KENNAMETAL®

Engineering Your Competitive Edge













GMILLINGMILL MILLINGMILLIN OOLINGTOOLING



Catalog 6050
METRIC



WORLD'S MOST COMPREHENSIVE MILLING SOLUTIONS FOR INDUSTRY



INDEXABLE END MILLING • **FACE** MILLING • **SLOTTING** • **SHOULDER** MILLING • **90°** MILLING • **DIE & MOLD** • **THREAD** MILLING •

LUTIONS • **SOLID-CARBIDE** END MILLING • **INDEXABLE** END MILLING • **FACE** MILLING • **SLOTTING** • **SHOULDER** MILLING • **90°**

E & MOLD • **THREAD** MILLING • **CUSTOM SOLUTIONS** • **SOLID-CARBIDE** END MILLING • **INDEXABLE** END MILLING • **FACE** MILLING

• **SHOULDER** MILLING • **90°** MILLING • **DIE & MOLD** • **THREAD** MILLING • **CUSTOM SOLUTIONS** • **SOLID-CARBIDE** ENDMILLING •

END MILLING • **FACE** MILLING • **SLOTTING** • **SHOULDER** MILLING • **90°** MILLING • **DIE & MOLD** • **THREAD** MILLING • **CUSTOM**

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Milling Tooling

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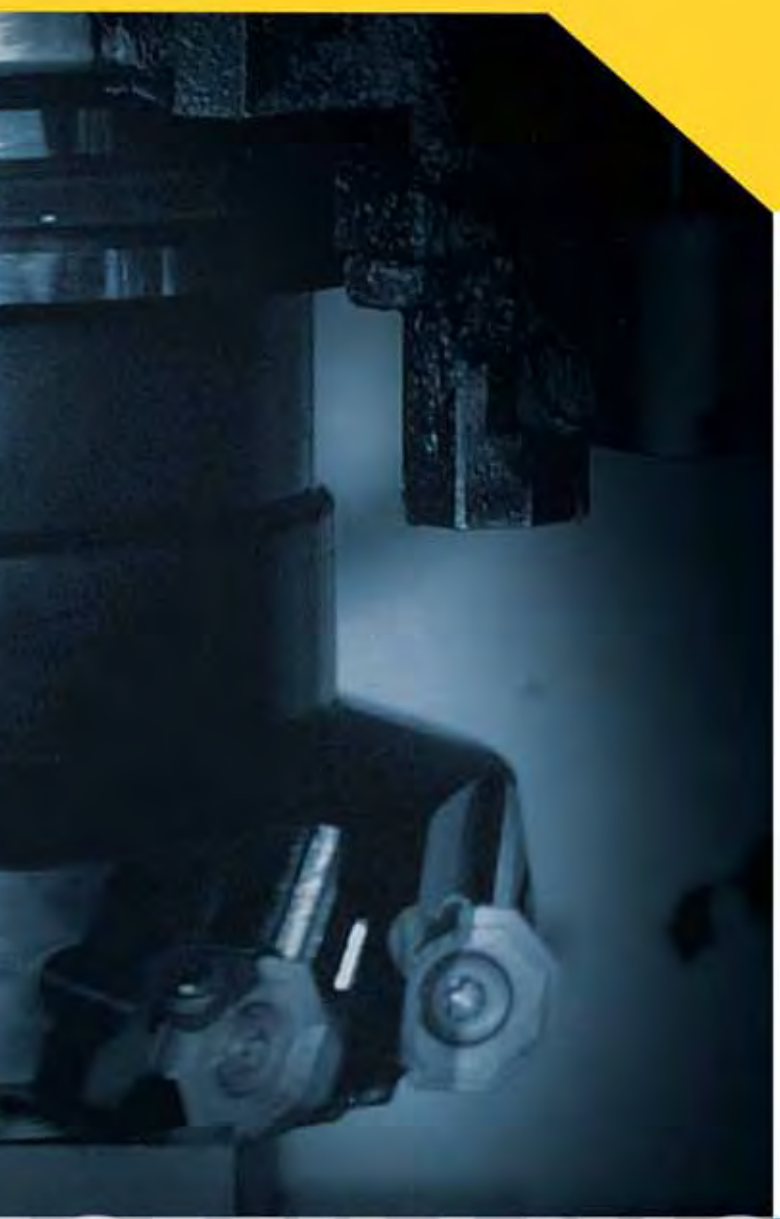


THINK **MILLING,**
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FACE MILLING
INDEXABLE
END MILLING

KENNAMETAL®

Kennametal is a world leader in the development, manufacture, application, and supply of metalcutting tools and services — and the undisputed top global maker of mining and highway-construction tooling. No matter what your industry, Kennametal will significantly boost your manufacturing competitiveness!



THE POWER OF THE **KENNAMETAL ENTERPRISE**

- Documented annual customer cost-savings from 10% to 30%.
- Thousands of new, top-quality products each year.
- 40% of revenue from new products developed within the last five years.
- Over $2.3-billion in annual global sales.
- 13,500 employees in more than 60 countries.
- 1,000 highly trained staffers in cutting and wear solutions.

DEVELOPING **INNOVATIVE CUSTOMER SOLUTIONS**

- Our tooling innovations and process-optimization services enable you to greatly reduce cost-per-part time and expense.
- Globally recognized for our continuous commitment to R&D and breakthrough technology.
- Seven worldwide and highly focused R&D facilities.

INTENSELY **DEDICATED EMPLOYEES**

- Our Field Sales force consists of application experts who work directly on your shop floor to solve problems — while increasing your productivity.







KENNAMETAL®

Our metalcutting tools are unsurpassed in quality, value, and performance! No other single resource delivers such a comprehensive combination of indexable and solid Milling products – carbide and HSS!

We have the BEST tool – no matter what your Milling application, workpiece, or equipment – to reduce your machining time, while providing you superior surface finishes!

END MILLING FACE MILL



We offer the world's most complete array of high-performance ***FACE-MILLING*** products! Ask about our KSOM™, FIX-PERFECT™, KSCM™, and KSRM™ cutters!

Our ***END-MILLING*** tooling is world-renowned for innovation and productivity! Try our NGE-A, Mill 1™, and KSSM 90° styles!

Kennametal's KSSM™ and A2™ ***SLOTTING*** selection is unsurpassed, with adjustable or fixed pockets, for delivering ultimate output in the toughest machining challenges!

For ***DIE & MOLD*** profiling, we provide tools for extremely high feed rates (KenFEED™) and also ball-nose and square shoulder designs (KDMB™, KDMS™, and KDMT™)!

No one has such a wide variety of products for milling ***CERAMICS*** – FIX-PERFECT™, HexaCut™, KIPR™, and KSSR™!

We have everything for internal or external ***THREADING***: TMS and TM25!

Our ***SOLID-CARBIDE END MILLS*** are simply second to none! With its patented flute design with unequal spacing, our HARVI™ style enables true, chatter-free machining! And, Kennametal's overall lines of general-purpose, ball-nose, or double-end models – all with a new fine micro-grade substrate – yield the metalcutting industry's most consistent and reliable results!



