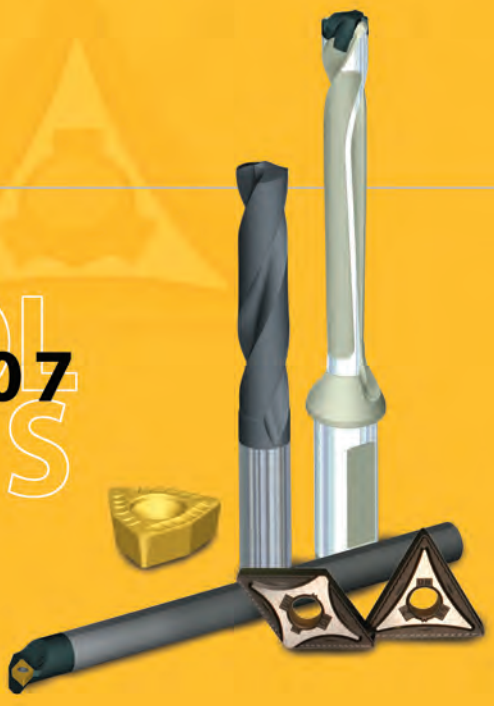
KM Micro Carbide Boring Bars, KenTIP™ Drills and More Inside!

KENNAMETAL®

Engineering Your Competitive Edge

CUTTING TOOL INNOVATIONS EDGE 2007



KENNAMETAL®
Engineering Your Competitive Edge

Introducing the Kennametal EDGE...

Featuring Kennametal's newest premier turning and holemaking tools! These technologically advanced metalcutting solutions will give you the competitive edge to increase your productivity and profitability.

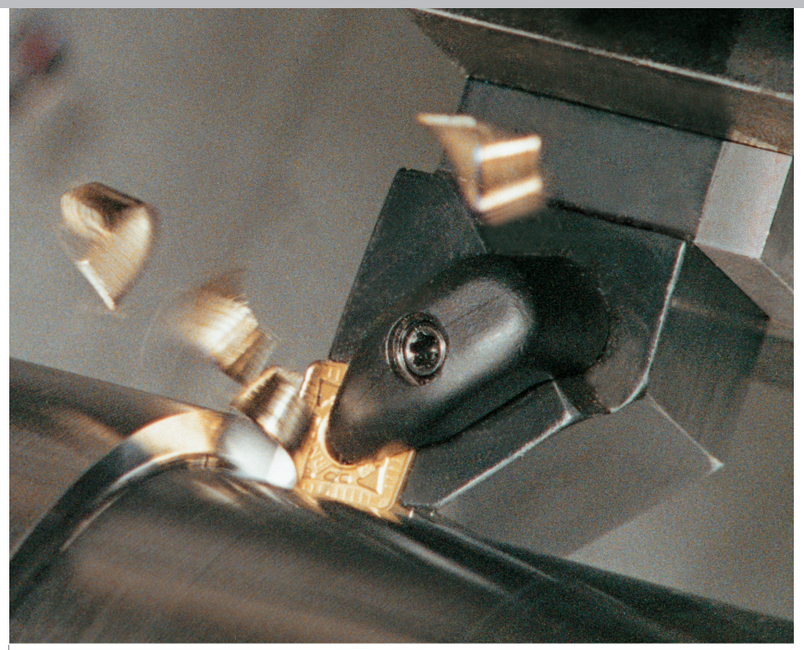
*All of the tooling in this catalog is backed by our 100% Perfect-Performance Promise. These KENNA PERFECT tooling solutions are guaranteed to boost your metal-cutting output by 30% to 100% – or you get 100% of your KENNA PERFECT tooling cost returned.**

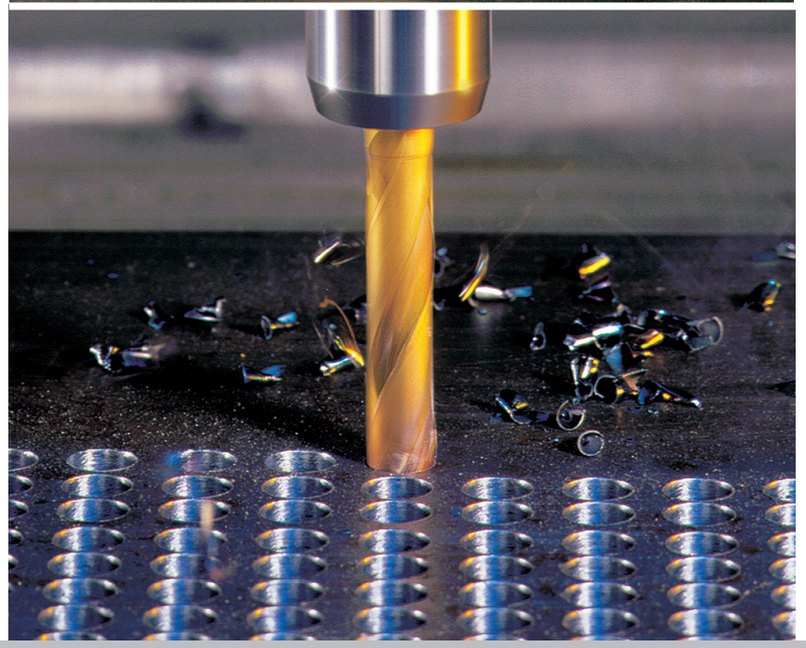
What could be more perfect?

No matter how challenging your application, no matter what your workpiece material, no matter what your industry, Kennametal has the right tooling solutions for you.

**See terms and conditions of this program at the back of this brochure.*

Engineering Your Competitive Edge





Our 100% Perfect-Performance Promise!

All tooling solutions are guaranteed to improve your machining output by 30% or more OR you get 100% of your investment back!

www.kennametal.com

Grade Descriptions

KENNAMETAL

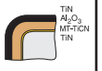
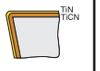
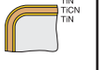
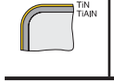
New Turning Grades!

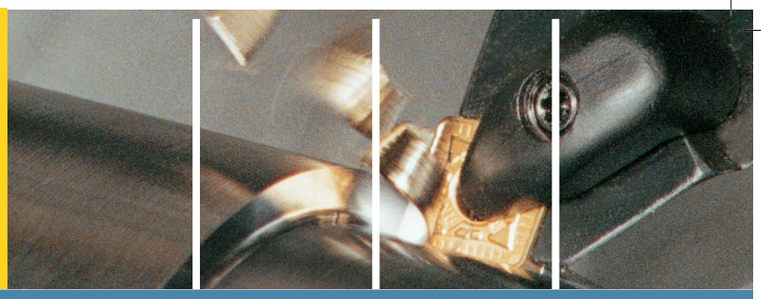
- Three new grades for steel, stainless steel, and cast iron!
- Boost cycle times and tool life by up to 50%!

Grade	Composition and Application	Standard designation	Area of Use: Wear resistance → Toughness
KC9105  C3-C4	**composition:** An innovative, highly deformation-resistant cobalt-enriched substrate patent-protected with a new thick multi-layer MTCVD-TiCN-Al_2O_3-TiCN-TiN coating for maximum wear resistance. **application:** KC9105 grade is for finishing to medium machining of most steels, ferritic, martensitic, and PH stainless steels and cast irons The specially designed substrate provides deformation resistance and insert edge strength. The extra-thick MT-TiCN layer provides outstanding flank wear resistance, while the thick Al_2O_3 layer offers excellent crater wear resistance and speed capability.	P M K N S H	
KC9225  C2 – C3	**composition:** A newly engineered, patent-protected, multi-layered MTCVD coated cobalt-enriched carbide grade. **application:** KC9225 grade has been specially designed for resisting depth-of-cut notching and minimizing burr formation in austenitic stainless steels. Cobalt-enrichment provides toughness and deformation resistance. This grade's polished edge minimizes build-up and ensures superior workpiece finishes.	P M K N S H	
KC9320  C3	**composition:** A patent-protected specially toughened MTCVD-TiCN and Al_2O_3 coating over a wear-resistant substrate. **application:** KC9320 is specifically engineered to maximize coating adhesion and edge strength making this grade idea in wet interrupted cutting of ductile and gray irons. It can be used in a wide range of applications from finishing to roughing to maximize productivity wherever strength and reliability are needed.	P M K N S H	

New Holemaking Grades!

- State-of-the-art grades for steel and cast irons!
- Exceptional performance at higher speeds!

KC7315 	**composition:** Multi-layered PVD coating, universal fine grain carbide. TiAlN top layer provides excellent wear and heat resistance at elevated speeds. **application:** Alloyed, high alloyed steels, and gray cast irons. **geometry:** Straight cutting edges with a moderate hone.	P M K N S H
KC7425 	**composition:** State-of-the-art multi-layered PVD coating over ultra-fine grain carbide. The coating is very smooth and hard providing excellent wear resistance and outstanding chip flow in deep-hole applications. **application:** low carbon, carbon, alloyed steels and gray cast irons. **geometry:** Straight cutting edges with a moderate hone.	P M K N S H
KC7915 	**composition:** Advanced MT-CVD alumina (Al_2O_3) coating, fine-grain carbide. The top layer of aluminum oxide provides superior wear and heat resistance when drilling at elevated speeds. **application:** Designed for drilling steels and cast irons. **geometry:** Straight cutting edges with a heavy hone.	P M K N S H
KC7140 	**composition:** PVD TiN/TiCN-coated alloyed grade on tough substrate containing 11% cobalt. **application:** Ideal for general machining of alloy steel, low- and medium-carbon steel, tool steels, and 400 series stainless steels. Used in inserts for DRILL-FIX DFR and DFT, HTS, and HTS-C drill bodies.	P M K N S H
KC7815 	**composition:** A patented protected multi-layered MT-CVD coating with Al_2O_3, TiCN layers for maximum ßwear resistance, designed for alloy steels and some cast irons. **application:** KC7815 provides superior performance when drilling ferrous steels at elevated speeds. Expect 100% improvement in tool life versus competitive grades. Use KC7815 in outboard pockets, KC7140 in inboard pockets for optimum performance with DRILL-FIX bodies. **geometry:** -GD with honed negative land provides added strength.	P M K N S H
KC7820 	**composition:** A multi-layered MT-CVD coating with TiN, TiCN, and TiN layers over a tough substrate, designed for applications in low-carbon steel. **application:** KC7820 provides superior performance when drilling low-carbon steels at elevated speeds. Available in DFR-style inserts with -MD geometry for enhanced chip control. In DRILL-FIX bodies, use grade KC7140 in the inboard pocket, KC7820 in the outboard pocket. **geometry:** –MD with honed cutting edge.	P M K N S H
KC7542 	**composition:** A patented multi-layered coating with TiAlN and TiN over a high-strength substrate specifically designed for tap application. **application:** KC7542 provides superior performance for tapping carbon and alloys steels up to 32 HRc plus ductile and gray cast irons. KC7542 is specifically designed to reduce edge chipping. Use in alloy steels at four times faster tap speeds versus high-performance HSSE taps.	P M K N S H



Turning

TABLE OF CONTENTS

Kennametal will significantly improve your machine productivity!

Let us prove it.

www.kennametal.com

KENNAMETAL®
Engineering Your Competitive Edge

Three Premium NEW Turning Grades!

NEW!

KENNA PERFECT Grades
The KC9105 Grade

Ideal for Finishing and Medium Machining!

- All alloy steel and tool steels.
- Ferritic, martensitic, and PH stainless steels.
- Well-suited for dry machining due to high-temperature deformation resistance.

Achieve Productivity Gains:

- Reduced cycle times — 30% to 50% higher speed capability.
- Longer tool life — 30% to 50% improved wear resistance.
- Better tool performance — reduced chip hammering and edge built-up.
- Improved seating — smooth and secure seating surface.

Proven Success

Challenge:

Extend tool life by 50% while improving size control on a medium-carbon steel drive shaft.

RESULT:

KC9105 insert produced 150% more parts and maintained better size control than competitive grade!

NEW!

The KC9225 Grade

New and Improved — Ideal for Finishing Stainless Steels!

Achieve productivity gains:

- Higher speed capability reduces cycle time by 20% to 40%.
- Improved wear resistance provides 25% to 50% longer tool life.
- Smooth and secure seating surface reduces insert breakage.

Proven Success

Challenge:

Increase parts-per-edge by 75% in uninterrupted copy turning of austenitic stainless steel shaft.

RESULT:

New KC9225 insert doubled metal removal rate and produced 100% more parts!

NEW!

The KC9320 Grade

Ideal for Finishing and Rough Machining All Ductile and Cast Irons!

Achieve productivity gains:

- Reduced cycle times — 30% to 50% higher speed and feed capability.
- Longer tool life — 30% to 50% improved wear resistance.
- Enhanced strength and reliability for wet interrupted cuts.
- Improved seating — smooth and secure seating surface.

Proven Success

Challenge:

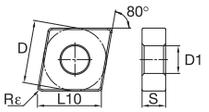
Reduce tool-changing downtime in wet interrupted turning of a ductile iron differential housing.

RESULT:

KC9320 insert doubled tool life and provided improved reliability!

KENLOC Inserts

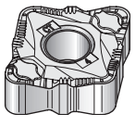
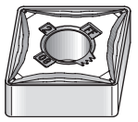
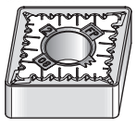
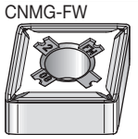
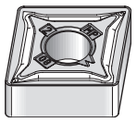
KENNAMETAL



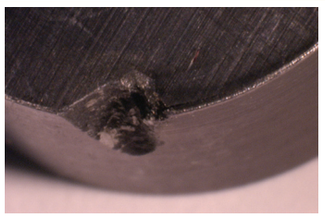
● first choice
○ alternate choice

H	
S	
N	
K	○ ●
M	○ ●
P	● ○ ○

dimensions

	ISO catalog number	ANSI catalog number	D mm	D inch	L10 mm	L10 inch	S mm	S inch	Rε mm	Rε inch	D1 mm	D1 inch	KC9105	KC9225	KC9320
CNMG-CT 	CNMG120408CT	CNMG432CT	12,70	1/2	12,90	.508	4,76	3/16	0,8	1/32	5,16	.203		●	
	CNMG120412CT	CNMG433CT	12,70	1/2	12,90	.508	4,76	3/16	1,2	3/64	5,16	.203		●	
CNMG-FF 	CNMG090304FF	CNMG321FF	9,53	3/8	9,67	.381	3,18	1/8	0,4	1/64	3,81	.150		●	
	CNMG090308FF	CNMG322FF	9,53	3/8	9,67	.381	3,18	1/8	0,8	1/32	3,81	.150		●	
	CNMG120404FF	CNMG431FF	12,70	1/2	12,90	.508	4,76	3/16	0,4	1/64	5,16	.203	●	●	
	CNMG120408FF	CNMG432FF	12,70	1/2	12,90	.508	4,76	3/16	0,8	1/32	5,16	.203	●	●	
CNMG-FP 	CNMG120404FP	CNMG431FP	12,70	1/2	12,90	.508	4,76	3/16	0,4	1/64	5,16	.203		●	
	CNMG120408FP	CNMG432FP	12,70	1/2	12,90	.508	4,76	3/16	0,8	1/32	5,16	.203		●	
	CNMG120412FP	CNMG433FP	12,70	1/2	12,90	.508	4,76	3/16	1,2	3/64	5,16	.203		●	
CNMG-FW 	CNMG120404FW	CNMG431FW	12,70	1/2	12,90	.508	4,76	3/16	0,4	1/64	5,16	.203	●	●	
	CNMG120408FW	CNMG432FW	12,70	1/2	12,90	.508	4,76	3/16	0,8	1/32	5,16	.203	●	●	
	CNMG120412FW	CNMG433FW	12,70	1/2	12,90	.508	4,76	3/16	1,2	3/64	5,16	.203	●	●	
CNMG-MP 	CNMG090308MP	CNMG322MP	9,53	3/8	9,67	.381	3,18	1/8	0,8	1/32	3,81	.150		●	
	CNMG120404MP	CNMG431MP	12,70	1/2	12,90	.508	4,76	3/16	0,4	1/64	5,16	.203		●	
	CNMG120408MP	CNMG432MP	12,70	1/2	12,90	.508	4,76	3/16	0,8	1/32	5,16	.203		●	
	CNMG120412MP	CNMG433MP	12,70	1/2	12,90	.508	4,76	3/16	1,2	3/64	5,16	.203		●	
	CNMG120416MP	CNMG434MP	12,70	1/2	12,90	.508	4,76	3/16	1,6	1/16	5,16	.203		●	
	CNMG160608MP	CNMG542MP	15,88	5/8	16,12	.635	6,35	1/4	0,8	1/32	6,35	.250		●	
	CNMG160612MP	CNMG543MP	15,88	5/8	16,12	.635	6,35	1/4	1,2	3/64	6,35	.250		●	
	CNMG160616MP	CNMG544MP	15,88	5/8	16,12	.635	6,35	1/4	1,6	1/16	6,35	.250		●	
	CNMG190608MP	CNMG642MP	19,05	3/4	19,34	.762	6,35	1/4	0,8	1/32	7,93	.313		●	
	CNMG190612MP	CNMG643MP	19,05	3/4	19,34	.762	6,35	1/4	1,2	3/64	7,93	.313		●	
	CNMG190616MP	CNMG644MP	19,05	3/4	19,34	.762	6,35	1/4	1,6	1/16	7,93	.313		●	
													KC9105	KC9225	KC9320

Insert Failure Tech Tip:
Depth-Of-Cut Notching

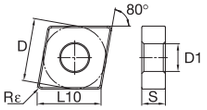


Effect:

Large burr is likely to form – may result in breakage if notch grows too large.

Corrective Actions:

- *Increase lead angle.*
- *Change to smaller T-land or hone edge preparation.*
- *Apply different grade.*
- *Decrease feed.*
- *Decrease depth-of-cut (round insert).*
- *Program multiple passes with varying depths.*
- *Use a more positive geometry.*



● first choice
○ alternate choice

			dimensions												
			D		L10		S		Rε		D1				
	ISO catalog number	ANSI catalog number	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	KC9105	KC9225	KC9320
CNMG-MW	CNMG120408MW	CNMG432MW	12,70	1/2	12,90	.508	4,76	3/16	0,8	1/32	5,16	.203	●	●	
	CNMG120412MW	CNMG433MW	12,70	1/2	12,90	.508	4,76	3/16	1,2	3/64	5,16	.203	●	●	
CNMG-P	CNMG120404P	CNMG431P	12,70	1/2	12,90	.508	4,76	3/16	0,4	1/64	5,16	.203		●	
	CNMG120408P	CNMG432P	12,70	1/2	12,90	.508	4,76	3/16	0,8	1/32	5,16	.203		●	
	CNMG120412P	CNMG433P	12,70	1/2	12,90	.508	4,76	3/16	1,2	3/64	5,16	.203		●	
	CNMG160608P	CNMG542P	15,88	5/8	16,12	.635	6,35	1/4	0,8	1/32	6,35	.250		●	
	CNMG160612P	CNMG543P	15,88	5/8	16,12	.635	6,35	1/4	1,2	3/64	6,35	.250		●	
	CNMG190612P	CNMG643P	19,05	3/4	19,34	.762	6,35	1/4	1,2	3/64	7,93	.313		●	
CNMG-RP	CNMG120404RP	CNMG431RP	12,70	1/2	12,90	.508	4,76	3/16	0,4	1/64	5,16	.203		●	
	CNMG120408RP	CNMG432RP	12,70	1/2	12,90	.508	4,76	3/16	0,8	1/32	5,16	.203	●	●	●
	CNMG120412RP	CNMG433RP	12,70	1/2	12,90	.508	4,76	3/16	1,2	3/64	5,16	.203	●	●	●
	CNMG120416RP	CNMG434RP	12,70	1/2	12,90	.508	4,76	3/16	1,6	1/16	5,16	.203	●	●	●
	CNMG160608RP	CNMG542RP	15,88	5/8	16,12	.635	6,35	1/4	0,8	1/32	6,35	.250		●	
	CNMG160612RP	CNMG543RP	15,88	5/8	16,12	.635	6,35	1/4	1,2	3/64	6,35	.250	●	●	●
	CNMG160616RP	CNMG544RP	15,88	5/8	16,12	.635	6,35	1/4	1,6	1/16	6,35	.250	●	●	
	CNMG190612RP	CNMG643RP	19,05	3/4	19,34	.762	6,35	1/4	1,2	3/64	7,93	.313	●	●	●
	CNMG190616RP	CNMG644RP	19,05	3/4	19,34	.762	6,35	1/4	1,6	1/16	7,93	.313	●	●	
													KC9105	KC9225	KC9320

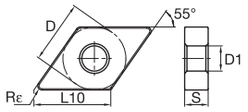
Insert Failure Tech Tip:
Crater Wear

Effect:
Sudden change in chip formation, decrease in power consumption – will result in rapid chipping, breakage, or heat deformation if allowed to progress.

Corrective Actions:
- *Reduce speed.*
- *Use grade with thicker coating.*

KENLOC Inserts

KENNAMETAL

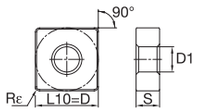


● first choice
○ alternate choice

H	
S	
N	
K	○ ●
M	○ ●
P	● ○ ○

dimensions

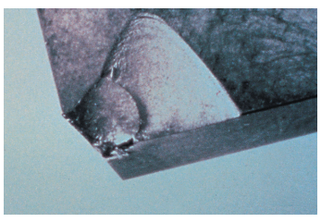
	ISO catalog number	ANSI catalog number	D mm	D inch	L10 mm	L10 inch	S mm	S inch	Rε mm	Rε inch	D1 mm	D1 inch	KC9105	KC9225	KC9320
DNMG-CT	DNMG110404CT	DNMG331CT	9,53	3/8	11,63	.458	4,76	3/16	0,4	1/64	3,81	.150		●	
	DNMG110408CT	DNMG332CT	9,53	3/8	11,63	.458	4,76	3/16	0,8	1/32	3,81	.150		●	
	DNMG150404CT	DNMG431CT	12,70	1/2	15,50	.610	4,76	3/16	0,4	1/64	5,16	.203		●	
	DNMG150408CT	DNMG432CT	12,70	1/2	15,50	.610	4,76	3/16	0,8	1/32	5,16	.203		●	
	DNMG150412CT	DNMG433CT	12,70	1/2	15,50	.610	4,76	3/16	1,2	3/64	5,16	.203		●	
	DNMG150604CT	DNMG441CT	12,70	1/2	15,50	.610	6,35	1/4	0,4	1/64	5,16	.203		●	
	DNMG150608CT	DNMG442CT	12,70	1/2	15,50	.610	6,35	1/4	0,8	1/32	5,16	.203		●	
	DNMG150612CT	DNMG443CT	12,70	1/2	15,50	.610	6,35	1/4	1,2	3/64	5,16	.203		●	
DNMG-FF	DNMG110404FF	DNMG331FF	9,53	3/8	11,63	.458	4,76	3/16	0,4	1/64	3,81	.150		●	
	DNMG110408FF	DNMG332FF	9,53	3/8	11,63	.458	4,76	3/16	0,8	1/32	3,81	.150	●	●	
	DNMG150404FF	DNMG431FF	12,70	1/2	15,50	.610	4,76	3/16	0,4	1/64	5,16	.203		●	
	DNMG150408FF	DNMG432FF	12,70	1/2	15,50	.610	4,76	3/16	0,8	1/32	5,16	.203	●	●	
	DNMG150604FF	DNMG441FF	12,70	1/2	15,50	.610	6,35	1/4	0,4	1/64	5,16	.203		●	
	DNMG150608FF	DNMG442FF	12,70	1/2	15,50	.610	6,35	1/4	0,8	1/32	5,16	.203	●	●	
DNMG-FP	DNMG110404FP	DNMG331FP	9,53	3/8	11,63	.458	4,76	3/16	0,4	1/64	3,81	.150		●	
	DNMG110408FP	DNMG332FP	9,53	3/8	11,63	.458	4,76	3/16	0,8	1/32	3,81	.150		●	
	DNMG150404FP	DNMG431FP	12,70	1/2	15,50	.610	4,76	3/16	0,4	1/64	5,16	.203		●	
	DNMG150408FP	DNMG432FP	12,70	1/2	15,50	.610	4,76	3/16	0,8	1/32	5,16	.203		●	
	DNMG150412FP	DNMG433FP	12,70	1/2	15,50	.610	4,76	3/16	1,2	3/64	5,16	.203		●	
	DNMG150604FP	DNMG441FP	12,70	1/2	15,50	.610	6,35	1/4	0,4	1/64	5,16	.203		●	
	DNMG150608FP	DNMG442FP	12,70	1/2	15,50	.610	6,35	1/4	0,8	1/32	5,16	.203	●	●	
	DNMG150612FP	DNMG443FP	12,70	1/2	15,50	.610	6,35	1/4	1,2	3/64	5,16	.203		●	
DNMG-FW	DNMG110404FW	DNMG331FW	9,53	3/8	11,63	.458	4,76	3/16	0,4	1/64	3,81	.150	●	●	
	DNMG110408FW	DNMG332FW	9,53	3/8	11,63	.458	4,76	3/16	0,8	1/32	3,81	.150	●	●	
	DNMG150404FW	DNMG431FW	12,70	1/2	15,50	.610	4,76	3/16	0,4	1/64	5,16	.203	●	●	
	DNMG150408FW	DNMG432FW	12,70	1/2	15,50	.610	4,76	3/16	0,8	1/32	5,16	.203	●	●	
	DNMG150604FW	DNMG441FW	12,70	1/2	15,50	.610	6,35	1/4	0,4	1/64	5,16	.203	●	●	
	DNMG150608FW	DNMG442FW	12,70	1/2	15,50	.610	6,35	1/4	0,8	1/32	5,16	.203	●	●	
DNMG-MP	DNMG110408MP	DNMG332MP	9,53	3/8	11,63	.458	4,76	3/16	0,80	1/32	3,81	.150		●	
	DNMG110412MP	DNMG333MP	9,53	3/8	11,63	.458	4,76	3/16	1,20	3/64	3,81	.150		●	
	DNMG150404MP	DNMG431MP	12,70	1/2	15,50	.610	4,76	3/16	0,40	1/64	5,16	.203		●	
	DNMG150408MP	DNMG432MP	12,70	1/2	15,50	.610	4,76	3/16	0,80	1/32	5,16	.203		●	
	DNMG150412MP	DNMG433MP	12,70	1/2	15,50	.610	4,76	3/16	1,20	3/64	5,16	.203		●	
	DNMG150604MP	DNMG441MP	12,70	1/2	15,50	.610	6,35	1/4	0,40	1/64	5,16	.203		●	
	DNMG150608MP	DNMG442MP	12,70	1/2	15,50	.610	6,35	1/4	0,80	1/32	5,16	.203		●	
	DNMG150612MP	DNMG443MP	12,70	1/2	15,50	.610	6,35	1/4	1,20	3/64	5,16	.203		●	
DNMG-MW	DNMG150408MW	DNMG432MW	12,70	1/2	15,50	.610	4,76	3/16	0,8	1/32	5,16	.203	●	●	
	DNMG150412MW	DNMG433MW	12,70	1/2	15,50	.610	4,76	3/16	1,2	3/64	5,16	.203	●		
	DNMG150608MW	DNMG442MW	12,70	1/2	15,50	.610	6,35	1/4	0,8	1/32	5,16	.203	●	●	
	DNMG150612MW	DNMG443MW	12,70	1/2	15,50	.610	6,35	1/4	1,2	3/64	5,16	.203	●	●	
DNMG-RP	DNMG110408RP	DNMG332RP	9,53	3/8	11,63	.458	4,76	3/16	0,8	1/32	3,81	.150		●	
	DNMG150408RP	DNMG432RP	12,70	1/2	15,50	.610	4,76	3/16	0,8	1/32	5,16	.203	●	●	●
	DNMG150412RP	DNMG433RP	12,70	1/2	15,50	.610	4,76	3/16	1,2	3/64	5,16	.203	●	●	
	DNMG150608RP	DNMG442RP	12,70	1/2	15,50	.610	6,35	1/4	0,8	1/32	5,16	.203	●	●	●
	DNMG150612RP	DNMG443RP	12,70	1/2	15,50	.610	6,35	1/4	1,2	3/64	5,16	.203	●	●	●



● first choice
○ alternate choice

			dimensions												
			D		L10		S		Rε		D1		H		
	ISO catalog number	ANSI catalog number	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	KC9105	KC9225	KC9320
SNMG-FF	SNMG090304FF	SNMG321FF	9,53	3/8	9,53	.375	3,18	1/8	0,4	1/64	3,81	.150		●	
	SNMG090308FF	SNMG322FF	9,53	3/8	9,53	.375	3,18	1/8	0,8	1/32	3,81	.150		●	
	SNMG120404FF	SNMG431FF	12,70	1/2	12,70	.500	4,76	3/16	0,4	1/64	5,16	.203		●	
	SNMG120408FF	SNMG432FF	12,70	1/2	12,70	.500	4,76	3/16	0,8	1/32	5,16	.203		●	
	SNMG120404FP	SNMG431FP	12,70	1/2	12,70	.500	4,76	3/16	0,4	1/64	5,16	.203		●	
	SNMG120408FP	SNMG432FP	12,70	1/2	12,70	.500	4,76	3/16	0,8	1/32	5,16	.203		●	
	SNMG120412FP	SNMG433FP	12,70	1/2	12,70	.500	4,76	3/16	1,2	3/64	5,16	.203		●	
SNMG-FP	SNMG120408FW	SNMG432FW	12,70	1/2	12,70	.500	4,76	3/16	0,8	1/32	5,16	.203		●	
	SNMG120412FW	SNMG433FW	12,70	1/2	12,70	.500	4,76	3/16	1,2	3/64	5,16	.203		●	
SNMG-FW	SNMG120408MP	SNMG432MP	12,70	1/2	12,70	.500	4,76	3/16	0,8	1/32	5,16	.203		●	
	SNMG120412MP	SNMG433MP	12,70	1/2	12,70	.500	4,76	3/16	1,2	3/64	5,16	.203		●	
	SNMG120416MP	SNMG434MP	12,70	1/2	12,70	.500	4,76	3/16	1,6	1/16	5,16	.203		●	
	SNMG150608MP	SNMG542MP	15,88	5/8	15,88	.625	6,35	1/4	0,8	1/32	6,35	.250		●	
	SNMG150612MP	SNMG543MP	15,88	5/8	15,88	.625	6,35	1/4	1,2	3/64	6,35	.250		●	
	SNMG150616MP	SNMG544MP	15,88	5/8	15,88	.625	6,35	1/4	1,6	1/16	6,35	.250		●	
	SNMG190612MP	SNMG643MP	19,05	3/4	19,05	.750	6,35	1/4	1,2	3/64	7,93	.313		●	
	SNMG190616MP	SNMG644MP	19,05	3/4	19,05	.750	6,35	1/4	1,6	1/16	7,93	.313		●	
SNMG-MP	SNMG120408RP	SNMG432RP	12,70	1/2	12,70	.500	4,76	3/16	0,8	1/32	5,16	.203	●	●	●
	SNMG120412RP	SNMG433RP	12,70	1/2	12,70	.500	4,76	3/16	1,2	3/64	5,16	.203	●	●	●
	SNMG120416RP	SNMG434RP	12,70	1/2	12,70	.500	4,76	3/16	1,6	1/16	5,16	.203		●	
	SNMG150612RP	SNMG543RP	15,88	5/8	15,88	.625	6,35	1/4	1,2	3/64	6,35	.250		●	
	SNMG150616RP	SNMG544RP	15,88	5/8	15,88	.625	6,35	1/4	1,6	1/16	6,35	.250		●	
	SNMG190612RP	SNMG643RP	19,05	3/4	19,05	.750	6,35	1/4	1,2	3/64	7,93	.313		●	
	SNMG190616RP	SNMG644RP	19,05	3/4	19,05	.750	6,35	1/4	1,6	1/16	7,93	.313		●	
SNMG-RP	SNMG120408RP	SNMG432RP	12,70	1/2	12,70	.500	4,76	3/16	0,8	1/32	5,16	.203	●	●	●
	SNMG120412RP	SNMG433RP	12,70	1/2	12,70	.500	4,76	3/16	1,2	3/64	5,16	.203	●	●	●
	SNMG120416RP	SNMG434RP	12,70	1/2	12,70	.500	4,76	3/16	1,6	1/16	5,16	.203		●	
	SNMG150612RP	SNMG543RP	15,88	5/8	15,88	.625	6,35	1/4	1,2	3/64	6,35	.250		●	
	SNMG150616RP	SNMG544RP	15,88	5/8	15,88	.625	6,35	1/4	1,6	1/16	6,35	.250		●	
	SNMG190612RP	SNMG643RP	19,05	3/4	19,05	.750	6,35	1/4	1,2	3/64	7,93	.313		●	
	SNMG190616RP	SNMG644RP	19,05	3/4	19,05	.750	6,35	1/4	1,6	1/16	7,93	.313		●	
													KC9105	KC9225	KC9320

Insert Failure Tech Tip:
Catastrophic Breakage

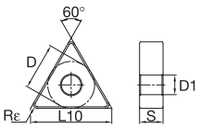


Effect:
Sudden unpredictable loss of cutting action resulting in scrap or damaged parts and possibly a damaged holder.

