.0006	0.0009	0.0012
				Feed (ipm)	0.1	0.1	0.1	0.1	0.1	0.1	0.1
K	CAST IRONS Gray, Malleable, Ductile	≤ 220 Bhn or ≤ 19 HRc	105	RPM	3209	2139	1604	1070	802	535	401
			(84-126)	Fr	0.0006	0.0009	0.0012	0.0018	0.0024	0.0036	0.0047
				Feed (ipm)	1.9	1.9	1.9	1.9	1.9	1.9	1.9
		≤ 330 Bhn or ≤ 36 HRc	75	RPM	2292	1528	1146	764	573	382	287
			(60-90)	Fr	0.0006	0.0009	0.0012	0.0018	0.0024	0.0037	0.0049
				Feed (ipm)	1.4	1.4	1.4	1.4	1.4	1.4	1.4

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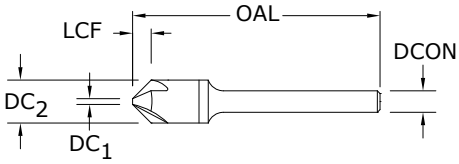
FRACTIONAL

Single Flute Countersink

	Series 601 Fractional	Hardness	Vc (sfm)		DC • in 1/8	3/16	1/4	3/8	1/2	3/4	1
N	ALUMINUM ALLOYS 2017, 2024, 356, 6061, 7075	≤ 80 Bhn or ≤ 47 HRb	225	RPM	6876	4584	3438	2292	1719	1146	860
			(180-270)	Fr	0.0008	0.0011	0.0015	0.0023	0.0030	0.0045	0.0061
				Feed (ipm)	5.2	5.2	5.2	5.2	5.2	5.2	5.2
		≤ 150 Bhn or ≤ 88 HRb	190	RPM	5806	3871	2903	1935	1452	968	726
			(152-228)	Fr	0.0008	0.0011	0.0015	0.0023	0.0030	0.0045	0.0061
				Feed (ipm)	4.4	4.4	4.4	4.4	4.4	4.4	4.4
	COPPER ALLOYS Alum Bronze, C110, Muntz Brass	≤ 140 Bhn or ≤ 3 HRc	95	RPM	2903	1935	1452	968	726	484	363
			(76-114)	Fr	0.0004	0.0006	0.0008	0.0011	0.0015	0.0023	0.0030
				Feed (ipm)	1.1	1.1	1.1	1.1	1.1	1.1	1.1
		≤ 200 Bhn or ≤ 23 HRc	80	RPM	2445	1630	1222	815	611	407	306
			(64-96)	Fr	0.0004	0.0006	0.0008	0.0012	0.0016	0.0025	0.0033
				Feed (ipm)	1.0	1.0	1.0	1.0	1.0	1.0	1.0
S	HIGH TEMP ALLOYS (NICKEL, COBALT, IRON BASE) Inconel 601, 617, 625, Incoloy 800, Monel 400, Rene, Waspaloy	≤ 220 Bhn or ≤ 19 HRc	18	RPM	550	367	275	183	138	92	69
			(14-22)	Fr	0.0002	0.0003	0.0004	0.0005	0.0007	0.0011	0.0015
				Feed (ipm)	0.1	0.1	0.1	0.1	0.1	0.1	0.1
		≤ 320 Bhn or ≤ 34 HRc	14	RPM	428	285	214	143	107	71	53
			(11-17)	Fr	0.0002	0.0004	0.0005	0.0007	0.0009	0.0014	0.0019
				Feed (ipm)	0.1	0.1	0.1	0.1	0.1	0.1	0.1
		≤ 425 Bhn or ≤ 45 HRc	12	RPM	367	244	183	122	92	61	46
			(10-14)	Fr	0.0003	0.0004	0.0005	0.0008	0.0011	0.0016	0.0022
				Feed (ipm)	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	TITANIUM ALLOYS Pure Titanium, Ti6Al4V, Ti6Al2Sn4Zr2Mo, Ti4Al4Mo2Sn0.5Si, Ti-6Al4V	≤ 275 Bhn or ≤ 28 HRc	36	RPM	1100	733	550	367	275	183	138
			(29-43)	Fr	0.0005	0.0007	0.0009	0.0014	0.0018	0.0027	0.0036
				Feed (ipm)	0.5	0.5	0.5	0.5	0.5	0.5	0.5
		≤ 350 Bhn or ≤ 38 HRc	28	RPM	856	570	428	285	214	143	107
			(22-34)	Fr	0.0004	0.0005	0.0007	0.0011	0.0014	0.0021	0.0028
				Feed (ipm)	0.3	0.3	0.3	0.3	0.3	0.3	0.3
		≤ 440 Bhn or ≤ 47 HRc	21	RPM	642	428	321	214	160	107	80
			(17-25)	Fr	0.0002	0.0002	0.0003	0.0005	0.0006	0.0009	0.0012
				Feed (ipm)	0.1	0.1	0.1	0.1	0.1	0.1	0.1
H	TOOL STEELS A2, D2, H13, L2, M2, P20, S7, T15, W2	≤ 475 Bhn or ≤ 50 HRc	20	RPM	611	407	306	204	153	102	76
			(16-24)	Fr	0.0002	0.0002	0.0003	0.0005	0.0007	0.0010	0.0013
				Feed (ipm)	0.1	0.1	0.1	0.1	0.1	0.1	0.1

Bhn (Brinell) HRc (Rockwell C) HRb (Rockwell B)
rpm = Vc x 3.82 / DC
ipm = Fr x rpm
reduce speed and feed for materials harder than listed
refer to the SGS Tool Wizard® for complete technical information (www.kyocera-sgstool.com)

3 Flute Countersink



603
FRACTIONAL SERIES

TOLERANCES (inch)

1/8–1/4 DIAMETER
DC = +0.0000/–0.0005

3/8–1 DIAMETER
DC = +0.003/–0.000

Included Angle +1°/–1°

- STEELS
- STAINLESS STEELS
- CAST IRON
- NON-FERROUS
- HIGH TEMP ALLOYS
- HARDENED STEELS

For patent information visit www.ksptpatents.com

inch					EDP NO.		
CUTTING DIAMETER DC_2	SHANK DIAMETER DCON	OVERALL LENGTH OAL	FLUTE LENGTH LCF	TIP DIAMETER DC_1	UNCOATED 60°	UNCOATED 82°	UNCOATED 90°
1/8	1/8	1-1/2	.045	.040	–	–	74225
1/8	1/8	1-1/2	.049	.040	–	74125	–
1/8	1/8	1-1/2	.078	.035	74025	–	–
3/16	3/16	2	.071	.060	–	–	74228
3/16	3/16	2	.073	.060	–	74128	–
3/16	3/16	2	.123	.045	74028	–	–
1/4	1/4	2	.090	.100	–	–	74231
1/4	1/4	2	.086	.100	–	74131	–
1/4	1/4	2	.156	.070	74031	–	–
*3/8	1/4	2-13/16	.138	.108	–	–	74234
*3/8	1/4	2-13/16	.154	.108	–	74134	–
*3/8	1/4	2-13/16	.238	.100	74034	–	–
*1/2	1/4	2-7/8	.194	.122	–	–	74237
*1/2	1/4	2-7/8	.217	.122	–	74137	–
*1/2	1/4	2-7/8	.335	.113	74037	–	–
*5/8	3/8	3	.249	.138	–	–	74240
*5/8	3/8	3	.280	.138	–	74140	–
*5/8	3/8	3	.430	.128	74040	–	–
*3/4	1/2	3	.304	.153	–	–	74243
*3/4	1/2	3	.343	.153	–	74143	–
*3/4	1/2	3	.526	.143	74043	–	–
*1	1/2	3-1/4	.421	.168	–	–	74246
*1	1/2	3-1/4	.479	.168	–	74146	–
*1	1/2	3-1/4	.729	.158	74046	–	–

*Steel Shank / Con mango de acero / Avec queue en acier / Mit Stahlschaft
NOTE: DC_1 dimension varies based on angle. Contact your KSPT representative or consult SGS Tool Wizard® for dimension information.

FRACTIONAL

3 Flute Countersink

	Series 603 Fractional	Hardness	Vc (sfm)		DC • in 1/8	3/16	1/4	3/8	1/2	3/4	1
P	CARBON STEELS 1018, 1040, 1080, 1090, 10L50, 1140, 1212, 12L15, 1525, 1536	≤ 175 Bhn or ≤ 7 HRc	125	RPM	3820	2547	1910	1273	955	637	478
			(100-150)	Fr	0.0008	0.0012	0.0016	0.0024	0.0031	0.0047	0.0063
				Feed (ipm)	3.0	3.0	3.0	3.0	3.0	3.0	3.0
		≤ 300 Bhn or ≤ 32 HRc	60	RPM	1834	1222	917	611	458	306	229
			(48-72)	Fr	0.0007	0.0011	0.0014	0.0021	0.0028	0.0043	0.0057
				Feed (ipm)	1.3	1.3	1.3	1.3	1.3	1.3	1.3
		≤ 425 Bhn or ≤ 45 HRc	45	RPM	1375	917	688	458	344	229	172
			(36-54)	Fr	0.0004	0.0007	0.0009	0.0013	0.0017	0.0026	0.0035
				Feed (ipm)	0.6	0.6	0.6	0.6	0.6	0.6	0.6
	ALLOY STEELS 4140, 4150, 4320, 5120, 5150, 8630, 86L20, 50100	≤ 275 Bhn or ≤ 28 HRc	95	RPM	2903	1935	1452	968	726	484	363
			(76-114)	Fr	0.0007	0.0010	0.0014	0.0021	0.0028	0.0041	0.0055
				Feed (ipm)	2.0	2.0	2.0	2.0	2.0	2.0	2.0
		≤ 375 Bhn or ≤ 40 HRc	60	RPM	1834	1222	917	611	458	306	229
			(48-72)	Fr	0.0007	0.0010	0.0013	0.0020	0.0026	0.0039	0.0052
				Feed (ipm)	1.2	1.2	1.2	1.2	1.2	1.2	1.2
		≤ 425 Bhn or ≤ 45 HRc	35	RPM	1070	713	535	357	267	178	134
			(28-42)	Fr	0.0004	0.0006	0.0007	0.0011	0.0015	0.0022	0.0030
				Feed (ipm)	0.4	0.4	0.4	0.4	0.4	0.4	0.4
	TOOL STEELS A2, D2, H13, L2, M2, P20, S7, T15, W2	≤ 250 Bhn or ≤ 24 HRc	35	RPM	1070	713	535	357	267	178	134
			(28-42)	Fr	0.0004	0.0006	0.0007	0.0011	0.0015	0.0022	0.0030
				Feed (ipm)	0.4	0.4	0.4	0.4	0.4	0.4	0.4
		≤ 375 Bhn or ≤ 40 HRc	25	RPM	764	509	382	255	191	127	96
			(20-30)	Fr	0.0003	0.0004	0.0005	0.0008	0.0010	0.0016	0.0021
				Feed (ipm)	0.2	0.2	0.2	0.2	0.2	0.2	0.2
M	STAINLESS STEELS (FREE MACHINING) 303, 416, 420F, 430F 440F	≤ 250 Bhn or ≤ 24 HRc	53	RPM	1620	1080	810	540	405	270	202
			(42-64)	Fr	0.0004	0.0006	0.0009	0.0013	0.0017	0.0026	0.0035
				Feed (ipm)	0.7	0.7	0.7	0.7	0.7	0.7	0.7
		≤ 330 Bhn or ≤ 36 HRc	46	RPM	1406	937	703	469	351	234	176
			(37-55)	Fr	0.0004	0.0005	0.0007	0.0011	0.0014	0.0021	0.0028
				Feed (ipm)	0.5	0.5	0.5	0.5	0.5	0.5	0.5
	STAINLESS STEELS (DIFFICULT) 304, 316, 321, 13-8 PH, 15-5PH, 17-4 PH, Custom 450	≤ 275 Bhn or ≤ 28 HRc	28	RPM	856	570	428	285	214	143	107
			(22-34)	Fr	0.0005	0.0007	0.0009	0.0014	0.0019	0.0028	0.0037
				Feed (ipm)	0.4	0.4	0.4	0.4	0.4	0.4	0.4
		≤ 375 Bhn or ≤ 40 HRc	21	RPM	642	428	321	214	160	107	80
			(17-25)	Fr	0.0002	0.0002	0.0003	0.0005	0.0006	0.0009	0.0012
				Feed (ipm)	0.1	0.1	0.1	0.1	0.1	0.1	0.1
K	CAST IRONS Gray, Malleable, Ductile	≤ 220 Bhn or ≤ 19 HRc	105	RPM	3209	2139	1604	1070	802	535	401
			(84-126)	Fr	0.0009	0.0014	0.0018	0.0027	0.0036	0.0054	0.0072
				Feed (ipm)	2.9	2.9	2.9	2.9	2.9	2.9	2.9
		≤ 330 Bhn or ≤ 36 HRc	75	RPM	2292	1528	1146	764	573	382	287
			(60-90)	Fr	0.0009	0.0014	0.0018	0.0027	0.0037	0.0055	0.0073
				Feed (ipm)	2.1	2.1	2.1	2.1	2.1	2.1	2.1