MILL 1-14



KSOM MINI



KSCM ALUMINUM MILL



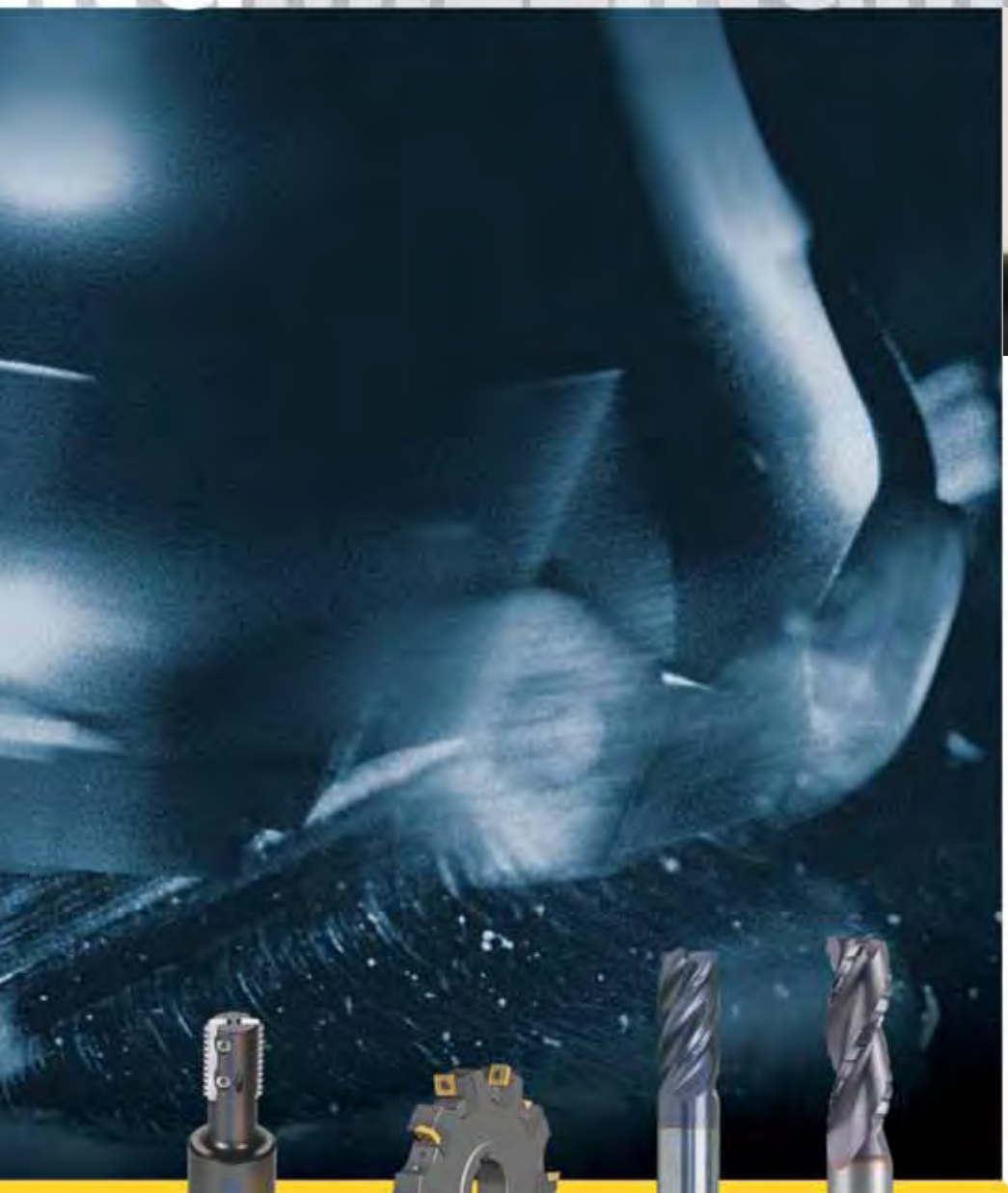
KENFEED MILL

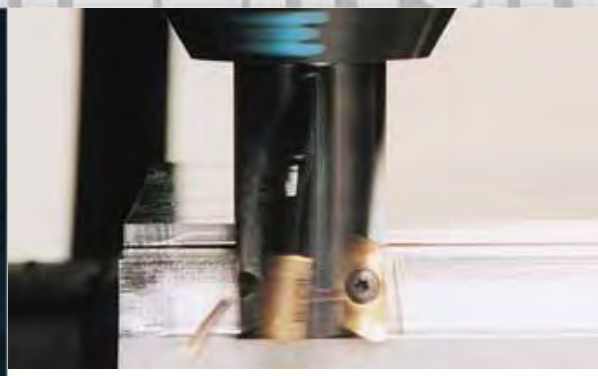


KSRM FACE MILL

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THREAD MILLING INDEXABLE MILLING







EASY-TO-USE TOOL SELECTOR

Choose the ***RIGHT*** indexable or solid tool for your particular material or operation! Our unique Tool Selector enables you to ***SEE – by style, photo, geometry, and size – your choices!***

OPERATION UPGRADE
Proven Milling Performance

OPERATION UPGRADE™ PROGRAM

Kennametal's unsurpassed grade technology and reliability is built into every one of our industry-standard shapes and sizes! No matter what your milling application or workpiece, our inserts will deliver second-to-none results! Make a change for the better today!



TM25 THREAD MILL

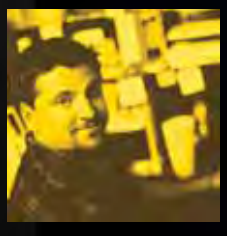
KSSM SLOTTING CUTTER

HARVI END MILL

SOLID-CARBIDE END MILL

FACE MILLING
INDEXABLE
END MILLING





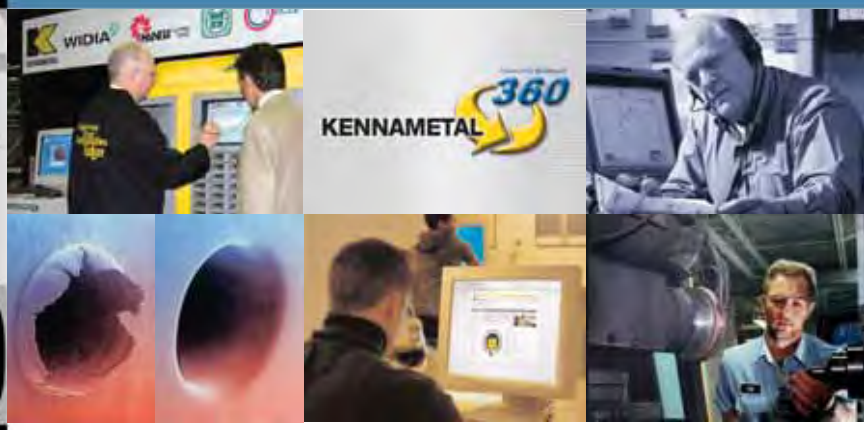






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KENNAMETAL®

Kennametal offers far more than the world's best metalcutting products! No one else delivers such a total array of beyond-the-purchase support!