Corrective Actions:
- *Use stronger insert geometry.*
- *Reduce feed rate.*
- *Inspect toolholder and replace hardware if necessary.*
- *Use a grade with higher ISO range (i.e., P40, K25, etc.).*
- *Reduce depth-of-cut.*
- *Ensure rigidity of system.*
- *Reduce tool overhang.*
- *Eliminate vibrations.*

KENLOC Inserts

KENNAMETAL



● first choice
○ alternate choice

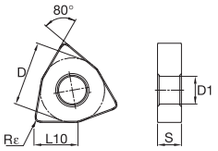
			dimensions												H					
															S					
															N					
															K	○		●		
															M	○	●			
															P	●	○	○		
			D		L10		S		Rε		D1									
	ISO catalog number	ANSI catalog number	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	KC9105	KC9225	KC9320					
TNMG-CT	TNMG160408CT	TNMG332CT	9,53	3/8	16,50	.650	4,76	3/16	0,8	1/32	3,81	.150	●							
	TNMG160412CT	TNMG333CT	9,53	3/8	16,50	.650	4,76	3/16	1,2	3/64	3,81	.150	●							
	TNMG220408CT	TNMG432CT	12,70	1/2	22,00	.866	4,76	3/16	0,8	1/32	5,16	.203		●						
TNMG-FF	TNMG110304FF	TNMG221FF	6,35	1/4	11,00	.433	3,18	1/8	0,4	1/64	2,26	.089		●						
	TNMG110308FF	TNMG222FF	6,35	1/4	11,00	.433	3,18	1/8	0,8	1/32	2,26	.089		●						
	TNMG160404FF	TNMG331FF	9,53	3/8	16,50	.650	4,76	3/16	0,4	1/64	3,81	.150		●						
	TNMG160408FF	TNMG332FF	9,53	3/8	16,50	.650	4,76	3/16	0,8	1/32	3,81	.150	●	●						
TNMG-FP	TNMG160404FP	TNMG331FP	9,53	3/8	16,50	.650	4,76	3/16	0,4	1/64	3,81	.150		●						
	TNMG160408FP	TNMG332FP	9,53	3/8	16,50	.650	4,76	3/16	0,8	1/32	3,81	.150		●						
	TNMG220404FP	TNMG431FP	12,70	1/2	22,00	.866	4,76	3/16	0,4	1/64	5,16	.203		●						
	TNMG220408FP	TNMG432FP	12,70	1/2	22,00	.866	4,76	3/16	0,8	1/32	5,16	.203		●						
TNMG-FW	TNMG160404FW	TNMG331FW	9,53	3/8	16,50	.650	4,76	3/16	0,4	1/64	3,81	.150		●						
	TNMG160408FW	TNMG332FW	9,53	3/8	16,50	.650	4,76	3/16	0,8	1/32	3,81	.150	●	●						
	TNMG160412FW	TNMG333FW	9,53	3/8	16,50	.650	4,76	3/16	1,2	3/64	3,81	.150	●	●						
TNMG-MP	TNMG160404MP	TNMG331MP	9,53	3/8	16,50	.650	4,76	3/16	0,4	1/64	3,81	.150		●						
	TNMG160408MP	TNMG332MP	9,53	3/8	16,50	.650	4,76	3/16	0,8	1/32	3,81	.150		●						
	TNMG160412MP	TNMG333MP	9,53	3/8	16,50	.650	4,76	3/16	1,2	3/64	3,81	.150		●						
	TNMG220408MP	TNMG432MP	12,70	1/2	22,00	.866	4,76	3/16	0,8	1/32	5,16	.203		●						
	TNMG220412MP	TNMG433MP	12,70	1/2	22,00	.866	4,76	3/16	1,2	3/64	5,16	.203		●						
	TNMG220416MP	TNMG434MP	12,70	1/2	22,00	.866	4,76	3/16	1,6	1/16	5,16	.203		●						
TNMG-MW	TNMG160408MW	TNMG332MW	9,53	3/8	16,50	.650	4,76	3/16	0,8	1/32	3,81	.150	●	●						
	TNMG160412MW	TNMG333MW	9,53	3/8	16,50	.650	4,76	3/16	1,2	3/64	3,81	.150	●	●						
TNMG-RP	TNMG160408RP	TNMG332RP	9,53	3/8	16,50	.650	4,76	3/16	0,8	1/32	3,81	.150	●	●	●					
	TNMG160412RP	TNMG333RP	9,53	3/8	16,50	.650	4,76	3/16	1,2	3/64	3,81	.150	●	●						
	TNMG220408RP	TNMG432RP	12,70	1/2	22,00	.866	4,76	3/16	0,8	1/32	5,16	.203	●	●						
	TNMG220412RP	TNMG433RP	12,70	1/2	22,00	.866	4,76	3/16	1,2	3/64	5,16	.203	●	●	●					
	TNMG220416RP	TNMG434RP	12,70	1/2	22,00	.866	4,76	3/16	1,6	1/16	5,16	.203		●						
	TNMG270612RP	TNMG543RP	15,88	5/8	27,50	1.083	6,35	1/4	1,2	3/64	6,35	.250		●						
	TNMG270616RP	TNMG544RP	15,88	5/8	27,50	1.083	6,35	1/4	1,6	1/16	6,35	.250		●						
													KC9105	KC9225	KC9320					

● first choice
○ alternate choice

			dimensions																
			D		L10		S		Rε		D1		H						
													S						
													N						
													K	○			●		
													M		○	●			
													P	●	○	○			
	ISO catalog number	ANSI catalog number	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch		KC9105	KC9225	KC9320			
VNMG-FF	VNMG160404FF	VNMG331FF	9,53	3/8	16,61	.654	4,76	3/16	0,4	1/64	3,81	.150		●	●				
	VNMG160408FF	VNMG332FF	9,53	3/8	16,61	.654	4,76	3/16	0,8	1/32	3,81	.150		●	●				
VNMG-FP	VNMG160404FP	VNMG331FP	9,53	3/8	16,61	.654	4,76	3/16	0,4	1/64	3,81	.150			●				
	VNMG160408FP	VNMG332FP	9,53	3/8	16,61	.654	4,76	3/16	0,8	1/32	3,81	.150			●				
VNMG-MP	VNMG160404MP	VNMG331MP	9,53	3/8	16,61	.654	4,76	3/16	0,4	1/64	3,81	.150			●				
	VNMG160408MP	VNMG332MP	9,53	3/8	16,61	.654	4,76	3/16	0,8	1/32	3,81	.150			●				
	VNMG160412MP	VNMG333MP	9,53	3/8	16,61	.654	4,76	3/16	1,2	3/64	3,81	.150			●				
VNMG-RP	VNMG160408RP	VNMG332RP	9,53	3/8	16,61	.654	4,76	3/16	0,8	1/32	3,81	.150		●	●				
	VNMG160412RP	VNMG333RP	9,53	3/8	16,61	.654	4,76	3/16	1,2	3/64	3,81	.150		●	●	●			
														KC9105	KC9225	KC9320			

● first choice
○ alternate choice

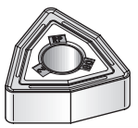
			dimensions																
			D		L10		S		Rε		D1		H						
													S						
													N						
													K	○			●		
													M		○	●			
													P	●	○	○			
	ISO catalog number	ANSI catalog number	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch		KC9105	KC9225	KC9320			
WNMG-FF	WNMG060404FF	WNMG331FF	9,53	3/8	6,52	.257	4,76	3/16	0,4	1/64	3,81	.150			●				
	WNMG080404FF	WNMG431FF	12,70	1/2	8,69	.342	4,76	3/16	0,4	1/64	5,16	.203			●				
	WNMG080408FF	WNMG432FF	12,70	1/2	8,69	.342	4,76	3/16	0,8	1/32	5,16	.203		●	●				
WNMG-FP	WNMG060404FP	WNMG331FP	9,53	3/8	6,52	.257	4,76	3/16	0,4	1/64	3,81	.150			●				
	WNMG060408FP	WNMG332FP	9,53	3/8	6,52	.257	4,76	3/16	0,8	1/32	3,81	.150			●				
	WNMG080404FP	WNMG431FP	12,70	1/2	8,69	.342	4,76	3/16	0,4	1/64	5,16	.203			●				
	WNMG080408FP	WNMG432FP	12,70	1/2	8,69	.342	4,76	3/16	0,8	1/32	5,16	.203			●				
	WNMG080412FP	WNMG433FP	12,70	1/2	8,69	.342	4,76	3/16	1,2	3/64	5,16	.203			●				
WNMG-FW	WNMG060404FW	WNMG331FW	9,53	3/8	6,52	.257	4,76	3/16	0,4	1/64	3,81	.150		●	●				
	WNMG060408FW	WNMG332FW	9,53	3/8	6,52	.257	4,76	3/16	0,8	1/32	3,81	.150		●	●				
	WNMG060412FW	WNMG333FW	9,53	3/8	6,52	.257	4,76	3/16	1,2	3/64	3,81	.150		●	●				
	WNMG080404FW	WNMG431FW	12,70	1/2	8,69	.342	4,76	3/16	0,4	1/64	5,16	.203		●	●				
	WNMG080408FW	WNMG432FW	12,70	1/2	8,69	.342	4,76	3/16	0,8	1/32	5,16	.203		●	●				
	WNMG080412FW	WNMG433FW	12,70	1/2	8,69	.342	4,76	3/16	1,2	3/64	5,16	.203		●	●				
WNMG-MP	WNMG060404MP	WNMG331MP	9,53	3/8	6,52	.257	4,76	3/16	0,4	1/64	3,81	.150			●				
	WNMG060408MP	WNMG332MP	9,53	3/8	6,52	.257	4,76	3/16	0,8	1/32	3,81	.150			●				
	WNMG080408MP	WNMG432MP	12,70	1/2	8,69	.342	4,76	3/16	0,8	1/32	5,16	.203			●				
	WNMG080412MP	WNMG433MP	12,70	1/2	8,69	.342	4,76	3/16	1,2	3/64	5,16	.203			●				
														KC9105	KC9225	KC9320			



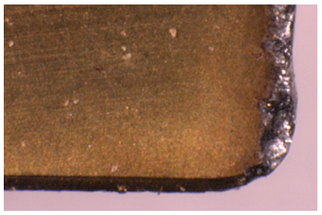
● first choice
○ alternate choice

			dimensions													
			D		L10		S		Rε		D1					
	ISO catalog number	ANSI catalog number	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	KC9105	KC9225	KC9320	
WNMG-MW	WNMG060408MW	WNMG332MW	9,53	3/8	6,52	.257	4,76	3/16	0,8	1/32	3,81	.150	●	●		
	WNMG060412MW	WNMG333MW	9,53	3/8	6,52	.257	4,76	3/16	1,2	3/64	3,81	.150	●			
	WNMG080408MW	WNMG432MW	12,70	1/2	8,69	.342	4,76	3/16	0,8	1/32	5,16	.203	●	●		
	WNMG080412MW	WNMG433MW	12,70	1/2	8,69	.342	4,76	3/16	1,2	3/64	5,16	.203	●	●		
WNMG-RP	WNMG060408RP	WNMG332RP	9,53	3/8	6,52	.257	4,76	3/16	0,8	1/32	3,81	.150	●	●		
	WNMG060412RP	WNMG333RP	9,53	3/8	6,52	.257	4,76	3/16	1,2	3/64	3,81	.150	●			
	WNMG080408RP	WNMG432RP	12,70	1/2	8,69	.342	4,76	3/16	0,8	1/32	5,16	.203	●	●	●	
	WNMG080412RP	WNMG433RP	12,70	1/2	8,69	.342	4,76	3/16	1,2	3/64	5,16	.203	●	●	●	
	WNMG080416RP	WNMG434RP	12,70	1/2	8,69	.342	4,76	3/16	1,6	1/16	5,16	.203	●			

H	S	N	K	M	P
			○	○	●
				●	○
			●		○

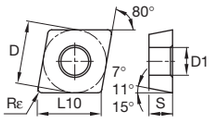


Insert Failure Tech Tip:
Chipping



Effect:
Sudden change in part size or surface finish, sparking, or fuzzing of surface.

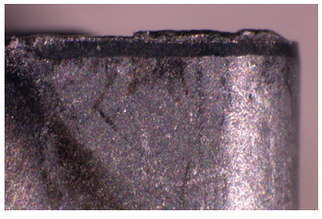
Corrective Actions:
- *Use a higher ISO range (i.e., P40, K25, etc.).*
- *Use larger edge preparation.*
- *Ensure rigidity of system.*
- *Increase lead angle.*



● first choice
○ alternate choice

			dimensions												
			D		L10		S		Rε		D1		H		
													S		
													N		
													K	○	●
													M	○	●
													P	●	○
	ISO catalog number	ANSI catalog number	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	KC9105	KC9225	KC9320
CCMT-FW	CCMT060204FW	CCMT2151FW	6,35	1/4	6,45	.254	2,38	3/32	0,4	1/64	2,80	.110		●	●
	CCMT060208FW	CCMT2152FW	6,35	1/4	6,45	.254	2,38	3/32	0,8	1/32	2,80	.110		●	
	CCMT09T304FW	CCMT3251FW	9,53	3/8	9,67	.381	3,97	5/32	0,4	1/64	4,40	.173		●	●
	CCMT09T308FW	CCMT3252FW	9,53	3/8	9,67	.381	3,97	5/32	0,8	1/32	4,40	.173		●	●
CCMT-LF	CCMT060204LF	CCMT2151LF	6,35	1/4	6,45	.254	2,38	3/32	0,4	1/64	2,80	.110	●	●	●
	CCMT060208LF	CCMT2152LF	6,35	1/4	6,45	.254	2,38	3/32	0,8	1/32	2,80	.110		●	●
	CCMT09T304LF	CCMT3251LF	9,53	3/8	9,67	.381	3,97	5/32	0,4	1/64	4,40	.173	●	●	●
	CCMT09T308LF	CCMT3252LF	9,53	3/8	9,67	.381	3,97	5/32	0,8	1/32	4,40	.173	●	●	●
	CCMT120404LF	CCMT431LF	12,70	1/2	12,90	.508	4,76	3/16	0,4	1/64	5,50	.217		●	●
	CCMT120408LF	CCMT432LF	12,70	1/2	12,90	.508	4,76	3/16	0,8	1/32	5,50	.217	●	●	●
	CCMT120412LF	CCMT433LF	12,70	1/2	12,90	.508	4,76	3/16	1,2	3/64	5,50	.217	●	●	●
CCMT-MF	CCMT060204MF	CCMT2151MF	6,35	1/4	6,45	.254	2,38	3/32	0,4	1/64	2,80	.110		●	●
	CCMT09T304MF	CCMT3251MF	9,53	3/8	9,67	.381	3,97	5/32	0,4	1/64	4,40	.173		●	●
	CCMT09T308MF	CCMT3252MF	9,53	3/8	9,67	.381	3,97	5/32	0,8	1/32	4,40	.173	●	●	●
	CCMT09T312MF	CCMT3253MF	9,53	3/8	9,67	.381	3,97	5/32	1,2	3/64	4,40	.173		●	
	CCMT120408MF	CCMT432MF	12,70	1/2	12,90	.508	4,76	3/16	0,8	1/32	5,50	.217	●	●	●
	CCMT120412MF	CCMT433MF	12,70	1/2	12,90	.508	4,76	3/16	1,2	3/64	5,50	.217			●
CCMT-MW	CCMT09T304MW	CCMT3251MW	9,53	3/8	9,67	.381	3,97	5/32	0,4	1/64	4,40	.173		●	
	CCMT09T308MW	CCMT3252MW	9,53	3/8	9,67	.381	3,97	5/32	0,8	1/32	4,40	.173		●	
	CCMT120408MW	CCMT432MW	12,70	1/2	12,90	.508	4,76	3/16	0,8	1/32	5,50	.217		●	
CDHB	CDHBS4T0S0	CDHB120601	3,97	5/32	4,03	.159	1,02	.040	0,1	.0020	2,10	.083			
	CDHBS4T002	CDHB120605	3,97	5/32	4,03	.159	1,02	.040	0,2	.0080	2,10	.083			
	CDHBS4T004	CDHB12061	3,97	5/32	4,03	.159	1,02	.040	0,4	1/64	2,10	.083			
CPGW-M	CPGW060202EM	CPGW21505EM	6,35	1/4	6,45	.254	2,38	3/32	0,2	.0080	2,80	.110			
	CPGW060204S01015M	CPGW2151S0415M	6,35	1/4	6,45	.254	2,38	3/32	0,4	1/64	2,80	.110			
	CPGW060208S01015M	CPGW2152S0415M	6,35	1/4	6,45	.254	2,38	3/32	0,8	1/32	2,80	.110			
	CPGW09T304S01015M	CPGW3251S0415M	9,53	3/8	9,67	.381	3,97	5/32	0,4	1/64	4,40	.173			
	CPGW09T308S01015M	CPGW3252S0415M	9,53	3/8	9,67	.381	3,97	5/32	0,8	1/32	4,40	.173			
													KC9105	KC9225	KC9320

Insert Failure Tech Tip:
Built-Up Edge



Effect:

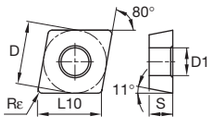
Varying part sizes, poor surface finish, fuzz or hairs adhering to part surface.

Corrective Actions:

- *Increase speed.*
- *Increase feed rate.*
- *Switch from roughing to medium or medium to finishing insert.*
- *Apply newest coated grades or cermets.*
- *Switch to a smaller edge preparation (i.e., smaller hone size).*
- *Use more lubricious coolant (or higher coolant concentration).*

Screw-On Inserts

KENNAMETAL



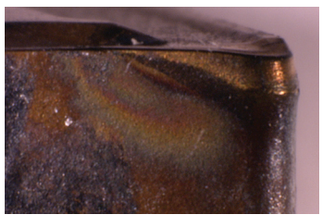
● first choice
○ alternate choice

			dimensions													
			D		L10		S		Rε		D1					
	ISO catalog number	ANSI catalog number	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	KC9105	KC9225	KC9320
CPMT-FW	CPMT060204FW	CPMT2151FW	6,35	1/4	6,45	.254	2,38	3/32	0,4	1/64	2,80	.110		●	●
	CPMT060208FW	CPMT2152FW	6,35	1/4	6,45	.254	2,38	3/32	0,8	1/32	2,80	.110		●	
	CPMT09T304FW	CPMT3251FW	9,53	3/8	9,67	.381	3,97	5/32	0,4	1/64	4,40	.173		●	●
	CPMT09T308FW	CPMT3252FW	9,53	3/8	9,67	.381	3,97	5/32	0,8	1/32	4,40	.173		●	●
CPMT-LF	CPMT060204LF	CPMT2151LF	6,35	1/4	6,45	.254	2,38	3/32	0,40	1/64	2,80	.110	●	●	●
	CPMT060208LF	CPMT2152LF	6,35	1/4	6,45	.254	2,38	3/32	0,80	1/32	2,80	.110	●	●	●
	CPMT09T304LF	CPMT3251LF	9,53	3/8	9,67	.381	3,97	5/32	0,40	1/64	4,40	.173	●	●	●
	CPMT09T308LF	CPMT3252LF	9,53	3/8	9,67	.381	3,97	5/32	0,80	1/32	4,40	.173	●	●	●
CPMT-MF	CPMT060208MF	CPMT2152MF	6,35	1/4	6,45	.254	2,38	3/32	0,8	1/32	2,80	.110	●	●	●
	CPMT09T308MF	CPMT3252MF	9,53	3/8	9,67	.381	3,97	5/32	0,8	1/32	4,40	.173	●	●	●
	CPMT09T312MF	CPMT3253MF	9,53	3/8	9,67	.381	3,97	5/32	1,2	3/64	4,40	.173		●	●
CPMT-MW	CPMT09T304MW	CPMT3251MW	9,53	3/8	9,67	.381	3,97	5/32	0,4	1/64	4,40	.173		●	
	CPMT09T308MW	CPMT3252MW	9,53	3/8	9,67	.381	3,97	5/32	0,8	1/32	4,40	.173		●	

H	S	N	K	M	P
			○	○	●
				●	○
			●		○

KC9105 KC9225 KC9320

Insert Failure Tech Tip:
Heat Deformation



Effect:
Accelerating loss of part size, poor cutting action, power increase – may result in breakage if allowed to progress.

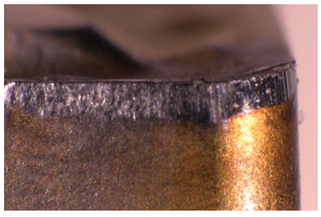
Corrective Actions:
- *Reduce speed.*
- *Reduce feed.*
- *Use coolant with correct pressure, direction and flow rate.*
- *Reduce depth of cut.*
- *Use grade with higher hardness (lower ISO range, i.e., P05, K15, etc.).*

● first choice
○ alternate choice

			dimensions												
			D		L10		S		Rε		D1		H		
	ISO catalog number	ANSI catalog number	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	KC9105	KC9225	KC9320
DCGW-M	DCGW070202EM	DCGW21505EM	6,35	1/4	7,75	.305	2,38	3/32	0,2	.0080	2,80	.110	●		
	DCGW070204S01015M	DCGW2151S0415M	6,35	1/4	7,75	.305	2,38	3/32	0,4	1/64	2,80	.110	●		
	DCGW11T304S01015M	DCGW3251S0415M	9,53	3/8	11,63	.458	3,97	5/32	0,4	1/64	4,40	.173	●		
	DCGW11T308S01015M	DCGW3252S0415M	9,53	3/8	11,63	.458	3,97	5/32	0,8	1/32	4,40	.173	●		
DCMT-FW	DCMT11T304FW	DCMT3251FW	9,53	3/8	11,63	.458	3,97	5/32	0,4	1/64	4,40	.173		●	
	DCMT11T308FW	DCMT3252FW	9,53	3/8	11,63	.458	3,97	5/32	0,8	1/32	4,40	.173		●	
DCMT-LF	DCMT070204LF	DCMT2151LF	6,35	1/4	7,75	.305	2,38	3/32	0,4	1/64	2,80	.110	●	●	●
	DCMT11T304LF	DCMT3251LF	9,53	3/8	11,63	.458	3,97	5/32	0,4	1/64	4,40	.173	●	●	●
	DCMT11T308LF	DCMT3252LF	9,53	3/8	11,63	.458	3,97	5/32	0,8	1/32	4,40	.173	●	●	●
	DCMT11T312LF	DCMT3253LF	9,53	3/8	11,63	.458	3,97	5/32	1,2	3/64	4,40	.173	●	●	
	DCMT150404LF	DCMT431LF	12,70	1/2	15,50	.610	4,76	3/16	0,4	1/64	5,50	.217		●	
	DCMT150408LF	DCMT432LF	12,70	1/2	15,50	.610	4,76	3/16	0,8	1/32	5,50	.217		●	●
DCMT-MF	DCMT11T304MF	DCMT3251MF	9,53	3/8	11,63	.458	3,97	5/32	0,4	1/64	4,40	.173		●	●
	DCMT11T308MF	DCMT3252MF	9,53	3/8	11,63	.458	3,97	5/32	0,8	1/32	4,40	.173	●	●	●
	DCMT11T312MF	DCMT3253MF	9,53	3/8	11,63	.458	3,97	5/32	1,2	3/64	4,40	.173		●	●
DCMT-MW	DCMT11T304MW	DCMT3251MW	9,53	3/8	11,63	.458	3,97	5/32	0,4	1/64	4,40	.173		●	
	DCMT11T308MW	DCMT3252MW	9,53	3/8	11,63	.458	3,97	5/32	0,8	1/32	4,40	.173		●	
DPGW-M	DPGW070202EM	DPGW21505EM	6,35	1/4	7,75	.305	2,38	3/32	0,2	.0080	2,80	.110			
	DPGW070204S01015M	DPGW2151S0415M	6,35	1/4	7,75	.305	2,38	3/32	0,4	1/64	2,80	.110			
	DPGW070208S01015M	DPGW2152S0415M	6,35	1/4	7,75	.305	2,38	3/32	0,8	1/32	2,80	.110			
	DPGW11T304S01015M	DPGW3251S0415M	9,53	3/8	11,63	.458	3,97	5/32	0,4	1/64	4,40	.173			
	DPGW11T308S01015M	DPGW3252S0415M	9,53	3/8	11,63	.458	3,97	5/32	0,8	1/32	4,40	.173			
													KC9105	KC9225	KC9320

H
S
N
K ○ ●
M ○ ● ○
P ● ○ ○

Insert Failure Tech Tip:
Edge Wear

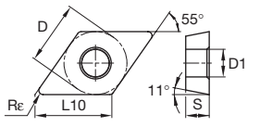


Effect:
Gradual uniform change in part size or deterioration of surface finish. Preferred mode of insert failure.

Corrective Actions:
- *Apply grades with thicker coating (more wear resistance; i.e., lower ISO range, P05, K10).*
- *Reduce speed.*
- *Use more wear-resistant grade.*

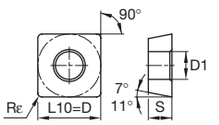
Screw-On Inserts

KENNAMETAL



● first choice
○ alternate choice

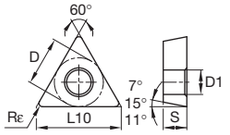
			dimensions													
			D		L10		S		Rε		D1		H	S	N	K	M	P
	ISO catalog number	ANSI catalog number	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	KC9105	KC9225	KC9320			
DPMT-LF	DPMT070204LF	DPMT2151LF	6,35	1/4	7,75	.305	2,38	3/32	0,40	1/64	2,80	.110		●				
	DPMT11T304LF	DPMT3251LF	9,53	3/8	11,63	.458	3,97	5/32	0,40	1/64	4,40	.173	●	●				
	DPMT11T308LF	DPMT3252LF	9,53	3/8	11,63	.458	3,97	5/32	0,80	1/32	4,40	.173	●	●	●			
DPMT-MF	DPMT11T308MF	DPMT3252MF	9,53	3/8	11,63	.458	3,97	5/32	0,8	1/32	4,40	.173		●	●			



● first choice
○ alternate choice

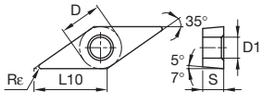
			dimensions													
			D		L10		S		Rε		D1		H	S	N	K	M	P
	ISO catalog number	ANSI catalog number	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	KC9105	KC9225	KC9320			
SCMT-LF	SCMT09T304LF	SCMT3251LF	9,53	3/8	9,53	.375	3,97	5/32	0,40	1/64	4,40	.173	●	●	●			
	SCMT09T308LF	SCMT3252LF	9,53	3/8	9,53	.375	3,97	5/32	0,80	1/32	4,40	.173	●	●	●			
	SCMT120404LF	SCMT431LF	12,70	1/2	12,70	.500	4,76	3/16	0,40	1/64	5,50	.217		●				
	SCMT120408LF	SCMT432LF	12,70	1/2	12,70	.500	4,76	3/16	0,80	1/32	5,50	.217	●	●	●			
	SCMT120412LF	SCMT433LF	12,70	1/2	12,70	.500	4,76	3/16	1,20	3/64	5,50	.217	●		●			
SCMT-MF	SCMT09T308MF	SCMT3252MF	9,53	3/8	9,53	.375	3,97	5/32	0,8	1/32	4,40	.173	●	●	●			
	SCMT120408MF	SCMT432MF	12,70	1/2	12,70	.500	4,76	3/16	0,8	1/32	5,50	.217		●	●			
SPMT-LF	SPMT09T304LF	SPMT3251LF	9,53	3/8	9,53	.375	3,97	5/32	0,4	1/64	4,40	.173		●	●			
	SPMT09T308LF	SPMT3252LF	9,53	3/8	9,53	.375	3,97	5/32	0,8	1/32	4,40	.173	●		●			
SPMT-MF	SPMT09T308MF	SPMT3252MF	9,53	3/8	9,53	.375	3,97	5/32	0,8	1/32	4,40	.173		●	●			
	SPMT120408MF	SPMT432MF	12,70	1/2	12,70	.500	4,76	3/16	0,8	1/32	5,50	.217		●	●			
													KC9105	KC9225	KC9320			

To place an order, contact Kennametal or your authorized Kennametal distributor, or visit www.kennametal.com.



● first choice
○ alternate choice

			dimensions												
			D		L10		S		Rε		D1		H		
													S		
													N		
													K	○	
													M	○	●
													P	●	○
	ISO catalog number	ANSI catalog number	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	KC9105	KC9225	KC9320
TCMT-LF	TCMT110204LF	TCMT2151LF	6,35	1/4	11,00	.433	2,38	3/32	0,4	1/64	2,80	.110	●	●	●
	TCMT110208LF	TCMT2152LF	6,35	1/4	11,00	.433	2,38	3/32	0,8	1/32	2,80	.110	●	●	●
	TCMT16T304LF	TCMT3251LF	9,53	3/8	16,50	.650	3,97	5/32	0,4	1/64	4,40	.173	●	●	●
	TCMT16T308LF	TCMT3252LF	9,53	3/8	16,50	.650	3,97	5/32	0,8	1/32	4,40	.173	●	●	●
	TCMT16T312LF	TCMT3253LF	9,53	3/8	16,50	.650	3,97	5/32	1,2	3/64	4,40	.173	●	●	●
	TCMT220408LF	TCMT432LF	12,70	1/2	22,00	.866	4,76	3/16	0,8	1/32	5,50	.217		●	
TCMT-MF	TCMT110208MF	TCMT2152MF	6,35	1/4	11,00	.433	2,38	3/32	0,8	1/32	2,80	.110		●	●
	TCMT16T308MF	TCMT3252MF	9,53	3/8	16,50	.650	3,97	5/32	0,8	1/32	4,40	.173		●	●
	TCMT16T312MF	TCMT3253MF	9,53	3/8	16,50	.650	3,97	5/32	1,2	3/64	4,40	.173			●
TPMT-LF	TPMT090204LF	TPMT18151LF	5,56	7/32	9,63	.379	2,38	3/32	0,4	1/64	2,65	.104	●	●	●
	TPMT110204LF	TPMT2151LF	6,35	1/4	11,00	.433	2,38	3/32	0,4	1/64	2,80	.110	●	●	●
	TPMT110208LF	TPMT2152LF	6,35	1/4	11,00	.433	2,38	3/32	0,8	1/32	2,80	.110	●	●	●
	TPMT16T304LF	TPMT3251LF	9,53	3/8	16,50	.650	3,97	5/32	0,4	1/64	4,40	.173	●	●	●
	TPMT16T308LF	TPMT3252LF	9,53	3/8	16,50	.650	3,97	5/32	0,8	1/32	4,40	.173	●	●	●
	TPMT16T312LF	TPMT3253LF	9,53	3/8	16,50	.650	3,97	5/32	1,2	3/64	4,40	.173		●	
TPMT-MF	TPMT110208MF	TPMT2152MF	6,35	1/4	11,00	.433	2,38	3/32	0,8	1/32	2,80	.110		●	
	TPMT16T308MF	TPMT3252MF	9,53	3/8	16,50	.650	3,97	5/32	0,8	1/32	4,40	.173		●	●
	TPMT16T312MF	TPMT3253MF	9,53	3/8	16,50	.650	3,97	5/32	1,2	3/64	4,40	.173		●	



● first choice
○ alternate choice

			dimensions												
			D		L10		S		Rε		D1		H		
													S		
													N		
													K	○	
													M	○	●
													P	●	○
	ISO catalog number	ANSI catalog number	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	KC9105	KC9225	KC9320
VBMT-LF	VBMT110304LF	VBMT221LF	6,35	1/4	11,07	.436	3,18	1/8	0,4	1/64	2,80	.110	●	●	●
	VBMT110308LF	VBMT222LF	6,35	1/4	11,07	.436	3,18	1/8	0,8	1/32	2,80	.110		●	
	VBMT160404LF	VBMT331LF	9,53	3/8	16,61	.654	4,76	3/16	0,4	1/64	4,40	.173	●	●	●
	VBMT160408LF	VBMT332LF	9,53	3/8	16,61	.654	4,76	3/16	0,8	1/32	4,40	.173	●	●	●
	VBMT160412LF	VBMT333LF	9,53	3/8	16,61	.654	4,76	3/16	1,2	3/64	4,40	.173	●		

KC9105 - for Steel

KENNA PERFECT		Speed - sfm (m/min)								Starting Conditions	
Material Group		300 (90)	500 (150)	700 (210)	900 (240)	1100 (335)	1300 (400)	1500 (460)	1700 (520)	sfm	m/min
P1	Low-Carbon (<0,3% C) and Free-Machining Steel									1580	480
P2	Medium- and High-Carbon Steels (>0,3% C)									960	300
P3	Alloy Steels and Tool Steels (≤330 HB) (≤35 HRC)									760	230
P4	Alloy Steels and Tool Steels (340 - 450 HB) (36 - 48 HRC)									575	180
P5	Ferritic, Martensitic, and PH Stainless Steels (≤330 HB) (≤35 HRC)									860	275
P6	Ferritic, Martensitic, and PH Stainless Steels (340 - 450 HB) (36 - 48 HRC)									720	215

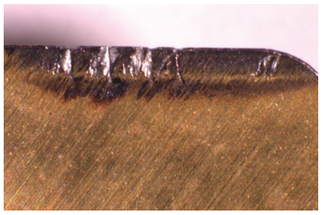
KC9225 - for Stainless Steel

KENNA PERFECT		Speed - sfm (m/min)								Starting Conditions	
Material Group		300 (90)	400 (125)	500 (150)	600 (185)	700 (210)	800 (245)	900 (275)	1000 (305)	sfm	m/min
M1	Austenitic Stainless Steel									650	200
M2	Austenitic Stainless Steel: and ASTM Cast:									600	185
M3	Austenitic Stainless Steel: Duplex (Ferritic and Austenitic Mixture)									500	150

KC9320 - for Cast Iron

KENNA PERFECT		Speed - sfm (m/min)								Starting Conditions	
Material Group		200 (60)	450 (135)	700 (210)	950 (290)	1200 (365)	1450 (440)	1700 (520)	1950 (595)	sfm	m/min
K1	Gray Cast Iron									950	290
K2	Ductile, Compacted Graphite & Malleable Cast Irons (<80 KSI tensile strength)									875	265
K3	Ductile, Malleable & Austempered Cast Irons (>80 KSI tensile strength)									725	220

Insert Failure Tech Tip:
Thermal Cracking



Effect:
Can lead to chipping and breakage; common for interrupted cutting.

Corrective Actions:
- *Switch to dry machining or coolant to ensure high volume of properly directed coolant.*
- *Reduce speed.*

KENNAMETAL

Chip Control Geometries

	operation	insert style application	insert geometry	profile	feed rate - inches: .0015 .0025 .004 .006 .010 .016 .025 .040 .060 .100 .200 / depth of cut - Inches: .004 .006 .010 .016 .025 .040 .060 .100 .160 .250 .500
Kenloc Inserts	medium machining ▼▼	**MG-CT**			OD Turning: .005 - .020 (0,13 - 0,5); .040 - .115 (1,0 - 3,0) / Outward Facing: .010 - .020 (0,25 - 0,5); .010 - .040 (0,25 - 1,0)
	fine finishing ▼▼▼▼	**MG-FF**			.002 - .010 (0,1 - 0,3); .003 - .080 (0,1 - 2,0)
	finishing ▼▼▼	**MG-FP**			.004 - .012 (0,1 - 0,3); .010 - .100 (0,3 - 2,5)
	wiper, finishing	**MG-FW**			.008 - .016 (0,2 - 0,4); .010 - .080 (0,3 - 2,0)
	medium machining ▼▼	**MG-MP**			.006 - .020 (0,2 - 0,5); .030 - .200 (0,8 - 5,1)
	wiper, medium machining	**MG-MW**			.012 - .024 (0,3 - 0,6); .030 - .200 (0,8 - 5,1)
	medium machining ▼▼	**MG-P**			.006 - .020 (0,15 - 0,5); .030 - .200 (0,75 - 5,0)
	roughing ▼	**MG-RP**			.008 - .025 (0,2 - 0,6); .045 - .250 (1,1 - 6,4)
	wiper, finishing	**MT-FW**			.003 - .013 (0,1 - 0,3); .008 - .060 (0,2 - 1,5)
Screw-On Inserts	finishing ▼▼▼	**MT-LF**			.007 - .015 (0,2 - 0,4); .030 - .090 (0,8 - 2,3)
	medium machining ▼▼	**MT-MF**			.009 - .017 (0,2 - 0,4); .045 - .090 (1,1 - 2,3)
	wiper, medium finishing	**MT-MW**			.005 - .020 (0,1 - 0,5); .016 - .130 (0,4 - 3,3)

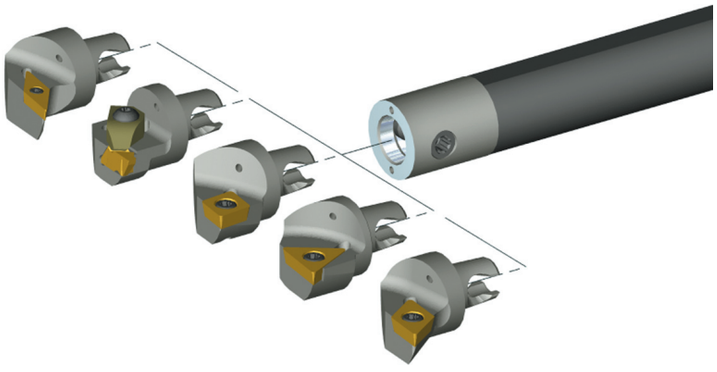
feed rate - (mm): 0,04 0,063 0,01 0,16 0,25 0,4 0,63 1,0 1,6 2,5 5,0

depth of cut - (mm): 0,1 0,16 0,25 0,4 0,63 1,0 1,6 2,5 4,0 6,3 10,0

TURNING: ISO INSERTS | BORING BARS | A4 GROOVE & TURN | A2 CUT-OFF

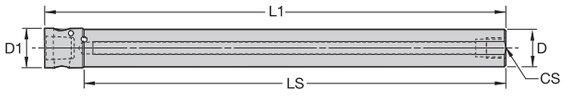
KENNAMETAL®
Engineering Your Competitive Edge

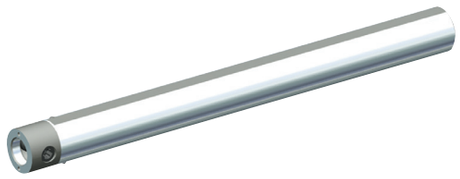
KM Micro Boring Bars – 20mm and 3/4 Inch



Achieve greater cost savings when you switch to Kennametal's new boring bars!

- **Length-to-diameter (L/D) ratio -** Steel bars 4:1, Carbide bars 6:1.
- **Reduce machine set-up time -** Compact quick-change system provides offline capability to change cutting units, index inserts, and pre-gage tooling.
- **Minimize or eliminate test cuts -** Face and taper surface contact between the cutting unit and clamping unit guarantees precise and repeatable cutting edge position in both directions of cut**.**
- **User friendly -** Simple but highly effective clamping mechanism enables secure release and locking of cutting unit by adjusting one screw (in three turns).
- **Machine friendly -** KM2016 boring bar dimensions comply with industry standards, which makes it easy to switch from conventional tooling to the new system with no machine modifications.