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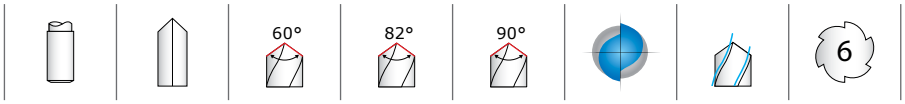
3 Flute Countersink

	Series 603 Fractional	Hardness	Vc (sfm)		DC • in 1/8	3/16	1/4	3/8	1/2	3/4	1
N	ALUMINUM ALLOYS 2017, 2024, 356, 6061, 7075	≤ 80 Bhn or ≤ 47 HRb	225	RPM	6876	4584	3438	2292	1719	1146	860
			(180-270)	Fr	0.0011	0.0017	0.0023	0.0034	0.0045	0.0068	0.0091
				Feed (ipm)	7.8	7.8	7.8	7.8	7.8	7.8	7.8
		≤ 150 Bhn or ≤ 88 HRb	190	RPM	5806	3871	2903	1935	1452	968	726
			(152-228)	Fr	0.0011	0.0017	0.0022	0.0034	0.0045	0.0067	0.0090
				Feed (ipm)	6.5	6.5	6.5	6.5	6.5	6.5	6.5
	COPPER ALLOYS Alum Bronze, C110, Muntz Brass	≤ 140 Bhn or ≤ 3 HRc	95	RPM	2903	1935	1452	968	726	484	363
			(76-114)	Fr	0.0006	0.0009	0.0012	0.0018	0.0023	0.0035	0.0047
				Feed (ipm)	1.7	1.7	1.7	1.7	1.7	1.7	1.7
		≤ 200 Bhn or ≤ 23 HRc	80	RPM	2445	1630	1222	815	611	407	306
			(64-96)	Fr	0.0006	0.0009	0.0011	0.0017	0.0023	0.0034	0.0046
				Feed (ipm)	1.4	1.4	1.4	1.4	1.4	1.4	1.4
S	HIGH TEMP ALLOYS (NICKEL, COBALT, IRON BASE) Inconel 601, 617, 625, Incoloy 800, Monel 400, Rene, Waspaloy	≤ 220 Bhn or ≤ 19 HRc	18	RPM	550	367	275	183	138	92	69
			(14-22)	Fr	0.0004	0.0005	0.0007	0.0011	0.0015	0.0022	0.0029
				Feed (ipm)	0.2	0.2	0.2	0.2	0.2	0.2	0.2
		≤ 320 Bhn or ≤ 34 HRc	14	RPM	428	285	214	143	107	71	53
			(11-17)	Fr	0.0002	0.0004	0.0005	0.0007	0.0009	0.0014	0.0019
				Feed (ipm)	0.1	0.1	0.1	0.1	0.1	0.1	0.1
		≤ 425 Bhn or ≤ 45 HRc	12	RPM	367	244	183	122	92	61	46
			(10-14)	Fr	0.0003	0.0004	0.0005	0.0008	0.0011	0.0016	0.0022
				Feed (ipm)	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	TITANIUM ALLOYS Pure Titanium, Ti6Al4V, Ti6Al2Sn4Zr2Mo, Ti4Al4Mo2Sn0.5Si, Ti-6Al4V	≤ 275 Bhn or ≤ 28 HRc	36	RPM	1100	733	550	367	275	183	138
			(29-43)	Fr	0.0007	0.0011	0.0015	0.0022	0.0029	0.0044	0.0058
				Feed (ipm)	0.8	0.8	0.8	0.8	0.8	0.8	0.8
		≤ 350 Bhn or ≤ 38 HRc	28	RPM	856	570	428	285	214	143	107
			(22-34)	Fr	0.0006	0.0009	0.0012	0.0018	0.0023	0.0035	0.0047
				Feed (ipm)	0.5	0.5	0.5	0.5	0.5	0.5	0.5
		≤ 440 Bhn or ≤ 47 HRc	21	RPM	642	428	321	214	160	107	80
			(17-25)	Fr	0.0002	0.0002	0.0003	0.0005	0.0006	0.0009	0.0012
				Feed (ipm)	0.1	0.1	0.1	0.1	0.1	0.1	0.1
H	TOOL STEELS A2, D2, H13, L2, M2, P20, S7, T15, W2	≤ 475 Bhn or ≤ 50 HRc	20	RPM	611	407	306	204	153	102	76
			(16-24)	Fr	0.0002	0.0002	0.0003	0.0005	0.0007	0.0010	0.0013
				Feed (ipm)	0.1	0.1	0.1	0.1	0.1	0.1	0.1

Bhn (Brinell) HRc (Rockwell C) HRb (Rockwell B)
rpm = Vc x 3.82 / DC
ipm = Fr x rpm
reduce speed and feed for materials harder than listed
refer to the SGS Tool Wizard® for complete technical information (www.kyocera-sgstool.com)

FRACTIONAL

6 Flute Countersink



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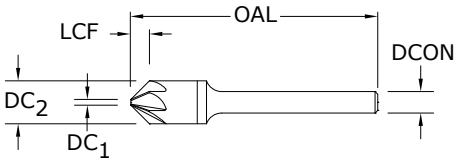
FRACTIONAL SERIES



inch					EDP NO.		
CUTTING DIAMETER DC_2	SHANK DIAMETER DCON	OVERALL LENGTH OAL	FLUTE LENGTH LCF	TIP DIAMETER DC_1	UNCOATED 60°	UNCOATED 82°	UNCOATED 90°
1/8	1/8	1-1/2	.045	.035	–	–	74249
1/8	1/8	1-1/2	.052	.035	–	74149	–
1/8	1/8	1-1/2	.078	.035	74049	–	–
3/16	3/16	2	.071	.045	–	–	74252
3/16	3/16	2	.082	.045	–	74152	–
3/16	3/16	2	.123	.045	74052	–	–
1/4	1/4	2	.090	.070	–	–	74255
1/4	1/4	2	.104	.070	–	74155	–
1/4	1/4	2	.156	.070	74055	–	–
*3/8	1/4	2-13/16	.138	.100	–	–	74258
*3/8	1/4	2-13/16	.158	.100	–	74158	–
*3/8	1/4	2-13/16	.238	.100	74058	–	–
*1/2	1/4	2-7/8	.170	.160	–	–	74261
*1/2	1/4	2-7/8	.196	.160	–	74161	–
*1/2	1/4	2-7/8	.294	.160	74061	–	–
*5/8	3/8	3	.218	.190	–	–	74264
*5/8	3/8	3	.250	.190	–	74164	–
*5/8	3/8	3	.377	.190	74064	–	–
*3/4	1/2	3	.265	.220	–	–	74267
*3/4	1/2	3	.305	.220	–	74167	–
*3/4	1/2	3	.459	.220	74067	–	–
*1	1/2	3-1/4	.370	.260	–	–	74270
*1	1/2	3-1/4	.426	.260	–	74170	–
*1	1/2	3-1/4	.641	.260	74070	–	–

*Steel Shank / Con mango de acero / Avec queue en acier / Mit Stahlschaft
NOTE: DC_1 dimension varies based on angle. Contact your KSPT representative or consult SGS Tool Wizard® for dimension information.

TOLERANCES (inch)

1/8–1/4 DIAMETER
DC = +0.0000/–0.0005

3/8–1 DIAMETER
DC = +0.003/–0.000

Included Angle +1°/–1°

- STEELS
- STAINLESS STEELS
- CAST IRON
- NON-FERROUS
- HIGH TEMP ALLOYS
- HARDENED STEELS

For patent information visit www.ksptpatents.com

6 Flute Countersink

	Series 606 Fractional	Hardness	Vc (sfm)		DC • in 1/8	3/16	1/4	3/8	1/2	3/4	1
P	CARBON STEELS 1018, 1040, 1080, 1090, 10L50, 1140, 1212, 12L15, 1525, 1536	≤ 175 Bhn or ≤ 7 HRc	125	RPM	3820	2547	1910	1273	955	637	478
			(100-150)	Fr	0.0010	0.0016	0.0021	0.0031	0.0042	0.0063	0.0084
				Feed (ipm)	4.0	4.0	4.0	4.0	4.0	4.0	4.0
		≤ 300 Bhn or ≤ 32 HRc	60	RPM	1834	1222	917	611	458	306	229
			(48-72)	Fr	0.0010	0.0015	0.0020	0.0029	0.0039	0.0059	0.0079
				Feed (ipm)	1.8	1.8	1.8	1.8	1.8	1.8	1.8
		≤ 425 Bhn or ≤ 45 HRc	45	RPM	1375	917	688	458	344	229	172
			(36-54)	Fr	0.0006	0.0009	0.0012	0.0017	0.0023	0.0035	0.0047
				Feed (ipm)	0.8	0.8	0.8	0.8	0.8	0.8	0.8
	ALLOY STEELS 4140, 4150, 4320, 5120, 5150, 8630, 86L20, 50100	≤ 275 Bhn or ≤ 28 HRc	95	RPM	2903	1935	1452	968	726	484	363
			(76-114)	Fr	0.0009	0.0013	0.0018	0.0027	0.0036	0.0054	0.0072
				Feed (ipm)	2.6	2.6	2.6	2.6	2.6	2.6	2.6
		≤ 375 Bhn or ≤ 40 HRc	60	RPM	1834	1222	917	611	458	306	229
			(48-72)	Fr	0.0009	0.0014	0.0019	0.0028	0.0037	0.0056	0.0074
				Feed (ipm)	1.7	1.7	1.7	1.7	1.7	1.7	1.7
		≤ 425 Bhn or ≤ 45 HRc	35	RPM	1070	713	535	357	267	178	134
			(28-42)	Fr	0.0006	0.0008	0.0011	0.0017	0.0022	0.0034	0.0045
				Feed (ipm)	0.6	0.6	0.6	0.6	0.6	0.6	0.6
	TOOL STEELS A2, D2, H13, L2, M2, P20, S7, T15, W2	≤ 250 Bhn or ≤ 24 HRc	35	RPM	1070	713	535	357	267	178	134
			(28-42)	Fr	0.0006	0.0008	0.0011	0.0017	0.0022	0.0034	0.0045
				Feed (ipm)	0.6	0.6	0.6	0.6	0.6	0.6	0.6
		≤ 375 Bhn or ≤ 40 HRc	25	RPM	764	509	382	255	191	127	96
			(20-30)	Fr	0.0003	0.0004	0.0005	0.0008	0.0010	0.0016	0.0021
				Feed (ipm)	0.2	0.2	0.2	0.2	0.2	0.2	0.2
M	STAINLESS STEELS (FREE MACHINING) 303, 416, 420F, 430F 440F	≤ 250 Bhn or ≤ 24 HRc	53	RPM	1620	1080	810	540	405	270	202
			(42-64)	Fr	0.0006	0.0009	0.0012	0.0019	0.0025	0.0037	0.0049
				Feed (ipm)	1.0	1.0	1.0	1.0	1.0	1.0	1.0
		≤ 330 Bhn or ≤ 36 HRc	46	RPM	1406	937	703	469	351	234	176
			(37-55)	Fr	0.0005	0.0007	0.0010	0.0015	0.0020	0.0030	0.0040
				Feed (ipm)	0.7	0.7	0.7	0.7	0.7	0.7	0.7
	STAINLESS STEELS (DIFFICULT) 304, 316, 321, 13-8 PH, 15-5PH, 17-4 PH, Custom 450	≤ 275 Bhn or ≤ 28 HRc	28	RPM	856	570	428	285	214	143	107
			(22-34)	Fr	0.0007	0.0011	0.0014	0.0021	0.0028	0.0042	0.0056
				Feed (IPM)	0.6	0.6	0.6	0.6	0.6	0.6	0.6
		≤ 375 Bhn or ≤ 40 HRc	21	RPM	642	428	321	214	160	107	80
			(17-25)	Fr	0.0003	0.0005	0.0006	0.0009	0.0012	0.0019	0.0025
				Feed (IPM)	0.2	0.2	0.2	0.2	0.2	0.2	0.2