VALUE-ADDED SERVICES

- **ToolBOSS® / Supply-Chain Management**
  We combine the industry's best practices with premier equipment and software solutions to help you manage tools and supplies; reduce acquisition, possession, and usage costs; and increase operational effectiveness!
- **Kennametal Complete™ Customized Solutions**
  Our potent combination of products and services will reduce your production costs, improve performance, increase profitability, strengthen customer loyalty, and enable you to thrive in an increasingly competitive marketplace!
- **Kennametal 360™ Tool Optimization Program**
  We can actually find the harmonics of your spindle – and set tooling to neutralize vibration. Result: You get absolutely the highest metal-removal rates!
- **Machine Tool Builder Relationships**
  We're right where you need us – with excellent partnerships with the world's top machine tool makers!
- **Precision Deburring, Superior Polishing, and Accurate Surface-Finishing**
  Extrude Hone, a Kennametal company, provides a complete menu of non-traditional, state-of-the-art technologies to drive up your productivity while reducing your manufacturing costs!
- **Customer Application Support**
  Simply, our help-desk resource is the world's finest for tooling application solutions and problem resolution!
- **Tool Reconditioning and Carbide Recycling**
  Optimize the total value of your metalcutting tools throughout their lives!
- **e-Business**
  Our website, Buy-Online, and EDI services make electronic commerce with us easy!
- **Kennametal Knowledge Center**
  The ultimate source for world-class talent development in metalworking science and application!



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Solid-Carbide End Mills

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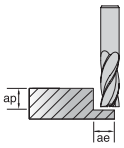
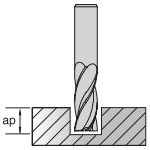
Speciality Application Finishers *124*



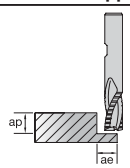
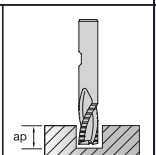
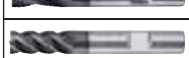
MILLING

● ... first choice
○ ... alternate choice

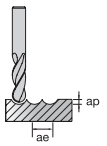
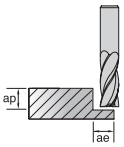
Type of Tool	Tool Style	Range of Diameter (mm) Min ~ Max	No. of Flutes	Helix Angle	Special Features R-Radius CH-Chamfer N-Neck C-Coolant KW-Keyway Mic-Micro TR-Toroidal SQ-Square End	Type of Application		Workpiece Materials P	M	K	N	S	H	See Page
	F2AH….AWS30L…	0,3~2,5	2	30	Mic	Side Milling	Slotting	●		●			●	18
	F2AH….AWS30	0,4~3	2	30	Mic	Side Milling	Slotting	●	●	●		●	●	19
	F3AH….AWS30	0,4~3	3	30	Mic	Side Milling	Slotting	●	●	●		●	●	19
	F2AH….A/BDK30	2~20	2	30/45		Side Milling	Slotting	●	●	●	○	●		20
	F3AH….A/BDK30/45	2,5~20	3	30/45		Side Milling	Slotting	●	●	●	○	●		21
	F4AJ….A/BDK30	2~20	4	30		Side Milling		●	●	●	○	●		23
	F3AR….BWS30	2~10	3	30		Side Milling		●	●	●	○	●		24
	F2AU….A/BDK30	2,8~19,7	2	30	KW		Slotting	●	●	●	○	●		25
	F3AU….A/BDK30	2,8~19,7	3	30	KW		Slotting	●	●	●	○	●		26
	F3AS….BDK35	3~20	3	35	R	Side Milling	Slotting	●	●			○		27
	F2AT….AWL/M/X20 R…	2~12	2	20	TR, N	Side Milling	Slotting	●		●			●	28
	F2AT….AWL/M/X00 R…	3~10	2	0	TR, N	Side Milling	Slotting	●		●			●	29
	F4AT….AWS/M/L/X20/30R…	4~12	4	20/30	TR, N	Side Milling	Slotting	●		●			●	30
	F2/3AH….ADN30	2~20	2/3	30		Side Milling	Slotting	●	●	●	○	●		31
	F4AJ….ADN30	2~20	4	30		Side Milling		●	●	●	○	●		33
	F2AH….A/BDL30	2.5~20	2	30		Side Milling	Slotting	●	●	●	○	●		34
	F3AH….A/BDL30/45	3~20	3	30/45		Side Milling	Slotting	●	●	●	○	●		35
	F3AJ….ADL60	6~20	3	60		Side Milling		●	●	●	○	●	○	37
	F4AJ….A/BDL30	4~20	4	30		Side Milling		●	●	●	○	●		38
	F2AH….AWM/L/X30	.4~20	2	30		Side Milling	Slotting	●	●	●	○	●		39
	F4AJ….AWM/L/X30	3~20	4	30		Side Milling	Slotting	●	●	●	○	●		40
	F1AA….AWS/M30	2~12	1	30		Side Milling	Slotting				●			41
	F2AA….ADL45	4~20	2	45		Side Milling	Slotting				●			42
	F2AA….AWM/L/X45 R…	6~25	2	45	R, N	Side Milling	Slotting				●			43
	F3AA….AWS/L45	3~20	3	45		Side Milling	Slotting				●			45
	F3AA….AWM/L/X45 R…	6~25	3	45	R, N	Side Milling	Slotting				●			44

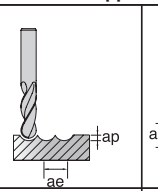
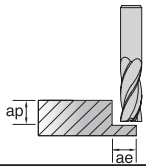
Type of Tool	Tool Style	Range of Diameter (mm) Min ~ Max	No. of Flutes	Helix Angle	Special Features R-Radius CH-Chamfer N-Neck C-Coolant KW-Keyway Mic-Micro TR-Toroidal SQ-Square End	Type of Application		Workpiece Materials P	M	K	N	S	H	See Page
														
	F8/10AJ….ADK45E…	8~20	8/10	45	R, N	Side Milling		●	●	●		●	○	46
	F4AS….ADL38	4~25	4	38	CH	Side Milling	Slotting	●	●	●		●		49
	F4AS….A/BWM/L/X38R…	6~25	4	38	R, N	Side Milling	Slotting	●	●	●		●		48
	F6AJ….A/BDL30	6~20	6	30		Side Milling		●	●	●	○	●		47
	F6/8AJ….A/BDL45	6~20	6/8	45		Side Milling		●	●	●	○	●		50
	F6/8AJ….A/BWM/L/X45	6~25	6/8	45		Side Milling		●	●	●	○	●		51
	F6/8AV….ADL45	6~25	6/8	45		Side Milling		○					●	53
	F6/8AV….AWM/L/X	6~25	6/8	45		Side Milling							●	54
	F4/5/6AJ….A/BWS/M/L/X50L…	6~25	4/5/6	50		Side Milling		●					●	55
	F4/5AJ….AWS/M/L/X50R…	6~25	4/5	50	R	Side Milling		●		○			●	57