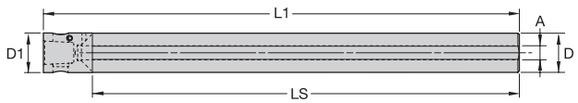
KM-NCM-S Micro

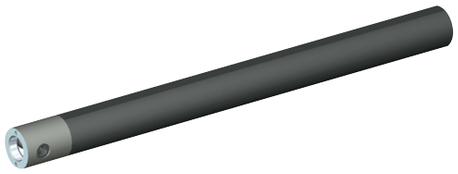
Metric

system size front	order number	catalog number	D1	D	L1	LS	CS	KM spare part pkg
KM2016	3016744	KM2016NCMS20	20,00	20,00	230,00	210,00	1/8 - 27 NPT	KM2016NRPKG

Inch

system size front	order number	catalog number	D1	D	L1	LS	CS	KM spare part pkg
KM2016	3016743	KM2016NCMS12	.787	.750	9.213	8.425	1/8 - 27 NPT	KM2016NRPKG





KM-NCM-E Micro

Metric

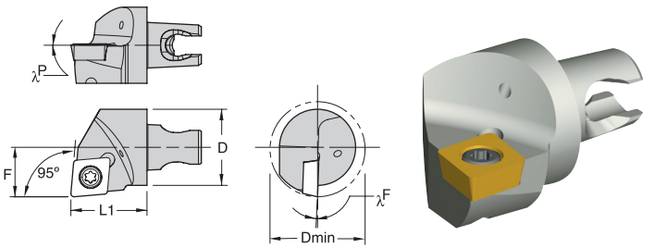
system size front	order number	catalog number	D1	D	L1	LS	A	KM spare part pkg
KM2016	3016722	KM2016NCME20	20,18	20,00	242,84	217,84	7,14	KM2016NRPKG

Inch

system size front	order number	catalog number	D1	D	L1	LS	A	KM spare part pkg
KM2016	3016721	KM2016NCME12	.787	.750	9.589	8.605	.281	KM2016NRPKG

Ordering Example:
Clamping Unit: KM2016NCMS20
Cutting Unit: KM2016SCLPR0920

KM2016 Cutting Units — Screw-On

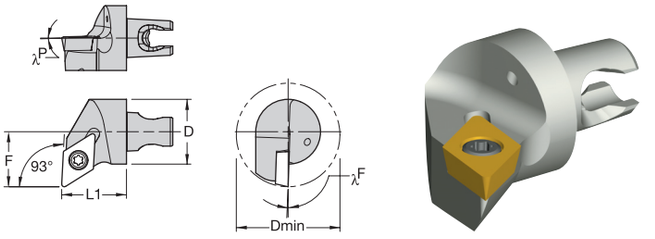


KM-SCLP Micro

system size back	order number	catalog number	D	D min mm	D min inch	F mm	F inch	L1 mm	L1 inch	GAMMA F	GAMMA P	insert 1
KM2016	3016745	KM2016SCLPR0920	20	25,00	.984	13,00	.512	20,00	.787	-2.0	.0	CP..09T308/CP..3252
KM2016	3016746	KM2016SCLPL0920	20	25,00	.984	13,00	.512	20,00	.787	-2.0	.0	CP..09T308/CP..3252

Spare Parts

insert screw	insert screw ID drive size
MS1155	T15
MS1155	T15

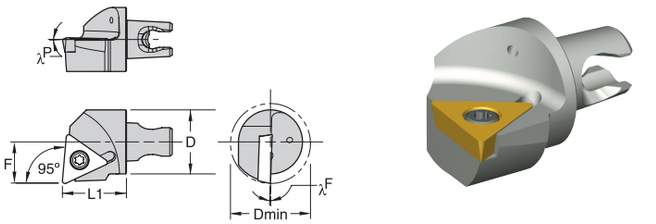


KM-SDUP Micro

system size back	order number	catalog number	D	D min mm	D min inch	F mm	F inch	L1 mm	L1 inch	GAMMA F	GAMMA P	insert 1
KM2016	3016747	KM2016SDUPR1120	20	32,00	1.260	17,00	.669	20,00	.787	-2.0	.0	DP..11T308/DP..3252
KM2016	3016748	KM2016SDUPL1120	20	32,00	1.260	17,00	.669	20,00	.787	-2.0	.0	DP..11T308/DP..3252

Spare Parts

insert screw	insert screw ID drive size
MS1155	T15
MS1155	T15

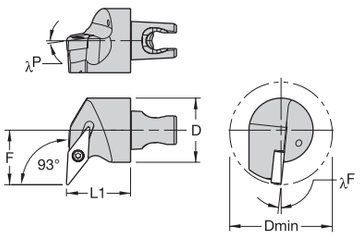


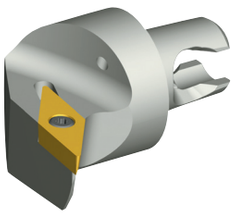
KM-STLP Micro

system size back	order number	catalog number	D	D min mm	D min inch	F mm	F inch	L1 mm	L1 inch	GAMMA F	GAMMA P	insert 1
KM2016	3016753	KM2016STLPR1620	20	25,00	.984	13,00	.512	20,00	.787	-2.0	.0	TP..16T308/TP..3252
KM2016	3016754	KM2016STLPL1620	20	25,00	.984	13,00	.512	20,00	.787	-2.0	.0	TP..16T308/TP..3252

Spare Parts

insert screw	insert screw ID drive size
MS1155	T15
MS1155	T15



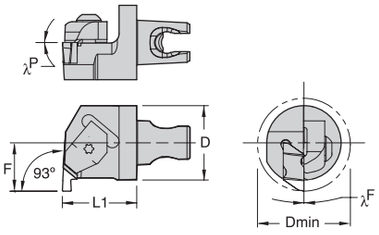


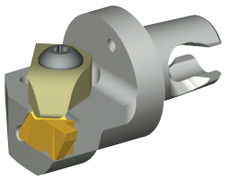
KM-SVUB Micro

system size back	order number	catalog number	D	D min mm	D min inch	F mm	F inch	L1 mm	L1 inch	GAMMA F	GAMMA P	insert 1
KM2016	3016749	KM2016SVUBR1120	20	32,00	1.260	17,00	.669	20,00	.787	-6.0	.0	VB..110304/VB..221
KM2016	3016750	KM2016SVUBL1120	20	32,00	1.260	17,00	.669	20,00	.787	-6.0	.0	VB..110304/VB..221

Spare Parts

insert screw	insert screw ID drive size
MS1153	T7
MS1153	T7





KM-NE Micro

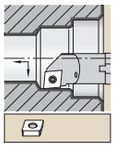
system size back	order number	catalog number	D	D min mm	D min inch	F mm	F inch	L1 mm	L1 inch	GAMMA F	GAMMA P	insert 1
KM2016	3016751	KM2016NER220	20	25,00	.984	13,00	.512	20,00	.787	.0	.0	NG2L
KM2016	3016752	KM2016NEL220	20	25,00	.984	13,00	.512	20,00	.787	.0	.0	NG2R

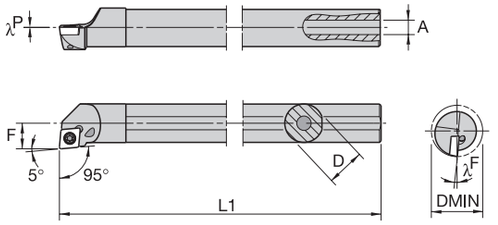
Spare Parts

clamp	socket-head cap screw	wrench size-clamp screw
CM183	MS1200	T10
CM182	MS1200	T10

Ordering Example:
Clamping Unit: KM2016NCMS20
Cutting Unit: KM2016SCLPR0920

Screw-On Boring Bars



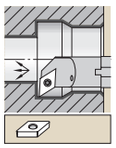


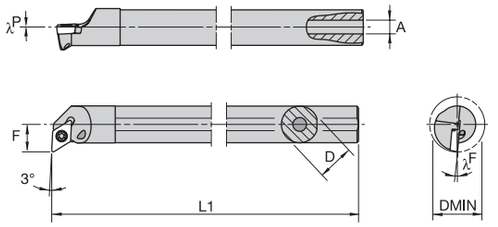
E-SCLC -5°

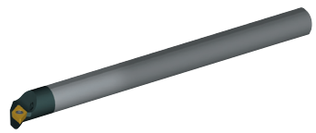
catalog number	catalog number	D	D min	F	L1	A	GAMMA F	GAMMA P	insert 1
E06MSCLCR2	E06MSCLCL2	.375	.480	.250	6.00	.125	-8.0	.0	CC..2151
E08RSCLCR2	E08RSCLCL2	.500	.600	.312	8.00	.187	-7.0	.0	CC..2151
E10SSCLCR2	E10SSCLCL2	.625	.770	.406	10.00	.218	-4.0	.0	CC..2151
E10SSCLCR3	E10SSCLCL3	.625	.770	.406	10.00	.218	-7.0	.0	CC..3252
E12SSCLCR3	E12SSCLCL3	.750	.930	.500	10.00	.281	-5.0	.0	CC..3252
E16TSCLCR3	E16TSCLCL3	1.000	1.200	.640	12.00	.312	-4.0	.0	CC..3252

Spare Parts

insert screw	Torx plus wrench
MS2066	F7IP
MS2066	F7IP
MS2066	F7IP
MS2055	F15IP
MS2055	F15IP
MS2055	F15IP







E-SDUC -3°

catalog number	catalog number	D	D min	F	L1	A	GAMMA F	GAMMA P	insert 1
E06MSDUCR2	E06MSDUCL2	.375	.600	.38	6.00	.125	-6.0	.0	DC..2151
E08RSDUCR2	E08RSDUCL2	.500	.730	.44	8.00	.187	-5.0	.0	DC..2151
E12SSDUCR3	E12SSDUCL3	.750	.980	.56	10.00	.281	-5.0	.0	DC..3252
E16TSDUCR3	E16TSDUCL3	1.000	1.300	.75	12.00	.312	-3.0	.0	DC..3252

Spare Parts

insert screw	Torx plus wrench
MS2066	F7IP
MS2066	F7IP
MS2055	F15IP
MS2055	F15IP

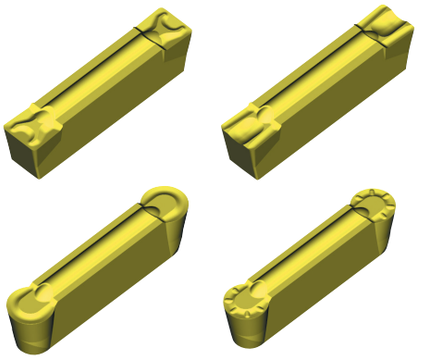
Ordering Example:
Right hand: A3206XSCFDR1205 Left hand: A3206XSCFDL1205

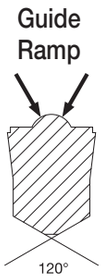
To place an order, contact Kennametal or your authorized Kennametal distributor, or visit www.kennametal.com.

Precise and productive solutions to increase productivity!

A4 Groove & Turn System

- One tool for turning, facing, grooving, face-grooving, and cut-off in OD and ID applications.
- Exceptionally fast cycle times with no turret indexes.
- Extra-long clamping area and ground 120° bottom prism seating surface.
- Exclusive top guide rail delivers unsurpassed grooving and side-turning stability.
- Precise insert positioning for accurate cuts.

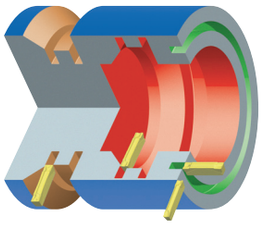




The A4 system increases your productivity:

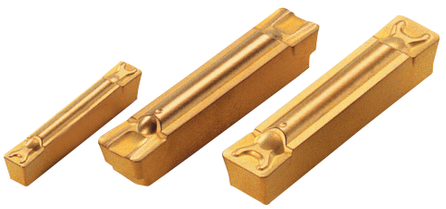
- Covers multiple applications.
- Reduces tool cost.
- Minimizes machining time.

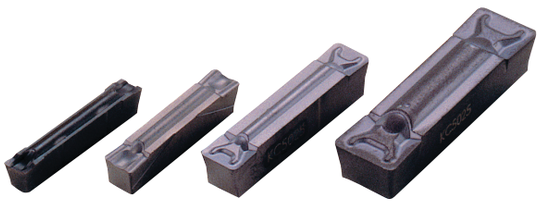
*See Kennametal Lathe Catalog 4010 for our complete line of grooving and cut-off products and KENNA PERFECT grade selection.



NEW! Narrow Width Groove & Turn Inserts!

NEW! Ceramic Grade KY3500 for Cast Iron Material!



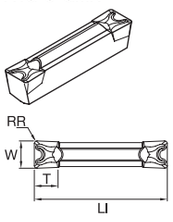


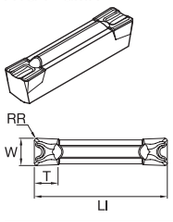
A4 Groove & Turn Inserts

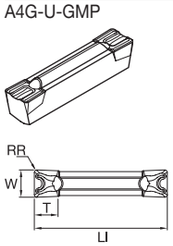
KENNAMETAL

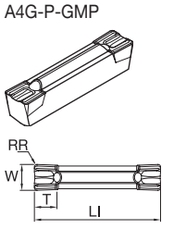
● first choice
○ alternate choice

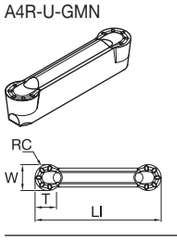
			W			Rε (RR)		LI		T						
	seat size	mm	inch	catalog number	mm	inch	mm	inch	mm	inch	KC5010	KC5025	KC9110	KC9125	KY3500
H											●				
S											●	●			
N											●	●			
K													●	●	●
M											●	●			
P													●	●	
A4G-U-GMN	2	2,05	.081	A4G0205M02U02GMN	0,20	.008	20,10	.791	2,00	.079	●	●	●	●	
	2B	2,62	.103	A4G0255M2BU02GMN	0,20	.008	20,10	.791	2,00	.079	●	●	●	●	
	2B	2,46	.097	A4G097I2BU05GMN	0,20	.008	20,00	.787	1,91	0.75	●	●			
A4G-P-GMN	2B	2,39	.094	A4G094I2BP05GMN	0,20	.008	20,00	.787	1,90	.075	●	●			
A4G-U-GMP	2	2,05	.081	A4G0205M02U02GMP	0,20	.008	20,10	.791	2,00	.079	●	●	●	●	
	2B	2,62	.103	A4G0255M2BU02GMP	0,20	.008	20,10	.791	2,00	.079	●	●	●	●	
A4G-P-GMP	2	2,00	.079	A4G0200M02P02GMP	0,20	.008	20,00	.787	2,00	.079	●	●			
	2B	2,50	.098	A4G0250M2BP02GMP	0,20	.008	20,00	.787	2,00	.079	●	●			
A4R-U-GMN	2	2,05	.081	A4R0205M02U00GMN	1,06	.042	20,10	.791	1,76	.069	●	●	●	●	











Ordering Example:
Catalog number: A4G0205M02U02GMN Insert grade: KC5010

*See Kennametal Lathe Catalog 4010 for our complete line of grooving and cut-off products.

To place an order, contact Kennametal or your authorized Kennametal distributor, or visit www.kennametal.com.

KENNAMETAL

A4 Groove & Turn Inserts

● first choice
○ alternate choice

		W			Rε		Ll		T							
	seat size	mm	inch	catalog number	mm	inch	mm	inch	mm	inch	H	S	N	K	M	P
A4R-P-GMP	2	2,00	.079	A4R0200M02P00GMP	1,00	.039	20,00	.787	1,71	.067	●	●				
Metric																
A4G-P-T	3	.118	3,00	A4G0300M03P04T01025	.016	0,4	.79	20	.134	3,4						●
	4	.157	4,00	A4G0400M04P04T01025	.016	0,4	.79	20	.134	3,4						●
	5	.197	5,00	A4G0500M05P08T01025	.031	0,8	.98	25	.165	4,2						●
	6	.236	6,00	A4G0600M06P08T01025	.031	0,8	1.18	30	.189	4,8						●
	8	.315	8,00	A4G0800M08P08T01025	.031	0,8	1.18	30	.250	6,4						●
Inch																
	3	.125	3,18	A4G125I03P1T0425	.016	0,4	.79	20	.134	3,4						●
	4	.187	4,76	A4G187I04P2T0425	.031	0,8	.79	20	.134	3,4						●
	6	.250	6,35	A4G250I06P2T0425	.031	0,8	1.18	30	.193	4,9						●
Metric																
A4R-P-T	3	.118	3,00	A4R0300M03P00T01025	.059	1,5	.79	20	.095	2,4						●
	4	.157	4,00	A4R0400M04P00T01025	.079	2,0	.79	20	.117	3,0						●
	5	.197	5,00	A4R0500M05P00T01025	.098	2,5	.98	25	.163	4,1						●
	6	.236	6,00	A4R0600M06P00T01025	.118	3,0	1.18	30	.171	4,3						●
	8	.315	8,00	A4R0800M08P00T01025	.157	4,0	1.18	30	.250	6,4						●
Inch																
	3	.125	3,18	A4R125I03P00T0425	.062	1,6	.79	20	.100	2,6						●
	4	.187	4,76	A4R187I04P00T0425	.094	2,4	.79	20	.141	3,6						●
	6	.250	6,35	A4R250I06P00T0425	.125	3,2	1.18	30	.191	4,8						●
											KC5010	KC5025	KC9110	KC9125	KY3500	

New A4 Inserts in KY3500 Grade:

- ***Maximum toughness.***
- ***Used at high feed rates for rough machining of gray cast iron, including machining through interruptions.***

Ordering Example:
Catalog number: A4G0205M02U02GMN Insert grade: KC5010

*See Kennametal Lathe Catalog 4010 for our complete line of grooving and cut-off products.

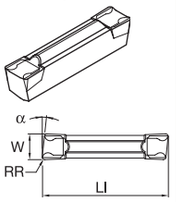
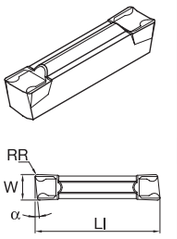
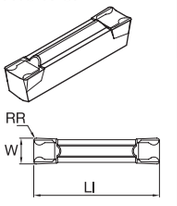
To place an order, contact Kennametal or your authorized Kennametal distributor, or visit www.kennametal.com.

A4 Cut-Off Inserts

KENNAMETAL

● first choice
○ alternate choice

	KC5010	KC5025	KC9110	KC9125	KY3500
H	●				
S	●	●			
N	●	●			
K			●	●	●
M	●	●			
P		●	●	●	

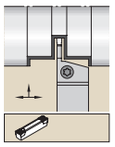
	seat size	W mm	W inch	catalog number	Rε(RR) mm	Rε(RR) inch	LI mm	LI inch	ALPHA L	KC5010	KC5025	KC9110	KC9125	KY3500
A4C-L-CF	1	1,50	.059	A4C0155L06CF01	0,15	.006	15,50	.610	6.000		●			
	1	1,50	.059	A4C0155L10CF01	0,15	.006	15,50	.610	10.000		●			
	1	1,50	.059	A4C0155L16CF01	0,15	.006	15,50	.610	16.000		●			
	2	1,99	.078	A4C0205L06CF02	0,20	.008	20,03	.788	6.000		●			
	2	1,99	.078	A4C0205L10CF02	0,20	.008	20,03	.788	10.000		●			
	2B	2,49	.098	A4C0255L06CF02	0,20	.008	20,03	.788	6.000		●			
	2B	2,49	.098	A4C0255L10CF02	0,20	.008	20,03	.788	10.000		●			
A4C-R-CF	1	1,50	.059	A4C0155R06CF01	0,15	.006	15,50	.610	6.000		●			
	1	1,50	.059	A4C0155R10CF01	0,15	.006	15,50	.610	10.000		●			
	1	1,50	.059	A4C0155R16CF01	0,15	.006	15,50	.610	16.000		●			
	2	1,99	.078	A4C0205R06CF02	0,20	.008	20,03	.788	6.000		●			
	2	1,99	.078	A4C0205R10CF02	0,20	.008	20,03	.788	10.000		●			
	2B	2,49	.098	A4C0255R06CF02	0,20	.008	20,03	.788	6.000		●			
	2B	2,49	.098	A4C0255R10CF02	0,20	.008	20,03	.788	10.000		●			
A4C-N-CF	1	1,50	.059	A4C0155N00CF01	0,15	.006	15,50	.610	–		●			
	2	2,05	.081	A4C0205N00CF02	0,20	.008	20,02	.788	–		●			
	2B	2,50	.098	A4C0255N00CF02	0,20	.008	20,03	.788	–		●			

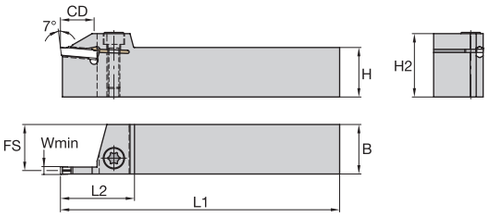
KC5025 Grade:

- ***For general-purpose machining of most steels, stainless steels, high-temperature alloys, titanium, irons, and non-ferrous materials.***
- ***Speeds may vary from low to medium.***
- ***Handles interruptions and high feed rates.***

Ordering Example:
Catalog number: A4G0205M02U02GMN Insert grade: KC5010

*See Kennametal Lathe Catalog 4010 for our complete line of grooving and cut-off products.





A4SM

Metric

ISC	CD	catalog number right hand	catalog number left hand	W	H	B	H2	L1	FS	L2
2	14,00	A4SMR1616K0214	A4SML1616K0214	2,00	16,00	16,00	25,00	125,00	15,20	30,00
2	14,00	A4SMR2020K0214	A4SML2020K0214	2,00	20,00	20,00	25,00	125,00	19,20	30,00
2	14,00	A4SMR2525M0214	A4SML2525M0214	2,00	25,00	25,00	30,00	150,00	24,20	30,00
2	17,00	A4SMR2020K0217	A4SML2020K0217	2,00	20,00	20,00	31,00	125,00	19,20	34,00
2	17,00	A4SMR2525M0217	A4SML2525M0217	2,00	25,00	25,00	31,00	150,00	24,20	34,00

Spare Parts

Torx clamp screw	Torx
MS1160	KT20
MS1160	KT20
MS1160	KT20
MS1944	KT25
MS1944	KT25

Inch

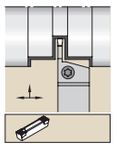
seat size	CD	catalog number right hand	catalog number left hand	W min	H	B	H2	L1	FS	L2
2	.55	A4SMR100214	A4SML100214	.079	.625	.625	.98	5.00	.59	1.18
2	.55	A4SMR120214	A4SML120214	.079	.750	.750	.94	5.00	.71	1.18
2	.67	A4SMR120217	A4SML120217	.079	.750	.750	1.18	5.00	.71	1.34
2	.67	A4SMR160217	A4SML160217	.079	1.000	1.000	1.24	6.00	.96	1.34

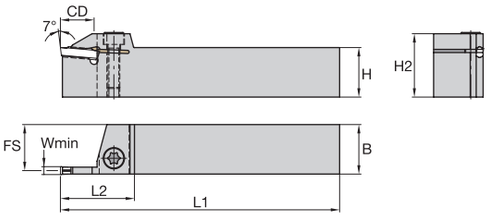
Spare Parts

Torx clamp screw	Torx
MS1160	KT20
MS1160	KT20
MS1944	KT25
MS1944	KT25

Ordering Example:
Right hand: A4SMR100214 Left hand: A4SML100214

A4 Cut-Off Toolholders





A4SM

Metric

ISC	CD	catalog number right hand	catalog number left hand	W min	H	B	H2	L1	FS	L2
1.5	14	A4SCR1010K0113	A4SCL1010K0113	1,50	10,00	10,00	21,00	125,00	9,40	.98
1.5	14	A4SCR1212K0113	A4SCL1212K0113	1,50	12,00	12,00	21,00	125,00	11,40	.98
1.5	14	A4SCR1616K0113	A4SCL1616K0113	1,50	16,00	16,00	21,00	125,00	15,40	.98
1.5	14	A4SCR2020K0113	A4SCL2020K0113	1,50	20,00	20,00	25,00	125,00	19,40	.98

Spare Parts

insert screw	Torx
MS1156	KT15
MS1156	KT15
MS1156	KT15
MS1156	KT15

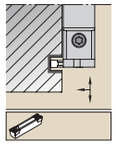
Inch

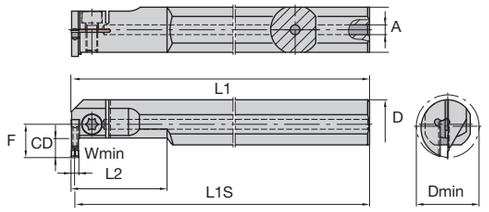
ISC	CD	catalog number right hand	catalog number left hand	W min	H	B	H2	L1	FS	L2
1.5	.53	A4SCR060113	A4SCL060113	.059	.375	.375	.82	5.00	.35	.98
1.5	.53	A4SCR080113	A4SCL080113	.059	.500	.500	.82	5.00	.47	.98
1.5	.53	A4SCR100113	A4SCL100113	.059	.625	.625	.82	5.00	.60	.98
1.5	.53	A4SCR120113	A4SCL120113	.059	.750	.750	.94	5.00	.72	.98

Spare Parts

insert screw	Torx
MS1156	KT15
MS1156	KT15
MS1156	KT15
MS1156	KT15

Ordering Example:
Right hand: A4SMR100214 Left hand: A4SML100214





A-A4E

Metric

Seat Size	CD	catalog number right hand	catalog number left hand	W min	D	D min	L1	F	L1S	L2	A
2	7,00	A20RA4EMR0207M	A20RA4EML0207M	2,00	20,00	25,00	200,00	13,00	199,00	40,00	4,00
2	10,00	A25RA4EMR0210M	A25RA4EML0210M	2,00	25,00	32,00	200,00	17,00	199,00	50,00	5,00

Spare Parts

Torx clamp screw	wrench size-clamp screw
MS2089	25 IP
MS2089	25 IP

Inch

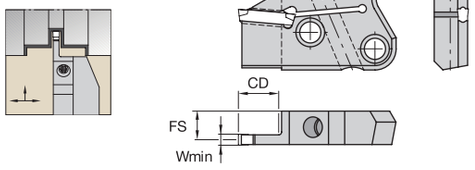
Seat Size	CD	catalog number right hand	catalog number left hand	W min	D	D min	L1	F	L1S	L2	A
2	.276	A12RA4EMR0207N	A12RA4EML0207N	.079	.750	.984	8.00	.507	7.96	1.57	.16
2	.394	A16RA4EMR0210N	A16RA4EML0210N	.079	1.000	1.260	8.00	.664	7.96	1.97	.20

Spare Parts

Torx clamp screw	wrench size-clamp screw
MS2089	25 IP
MS2089	25 IP

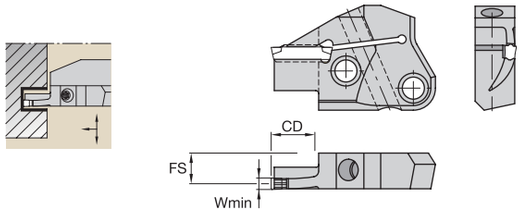
Ordering Example:
Right hand: A4SMR100214 Left hand: A4SML100214

A4 Groove & Turn Modular Blades



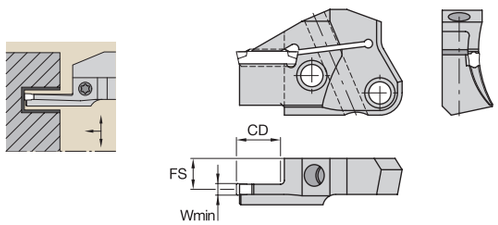
A4M-M

seat size	CD mm	CD inch	catalog number right hand	catalog number left hand	W min mm	W min inch	FS mm	FS inch	blade size
2	14,00	.551	A4M50R0214M	A4M50L0214M	2,00	.079	10,87	.428	50
2B	14,00	.551	A4M50R2B14M	A4M50L2B14M	2,50	.098	10,70	.421	50



A4M-A INBOARD SWEEP

seat size	D min mm	D min inch	D max mm	D max inch	catalog number right hand	catalog number left hand	W min mm	W min inch	CD mm	CD inch	FS mm	FS inch	blade size
2	36,00	1.417	46,00	1.811	A4M50R0212A036046	A4M50L0212A036046	2,00	.079	12,00	.472	10,90	.429	50
2	42,00	1.654	54,00	2.126	A4M50R0212A042054	A4M50L0212A042054	2,00	.079	12,00	.472	10,90	.429	50
2	50,00	1.969	64,00	2.520	A4M50R0212A050064	A4M50L0212A050064	2,00	.079	12,00	.472	10,90	.429	50
2	60,00	2.362	84,00	3.307	A4M50R0212A060084	A4M50L0212A060084	2,00	.079	12,00	.472	10,90	.429	50
2	80,00	3.150	124,00	4.882	A4M50R0212A080124	A4M50L0212A080124	2,00	.079	12,00	.472	10,90	.429	50
2	120,00	4.724	254,00	10.000	A4M50R0212A120254	A4M50L0212A120254	2,00	.079	12,00	.472	10,90	.429	50
2	250,00	9.843	—	—	A4M50R0212A250999	A4M50L0212A250999	2,00	.079	12,00	.472	10,90	.429	50

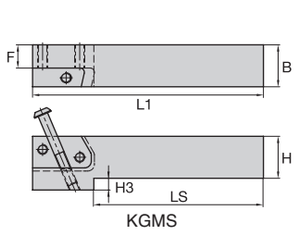


A4M-B OUTBOARD SWEEP

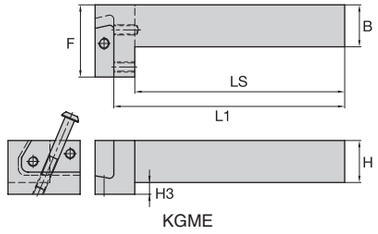
seat size	D min mm	D min inch	D max mm	D max inch	catalog number right hand	catalog number left hand	W min mm	W min inch	CD mm	CD inch	FS mm	FS inch	blade size
2	36,00	1.417	46,00	1.811	A4M50R0212B036046	A4M50L0212B036046	2,00	.079	12,00	.472	10,90	.429	50
2	42,00	1.654	54,00	2.126	A4M50R0212B042054	A4M50L0212B042054	2,00	.079	12,00	.472	10,90	.429	50
2	50,00	1.969	64,00	2.520	A4M50R0212B050064	A4M50L0212B050064	2,00	.079	12,00	.472	10,90	.429	50
2	60,00	2.362	84,00	3.307	A4M50R0212B060084	A4M50L0212B060084	2,00	.079	12,00	.472	10,90	.429	50
2	80,00	3.150	124,00	4.882	A4M50R0212B080124	A4M50L0212B080124	2,00	.079	12,00	.472	10,90	.429	50
2	120,00	4.724	254,00	10.000	A4M50R0212B120254	A4M50L0212B120254	2,00	.079	12,00	.472	10,90	.429	50
2	250,00	9.843	—	—	A4M50R0212B250999	A4M50L0212B250999	2,00	.079	12,00	.472	10,90	.429	50

Ordering Example:
Right hand: A4SMR100214 Left hand: A4SML100214

To place an order, contact Kennametal or your authorized Kennametal distributor, or visit www.kennametal.com.



KGMS



KGME

KGMS..

Metric

catalog number right hand	catalog number left hand	H	B	L1	LS	F	H3
KGMSR2525M50	KGMSL2525M50	25	25	138,75	101,25	13,84	7,00
KGMSR3232P50	KGMSL3232P50	32	32	158,75	–	20,81	–

Spare Parts

blade screw (2 req'd)	clamp screw	wrench size-clamp screw
MS1162	MS2002	T25
MS1162	MS2002	T25

Inch

catalog number right hand	catalog number left hand	H	B	L1	LS	F	H3
KGMSR1650N	KGMSL1650N	1.00	1.00	5.5	4.26	.56	.25
KGMSR2050N	KGMSL2050N	1.25	1.25	5.5	–	.81	–
KGMSR2450N	KGMSL2450N	1.50	1.50	5.5	–	1.06	–

Spare Parts

blade screw (2 req'd)	clamp screw	wrench size-clamp screw
MS1162	MS2002	T25
MS1162	MS2002	T25
MS1162	MS2002	T25

KGME..

Metric

catalog number right hand	catalog number left hand	H	B	L1	LS	F	H3
KGMER2525M50	KGMEL2525M50	25	25	139,25	125,25	42,75	6,84
KGMER3232P50	KGMEL3232P50	32	32	159,25	145,25	42,75	–

Spare Parts

blade screw (2 req'd)	clamp screw	wrench size-clamp screw
MS1162	MS2002	T25
MS1162	MS2002	T25

Inch

catalog number right hand	catalog number left hand	H	B	L1	LS	F	H3
KGMER1650N	KGMEL1650N	1.00	1.00	5.5	4.96	1.7	.24
KGMER2050N	KGMEL2050N	1.25	1.25	5.5	4.96	1.7	–
KGMER2450N	KGMEL2450N	1.50	1.50	5.5	4.96	1.7	–

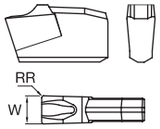
Spare Parts

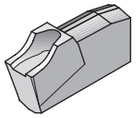
blade screw (2 req'd)	clamp screw	wrench size-clamp screw
MS1162	MS2002	T25
MS1162	MS2002	T25
MS1162	MS2002	T25

Ordering Example:
Right hand: KGMSR1650 Left hand: KGMSL1650

A2 Cut-Off Inserts

KENNAMETAL



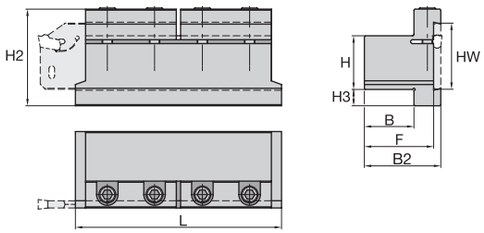


● first choice
○ alternate choice

H	●
S	●
N	●
K	●
M	●
P	●

A2-N-CF

seat size	W mm	W inch	catalog number	Rε (RR)	KC5025
1	1,55	.061	A2016N00CF00	–	●
2	2,20	.087	A2022N00CF00	–	●
3	3,10	.122	A2030N00CF00	–	●
4	4,05	.159	A2040N00CF00	–	●



A2TE – Integral Clamp

Metric

HW	HW	H	catalog number	B	F	H2	B2	H3	L
1	32	20,00	A2TEN2020J32	20,00	30,50	48,00	36,00	13,00	110,00
1	32	40,00	A2TEN4038J32	38,00	48,50	59,00	54,00	4,00	110,00

Spare Parts

clamp	wrench size-clamp screw
125.630	5 MM
125.630	5 MM

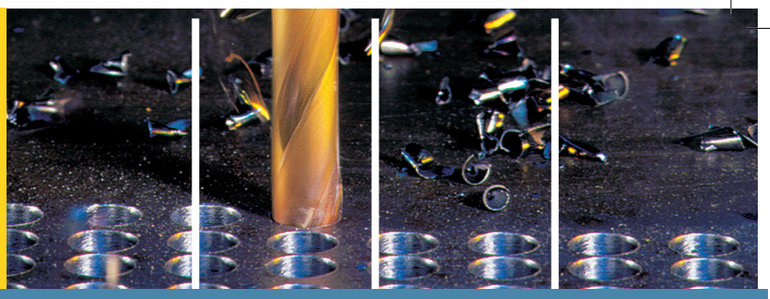
Inch

HW	HW	H	catalog number	B	F	H2	B2	H3	L
1.260	32	.750	A2TEN1232	.750	1.163	1.89	1.38	.55	4.33
1.260	32	1.500	A2TEN2432	1.500	1.913	2.25	2.13	.16	4.33

Spare Parts

clamp screw	wrench size-clamp screw
125.630	5 MM
125.630	5 MM

Ordering Example:
A2TEN1232



Holemaking

TABLE OF CONTENTS

Kennametal will significantly improve your machine productivity!