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FRACTIONAL

6 Flute Countersink

	Series 606 Fractional	Hardness	Vc (sfm)		DC • in 1/8	3/16	1/4	3/8	1/2	3/4	1
K	CAST IRONS Gray, Malleable, Ductile	≤ 220 Bhn or ≤ 19 HRc	105	RPM	3209	2139	1604	1070	802	535	401
			(84-126)	Fr	0.0012	0.0018	0.0024	0.0036	0.0049	0.0073	0.0097
				Feed (ipm)	3.9	3.9	3.9	3.9	3.9	3.9	3.9
		≤ 330 Bhn or ≤ 36 HRc	75	RPM	2292	1528	1146	764	573	382	287
			(60-90)	Fr	0.0012	0.0018	0.0024	0.0037	0.0049	0.0073	0.0098
				Feed (ipm)	2.8	2.8	2.8	2.8	2.8	2.8	2.8
N	ALUMINUM ALLOYS 2017, 2024, 356, 6061, 7075	≤ 80 Bhn or ≤ 47 HRb	225	RPM	6876	4584	3438	2292	1719	1146	860
			(180-270)	Fr	0.0015	0.0022	0.0030	0.0045	0.0060	0.0090	0.0120
				Feed (ipm)	10.3	10.3	10.3	10.3	10.3	10.3	10.3
		≤ 150 Bhn or ≤ 88 HRb	190	RPM	5806	3871	2903	1935	1452	968	726
			(152-228)	Fr	0.0015	0.0022	0.0030	0.0045	0.0060	0.0090	0.0120
				Feed (ipm)	8.7	8.7	8.7	8.7	8.7	8.7	8.7
	COPPER ALLOYS Alum Bronze, C110, Muntz Brass	≤ 140 Bhn or ≤ 3 HRc	95	RPM	2903	1935	1452	968	726	484	363
			(76-114)	Fr	0.0008	0.0011	0.0015	0.0023	0.0030	0.0045	0.0061
				Feed (ipm)	2.2	2.2	2.2	2.2	2.2	2.2	2.2
		≤ 200 Bhn or ≤ 23 HRc	80	RPM	2445	1630	1222	815	611	407	306
			(64-96)	Fr	0.0008	0.0012	0.0016	0.0023	0.0031	0.0047	0.0062
				Feed (ipm)	1.9	1.9	1.9	1.9	1.9	1.9	1.9

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6 Flute Countersink

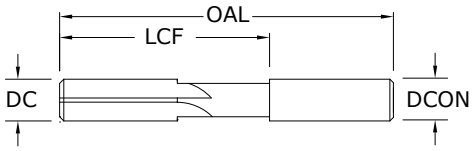
	Series 606 Fractional	Hardness	Vc (sfm)		DC • in 1/8	3/16	1/4	3/8	1/2	3/4	1
S	HIGH TEMP ALLOYS (NICKEL, COBALT, IRON BASE) Inconel 601, 617, 625, Incoloy 800, Monel 400, Rene, Waspaloy	≤ 220 Bhn or ≤ 19 HRc	18	RPM	550	367	275	183	138	92	69
			(14-22)	Fr	0.0005	0.0008	0.0011	0.0016	0.0022	0.0033	0.0044
				Feed (ipm)	0.3	0.3	0.3	0.3	0.3	0.3	0.3
		≤ 320 Bhn or ≤ 34 HRc	14	RPM	428	285	214	143	107	71	53
			(11-17)	Fr	0.0005	0.0007	0.0009	0.0014	0.0019	0.0028	0.0037
				Feed (ipm)	0.2	0.2	0.2	0.2	0.2	0.2	0.2
		≤ 425 Bhn or ≤ 45 HRc	12	RPM	367	244	183	122	92	61	46
			(10-14)	Fr	0.0003	0.0004	0.0005	0.0008	0.0011	0.0016	0.0022
				Feed (ipm)	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	TITANIUM ALLOYS Pure Titanium, Ti6Al4V, Ti6Al2Sn4Zr2Mo, Ti4Al4Mo2Sn0.5Si, Ti-6Al4V	≤ 275 Bhn or ≤ 28 HRc	36	RPM	1100	733	550	367	275	183	138
			(29-43)	Fr	0.0009	0.0014	0.0018	0.0027	0.0036	0.0055	0.0073
				Feed (ipm)	1.0	1.0	1.0	1.0	1.0	1.0	1.0
		≤ 350 Bhn or ≤ 38 HRc	28	RPM	856	570	428	285	214	143	107
			(22-34)	Fr	0.0007	0.0011	0.0014	0.0021	0.0028	0.0042	0.0056
				Feed (ipm)	0.6	0.6	0.6	0.6	0.6	0.6	0.6
		≤ 440 Bhn or ≤ 47 HRc	21	RPM	642	428	321	214	160	107	80
			(17-25)	Fr	0.0003	0.0005	0.0006	0.0009	0.0012	0.0019	0.0025
				Feed (ipm)	0.2	0.2	0.2	0.2	0.2	0.2	0.2
H	TOOL STEELS A2, D2, H13, L2, M2, P20, S7, T15, W2	≤ 475 Bhn or ≤ 50 HRc	20	RPM	611	407	306	204	153	102	76
			(16-24)	Fr	0.0003	0.0005	0.0007	0.0010	0.0013	0.0020	0.0026
				Feed (ipm)	0.2	0.2	0.2	0.2	0.2	0.2	0.2

Bhn (Brinell) HRc (Rockwell C) HRb (Rockwell B)
rpm = Vc x 3.82 / DC
ipm = Fr x rpm
reduce speed and feed for materials harder than listed
refer to the SGS Tool Wizard® for complete technical information (www.kyocera-sgstool.com)

FRACTIONAL

Straight Flute Accu-Reamer

200
FRACTIONAL SERIES



inch					EDP NO.
CUTTING DIAMETER DC	SHANK DIAMETER DCON	MAXIMUM REAM LENGTH LCF	OVERALL LENGTH OAL	NO. OF FLUTES	UNCOATED
3/64	3/64	3/4	1-1/2	4	70003
1/16	1/16	3/4	1-1/2	4	70004
5/64	5/64	1	2	4	70005
3/32	3/32	1-1/4	2-1/4	4	70006
7/64	7/64	1-1/4	2-1/4	4	70007
1/8	1/8	1-1/4	2-1/4	4	70008
9/64	9/64	1-1/2	2-1/2	4	70009
5/32	5/32	1-1/2	2-1/2	4	70010
11/64	11/64	1-3/4	2-3/4	4	70011
3/16	3/16	1-3/4	2-3/4	4	70012
13/64	13/64	2	3	4	70013
7/32	7/32	2	3	4	70014
15/64	15/64	2	3	4	70015
1/4	1/4	2	3	4	70016
17/64	17/64	2-1/4	3-1/4	6	70017
9/32	9/32	2-1/4	3-1/4	6	70018
19/64	19/64	2-1/4	3-1/4	6	70019
5/16	5/16	2-1/4	3-1/4	6	70020
21/64	21/64	2-3/8	3-1/2	6	70021
11/32	11/32	2-3/8	3-1/2	6	70022
23/64	23/64	2-3/8	3-1/2	6	70023
3/8	3/8	2-3/8	3-1/2	6	70024
25/64	25/64	2-7/8	4	6	70025
13/32	13/32	2-7/8	4	6	70026
27/64	27/64	2-7/8	4	6	70027
7/16	7/16	2-7/8	4	6	70028
29/64	29/64	2-7/8	4	6	70029
15/32	15/32	2-7/8	4	6	70030
31/64	31/64	2-7/8	4	6	70031
1/2	1/2	2-7/8	4	6	70032

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TOLERANCES (inch)

DC = +0.0002/–0.0000
DCON = +0.0002/–0.0000

- STEELS
- STAINLESS STEELS
- CAST IRON
- NON-FERROUS
- HIGH TEMP ALLOYS
- HARDENED STEELS

For patent information visit www.ksptpatents.com

Straight Flute Accu-Reamer

200
FRACTIONAL SERIES

CONTINUED

inch				
CUTTING DIAMETER DC	SHANK DIAMETER DCON	MAXIMUM REAM LENGTH LCF	OVERALL LENGTH OAL	NO. OF FLUTES
.0470 – .0625	1/16	3/4	1-1/2	4
.0626 – .0781	5/64	1	2	4
.0782 – .0938	3/32	1-1/4	2-1/4	4
.0939 – .1094	7/64	1-1/4	2-1/4	4
.1095 – .1250	1/8	1-1/4	2-1/4	4
.1251 – .1406	9/64	1-1/2	2-1/2	4
.1407 – .1562	5/32	1-1/2	2-1/2	4
.1563 – .1719	11/64	1-3/4	2-3/4	4
.1720 – .1875	3/16	1-3/4	2-3/4	4
.1876 – .2031	13/64	2	3	4
.2032 – .2188	7/32	2	3	4
.2189 – .2344	15/64	2	3	4
.2345 – .2500	1/4	2	3	4
.2501 – .2656	17/64	2-1/4	3-1/4	6
.2657 – .2812	9/32	2-1/4	3-1/4	6
.2813 – .2969	19/64	2-1/4	3-1/4	6
.2970 – .3125	5/16	2-1/4	3-1/4	6
.3126 – .3281	21/64	2-3/8	3-1/2	6
.3282 – .3438	11/32	2-3/8	3-1/2	6
.3439 – .3594	23/64	2-3/8	3-1/2	6
.3595 – .3750	3/8	2-3/8	3-1/2	6
.3751 – .3906	25/64	2-7/8	4	6
.3907 – .4062	13/32	2-7/8	4	6
.4063 – .4219	27/64	2-7/8	4	6
.4220 – .4375	7/16	2-7/8	4	6
.4376 – .4531	29/64	2-7/8	4	6
.4532 – .4688	15/32	2-7/8	4	6
.4689 – .4844	31/64	2-7/8	4	6
.4845 – .5000	1/2	2-7/8	4	6

SER 200 Fractional reamers can be ordered to specific diameters according to the size range of Cutting Diameter DC. Please order as:
- 200. Then the size of the cut diameter in fractional format.
- i.e. 200.0492
- Description: Series 200 size 0.0492
- For Metric sizes convert to fractional inches (i.e. ÷ 25.4)
- The above sample would be a 1.25mm size (1.25 ÷ 25.4 = 0.0492")