Semi-Finishers & Roughers

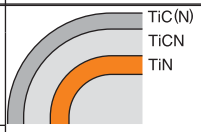
Type of Tool	Tool Style	Range of Diameter (mm) Min ~ Max	No. of Flutes	Helix Angle	Special Features R-Radius CH-Chamfer N-Neck C-Coolant KW-Keyway Mic-Micro TR-Toroidal SQ-Square End	Type of Application		Workpiece Materials P	M	K	N	S	H	See Page
														
	F3/4/6BT….AWM/L/X45R…	4~25	3/4/6	45	R, N	Side Milling	Slotting	●	●	●	○	●	○	75
	F3BS….BDK/L35	6~20	3	35	R=0,45mm	Side Milling	Slotting	●	●					77
	F3/4BH/J…BDL30	4~20	3/4	30		Side Milling	Slotting	●	●					78
	F4/6BJ….BDL45	6~25	4/6	45		Side Milling	Slotting	●	●					80
	F3/4/5BH….BDL30	4~25	3/4/5	30		Side Milling	Slotting	●		●				81
	F4/6BJ….BDL45L…	6~25	4/6	45	R	Side Milling	Slotting	●	●	○			●	82
	F3BA….ADL40E…	6~20	3	40	R, N	Side Milling	Slotting				●			88
	F3/4B/JH….BWS/M/L/X20C…	8~20	3/4	20	C	Side Milling	Slotting	●		●				84
	F3/4/5BH/J….BWS/M/L/X20L…	4~25	3/4/5	20		Side Milling	Slotting	●		●				85
	F3BA….BWS/M/L/X30	6~25	3	30		Side Milling	Slotting				●			86
	F3BA….BWM/L/X30C…	8~25	3	30	C	Side Milling	Slotting				●			87
	F4BS….AWM/L/X38R…	6~25	4	38	N, R	Side Milling	Slotting	●	●	●		●		83

● ... first choice
○ ... alternate choice

Type of Tool	Tool Style	Range of Diameter (mm) Min ~ Max	No. of Flutes	Helix Angle	Special Features R-Radius CH-Chamfer N-Neck C-Coolant KW-Keyway Mic-Micro TR-Toroidal SQ-Square End	Type of Application 	Type of Application 	Workpiece Materials P	M	K	N	S	H	See Page
	F2AL….AWS30L…	0,3~6	2	30	Mic	3D cutting		●		●			●	94
	F2AL….AWM30E…	0,5~4	2	30	Mic, N	3D cutting		●		●			●	96
	F2AL….AWS30	0,5~3	2	30	Mic, N	3D cutting		●		●			●	95
	F2AL….AWS30E…	0,5~3	2	30	Mic, N, GR	3D cutting					●			97
	F2AL….AWM/L/X20	2~12	2	20	N, GR	3D cutting					●			98
	F2AL….AWL/M30	1~16	2	30		3D cutting		●	●	●			●	99
	F2AL….AWM/L/X30	6~16	2	30		3D cutting		●	●	●			●	101
	F2AL….AWM/L/X20	2~12	2	20		3D cutting		●	●	●			●	100
	F2AB….AWM/L/X30	2~12	2	30	N	3D cutting		●	●	●			●	102
	F2AL….AWM/L/X00L…	3~10	2	0	N	3D cutting		●	●	●			●	103
	F4AL….AWM/L/X30L…	3~10	4	30	N	3D cutting		●	●	●			●	104
	F2AL….AWS/M/L00	4~12	2	0		3D cutting		●	●	●			●	105
	F2/4AL….ADN30	2~20	2/4	30		3D cutting		●	●	●		●	○	106
	F2AL….A/BDL30	2~20	2	30		3D cutting		●	●	●		●	○	108
	F4AL….A/BDL30	3~20	4	30		3D cutting		●	●	●		●	○	109
	F2/4AL….AWM/L/X30L…	3~12	2/4	30		3D cutting		●	●	●	○	●	○	110
	F3AW….AWL/X35E…	6~16	3	35	N	3D cutting		●	●			○		112
	F4AW….AWL/X38E…	6~16	4	38	N	3D cutting			●			●		113
	F4AL...WM-WL-WX...	3~12	4	30		3D cutting	Side Milling	●	●	●	○	●	○	111
	F3BL-F4BL...WS-WM-WL-WX	6~20	3/4	20		3D cutting	Side Milling/ Slotting	○	○	○		○		114

Type of Tool	Tool Style	Range of Diameter (mm) Min ~ Max	No. of Flutes	Helix Angle	Special Features R-Radius CH-Chamfer N-Neck C-Coolant KW-Keyway Mic-Micro TR-Toroidal SQ-Square End	Type of Application		Workpiece Materials ● ... first choice ○ ... alternate choice						See Page
								P	M	K	N	S	H	
	F2AT….ABT00R…	10~25	2	0	TR	3D cutting		●		●			●	124
	F2/4AT….ABT30R…	10~25	2/4	30	TR	3D cutting		●		●			●	125
	F2AL….ABT00	10~25	2	0		3D cutting		●		●			●	127
	F2AL….ABT30	10~25	2	30		3D cutting		●		●			●	128
	F6/8AJ….M….	8~20	6/8	45	CH		Side Milling						●	129
	F6/8AJ….M….R…	8~20	6/8	45	R		Side Milling						●	130
	F4/6AT….M….R…	8~20	4/6	20	R		Side Milling	●		●			●	131
	F2/4AL….M….	8~20	2/4	30		3D cutting		●		●			●	132
	F4AL...M	8~20	4	30		3D cutting	Side Milling	●		●			●	133
	F2AB….M….	10~20	2	30		3D cutting		●		●			●	134
	F4AW….AWL/X30W…	4~10	4	38		3D cutting			●			●		135

Grade Descriptions

grades	coating composition	recommended use
K600		Carbide grade made from high quality, micro-grain materials for cutting all types of workpiece materials. Very high toughness ensures a controlled wear rate. The micro-grain structure enables extremely sharp cutting edges.
KC625M		Coated carbide grade with PVD multi-layer (TiN/TiCN/TiC). For universal use due to its high wear resistance and hardness. Only use wet or with minimal amounts of lubrication.
KC631M		Coated carbide grade with PVD coating (TiAlN). KC631M is a very thin and smooth PVD coating particularly suitable for cutting aluminum with silicon content greater than 12%. This coating maintains a sharp cutting edge and protects the tool against built up edge.
KC633M		Coated carbide grade with 3µm thick PVD coating (TiAlN/TiN/TiAlN). KC633M is a high-performance grade for dry milling most types of material, apart from the hardened variety. This grade is characterized by good hardness and wear resistance. It provides outstanding protection for solid carbide tools against cratering and abrasion.
KC635M		Coated carbide grade with 3µm thick PVD coating (TiAlN). KC635M is a high-performance grade for finishing operations. This grade is characterized by high hardness and wear resistance.
KC637M		PVD (TiAlN) coated carbide on a new sub-micron carbide substrate. This hard coating provides outstanding performance in milling hardened materials (58-65HRC).
KC643M		Coated fine grain grade with PVD multilayer (TiAlN). KC643M is a very thin and hard PVD coating particularly suitable for cutting cast iron, stainless steel, and titanium (wet and dry). This grade can be used for materials with hardness up to 52HRC.
KDF310		Diamond coated carbide grade with PVD mono-layer. Specially designed for cutting graphite and composite materials. This grade is characterized by high wear resistance and chemical stability.
KB1615		Soldered, highly wear-resistant CBN tip for machining hardened steel up to 65 HRC. Particularly suitable for finishing operations that require high dimensional consistency.