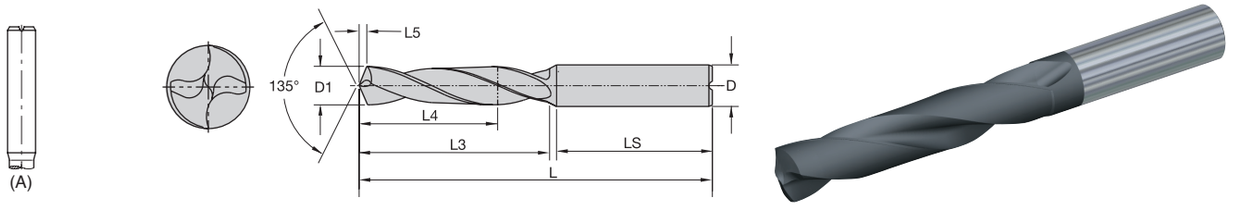
Let us prove it.

www.kennametal.com

High-Performance Solid Carbide Drills

KENNAMETAL

SE Drills Without Coolant



● first choice
○ alternate choice

H	
S	
N	
K	●
M	
P	●

B221HP — A-Shank

D1 mm	D1 inch	order number	catalog number	D	L	L3	L4 max	LS	L5	KC7315
3,00	.1181	3043594	B221A03000HP	6	62	20	14	36	0,55	●
3,10	.1220	3043595	B221A03100HP	6	62	20	14	36	0,57	●
3,20	.1260	3043596	B221A03200HP	6	62	20	14	36	0,59	●
3,30	.1299	3043597	B221A03300HP	6	62	20	14	36	0,61	●
3,40	.1339	3043598	B221A03400HP	6	62	20	14	36	0,63	●
3,50	.1378	3043599	B221A03500HP	6	62	20	14	36	0,65	●
3,60	.1417	3043600	B221A03600HP	6	62	20	14	36	0,67	●
3,70	.1457	3043601	B221A03700HP	6	62	20	14	36	0,68	●
3,80	.1496	3043602	B221A03800HP	6	66	24	17	36	0,70	●
3,90	.1535	3043713	B221A03900HP	6	66	24	17	36	0,72	●
4,00	.1575	3043714	B221A04000HP	6	66	24	17	36	0,74	●
4,10	.1614	3043715	B221A04100HP	6	66	24	17	36	0,76	●
4,20	.1654	3043716	B221A04200HP	6	66	24	17	36	0,78	●
4,30	.1693	3043717	B221A04300HP	6	66	24	17	36	0,79	●
4,40	.1732	3043718	B221A04400HP	6	66	24	17	36	0,81	●
4,50	.1772	3043719	B221A04500HP	6	66	24	17	36	0,83	●
4,60	.1811	3043720	B221A04600HP	6	66	24	17	36	0,85	●
4,70	.1850	3043721	B221A04700HP	6	66	24	17	36	0,87	●
4,80	.1890	3043722	B221A04800HP	6	66	28	20	36	0,89	●
4,90	.1929	3043723	B221A04900HP	6	66	28	20	36	0,90	●
5,00	.1969	3043724	B221A05000HP	6	66	28	20	36	0,92	●
5,10	.2008	3043725	B221A05100HP	6	66	28	20	36	0,94	●
5,20	.2047	3043726	B221A05200HP	6	66	28	20	36	0,96	●
5,30	.2087	3043727	B221A05300HP	6	66	28	20	36	0,98	●
5,40	.2126	3043728	B221A05400HP	6	66	28	20	36	1,00	●
5,50	.2165	3043729	B221A05500HP	6	66	28	20	36	1,02	●
5,60	.2205	3043730	B221A05600HP	6	66	28	20	36	1,03	●
5,70	.2244	3043731	B221A05700HP	6	66	28	20	36	1,05	●
5,80	.2283	3043732	B221A05800HP	6	66	28	20	36	1,07	●
5,90	.2323	3043733	B221A05900HP	6	66	28	20	36	1,09	●
6,00	.2362	3043734	B221A06000HP	6	66	28	20	36	1,11	●
6,10	.2402	3043735	B221A06100HP	8	79	34	24	36	1,13	●
6,20	.2441	3043736	B221A06200HP	8	79	34	24	36	1,14	●
6,30	.2480	3043737	B221A06300HP	8	79	34	24	36	1,16	●
6,40	.2520	3043738	B221A06400HP	8	79	34	24	36	1,18	●
6,50	.2559	3043739	B221A06500HP	8	79	34	24	36	1,20	●
6,60	.2598	3043740	B221A06600HP	8	79	34	24	36	1,22	●
6,70	.2638	3043741	B221A06700HP	8	79	34	24	36	1,24	●
6,80	.2677	3043742	B221A06800HP	8	79	34	24	36	1,26	●
6,90	.2717	3043743	B221A06900HP	8	79	34	24	36	1,27	●
7,00	.2756	3043744	B221A07000HP	8	79	34	24	36	1,29	●
7,10	.2795	3043745	B221A07100HP	8	79	41	29	36	1,31	●
7,20	.2835	3043746	B221A07200HP	8	79	41	29	36	1,33	●
7,30	.2874	3043747	B221A07300HP	8	79	41	29	36	1,35	●

continued on next page

Tolerance			
D1	**Tolerance m7**	**D**	**Tolerance h6**
>3 to 6	0,004/0,016	6	0,000/-0,008
>6 to 10	0,006/0,021	8 to 10	0,000/-0,009
>10 to 18	0,007/0,025	12 to 18	0,000/-0,011
>18 to 21	0,008/0,029	20	0,000/-0,013

● first choice
○ alternate choice

H	
S	
N	
K	●
M	
P	●

B221HP — A-Shank

(continued from previous page)

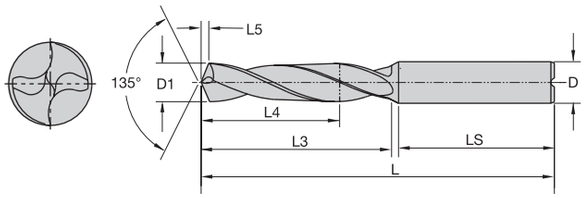
D1 mm	D1 inch	order number	catalog number	D	L	L3	L4 max	LS	L5	KC7315
7,40	.2913	3043748	B221A07400HP	8	79	41	29	36	1,37	●
7,50	.2953	3043749	B221A07500HP	8	79	41	29	36	1,38	●
7,60	.2992	3043750	B221A07600HP	8	79	41	29	36	1,40	●
7,70	.3031	3043751	B221A07700HP	8	79	41	29	36	1,42	●
7,80	.3071	3043752	B221A07800HP	8	79	41	29	36	1,44	●
7,90	.3110	3043753	B221A07900HP	8	79	41	29	36	1,46	●
8,00	.3150	3043754	B221A08000HP	8	79	41	29	36	1,48	●
8,10	.3189	3043755	B221A08100HP	10	89	47	35	40	1,50	●
8,20	.3228	3043756	B221A08200HP	10	89	47	35	40	1,51	●
8,30	.3268	3043757	B221A08300HP	10	89	47	35	40	1,53	●
8,40	.3307	3043758	B221A08400HP	10	89	47	35	40	1,55	●
8,50	.3346	3043759	B221A08500HP	10	89	47	35	40	1,57	●
8,60	.3386	3043760	B221A08600HP	10	89	47	35	40	1,59	●
8,70	.3425	3043761	B221A08700HP	10	89	47	35	40	1,61	●
8,80	.3465	3043762	B221A08800HP	10	89	47	35	40	1,62	●
8,90	.3504	3043763	B221A08900HP	10	89	47	35	40	1,64	●
9,00	.3543	3043764	B221A09000HP	10	89	47	35	40	1,66	●
9,10	.3583	3043765	B221A09100HP	10	89	47	35	40	1,68	●
9,20	.3622	3043766	B221A09200HP	10	89	47	35	40	1,70	●
9,30	.3661	3043767	B221A09300HP	10	89	47	35	40	1,72	●
9,40	.3701	3043768	B221A09400HP	10	89	47	35	40	1,74	●
9,50	.3740	3043769	B221A09500HP	10	89	47	35	40	1,75	●
9,60	.3780	3043770	B221A09600HP	10	89	47	35	40	1,77	●
9,70	.3819	3043771	B221A09700HP	10	89	47	35	40	1,79	●
9,80	.3858	3043772	B221A09800HP	10	89	47	35	40	1,81	●
9,90	.3898	3043773	B221A09900HP	10	89	47	35	40	1,83	●
10,00	.3937	3043774	B221A10000HP	10	89	47	35	40	1,85	●
10,10	.3976	3043775	B221A10100HP	12	102	55	40	45	1,86	●
10,20	.4016	3043776	B221A10200HP	12	102	55	40	45	1,88	●
10,30	.4055	3043777	B221A10300HP	12	102	55	40	45	1,90	●
10,40	.4094	3043778	B221A10400HP	12	102	55	40	45	1,92	●
10,50	.4134	3043779	B221A10500HP	12	102	55	40	45	1,94	●
10,60	.4173	3043780	B221A10600HP	12	102	55	40	45	1,96	●
10,70	.4213	3043781	B221A10700HP	12	102	55	40	45	1,98	●
10,80	.4252	3043782	B221A10800HP	12	102	55	40	45	2,00	●
10,90	.4291	3043783	B221A10900HP	12	102	55	40	45	2,01	●
11,00	.4331	3043784	B221A11000HP	12	102	55	40	45	2,03	●
11,10	.4370	3043785	B221A11100HP	12	102	55	40	45	2,05	●
11,20	.4409	3043786	B221A11200HP	12	102	55	40	45	2,07	●
11,30	.4449	3043787	B221A11300HP	12	102	55	40	45	2,09	●
11,40	.4488	3043788	B221A11400HP	12	102	55	40	45	2,10	●
11,50	.4528	3043789	B221A11500HP	12	102	55	40	45	2,12	●
11,60	.4567	3043790	B221A11600HP	12	102	55	40	45	2,14	●
11,70	.4606	3043791	B221A11700HP	12	102	55	40	45	2,16	●
11,80	.4646	3043792	B221A11800HP	12	102	55	40	45	2,18	●
11,90	.4685	3043793	B221A11900HP	12	102	55	40	45	2,20	●
12,00	.4724	3043794	B221A12000HP	12	102	55	40	45	2,22	●
12,10	.4764	3043795	B221A12100HP	14	107	60	43	45	2,23	●
12,20	.4803	3043796	B221A12200HP	14	107	60	43	45	2,25	●
12,30	.4843	3043797	B221A12300HP	14	107	60	43	45	2,27	●

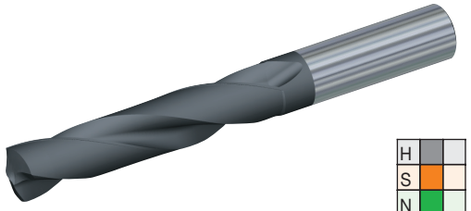
continued on next page

High-Performance Solid Carbide Drills

KENNAMETAL

SE Drills Without Coolant





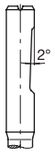
● first choice
○ alternate choice

H	
S	
N	
K	●
M	
P	●

B221HP — A-Shank (continued from previous page)

D1 mm	D1 inch	order number	catalog number	D	L	L3	L4 max	LS	L5	KC7315
12,40	.4882	3043798	B221A12400HP	14	107	60	43	45	2,29	●
12,50	.4921	3043799	B221A12500HP	14	107	60	43	45	2,31	●
12,60	.4961	3043800	B221A12600HP	14	107	60	43	45	2,33	●
12,70	.5000	3043801	B221A12700HP	14	107	60	43	45	2,34	●
12,80	.5039	3043802	B221A12800HP	14	107	60	43	45	2,36	●
12,90	.5079	3043803	B221A12900HP	14	107	60	43	45	2,38	●
13,00	.5118	3043804	B221A13000HP	14	107	60	43	45	2,40	●
13,10	.5157	3043805	B221A13100HP	14	107	60	43	45	2,42	●
13,20	.5197	3043806	B221A13200HP	14	107	60	43	45	2,44	●
13,30	.5236	3043807	B221A13300HP	14	107	60	43	45	2,46	●
13,50	.5315	3043808	B221A13500HP	14	107	60	43	45	2,49	●
13,60	.5354	3043809	B221A13600HP	14	107	60	43	45	2,51	●
13,70	.5394	3043810	B221A13700HP	14	107	60	43	45	2,53	●
13,80	.5433	3043811	B221A13800HP	14	107	60	43	45	2,55	●
13,90	.5472	3043812	B221A13900HP	14	107	60	43	45	2,57	●
14,00	.5512	3043813	B221A14000HP	14	107	60	43	45	2,58	●
14,10	.5551	3043814	B221A14100HP	16	115	65	45	48	2,60	●
14,20	.5591	3043815	B221A14200HP	16	115	65	45	48	2,62	●
14,30	.5630	3043816	B221A14300HP	16	115	65	45	48	2,64	●
14,40	.5669	3043817	B221A14400HP	16	115	65	45	48	2,66	●
14,50	.5709	3043818	B221A14500HP	16	115	65	45	48	2,68	●
14,60	.5748	3043819	B221A14600HP	16	115	65	45	48	2,70	●
14,70	.5787	3043820	B221A14700HP	16	115	65	45	48	2,71	●
14,80	.5827	3043821	B221A14800HP	16	115	65	45	48	2,73	●
14,90	.5866	3043822	B221A14900HP	16	115	65	45	48	2,75	●
15,00	.5906	3043833	B221A15000HP	16	115	65	45	48	2,77	●
15,10	.5945	3043834	B221A15100HP	16	115	65	45	48	2,79	●
15,20	.5984	3043835	B221A15200HP	16	115	65	45	48	2,81	●
15,30	.6024	3043836	B221A15300HP	16	115	65	45	48	2,82	●
15,40	.6063	3043837	B221A15400HP	16	115	65	45	48	2,84	●
15,50	.6102	3043838	B221A15500HP	16	115	65	45	48	2,86	●
15,60	.6142	3043839	B221A15600HP	16	115	65	45	48	2,88	●
15,70	.6181	3043840	B221A15700HP	16	115	65	45	48	2,90	●
15,80	.6220	3043841	B221A15800HP	16	115	65	45	48	2,92	●
15,90	.6260	3043842	B221A15900HP	16	115	65	45	48	2,94	●
16,00	.6299	3043843	B221A16000HP	16	115	65	45	48	2,95	●
16,50	.6496	3043844	B221A16500HP	18	123	73	51	48	3,05	●
17,00	.6693	3043845	B221A17000HP	18	123	73	51	48	3,14	●
17,50	.6890	3043846	B221A17500HP	18	123	73	51	48	3,23	●
17,70	.6969	3043847	B221A17700HP	18	123	73	51	48	3,27	●
18,00	.7087	3043848	B221A18000HP	18	123	73	51	48	3,32	●
18,50	.7283	3043849	B221A18500HP	20	131	79	55	50	3,42	●
19,00	.7480	3043850	B221A19000HP	20	131	79	55	50	3,51	●
19,50	.7677	3043851	B221A19500HP	20	131	79	55	50	3,60	●
20,00	.7874	3043852	B221A20000HP	20	131	79	55	50	3,69	●
20,50	.8071	3043853	B221A20500HP	20	141	86	60	50	3,78	●
21,00	.8268	3043854	B221A21000HP	20	141	86	60	50	3,88	●

To place an order, contact Kennametal or your authorized Kennametal distributor, or visit www.kennametal.com.



(F)

Tolerance			
D1	Tolerance m7	D	Tolerance h6
>3 to 6	0,004/0,016	6	0,000/-0,008
>6 to 10	0,006/0,021	8 to 10	0,000/-0,009
>10 to 18	0,007/0,025	12 to 18	0,000/-0,011
>18 to 21	0,008/0,029	20	0,000/-0,013

● first choice
○ alternate choice

	KC7315
H	
S	
N	
K	●
M	
P	●

B221HP — F-Shank

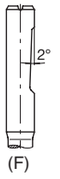
D1 mm	D1 inch	order number	catalog number	D	L	L3	L4 max	LS	L5	KC7315
3,00	.1181	3044373	B221F03000HP	6	62	20	14	36	0,55	●
3,10	.1220	3044374	B221F03100HP	6	62	20	14	36	0,57	●
3,30	.1299	3044375	B221F03300HP	6	62	20	14	36	0,61	●
3,40	.1339	3044376	B221F03400HP	6	62	20	14	36	0,63	●
3,50	.1378	3044377	B221F03500HP	6	62	20	14	36	0,65	●
3,80	.1496	3044378	B221F03800HP	6	66	24	17	36	0,70	●
4,00	.1575	3044379	B221F04000HP	6	66	24	17	36	0,74	●
4,10	.1614	3044380	B221F04100HP	6	66	24	17	36	0,76	●
4,20	.1654	3044381	B221F04200HP	6	66	24	17	36	0,78	●
4,30	.1693	3044382	B221F04300HP	6	66	24	17	36	0,79	●
4,50	.1772	3044383	B221F04500HP	6	66	24	17	36	0,83	●
4,80	.1890	3044384	B221F04800HP	6	66	28	20	36	0,89	●
4,90	.1929	3044385	B221F04900HP	6	66	28	20	36	0,90	●
5,00	.1969	3044386	B221F05000HP	6	66	28	20	36	0,92	●
5,10	.2008	3044387	B221F05100HP	6	66	28	20	36	0,94	●
5,20	.2047	3044388	B221F05200HP	6	66	28	20	36	0,96	●
5,50	.2165	3044389	B221F05500HP	6	66	28	20	36	1,02	●
5,80	.2283	3044390	B221F05800HP	6	66	28	20	36	1,07	●
5,90	.2323	3044391	B221F05900HP	6	66	28	20	36	1,09	●
6,00	.2362	3044392	B221F06000HP	6	66	28	20	36	1,11	●
6,20	.2441	3044393	B221F06200HP	8	79	34	24	36	1,14	●
6,30	.2480	3044394	B221F06300HP	8	79	34	24	36	1,16	●
6,50	.2559	3044395	B221F06500HP	8	79	34	24	36	1,20	●
6,60	.2598	3044396	B221F06600HP	8	79	34	24	36	1,22	●
6,80	.2677	3044397	B221F06800HP	8	79	34	24	36	1,26	●
6,90	.2717	3044398	B221F06900HP	8	79	34	24	36	1,27	●
7,00	.2756	3044399	B221F07000HP	8	79	34	24	36	1,29	●
7,40	.2913	3044400	B221F07400HP	8	79	41	29	36	1,37	●
7,50	.2953	3044401	B221F07500HP	8	79	41	29	36	1,38	●
7,80	.3071	3044402	B221F07800HP	8	79	41	29	36	1,44	●
7,90	.3110	3044403	B221F07900HP	8	79	41	29	36	1,46	●
8,00	.3150	3044404	B221F08000HP	8	79	41	29	36	1,48	●
8,10	.3189	3044405	B221F08100HP	10	89	47	35	40	1,50	●
8,20	.3228	3044406	B221F08200HP	10	89	47	35	40	1,51	●
8,30	.3268	3044407	B221F08300HP	10	89	47	35	40	1,53	●
8,50	.3346	3044408	B221F08500HP	10	89	47	35	40	1,57	●
8,60	.3386	3044409	B221F08600HP	10	89	47	35	40	1,59	●
8,70	.3425	3044410	B221F08700HP	10	89	47	35	40	1,61	●
8,80	.3465	3044411	B221F08800HP	10	89	47	35	40	1,62	●
9,00	.3543	3044412	B221F09000HP	10	89	47	35	40	1,66	●
9,10	.3583	3044413	B221F09100HP	10	89	47	35	40	1,68	●
9,50	.3740	3044414	B221F09500HP	10	89	47	35	40	1,75	●
9,70	.3819	3044415	B221F09700HP	10	89	47	35	40	1,79	●
9,80	.3858	3044416	B221F09800HP	10	89	47	35	40	1,81	●
9,90	.3898	3044417	B221F09900HP	10	89	47	35	40	1,83	●
10,00	.3937	3044418	B221F10000HP	10	89	47	35	40	1,85	●
10,10	.3976	3044419	B221F10100HP	12	102	55	40	45	1,86	●
10,20	.4016	3044420	B221F10200HP	12	102	55	40	45	1,88	●

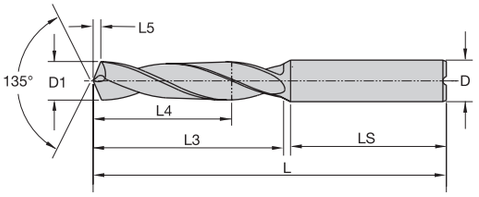
continued on next page

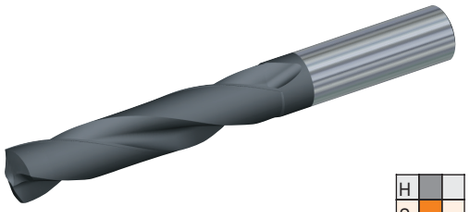
High-Performance Solid Carbide Drills

KENNAMETAL

SE Drills Without Coolant







● first choice
○ alternate choice

H	
S	
N	
K	●
M	
P	●

B221HP — F-Shank

(continued from previous page)

D1 mm	D1 inch	order number	catalog number	D	L	L3	L4 max	LS	L5	KC7315
10,30	.4055	3044421	B221F10300HP	12	102	55	40	45	1,90	●
10,40	.4094	3044422	B221F10400HP	12	102	55	40	45	1,92	●
10,50	.4134	3044423	B221F10500HP	12	102	55	40	45	1,94	●
10,60	.4173	3044424	B221F10600HP	12	102	55	40	45	1,96	●
10,70	.4213	3044425	B221F10700HP	12	102	55	40	45	1,98	●
10,80	.4252	3044426	B221F10800HP	12	102	55	40	45	1,99	●
11,00	.4331	3044427	B221F11000HP	12	102	55	40	45	2,03	●
11,10	.4370	3044428	B221F11100HP	12	102	55	40	45	2,05	●
11,20	.4409	3044429	B221F11200HP	12	102	55	40	45	2,07	●
11,50	.4528	3044430	B221F11500HP	12	102	55	40	45	2,12	●
11,70	.4606	3044431	B221F11700HP	12	102	55	40	45	2,16	●
11,80	.4646	3044432	B221F11800HP	12	102	55	40	45	2,18	●
12,00	.4724	3044433	B221F12000HP	12	102	55	40	45	2,22	●
12,10	.4764	3044434	B221F12100HP	14	107	60	43	45	2,23	●
12,20	.4803	3044435	B221F12200HP	14	107	60	43	45	2,25	●
12,30	.4843	3044436	B221F12300HP	14	107	60	43	45	2,24	●
12,50	.4921	3044437	B221F12500HP	14	107	60	43	45	2,31	●
12,70	.5000	3044438	B221F12700HP	14	107	60	43	45	2,34	●
12,80	.5039	3044439	B221F12800HP	14	107	60	43	45	2,36	●
13,00	.5118	3044440	B221F13000HP	14	107	60	43	45	2,40	●
13,20	.5197	3044441	B221F13200HP	14	107	60	43	45	2,44	●
13,50	.5315	3044442	B221F13500HP	14	107	60	43	45	2,49	●
13,70	.5394	3044443	B221F13700HP	14	107	60	43	45	2,53	●
13,80	.5433	3044444	B221F13800HP	14	107	60	43	45	2,55	●
14,00	.5512	3044445	B221F14000HP	14	107	60	43	45	2,58	●
14,10	.5551	3044446	B221F14100HP	16	115	65	45	48	2,60	●
14,20	.5591	3044447	B221F14200HP	16	115	65	45	48	2,62	●
14,30	.5630	3044448	B221F14300HP	16	115	65	45	48	2,64	●
14,50	.5709	3044449	B221F14500HP	16	115	65	45	48	2,68	●
14,60	.5748	3044450	B221F14600HP	16	115	65	45	48	2,70	●
14,80	.5827	3044451	B221F14800HP	16	115	65	45	48	2,73	●
15,00	.5906	3044452	B221F15000HP	16	115	65	45	48	2,77	●
15,30	.6024	3044453	B221F15300HP	16	115	65	45	48	2,82	●
15,50	.6102	3044454	B221F15500HP	16	115	65	45	48	2,86	●
15,80	.6220	3044455	B221F15800HP	16	115	65	45	48	2,92	●
16,00	.6299	3044456	B221F16000HP	16	115	65	45	48	2,95	●
16,50	.6496	3044457	B221F16500HP	18	123	73	51	48	3,05	●
17,00	.6693	3044458	B221F17000HP	18	123	73	51	48	3,14	●
17,50	.6890	3044459	B221F17500HP	18	123	73	51	48	3,23	●
17,70	.6969	3044460	B221F17700HP	18	123	73	51	48	3,27	●
18,00	.7087	3044461	B221F18000HP	18	123	73	51	48	3,32	●
18,50	.7283	3044462	B221F18500HP	20	131	79	55	50	3,42	●

continued on next page

Tolerance			
D1	Tolerance m7	D	Tolerance h6
>3 to 6	0,004/0,016	6	0,000/-0,008
>6 to 10	0,006/0,021	8 to 10	0,000/-0,009
>10 to 18	0,007/0,025	12 to 18	0,000/-0,011
>18 to 21	0,008/0,029	20	0,000/-0,013

● first choice
○ alternate choice

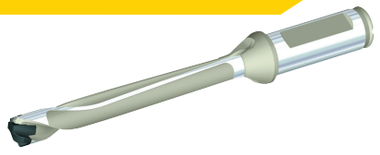
H		
S		
N		
K		●
M		
P		●

B221HP — F-Shank

(continued from previous page)

D1 mm	D1 inch	order number	catalog number	D	L	L3	L4 max	LS	L5	KC7315
19,00	.7480	3044463	B221F19000HP	20	131	79	55	50	3,51	●
19,50	.7677	3044464	B221F19500HP	20	131	79	55	50	3,60	●
20,00	.7874	3044465	B221F20000HP	20	131	79	55	50	3,69	●
20,50	.8071	3044466	B221F20500HP	20	141	86	60	50	3,78	●
21,00	.8268	3044467	B221F21000HP	20	141	86	60	50	3,88	●

KenTIP® Drills



- ***Change worn tips without removing the drill from the machine.***
- ***More cost-effective than solid carbide drills.***

DRILL-FIX DFR 4xD

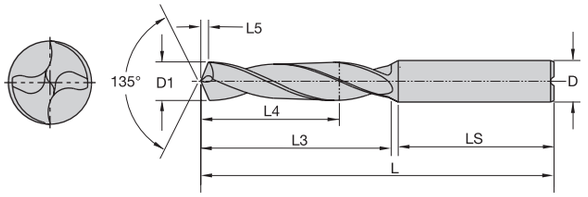
Get the security and dependability of Kennametal DFR indexable drills in a 4xD cutting depth. Exceptional performance at higher feed rates!

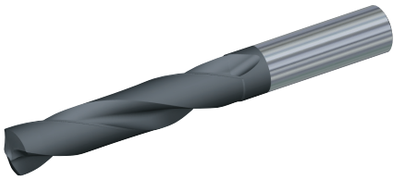
Ordering Example:
Ø 3,0 mm, straight shank without clamping flat, TiAlN-coated carbide

Type		Ø	
B221	**A**	**03000HPKC7315**	
	Shank style		grade

High-Performance Solid Carbide Drills

SE Drills Without Coolant





● first choice
○ alternate choice

H	S	N	K	M	P
			●		●

B222HP

D1 mm	D1 inch	order number	catalog number	D	L	L3	L4 max	LS	L5	KC7315
3,00	.1181	3006617	B222A03000HP	6	66	28	23	36	0,55	●
3,18	.1250	3006392	B222A03175HP	6	66	28	23	36	0,59	●
3,50	.1378	3006618	B222A03500HP	6	66	28	23	36	0,65	●
3,97	.1563	3006593	B222A03970HP	6	74	36	29	36	0,73	●
4,00	.1575	3006619	B222A04000HP	6	74	36	29	36	0,74	●
4,50	.1772	3006620	B222A04500HP	6	74	36	29	36	0,83	●
4,76	.1875	3006594	B222A04763HP	6	82	44	35	36	0,88	●
5,00	.1969	3006621	B222A05000HP	6	82	44	35	36	0,92	●
5,50	.2165	3006622	B222A05500HP	6	82	44	35	36	1,02	●
5,56	.2188	3006595	B222A05558HP	6	82	44	35	36	1,03	●
6,00	.2362	3006623	B222A06000HP	6	82	44	35	36	1,11	●
6,35	.2500	3006596	B222A06350HP	8	91	53	43	36	1,17	●
6,50	.2559	3006624	B222A06500HP	8	91	53	43	36	1,20	●
6,75	.2656	3006597	B222A06746HP	8	91	53	43	36	1,25	●
7,00	.2756	3006625	B222A07000HP	8	91	53	43	36	1,29	●
7,15	.2813	3006598	B222A07145HP	8	91	53	43	36	1,32	●
7,50	.2953	3006626	B222A07500HP	8	91	53	43	36	1,38	●
7,54	.2969	3006599	B222A07541HP	8	91	53	43	36	1,39	●
7,94	.3125	3006600	B222A07938HP	8	91	53	43	36	1,47	●
8,00	.3150	3006627	B222A08000HP	8	91	53	43	36	1,48	●
8,33	.3281	3006601	B222A08334HP	10	103	61	49	40	1,54	●
8,50	.3346	3006628	B222A08500HP	10	103	61	49	40	1,57	●
8,73	.3438	3006602	B222A08733HP	10	103	61	49	40	1,61	●
9,00	.3543	3006629	B222A09000HP	10	103	61	49	40	1,66	●
9,13	.3594	3006603	B222A09129HP	10	103	61	49	40	1,69	●
9,50	.3740	3006630	B222A095000HP	10	103	61	49	40	1,75	●
9,53	.3750	3006604	B222A09525HP	10	103	61	49	40	1,76	●
9,92	.3906	3006605	B222A09921HP	10	103	61	49	40	1,83	●
10,00	.3937	3006631	B222A10000HP	10	103	61	49	40	1,85	●
10,32	.4063	3006606	B222A10320HP	12	118	71	56	45	1,91	●
10,50	.4134	3006632	B222A10500HP	12	118	71	56	45	1,94	●
10,72	.4219	3006607	B222A10716HP	12	118	71	56	45	1,98	●
11,00	.4331	3006633	B222A11000HP	12	118	71	56	45	2,03	●
11,11	.4374	3006608	B222A11111HP	12	118	71	56	45	2,05	●
11,50	.4528	3006634	B222A11500HP	12	118	71	56	45	2,12	●
11,51	.4531	3006609	B222A11509HP	12	118	71	56	45	2,12	●
11,91	.4688	3006610	B222A11908HP	12	118	71	56	45	2,20	●

continued on next page

Tolerance			
D1	Tolerance m7	D	Tolerance h6
>3 to 6	0,004/0,016	6	0,000/-0,008
>6 to 10	0,006/0,021	8 to 10	0,000/-0,009
>10 to 18	0,007/0,025	12 to 18	0,000/-0,011
>18 to 21	0,008/0,029	20	0,000/-0,013

● first choice
○ alternate choice

	KC7315
H	
S	
N	
K	●
M	
P	●

B222HP (continued from previous page)

D1 mm	D1 inch	order number	catalog number	D	L	L3	L4 max	LS	L5	KC7315
12,00	.4724	3006635	B222A12000HP	12	118	71	56	45	2,22	●
12,30	.4844	3006611	B222A12304HP	14	124	77	60	45	2,27	●
12,50	.4921	3006636	B222A12500HP	14	124	77	60	45	2,31	●
12,70	.5000	3006612	B222A12700HP	14	124	77	60	45	2,34	●
13,00	.5118	3006637	B222A13000HP	14	124	77	60	45	2,40	●
13,50	.5315	3006638	B222A13500HP	14	124	77	60	45	2,49	●
14,00	.5512	3006639	B222A14000HP	14	124	77	60	45	2,58	●
14,29	.5625	3006613	B222A14288HP	16	133	83	63	48	2,64	●
14,50	.5709	3006640	B222A14500HP	16	133	83	63	48	2,68	●
15,00	.5906	3006641	B222A15000HP	16	133	83	63	48	2,77	●
15,50	.6102	3006642	B222A15500HP	16	133	83	63	48	2,86	●
15,88	.6250	3006614	B222A15875HP	16	133	83	63	48	2,93	●
16,00	.6299	3006643	B222A16000HP	16	133	83	63	48	2,95	●
16,50	.6496	3006644	B222A16500HP	18	143	93	71	48	3,05	●
17,00	.6693	3006645	B222A17000HP	18	143	93	71	48	3,14	●
17,46	.6875	3006615	B222A17463HP	18	143	93	71	48	3,22	●
17,50	.6890	3006646	B222A17500HP	18	143	93	71	48	3,23	●
18,00	.7087	3006647	B222A18000HP	18	143	93	71	48	3,32	●
18,50	.7283	3006648	B222A18500HP	20	153	101	77	50	3,42	●
19,00	.7480	3006649	B222A19000HP	20	153	101	77	50	3,51	●
19,05	.7500	3006616	B222A19050HP	20	153	101	77	50	3,52	●

SE221HP and SE222HP Drill Features!