All other dimensions are fractional as per table including the Shank

FRACTIONAL

Straight Flute Accu-Reamer

	Series 200 Fractional	Hardness	Vc (sfm)		DC • in 1/16	1/8	3/16	1/4	5/16	3/8	1/2
P	CARBON STEELS 1018, 1040, 1080, 1090, 10L50, 1140, 1212, 12L15, 1525, 1536	≤ 175 Bhn or ≤ 7 HRc	150	RPM	9168	4584	3056	2292	1834	1528	1146
			(120-180)	Fr	0.0018	0.0035	0.0053	0.0071	0.0088	0.0106	0.0141
				Feed (ipm)	16.5	16.0	16.2	16.3	16.1	16.2	16.2
		≤ 300 Bhn or ≤ 32 HRc	75	RPM	4584	2292	1528	1146	917	764	573
			(60-90)	Fr	0.0016	0.0031	0.0047	0.0062	0.0078	0.0093	0.0124
				Feed (ipm)	7.3	7.1	7.2	7.1	7.2	7.1	7.1
		≤ 425 Bhn or ≤ 45 HRc	55	RPM	3362	1681	1121	840	672	560	420
			(44-66)	Fr	0.0009	0.0019	0.0028	0.0037	0.0046	0.0056	0.0074
				Feed (ipm)	3.0	3.2	3.1	3.1	3.1	3.1	3.1
	ALLOY STEELS 4140, 4150, 4320, 5120, 5150, 8630, 86L20, 50100	≤ 275 Bhn or ≤ 28 HRc	115	RPM	7029	3514	2343	1757	1406	1171	879
			(92-138)	Fr	0.0015	0.0030	0.0045	0.0060	0.0075	0.0090	0.0120
				Feed (ipm)	10.5	10.5	10.5	10.5	10.5	10.5	10.5
		≤ 375 Bhn or ≤ 40 HRc	70	RPM	4278	2139	1426	1070	856	713	535
			(56-84)	Fr	0.0015	0.0030	0.0045	0.0060	0.0075	0.0090	0.0120
				Feed (ipm)	6.4	6.4	6.4	6.4	6.4	6.4	6.4
		≤ 425 Bhn or ≤ 45 HRc	45	RPM	2750	1375	917	688	550	458	344
			(36-54)	Fr	0.0009	0.0019	0.0028	0.0037	0.0046	0.0056	0.0074
				Feed (ipm)	2.5	2.6	2.6	2.5	2.5	2.6	2.5
	TOOL STEELS A2, D2, H13, L2, M2, P20, S7, T15, W2	≤ 250 Bhn or ≤ 24 HRc	40	RPM	2445	1222	815	611	489	407	306
			(32-48)	Fr	0.0010	0.0020	0.0029	0.0039	0.0049	0.0059	0.0078
				Feed (ipm)	2.4	2.4	2.4	2.4	2.4	2.4	2.4
		≤ 375 Bhn or ≤ 40 HRc	25	RPM	1528	764	509	382	306	255	191
			(20-30)	Fr	0.0006	0.0013	0.0019	0.0025	0.0031	0.0038	0.0050
				Feed (ipm)	0.9	1.0	1.0	1.0	0.9	1.0	1.0
M	STAINLESS STEELS (FREE MACHINING) 303, 416, 420F, 430F 440F	≤ 250 Bhn or ≤ 24 HRc	75	RPM	4584	2292	1528	1146	917	764	573
			(60-90)	Fr	0.0010	0.0020	0.0029	0.0039	0.0049	0.0059	0.0078
				Feed (ipm)	4.6	4.6	4.4	4.5	4.5	4.5	4.5
		≤ 330 Bhn or ≤ 36 HRc	55	RPM	3362	1681	1121	840	672	560	420
			(44-66)	Fr	0.0008	0.0015	0.0023	0.0030	0.0038	0.0045	0.0060
				Feed (ipm)	2.7	2.5	2.6	2.5	2.6	2.5	2.5
	STAINLESS STEELS (DIFFICULT) 304, 316, 321, 13-8 PH, 15-5PH, 17-4 PH, Custom 450	≤ 275 Bhn or ≤ 28 HRc	35	RPM	2139	1070	713	535	428	357	267
			(28-42)	Fr	0.0010	0.0020	0.0029	0.0039	0.0049	0.0059	0.0078
				Feed (ipm)	2.1	2.1	2.1	2.1	2.1	2.1	2.1
		≤ 375 Bhn or ≤ 40 HRc	25	RPM	1528	764	509	382	306	255	191
			(20-30)	Fr	0.0006	0.0013	0.0019	0.0025	0.0031	0.0038	0.0050
				Feed (ipm)	0.9	1.0	1.0	1.0	0.9	1.0	1.0
K	CAST IRONS Gray, Malleable, Ductile	≤ 220 Bhn or ≤ 19 HRc	125	RPM	7640	3820	2547	1910	1528	1273	955
			(100-150)	Fr	0.0020	0.0040	0.0060	0.0081	0.0101	0.0121	0.0161
				Feed (ipm)	15.3	15.3	15.3	15.5	15.4	15.4	15.4
		≤ 330 Bhn or ≤ 36 HRc	95	RPM	5806	2903	1935	1452	1161	968	726
			(76-114)	Fr	0.0020	0.0040	0.0060	0.0081	0.0101	0.0121	0.0161
				Feed (ipm)	11.6	11.6	11.6	11.8	11.7	11.7	11.7

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Straight Flute Accu-Reamer

	Series 200 Fractional	Hardness	Vc (sfm)		DC • in 1/16	1/8	3/16	1/4	5/16	3/8	1/2
N	ALUMINUM ALLOYS 2017, 2024, 356, 6061, 7075	≤ 80 Bhn or ≤ 47 HRb	270	RPM	16502	8251	5501	4126	3300	2750	2063
			(216-324)	Fr	0.0025	0.0050	0.0075	0.0100	0.0125	0.0150	0.0200
				Feed (ipm)	41.3	41.3	41.3	41.3	41.3	41.3	41.3
		≤ 150 Bhn or ≤ 88 HRb	230	RPM	14058	7029	4686	3514	2812	2343	1757
			(184-276)	Fr	0.0025	0.0050	0.0075	0.0100	0.0125	0.0150	0.0200
				Feed (ipm)	35.1	35.1	35.1	35.1	35.1	35.1	35.1
	COPPER ALLOYS Alum Bronze, C110, Muntz Brass	≤ 140 Bhn or ≤ 3 HRc	115	RPM	7029	3514	2343	1757	1406	1171	879
			(92-138)	Fr	0.0013	0.0026	0.0038	0.0051	0.0064	0.0077	0.0102
				Feed (ipm)	9.1	9.1	8.9	9.0	9.0	9.0	9.0
		≤ 200 Bhn or ≤ 23 HRc	95	RPM	5806	2903	1935	1452	1161	968	726
			(76-114)	Fr	0.0013	0.0026	0.0038	0.0051	0.0064	0.0077	0.0102
				Feed (ipm)	7.5	7.5	7.4	7.4	7.4	7.5	7.4
S	HIGH TEMP ALLOYS (NICKEL, COBALT, IRON BASE) Inconel 601, 617, 625, Incoloy 800, Monel 400, Rene, Waspaloy	≤ 220 Bhn or ≤ 19 HRc	20	RPM	1222	611	407	306	244	204	153
			(16-24)	Fr	0.0008	0.0015	0.0023	0.0030	0.0038	0.0045	0.0060
				Feed (ipm)	1.0	0.9	0.9	0.9	0.9	0.9	0.9
		≤ 320 Bhn or ≤ 34 HRc	15	RPM	917	458	306	229	183	153	115
			(12-18)	Fr	0.0006	0.0013	0.0019	0.0025	0.0031	0.0038	0.0050
				Feed (ipm)	0.6	0.6	0.6	0.6	0.6	0.6	0.6
		≤ 425 Bhn or ≤ 45 HRc	10	RPM	611	306	204	153	122	102	76
			(8-12)	Fr	0.0004	0.0007	0.0011	0.0015	0.0018	0.0022	0.0029
				Feed (ipm)	0.2	0.2	0.2	0.2	0.2	0.2	0.2
	TITANIUM ALLOYS Pure Titanium, Ti6Al4V, Ti6Al2Sn4Zr2Mo, Ti4Al4Mo2Sn0.5Si, Ti-6Al4V	≤ 275 Bhn or ≤ 28 HRc	45	RPM	2750	1375	917	688	550	458	344
			(36-54)	Fr	0.0015	0.0030	0.0045	0.0060	0.0075	0.0090	0.0120
				Feed (ipm)	4.1	4.1	4.1	4.1	4.1	4.1	4.1
		≤ 350 Bhn or ≤ 38 HRc	35	RPM	2139	1070	713	535	428	357	267
			(28-42)	Fr	0.0010	0.0020	0.0029	0.0039	0.0049	0.0059	0.0078
				Feed (ipm)	2.1	2.1	2.1	2.1	2.1	2.1	2.1
		≤ 440 Bhn or ≤ 47 HRc	25	RPM	1528	764	509	382	306	255	191
			(20-30)	Fr	0.0006	0.0013	0.0019	0.0025	0.0031	0.0038	0.0050
				Feed (ipm)	0.9	1.0	1.0	1.0	0.9	1.0	1.0
H	TOOL STEELS A2, D2, H13, L2, M2, P20, S7, T15, W2	≤ 475 Bhn or ≤ 50 HRc	20	RPM	1222	611	407	306	244	204	153
			(16-24)	Fr	0.0004	0.0008	0.0012	0.0016	0.0019	0.0023	0.0031
				Feed (ipm)	0.5	0.5	0.5	0.5	0.5	0.5	0.5
		≤ 655 Bhn or ≤ 60 HRc	14	RPM	856	428	285	214	171	143	107
			(11-17)	Fr	0.0003	0.0007	0.0011	0.0014	0.0018	0.0021	0.0028
				Feed (ipm)	0.3	0.3	0.3	0.3	0.3	0.3	0.3

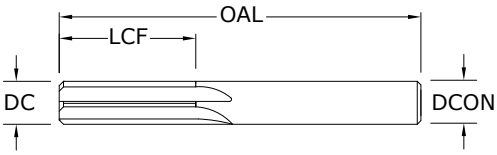
Bhn (Brinell) HRc (Rockwell C) HRb (Rockwell B)
rpm = Vc x 3.82 / DC
ipm = Fr x rpm
increase speed and feed 30 percent when using coated reamers
reduce speed and feed for materials harder than listed
refer to the SGS Tool Wizard® for complete technical information (www.kyocera-sgstool.com)

METRIC

Straight Flute Reamer

201M

METRIC SERIES



mm					EDP NO.
CUTTING DIAMETER DC	SHANK DIAMETER DCON	MAXIMUM REAM LENGTH LCF	OVERALL LENGTH OAL	NO. OF FLUTES	UNCOATED
1,0	1,0	6,0	32,0	4	81001
1,5	1,5	9,5	38,0	4	81003
2,0	2,0	12,7	44,0	4	81005
2,5	2,5	12,7	50,0	4	81007
3,0	3,0	16,0	57,0	4	81009
3,5	3,5	19, 0	63,0	4	81011
4,0	4,0	19,0	63,0	4	81013
4,5	4,5	22,0	70,0	4	81015
5,0	5,0	25,0	75,0	4	81017
5,5	5,5	25,0	75,0	4	81019
6,0	6,0	25,0	75,0	4	81021
7,0	7,0	28,0	82,0	6	81023
8,0	8,0	28,0	82,0	6	81025
9,0	9,0	31,0	89,0	6	81027
10,0	10,0	31,0	89,0	6	81029

TOLERANCES (mm)

1–6 DIAMETER

DC = +0,008/–0,000

>6–10 DIAMETER

DC = +0,010/–0,000

- STEELS
- STAINLESS STEELS
- CAST IRON
- NON-FERROUS
- HIGH TEMP ALLOYS
- HARDENED STEELS

For patent information visit www.ksptpatents.com

Straight Flute Reamer

	Series 201M Metric	Hardness	Vc (m/min)		DC • mm 1	2	3	4	6	8	10
P	CARBON STEELS 1018, 1040, 1080, 1090, 10L50, 1140, 1212, 12L15, 1525, 1536	≤ 175 Bhn or ≤ 7 HRc	46	RPM	14541	7271	4847	3635	2424	1818	1454
			(37-55)	Fr	0.028	0.056	0.085	0.113	0.169	0.226	0.282
				Feed (mm/min)	410	410	410	410	410	410	410
		≤ 300 Bhn or ≤ 32 HRc	23	RPM	7271	3635	2424	1818	1212	909	727
			(18-27)	Fr	0.025	0.050	0.074	0.099	0.149	0.198	0.248
				Feed (mm/min)	180	180	180	180	180	180	180
		≤ 425 Bhn or ≤ 45 HRc	17	RPM	5332	2666	1777	1333	889	666	533
			(13-20)	Fr	0.015	0.030	0.044	0.059	0.089	0.119	0.148
				Feed (mm/min)	79	79	79	79	79	79	79
	ALLOY STEELS 4140, 4150, 4320, 5120, 5150, 8630, 86L20, 50100	≤ 275 Bhn or ≤ 28 HRc	35	RPM	11148	5574	3716	2787	1858	1394	1115
			(28-42)	Fr	0.024	0.048	0.072	0.096	0.144	0.192	0.240
				Feed (mm/min)	268	268	268	268	268	268	268
		≤ 375 Bhn or ≤ 40 HRc	21	RPM	6786	3393	2262	1696	1131	848	679
			(17-26)	Fr	0.024	0.048	0.072	0.096	0.144	0.192	0.240
				Feed (mm/min)	163	163	163	163	163	163	163
		≤ 425 Bhn or ≤ 45 HRc	14	RPM	4362	2181	1454	1091	727	545	436
			(11-16)	Fr	0.015	0.030	0.045	0.060	0.089	0.119	0.149
				Feed (mm/min)	65	65	65	65	65	65	65
	TOOL STEELS A2, D2, H13, L2, M2, P20, S7, T15, W2	≤ 250 Bhn or ≤ 24 HRc	12	RPM	3878	1939	1293	969	646	485	388
			(10-15)	Fr	0.015	0.031	0.046	0.062	0.093	0.124	0.155
				Feed (mm/min)	60	60	60	60	60	60	60
		≤ 375 Bhn or ≤ 40 HRc	8	RPM	2424	1212	808	606	404	303	242
			(6-9)	Fr	0.010	0.020	0.030	0.040	0.059	0.079	0.099
				Feed (mm/min)	24	24	24	24	24	24	24
M	STAINLESS STEELS (FREE MACHINING) 303, 416, 420F, 430F 440F	≤ 250 Bhn or ≤ 24 HRc	23	RPM	7271	3635	2424	1818	1212	909	727
			(18-27)	Fr	0.015	0.030	0.045	0.059	0.089	0.119	0.149
				Feed (mm/min)	108	108	108	108	108	108	108
		≤ 330 Bhn or ≤ 36 HRc	17	RPM	5332	2666	1777	1333	889	666	533
			(13-20)	Fr	0.012	0.024	0.036	0.048	0.072	0.096	0.120
				Feed (mm/min)	64	64	64	64	64	64	64
	STAINLESS STEELS (DIFFICULT) 304, 316, 321, 13-8 PH, 15-5PH, 17-4 PH, Custom 450	≤ 275 Bhn or ≤ 28 HRc	11	RPM	3393	1696	1131	848	565	424	339
			(9-13)	Fr	0.015	0.029	0.044	0.059	0.088	0.118	0.147
				Feed (mm/min)	50	50	50	50	50	50	50
		≤ 375 Bhn or ≤ 40 HRc	8	RPM	2424	1212	808	606	404	303	242
			(6-9)	Fr	0.010	0.020	0.030	0.040	0.059	0.079	0.099
				Feed (mm/min)	24	24	24	24	24	24	24