1.	2.	3.	4.	5.	6.	7.	8.	9.
F – Solid carbide mill	Number of teeth	Mill type	Milling cutter type	Milling cutter diameter	Shank form	Standard/size	Helix Angle	Specification
F	2	A	H	0600	B	DN	30	L200

3. Mill type

- **A** Solid material with continuous cutting edge
- **B** Solid material with discontinuous cutting edge
- **D** With soldered, continuous cutting edge
- **E** With soldered, discontinuous cutting edge

5. Milling cutter diameter

Values in 1/100 mm

7. Standard/size

- **DN** DIN 6528
- **DK** DIN 6527 short
- **DL** DIN 6527 long
- **WS** Factory standard Small Total length ≤ 60 mm
- **WM** Factory standard Medium Total length > 60 ≤ 75 mm
- **WL** Factory standard Large Total length > 75 ≤ 100 mm
- **WX** Factory standard Extra Large Total length > 100 mm

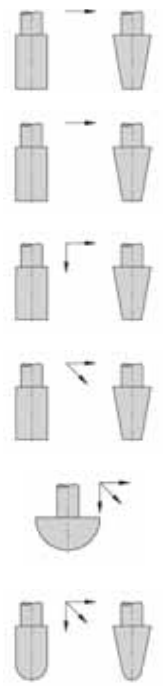
9. Specification

- **L** Cutting edge length
- **R** Corner radius
- **C** Internal cooling and cutting edge length

Values in 1/10 mm

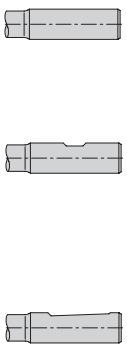
4. Milling cutter type

- **F** T-slot mill
- **G** Helical end mill, straight and tapered
- **H** Slotting mill, straight and tapered
- **J** Slot mill, straight and tapered
- **K** Die sinking mill with round face
- **L** Die sinking mill with round face



6. Shank form

- **A** Smooth straight shank
- **B** Straight shank with lateral clamping surface (ISO 3338-1) (Weldon)
- **E** Straight shank with inclined clamping surface (Whistle Notch)



Special applications

- **D** – Dry machining
- **A** – Aluminium machining
- **R** – Non-regrinding end mill
- **U** – Undersize mill
- **V** – Hard machining (Vickers)
- **S** – Stainless steel
- **T** – Radiused mill
- **W** – Radiused mill and ball nose

AEROSPACE



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Airframe



Landing Gear



Engine Component

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Square End Mills — Finishing

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High-Performance Finishing End Mills

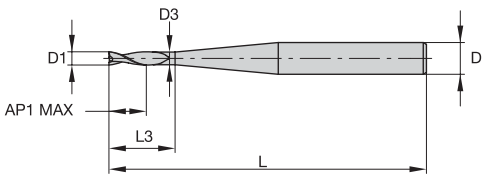
F2AH...WS-WM — Micro — Long with Extended Neck

Features

- Factory standard.
- Straight shank.
- Sharp corner - center cutting.

Operations

- Side cutting, slotting, and ramping.
- For general engineering, die and mold, and medical applications.





● first choice
○ alternate choice

H	●
S	
N	
K	●
M	
P	●

2-Flute, 30° Helix

D1	D3	D	Ap1 max	L3	LS	L	Z U	catalog number	KC637M
0,30	—	6	0,4	—	36	50	2	F2AH0030AWS30L040	●
0,40	—	6	0,6	—	36	50	2	F2AH0040AWS30L060	●
0,50	0,45	6	0,7	2	36	50	2	F2AH0050AWS30L070	●
0,50	0,45	6	0,7	3	36	60	2	F2AH0050AWM30L070	●
0,60	0,55	6	0,9	2	36	50	2	F2AH0060AWS30L090	●
0,60	0,55	6	0,9	3	36	60	2	F2AH0060AWM30L090	●
0,80	0,75	6	1,2	2	36	50	2	F2AH0080AWS30L120	●
0,80	0,75	6	1,2	4	36	60	2	F2AH0080AWM30L120	●
1,00	0,95	6	1,5	3	36	50	2	F2AH0100AWS30L150	●
1,00	0,95	6	1,5	5	36	60	2	F2AH0100AWM30L150	●
1,20	1,15	6	1,8	3	36	50	2	F2AH0120AWS30L180	●
1,20	1,15	6	1,8	6	36	60	2	F2AH0120AWM30L180	●
1,40	1,35	6	2,1	4	36	50	2	F2AH0140AWS30L210	●
1,40	1,35	6	2,1	7	36	60	2	F2AH0140AWM30L210	●
1,50	1,45	6	2,3	4	36	50	2	F2AH0150AWS30L230	●
1,50	1,45	6	2,3	8	36	60	2	F2AH0150AWM30L230	●
1,60	1,55	6	2,4	4	36	50	2	F2AH0160AWS30L240	●
1,60	1,55	6	2,4	8	36	60	2	F2AH0160AWM30L240	●
1,80	1,75	6	2,7	5	36	50	2	F2AH0180AWS30L270	●
1,80	1,75	6	2,7	9	36	60	2	F2AH0180AWM30L270	●
2,00	1,95	6	3,0	5	36	50	2	F2AH0200AWS30L300	●
2,00	1,95	6	3,0	10	36	60	2	F2AH0200AWM30L300	●
2,50	2,40	6	3,7	5	36	50	2	F2AH0250AWS30L370	●
2,50	2,40	6	3,7	13	36	60	2	F2AH0250AWM30L370	●

For application data, see page 58.

Ordering Example:
F2AH0030AWS30L040 KC637M

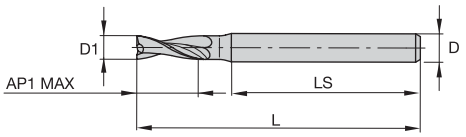
To place an order, contact Kennametal or your authorized Kennametal distributor, or visit www.kennametal.com.

Features

- Factory standard
- Plain shank
- Sharp corner - center cutting

Operations

- Slotting and ramping.
- For general engineering, die & mold, and medical applications.