- ***Drill dry or with flood coolant in steel and iron applications!***
- ***Go twice as fast, with longer tool life, versus conventional solid carbide drills!***
- ***Exceptionally smooth, advanced multi-layer coating for optimum chip evacuation!***
- ***Revolutionary point geometry produces lower cutting forces!***

Ordering Example:
Ø 3,0 mm, straight shank without clamping flat, TiAlN-coated carbide

Type		Ø	
B222	**A**	**03000HPKC7315**	
	Shank style		grade

SE221HP and SE222HP

KENNAMETAL

Cutting Data Recommendations

Flood Coolant Applications

Cutting Groups	Material Group	Composition/Structure		Tensile Strength RM (Mpa)	Hardness HB	Cutting Speed v_c: (m/min) (sfm)	Feed Rate Per Revolution by Drill Diameter: [mm/rev] (ipr)							
							3mm .1181"	4mm .1574"	6mm .2362"	8mm .3149"	10mm .3937"	12mm .4724"	16mm .6299"	20mm .7874"
1.1	Unalloyed steel, cast steel, machining steel	C = 0,10 - 0,25	Annealed, long-chipping	420	125	100 - 140	**0,08 - 0,13**	0,07 - 0,12	**0,11 - 0,19**	0,08 - 0,13	**0,07 - 0,12**	0,11 - 0,19	**0,24 - 0,40**	0,11 - 0,19
						324 - 454	**.003 - .005**	.003 - .005	**.004 - .007**	.003 - .005	**.003 - .005**	.004 - .007	**.009 - .016**	.004 - .007
1.2		C = 0,10 - 0,25	Annealed, short-chipping	420	125	110 - 150	**0,09 - 0,14**	0,07 - 0,12	**0,12 - 0,20**	0,15 - 0,25	**0,15 - 0,25**	0,20 - 0,34	**0,26 - 0,44**	0,32 - 0,54
						356 - 486	**.004 - .006**	.003 - .005	**.005 - .008**	.006 - .010	**.006 - .010**	.008 - .013	**.010 - .017**	.013 - .021
2.1		C = 0,25 - 0,55	Annealed, long-chipping	640	190	90 - 120	**0,08 - 0,13**	0,07 - 0,12	**0,11 - 0,19**	0,13 - 0,22	**0,15 - 0,25**	0,18 - 0,31	**0,24 - 0,40**	0,31 - 0,52
						292 - 389	**.003 - .005**	.003 - .005	**.004 - .007**	.005 - .009	**.006 - .010**	.007 - .012	**.009 - .016**	.012 - .020
2.2		C = 0,25 - 0,55	Annealed, short-chipping	640	190	100 - 140	**0,08 - 0,14**	0,08 - 0,13	**0,13 - 0,22**	0,16 - 0,28	**0,16 - 0,27**	0,22 - 0,38	**0,28 - 0,48**	0,34 - 0,57
						324 - 454	**.003 - .006**	.003 - .005	**.005 - .009**	.006 - .011	**.006 - .011**	.009 - .015	**.011 - .019**	.013 - .022
3		C = 0,25 - 0,55	Tempered	850	250	70 - 115	**0,09 - 0,15**	0,10 - 0,16	**0,14 - 0,23**	0,17 - 0,28	**0,20 - 0,33**	0,24 - 0,40	**0,31 - 0,52**	0,38 - 0,64
						227 - 373	**.004 - .006**	.004 - .006	**.006 - .009**	.007 - .011	**.008 - .013**	.009 - .016	**.012 - .020**	.015 - .025
4		C = 0,25 - 0,80	Annealed	915	270	70 - 115	**0,09 - 0,15**	0,10 - 0,16	**0,14 - 0,23**	0,17 - 0,28	**0,20 - 0,33**	0,24 - 0,40	**0,31 - 0,52**	0,38 - 0,64
						227 - 373	**.004 - .006**	.004 - .006	**.006 - .009**	.007 - .011	**.008 - .013**	.009 - .016	**.012 - .020**	.015 - .025
5			Tempered	1020	300	60 - 100	**0,09 - 0,15**	0,10 - 0,16	**0,14 - 0,23**	0,17 - 0,28	**0,20 - 0,33**	0,24 - 0,40	**0,31 - 0,52**	0,38 - 0,64
						194 - 324	**.004 - .006**	.004 - .006	**.006 - .009**	.007 - .011	**.008 - .013**	.009 - .016	**.012 - .020**	.015 - .025
6	Low-alloy steel, cast steel, machining steel		Annealed	610	180	70 - 115	**0,09 - 0,15**	0,09 - 0,16	**0,15 - 0,26**	0,19 - 0,31	**0,19 - 0,31**	0,25 - 0,42	**0,31 - 0,51**	0,35 - 0,59
						227 - 373	**.004 - .006**	.004 - .006	**.006 - .010**	.007 - .012	**.007 - .012**	.010 - .017	**.012 - .020**	.014 - .023
7			Tempered	930	275	60 - 100	**0,08 - 0,13**	0,08 - 0,14	**0,14 - 0,23**	0,17 - 0,28	**0,17 - 0,29**	0,22 - 0,37	**0,27 - 0,45**	0,31 - 0,52
						194 - 324	**.003 - .005**	.003 - .006	**.006 - .009**	.007 - .011	**.007 - .011**	.009 - .015	**.011 - .018**	.012 - .020
8			Tempered	1020	300	60 - 100	**0,08 - 0,13**	0,08 - 0,13	**0,12 - 0,21**	0,15 - 0,25	**0,16 - 0,27**	0,20 - 0,34	**0,25 - 0,42**	0,30 - 0,50
						194 - 324	**.003 - .005**	.003 - .005	**.005 - .008**	.006 - .010	**.006 - .011**	.008 - .013	**.010 - .017**	.012 - .020
9			Tempered	1190	350	50 - 90	**0,08 - 0,13**	0,08 - 0,13	**0,14 - 0,23**	0,17 - 0,28	**0,16 - 0,27**	0,22 - 0,37	**0,27 - 0,45**	0,31 - 0,52
						162 - 292	**.003 - .005**	.003 - .005	**.006 - .009**	.007 - .011	**.006 - .011**	.009 - .015	**.011 - .018**	.012 - .020
10	High-alloy steel, cast steel, high-alloy tool steel		Annealed	680	200	70 - 115	**0,06 - 0,10**	0,07 - 0,12	**0,10 - 0,16**	0,12 - 0,20	**0,14 - 0,23**	0,17 - 0,29	**0,22 - 0,38**	0,28 - 0,47
						227 - 373	**.002 - .004**	.003 - .005	**.004 - .006**	.005 - .008	**.006 - .009**	.007 - .011	**.009 - .015**	.011 - .019
11			Hardened and Tempered	1100	325	50 - 90	**0,06 - 0,09**	0,07 - 0,12	**0,09 - 0,15**	0,12 - 0,19	**0,14 - 0,23**	0,17 - 0,28	**0,22 - 0,36**	0,27 - 0,45
						162 - 292	**.002 - .004**	.003 - .005	**.004 - .006**	.005 - .007	**.006 - .009**	.007 - .011	**.009 - .014**	.011 - .018
15	Gray cast iron		Pearlitic/ Ferritic		180	70 - 115	**0,12 - 0,20**	0,10 - 0,17	**0,16 - 0,27**	0,19 - 0,32	**0,21 - 0,35**	0,26 - 0,43	**0,33 - 0,55**	0,40 - 0,68
						227 - 373	**.005 - .008**	.004 - .007	**.006 - .011**	.007 - .013	**.008 - .014**	.010 - .017	**.013 - .022**	.016 - .027
16			Pearlitic (Martensitic)		260	50 - 90	**0,10 - 0,16**	0,09 - 0,15	**0,13 - 0,21**	0,15 - 0,26	**0,18 - 0,31**	0,21 - 0,36	**0,29 - 0,48**	0,37 - 0,62
						162 - 292	**.004 - .006**	.004 - .006	**.005 - .008**	.006 - .010	**.007 - .012**	.008 - .014	**.011 - .019**	.015 - .024
17	Cast iron with nodular cast iron		Ferritic		160	70 - 115	**0,10 - 0,18**	0,09 - 0,15	**0,13 - 0,22**	0,15 - 0,26	**0,18 - 0,30**	0,21 - 0,35	**0,27 - 0,45**	0,34 - 0,57
						227 - 373	**.004 - .007**	.004 - .006	**.005 - .009**	.006 - .010	**.007 - .012**	.008 - .014	**.011 - .018**	.013 - .022
18			Pearlitic		250	50 - 90	**0,09 - 0,15**	0,08 - 0,13	**0,11 - 0,18**	0,12 - 0,21	**0,16 - 0,26**	0,17 - 0,29	**0,24 - 0,40**	0,32 - 0,53
						162 - 292	**.004 - .006**	.003 - .005	**.004 - .007**	.005 - .008	**.006 - .010**	.007 - .011	**.009 - .016**	.013 - .021
19	Malleable cast iron		Ferritic		130	80 - 120	**0,10 - 0,16**	0,07 - 0,12	**0,14 0,24**	0,17 0,28	**0,15 - 0,25**	0,22 - 0,37	**0,27 - 0,46**	0,33 - 0,55
						259 - 389	**.004 - .006**	.003 - .005	**.006 - .009**	.007 - .011	**.006 - .010**	.009 - .015	**.011 - .018**	.013 - .022
20			Pearlitic		230	80 - 120	**0,08 - 0,14**	0,08 - 0,13	**0,13 - 0,21**	0,15 - 0,25	**0,16 - 0,26**	0,20 - 0,33	**0,24 - 0,41**	0,28 - 0,48
						259 - 389	**.003 - .006**	.003 - .005	**.005 - .008**	.006 - .010	**.006 - .010**	.008 - .013	**.009 - .016**	.011 - .019

NOTE: These are starting condition guidelines only. The machine tool, fixturing, toolholding, part configuration, and coolant capability may significantly influence specific applications.

Use proper and safe machining practices. Make the set-up as rigid as possible.

Decrease cutting speed as material hardness increases.

Large-diameter drills require increased horsepower.

To place an order, contact Kennametal or your authorized Kennametal distributor, or visit www.kennametal.com.

Dry Applications

Cutting Groups	Material Group	Composition/Structure		Tensile Strength RM (Mpa)	Hardness HB	Cutting Speed v_c: (m/min) (sfm)	Feed Rate Per Revolution by Drill Diameter: [mm/rev] (ipr)							
							3mm .1181"	4mm .1574"	6mm .2362"	8mm .3149"	10mm .3937"	12mm .4724"	16mm .6299"	20mm .7874"
1.1	Unalloyed steel, cast steel, machining steel	C = 0,10 - 0,25	Annealed, long-chipping	420	125	60 - 90	**0,07 - 0,11**	0,07 - 0,12	**0,12 - 0,18**	0,16 - 0,24	**0,15 - 0,25**	0,24 - 0,36	**0,32 - 0,48**	0,40 - 0,60
						462 - 553	**.003 - .004**	.003 - .005	**.005 - .007**	.006 - .009	**.006 - .010**	.009 - .014	**.013 - .019**	.016 - .024
1.2		C = 0,10 - 0,25	Annealed, short-chipping	420	125	80 - 110	**0,07 - 0,12**	0,07 - 0,12	**0,14 - 0,20**	0,18 - 0,27	**0,15 - 0,25**	0,26 - 0,40	**0,35 - 0,53**	0,44 - 0,66
						504 - 595	**.003 - .005**	.003 - .005	**.006 - .008**	.007 - .011	**.006 - .010**	.010 - .016	**.014 - .021**	.017 - .026
2.1		C = 0,25 - 0,55	Annealed, long-chipping	640	190	60 - 90	**0,07 - 0,11**	0,08 - 0,13	**0,12 - 0,18**	0,16 - 0,24	**0,16 - 0,27**	0,24 - 0,36	**0,32 - 0,48**	0,40 - 0,60
						413 - 504	**.003 - .004**	.003 - .005	**.005 - .007**	.006 - .009	**.006 - .011**	.009 - .014	**.013 - .019**	.016 - .024
2.2		C = 0,25 - 0,55	Annealed, short-chipping	640	190	90 - 110	**0,07 - 0,11**	0,08 - 0,13	**0,14 - 0,20**	0,18 - 0,27	**0,16 - 0,27**	0,26 - 0,40	**0,32 - 0,48**	0,44 - 0,66
						462 - 553	**.003 - .004**	.003 - .005	**.006 - .008**	.007 - .011	**.006 - .011**	.010 - .016	**.013 - .019**	.017 - .026
3		C = 0,25 - 0,55	Tempered	850	250	60 - 90	**0,07 - 0,11**	0,10 - 0,16	**0,12 - 0,18**	0,16 - 0,24	**0,20 - 0,33**	0,24 - 0,36	**0,32 - 0,48**	0,40 - 0,60
						322 - 413	**.028 - .004**	.004 - .006	**.005 - .007**	.006 - .009	**.008 - .013**	.009 - .014	**.013 - .019**	.016 - .024
6	Low-alloy steel, cast steel, machining steel		Annealed	610	180	60 - 90	**0,05 - 0,07**	0,09 - 0,16	**0,10 - 0,15**	0,13 - 0,20	**0,19 - 0,31**	0,20 - 0,30	**0,27 - 0,40**	0,34 - 0,50
						322 - 413	**.002 - .003**	.004 - .006	**.004 - .006**	.005 - .008	**.007 - .012**	.008 - .012	**.011 - .016**	.013 - .020
10	High-alloy steel, cast steel, high-alloy tool steel		Annealed	680	200	60 - 90	**0,05 - 0,07**	0,07 - 0,12	**0,10 - 0,15**	0,13 - 0,20	**0,14 - 0,23**	0,20 - 0,30	**0,27 - 0,40**	0,34 - 0,50
						322 - 413	**.002 - .003**	.003 - .005	**.004 - .006**	.005 - .008	**.006 - .009**	.008 - .012	**.011 - .016**	.013 - .020

NOTE: These are starting condition guidelines only. The machine tool, fixturing, toolholding, part configuration, and coolant capability may significantly influence specific applications.

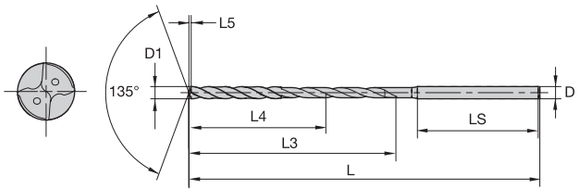
Use proper and safe machining practices. Make the set-up as rigid as possible.

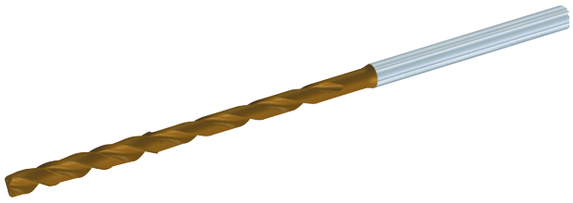
Decrease cutting speed as material hardness increases.

Large-diameter drills require increased horsepower.

High-Performance Solid Carbide Drills

SE Deep-Hole Drills With Coolant — 15xD





● first choice
○ alternate choice

H	
S	
N	
K	●
M	
P	●

B271HPG

D1 mm	D1 inch	order number	catalog number	D	L	L3	L4 max	LS	L5	KC7425
3,00	.1181	3123835	B271Z03000HPG	3	86	53	48	30	0,55	●
3,18	.1250	3128364	B271Z03180HPG	4	105	67	62	32	0,59	●
3,50	.1378	3124769	B271Z03500HPG	4	105	68	63	32	0,65	●
3,97	.1563	3128365	B271Z03970HPG	4	105	70	64	32	0,73	●
4,00	.1575	3043632	B271Z04000HPG	4	105	70	64	32	0,74	●
4,50	.1772	3128366	B271Z04500HPG	5	124	85	79	34	0,83	●
4,62	.1819	3128367	B271Z04620HPG	5	124	86	79	34	0,85	●
4,76	.1874	3128368	B271Z04760HPG	5	124	86	79	34	0,88	●
5,00	.1969	3038531	B271Z05000HPG	5	124	87	80	34	0,92	●
5,25	.2067	3128369	B271Z05250HPG	6	143	102	94	36	0,97	●
5,41	.2130	3128370	B271Z05410HPG	6	143	102	94	36	1,00	●
5,50	.2165	3128371	B271Z05500HPG	6	143	102	95	36	1,02	●
5,56	.2189	3128372	B271Z05560HPG	6	143	102	95	36	1,03	●
5,80	.2283	3128503	B271Z05800HPG	6	143	103	95	36	1,07	●
6,00	.2362	3128504	B271Z06000HPG	6	143	104	96	36	1,11	●
6,20	.2441	3128505	B271Z06200HPG	7	162	118	110	38	1,14	●
6,35	.2500	3128506	B271Z06350HPG	7	162	119	110	38	1,17	●
6,50	.2559	3128507	B271Z06500HPG	7	162	119	111	38	1,20	●
6,53	.2571	3128508	B271Z06530HPG	7	162	119	111	38	1,21	●
6,75	.2657	3128509	B271Z06750HPG	7	162	120	111	38	1,25	●
6,91	.2720	3128510	B271Z06910HPG	7	162	121	112	38	1,28	●
7,00	.2756	3092981	B271Z07000HPG	7	162	121	112	38	1,29	●
7,15	.2815	3128511	B271Z07150HPG	8	181	135	125	40	1,32	●
7,50	.2953	3128512	B271Z07500HPG	8	181	136	127	40	1,38	●
7,54	.2969	3128513	B271Z07540HPG	8	181	136	127	40	1,39	●
7,94	.3126	3128514	B271Z07940HPG	8	181	138	128	40	1,47	●
8,00	.3150	3123257	B271Z08000HPG	8	181	138	128	40	1,48	●
8,33	.3281	3128515	B271Z08333HPG	9	200	153	142	42	1,54	●
8,43	.3319	3128516	B271Z08430HPG	9	200	153	142	42	1,56	●
8,50	.3346	3128517	B271Z08500HPG	9	200	153	143	42	1,57	●
8,73	.3437	3128518	B271Z08730HPG	9	200	154	143	42	1,61	●
9,00	.3543	3128519	B271Z09000HPG	9	200	155	144	42	1,66	●
9,50	.3740	3128520	B271Z09500HPG	10	219	170	159	44	1,75	●
9,53	.3752	3128521	B271Z09530HPG	10	219	170	159	44	1,76	●
9,75	.3839	3128522	B271Z09750HPG	10	219	171	159	44	1,80	●
10,00	.3937	3128523	B271Z10000HPG	10	219	172	160	44	1,85	●

Ordering Example:

Ø 3,0 mm, straight shank without clamping flat, TiAlN-coated carbide

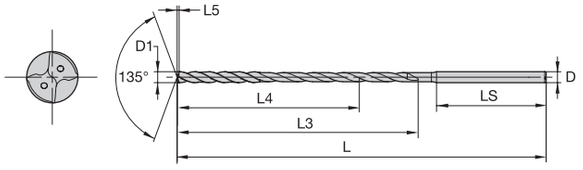
Type		Ø	
B271	**Z**	**03000HPG**	**KC7425**
	Shank style		grade

Tolerance			
D1	**Tolerance h7**	**D**	**Tolerance h6**
>3 to 6	0,000/-0,012	>3 to 6	0,000/-0,008
>6 to 10	0,000/-0,015	>6 to 10	0,000/-0,009

KENNAMETAL

High-Performance Solid Carbide Drills

SE Deep-Hole Drills With Coolant — 20xD



● first choice
○ alternate choice

H		
S		
N		
K		●
M		
P		●

B272HPG

D1 mm	D1 inch	catalog number	D	L	L3	L4 max	LS	L5	KC7425
3,00	.1181	B272Z03000HPG	3	101	68	63	30	0,55	●
3,18	.1252	B272Z03180HPG	4	125	72	67	32	0,59	●
3,50	.1378	B272Z03500HPG	4	125	79	74	32	0,65	●
3,97	.1563	B272Z03970HPG	4	125	89	83	32	0,73	●
4,00	.1575	B272Z04000HPG	4	125	90	84	32	0,74	●
4,50	.1772	B272Z04500HPG	5	149	101	95	34	0,83	●
4,62	.1819	B272Z04620HPG	5	149	104	97	34	0,85	●
4,76	.1874	B272Z04760HPG	5	149	107	100	34	0,88	●
5,00	.1969	B272Z05000HPG	5	149	112	105	34	0,92	●
5,25	.2067	B272Z05250HPG	6	173	118	110	36	0,97	●
5,41	.2130	B272Z05410HPG	6	173	121	114	36	1,00	●
5,50	.2165	B272Z05500HPG	6	173	123	116	36	1,02	●
5,56	.2189	B272Z05560HPG	6	173	125	117	36	1,03	●
5,80	.2283	B272Z05800HPG	6	173	130	122	36	1,07	●
6,00	.2362	B272Z06000HPG	6	173	134	126	36	1,11	●
6,20	.2441	B272Z06200HPG	7	197	139	130	38	1,14	●
6,35	.2500	B272Z06350HPG	7	197	142	133	38	1,17	●
6,50	.2559	B272Z06500HPG	7	197	145	137	38	1,20	●
6,53	.2571	B272Z06530HPG	7	197	146	137	38	1,21	●
6,75	.2657	B272Z06750HPG	7	197	151	142	38	1,25	●
6,91	.2720	B272Z06910HPG	7	197	154	145	38	1,28	●
7,00	.2756	B272Z07000HPG	7	197	156	147	38	1,29	●
7,15	.2815	B272Z07150HPG	8	221	160	150	40	1,32	●
7,50	.2953	B272Z07500HPG	8	221	167	158	40	1,38	●
7,54	.2969	B272Z07540HPG	8	221	168	158	40	1,39	●
7,94	.3126	B272Z07940HPG	8	221	177	167	40	1,47	●
8,00	.3150	B272Z08000HPG	8	221	178	168	40	1,48	●
8,33	.3281	B272Z08333HPG	9	245	186	175	42	1,54	●
8,43	.3319	B272Z08430HPG	9	245	188	177	42	1,56	●
8,50	.3346	B272Z08500HPG	9	245	189	179	42	1,57	●
8,73	.3437	B272Z08730HPG	9	245	194	183	42	1,61	●
9,00	.3543	B272Z09000HPG	9	245	200	189	42	1,66	●
9,50	.3740	B272Z09500HPG	10	269	211	200	44	1,75	●
9,53	.3752	B272Z09530HPG	10	269	212	200	44	1,76	●
9,75	.3839	B272Z09750HPG	10	269	217	205	44	1,80	●
10,00	.3937	B272Z10000HPG	10	269	222	210	44	1,85	●

Ordering Example:

Ø 3,0 mm, straight shank without clamping flat, TiAlN-coated carbide

Type		Ø	
B272	**Z**	**03000HPG**	**KC7425**
	Shank style		grade

Tolerance

D1	Tolerance h7	D	Tolerance h6
>3 to 6	0,000/-0,012	>3 to 6	0,000/-0,008
>6 to 10	0,000/-0,015	>6 to 10	0,000/-0,009

SE271 and SE272HPG Deep-Hole Drills

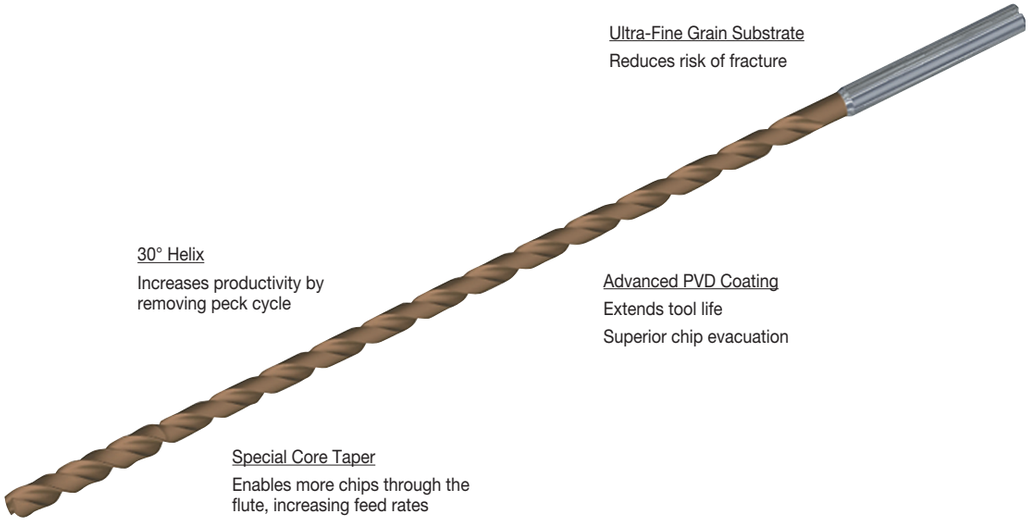
KENNAMETAL

The SE deep-hole drill offers up to 100% increase in metal removal rates (MRR) compared to competitive gun and HSS drills. It also enables up to 20% to 30% increased MRR compared to competitive solid carbide products. This MRR increase means bottom-line savings to customers just like you in through-put, machine time, and personnel hours.

Increased drill head
Reduces contact with hole wall

135° HP point geometry
Excellent centering ability

Four-Margin Design
Stability increases tool life



Ultra-Fine Grain Substrate
Reduces risk of fracture

30° Helix
Increases productivity by removing peck cycle

Advanced PVD Coating
Extends tool life
Superior chip evacuation

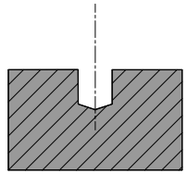
Special Core Taper
Enables more chips through the flute, increasing feed rates

To achieve the best tool performance, we recommend using the deep-hole drill with a hydraulic chuck.
Reduction sleeves are available to hold the drill shank with the hydraulic chuck.

	12mm hydraulic reducer sleeve		20mm hydraulic reducer sleeve		25mm hydraulic reducer sleeve		32mm hydraulic reducer sleeve	
drill shank Ø	order number	catalog number	order number	catalog number	order number	catalog number	order number	catalog number
3	3026450	12MHC030M	3026648	20MHC030M	3026662	25MHC030M	–	–
4	3026451	12MHC040M	3026649	20MHC040M	3026663	25MHC040M	–	–
5	3026452	12MHC050M	3026650	20MHC050M	3026664	25MHC050M	–	–
6	3026643	12MHC060M	3026651	20MHC060M	3026665	25MHC060M	3026675	32MHC060M
7	3026644	12MHC070M	3026652	20MHC070M	3026666	25MHC070M	3026676	32MHC070M
8	3026645	12MHC080M	3026653	20MHC080M	3026667	25MHC080M	3026677	32MHC080M
9	3026646	12MHC090M	3026654	20MHC090M	3026668	25MHC090M	3026678	32MHC090M
10	3026647	12MHC100M	3026655	20MHC100M	3026669	25MHC100M	3026679	32MHC100M

	.500" hydraulic reducer sleeve		.750" hydraulic reducer sleeve	
drill shank Ø	order number	catalog number	order number	catalog number
3	2248993	50HC030M	2248995	75HC030M
4	1606050	50HC040M	2248996	75HC040M
5	2248994	50HC050M	2248997	75HC050M
6	1606061	50HC060M	1093271	75HC060M
7	–	–	–	–
8	1606062	50HC080M	1093272	75HC080M
9	–	–	–	–
10	1606064	50HC100M	1093273	75HC100M

1) Pilot/Pre-Drill Hole

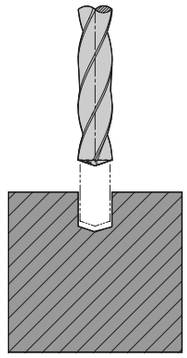


- Drill: B976A…..KC7315 or another drill with a 140° point angle
- Depth of Pilot: 3 x D
- Drill Ø = nominal Ø up to nominal + 0,010 mm (+.0004")
- Cutting Parameters: Catalog recommended feeds and speeds on next page.

Recommendations:

- Use only a conical (B976A) or split-point drill to pilot (not an SE-HP drill).
- Do not use a flat-bottom end mill or drill to pilot.
- Use a hydraulic chuck to achieve minimum TIR.
- Be sure the machine tool and setup are rigid.
- Check the pilot drill for wear. Excessive wear can lead to premature wear on the B27_Z cutting edge and possibly catastrophic failure.

2) Feed B27_Z Into Pilot Hole:



- Drill: B27_Z
- Cutting Parameters: 1,000 RPM and recommended feed rate (no rapid traverse)
- Depth: to 0,25-0,30 mm (.010-.012”) above the bottom of pilot hole

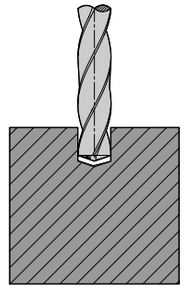
Recommendations:

The coolant channels of the B272Z are smaller than typical Kennametal drills. Be sure that a steady supply of coolant is delivered through the coolant channels to the cutting edges. If coolant supply is not steady or is unequal through both channels, check:

1. Coolant filtering system
2. Sealing of adapter/spindle
3. Chips blocking the coolant hole on the drill shank

NOTE: Reduce cutting speed to minimize imbalances in machine spindle/adapter!

3) Drill Hole:



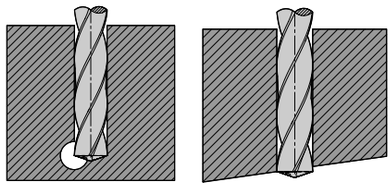
Cutting Parameters: Start recommended speed and feed rate at 0,25-0,30 mm (.010-.012”) from the bottom of the pilot hole.

Note: Feed recommendations are usually higher than with conventional solid carbide drills!

Recommendations:

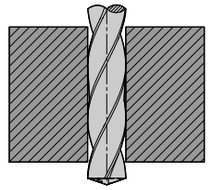
DO NOT PECK OR DWELL!

With long-chipping materials, it may be necessary to increase feed rate by 10%-20% to provide optimal chip control.



Reduce feed rate on angled exits and crossholes by 50%-60%.

4) Drill Retraction:



Cutting Parameters:1,000 RPM and recommended feed rates

NOTE: Reduce cutting speed to minimize imbalances in machine spindle/adapter!

SE271HPG and SE272HPG

KENNAMETAL

Cutting Data Recommendations

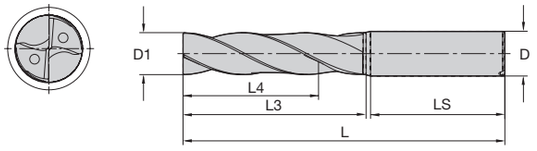
Cutting Groups	Material Group	Composition/Structure		Tensile Strength RM (Mpa)	Hardness HB	Cutting Speed v_c: (m/min) (sfm)	Feed Rate Per Revolution by Drill Diameter: [mm/rev] (ipr)			
							3 mm .1181"	5 mm .1969"	8 mm .3149"	10 mm .3937"
1.1	Unalloyed steel, cast steel, machining steel	C = 0,10 - 0,25	Annealed, long-chipping	420	125	70 - 90 230 - 300	**0,15 - 0,18** **.006 - .007**	0,18 - 0,22 .007 - .009	**0,22 - 0,30** **.009 - .012**	0,30 - 0,40 .012 - .016
1.2		C = 0,10 - 0,25	Annealed, short-chipping	420	125	70 - 90 230 - 300	**0,15 - 0,18** **.006 - .007**	0,18 - 0,22 .007 - .009	**0,22 - 0,30** **.009 - .012**	0,30 - 0,40 .012 - .016
2.1		C = 0,25 - 0,55	Annealed, long-chipping	640	190	70 - 90 230 - 300	**0,15 - 0,18** **.006 - .007**	0,18 - 0,22 .007 - .009	**0,22 - 0,30** **.009 - .012**	0,30 - 0,40 .012 - .016
2.2		C = 0,25 - 0,55	Annealed, short-chipping	640	190	70 - 90 230 - 300	**0,15 - 0,18** **.006 - .007**	0,18 - 0,22 .007 - .009	**0,22 - 0,30** **.009 - .012**	0,30 - 0,40 .012 - .016
3		C = 0,25 - 0,55	Tempered	850	250	70 - 90 230 - 300	**0,15 - 0,18** **.006 - .007**	0,18 - 0,22 .007 - .009	**0,22 - 0,30** **.009 - .012**	0,30 - 0,40 .012 - .016
4		C = 0,25 - 0,80	Annealed	915	270	70 - 90 230 - 300	**0,15 - 0,18** **.006 - .007**	0,18 - 0,22 .007 - .009	**0,22 - 0,30** **.009 - .012**	0,30 - 0,40 .012 - .016
5		C = 0,25 - 0,80	Tempered	1020	300	70 - 90 230 - 300	**0,15 - 0,18** **.006 - .007**	0,18 - 0,22 .007 - .009	**0,22 - 0,30** **.009 - .012**	0,30 - 0,40 .012 - .016
6	Low-alloy steel, cast steel, machining steel		Annealed	610	180	60 - 80 200 - 260	**0,15 - 0,18** **.006 - .007**	0,18 - 0,22 .007 - .009	**0,22 - 0,30** **.009 - .012**	0,30 - 0,40 .012 - .016
7			Tempered	930	275	60 - 80 200 - 260	**0,15 - 0,18** **.006 - .007**	0,18 - 0,22 .007 - .009	**0,22 - 0,30** **.009 - .012**	0,30 - 0,40 .012 - .016
8			Tempered	1020	300	60 - 80 200 - 260	**0,15 - 0,18** **.006 - .007**	0,18 - 0,22 .007 - .009	**0,22 - 0,30** **.009 - .012**	0,30 - 0,40 .012 - .016
9			Tempered	1190	350	60 - 80 200 - 260	**0,15 - 0,18** **.006 - .007**	0,18 - 0,22 .007 - .009	**0,22 - 0,30** **.009 - .012**	0,30 - 0,40 .012 - .016
15	Gray cast Iron		Pearlitic/ Ferritic		180	80 - 100 260 - 330	**0,17 - 0,20** **.007 - .008**	0,21 - 0,25 .008 - .010	**0,25 - 0,33** **.010 - .013**	0,33 - 0,44 .013 - .017
16			Pearlitic (Martensitic)		260	80 - 100 260 - 330	**0,17 - 0,20** **.007 - .008**	0,21 - 0,25 .008 - .010	**0,25 - 0,33** **.010 - .013**	0,33 - 0,44 .013 - .017
17	Nodular cast iron		Ferritic		160	60 - 80 200 - 260	**0,15 - 0,18** **.006 - .007**	0,18 - 0,22 .007 - .009	**0,22 - 0,30** **.009 - .012**	0,30 - 0,40 .012 - .016
18			Pearlitic		250	40 - 70 130 - 230	**0,15 - 0,18** **.006 - .007**	0,18 - 0,22 .007 - .009	**0,22 - 0,30** **.009 - .012**	0,30 - 0,40 .012 - .016
19	Malleable cast iron		Ferritic		130	80 - 100 260 - 330	**0,15 - 0,18** **.006 - .007**	0,18 - 0,22 .007 - .009	**0,22 - 0,30** **.009 - .012**	0,30 - 0,40 .012 - .016
20			Pearlitic		230	80 - 100 260 - 330	**0,15 - 0,18** **.006 - .007**	0,18 - 0,22 .007 - .009	**0,22 - 0,30** **.009 - .012**	0,30 - 0,40 .012 - .016

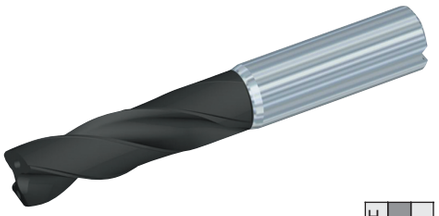
NOTE: These are starting condition guidelines only. The machine tool, fixturing, toolholding, part configuration, and coolant capability may significantly influence specific applications.

Use proper and safe machining practices. Make the set-up as rigid as possible.

Decrease dutting speed as material hardness increases.

Large-diameter drills require increased horsepower.





H	S	N	K	M	P
			●		●

● first choice
○ alternate choice

B707FBG

D1 mm	D1 inch	order number	catalog number	D	L	L3	L4 max	LS	KC7315
3,00	.1181	2887724	B707A03000FBG	6	62	20	14	36,00	●
3,50	.1378	2985272	B707A03500FBG	6	62	20	14	36,00	●
4,00	.1575	2450291	B707A04000FBG	6	66	24	17	36,00	●
4,50	.1772	2985333	B707A04500FBG	6	66	24	17	36,00	●
4,80	.1890	2655963	B707A04800FBG	6	66	28	20	36,00	●
4,90	.1929	2629032	B707A04900FBG	6	66	28	20	36,00	●
5,00	.1969	2450292	B707A05000FBG	6	66	28	20	36,00	●
5,56	.2188	2619033	B707A05560FBG	6	66	28	20	36,00	●
5,90	.2323	2660384	B707A05900FBG	6	66	28	20	36,00	●
6,00	.2362	2450343	B707A06000FBG	6	66	28	20	36,00	●
6,50	.2559	2985334	B707A06500FBG	8	79	34	24	36,00	●
7,00	.2756	2541133	B707A07000FBG	8	79	34	24	36,00	●
7,50	.2953	2634568	B707A07500FBG	8	79	41	29	36,00	●
8,00	.3150	2450344	B707A08000FBG	8	79	41	29	36,00	●
8,50	.3346	2650038	B707A08500FBG	10	89	47	35	40,00	●
8,80	.3465	2658030	B707A08800FBG	10	89	47	35	40,00	●
9,00	.3543	2652755	B707A09000FBG	10	89	47	35	40,00	●
9,50	.3740	2985335	B707A09500FBG	10	89	47	35	40,00	●
10,00	.3937	2607377	B707A10000FBG	10	89	47	35	40,00	●
11,00	.4331	2499516	B707A11000FBG	12	102	55	40	45,00	●
11,57	.4555	2628928	B707A11570FBG	12	102	55	40	45,00	●
11,70	.4606	2657603	B707A11700FBG	12	102	55	40	45,00	●
11,80	.4646	2639052	B707A11800FBG	12	102	55	40	45,00	●
12,00	.4724	2629368	B707A12000FBG	12	102	55	40	45,00	●
12,80	.5039	2636514	B707A12800FBG	14	107	60	43	45,00	●
13,00	.5118	2450345	B707A13000FBG	14	107	60	43	45,00	●
14,00	.5512	2985336	B707A14000FBG	14	107	60	43	45,00	●
14,50	.5709	2957497	B707A14500FBG	16	115	65	45	48,00	●
15,00	.5906	2646000	B707A15000FBG	16	115	65	45	48,00	●
15,25	.6004	2639144	B707A15250FBG	16	115	65	45	48,00	●
16,00	.6299	2623070	B707A16000FBG	16	115	65	45	48,00	●
17,00	.6693	2582790	B707A17000FBG	18	123	73	51	48,00	●
18,00	.7087	2633016	B707A18000FBG	18	123	73	51	48,00	●
19,00	.7480	2896948	B707A19000FBG	20	131	79	55	50,00	●
20,00	.7874	2450346	B707A20000FBG	20	131	79	55	50,00	●
21,00	.8268	2594849	B707A21000FBG	20	141	86	60	50,00	●

Ordering Example:

Ø 3,0 mm, straight shank without clamping flat, TiAlN-coated carbide

Type		Ø	
B707	**A**	**03000FBG**	**KC7315**
	Shank style		Grade

Tolerance

D1	Tolerance m7	D	Tolerance h6
>3 to 6	0,004/0,016	6	0,000/-0,008
>6 to 10	0,006/0,021	8 to 10	0,000/-0,009
>10 to 18	0,007/0,025	12 to 18	0,000/-0,011
>18 to 21	0,008/0,029	20	0,000/-0,013

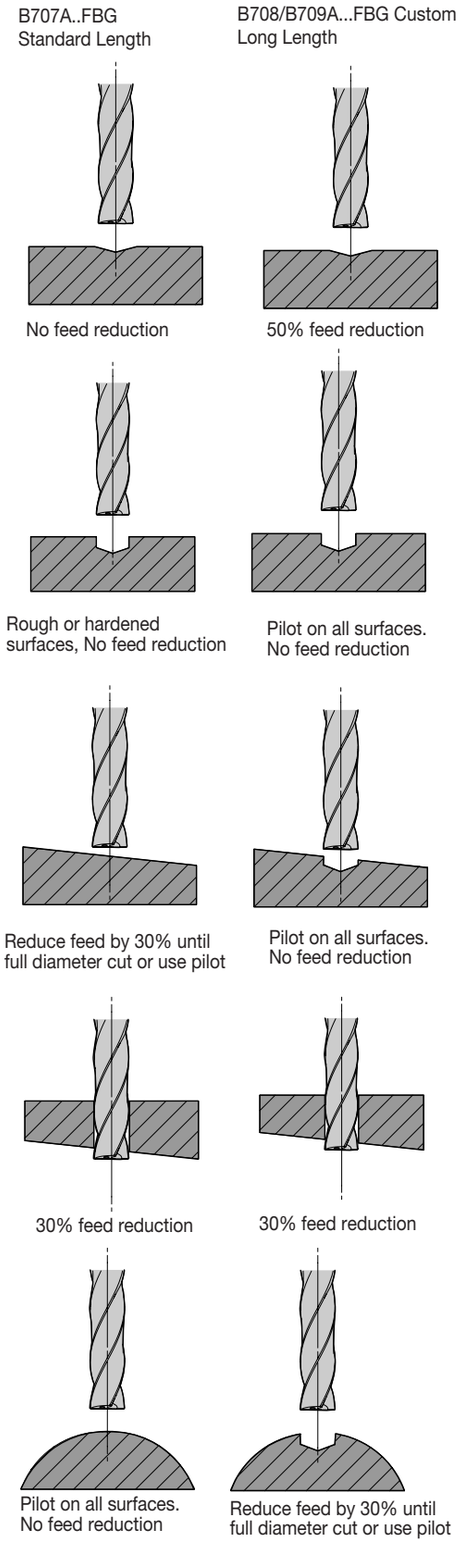
SE707FBG Flat-Bottom Drills

KENNAMETAL

The new SE707FBG drill eliminates the traditional two-step process to create a flat-bottom hole using a drill and end mill, and can perform the operation 25% to 40% faster.