continued on next page

METRIC

Straight Flute Reamer

	Series 201M Metric	Hardness	Vc (m/min)		DC • mm 1	2	3	4	6	8	10
K	CAST IRONS Gray, Malleable, Ductile	≤ 220 Bhn or ≤ 19 HRc	38	RPM	12118	6059	4039	3029	2020	1515	1212
			(30-46)	Fr	0.032	0.064	0.097	0.129	0.193	0.257	0.322
				Feed (mm/min)	390	390	390	390	390	390	390
		≤ 330 Bhn or ≤ 36 HRc	29	RPM	9209	4605	3070	2302	1535	1151	921
			(23-35)	Fr	0.032	0.064	0.096	0.128	0.192	0.256	0.320
				Feed (mm/min)	295	295	295	295	295	295	295
N	ALUMINUM ALLOYS 2017, 2024, 356, 6061, 7075	≤ 80 Bhn or ≤ 47 HRb	82	RPM	26174	13087	8725	6544	4362	3272	2617
			(66-99)	Fr	0.040	0.080	0.120	0.160	0.240	0.320	0.400
				Feed (mm/min)	1047	1047	1047	1047	1047	1047	1047
		≤ 150 Bhn or ≤ 88 HRb	70	RPM	22297	11148	7432	5574	3716	2787	2230
			(56-84)	Fr	0.040	0.080	0.120	0.160	0.240	0.320	0.400
				Feed (mm/min)	892	892	892	892	892	892	892
	COPPER ALLOYS Alum Bronze, C110, Muntz Brass	≤ 140 Bhn or ≤ 3 HRc	35	RPM	11148	5574	3716	2787	1858	1394	1115
			(28-42)	Fr	0.020	0.041	0.061	0.081	0.122	0.163	0.204
				Feed (mm/min)	227	227	227	227	227	227	227
		≤ 200 Bhn or ≤ 23 HRc	29	RPM	9209	4605	3070	2302	1535	1151	921
			(23-35)	Fr	0.020	0.041	0.061	0.082	0.122	0.163	0.204
				Feed (mm/min)	188	188	188	188	188	188	188

continued on next page

Straight Flute Reamer

	Series 201M Metric	Hardness	Vc (m/min)		DC • mm 1	2	3	4	6	8	10
S	HIGH TEMP ALLOYS (NICKEL, COBALT, IRON BASE) Inconel 601, 617, 625, Incoloy 800, Monel 400, Rene, Waspaloy	≤ 220 Bhn or ≤ 19 HRc	6	RPM	1939	969	646	485	323	242	194
			(5-7)	Fr	0.012	0.024	0.036	0.047	0.071	0.095	0.119
				Feed (mm/min)	23	23	23	23	23	23	23
		≤ 320 Bhn or ≤ 34 HRc	5	RPM	1454	727	485	364	242	182	145
			(4-5)	Fr	0.010	0.021	0.031	0.041	0.062	0.083	0.103
				Feed (mm/min)	15	15	15	15	15	15	15
		≤ 425 Bhn or ≤ 45 HRc	3	RPM	969	485	323	242	162	121	97
			(2-4)	Fr	0.006	0.012	0.019	0.025	0.037	0.050	0.062
				Feed (mm/min)	6	6	6	6	6	6	6
	TITANIUM ALLOYS Pure Titanium, Ti6Al4V, Ti6Al2Sn4Zr2Mo, Ti4Al4Mo2Sn0.5Si, Ti-6Al4V	≤ 275 Bhn or ≤ 28 HRc	14	RPM	4362	2181	1454	1091	727	545	436
			(11-16)	Fr	0.024	0.048	0.072	0.096	0.144	0.193	0.241
				Feed (mm/min)	105	105	105	105	105	105	105
		≤ 350 Bhn or ≤ 38 HRc	11	RPM	3393	1696	1131	848	565	424	339
			(9-13)	Fr	0.015	0.029	0.044	0.059	0.088	0.118	0.147
				Feed (mm/min)	50	50	50	50	50	50	50
		≤ 440 Bhn or ≤ 47 HRc	8	RPM	2424	1212	808	606	404	303	242
			(6-9)	Fr	0.010	0.020	0.030	0.040	0.059	0.079	0.099
				Feed (mm/min)	24	24	24	24	24	24	24
H	TOOL STEELS A2, D2, H13, L2, M2, P20, S7, T15, W2	≤ 475 Bhn or ≤ 50 HRc	6	RPM	1939	969	646	485	323	242	194
			(5-7)	Fr	0.006	0.012	0.019	0.025	0.037	0.050	0.062
				Feed (mm/min)	12	12	12	12	12	12	12
		≤ 655 Bhn or ≤ 60 HRc	4	RPM	1272	636	424	318	212	159	127
			(3-5)	Fr	0.006	0.013	0.019	0.025	0.038	0.050	0.063
				Feed (mm/min)	8	8	8	8	8	8	8

Bhn (Brinell) HRc (Rockwell C) HRb (Rockwell B)
rpm = (Vc x 1000) / (DC x 3.14)
mm/min = Fr x rpm
increase speed and feed 30 percent when using coated reamers
reduce speed and feed for materials harder than listed
refer to the SGS Tool Wizard® for complete technical information (www.kyocera-sgstool.com)

SGS Solid Carbide Tools

Keeping the world moving

Routers

Routing

HIGH PERFORMANCE ROUTERS	SERIES	DESCRIPTION	PAGE	S&F PAGE
Carbon Composite	20M-CCR	Multi-Flute Carbon Composite Metric	279	280
	20M-CCR-LHC	Multi-Flute Carbon Composite Left Hand Cut Metric	279	280
Coarse Cut Carbon Composite	31M-CCR	Multi-Flute Coarse Composite Metric	281	282
Compression	25M	Multi-Flute Compression Metric	283	284

GENERAL APPLICATION ROUTERS	SERIES	DESCRIPTION	PAGE	S&F PAGE
Up Cut	21M	2 Flute Up Cut Metric	285	287
Down Cut	22M	2 Flute Down Cut Metric	286	287

Speed & Feed Recommendations listed after each series

Ranurado

RANURADORES DE ALTO RENDIMIENTO	SERIE	DESCRIPCIÓN	PÁGINA	S&F PÁGINA
Compuesto de carbono	20M-CCR	Filo múltiple, compuesto de carbono, métrico	279	280
	20M-CCR-LHC	Filo múltiple, carbo composite corte hélice izquierda métrico	279	280
Compuesto de carbono de corte grueso	31M-CCR	Filo múltiple, compuesto grueso, métrico	281	282
Compresión	25M	Filo múltiple, compresión, métrico	283	284

RANURADORES DE USO GENERAL	SERIE	DESCRIPCIÓN	PÁGINA	S&F PÁGINA
Corte ascendente	21M	2 filos, corte ascendente, métrico	285	287
Corte descendente	22M	2 filos, corte descendente, métrico	286	287

Recomendaciones de velocidades y avances mostradas tras cada serie

Détourage

FRAISES A DETOURER HAUTE PERFORMANCE	SÈRIES	DESCRIPTION	PAGE	S&F PAGE
Composites carbone	20M-CCR	Multi-dents pour composites carbone (métrique)	279	280
	20M-CCR-LHC	Multi-dents carbon composite coupe à gauche (métrique)	279	280
Pour composites carbone coupe grossière	31M-CCR	Multi-dents pour composites grossiers (métrique)	281	282
Compression	25M	Multi-dents de compression (métrique)	283	284

FRAISES À DÉTOURER UNIVERSELLES	SÈRIES	DESCRIPTION	PAGE	S&F PAGE
Coupe ascendante	21M	2 dents coupe ascendante (métrique)	285	287
Coupe descendante	22M	2 dents coupe descendante (métrique)	286	287

Recommandations de vitesse et avance indiquées après chaque série

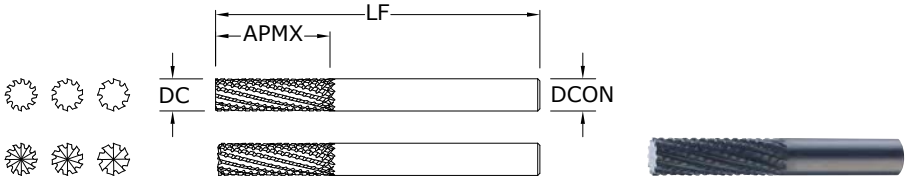
Konturenfräsen

HOCHLEISTUNGS-KONTURENFRÄSER	SERIE	BESCHREIBUNG	SEITE	S&F SEITE
Kohlefaserverbundwerkstoff	20M-CCR	Konturenfräser für Kohlefaserverbundwerkstoff	279	280
	20M-CCR-LHC	Mehrschneider Carbon Composite Links geschnittene metrisch	279	280
Grobschnitt Kohlefaserverbundwerkstoff	31M-CCR	Konturenfräser für Verbundkunststoff	281	282
Gegenläufiger Drall	25M	Gegenläufiger Konturenfräser	283	284

STANDARD-KONTURENFRÄSER	SERIE	BESCHREIBUNG	SEITE	S&F SEITE
Rechtsspirale	21M	VHM-Fräser mit 2 Schneiden (ziehend)	285	287
Linksspirale	22M	VHM-Fräser mit 2 Schneiden (drückend)	286	287

Empfehlungen für Drehzahl & Vorschub im Anhang zu jeder Serie

Carbon Composite



20M-CCR

METRIC SERIES

TOLERANCES (mm)

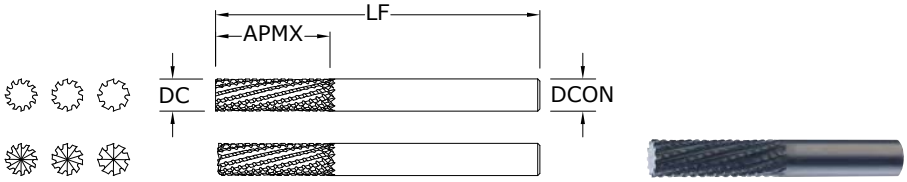
DC = +0,000/–0,130
DCON = h_6

NON-FERROUS

For patent information visit www.ksptpatents.com

mm						EDP NO.		
CUTTING DIAMETER DC	LENGTH OF CUT APMX	OVERALL LENGTH LF	SHANK DIAMETER DCON	NO. OF FLUTES	END STYLE	UNCOATED	Ti-NAMITE-B (TiB_2)	Di-NAMITE® (Diamond)
2,0	6,0	38,0	3,0	5	End Cutting	82930	83100	83070
3,0	10,0	38,0	3,0	6	End Cutting	82931	83101	83071
4,0	12,0	50,0	4,0	7	End Cutting	82932	83102	83072
5,0	15,0	50,0	6,0	8	End Cutting	82933	83103	83073
6,0	25,0	63,0	6,0	8	No End Cutting	82966	83104	83027
6,0	25,0	63,0	6,0	8	End Cutting	82967	83105	83026
8,0	25,0	63,0	8,0	10	No End Cutting	82968	83106	83029
8,0	25,0	63,0	8,0	10	End Cutting	82969	83107	83028
10,0	28,0	63,0	10,0	12	No End Cutting	82970	83108	83042
10,0	28,0	63,0	10,0	12	End Cutting	82971	83109	83041
12,0	38,0	89,0	12,0	12	No End Cutting	82972	83110	83044
12,0	38,0	89,0	12,0	12	End Cutting	82973	83111	83043