● first choice
○ alternate choice

H	●	●
S	●	●
N		
K	●	●
M	●	●
P	●	●

2-Flute, 30° Helix

D1	D	Ap1 max	LS	L	Z U	catalog number	K600	KC625M
0,40	3	0,8	28	38	2	F2AH0040AWS30	●	●
0,50	3	1,0	28	38	2	F2AH0050AWS30	●	●
0,60	3	1,0	28	38	2	F2AH0060AWS30	●	●
0,80	3	2,0	28	38	2	F2AH0080AWS30	●	●
1,00	3	2,0	28	38	2	F2AH0100AWS30	●	●
1,20	3	2,0	28	38	2	F2AH0120AWS30		●
1,50	3	3,0	28	38	2	F2AH0150AWS30	●	●
1,80	3	4,0	28	38	2	F2AH0180AWS30	●	●
2,00	3	6,0	28	38	2	F2AH0200AWS30	●	●
2,50	3	7,0	28	38	2	F2AH0250AWS30	●	●
3,00	3	7,0	28	38	2	F2AH0300AWS30		●

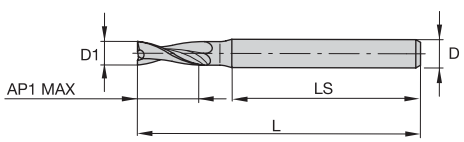
For application data, see page 58.

Features

- Factory standard
- Plain shank
- Sharp corner - center cutting

Operations

- Side cutting, slotting, and ramping.
- For general engineering, die & mold, and medical applications.





● first choice
○ alternate choice

H	●	●
S	●	●
N		
K	●	●
M	●	●
P	●	●

3-Flute, 30° Helix

D1	D	Ap1 max	LS	L	Z U	catalog number	K600	KC635M
0,40	3	1,5	28	38	3	F3AH0040AWS30	●	●
0,50	3	1,5	28	38	3	F3AH0050AWS30	●	●
0,60	3	1,5	28	38	3	F3AH0060AWS30	●	●
0,80	3	1,5	28	38	3	F3AH0080AWS30	●	●
1,00	3	2,0	28	38	3	F3AH0100AWS30	●	●
1,20	3	2,0	28	38	3	F3AH0120AWS30	●	●
1,50	3	2,0	28	38	3	F3AH0150AWS30	●	●
1,80	3	2,0	28	38	3	F3AH0180AWS30	●	●
2,00	3	8,0	28	38	3	F3AH0200AWS30	●	●
2,50	3	9,0	28	38	3	F3AH0250AWS30	●	●
3,00	3	12,0	28	38	3	F3AH0300AWS30	●	●

For application data, see page 59.

Ordering Example:
F2AH0040AWS30 KC625M

General Application Finishing End Mills

F2AH...DK — DIN 6527 — Short

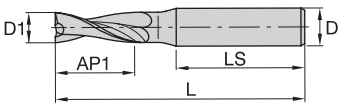
Features

- DIN 6527 short.
- Plain and Weldon shank.
- Sharp corner - center cutting.

Operations

- Side cutting, slotting, and ramping.







2-Flute, 30° Helix

● first choice
○ alternate choice





D1	D	Ap1 max	LS	L	Z U	catalog number	KC633M	catalog number	KC633M
2,00	6	3,0	36	50	2	F2AH0200ADK30	●	F2AH0200BDK30	●
2,50	6	3,0	36	50	2	F2AH0250ADK30	●	F2AH0250BDK30	●
3,00	6	4,0	36	50	2	F2AH0300ADK30	●	F2AH0300BDK30	●
3,50	6	4,0	36	50	2	F2AH0350ADK30	●	F2AH0350BDK30	●
4,00	6	5,0	36	54	2	F2AH0400ADK30	●	F2AH0400BDK30	●
4,50	6	5,0	36	54	2	F2AH0450ADK30	●	F2AH0450BDK30	●
5,00	6	6,0	36	54	2	F2AH0500ADK30	●	F2AH0500BDK30	●
5,50	6	7,0	36	54	2	F2AH0550ADK30	●	F2AH0550BDK30	●
6,00	6	7,0	36	54	2	F2AH0600ADK30	●	F2AH0600BDK30	●
6,50	8	8,0	36	58	2	F2AH0650ADK30	●	F2AH0650BDK30	●
7,00	8	8,0	36	58	2	F2AH0700ADK30	●	F2AH0700BDK30	●
7,50	8	9,0	36	58	2	F2AH0750ADK30	●	F2AH0750BDK30	●
8,00	8	9,0	36	58	2	F2AH0800ADK30	●	F2AH0800BDK30	●
8,50	10	10,0	40	66	2	F2AH0850ADK30	●	F2AH0850BDK30	●
9,00	10	10,0	40	66	2	F2AH0900ADK30	●	F2AH0900BDK30	●
9,50	10	11,0	40	66	2	F2AH0950ADK30	●	F2AH0950BDK30	●
10,00	10	11,0	40	66	2	F2AH1000ADK30	●	F2AH1000BDK30	●
11,00	12	12,0	45	73	2	F2AH1100ADK30	●	F2AH1100BDK30	●
12,00	12	12,0	45	73	2	F2AH1200ADK30	●	F2AH1200BDK30	●
13,00	14	14,0	45	75	2	F2AH1300ADK30	●	F2AH1300BDK30	●
14,00	14	14,0	45	75	2	F2AH1400ADK30	●	F2AH1400BDK30	●
15,00	16	16,0	48	82	2	F2AH1500ADK30	●	F2AH1500BDK30	●
16,00	16	16,0	48	82	2	F2AH1600ADK30	●	F2AH1600BDK30	●
18,00	18	18,0	48	84	2	F2AH1800ADK30	●	F2AH1800BDK30	●
20,00	20	20,0	50	92	2	F2AH2000ADK30	●	F2AH2000BDK30	●

For application data, see page 59.

Ordering Example:
Shank form A (Plain): F2AH0200ADK30 KC633M
Shank form B (Weldon): F2AH0200BDK30 KC633M

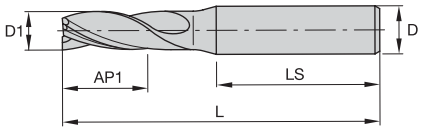
To place an order, contact Kennametal or your authorized Kennametal distributor, or visit www.kennametal.com.

Features

- DIN 6527 short
- Plain and Weldon shank.
- Corner chamfer - center cutting.

Operations

- Side cutting, slotting, and ramping.