The SE707FBG also eliminates the two-step process on inclined surfaces of using an end mill to pre-machine a flat on the workpiece material.

Workpiece/Application



Cutting Groups	Material Group	Composition/Structure		Tensile Strength RM (Mpa)	Hardness HB	Cutting Speed v_c (m/min) (sfm)	Feed Rate Per Revolution by Drill Diameter: [mm/rev] (ipr)					
							3 mm .1181"	6mm .2362"	8 mm .3149"	12 mm .4724"	16 mm .6299"	18 mm .7087"
1.1	Unalloyed steel, cast steel, machining steel	C = 0,10 - 0,25	Annealed, long-chipping	420	125	140 - 168	**0,07 - 0,12**	0,10 - 0,17	**0,13 - 0,21**	0,17 - 0,28	**0,19 - 0,32**	0,22 - 0,36
						462 - 553	**.003 - .005**	.004 - .007	**.005 - .008**	.007 - .011	**.007 - .013**	.009 - .014
1.2		C = 0,10 - 0,25	Annealed, short-chipping	420	125	154 - 182	**0,07 - 0,12**	0,10 - 0,17	**0,13 - 0,21**	0,17 - 0,28	**0,19 - 0,32**	0,22 - 0,36
						504 - 595	**.003 - .005**	.004 - .007	**.005 - .008**	.007 - .011	**.007 - .013**	.009 - .014
2.1		C = 0,25 - 0,55	Annealed, long-chipping	640	190	126 - 154	**0,08 - 0,13**	0,11 - 0,19	**0,14 - 0,23**	0,18 - 0,30	**0,21 - 0,35**	0,24 - 0,39
						413 - 504	**.003 - .005**	.004 - .007	**.006 - .009**	.007 - .012	**.008 - .014**	.009 - .015
2.2		C = 0,25 - 0,55	Annealed, short-chipping	640	190	140 - 168	**0,08 - 0,13**	0,11 - 0,19	**0,14 - 0,23**	0,18 - 0,30	**0,21 - 0,35**	0,24 - 0,39
						462 - 553	**.003 - .005**	.004 - .007	**.006 - .009**	.007 - .012	**.008 - .014**	.009 - .015
3		C = 0,25 - 0,55	Tempered	850	250	98 - 126	**0,10 - 0,16**	0,14 - 0,23	**0,17 - 0,29**	0,22 - 0,37	**0,26 - 0,44**	0,29 - 0,49
						322 - 413	**.004 - .006**	.006 - .009	**.007 - .011**	.009 - .015	**.010 - .017**	.011 - .019
4		C = 0,25 - 0,80	Annealed	850	250	98 - 126	**0,10 - 0,16**	0,14 - 0,23	**0,17 - 0,29**	0,22 - 0,37	**0,26 - 0,44**	0,29 - 0,36
						322 - 413	**.004 - .006**	.006 - .009	**.007 - .011**	.009 - .015	**.010 - .017**	.011 - .014
5			Tempered	1020	300	84 - 112	**0,10 - 0,16**	0,14 - 0,23	**0,17 - 0,29**	0,22 - 0,37	**0,26 - 0,44**	0,29 - 0,36
						273 - 364	**.004 - .006**	.006 - .009	**.007 - .011**	.009 - .015	**.010 - .017**	.011 - .014
6	Low-alloy steel, cast steel, machining steel		Annealed	610	180	98 - 126	**0,09 - 0,16**	0,13 - 0,22	**0,16 - 0,27**	0,21 - 0,35	**0,25 - 0,41**	0,28 - 0,46
						322 - 413	**.004 - .006**	.005 - .009	**.006 - .011**	.008 - .014	**.010 - .016**	.011 - .018
7			Tempered	930	275	84 - 112	**0,08 - 0,14**	0,11 - 0,20	**0,15 - 0,25**	0,19 - 0,32	**0,23 - 0,38**	0,25 - 0,42
						273 - 364	**.003 - .006**	.004 - .008	**.006 - .010**	.007 - .013	**.009 - .015**	.010 - .017
8			Tempered	1020	300	84 - 112	**0,08 - 0,13**	0,11 - 0,19	**0,14 - 0,23**	0,18 - 0,30	**0,21 - 0,35**	0,24 - 0,39
						273 - 364	**.003 - .005**	.004 - .007	**.006 - .009**	.007 - .012	**.008 - .014**	.009 - .015
9			Tempered	1190	350	70 - 98	**0,08 - 0,13**	0,11 - 0,19	**0,14 - 0,23**	0,18 - 0,30	**0,21 - 0,35**	0,24 - 0,39
						231 - 322	**.003 - .005**	.004 - .007	**.006 - .009**	.007 - .012	**.008 - .014**	.009 - .015
10	High-alloy steel, cast steel, high-alloy tool steel		Annealed	680	200	98 - 126	**0,07 - 0,12**	0,10 - 0,16	**0,12 - 0,20**	0,16 - 0,26	**0,18 - 0,31**	0,21 - 0,34
						322 - 413	**.003 - .005**	.004 - .006	**.005 - .008**	.006 - .010	**.007 - .012**	.008 - .013
11			Hardened and Tempered	1100	325	70 - 98	**0,07 - 0,12**	0,10 - 0,16	**0,12 - 0,20**	0,16 - 0,26	**0,18 - 0,31**	0,21 - 0,34
						231 - 322	**.003 - .005**	.004 - .006	**.005 - .008**	.006 - .010	**.007 - .012**	.008 - .013
15	Gray cast Iron		Pearlitic/ Ferritic		180	98 - 126	**0,10 - 0,17**	0,15 - 0,25	**0,18 - 0,31**	0,24 - 0,39	**0,28 - 0,46**	0,31 - 0,52
						322 - 413	**.004 - .007**	.006 - .010	**.007 - .012**	.009 - .015	**.011 - .018**	.012 - .020
16			Pearlitic (Martensitic)		260	70 - 98	**0,09 - 0,15**	0,13 - 0,22	**0,16 - 0,26**	0,20 - 0,34	**0,24 - 0,40**	0,27 - 0,45
						231 - 322	**.004 - .006**	.005 - .009	**.006 - .010**	.008 - .013	**.009 - .016**	.011 - .018
17	Cast iron with nodular cast iron		Ferritic		160	98 - 126	**0,09 - 0,15**	0,12 - 0,21	**0,15 - 0,26**	0,20 - 0,33	**0,23 - 0,39**	0,26 - 0,44
						322 - 413	**.004 - .006**	.005 - .008	**.006 - .010**	.008 - .013	**.009 - .015**	.010 - .017
18			Pearlitic		250	70 - 98	**0,08 - 0,13**	0,11 - 0,18	**0,14 - 0,23**	0,17 - 0,29	**0,21 - 0,34**	0,23 - 0,38
						231 - 322	**.003 - .005**	.004 - .007	**.006 - .009**	.007 - .011	**.008 - .013**	.009 - .015
19	Malleable cast iron		Ferritic		130	112 - 140	**0,07 - 0,12**	0,11 - 0,18	**0,13 - 0,22**	0,17 - 0,28	**0,20 - 0,33**	0,22 - 0,37
						364 - 462	**.003 - .005**	.004 - .007	**.005 - .009**	.007 - .011	**.008 - .013**	.009 - .015
20			Pearlitic		230	112 - 140	**0,08 - 0,13**	0,11 - 0,19	**0,14 - 0,23**	0,18 - 0,30	**0,21 - 0,35**	0,23 - 0,39
						364 - 462	**.003 - .005**	.004 - .007	**.006 - .009**	.007 - .012	**.008 - .014**	.009 - .015

NOTE: These are starting condition guidelines only. The machine tool, fixturing, toolholding, part configuration, and coolant capability may significantly influence specific applications.

Use proper and safe machining practices. Make the set-up as rigid as possible.

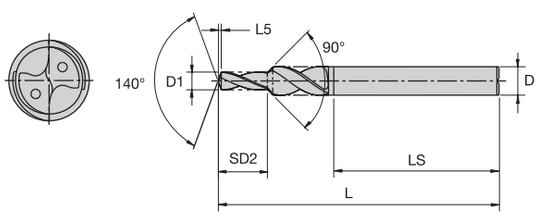
Decrease cutting speed as material hardness increases.

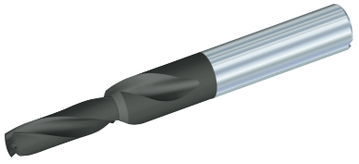
Large-diameter drills require increased horsepower.

High-Performance Solid Carbide Drills

KENNAMETAL

Step Drills With Coolant



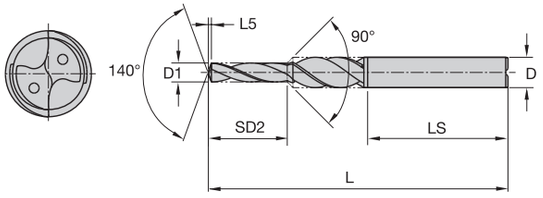


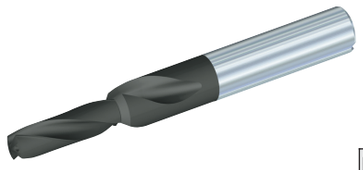
● first choice
○ alternate choice

H	S	N	K	M	P	KC7315
			●		●	●

■ B731HP

D1 mm	D1 inch	order number	catalog number	D	L	SD2	LS	L5	KC7315
4,20	.1654	3022101	B731A04200HP	6	66	13	36	0,68	●
5,00	.1969	3022102	B731A05000HP	8	79	15	36	0,81	●
6,80	.2677	3022383	B731A06800HP	10	89	18	40	1,10	●
8,50	.3346	3022384	B731A08500HP	12	102	21	45	1,37	●
10,20	.4016	3022385	B731A10200HP	14	107	25	45	1,65	●
10,50	.4134	3022386	B731A10500HP	14	107	25	45	1,70	●
12,00	.4724	3022387	B731A12000HP	16	115	30	48	1,94	●
12,50	.4921	3022388	B731A12500HP	16	115	30	48	2,02	●
14,00	.5512	3022389	B731A14000HP	18	123	33	48	2,26	●





● first choice
○ alternate choice

H	S	N	K	M	P	KC7315
			●		●	●

■ B732HP

D1 mm	D1 inch	order number	catalog number	D	L	SD2	LS	L5	KC7315
4,20	.1654	3022390	B732A04200HP	6	66	18	36	0,68	●
5,00	.1969	3022391	B732A05000HP	8	79	22	36	0,81	●
6,80	.2677	3022392	B732A06800HP	10	89	27	40	1,10	●
8,50	.3346	3022393	B732A08500HP	12	102	32	45	1,37	●
10,20	.4016	3022394	B732A10200HP	14	107	38	45	1,65	●
10,50	.4134	3022395	B732A10500HP	14	107	38	45	1,70	●
12,00	.4724	3022396	B732A12000HP	16	115	43	48	1,94	●
12,50	.4921	3022397	B732A12500HP	16	115	43	48	2,02	●
14,00	.5512	3022398	B732A14000HP	18	123	47	48	2,26	●

Ordering Example:

Ø 4,2 mm, straight shank without clamping flat, TiAlN-coated carbide

Type		Ø
B732	**A**	**04200HPKC7315**
	Shank style	Grade

Tolerance

D1	Tolerance m7	D	Tolerance h6
>3 to 6	0,004/0,016	6	0,000/-0,008
>6 to 10	0,006/0,021	8 to 10	0,000/-0,009
>10 to 14	0,007/0,025	12 to 18	0,000/-0,011

To place an order, contact Kennametal or your authorized Kennametal distributor, or visit www.kennametal.com.

Cutting Groups	Material Group	Composition/Structure		Tensile Strength RM (Mpa)	Hardness HB	Cutting Speed v_c: (m/min) (sfm)	Feed Rate Per Revolution by Drill Diameter: [mm/rev] (ipr)				
							3 mm .1181"	6 mm .2362"	8 mm .3150"	12 mm .4724"	16 mm .6299"
1.1	Unalloyed steel, cast steel, machining steel	C = 0,10 - 0,25	Annealed, long-chipping	420	125	200 - 240	**0,07 - 0,11**	0,10 - 0,17	**0,13 - 0,21**	0,17 - 0,28	**0,19 - 0,32**
						660 - 790	**.003 - .004**	.004 - .007	**.005 - .008**	.007 - .011	**.007 - .013**
1.2		C = 0,10 - 0,25	Annealed, short-chipping	420	125	220 - 260	**0,07 - 0,11**	0,10 - 0,17	**0,13 - 0,21**	0,17 - 0,28	**0,19 - 0,32**
						720 - 850	**.003 - .004**	.004 - .007	**.005 - .008**	.007 - .011	**.007 - .013**
2.1		C = 0,25 - 0,55	Annealed, long-chipping	640	190	180 - 220	**0,08 - 0,13**	0,11 - 0,19	**0,14 - 0,23**	0,18 - 0,30	**0,21 - 0,35**
						590 - 720	**.003 - .005**	.004 - .007	**.006 - .009**	.007 - .012	**.008 - .014**
2.2		C = 0,25 - 0,55	Annealed, short-chipping	640	190	200 - 240	**0,08 - 0,13**	0,11 - 0,19	**0,14 - 0,23**	0,18 - 0,30	**0,21 - 0,35**
						660 - 790	**.003 - .005**	.004 - .007	**.006 - .009**	.007 - .012	**.008 - .014**
3		C = 0,25 - 0,55	Tempered	850	250	140 - 180	**0,10 - 0,16**	0,14 - 0,23	**0,17 - 0,29**	0,22 - 0,37	**0,26 - 0,44**
						460 - 590	**.004 - .006**	.006 - .009	**.007 - .011**	.009 - .015	**.010 - .017**
4		C = 0,25 - 0,80	Annealed	915	270	140 - 180	**0,10 - 0,16**	0,14 - 0,23	**0,17 - 0,29**	0,22 - 0,37	**0,26 - 0,44**
						460 - 590	**.004 - .006**	.006 - .009	**.007 - .011**	.009 - .015	**.010 - .017**
5		C = 0,25 - 0,80	Tempered	1020	300	120 - 160	**0,10 - 0,16**	0,14 - 0,23	**0,17 - 0,29**	0,22 - 0,37	**0,26 - 0,44**
						390 - 520	**.004 - .006**	.006 - .009	**.007 - .011**	.009 - .015	**.010 - .017**
6	Low-alloy steel, cast steel, machining steel		Annealed	610	180	140 - 180	**0,09 - 0,16**	0,13 - 0,22	**0,16 - 0,27**	0,21 - 0,35	**0,25 - 0,41**
						460 - 590	**.004 - .006**	.005 - .009	**.006 - .011**	.008 - .014	**.010 - .016**
7			Tempered	930	275	120 - 160	**0,08 - 0,14**	0,11 - 0,20	**0,15 - 0,25**	0,19 - 0,32	**0,23 - 0,38**
						390 - 520	**.003 - .006**	.004 - .008	**.006 - .010**	.007 - .013	**.009 - .015**
8			Tempered	1020	300	120 - 160	**0,08 - 0,13**	0,11 - 0,19	**0,14 - 0,23**	0,18 - 0,30	**0,21 - 0,35**
						390 - 520	**.003 - .005**	.004 - .007	**.006 - .009**	.007 - .012	**.008 - .014**
9			Tempered	1190	350	100 - 140	**0,08 - 0,13**	0,11 - 0,19	**0,14 - 0,23**	0,18 - 0,30	**0,21 - 0,35**
						330 - 460	**.003 - .005**	.004 - .007	**.006 - .009**	.007 - .012	**.008 - .014**
10	High-alloy steel, cast steel, high-alloy tool steel		Pearlitic/ Ferritic	680	200	140 - 180	**0,07 - 0,12**	0,10 - 0,16	**0,12 - 0,20**	0,16 - 0,26	**0,18 - 0,31**
						460 - 590	**.003 - .005**	.004 - .006	**.005 - .008**	.006 - .010	**.007 - .012**
11			Pearlitic (Martensitic)	1100	325	100 - 140	**0,07 - 0,12**	0,10 - 0,16	**0,12 - 0,20**	0,16 - 0,26	**0,18 - 0,31**
						330 - 460	**.003 - .005**	.004 - .006	**.005 - .008**	.006 - .010	**.007 - .012**
15	Gray cast Iron		Ferritic		180	140 - 180	**0,10 - 0,17**	0,15 - 0,25	**0,18 - 0,31**	0,24 - 0,39	**0,28 - 0,46**
						460 - 590	**.004 - .007**	.006 - .010	**.007 - .012**	.009 - .015	**.011 - .018**
16			Pearlitic		260	100 - 140	**0,09 - 0,15**	0,13 - 0,22	**0,16 - 0,26**	0,20 - 0,34	**0,24 - 0,40**
						330 - 460	**.004 - .006**	.005 - .009	**.006 - .010**	.008 - .013	**.009 - .016**
17	Cast iron with nodular cast iron		Ferritic		160	140 - 180	**0,09 - 0,15**	0,12 - 0,21	**0,15 - 0,26**	0,20 - 0,33	**0,23 - 0,39**
						460 - 590	**.004 - .006**	.005 - .008	**.006 - .010**	.008 - .013	**.009 - .015**
18			Pearlitic		250	100 - 140	**0,08 - 0,13**	0,11 - 0,18	**0,14 - 0,23**	0,17 - 0,29	**0,21 - 0,34**
						330 - 460	**.003 - .005**	.004 - .007	**.006 - .009**	.007 - .011	**.008 - .013**
19	Malleable cast iron		Ferritic		130	160 - 200	**0,07 - 0,12**	0,11 - 0,18	**0,13 - 0,22**	0,17 - 0,28	**0,20 - 0,33**
						520 - 660	**.003 - .005**	.004 - .007	**.005 - .009**	.007 - .011	**.008 - .013**
20			Pearlitic		230	160 - 200	**0,08 - 0,13**	0,11 - 0,19	**0,14 - 0,23**	0,18 - 0,30	**0,21 - 0,35**
						520 - 660	**.003 - .005**	.004 - .007	**.006 - .009**	.007 - .012	**.008 - .014**

NOTE: These are starting condition guidelines only. The machine tool, fixturing, toolholding, part configuration, and coolant capability may significantly influence specific applications.

Use proper and safe machining practices. Make the set-up as rigid as possible.

Decrease cutting speed as material hardness increases.

Large-diameter drills require increased horsepower.

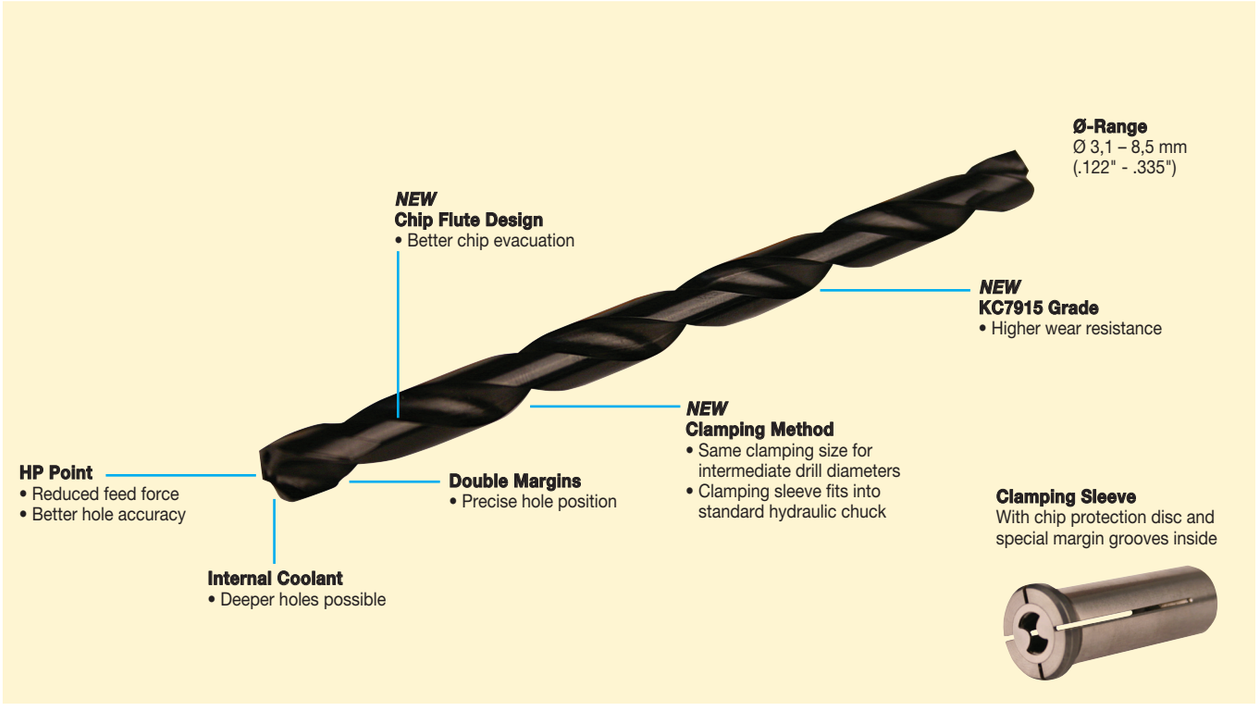
2x2 Drill

KENNAMETAL

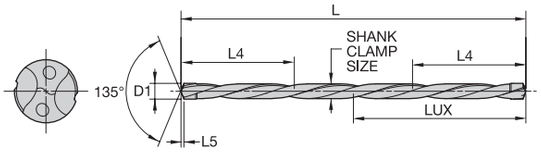
Features and Benefits

The New Kennametal 2x2 Drill

The Kennametal 2x2 Drill presents a revolutionary new concept in drilling. This product offers two unique features. First, it has two cutting edges. Use one side, then the second side, and recycle the drill (or throw it away). No more regrinding!
Second, this 2x2 Drill is the first ever to be made with MT-CVD alumina (Al_2O_3) coating. This enables higher cutting speeds and provides superior tool life compared to the conventional PVD used on virtually all other carbide drills.



FEATURES	FUNCTION	BENEFIT
Throw-away design	• Eliminates regrinding	• Consistent performance • No offsets on the machine • No presetting necessary • Higher quality holes • Reduce administrative costs
Patented HP point	• High metal removal rate	• Up to 50% shorter cycle times • Up to 4X longer tool life • Cost per hole is lower than other solid carbide drills
Internal coolant	• Secure chip evacuation	• Improved surface finish • Reduced drill breakage
Four margins	• Better guiding	• Accurate hole positioning • Better hole roundness
Clamping on round portion of drill	• Allows one diameter range for each clamping sleeve	• Intermediate drill diameters use standard clamping sleeve • Precise clamping
MT-CVD KC7915 coating	• Better hot hardness at higher cutting speeds • Improved adhesion to the substrate	• Longer tool life compared to conventional PVD coatings • Reduced cost per hole • Less time needed for change of drill and set up
Approximately 7xD drilling depth	• Covers regular and extra long drill series	• Wider application range



2x2 HPGM

● first choice
○ alternate choice

H													
S													
N													
K													●
M													
P													●

D1 mm	D1 inch	D1 fraction	order number	catalog number	L	L4 max mm	L4 max inch	L5	LUX*	clamping sleeve	drill sealing cap	shank clamp size	KC7915
3,10	.1220	—	3006773	2X2D03100R7HPGM	70	23,1	.909	0,57	32,8	280.488	360.685	AA	●
3,17	.1250	1/8	3006829	2X2D03170R7HPGM	70	23,1	.909	0,58	32,8	280.488	360.685	AA	●
3,20	.1260	—	3006774	2X2D03200R7HPGM	70	23,1	.909	0,59	32,8	280.488	360.685	AA	●
3,30	.1299	—	2631709	2X2D03300R7HPGM	70	23,1	.909	0,61	32,8	280.488	360.685	AA	●
3,40	.1339	—	3006775	2X2D03400R7HPGM	70	23,1	.909	0,63	32,8	280.488	360.685	AA	●
3,50	.1378	—	3006776	2X2D03500R7HPGM	70	25,9	1.020	0,65	35,6	280.489	360.686	BB	●
3,57	.1406	9/64	3006830	2X2D03570R7HPGM	70	25,9	1.020	0,66	35,6	280.489	360.686	BB	●
3,60	.1417	—	3006777	2X2D03600R7HPGM	70	25,9	1.020	0,66	35,6	280.489	360.686	BB	●
3,70	.1457	—	3006778	2X2D03700R7HPGM	70	25,9	1.020	0,68	35,6	280.489	360.686	BB	●
3,80	.1496	—	3006779	2X2D03800R7HPGM	70	28,7	1.130	0,70	39,5	280.490	360.687	CC	●
3,90	.1535	—	3006780	2X2D03900R7HPGM	70	28,7	1.130	0,72	39,5	280.490	360.687	CC	●
3,97	.1563	5/32	3006781	2X2D03970R7HPGM	70	28,7	1.130	0,73	39,5	280.490	360.687	CC	●
4,00	.1575	—	3006782	2X2D04000R7HPGM	70	28,7	1.130	0,74	39,5	280.490	360.687	CC	●
4,10	.1614	—	3006783	2X2D04100R7HPGM	70	28,7	1.130	0,76	39,5	280.490	360.687	CC	●
4,20	.1654	—	3006784	2X2D04200R7HPGM	79	29,4	1.158	0,78	40,2	280.491	360.688	DD	●
4,30	.1693	—	3006785	2X2D04300R7HPGM	79	29,4	1.158	0,79	40,2	280.491	360.688	DD	●
4,40	.1732	—	3006786	2X2D04400R7HPGM	79	29,4	1.158	0,81	40,2	280.491	360.688	DD	●
4,50	.1772	—	3006787	2X2D04500R7HPGM	79	29,4	1.158	0,83	40,2	280.491	360.688	DD	●
4,62	.1820	—	3006788	2X2D04620R7HPGM	79	34,3	1.350	0,85	45,3	280.492	360.689	EE	●
4,76	.1874	3/16	3006789	2X2D04760R7HPGM	79	34,3	1.350	0,88	45,3	280.492	360.689	EE	●
4,80	.1890	—	3006790	2X2D04800R7HPGM	79	34,3	1.350	0,89	45,3	280.492	360.689	EE	●
5,00	.1969	—	2631710	2X2D05000R7HPGM	79	35,0	1.378	0,92	46,0	280.493	360.690	FF	●
5,10	.2008	—	3006791	2X2D05100R7HPGM	79	35,0	1.378	0,94	46,0	280.493	360.690	FF	●
5,20	.2047	—	3006792	2X2D05200R7HPGM	79	35,0	1.378	0,96	46,0	280.493	360.690	FF	●
5,30	.2087	—	3006793	2X2D05300R7HPGM	79	35,0	1.378	0,98	46,0	280.493	360.690	FF	●
5,40	.2126	—	3006794	2X2D05400R7HPGM	79	35,0	1.378	1,00	46,0	280.493	360.690	FF	●
5,41	.2130	—	3006795	2X2D05410R7HPGM	95	41,3	1.626	1,00	52,5	280.494	360.691	GG	●
5,50	.2165	—	3006796	2X2D05500R7HPGM	95	41,3	1.626	1,02	52,5	280.494	360.691	GG	●
5,56	.2188	7/32	3006797	2X2D05560R7HPGM	95	41,3	1.626	1,03	52,5	280.494	360.691	GG	●
5,80	.2283	—	3006798	2X2D05800R7HPGM	95	41,3	1.626	1,07	52,5	280.494	360.691	GG	●
6,00	.2362	—	3006799	2X2D06000R7HPGM	102	45,5	1.791	1,11	58,8	280.495	360.692	HH	●
6,10	.2402	—	3006800	2X2D06100R7HPGM	102	45,5	1.791	1,13	58,8	280.495	360.692	HH	●
6,20	.2441	—	3006801	2X2D06200R7HPGM	102	45,5	1.791	1,14	58,8	280.495	360.692	HH	●
6,30	.2480	—	3006802	2X2D06300R7HPGM	102	45,5	1.791	1,16	58,8	280.495	360.692	HH	●

Sealing cap included with drill.

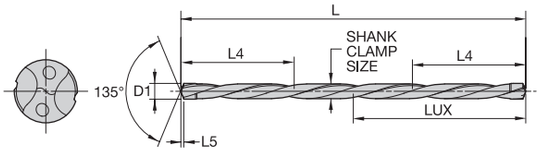
*LUX is overhang length identified in diagram on page 59.

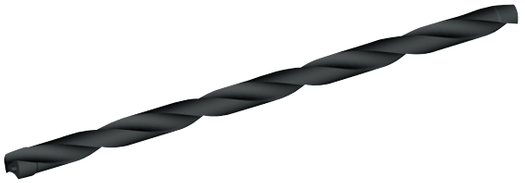
NOTE: Match shank clamp size to clamping sleeve on page 59.

continued on next page

High-Performance Modular Drills

2x2 Drills





2x2 HPGM

(continued from previous page)

● first choice
○ alternate choice

H	
S	
N	
K	●
M	
P	●

mm	D1 inch	fraction	order number	catalog number	L	L4 max mm	L4 max inch	L5	LUX*	clamping sleeve	drill sealing cap	shank clamp size	KC7915
6,35	.2500	1/4	3006803	2X2D06350R7HPGM	102	45,5	1.791	1,17	58,8	280.495	360.692	HH	●
6,40	.2520	–	3006804	2X2D06400R7HPGM	102	45,5	1.791	1,18	58,8	280.495	360.692	HH	●
6,50	.2559	–	3006805	2X2D06500R7HPGM	102	45,5	1.791	1,20	58,8	280.495	360.692	HH	●
6,53	.2570	–	3006806	2X2D06530R7HPGM	105	47,6	1.874	1,20	61,0	280.496	360.693	JJ	●
6,60	.2598	–	3006807	2X2D06600R7HPGM	105	47,6	1.874	1,22	61,0	280.496	360.693	JJ	●
6,75	.2656	17/64	3006808	2X2D06750R7HPGM	105	47,6	1.874	1,25	61,0	280.496	360.693	JJ	●
6,80	.2677	–	3006809	2X2D06800R7HPGM	105	47,6	1.874	1,26	61,0	280.496	360.693	JJ	●
6,90	.2717	–	3006810	2X2D06900R7HPGM	105	47,6	1.874	1,27	61,0	280.496	360.693	JJ	●
6,91	.2720	–	3006811	2X2D06910R7HPGM	105	47,6	1.874	1,28	61,0	280.496	360.693	JJ	●
7,00	.2756	–	3006812	2X2D07000R7HPGM	105	47,6	1.874	1,29	61,0	280.496	360.693	JJ	●
7,10	.2795	–	3006813	2X2D07100R7HPGM	115	53,2	2.095	1,31	67,7	280.497	360.694	KK	●
7,15	.2813	9/32	3006814	2X2D07150R7HPGM	115	53,2	2.095	1,32	67,7	280.497	360.694	KK	●
7,20	.2835	–	3006815	2X2D07200R7HPGM	115	53,2	2.095	1,33	67,7	280.497	360.694	KK	●
7,40	.2913	–	3006816	2X2D07400R7HPGM	115	53,2	2.095	1,37	67,7	280.497	360.694	KK	●
7,50	.2953	–	3006817	2X2D07500R7HPGM	115	53,2	2.095	1,38	67,7	280.497	360.694	KK	●
7,54	.2969	19/64	3006818	2X2D07540R7HPGM	115	53,2	2.095	1,39	67,7	280.497	360.694	KK	●
7,70	.3031	–	3006819	2X2D07700R7HPGM	120	56,7	2.232	1,42	72,3	280.498	360.695	MM	●
7,80	.3071	–	3006820	2X2D07800R7HPGM	120	56,7	2.232	1,44	72,3	280.498	360.695	MM	●
7,90	.3110	–	3006821	2X2D07900R7HPGM	120	56,7	2.232	1,46	72,3	280.498	360.695	MM	●
7,94	.3125	5/16	3006822	2X2D07940R7HPGM	120	56,7	2.232	1,47	72,3	280.498	360.695	MM	●
8,00	.3150	–	3006823	2X2D08000R7HPGM	120	56,7	2.232	1,48	72,3	280.498	360.695	MM	●
8,10	.3189	–	3006824	2X2D08100R7HPGM	120	56,7	2.232	1,50	72,3	280.498	360.695	MM	●
8,20	.3228	–	3006825	2X2D08200R7HPGM	122	59,5	2.343	1,51	75,2	280.499	360.696	NN	●
8,30	.3268	–	3006826	2X2D08300R7HPGM	122	59,5	2.343	1,53	75,2	280.499	360.696	NN	●
8,33	.3281	21/64	3006827	2X2D08330R7HPGM	122	59,5	2.343	1,54	75,2	280.499	360.696	NN	●
8,43	.3319	–	3006828	2X2D08430R7HPGM	122	59,5	2.343	1,56	75,2	280.499	360.696	NN	●
8,50	.3346	–	2631711	2X2D08500R7HPGM	122	59,5	2.343	1,57	75,2	280.499	360.696	NN	●

Sealing cap included with drill.

*LUX is overhang length identified in diagram on page 59.

NOTE: Match shank clamp size to clamping sleeve on page 59.

Ordering Example:

2x2 drill for 3,10 mm diameters

OR

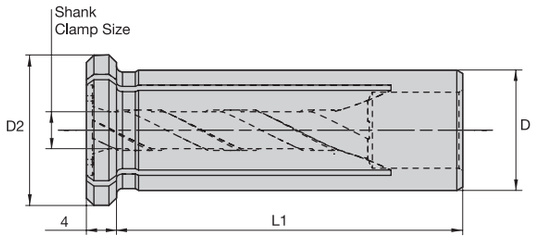
by order number: 1 x 30006773

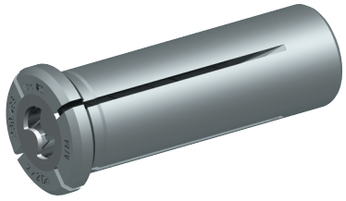
Type	Direction of cut		Geometry	
2x2 D03100	**R**	**7**	**HPGM**	**KC7915**
Ø		Relative drilling depth		Grade

Tolerance

D1 metric	Tolerance m7	D1 inch	Tolerance m7
>3 to 6	0,004/0,016	>.1181 to .2362	0.0002/0.0006
>6 to 8,5	0,006/0,021	>.2362 to .3346	0.0002/0.0008

- Clamping sleeves are sold separately.

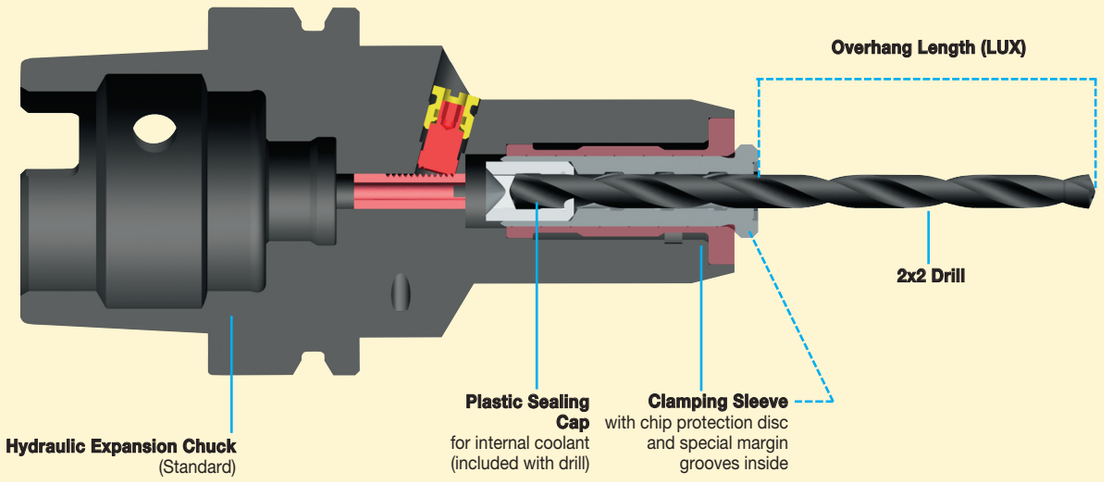




drill diameter range mm	drill diameter range inch	order number	catalog number	D	D2	L1	shank clamp size
3.100-3.400	.1220-.1339	2975841	280.488	12	16	40	AA
>3.400-3.700	>.1339-.1457	2975842	280.489	12	16	40	BB
>3.700-4.100	>.1457-.1614	2975903	280.490	12	16	40	CC
>4.100-4.500	>.1614-.1772	2975904	280.491	12	16	40	DD
>4.500-4.900	>.1772-.1929	2975905	280.492	12	16	40	EE
>4.900-5.400	>.1929-.2126	2975906	280.493	12	16	40	FF
>5.400-5.900	>.2126-.2323	2975907	280.494	12	16	40	GG
>5.900-6.500	>.2323-.2559	2975908	280.495	12	16	40	HH
>6.500-7.050	>.2559-.2776	2975909	280.496	16	20	46	JJ
>7.050-7.600	>.2776-.2992	2975910	280.497	16	20	46	KK
>7.600-8.100	>.2992-.3189	2975911	280.498	16	20	46	MM
>8.100-8.600	>.3189-.3386	2975912	280.499	16	20	46	NN

NOTE: Match clamping sleeve to drill by the shank clamp size.