- Multi-flute design and positive geometry to shear with minimal pressure and delamination
- Unique clearance grind minimizes contact between tool diameter and workpiece eliminating friction
- Left hand flutes engineered to control the fibers within CFRP, preventing excessive fiber breakout
- Excels at trimming and profiling difficult and abrasive fiber filled plastics



20M-CCR-LHC

METRIC SERIES

TOLERANCES (mm)

DC = +0,000/–0,130
DCON = h_6

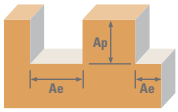
NON-FERROUS

For patent information visit www.ksptpatents.com

mm						EDP NO.	
CUTTING DIAMETER DC	LENGTH OF CUT APMX	OVERALL LENGTH LF	SHANK DIAMETER DCON	NO. OF FLUTES	END STYLE	UNCOATED	Di-NAMITE® (Diamond)
6,0	25,0	63,0	6,0	8	No End Cutting	83220	83230
6,0	25,0	63,0	6,0	8	End Cutting	83221	83231
8,0	25,0	63,0	8,0	10	No End Cutting	83222	83232
8,0	25,0	63,0	8,0	10	End Cutting	83223	83233
10,0	28,0	63,0	10,0	12	No End Cutting	83224	83234
10,0	28,0	63,0	10,0	12	End Cutting	83225	83235

- Multi-flute design and positive geometry to shear with minimal pressure and delamination
- Unique clearance grind minimizes contact between tool diameter and workpiece eliminating friction
- Left hand flutes engineered to control the fibers within CFRP, preventing excessive fiber breakout
- Excels at trimming and profiling difficult and abrasive fiber filled plastics

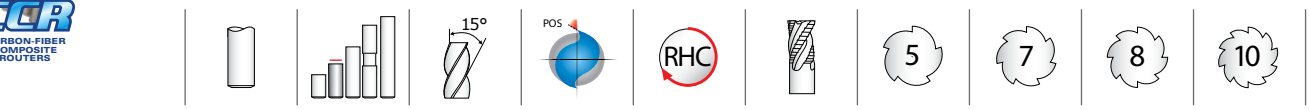
Carbon Composite

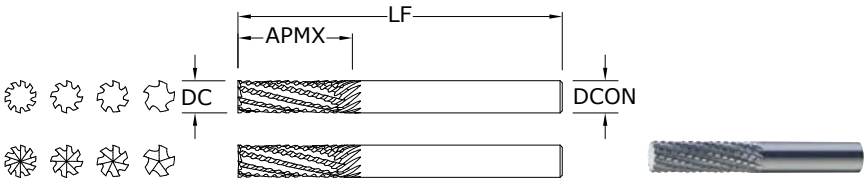


	Series 20M Metric		Ae x DC	Ap x DC	Vc (m/min)		DC • mm 3	6	8	10	12
N	CFRP, AFRP (CARBON FIBER, ARAMID FIBER)	Slot	1	≤ 1	120 (96-164)	RPM	12722	6361	4771	3817	3181
						Fr	0.055	0.113	0.243	0.366	0.439
						Feed (mm/min)	700	720	1160	1395	1395
		Profile	≤ 0.5	≤ 1.5	150 (120-180)	RPM	15903	7951	5963	4771	3976
						Fr	0.055	0.113	0.243	0.366	0.439
						Feed (mm/min)	875	900	1450	1744	1744
		HSM	≤ 0.05	≤ 2	250 (200-300)	RPM	26504	13252	9939	7951	6626
						Fr	0.126	0.260	0.556	0.833	1.000
						Feed (mm/min)	3350	3450	5527	6625	6625
	GFRP (FIBERGLASS)	Slot	1	≤ 1	100 (80-120)	RPM	10602	5301	3976	3181	2650
						Fr	0.054	0.111	0.236	0.357	0.428
						Feed (mm/min)	570	587	940	1135	1135
		Profile	≤ 0.5	≤ 1.5	120 (96-164)	RPM	12722	6361	4771	3817	3181
						Fr	0.054	0.111	0.236	0.357	0.428
						Feed (mm/min)	684	704	1128	1362	1362
		HSM	≤ 0.05	≤ 2	200 (160-240)	RPM	21203	10602	7951	6361	5301
						Fr	0.124	0.261	0.557	1.011	1.213
						Feed (mm/min)	2629	2765	4430	6430	6430
	CARBON, GRAPHITE	Slot	1	≤ 1	145 (116-174)	RPM	15372	7686	5765	4612	3843
						Fr	0.069	0.152	0.323	0.482	0.579
						Feed (mm/min)	1061	1165	1860	2224	2224
		Profile	≤ 0.5	≤ 1.5	185 (148-222)	RPM	19613	9807	7355	5884	4903
						Fr	0.069	0.152	0.323	0.482	0.579
						Feed (mm/min)	1353	1486	2373	2838	2838
		HSM	≤ 0.05	≤ 2	300 (240-360)	RPM	31805	15903	11927	9542	7951
						Fr	0.159	0.348	0.740	1.109	1.331
						Feed (mm/min)	5057	5535	8820	10580	10580
	PLASTICS	Slot	1	≤ 1	245 (196-294)	RPM	25974	12987	9740	7792	6494
						Fr	0.069	0.150	0.319	0.477	0.572
						Feed (mm/min)	1792	1945	3107	3717	3717
		Profile	≤ 0.5	≤ 1.5	305 (244-366)	RPM	32335	16168	12126	9701	8084
						Fr	0.069	0.150	0.319	0.477	0.572
						Feed (mm/min)	2231	2421	3868	4627	4627
		HSM	≤ 0.05	≤ 2	505 (404-606)	RPM	53538	26769	20077	16062	13385
						Fr	0.159	0.344	0.732	1.097	1.316
						Feed (mm/min)	8513	9220	14690	17617	17617

HSM (high speed machining)
rpm = (Vc x 1000) / (DC x 3.14)
mm/min = Fr x rpm
adjust parameters based on resin type and fiber structure
reduce speed when overheating causes melting or damage to resin
reduce feed if delamination or fraying occur
finish cuts typically required reduced feed and cutting depths
rates shown are for use without coolant; rates may be increased with coolant
dust collection is vital when machining dry
diamond coating will increase tool life in graphite and composite materials
refer to the SGS Tool Wizard® for complete technical information (www.kyocera-sgstool.com)

Coarse Cut Carbon Composite





31M-CCR
METRIC SERIES

TOLERANCES (mm)

DC = +0,000/–0,130
DCON = h_6

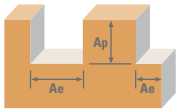
NON-FERROUS

For patent information visit www.ksptpatents.com

mm						EDP NO.		
CUTTING DIAMETER DC	LENGTH OF CUT APMX	OVERALL LENGTH LF	SHANK DIAMETER DCON	NO. OF FLUTES	END STYLE	UNCOATED	Ti-NAMITE-B (TiB_2)	Di-NAMITE® (Diamond)
6,0	25,0	63,0	6,0	5	End Cutting	82974	83200	82982
6,0	25,0	63,0	6,0	5	No End Cutting	82975	83201	82983
8,0	25,0	63,0	8,0	7	End Cutting	82976	83202	82984
8,0	25,0	63,0	8,0	7	No End Cutting	82977	83203	82985
10,0	28,0	63,0	10,0	8	End Cutting	82978	83204	82986
10,0	28,0	63,0	10,0	8	No End Cutting	82979	83205	82987
12,0	38,0	89,0	12,0	10	End Cutting	82980	83206	82988
12,0	38,0	89,0	12,0	10	No End Cutting	82981	83207	82989

- Fewer, deeper flutes to prevent clogging in heavy routing
- Unique clearance grind minimizes contact between tool diameter and workpiece eliminating friction
- Left hand flutes engineered to control the fibers within CFRP, preventing excessive fiber breakout
- Excels at trimming and profiling difficult and abrasive fiber filled plastics

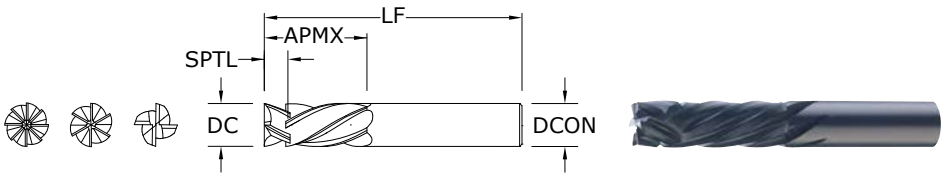
Coarse Cut Carbon Composite



	Series 31M Metric		Ae x DC	Ap x DC	Vc (m/min)		DC • mm 6	8	10	12
N	CFRP, AFRP (CARBON FIBER, ARAMID FIBER)	Slot	1	≤ 1	120	RPM	6361	4771	3817	3181
					(96-164)	Fr	0.071	0.170	0.244	0.366
						Feed (mm/min)	450	810	930	1165
		Profile	≤ 0.5	≤ 1.5	150	RPM	7951	5963	4771	3976
					(120-180)	Fr	0.071	0.170	0.244	0.366
						Feed (mm/min)	563	1013	1163	1456
		HSM	≤ 0.05	≤ 2	250	RPM	13252	9939	7951	6626
					(200-300)	Fr	0.162	0.388	0.555	0.832
						Feed (mm/min)	2150	3860	4415	5515
	GFRP (FIBERGLASS)	Slot	1	≤ 1	100	RPM	5301	3976	3181	2650
					(80-120)	Fr	0.069	0.165	0.237	0.357
						Feed (mm/min)	365	655	755	945
		Profile	≤ 0.5	≤ 1.5	120	RPM	6361	4771	3817	3181
					(96-164)	Fr	0.069	0.165	0.237	0.357
						Feed (mm/min)	438	786	906	1134
		HSM	≤ 0.05	≤ 2	200	RPM	10602	7951	6361	5301
					(160-240)	Fr	0.163	0.390	0.557	0.834
						Feed (mm/min)	1725	3100	3540	4420
	CARBON, GRAPHITE	Slot	1	≤ 1	145	RPM	7686	5765	4612	3843
					(116-174)	Fr	0.095	0.226	0.321	0.483
						Feed (mm/min)	728	1300	1480	1855
		Profile	≤ 0.5	≤ 1.5	185	RPM	9807	7355	5884	4903
					(148-222)	Fr	0.095	0.226	0.321	0.483
						Feed (mm/min)	929	1659	1888	2367
		HSM	≤ 0.05	≤ 2	300	RPM	15903	11927	9542	7951
					(240-360)	Fr	0.217	0.517	0.739	1.111
						Feed (mm/min)	3450	6170	7050	8830
	PLASTICS	Slot	1	≤ 1	245	RPM	12987	9740	7792	6494
					(196-294)	Fr	0.094	0.223	0.318	0.477
						Feed (mm/min)	1215	2175	2475	3100
		Profile	≤ 0.5	≤ 1.5	305	RPM	16168	12126	9701	8084
					(244-366)	Fr	0.094	0.223	0.318	0.477
						Feed (mm/min)	1513	2708	3081	3859
		HSM	≤ 0.05	≤ 2	505	RPM	26769	20077	16062	13385
					(404-606)	Fr	0.215	0.512	0.731	1.098
						Feed (mm/min)	5760	10280	11745	14700

HSM (high speed machining)
rpm = (Vc x 1000) / (DC x 3.14)
mm/min = Fr x rpm
adjust parameters based on resin type and fiber structure
reduce speed when overheating causes melting or damage to resin
reduce feed if delamination or fraying occur
finish cuts typically required reduced feed and cutting depths
rates shown are for use without coolant; rates may be increased with coolant
dust collection is vital when machining dry
diamond coating will increase tool life in graphite and composite materials
refer to the SGS Tool Wizard® for complete technical information (www.kyocera-sgstool.com)

Compression



25M
METRIC SERIES

TOLERANCES (mm)