	Corner Chamfer (Chamfer height)	
D1 h10	BCH	Tolerance
2 - 6.75	0,10	-0,05
6.76 - 9.7	0,20	-0,10
9.71 - 15.7	0,30	-0,10
15.71 - 25	0,40	-0,20

3-Flute, 30° Helix

● first choice
○ alternate choice

H								H			
S		●						S		●	
N		○						N		○	
K		●						K		●	
M		●						M		●	
P		●						P		●	
D1	D	Ap1 max	LS	L	Z U	catalog number	KC633M	catalog number	KC633M
2,50	6	3,0	36	50	3	F3AH0250ADK30	●	F3AH0250BDK30	●
2,80	6	4,0	36	50	3	F3AH0280ADK30	●	F3AH0280BDK30	●
3,00	6	4,0	36	50	3	F3AH0300ADK30	●	F3AH0300BDK30	●
3,50	6	4,0	36	50	3	F3AH0350ADK30	●	F3AH0350BDK30	●
3,80	6	5,0	36	54	3	F3AH0380ADK30	●	F3AH0380BDK30	●
4,00	6	5,0	36	54	3	F3AH0400ADK30	●	F3AH0400BDK30	●
4,50	6	5,0	36	54	3	F3AH0450ADK30	●	F3AH0450BDK30	●
4,80	6	6,0	36	54	3	F3AH0480ADK30	●	F3AH0480BDK30	●
5,00	6	6,0	36	54	3	F3AH0500ADK30	●	F3AH0500BDK30	●
5,50	6	7,0	36	54	3	F3AH0550ADK30	●	F3AH0550BDK30	●
5,75	6	7,0	36	54	3	F3AH0575ADK30	●	F3AH0575BDK30	●
6,00	6	7,0	36	54	3	F3AH0600ADK30	●	F3AH0600BDK30	●
6,50	8	8,0	36	58	3	F3AH0650ADK30	●	F3AH0650BDK30	●
6,75	8	8,0	36	58	3	F3AH0675ADK30	●	F3AH0675BDK30	●
7,00	8	8,0	36	58	3	F3AH0700ADK30	●	F3AH0700BDK30	●
7,50	8	9,0	36	58	3	F3AH0750ADK30	●	F3AH0750BDK30	●
7,75	8	9,0	36	58	3	F3AH0775ADK30	●	F3AH0775BDK30	●
8,00	8	9,0	36	58	3	F3AH0800ADK30	●	F3AH0800BDK30	●
8,50	10	10,0	40	66	3	F3AH0850ADK30	●	F3AH0850BDK30	●
8,70	10	10,0	40	66	3	F3AH0870ADK30	●	F3AH0870BDK30	●
9,00	10	10,0	40	66	3	F3AH0900ADK30	●	F3AH0900BDK30	●
9,50	10	11,0	40	66	3	F3AH0950ADK30	●	F3AH0950BDK30	●
9,70	10	11,0	40	66	3	F3AH0970ADK30	●	F3AH0970BDK30	●
10,00	10	11,0	40	66	3	F3AH1000ADK30	●	F3AH1000BDK30	●
11,00	12	12,0	45	73	3	F3AH1100ADK30	●	F3AH1100BDK30	●
11,70	12	12,0	45	73	3	F3AH1170ADK30	●	F3AH1170BDK30	●
12,00	12	12,0	45	73	3	F3AH1200ADK30	●	F3AH1200BDK30	●
13,00	14	14,0	45	75	3	F3AH1300ADK30	●	F3AH1300BDK30	●
13,70	14	14,0	45	75	3	F3AH1370ADK30	●	F3AH1370BDK30	●
14,00	14	14,0	45	75	3	F3AH1400ADK30	●	F3AH1400BDK30	●
15,00	16	16,0	48	82	3	F3AH1500ADK30	●	F3AH1500BDK30	●
15,70	16	16,0	48	82	3	F3AH1570ADK30	●	F3AH1570BDK30	●
16,00	16	16,0	48	82	3	F3AH1600ADK30	●	F3AH1600BDK30	●
18,00	18	18,0	48	84	3	F3AH1800ADK30	●	F3AH1800BDK30	●
20,00	20	20,0	50	92	3	F3AH2000ADK30	●	F3AH2000BDK30	●

Ordering Example:
Shank form A (plain): F3AH0250ADK30 KC633M
Shank form B (Weldon): F3AH0250BDK30 KC633M

For application data, see page 60.

General Application Finishing End Mills

F3AH...DK — DIN 6527 — Short

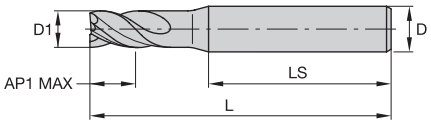
Features

- DIN 6527 short
- Plain and Weldon Shank.
- Corner chamfer - center cutting.

Operations

- Side cutting, slotting, and ramping.

KENNA UNIVERSAL





3-Flute, 45° Helix

● first choice
○ alternate choice

D1	D	Ap1 max	LS	L	Z U	catalog number	KC633M	catalog number	KC633M
2,00	6	3,0	36	50	3	F3AH0200ADK45	●	F3AH0200BDK45	●
2,50	6	3,0	36	50	3	F3AH0250ADK45	●	F3AH0250BDK45	●
3,00	6	4,0	36	50	3	F3AH0300ADK45	●	F3AH0300BDK45	●
3,50	6	4,0	36	50	3	F3AH0350ADK45	●	F3AH0350BDK45	●
4,00	6	5,0	36	54	3	F3AH0400ADK45	●	F3AH0400BDK45	●
4,50	6	5,0	36	54	3	F3AH0450ADK45	●	F3AH0450BDK45	●
5,00	6	6,0	36	54	3	F3AH0500ADK45	●	F3AH0500BDK45	●
6,00	6	7,0	36	54	3	F3AH0600ADK45	●	F3AH0600BDK45	●
7,00	8	8,0	36	58	3	F3AH0700ADK45	●	F3AH0700BDK45	●
8,00	8	9,0	36	58	3	F3AH0800ADK45	●	F3AH0800BDK45	●
9,00	10	10,0	40	66	3	F3AH0900ADK45	●	F3AH0900BDK45	●
10,00	10	11,0	40	66	3	F3AH1000ADK45	●	F3AH1000BDK45	●
12,00	12	12,0	45	73	3	F3AH1200ADK45	●	F3AH1200BDK45	●
14,00	14	14,0	45	75	3	F3AH1400ADK45	●	F3AH1400BDK45	●
16,00	16	16,0	48	82	3	F3AH1600ADK45	●	F3AH1600BDK45	●
18,00	18	18,0	48	84	3	F3AH1800ADK45	●	F3AH1800BDK45	●
20,00	20	20,0	50	92	3	F3AH2000ADK45	●	F3AH2000BDK45	●

For application data, see page 60.

	Corner Chamfer (Chamfer height)	
D1 h10	BCH	Tolerance
2 - 6.75	0,10	-0,05
6.76 - 9.7	0,20	-0,10
9.71 - 15.7	0,30	-0,10
15.71 - 25	0,40	-0,20

Ordering Example:
Shank form A (plain): F3AH0200ADK45 KC633M
Shank form B (Weldon): F3AH0200BDK45 KC633M

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

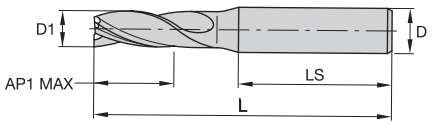
Features

- DIN 6527 short
- Plain and Weldon shank.
- Corner chamfer - center cutting.

Operations

- Side cutting and ramping.