The New 2x2 Drill

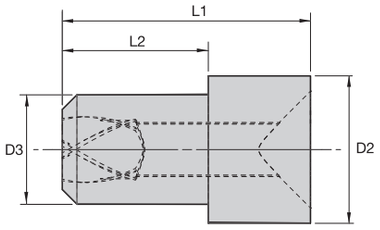


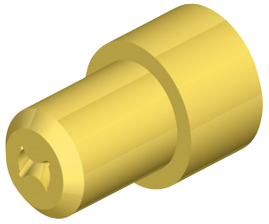
Ordering Example:
1 x 240.488
OR
by order number: 1 x 2975841

Sealing Cap

KENNAMETAL

- One sealing cap shipped with each 2x2 drill.





D1 range mm	D1 range inch	order number	catalog number	D2	D3	L1	L2	shank clamp size
3.100-3.400	.1220-.1339	2982429	360.685	–	7,5	17	10	AA
>3.400-3.700	>.1339-.1457	2982430	360.686	–	7,5	17	10	BB
>3.700-4.100	>.1457-.1614	2982431	360.687	–	7,5	17	10	CC
>4.100-4.500	>.1614-.1772	2982432	360.688	–	7,5	17	10	DD
>4.500-4.900	>.1772-.1929	2982543	360.689	–	–	15	–	EE
>4.900-5.400	>.1929-.2126	2982544	360.690	–	–	15	–	FF
>5.400-5.900	>.2126-.2323	2982545	360.691	–	–	15	–	GG
>5.900-6.500	>.2323-.2559	2982546	360.692	–	–	15	–	HH
>6.500-7.050	>.2559-.2776	2982547	360.693	–	–	15	–	JJ
>7.050-7.600	>.2776-.2992	2982548	360.694	–	–	15	–	KK
>7.600-8.100	>.2992-.3189	2982549	360.695	–	–	15	–	MM
>8.100-8.600	>.3189-.3386	2982550	360.696	–	–	15	–	NN

Ordering Example:
1 x 360685
OR
by order number: 1 x 2982429

To place an order, contact Kennametal or your authorized Kennametal distributor, or visit www.kennametal.com.

Cutting Groups	Material Group	Composition/Structure		Tensile Strength RM (Mpa)	Hardness HB	Cutting Speed v_c (m/min) (sfm)	Feed Rate Per Revolution by Drill Diameter: [mm/rev] (ipr)					
							3 mm .1181"	4 mm .1574"	5 mm .1969"	6 mm .2362"	7 mm .2755"	8 mm .3149"
1.1	Unalloyed steel, cast steel, machining steel	C = 0,10 - 0,25	Annealed, long-chipping	420	125	100 - 160	**0,07 - 0,11**	0,08 - 0,13	**0,09 - 0,15**	0,11 - 0,17	**0,12 - 0,19**	0,13 - 0,21
						330 - 520	**.003 - .004**	.003 - .005	**.004 - .006**	.004 - .007	**.005 - .007**	.005 - .008
1.2		C = 0,10 - 0,25	Annealed, short-chipping	420	125	100 - 160	**0,07 - 0,11**	0,08 - 0,13	**0,09 - 0,15**	0,11 - 0,17	**0,12 - 0,19**	0,13 - 0,21
						330 - 520	**.003 - .004**	.003 - .005	**.004 - .006**	.004 - .007	**.005 - .007**	.005 - .008
2.1		C = 0,25 - 0,55	Annealed, long-chipping	640	190	100 - 160	**0,08 - 0,13**	0,09 - 0,15	**0,10 - 0,17**	0,12 - 0,19	**0,13 - 0,21**	0,14 - 0,23
						330 - 520	**.003 - .005**	.004 - .006	**.004 - .007**	.005 - .007	**.005 - .008**	.006 - .009
2.2		C = 0,25 - 0,55	Annealed, short-chipping	640	190	100 - 160	**0,08 - 0,13**	0,09 - 0,15	**0,10 - 0,17**	0,12 - 0,19	**0,13 - 0,21**	0,14 - 0,23
						330 - 520	**.003 - .005**	.004 - .006	**.004 - .007**	.005 - .007	**.005 - .008**	.006 - .009
3		C = 0,25 - 0,55	Tempered	850	250	100 - 140	**0,08 - 0,15**	0,10 - 0,18	**0,12 - 0,21**	0,13 - 0,23	**0,15 - 0,26**	0,17 - 0,29
						330 - 460	**.003 - .006**	.004 - .007	**.005 - .008**	.005 - .009	**.006 - .010**	.007 - .011
4		C = 0,25 - 0,80	Annealed	915	270	100 - 140	**0,08 - 0,15**	0,10 - 0,18	**0,12 - 0,21**	0,13 - 0,23	**0,15 - 0,26**	0,17 - 0,29
						330 - 460	**.003 - .006**	.004 - .007	**.005 - .008**	.005 - .009	**.006 - .010**	.007 - .011
5		C = 0,25 - 0,80	Tempered	1020	300	80 - 120	**0,08 - 0,15**	0,10 - 0,18	**0,12 - 0,21**	0,13 - 0,23	**0,15 - 0,26**	0,17 - 0,29
						260 - 390	**.003 - .006**	.004 - .007	**.005 - .008**	.005 - .009	**.006 - .010**	.007 - .011
6	Low-alloy steel, cast steel, machining steel		Annealed	610	180	100 - 160	**0,08 - 0,13**	0,10 - 0,16	**0,12 - 0,19**	0,14 - 0,23	**0,16 - 0,26**	0,18 - 0,29
						330 - 520	**.003 - .005**	.004 - .006	**.005 - .007**	.006 - .009	**.006 - .010**	.007 - .011
7			Tempered	930	275	80 - 140	**0,08 - 0,14**	0,09 - 0,16	**0,11 - 0,18**	0,12 - 0,21	**0,14 - 0,23**	0,15 - 0,25
						260 - 460	**.003 - .006**	.004 - .006	**.004 - .007**	.005 - .008	**.006 - .009**	.006 - .010
8			Tempered	1020	300	80 - 140	**0,08 - 0,13**	0,09 - 0,15	**0,10 - 0,17**	0,12 - 0,19	**0,13 - 0,21**	0,14 - 0,23
						260 - 460	**.003 - .005**	.004 - .006	**.004 - .007**	.005 - .007	**.005 - .008**	.006 - .009
9			Tempered	1190	350	60 - 120	**0,08 - 0,13**	0,09 - 0,15	**0,10 - 0,17**	0,12 - 0,19	**0,13 - 0,21**	0,14 - 0,23
						200 - 390	**.003 - .005**	.004 - .006	**.004 - .007**	.005 - .007	**.005 - .008**	.006 - .009
10	High-alloy steel, cast steel, high-alloy tool steel		Annealed	680	200	70 - 110	**0,07 - 0,12**	0,08 - 0,14	**0,09 - 0,15**	0,10 - 0,17	**0,11 - 0,18**	0,12 - 0,20
						230 - 360	**.003 - .005**	.003 - .006	**.004 - .006**	.004 - .007	**.004 - .007**	.005 - .008
11			Hardened and Tempered	1100	325	60 - 90	**0,07 - 0,12**	0,08 - 0,14	**0,09 - 0,15**	0,10 - 0,17	**0,11 - 0,18**	0,12 - 0,20
						200 - 300	**.003 - .005**	.003 - .006	**.004 - .006**	.004 - .007	**.004 - .007**	.005 - .008
15	Gray cast Iron		Pearlitic/ Ferritic		180	120 - 160	**0,10 - 0,15**	0,12 - 0,20	**0,14 - 0,24**	0,16 - 0,27	**0,18 - 0,31**	0,20 - 0,34
						390 - 520	**.004 - .006**	.005 - .008	**.006 - .009**	.006 - .011	**.007 - .012**	.008 - .013
16			Pearlitic (Martensitic)		260	100 - 140	**0,09 - 0,15**	0,10 - 0,17	**0,12 - 0,19**	0,13 - 0,22	**0,14 - 0,24**	0,16 - 0,26
						330 - 460	**.004 - .006**	.004 - .007	**.005 - .007**	.005 - .009	**.006 - .009**	.006 - .010
17	Cast iron with nodular cast iron		Ferritic		160	80 - 140	**0,09 - 0,15**	0,10 - 0,17	**0,11 - 0,19**	0,13 - 0,22	**0,14 - 0,24**	0,15 - 0,26
						260 - 460	**.004 - .006**	.004 - .007	**.004 - .007**	.005 - .009	**.006 - .009**	.006 - .010
18			Pearlitic		250	100 - 140	**0,08 - 0,13**	0,09 - 0,15	**0,10 - 0,17**	0,12 - 0,19	**0,13 - 0,21**	0,14 - 0,23
						330 - 460	**.003 - .005**	.004 - .006	**.004 - .007**	.005 - .007	**.005 - .008**	.006 - .009
19	Malleable cast iron		Ferritic		130	100 - 160	**0,08 - 0,14**	0,10 - 0,17	**0,12 - 0,20**	0,13 - 0,22	**0,15 - 0,25**	0,17 - 0,28
						330 - 520	**.003 - .006**	.004 - .007	**.005 - .008**	.005 - .009	**.006 - .010**	.007 - .011
20			Pearlitic		230	100 - 160	**0,08 - 0,14**	0,09 - 0,16	**0,10 - 0,18**	0,12 - 0,21	**0,13 - 0,23**	0,14 - 0,25
						330 - 520	**.003 - .006**	.035 - .006	**.004 - .007**	.005 - .008	**.005 - .009**	.006 - .010

NOTE: These are starting condition guidelines only. The machine tool, fixturing, toolholding, part configuration, and coolant capability may significantly influence specific applications.

Use proper and safe machining practices. Make the set-up as rigid as possible.

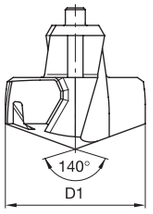
Decrease cutting speed as material hardness increases.

Large-diameter drills require increased horsepower.

KenTIP Insert Blades

KENNAMETAL

Carbide Inserts — Metric and Inch



● first choice
○ alternate choice

H	
S	
N	
K	●
M	
P	●

KTIP HP(M)

D1 mm	D1 inch	order number	ISO catalog number	ANSI catalog number	insert seat size	KC7315
17,00	.6692	2983124	KTIP1700HPM	KTIP1700HPM	V	●
17,07	.6719	2983125	KTIP1707HPM	KTIP06719HP	V	●
17,10	.6732	2983126	KTIP1710HPM	KTIP1710HPM	V	●
17,20	.6772	2983127	KTIP1720HPM	KTIP1720HPM	V	●
17,30	.6811	2983128	KTIP1730HPM	KTIP1730HPM	V	●
17,40	.6850	2983129	KTIP1740HPM	KTIP1740HPM	V	●
17,46	.6875	2983130	KTIP1748HPM	KTIP06875HP	V	●
17,50	.6890	2983131	KTIP1750HPM	KTIP1750HPM	V	●
17,60	.6929	2983132	KTIP1760HPM	KTIP1760HPM	V	●
17,70	.6969	2983283	KTIP1770HPM	KTIP1770HPM	V	●
17,80	.7008	2983284	KTIP1780HPM	KTIP1780HPM	V	●
17,86	.7031	2983285	KTIP1786HPM	KTIP07031HP	V	●
17,90	.7047	2983286	KTIP1790HPM	KTIP1790HPM	V	●
18,00	.7087	2983287	KTIP1800HPM	KTIP1800HPM	W	●
18,10	.7126	2983288	KTIP1810HPM	KTIP1810HPM	W	●
18,20	.7165	2983289	KTIP1820HPM	KTIP1820HPM	W	●
18,26	.7188	2983290	KTIP1826HPM	KTIP07188HP	W	●
18,30	.7205	2983291	KTIP1830HPM	KTIP1830HPM	W	●
18,40	.7244	2983292	KTIP1840HPM	KTIP1840HPM	W	●
18,50	.7283	2983293	KTIP1850HPM	KTIP1850HPM	W	●
18,60	.7323	2983294	KTIP1860HPM	KTIP1860HPM	W	●
18,65	.7344	2983295	KTIP1864HPM	KTIP07344HP	W	●
18,70	.7362	2983296	KTIP1870HPM	KTIP1870HPM	W	●
18,80	.7402	2983297	KTIP1880HPM	KTIP1880HPM	W	●
18,90	.7441	2983298	KTIP1890HPM	KTIP1890HPM	W	●
19,00	.7480	2983299	KTIP1900HPM	KTIP1900HPM	X	●
19,05	.7500	2983300	KTIP1905HPM	KTIP07500HP	X	●
19,10	.7520	2983301	KTIP1910HPM	KTIP1910HPM	X	●
19,20	.7559	2983302	KTIP1920HPM	KTIP1920HPM	X	●
19,23	.7570	2983326	KTIP1923HPM	KTIP07570HP	X	●

continued on next page

To place an order, contact Kennametal or your authorized Kennametal distributor, or visit www.kennametal.com.

Tolerance			
D1 metric	**Tolerance k8**	**D1 inch**	**Tolerance k8**
>17 to 18	0,000/+0,027	>.6692 to .7090	.000/+.0010
>18 to21	0,000/+0,033	>.7090 to .8228	.000/+.0013

● first choice
○ alternate choice

	KC7315
H	
S	
N	
K	●
M	
P	●

KTIP HP(M) (continued from previous page)

D1 mm	D1 inch	order number	ISO catalog number	ANSI catalog number	insert seat size	KC7315
19,25	.7580	2983303	KTIP1925HPM	KTIP07580HP	X	●
19,28	.7590	2983304	KTIP1928HPM	KTIP07590HP	X	●
19,30	.7598	2983305	KTIP1930HPM	KTIP1930HPM	X	●
19,35	.7620	2983327	KTIP1935HPM	KTIP07620HP	X	●
19,40	.7638	2983306	KTIP1940HPM	KTIP1940HPM	X	●
19,45	.7656	2983307	KTIP1946HPM	KTIP07656HP	X	●
19,50	.7677	2983308	KTIP1950HPM	KTIP1950HPM	X	●
19,60	.7717	2983309	KTIP1960HPM	KTIP1960HPM	X	●
19,70	.7756	2983310	KTIP1970HPM	KTIP1970HPM	X	●
19,80	.7795	2983311	KTIP1980HPM	KTIP1980HPM	X	●
19,84	.7812	2983312	KTIP1984HPM	KTIP07812HP	X	●
19,90	.7835	2983313	KTIP1990HPM	KTIP1990HPM	X	●
20,00	.7874	2983314	KTIP2000HPM	KTIP2000HPM	Y	●
20,10	.7913	2983315	KTIP2010HPM	KTIP2010HPM	Y	●
20,20	.7953	2983316	KTIP2020HPM	KTIP2020HPM	Y	●
20,24	.7969	2983317	KTIP2024HPM	KTIP07969HP	Y	●
20,30	.7992	2983318	KTIP2030HPM	KTIP2030HPM	Y	●
20,40	.8031	2983319	KTIP2040HPM	KTIP2040HPM	Y	●
20,50	.8071	2983320	KTIP2050HPM	KTIP2050HPM	Y	●
20,60	.8110	2983321	KTIP2060HPM	KTIP2060HPM	Y	●
20,64	.8125	2983322	KTIP2064HPM	KTIP08125HP	Y	●
20,70	.8150	2983323	KTIP2070HPM	KTIP2070HPM	Y	●
20,80	.8189	2983324	KTIP2080HPM	KTIP2080HPM	Y	●
20,90	.8228	2983325	KTIP2090HPM	KTIP2090HPM	Y	●
20,99	.8264	3124442	KTIP2099HPM	KTIP2099HPM	Y	●

KenTIP HPM Drill in KC7315 Grade:

- ***Expanded diameter ranges from 17,00mm to 20,99mm (.6693" to .8264")!***
- ***High-positive point geometry provides excellent self-centering!***
- ***Achieve solid carbide drill performance with the benefits of a modular tool!***
- ***Universal application for steel, gray cast, and ductile iron materials!***
- ***Eliminate costs associated with regrinding!***

Ordering Example:
KenTIP drilling insert, 17 mm diameter
OR
by order number: 1 x 2983124

Type	Ø	Geometry	
KTIP	**1700**	**HPM**	**KC7315**
			Grade

Cutting Data Recommendations

Cutting Groups	Material Group	Composition/Structure		Tensile Strength RM (Mpa)	Hardness HB	Cutting Speed v_c: (m/min) (sfm)	Feed Rate Per Revolution by Drill Diameter: [mm/rev] (ipr)		
							16mm .6299"	18mm .7087"	20mm .7874"
1.1	Unalloyed steel, cast steel, machining steel	C = 0,10 - 0,25	Annealed, long-chipping	420	125	110 - 170 360 - 560	**0,19 - 0,35** **.008 - .014**	0,23 - 0,38 .009 - .015	**0,25 - 0,41** **.010 - .016**
1.2		C = 0,10 - 0,25	Annealed, short-chipping	420	125	120 - 180 390 - 590	**0,19 - 0,35** **.008 - .014**	0,23 - 0,38 .009 - .015	**0,25 - 0,41** **.010 - .016**
2.1		C = 0,25 - 0,55	Annealed, long-chipping	640	190	100 - 150 330 - 490	**0,22 - 0,41** **.009 - .016**	0,25 - 0,46 .010 - .018	**0,28 - 0,48** **.011 - .019**
2.2		C = 0,25 - 0,55	Annealed, short-chipping	640	190	105 - 165 340 - 540	**0,22 - 0,41** **.009 - .016**	0,25 - 0,46 .010 - .018	**0,28 - 0,48** **.011 - .019**
3		C = 0,25 - 0,55	Tempered	850	250	80 - 120 260 - 390	**0,23 - 0,45** **.009 - .018**	0,25 - 0,53 .010 - .021	**0,28 - 0,61** **.011 - .024**
4		C = 0,25 - 0,80	Annealed	915	270	65 - 100 210 - 330	**0,23 - 0,37** **.009 - .015**	0,28 - 0,43 .011 - .017	**0,30 - 0,48** **.012 - .019**
5			Tempered	1020	300	50 - 75 160 - 250	**0,23 - 0,35** **.009 - .014**	0,25 - 0,41 .010 - .016	**0,28 - 0,41** **.011 - .016**
6	Low-alloy steel, cast steel, machining steel		Annealed	610	180	65 - 100 210 - 330	**0,25 - 0,46** **.010 - .018**	0,25 - 0,51 .011 - .020	**0,30 - 0,51** **.012 - .020**
7			Tempered	930	275	65 - 100 210 - 330	**0,23 - 0,35** **.009 - .015**	0,28 - 0,43 .011 - .017	**0,28 - 0,46** **.011 - .018**
8			Tempered	1020	300	60 - 90 200 - 300	**0,21 - 0,33** **.008 - .013**	0,23 - 0,36 .009 - .014	**0,25 - 0,38** **.010 - .015**
9			Tempered	1190	350	50 - 75 160 - 250	**0,18 - 0,32** **.007 - .013**	0,20 - 0,36 .008 - .014	**0,23 - 0,38** **.009 - .015**
15	Gray cast Iron		Pearlitic/ Ferritic		180	115 - 175 380 - 570	**0,30 - 0,55** **.012 - .022**	0,33 - 0,61 .013 - .024	**0,33 - 0,61** **0.13 - .024**
16			Pearlitic (Martensitic)		260	85 - 125 280 - 410	**0,26 - 0,47** **.010 - .019**	0,28 - 0,53 .011 - .021	**0,30 - 0,58** **.012 - .023**
17	Cast iron with nodular cast iron		Ferritic		160	60 - 90 200 - 300	**0,24 - 0,45** **.009 - .018**	0,28 - 0,51 .011 - .020	**0,28 - 0,56** **.011 - .022**
18			Pearlitic		250	40 - 65 130 - 210	**0,19 - 0,35** **.008 - .019**	0,23 - 0,51 .009 - .020	**0,25 - 0,53** **.010 - .021**
19	Malleable cast iron		Ferritic		130	75 - 115 250 - 380	**0,23 - 0,44** **.009 - .017**	0,25 - 0,48 .010 - .019	**0,28 - 0,51** **.011 - .020**
20			Pearlitic		230	75 - 115 250 - 380	**0,21 - 0,39** **.008 - .015**	0,25 - 0,41 .010 - .016	**0,28 - 0,43** **.011 - .017**

NOTE: These are starting condition guidelines only. The machine tool, fixturing, toolholding, part configuration, and coolant capability may significantly influence specific applications.

Use proper and safe machining practices. Make the set-up as rigid as possible.

Decrease cutting speed as material hardness increases.

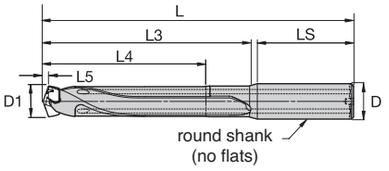
Large-diameter drills require increased horsepower.

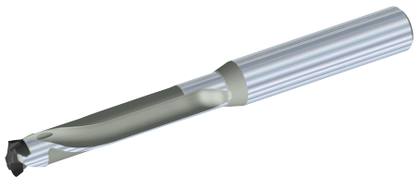
KENNAMETAL

High-Performance Modular Drill Bodies — KenTIP Style

Round Shank — Inch

- Tool body shipped with insert wrench.





3xD SS Shank — Inch

inch D1	inch D1 max	mm D1	mm D1 max	order number	catalog number	insert blade seat size	D	L	L3	L4 max	L5	LS	insert wrench
.6693	.7083	17,00	17,99	3018928	KTIP0669R3SS069	V	.6875	5.00	2.98	2.12	.120	1.91	170.314
.7087	.7476	18,00	18,99	3018929	KTIP0709R3SS075	W	.7500	5.25	3.13	2.24	.120	2.00	170.314
.7480	.7870	19,00	19,99	3018930	KTIP0748R3SS075	X	.7500	5.50	3.39	2.36	.130	2.00	170.314
.7874	.8264	20,00	20,99	3018931	KTIP0787R3SS081	Y	.8125	5.75	3.63	2.48	.140	2.00	170.314

5xD SS Shank — Inch

inch D1	inch D1 max	mm D1	mm D1 max	order number	catalog number	insert blade seat size	D	L	L3	L4 max	L5	LS	insert wrench
.6693	.7083	17,00	17,99	3018932	KTIP0669R5SS069	V	.6875	6.50	4.47	3.54	.120	1.91	170.314
.7087	.7476	18,00	18,99	3018933	KTIP0709R5SS075	W	.7500	6.88	4.76	3.74	.120	2.00	170.314
.7480	.7870	19,00	19,99	3018934	KTIP0748R5SS075	X	.7500	7.13	5.01	3.94	.130	2.00	170.314
.7874	.8264	20,00	20,99	3018935	KTIP0787R5SS081	Y	.8125	7.50	5.38	4.13	.140	2.00	170.314

8xD SS Shank — Inch

inch D1	inch D1 max	mm D1	mm D1 max	order number	catalog number	insert blade seat size	D	L	L3	L4 max	L5	LS	insert wrench
.6693	.7083	17,00	17,99	3033024	KTIP0669R8SS069	V	.6875	8.75	6.72	5.67	.120	1.91	170.314
.7087	.7476	18,00	18,99	3033025	KTIP0709R8SS075	W	.7500	9.25	7.13	5.98	.120	2.00	170.314
.7480	.7870	19,00	19,99	3033026	KTIP0748R8SS075	X	.7500	9.63	7.51	6.30	.130	2.00	170.314
.7874	.8264	20,00	20,99	3033027	KTIP0787R8SS081	Y	.8125	10.00	7.88	6.61	.140	2.00	170.314

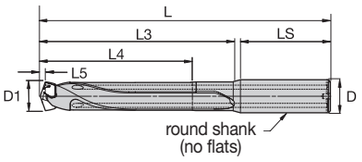
Ordering Example:
KenTIP tool body 3xD for drill diameters of .6693 to .7083 inch
OR
by order number: 1 x 3018928

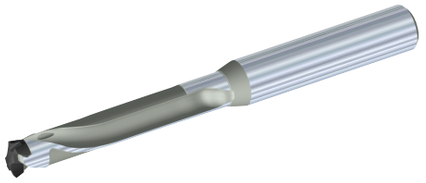
Type	Ø	Direction of cut	Relative drilling depth	Shank
KTIP	0669	R	3	SS069

High-Performance Modular Drill Bodies — KenTIP Style

Round Shank — Metric

- Tool body shipped with insert wrench.





3xD SS Shank — Metric

mm D1	mm D1 max	inch D1	inch D1 max	order number	catalog number	insert blade seat size	D	L	L3	L4 max	L5	LS	insert wrench
17,00	17,99	.6693	.7083	3017663	KTIP170R3SS18M	V	18	127	75	54	2,90	49	170.314
18,00	18,99	.7087	.7476	3017664	KTIP180R3SS20M	W	20	133	79	57	3,10	51	170.314
19,00	19,99	.7480	.7870	3017665	KTIP190R3SS20M	X	20	137	83	60	3,30	51	170.314
20,00	20,99	.7874	.8264	3017666	KTIP200R3SS25M	Y	25	147	87	63	3,40	57	170.314

5xD SS Shank — Metric

mm D1	mm D1 max	inch D1	inch D1 max	order number	catalog number	insert blade seat size	D	L	L3	L4 max	L5	LS	insert wrench
17,00	17,99	.6693	.7083	3017671	KTIP170R5SS18M	V	18	165	113	90	2,90	49	170.314
18,00	18,99	.7087	.7476	3017672	KTIP180R5SS20M	W	20	173	119	95	3,10	51	170.314
19,00	19,99	.7480	.7870	3017673	KTIP190R5SS20M	X	20	179	125	100	3,30	51	170.314
20,00	20,99	.7874	.8264	3017674	KTIP200R5SS25M	Y	25	191	131	105	3,40	57	170.314

8xD SS Shank — Metric

mm D1	mm D1 max	inch D1	inch D1 max	order number	catalog number	insert blade seat size	D	L	L3	L4 max	L5	LS	insert wrench
17,00	17,99	.6690	.7083	3114313	KTIP170R8SS18M	V	18	219	166	144	2,90	49	170.314
18,00	18,99	.7090	.7476	3114314	KTIP180R8SS20M	W	20	230	175	152	3,10	51	170.314
19,00	19,99	.7480	.7870	3114315	KTIP190R8SS20M	X	20	239	184	160	3,30	51	170.314
20,00	20,99	.7870	.8264	3114316	KTIP200R8SS25M	Y	25	254	196	168	3,40	57	170.314

Ordering Example:

KenTIP tool body 3xD for drill diameters of 17,00 to 18,00 mm

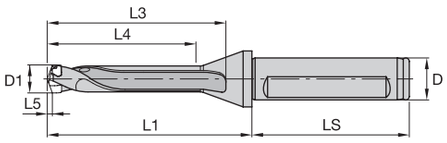
OR

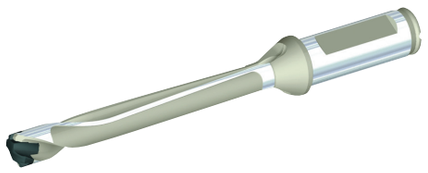
by order number: 1 x 3017663

Type | Ø | Direction of cut | Relative drilling depth | Shank

KTIP 170 R 3 SS18M

- Tool body shipped with insert wrench.





3xD SCF Shank — Metric

mm		inch				insert blade							insert
D1	D1 max	D1	D1 max	order number	catalog number	seat size	D	L1	L3	L4 max	L5	LS	wrench
17,00	17,99	.6693	.7083	3017667	KTIP170R3SCF20M	V	20	81	75	54	2,90	50	170.314
18,00	18,99	.7087	.7476	3017668	KTIP180R3SCF25M	W	25	85	79	57	3,10	56	170.314
19,00	19,99	.7480	.7870	3017669	KTIP190R3SCF25M	X	25	89	83	60	3,30	56	170.314
20,00	20,99	.7874	.8264	3017670	KTIP200R3SCF25M	Y	25	93	87	63	3,40	56	170.314

5xD SCF Shank — Metric

mm		inch				insert blade							insert
D1	D1 max	D1	D1 max	order number	catalog number	seat size	D	L1	L3	L4 max	L5	LS	wrench
17,00	17,99	.6693	.7083	3017675	KTIP170R5SCF20M	V	20	119	113	90	2,90	50	170.314
18,00	18,99	.7087	.7476	3017676	KTIP180R5SCF25M	W	25	125	119	95	3,10	56	170.314
19,00	19,99	.7480	.7870	3017677	KTIP190R5SCF25M	X	25	131	125	100	3,30	56	170.314
20,00	20,99	.7874	.8264	3017678	KTIP200R5SCF25M	Y	25	137	131	105	3,40	56	170.314

8xD SCF Shank — Metric

mm		inch				insert blade							insert
D1	D1 max	D1	D1 max	order number	catalog number	seat size	D	L1	L3	L4 max	L5	LS	wrench
17,00	17,99	.6690	.7083	3114317	KTIP170R8SCF20M	V	20	173	167	144	2,90	50	170.314
18,00	18,99	.7090	.7476	3114318	KTIP180R8SCF25M	W	25	182	176	152	3,10	56	170.314
19,00	19,99	.7480	.7870	3114319	KTIP190R8SCF25M	X	25	191	185	160	3,30	56	170.314
20,00	20,99	.7870	.8264	3114320	KTIP200R8SCF25M	Y	25	200	194	168	3,40	56	170.314

Ordering Example:

KenTIP tool body 3xD for drill diameters of 17,00 to 17,99 mm

OR

by order number: 1 x 3017667

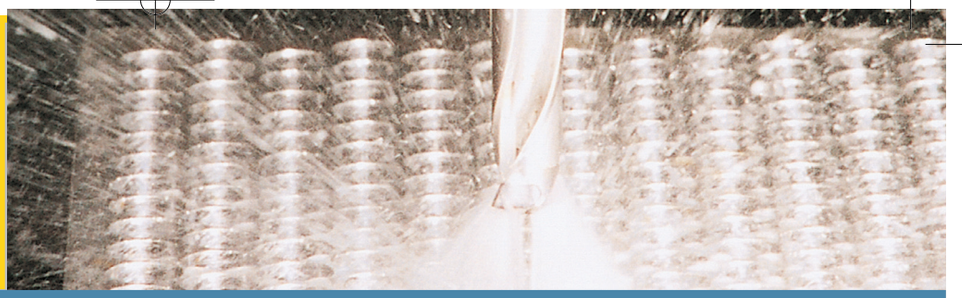
Type Ø Direction of cut

KTIP 170 R 3 SCF20M

Shank

Relative drilling depth

KENNAMETAL®
Engineering Your Competitive Edge



Introducing Kennametal's
New KenTIP® Modular Drills for Close-Tolerance Holes

KenTIP is a custom solution designed for tight-tolerance applications, such as rock bit and roller cone bit manufacturing!

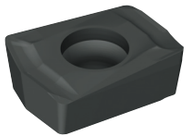
...engineered specifically to deliver superior hole quality!

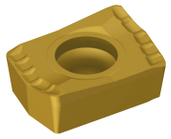
- Produces quality holes as good as solid carbide drills!
- Improves repeatability in hole size and tolerance!
- More cost-effective than solid carbide drills — with longer life and no reconditioning costs!
- Reduce setup time – change worn drill tips without removing the drill from the machine or holder!
- Customized to meet your exact specifications!

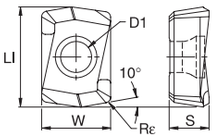
Kennametal will significantly improve your drilling performance!

Let us prove it.

www.kennametal.com







● first choice
○ alternate choice

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

DFR-GD

catalog number	LI mm	LI inch	W mm	W inch	D1 mm	D1 inch	S mm	S inch	Rε mm	Rε inch	KC7140	KC7815	KC7820
DFR020204GD	7,12	.280	4,90	.193	2,30	.091	2,79	.110	0,40	.016	●	●	
DFR030204GD	8,71	.343	6,00	.236	2,50	.098	2,88	.113	0,40	.016	●	●	
DFR040304GD	10,76	.424	7,38	.291	2,85	.112	3,79	.149	0,40	.016	●	●	

DFR-MD

catalog number	LI mm	LI inch	W mm	W inch	D1 mm	D1 inch	S mm	S inch	Rε mm	Rε inch	KC7140	KC7815	KC7820
DFR020204MD	7,12	.280	4,90	.193	2,30	.091	2,79	.110	0,40	.016	●		●
DFR030204MD	8,71	.343	6,00	.236	2,50	.098	2,88	.113	0,40	.016	●		●
DFR040304MD	10,76	.424	7,38	.291	2,85	.112	3,79	.149	0,40	.016	●		●

DFR-LGD — Left Hand

catalog number	LI mm	LI inch	W mm	W inch	D1 mm	D1 inch	S mm	S inch	Rε mm	Rε inch	KC7140	KC7815	KC7820
DFR020204LGD	7,12	.280	4,90	.193	2,30	.091	2,79	.110	0,40	.016	●	●	
DFR030204LGD	8,71	.343	6,00	.236	2,50	.098	2,88	.113	0,40	.016	●	●	
DFR040304LGD	10,76	.424	7,38	.291	2,85	.112	3,79	.149	0,40	.016	●	●	

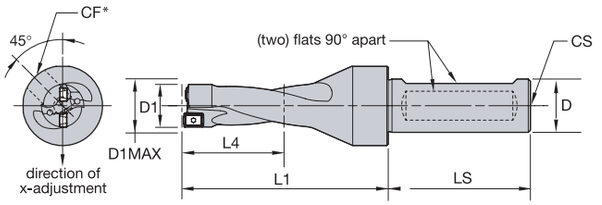
New KC7820 Grade with -MD geometry:

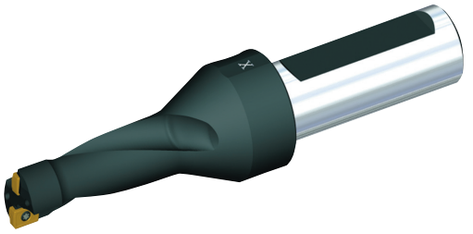
- ***Excellent wear resistance!***
- ***MT-CVD coating increases tool life in steel and cast iron applications!***
- ***Better chip control with -MD geometry in long-chipping, low-carbon steels!***

Ordering Example:
Inserts for DRILL-FIX DFR, coated carbide

Type	Size	Geometry	
DFR	**020204**	**GD**	**KC7815**
			Grade

DRILL-FIX DFR 4xD Drill Bodies — Inch





Flanged Shank

D1	D1 max	order number	D 0.7500	D 1.0000	D 1.2500	insert 1 outside	L1	L4 max	LS	insert screw	Torx wrench	CS
.500	.540	3022047	DFR0500R4SSF075	—	—	DFR020204..	2.94	2.00	2.00	193.281	170.027	1/8-27 NPT
.531	.571	3022048	DFR0531R4SSF075	—	—	DFR020204..	3.03	2.12	2.00	193.281	170.027	1/8-27 NPT
.563	.603	3022049	DFR0563R4SSF075	—	—	DFR020204..	3.19	2.25	2.00	193.281	170.027	1/8-27 NPT
.594	.634	3022050	DFR0594R4SSF075	—	—	DFR020204..	3.28	2.38	2.00	193.281	170.027	1/8-27 NPT
.625	.665	3022051	DFR0625R4SSF075	—	—	DFR020204..	3.44	2.50	2.00	193.281	170.027	1/8-27 NPT
.625	.669	3022052	—	DFR0625R4SSF100	—	DFR020204..	3.44	2.50	3.00	193.281	170.027	1/4-18 NPT
.656	.696	3022343	—	DFR0656R4SSF100	—	DFR030204..	3.56	2.62	3.00	192.416	170.023	1/4-18 NPT
.688	.728	3022344	—	DFR0688R4SSF100	—	DFR030204..	3.69	2.75	3.00	192.416	170.023	1/4-18 NPT
.703	.743	3022345	—	DFR0703R4SSF100	—	DFR030204..	3.81	2.81	3.00	192.416	170.023	1/4-18 NPT
.734	.774	3022346	—	DFR0734R4SSF100	—	DFR030204..	3.94	2.94	3.00	192.416	170.023	1/4-18 NPT
.750	.790	3022347	—	DFR0750R4SSF100	—	DFR030204..	4.00	3.00	3.00	192.416	170.023	1/4-18 NPT
.781	.821	3022348	—	DFR0781R4SSF100	—	DFR030204..	4.12	3.12	3.00	192.416	170.023	1/4-18 NPT
.813	.853	3022349	—	DFR0813R4SSF100	—	DFR040304..	4.25	3.25	3.00	192.432	170.028	1/4-18 NPT
.844	.884	3022350	—	DFR0844R4SSF100	—	DFR040304..	4.47	3.38	3.00	192.432	170.028	1/4-18 NPT
.875	.915	3022351	—	DFR0875R4SSF100	—	DFR040304..	4.59	3.50	3.00	192.432	170.028	1/4-18 NPT
.906	.946	3022352	—	DFR0906R4SSF100	—	DFR040304..	4.72	3.62	3.00	192.432	170.028	1/4-18 NPT
.938	.978	3022353	—	DFR0938R4SSF100	—	DFR040304..	4.85	3.75	3.00	192.432	170.028	1/4-18 NPT
.969	1.009	3022354	—	DFR0969R4SSF100	—	DFR040304..	4.97	3.88	3.00	192.432	170.028	1/4-18 NPT
.984	1.024	3022355	—	DFR0984R4SSF100	—	DFR040304..	5.03	3.94	3.00	192.432	170.028	1/4-18 NPT
1.000	1.040	3022356	—	DFR1000R4SSF100	—	DFR040304..	5.09	4.00	3.00	192.432	170.028	1/4-18 NPT
1.000	1.040	3022357	—	—	DFR1000R4SSF125	DFR040304..	5.09	4.00	3.25	192.432	170.028	1/4-18 NPT

Tool body with hex driver and insert screws for inserts included.