DC = +0,000/–0,080
DCON = h_6

NON-FERROUS

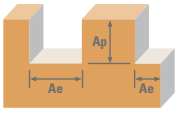
For patent information visit www.ksptpatents.com

mm						EDP NO.	
CUTTING DIAMETER DC	LENGTH OF CUT APMX	OVERALL LENGTH LF	SHANK DIAMETER DCON	SPLIT LENGTH SPTL	NO. OF FLUTES	UNCOATED	Di-NAMITE® (Diamond)
6,0	25,0	63,0	6,0	4,10	4	82990	82991
8,0	25,0	63,0	8,0	5,58	4	82992	82993
10,0	28,0	63,0	10,0	7,05	6	82994	82995
12,0	38,0	89,0	12,0	8,60	8	82996	82997

- Compression-style helixes direct cutting forces inward, eliminating fiber breakout and delamination
- Primary/secondary relief grind for reduced friction and pressure
- Rigid, heavy core

METRIC

Compression



	Series 25M Metric		Ae x DC	Ap x DC	Vc (m/min)		DC • mm 6	8	10	12
N	CFRP, AFRP (CARBON FIBER, ARAMID FIBER)	Profile	≤ 0.5	≤ 1.5	150	RPM	7951	5963	4771	3976
					(96-164)	Fz	0.040	0.065	0.075	0.100
						Feed (mm/min)	1272	1550	2147	3181
		HSM	≤ 0.05	≤ 2	250	RPM	13252	9939	7951	6626
					(200-300)	Fz	0.095	0.145	0.175	0.235
						Feed (mm/min)	5036	5765	8349	12457
	GFRP (FIBERGLASS)	Profile	≤ 0.5	≤ 1.5	120	RPM	6361	4771	3817	3181
					(96-164)	Fz	0.040	0.065	0.075	0.100
						Feed (mm/min)	1018	1240	1717	2544
		HSM	≤ 0.05	≤ 2	200	RPM	10602	7951	6361	5301
					(160-240)	Fz	0.095	0.145	0.175	0.235
						Feed (mm/min)	4029	4612	6679	9966
	CARBON, GRAPHITE	Profile	≤ 0.5	≤ 1.5	185	RPM	9807	7355	5884	4903
					(148-222)	Fz	0.050	0.080	0.095	0.125
						Feed (mm/min)	1961	2354	3354	4903
		HSM	≤ 0.05	≤ 2	300	RPM	15903	11927	9542	7951
					(240-360)	Fz	0.115	0.185	0.220	0.290
						Feed (mm/min)	7315	8826	12595	18447
	PLASTICS	Profile	≤ 0.5	≤ 1.5	305	RPM	16168	12126	9701	8084
					(244-366)	Fz	0.050	0.080	0.095	0.125
						Feed (mm/min)	3234	3880	5529	8084
		HSM	≤ 0.05	≤ 2	505	RPM	26769	20077	16062	13385
					(404-606)	Fz	0.115	0.185	0.220	0.290
						Feed (mm/min)	12314	14857	21201	31052
	MACHINABLE CERAMICS MACHINABLE GLASS	Profile	≤ 0.5	≤ 1.5	15	RPM	795	596	477	398
					(12-18)	Fz	0.020	0.035	0.045	0.050
						Feed (mm/min)	64	83	129	159
		HSM	≤ 0.05	≤ 2	25	RPM	1325	994	795	663
					(20-30)	Fz	0.045	0.075	0.085	0.115
						Feed (mm/min)	239	298	406	610

HSM (high speed machining)
rpm = (Vc x 1000) / (DC x 3.14)
mm/min = Fz x number of flutes x rpm
adjust parameters based on resin type and fiber structure
reduce speed when overheating causes melting or damage to resin
reduce feed if delamination or fraying occur
finish cuts typically required reduced feed and cutting depths
rates shown are for use without coolant; rates may be increased with coolant
dust collection is vital when machining dry
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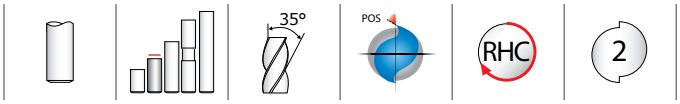
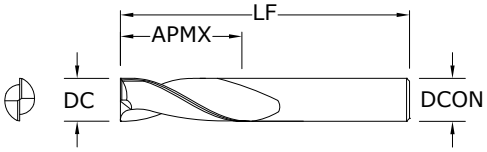
Up Cut





21M
METRIC SERIES

TOLERANCES (mm)

DC = +0,000/–0,080
DCON = h_6

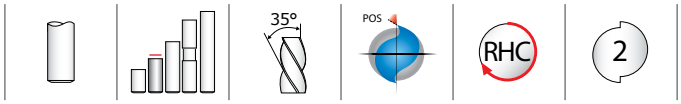
NON-FERROUS

For patent information visit www.ksptpatents.com

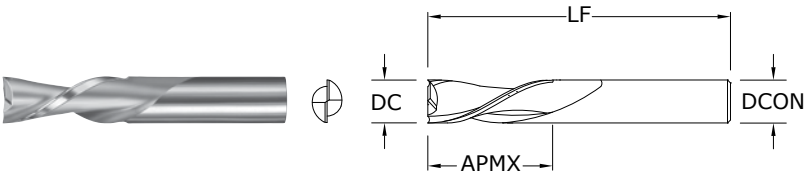
mm				EDP NO.
CUTTING DIAMETER DC	LENGTH OF CUT APMX	OVERALL LENGTH LF	SHANK DIAMETER DCON	UNCOATED
3,0	13,0	50,0	6,0	90101
4,0	16,0	63,0	6,0	90107
5,0	19,0	63,0	6,0	90109
6,0	25,0	63,0	6,0	90113
8,0	25,0	63,0	8,0	90121
10,0	31,0	75,0	10,0	90129
12,0	31,0	75,0	12,0	90137

METRIC

Down Cut



22M
METRIC SERIES



mm				EDP NO.
CUTTING DIAMETER DC	LENGTH OF CUT APMX	OVERALL LENGTH LF	SHANK DIAMETER DCON	UNCOATED
3,0	13,0	50,0	6,0	91101
4,0	16,0	63,0	6,0	91107
5,0	19,0	63,0	6,0	91109
6,0	25,0	63,0	6,0	91113
8,0	25,0	63,0	8,0	91121
10,0	31,0	75,0	10,0	91129
12,0	31,0	75,0	12,0	91137

TOLERANCES (inch)

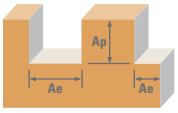
DC = +.000/–.003

DCON = h_6

NON-FERROUS

For patent information visit www.ksptpatents.com

Up Cut
Down Cut



	Series 21M, 22M Metric		Ae x DC	Ap x DC	Vc (m/min)		DC • mm 3	6	10	12	20
	HARDWOODS	Slot	1	≤ 1	470	RPM	49828	24914	14948	12457	7474
					(376-564)	Fz	0.020	0.040	0.065	0.075	0.115
						Feed (mm/min)	1993	1993	1943	1869	1719
		Profile	≤ 0.5	≤ 1.5	470	RPM	49828	24914	8155	4241	1509
					(376-564)	Fz	0.020	0.040	0.065	0.075	0.115
						Feed (mm/min)	1993	1993	1060	636	347
	SOFTWOODS	Slot	1	≤ 1	600	RPM	63610	31805	19083	15903	9542
					(480-720)	Fz	0.025	0.050	0.075	0.090	0.140
						Feed (mm/min)	3181	3181	2862	2862	2672
		Profile	≤ 0.5	≤ 1.5	600	RPM	63610	31805	19083	15903	303467
					(480-720)	Fz	0.025	0.050	0.075	0.090	0.140
						Feed (mm/min)	3181	3181	2862	2862	84971
	PLYWOODS	Slot	1	≤ 1	600	RPM	63610	31805	19083	15903	9542
					(480-720)	Fz	0.030	0.065	0.100	0.125	0.190
						Feed (mm/min)	3817	4135	3817	3976	3626
		Profile	≤ 0.5	≤ 1.5	600	RPM	63610	31805	19083	15903	303467
					(480-720)	Fz	0.030	0.065	0.100	0.125	0.190
						Feed (mm/min)	3817	4135	3817	3976	115318
N	PLASTICS	Slot	1	≤ 1	600	RPM	63610	31805	19083	15903	9542
					(480-720)	Fz	0.020	0.040	0.065	0.090	0.125
						Feed (mm/min)	2544	2544	2481	2862	2385
		Profile	≤ 0.5	≤ 1.5	600	RPM	63610	31805	19083	15903	9542
					(480-720)	Fz	0.020	0.040	0.065	0.090	0.125
						Feed (mm/min)	2544	2544	2481	2862	2385

rpm = (Vc x 1000) / (DC x 3.14)
mm/min = Fz x 2 x rpm

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83109	279
83110	279
83111	279
83200	281
83201	281
83202	281
83203	281
83204	281
83205	281
83206	281
83207	281
83220	279
83221	279
83222	279
83223	279
83224	279
83225	279
83230	279
83231	279
83232	279
83233	279
83234	279
83235	279
90101	285
90107	285
90109	285
90113	285
90121	285
90129	285
90137	285
91101	286
91107	286
91109	286
91113	286
91121	286
91129	286
91137	286
91349	70
91350	70
91351	70
91352	70
91353	70
91354	70
91355	70
91356	70
91357	70
91358	70
91359	70
91360	70
91361	70

KSPT Reference Information

ISO h6 SPECIFICATIONS

DIAMETER	+	–	DIAMETER	+	–
≥ 1/8 - 3/16	0.00000	–0.00032	≤ 3	0,000	0,006
> 3/16 - 7/16	0.00000	–0.00035	> 3 - 6	0,000	0,008
> 7/16 - 5/8	0.00000	–0.00043	> 6 - 10	0,000	0,009
> 5/8 - 1	0.00000	–0.00051	> 10 - 18	0,000	0,011
> 1 - 1-1/4	0.00000	–0.00063	> 18 - 25	0,000	0,013

MACHINING FORMULAS

INCH FORMULAS	METRIC FORMULAS
sfm = rpm x .262 x cutting diameter	m/min = (3.14 x cutting diameter x rpm) / 1000
rpm = sfm x 3.82 / cutting diameter	rpm = (1000 x m / min) / (3.14 x cutting diameter)
feed (inches per tooth) = ipm / (number of teeth x rpm)	feed (mm per tooth) = millimeters per minute / (number of teeth x rpm)
feed (inches / minute) = inches per tooth x number of teeth x rpm	feed (mm/minute) = feed per tooth x number of teeth x rpm
feed (inches / minute) = ipr x rpm	feed (mm/minute) = mmr x rpm
feed (inches / revolution) = ipm / rpm	feed (mm per revolution) = mmr / rpm
cusp height = (tool diameter / 2) – $\sqrt{(\text{tool diameter}^2 - \text{pitch}^2)}$ / 4	cusp height = (tool diameter / 2) –$\sqrt{(\text{tool diameter}^2 - \text{pitch}^2)}$ / 4
pitch = $\sqrt{4 \text{ x (cusp height x tool diameter)} - 4 \text{ x (cusp height}^2)}$	pitch = $\sqrt{4 \text{ x (cusp height x tool diameter)} - 4 \text{ x (cusp height}^2)}$
mrr – milling – (in^3/min) = width of cut x depth of cut x ipm	mrr – milling – (cm^3/min) = (width of cut x depth of cut x mm/min) / 1000
cutting time – drilling – (minutes) = length / ipm	cutting time – drilling – (minutes) = length / mm/min

sfm	surface feet per minute
rpm	revolutions per minute
ipm	feed rate in inches per minutes
ipr	inches per revolution
mmr	millimeters per revolution
mm/min	feed rate in millimeters per minute
mrr	material removal rate
	on flat surface

GENERAL FORMULAS

coolant pressure: 1 Bar = 14.5 Pounds per Square Inch (PSI)

calculation of coolant pressure: Pounds Per Square Inch (PSI) = (Horsepower of Pump x 1.460) / Gallons per Minute (GPM)

1 Liter = 0.254 Gallons

inch = millimeters / 25.4 millimeters = inch x 25.4

inch tap drill sizes = major diameter – ((1.299 x % of thread) / threads per inch)

metric tap drill sizes = major diameter – (1.082 x pitch x % of thread)

inch thread forming drill size: maximum diameter = basic major diameter – (3/8 x number of threads per inch)

inch thread forming drill size: minimum diameter = basic major diameter – (1/2 x number of threads per inch)

metric thread forming drill size: maximum diameter = basic major diameter – (.375 x pitch)

metric thread forming drill size: minimum diameter = basic major diameter – (.500 x pitch)