*CF = Pipe plug order number HSFS0125.

Inserts are shown on page 69.

Ordering Example:

(DRILL-FIX tool body 4xD for drill diameters of .500" to .540".)

Type	Ø	Direction of cut		
DFR	**0500**	**R**	**4**	**SSF075**
			Relative drilling depth	Shank

or by order number: 1 x 3022047

Cutting Groups	Material Group	Composition/Structure		Tensile Strength RM (Mpa)	Hardness HB	Geometry O: outside I: inside	Grade O: outside I: inside	Cutting Speed v_c: (m/min) (sfm) Stable	Normal	Unstable	Interrupted Cut	Feed Rate Per Revolution by Insert Size (mm/rev) (ipr) DFR 02…	DFR 03…	DFR 04…
1.1	Unalloyed steel, cast steel, machining steel	C = 0,10 - 0,25	Annealed, long-chipping	420	125	O: GD	O: KC7815	340	280	220	140	**0,06 - 0,12**	0,08 - 0,15	**0,11 - 0,21**
						I: LD	I: KC7225	1120	920	720	460	**.002 - .005**	.002 - .006	**.004 - .008**
1.2		C = 0,10 - 0,25	Annealed, short-chipping	420	125	O: GD	O: KC7815	340	280	220	140	**0,06 - 0,12**	0,08 - 0,15	**0,11 - 0,21**
						I: LD	I: KC7225	1120	920	720	460	**.002 - .005**	.002 - .006	**.004 - .008**
2.1		C = 0,25 - 0,55	Annealed, long-chipping	640	190	O: GD	O: KC7815	310	260	210	130	**0,06 - 0,12**	0,08 - 0,15	**0,11 - 0,21**
						I: LD	I: KC7225	1020	850	720	430	**.002 - .005**	.002 - .006	**.004 - .008**
2.2		C = 0,25 - 0,55	Annealed, short-chipping	640	190	O: GD	O: KC7815	340	280	220	140	**0,06 - 0,12**	0,08 - 0,15	**0,11 - 0,21**
						I: LD	I: KC7225	1020	920	720	460	**.002 - .005**	.002 - .006	**.004 - .008**
3		C = 0,25 - 0,55	Tempered	850	250	O: GD	O: KC7815	310	260	210	130	**0,05 - 0,10**	0,06 - 0,12	**0,10 - 0,18**
						I: GD	I: KC7020	1020	850	690	430	**.002 - .004**	.002 - .005	**.004 - .007**
4		C = 0,25 - 0,80	Annealed	915	270	O: GD	O: KC7815	300	250	200	130	**0,05 - 0,10**	0,06 - 0,12	**0,10 - 0,18**
						I: LD	I: KC7225	980	820	660	430	**.002 - .004**	.002 - .005	**.004 - .007**
5		C = 0,25 - 0,80	Tempered	1020	300	O: GD	O: KC7815	260	220	180	110	**0,05 - 0,10**	0,06 - 0,12	**0,10 - 0,18**
						I: LD	I: KC7225	850	720	590	360	**.002 - .004**	.002 - .005	**.004 - .007**
6	Low-alloy steel, cast steel, machining steel		Annealed	610	180	O: GD	O: KC7815	310	260	210	130	**0,06 - 0,12**	0,08 - 0,15	**0,11 - 0,21**
						I: LD	I: KC7225	1020	850	690	430	**.002 - .005**	.002 - .006	**.004 - .008**
7			Tempered	930	275	MD	KC7820	280	230	180	120	**0,06 - 0,12**	0,08 - 0,15	**0,11 - 0,21**
								920	760	590	390	**.002 - .005**	.002 - .006	**.004 - .008**
8			Tempered	1020	300	MD	KC7820	240	200	160	100	**0,06 - 0,12**	0,08 - 0,15	**0,11 - 0,21**
								790	660	530	330	**.002 - .005**	.002 - .006	**.004 - .008**
9			Tempered	1190	350	MD	KC7820	220	180	140	90	**0,06 - 0,12**	0,08 - 0,15	**0,11 - 0,21**
								720	590	460	300	**.002 - .005**	.002 - .006	**.004 - .008**
10	High-alloy steel, cast steel, high-alloy tool		Annealed	680	200	O: GD	O: KC7815	240	200	160	100	**0,06 - 0,12**	0,08 - 0,15	**0,11 - 0,21**
						I: GD	I: KC7020	790	660	530	330	**.002 - .005**	.002 - .006	**.004 - .008**
11			Hardened and Tempered	1100	325	MD	KC7820	190	160	130	80	**0,06 - 0,12**	0,05 - 0,10	**0,08 - 0,16**
								620	530	430	260	**.002 - .005**	.002 - .004	**.003 - .006**
12	Stainless steel, cast steel	Ferritic/Martensitic	Annealed	680	200	MD	KC7140	220	180	140	90	**0,04 - 0,07**	0,05 - 0,09	**0,07 - 0,13**
								720	590	460	300	**.002 - .003**	.002 - .004	**.003 - .005**
13		Martensitic	Tempered	810	240	MD	KC7140	190	160	130	80	**0,03 - 0,06**	0,04 - 0,07	**0,05 - 0,10**
								620	520	430	260	**.001 - .003**	.002 - .003	**.002 - .009**
14.1	Stainless steel	Austenitic		610	200	MD	KC7140	190	160	130	80	**0,04 - 0,09**	0,05 - 0,10	**0,08 - 0,16**
								620	520	430	260	**.002 - .004**	.002 - .004	**.003 - .006**
14.2		Austenitic/Ferritic (duplex)		880	260	MD	KC7140	190	160	130	80	**0,04 - 0,09**	0,05 - 0,10	**0,08 - 0,16**
								620	520	430	260	**.002 - .004**	.002 - .004	**.003 - .006**

NOTE: These are starting condition guidelines only. The machine tool, fixturing, toolholding, part configuration, and coolant capability may significantly influence specific applications.

Use proper and safe machining practices. Make the set-up as rigid as possible.

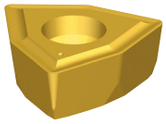
Decrease cutting speed as material hardness increases.

Large-diameter drills require increased horsepower.

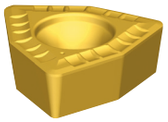
Indexable Drill Inserts

KENNAMETAL

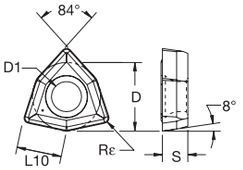
DRILL-FIX DFT Inserts



-GD



-MD



● first choice
○ alternate choice

H		
S	○	○
N	○	○
K	●	●
M	○	○
P	●	●

DFT-GD

catalog number	L10 mm	L10 inch	D mm	D inch	D1 mm	D1 inch	S mm	S inch	Rε mm	Rε inch	KC7815	KC7820
DFT030204GD	3,97	.156	6,00	.236	2,25	.089	2,45	.096	0,40	.016	●	
DFT030304GD	3,97	.156	6,00	.236	2,65	.104	2,95	.116	0,40	.016	●	
DFT05T308GD	5,29	.208	8,00	.315	3,40	.134	3,75	.148	0,80	.031	●	
DFT06T308GD	6,62	.260	10,00	.394	4,40	.173	3,75	.148	0,80	.031	●	
DFT070408GD	7,94	.313	12,00	.472	4,40	.173	4,75	.187	0,80	.031	●	
DFT090508GD	9,92	.391	15,00	.591	5,50	.217	5,25	.207	0,80	.031	●	

DFT-MD

catalog number	L10 mm	L10 inch	D mm	D inch	D1 mm	D1 inch	S mm	S inch	Rε mm	Rε inch	KC7815	KC7820
DFT05T308MD	5,29	.208	8,00	.315	3,40	.134	3,75	.148	0,80	.031		●
DFT06T308MD	6,62	.260	10,00	.394	4,40	.173	3,75	.148	0,80	.031		●
DFT070408MD	7,94	.313	12,00	.472	4,40	.173	4,75	.187	0,80	.031		●
DFT090508MD	9,92	.391	15,00	.591	5,50	.217	5,25	.207	0,80	.031		●

New KC7815 Grade:

- ***New MT-CVD coating for machining steel and cast iron at higher speeds!***
- ***Achieve unparalleled tool life for outboard inserts!***

Ordering Example:
Inserts for DRILL-FIX DFT, TiN-coated carbide

Type	Size	Geometry	Grade
DFT	**030204**	**GD**	**KC7815**

Cutting Groups	Material Group	Composition/Structure		Tensile Strength RM (Mpa)	Hardness HB	Geometry O: outside I: inside	Grade O: outside I: inside	Cutting Speed v_c: (m/min) (sfm) Stable	Normal	Unstable	Interrupted Cut	Feed Rate Per Revolution by Insert Size (mm/r) (ipr) DFT 03…	DFT 05…	DFT 06…	DFT 07…	DFT 09…
1.1	Unalloyed steel, cast steel, machining steel	C = 0,10 - 0,25	Annealed, long-chipping	420	125	O: GD	O: KC7815	340	280	220	140	**0,06 - 0,10**	0,09 - 0,15	**0,11 - 0,18**	0,15 - 0,25	**0,19 - 0,31**
						I: HP	I: KC7215	1120	920	720	460	**.002 - .004**	.003 - .006	**.004 - .007**	.006 - .010	**.007 - .012**
1.2		C = 0,10 - 0,25	Annealed, short-chipping	420	125	O: GD	O: KC7815	340	280	220	140	**0,06 - 0,10**	0,09 - 0,15	**0,11 - 0,18**	0,14 - 0,26	**0,19 - 0,31**
						I: HP	I: KC7215	1120	920	720	460	**.002 - .004**	.003 - .006	**.004 - .007**	.006 - .010	**.007 - .012**
2.1		C = 0,25 - 0,55	Annealed, long-chipping	640	190	O: GD	O: KC7815	310	260	210	130	**0,06 - 0,10**	0,09 - 0,15	**0,11 - 0,18**	0,14 - 0,26	**0,19 - 0,31**
						I: HP	I: KC7215	1020	850	720	430	**.002 - .004**	.003 - .006	**.004 - .007**	.006 - .010	**.007 - .012**
2.2		C = 0,25 - 0,55	Annealed, short-chipping	640	190	O: GD	O: KC7815	340	280	220	140	**0,06 - 0,10**	0,09 - 0,15	**0,11 - 0,18**	0,14 - 0,26	**0,19 - 0,31**
						I: HP	I: KC7215	1020	920	720	460	**.002 - .004**	.003 - .006	**.004 - .007**	.006 - .010	**.007 - .012**
3		C = 0,25 - 0,55	Tempered	850	250	O: GD	O: KC7815	310	260	210	130	**0,06 - 0,10**	0,09 - 0,15	**0,11 - 0,18**	0,14 - 0,26	**0,19 - 0,31**
						I: HP	I: KC7215	1020	850	690	430	**.002 - .004**	.003 - .006	**.004 - .007**	.006 - .010	**.007 - .012**
4		C = 0,25 - 0,80	Annealed	915	270	MD	KC7820	300	250	200	130	**0,06 - 0,10**	0,09 - 0,15	**0,11 - 0,18**	0,15 - 0,25	**0,19 - 0,31**
								980	820	660	430	**.002 - .004**	.003 - .006	**.004 - .007**	.006 - .010	**.007 - .012**
5		C = 0,25 - 0,80	Tempered	1020	300	MD	KC7820	260	220	180	110	**0,06 - 0,10**	0,09 - 0,15	**0,11 - 0,18**	0,14 - 0,26	**0,19 - 0,31**
								850	720	590	360	**.002 - .004**	.003 - .006	**.004 - .007**	.006 - .010	**.007 - .012**
6	Low-alloy steel, cast steel, machining steel		Annealed	610	180	O: GD	O: KC7815	310	260	210	130	**0,06 - 0,10**	0,09 - 0,15	**0,11 - 0,18**	0,14 - 0,26	**0,19 - 0,31**
						I: GD	I: KC7215	1020	850	690	430	**.002 - .004**	.003 - .006	**.004 - .007**	.006 - .010	**.007 - .012**
7			Tempered	930	275	MD	KC7820	280	230	180	120	**0,06 - 0,10**	0,09 - 0,15	**0,11 - 0,18**	0,14 - 0,26	**0,19 - 0,31**
								920	760	590	390	**.002 - .004**	.003 - .006	**.004 - .007**	.006 - .010	**.007 - .012**
8			Tempered	1020	300	MD	KC7820	240	200	160	100	**0,06 - 0,10**	0,09 - 0,15	**0,11 - 0,18**	0,15 - 0,25	**0,19 - 0,31**
								790	660	530	330	**.002 - .004**	.003 - .006	**.004 - .007**	.006 - .010	**.007 - .012**
9			Tempered	1190	350	MD	KC7820	220	180	140	90	**0,06 - 0,10**	0,09 - 0,15	**0,11 - 0,18**	0,14 - 0,26	**0,19 - 0,31**
								720	590	460	300	**.002 - .004**	.003 - .006	**.004 - .007**	.006 - .010	**.007 - .012**
10	High-alloy steel, cast steel, high-alloy tool steel		Annealed	680	200	O: GD	O: KC7815	240	200	160	100	**0,06 - 0,10**	0,09 - 0,15	**0,11 - 0,18**	0,14 - 0,26	**0,19 - 0,31**
						I: GD	I: KC7215	790	660	530	330	**.002 - .004**	.003 - .006	**.004 - .007**	.006 - .010	**.007 - .012**
11			Hardened and Tempered	1100	325	MD	KC7820	190	160	130	80	**0,06 - 0,10**	0,09 - 0,15	**0,11 - 0,18**	0,14 - 0,26	**0,19 - 0,31**
								620	530	430	260	**.002 - .004**	.003 - .006	**.004 - .007**	.006 - .010	**.007 - .012**

NOTE: These are starting condition guidelines only. The machine tool, fixturing, toolholding, part configuration, and coolant capability may significantly influence specific applications.

Use proper and safe machining practices. Make the set-up as rigid as possible.

Decrease cutting speed as material hardness increases.

Large-diameter drills require increased horsepower.

New KC7820 Grade:

- ***Excellent wear resistance!***
- ***MT-CVD coating increases tool life in steel and cast iron applications!***
- ***Better chip control with -MD geometry in long-chipping, low-carbon steels!***

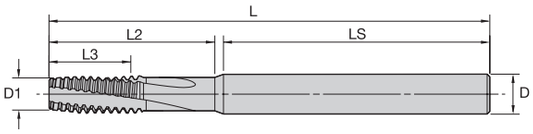
High-Performance Solid Carbide Taps

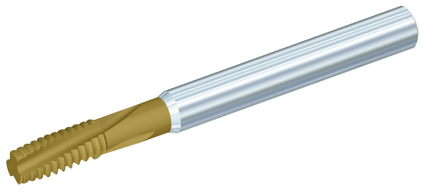
For Steels and Irons

Outstanding Productivity Through Exceptional Performance!

- Run up to 4x faster – with 4x the tool life versus HSS Taps!
- Ideal for high-speed CNC machines with synchronous or rigid tapping capability!
- Patented PVD TiAlN/TiN gold coating delivers superior edge strength and wear resistance!
- Get less than 10 microns run-out, resulting in exceptional thread quality!
- Specially designed and modified cutting edges guard against chipping!
- Taps can be reconditioned by Kennametal to original specifications.
- Available in metric and inch sizes.

Ideal for Shrink-Fit, hydraulic, or Synchroflex holders with TGHP collets!





T320 — Metric — Left-Hand Spiral Flute

● first choice
○ alternate choice

D1	TP	order number	catalog number	L	L3	L2	LS	D	Flutes	H	S	N	K	M	P	KC7542
6,000	1,00	3031914	T320M060X100R6H	70	12	25	43	6,000	3				●		●	●
8,000	1,25	3031915	T320M080X125R6H	80	15	31	47	8,000	3				●		●	●
10,000	1,50	3031916	T320M100X150R6H	90	18	37	51	10,000	4				●		●	●
12,000	1,75	3031917	T320M120X175R6H	100	21	45	54	12,000	4				●		●	●
14,000	2,00	3031918	T320M140X200R6H	110	24	39	70	12,000	4				●		●	●
16,000	2,00	3031919	T320M160X200R6H	110	24	39	70	14,000	4				●		●	●
12,000	1,50	3047640	T320MF120X150R6H	100	21	45	54	12,000	4				●		●	●
14,000	1,50	3047641	T320MF140X150R6H	110	24	40	68	12,000	4				●		●	●

TP = Pitch in mm

Shank Tolerance

D	Tolerance h6
6	0,000/-0,008
8 to 10	0,000/-0,009
12 to 18	0,000/-0,011

T320 — Inch — Left-Hand Spiral Flute

● first choice
○ alternate choice

D1	TPI	order number	catalog number	D	L	L3	L2	LS	Flutes	H	S	N	K	M	P	KC7542
1/4	20	3031904	T320NC02500-20R3B	.2500	2.76	.59	1.04	1.67	3				●		●	●
5/16	18	3031906	T320NC03125-18R3B	.3125	3.15	.67	1.25	1.85	3				●		●	●
3/8	16	3031908	T320NC03750-16R3B	.3750	3.54	.75	1.48	2.01	4				●		●	●
7/16	14	3031910	T320NC04375-14R3B	.4375	3.94	.87	1.63	2.26	4				●		●	●
1/2	13	3031911	T320NC05000-13R3B	.5000	3.94	.94	1.80	2.08	4				●		●	●
9/16	12	3031912	T320NC05625-12R3B	.5625	4.33	1.02	1.52	2.76	4				●		●	●
5/8	11	3031913	T320NC06250-11R3B	.6250	4.33	1.10	1.52	2.76	5				●		●	●
1/4	28	3031905	T320NF02500-28R3B	.2500	2.76	.59	1.04	1.67	3				●		●	●
5/16	24	3031907	T320NF03125-24R3B	.3125	3.15	.67	1.25	1.85	3				●		●	●
3/8	24	3031909	T320NF03750-24R3B	.3750	3.54	.75	1.48	2.01	4				●		●	●
1/2	20	3047639	T320NF0500020R3B	.5000	3.94	.94	1.80	2.08	4				●		●	●

TPI = Threads per inch

Ordering Example:

1/4-20 thread, straight shank without clamping flat, TiN-coated carbide

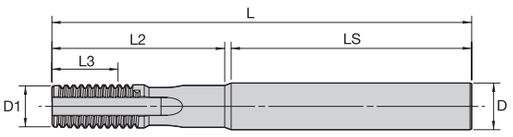
Type	Thread		Threads per inch	Cutting direction	Tolerance	Grade
T320	**NC02500**	**-**	**20**	**R**	**3B**	**KC7542**

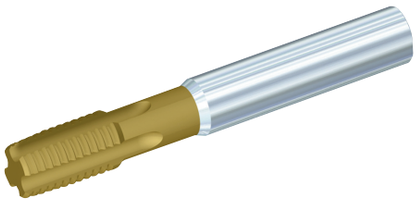
Shank Tolerance

D	Tolerance h6
.2500 to .6875	0.0000/-0.0004

High-Performance Solid Carbide Taps

For Through Holes





● first choice
○ alternate choice

H	S	N	K	M	P
			●		●

T340 — Metric — Straight Flute

D1	TP	order number	catalog number	L	L3	L2	LS	D	Flutes	KC7542
10,000	1,50	3031928	T340M100X150R6H	90	18	37	51	10	4	●
12,000	1,75	3031929	T340M120X175R6H	100	21	45	54	12	4	●
14,000	2,00	3031930	T340M140X200R6H	110	24	39	70	12	4	●
16,000	2,00	3031931	T340M160X200R6H	110	24	39	70	14	4	●
18,000	2,50	3031932	T340M180X250R6H	125	30	44	80	16	5	●
20,000	2,50	3031933	T340M200X250R6H	140	30	48	90	18	5	●

TP = Pitch in mm

Shank Tolerance

D	Tolerance h6
8 to 10	0,000/-0,009
12 to 18	0,000/-0,011

● first choice
○ alternate choice

H	S	N	K	M	P
			●		●

T340 — Inch — Straight Flute

D1	TPI	order number	catalog number	D	L	L3	L2	LS	Flutes	KC7542
3/8	16	3031920	T340NC03750-16R3B	.3750	3.54	.75	1.50	2.01	4	●
7/16	14	3031922	T340NC04375-14R3B	.4375	3.94	.87	1.62	2.26	4	●
1/2	13	3031923	T340NC05000-13R3B	.5000	3.94	.94	1.77	2.08	4	●
9/16	12	3031925	T340NC05625-12R3B	.5000	4.33	1.02	1.51	2.76	4	●
5/8	11	3031926	T340NC06250-11R3B	.5625	4.33	1.10	1.51	2.76	5	●
3/4	10	3031927	T340NC07500-10R3B	.6250	4.92	1.10	1.87	2.95	5	●
3/8	24	3031921	T340NF03750-24R3B	.3750	3.54	.75	1.50	2.01	4	●
1/2	20	3031924	T340NF05000-20R3B	.5000	3.94	.94	1.77	2.08	4	●

TPI = Threads per inch

Shank Tolerance

D	Tolerance h6
.2500 to .6875	0.0000/-0.0004

Ordering Example:

3/8-16 thread, straight shank without clamping flat, TiN-coated carbide

Type	Thread	Threads per inch	Cutting direction	Tolerance	Grade
T340	**NC03750**	**- 16**	**R**	**3B**	**KC7542**

Cutting Groups	Material Group	Composition/Structure		Tensile Strength RM (Mpa)	Hardness HB	Cutting Speed v_c: (m/min) (sfm)	Grade	Tap style
1.1	Unalloyed steel, cast steel, free machining steel	C = 0,10 - 0,25	Annealed, long-chipping	420	125	100 - 130 300 - 400	KC7542	T320
1.2		C = 0,10 - 0,25	Annealed, short-chipping	420	125	100 - 130 300 - 400	KC7542	T340
2.1		C = 0,25 - 0,55	Annealed, long-chipping	640	190	70 - 100 200 - 300	KC7542	T320
2.2		C = 0,25 - 0,55	Annealed, short-chipping	640	190	70 - 100 200 - 300	KC7542	T340
3		C = 0,25 - 0,55	Tempered	850	250	70 - 100 200 - 300	KC7542	T320
4		C = 0,55 - 0,80	Annealed	915	270	50 - 80 150 - 250	KC7542	T320
5		C = 0,55 - 0,80	Tempered	1020	300	50 - 80 150 - 250	KC7542	T320
6	Low-alloy steel, cast steel, machining steel		Annealed	610	180	70 - 100 200 - 300	KC7542	T320
7			Tempered	930	275	50 - 80 150 - 250	KC7542	T320
8			Tempered	1020	300	50 - 80 150 - 250	KC7542	T320
9			Tempered	1190	350	35 - 70 100 - 200	KC7542	T320
10	High-alloy steel, cast steel, high-alloy tool steel		Annealed	680	200	70 - 100 200 - 300	KC7542	T320
11			Hardened and Tempered	1100	325	35 - 70 100 - 200	KC7542	T320
15-16	Gray cast Iron		Pearlitic/ Ferritic		180	80 - 130 250 - 400	KC7542	T340
17-18	Cast iron with nodular cast iron		Ferritic or pearlitic		160	80 - 130 250 - 400	KC7542	T340
19-20	Malleable cast iron		Ferritic or pearlitic		130	80 - 130 250 - 400	KC7542	T320

NOTE: These are starting condition guidelines only. The machine tool, fixturing, toolholding, part configuration, and coolant capability may significantly influence specific applications.

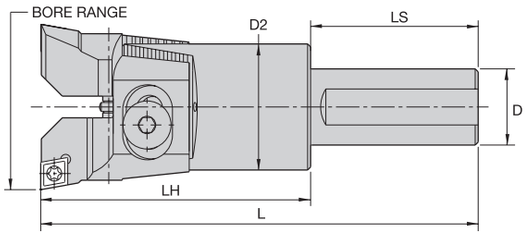
Use proper and safe machining practices. Make the set-up as rigid as possible.

Decrease cutting speed as material hardness increases.

ModBORE Boring Systems

Inch Round Shank with Flat

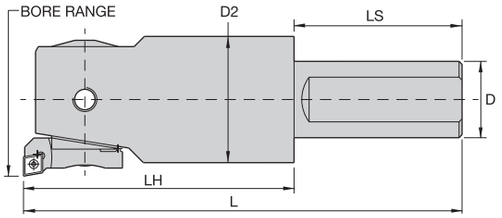
- Rough boring systems with twin cutters.
- RBHT series.
- Preset on toolsetter.
- Blade set included.



Rough Boring — Twin Cutters

BR1 bore range inch	BR1 bore range metric	order number	catalog number	D	D2	L	LH	LS	ModBORE RBHT parts pkg
.9252-1.2008	23,500-30,500	3077129	SF075RBHT24110F	.750	.79	5.91	1.65	4.25	PKG2001
1.1614-1.5748	29,500-40,000	3077128	SF100RBHT30120F	1.000	.98	6.69	1.85	4.84	PKG2501
1.5551-1.9882	39,500-50,500	3077127	SF125RBHT40130F	1.250	1.26	7.48	2.05	5.43	PKG3201
1.9488-2.6181	49,500-66,500	3077126	SF100RBHT5090F	1.000	1.65	5.74	3.54	2.20	PKG4201
2.5787-3.4449	65,500-87,500	3077125	SF125RBHT66100F	1.250	2.17	6.33	3.94	2.39	PKG5501
3.4055-4.5472	86,500-115,500	3077124	SF150RBHT87120F	1.500	2.83	7.54	4.72	2.82	PKG7201
4.5079-6.0236	114,500-153,000	3077123	SF200RBHT115150F	2.000	3.70	9.29	5.91	3.38	PKG9401

- Fine-boring single cutters.
- FBHS series with 0° lead.
- .0004" diameter adjustment.
- Insert holder included.

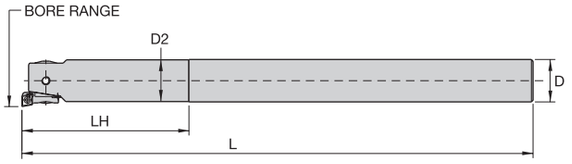


Fine Boring — Steel Shank

BR1 bore range inch	BR1 bore range metric	order number	catalog number	D	D2	L	LH	LS	ModBORE FBHS parts pkg
.9409-1.4606	23,900-37,100	3077136	SF075FBHS24110	.750	.79	5.91	1.65	4.25	PKG2002
1.2165-1.8543	30,900-47,100	3077135	SF100FBHS31120	.984	.98	6.69	1.85	4.84	PKG2502
1.5709-2.3268	39,900-59,100	3077134	SF125FBHS40130	1.250	1.26	7.48	2.05	5.43	PKG3202
2.0039-3.1929	50,900-81,100	3077133	SF100FBHS5190	1.000	1.65	5.74	3.54	2.20	PKG4202
2.6339-4.1378	66,900-105,100	3077132	SF125FBHS67100	1.250	2.17	6.33	3.94	2.39	PKG5502
3.4213-6.0670	86,900-154,100	3077131	SF150FBHS87120	1.500	2.83	7.54	4.72	2.82	PKG7202
4.5630-7.5236	115,900-191,100	3077130	SF200FBHS116150	2.000	3.70	9.29	5.91	3.38	PKG9402

To place an order, contact Kennametal or your authorized Kennametal distributor, or visit www.kennametal.com.

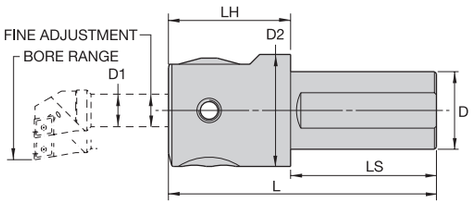
- Fine-boring single cutters with carbide shanks.
- FBHS series 0° lead.
- .0004" diameter adjustment.
- Insert holder included.



Fine Boring — Carbide Shank

BR1 bore range inch	BR1 bore range metric	order number	catalog number	D	D2	L	LH	ModBORE FBHS parts pkg
.941	23,90	3077139	SSE075FBHS24200	.750	.79	9.84	3.15	PKG2002
1.217	30,90	3077138	SSE100FBHS31250	1.000	.98	12.05	3.94	PKG2502
1.571	39,90	3077137	SSE125FBHS40320	1.250	1.26	14.96	5.04	PKG3202

- Offset boring head.
- FBHO series.
- .0004" diameter adjustment.
- Boring bars can be found in Holemaking 3070 catalog.



Offset Boring Heads

order number	catalog number	radial adjustment max	radial adjustment max	D	D1	D2	L	LH	LS
3077141	SF100FBHO1660	.106	2,700	1.000	.63	2.17	4.56	2.36	2.20
3077140	SF150FBHO1660	.106	2,700	1.500	.63	2.17	5.18	2.36	2.82

Carbide Recycling Program

Get cash for your used carbide — and help preserve the environment, too!

GET MORE SHOP SPACE, GET LEANER, GET MORE COMPETITIVE. AND, GET CASH, TOO!

Here's all you have to do:

1) Go to www.kennametal.com/carbiderecycling.
2) Locate latest scrap rates.
3) Complete (name, address, phone, email, scrap type, and amount) and submit online form.
4) Print a shipping label.
5) Ship your materials to Kennametal.

OR

Call 866/227-2433 or
fax 724-539-5049 for more details.

Let us prove it.
www.kennametal.com

METALCUTTING SAFETY

(Please read this before using products listed in this catalog.)

Modern metalcutting operations involve high energy, high spindle or cutter speeds, and high temperatures and cutting forces. Hot, flying chips may be projected from the workpiece during metalcutting. Although advanced cutting tool materials are designed and manufactured to withstand the high cutting forces and temperatures that normally occur in these operations, they are susceptible to fragmentating in service, particularly if they are subjected to over-stress, severe impact or are otherwise abused. Therefore, precautions should be taken to adequately protect workers, observers and equipment against hot, flying chips, fragmented cutting tools, broken workpieces or other similar projectiles. Machines should be fully guarded and personal protective equipment should be used at all times.

When grinding carbide or other advanced cutting tool materials, a suitable means for collection and disposal of dust, mist or sludge should be provided. Overexposure to dust or mist containing metallic particles can be hazardous to health, particularly if exposure continues over an extended period of time, and may cause eye, skin and mucous membrane irritation and temporary or permanent respiratory disease. Certain existing pulmonary and skin conditions may be aggravated by exposure to dust or mist. Adequate ventilation, respiratory protection and eye protection should be provided when grinding, and workers should avoid breathing of and prolonged skin contact with dust or mist. General Industry Safety and Health Regulations, Part 1910, U.S. Department of Labor, publishedin Title 29 of the Code of Federal Regulations should be consulted. Obtain from Kennametal and read the applicable Material Safety Data Sheet before grinding.

Cutting tools are only one part of the worker-machine tool system. Many variables exist in machining operations, including: metal removal rate; workpiece size, shape, strength and rigidity; chucking and fixturing; the load carrying capability of centers; cutter and spindle speed and torque limitations; the holder and boring bar overhang; available power, and the condition of the tooling and the machine. A safe metalcutting operation must take all of these variables, and others, into consideration.

Kennametal has no control over the end use of its products or the environment into which those products are placed. Kennametal urges that its customers adhere to the recommended standards of use of their metalcutting machines and tools, and that they follow procedures that ensure safe metalcutting operations. The technical information included throughout this catalog, as well as recommendations on machining practices referred to herein are only advisory in nature and do not constitute representations or warranties and are not necessarily appropriate for any particular work environment or application.

For more information, we suggest you obtain Kennametal's Metalcutting Safety booklet, if you do not already have one. Quantities of safety booklets and Material Safety Data Sheets may be obtained free from the Kennametal Corporate Compliance Office at 724-539-5747, or fax 724-539-5439. For product safety and environmental inquiries, contact our Corporate Environmental Health and Safety Office at 724-539-5631 or fax 724-539-5372.

100% PERFECT-PERFORMANCE PROMISE TERMS AND CONDITIONS.

Percent improvement per product based on comparison to competitive tools and taking into account:

- PRODUCTIVITY = Producing more parts per hour.
- LONGER TOOL LIFE = More parts produced per cutting edge at the same cycle time.
- A combination of PRODUCTIVITY and TOOL LIFE.

Kennametal reserves the right to have a Kennametal Sales Engineer assess the application to make recommendations for process improvement — in order to achieve targeted performance percentages.

A request for credit must be submitted to Kennametal within 60 days of shipment of the tool being credited. A Returned Materials Authorization number must be obtained from Kennametal, prior to applying for a credit under this program.

Credits for individual tool types will be issued on only one order per customer per year.

Credit will be issued as a refund, or at the discretion of the customer as a credit to the customer's account.

Unused and/or worn tools for which credit has been issued must be returned to Kennametal at the discretion of Kennametal (free of charge shipment).

Only tools listed in this brochure are covered by the money-back guarantee.

Kennametal's liability under this promotion is limited to refunds issued on tooling — and does not include damage to workpieces or machinery.

All orders are subject to Kennametal's standard terms and condition of sale.

KENNAMETAL ONLINE
www.kennametal.com *for:*
- *online buying*
- *contract ordering*
- *order status*
- *account status*
- *check price and availability*
- *favorites list*

APPLICATION SUPPORT
Tech Line
USA and Canada:
800/835-3668
Outside USA and Canada:
724/539-6921
Monday-Friday: 7am-7pm
Saturday: 9am-3pm

MACHINE UTILIZATION
Optimize your machine through:
- *quick-change tooling*
- *tool kit assembly*
- *tool pre-gauging*
- *advanced cutting tool materials*
- *tool location management*
- *tool sensors*

KENNAMETAL KNOWLEDGE CENTER
To enroll in our unique, five-day application engineering course, call 724/539-6828.

TOOL MANAGEMENT SYSTEM
ToolBoss®... to reduce your tool-buying, tool-inventory, and tool-supply costs.

Printed in USA
A07-2 (35) B7

KENNAMETAL®
Engineering Your Competitive Edge

Kennametal, Inc.
Metalworking Solutions & Services Group
1600 Technology Way
Latrobe, PA 15650

CHANGE SERVICE REQUESTED

Customer Service
(United States and Canada) Phone
800/446-7738
FAX: 888-505-5050