Decimal Equivalents

Fraction • Number • Letter • Metric Sizes

INCH	METRIC	DECIMAL EQUIVALENT
–	0,10	0.0039
–	0,20	0.0079
–	0,25	0.0098
–	0,30	0.0118
#80	0,34	0.0135
–	0,35	0.0138
#79	0,37	0.0145
1/64	0,40	0.0156
#78	0,41	0.0160
–	0,45	0.0177
#77	0,46	0.0180
–	0,50	0.0197
#76	0,51	0.0200
#75	0,53	0.0210
–	0,55	0.0217
#74	0,57	0.0225
–	0,60	0.0236
#73	0,61	0.0240
#72	0,64	0.0250
–	0,65	0.0256
#71	0,66	0.0260
–	0,70	0.0276
#70	0,71	0.0280
#69	0,74	0.0292
–	0,75	0.0295
#68	0,79	0.0310
1/32	0,79	0.0313
–	0,80	0.0315
#67	0,81	0.0320
#66	0,84	0.0330
–	0,85	0.0335
#65	0,89	0.0350
–	0,90	0.0354
#64	0,91	0.0360
#63	0,94	0.0370
–	0,95	0.0374
#62	0,97	0.0380
#61	0,99	0.0390
–	1,00	0.0394
#60	1,02	0.0400
#59	1,04	0.0410
–	1,05	0.0413
#58	1,07	0.0420
#57	1,09	0.0430
–	1,10	0.0433
–	1,15	0.0453
#56	1,18	0.0465
3/64	1,19	0.0469
–	1,20	0.0472
–	1,25	0.0492
–	1,30	0.0512
#55	1,32	0.0520
–	1,35	0.0531
#54	1,40	0.0550
#53	1,51	0.0595
–	1,55	0.0610
1/16	1,59	0.0625

INCH	METRIC	DECIMAL EQUIVALENT
–	1,60	0.0630
#52	1,61	0.0635
–	1,65	0.0650
#51	1,70	0.0669
–	1,75	0.0689
#50	1,78	0.0700
–	1,80	0.0709
#49	1,85	0.0728
–	1,90	0.0748
#48	1,93	0.0760
–	1,95	0.0768
5/64	1,98	0.0781
#47	1,99	0.0785
–	2,00	0.0787
–	2,05	0.0807
#46	2,06	0.0810
#45	2,08	0.0820
–	2,10	0.0827
–	2,15	0.0846
#44	2,18	0.0860
–	2,20	0.0866
–	2,25	0.0886
#43	2,26	0.0890
–	2,30	0.0906
–	2,35	0.0925
#42	2,37	0.0935
3/32	2,38	0.0938
–	2,40	0.0945
#41	2,44	0.0960
–	2,45	0.0965
#40	2,50	0.0984
#39	2,53	0.0995
#38	2,58	0.1015
–	2,60	0.1024
#37	2,64	0.1040
–	2,70	0.1063
#36	2,71	0.1065
–	2,75	0.1083
7/64	2,78	0.1094
#35	2,79	0.1100
–	2,80	0.1102
#34	2,82	0.1110
#33	2,87	0.1130
–	2,90	0.1142
#32	2,95	0.1160
–	3,00	0.1181
#31	3,05	0.1200
–	3,10	0.1220
1/8	3,18	0.1250
–	3,20	0.1260
–	3,25	0.1280
#30	3,26	0.1285
–	3,30	0.1299
–	3,40	0.1339
#29	3,45	0.1360
–	3,50	0.1378
#28	3,57	0.1405

INCH	METRIC	DECIMAL EQUIVALENT
9/64	3,57	0.1406
–	3,60	0.1417
#27	3,66	0.1440
–	3,70	0.1457
#26	3,73	0.1470
–	3,75	0.1476
#25	3,80	0.1495
–	3,80	0.1496
#24	3,86	0.1520
–	3,90	0.1535
#23	3,91	0.1540
5/32	3,97	0.1562
#22	3,99	0.1570
–	4,00	0.1575
#21	4,04	0.1590
#20	4,09	0.1610
–	4,10	0.1614
–	4,20	0.1654
#19	4,22	0.1660
–	4,25	0.1673
–	4,30	0.1693
#18	4,31	0.1695
11/64	4,37	0.1719
#17	4,39	0.1730
–	4,40	0.1732
#16	4,50	0.1770
–	4,50	0.1772
#15	4,57	0.1800
–	4,60	0.1811
#14	4,62	0.1820
#13	4,70	0.1850
–	4,75	0.1870
3/16	4,76	0.1875
#12	4,80	0.1890
#11	4,85	0.1910
–	4,90	0.1929
#10	4,91	0.1935
#9	4,98	0.1960
–	5,00	0.1969
#8	5,05	0.1990
–	5,10	0.2008
#7	5,11	0.2010
13/64	5,16	0.2031
#6	5,18	0.2040
–	5,20	0.2047
#5	5,22	0.2055
–	5,25	0.2067
–	5,3	0.2087
#4	5,31	0.2090
–	5,40	0.2126
#3	5,41	0.2130
–	5,50	0.2165
7/32	5,56	0.2188
–	5,60	0.2205
#2	5,61	0.2210
–	5,70	0.2244
–	5,75	0.2264

INCH	METRIC	DECIMAL EQUIVALENT
#1	5,79	0.2280
–	5,80	0.2283
–	5,90	0.2323
A	5,94	0.2340
15/64	5,95	0.2344
–	6,00	0.2362
B	6,05	0.2380
–	6,10	0.2402
C	6,15	0.2420
–	6,20	0.2441
D	6,25	0.2461
–	6,30	0.2480
E	6,35	0.2500
1/4	6,35	0.2500
–	6,40	0.2520
–	6,50	0.2559
F	6,53	0.2570
–	6,60	0.2598
G	6,63	0.2610
–	6,70	0.2638
17/64	6,75	0.2656
H	6,76	0.2660
–	6,80	0.2677
–	6,90	0.2717
I	6,91	0.2720
–	7,00	0.2756
J	7,04	0.2770
–	7,10	0.2795
K	7,14	0.2810
9/32	7,14	0.2812
–	7,20	0.2835
–	7,25	0.2854
–	7,30	0.2874
L	7,37	0.2900
–	7,40	0.2913
M	7,49	0.2950
–	7,50	0.2953
19/64	7,54	0.2969
–	7,60	0.2992
N	7,67	0.3020
–	7,70	0.3031
–	7,75	0.3051
–	7,80	0.3071
–	7,90	0.3110
5/16	7,94	0.3125
–	8,00	0.3150
O	8,03	0.3160
–	8,10	0.3189
–	8,20	0.3228
P	8,20	0.3230
–	8,25	0.3248
–	8,30	0.3268
21/64	8,33	0.3281
–	8,40	0.3307
Q	8,43	0.3320
–	8,50	0.3346
–	8,60	0.3386

INCH	METRIC	DECIMAL EQUIVALENT
R	8,61	0.3390
–	8,70	0.3425
11/32	8,73	0.3438
–	8,75	0.3445
–	8,80	0.3465
S	8,84	0.3480
–	8,90	0.3504
–	9,00	0.3543
T	9,09	0.3580
–	9,10	0.3583
23/64	9,13	0.3594
–	9,20	0.3622
–	9,25	0.3642
–	9,30	0.3661
U	9,35	0.3680
–	9,40	0.3701
–	9,50	0.3740
3/8	9,53	0.3750
V	9,56	0.3770
–	9,60	0.3780
–	9,70	0.3819
–	9,75	0.3839
W	9,80	0.3858
–	9,90	0.3898
25/64	9,92	0.3906
–	10,00	0.3937
X	10,08	0.3970
–	10,10	0.3976
–	10,20	0.4016
Y	10,26	0.4040
–	10,30	0.4055
13/32	10,32	0.4062
–	10,40	0.4094
Z	10,49	0.4130
–	10,50	0.4134
–	10,60	0.4173
–	10,70	0.4213
27/64	10,72	0.4219
–	10,80	0.4252
–	10,90	0.4291
–	11,00	0.4331
–	11,10	0.4370
7/16	11,11	0.4375
–	11,20	0.4409
–	11,30	0.4449
–	11,40	0.4488
–	11,50	0.4528
29/64	11,51	0.4531
–	11,60	0.4567
–	11,70	0.4606
–	11,80	0.4646
–	11,90	0.4685
15/32	11,91	0.4688
–	12,00	0.4724
31/64	12,30	0.4844
–	12,50	0.4921
1/2	12,70	0.5000

INCH	METRIC	DECIMAL EQUIVALENT
–	13,00	0.5118
33/64	13,10	0.5156
17/32	13,49	0.5312
–	13,50	0.5315
35/64	13,89	0.5469
–	14,00	0.5512
9/16	14,29	0.5625
–	14,50	0.5709
37/64	14,68	0.5781
–	15,00	0.5906
19/32	15,08	0.5938
39/64	15,48	0.6094
–	15,50	0.6102
5/8	15,88	0.6250
–	16,00	0.6299
41/64	16,27	0.6406
–	16,50	0.6496
21/32	16,67	0.6562
–	17,00	0.6693
43/64	17,07	0.6719
11/16	17,46	0.6875
–	17,50	0.6890
45/64	17,86	0.7031
–	18,00	0.7087
23/32	18,26	0.7188
–	18,50	0.7283
47/64	18,65	0.7344
–	19,00	0.7480
3/4	19,05	0.7500
49/64	19,45	0.7656
–	19,50	0.7677
25/32	19,84	0.7812
–	20,00	0.7874
51/64	20,24	0.7969
–	20,50	0.8071
13/16	20,64	0.8125
–	21,00	0.8268
53/64	21,03	0.8281
27/32	21,43	0.8438
–	21,50	0.8465
55/64	21,84	0.8594
–	22,00	0.8661
7/8	22,23	0.8750
–	22,50	0.8858
57/64	22,62	0.8906
–	23,00	0.9055
29/32	23,02	0.9062
59/64	23,42	0.9219
–	23,50	0.9252
15/16	23,81	0.9375
–	24,00	0.9449
61/64	24,21	0.9531
–	24,50	0.9646
31/32	24,61	0.9688
–	25,00	0.9843
63/64	25,00	0.9844
1	25,40	1.0000

Hardness Conversion Chart

ROCKWELL HARDNESS (HRb)	ROCKWELL HARDNESS (HRc)	BRINELL HARDNESS (HB)	VICKERS HARDNESS (HV)	TENSILE STRENGTH (N/mm2)	PSI (1000lb/in2)
67	–	121	122	401	58
70	–	126	127	432	63
73	–	132	132	448	65
75	–	136	137	455	66
77	–	140	143	463	67
80	–	147	150	479	69
82	–	153	156	494	72
84	–	159	163	525	76
86	–	165	171	540	78
89	–	177	178	556	81
91	–	186	188	602	88
93	–	197	196	632	92
96	–	216	212	664	97
97	–	223	218	695	101
98	21	230	234	756	110
–	22	236	241	772	112
–	23	242	247	787	114
–	24	248	255	818	118
–	25	254	261	849	123
–	27	266	269	865	125
–	28	272	275	895	130
–	29	278	284	911	132
–	30	284	292	942	136
–	31	293	300	973	141
–	32	302	308	988	143
–	33	310	318	1019	147
–	34	319	327	1050	152
–	35	328	337	1096	159
–	37	345	349	1127	163
–	38	353	359	1158	168
–	39	362	370	1189	172
–	40	370	381	1235	179
–	41	381	395	1266	183
–	42	391	408	1312	190
–	44	411	422	1359	197
–	45	422	437	1420	206
–	46	433	452	1467	212
–	48	455	470	1513	219
–	50	479	497	1559	226
–	51	485	517	1621	235
–	52	497	532	1668	241
–	54	–	573	1729	250
–	56	–	609	1807	262
–	57	–	630	1884	273
–	59	–	670	1961	284
–	60	–	698	2039	295
–	61	–	725	–	–
–	62	–	740	–	–
–	63	–	780	–	–
–	64	–	812	–	–
–	65	–	847	–	–
–	66	–	885	–	–
–	67	–	926	–	–
–	68	–	971	–	–

Conversions from each scale are approximate

SOLUTIONS AROUND THE GLOBE

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- Specialists in extreme and demanding product applications
- Comprehensive tooling services
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