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4-Flute, 30° Helix

● first choice
○ alternate choice

D1	D	Ap1 max	LS	L	Z U	catalog number	KC633M	catalog number	KC633M
2,00	6	4,0	36	50	4	F4AJ0200ADK30	●	F4AJ0200BDK30	●
2,50	6	4,0	36	50	4	F4AJ0250ADK30	●	F4AJ0250BDK30	●
3,00	6	5,0	36	50	4	F4AJ0300ADK30	●	F4AJ0300BDK30	●
3,50	6	6,0	36	50	4	F4AJ0350ADK30	●	F4AJ0350BDK30	●
4,00	6	8,0	36	54	4	F4AJ0400ADK30	●	F4AJ0400BDK30	●
4,50	6	8,0	36	54	4	F4AJ0450ADK30	●	F4AJ0450BDK30	●
5,00	6	9,0	36	54	4	F4AJ0500ADK30	●	F4AJ0500BDK30	●
5,50	6	10,0	36	54	4	F4AJ0550ADK30	●	F4AJ0550BDK30	●
6,00	6	10,0	36	54	4	F4AJ0600ADK30	●	F4AJ0600BDK30	●
6,50	8	11,0	36	58	4	F4AJ0650ADK30	●	F4AJ0650BDK30	●
7,00	8	11,0	36	58	4	F4AJ0700ADK30	●	F4AJ0700BDK30	●
7,50	8	12,0	36	58	4	F4AJ0750ADK30	●	F4AJ0750BDK30	●
8,00	8	12,0	36	58	4	F4AJ0800ADK30	●	F4AJ0800BDK30	●
8,50	10	13,0	40	66	4	F4AJ0850ADK30	●	F4AJ0850BDK30	●
9,00	10	13,0	40	66	4	F4AJ0900ADK30	●	F4AJ0900BDK30	●
9,50	10	14,0	40	66	4	F4AJ0950ADK30	●	F4AJ0950BDK30	●
10,00	10	14,0	40	66	4	F4AJ1000ADK30	●	F4AJ1000BDK30	●
11,00	12	16,0	45	73	4	F4AJ1100ADK30	●	F4AJ1100BDK30	●
12,00	12	16,0	45	73	4	F4AJ1200ADK30	●	F4AJ1200BDK30	●
13,00	14	18,0	45	75	4	F4AJ1300ADK30	●	F4AJ1300BDK30	●
14,00	14	18,0	45	75	4	F4AJ1400ADK30	●	F4AJ1400BDK30	●
15,00	16	22,0	48	82	4	F4AJ1500ADK30	●	F4AJ1500BDK30	●
16,00	16	22,0	48	82	4	F4AJ1600ADK30	●	F4AJ1600BDK30	●
18,00	18	24,0	48	84	4	F4AJ1800ADK30	●	F4AJ1800BDK30	●
20,00	20	26,0	50	92	4	F4AJ2000ADK30	●	F4AJ2000BDK30	●

For application data, see page 60.

	Corner Chamfer (Chamfer height)	
D1 h10	BCH	Tolerance
2 - 6.75	0,10	-0,05
6.76 - 9.7	0,20	-0,10
9.71 - 15.7	0,30	-0,10
15.71 - 25	0,40	-0,20

Ordering Example:
Shank form A (plain): F4AJ0200ADK30 KC633M
Shank form B (Weldon): F4AJ0200BDK30 KC633M

General Application Finishing End Mills

F3AR...WS — Economy Mill

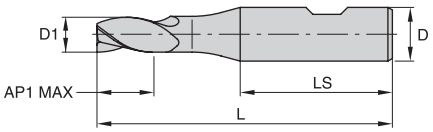
Features

- Kennametal standard.
- Weldon shank.
- Sharp corner - center cutting.

Operations

- Side cutting, slotting, and ramping.







3-Flute, 30° Helix

● first choice
○ alternate choice

H		
S		●
N		○
K		●
M		●
P		●

D1	D	Ap1 max	LS	L	Z U	catalog number	KC625M
2,00	6	4,0	27	38	3	F3AR0200BWS30	●
3,00	6	5,0	26	38	3	F3AR0300BWS30	●
4,00	6	7,0	25	38	3	F3AR0400BWS30	●
5,00	6	8,0	25	38	3	F3AR0500BWS30	●
6,00	6	8,0	30	38	3	F3AR0600BWS30	●
8,00	8	11,0	32	43	3	F3AR0800BWS30	●
10,00	10	13,0	37	50	3	F3AR1000BWS30	●

For application data, see page 61.

Ordering Example:
F3AR0200BWS30 KC625M

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

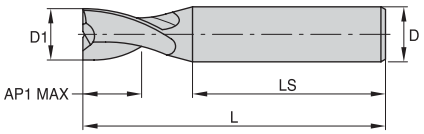
Features

- DIN 6527 short.
- Plain and Weldon shank.
- Corner chamfer - center cutting.

Operations

- Slotting and ramping
- Side cutting.

KENNA UNIVERSAL





2-Flute, 30° Helix

● first choice
○ alternate choice

	KC635M
H	
S	●
N	○
K	●
M	●
P	●

D1	D	Ap1 max	LS	L	Z U	catalog number	KC635M	catalog number	KC635M
2,80	6	4,0	36	50	2	F2AU0280ADK30	●	F2AU0280BDK30	●
3,80	6	5,0	36	54	2	F2AU0380ADK30	●	F2AU0380BDK30	●
4,80	6	6,0	36	54	2	F2AU0480ADK30	●	F2AU0480BDK30	●
5,75	6	7,0	36	54	2	F2AU0575ADK30	●	F2AU0575BDK30	●
7,75	8	9,0	36	58	2	F2AU0775ADK30	●	F2AU0775BDK30	●
9,70	10	11,0	40	58	2	F2AU0970ADK30	●	F2AU0970BDK30	●
11,70	12	12,0	45	66	2	F2AU1170ADK30	●	F2AU1170BDK30	●
13,70	14	14,0	45	73	2	F2AU1370ADK30	●	F2AU1370BDK30	●
15,70	16	16,0	48	75	2	F2AU1570ADK30	●	F2AU1570BDK30	●
17,70	18	18,0	48	84	2	F2AU1770ADK30	●	F2AU1770BDK30	●
19,70	20	20,0	50	92	2	F2AU1970ADK30	●	F2AU1970BDK30	●

For application data, see page 61.

	Corner Chamfer (Chamfer height)	
D1 h10	BCH	Tolerance
2 - 6.75	0,10	-0,05
6.76 - 9.7	0,20	-0,10
9.71 - 15.7	0,30	-0,10
15.71 - 25	0,40	-0,20

Ordering Example:
Shank form A (plain): F2AU0280ADK30 KC633M
Shank form B (Weldon): F2AU0280BDK30 KC633M

General Application Finishing End Mills

F3AU...DK — Undercut for Keyway Cutting

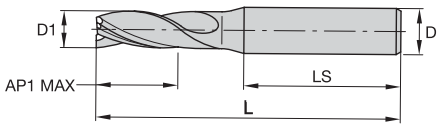
Features

- DIN 6527 short.
- Plain and Weldon shank.
- Corner chamfer - center cutting.

Operations

- Side cutting, slotting, and ramping.







3-Flute, 30° Helix

● first choice
○ alternate choice

D1	D	Ap1 max	LS	L	Z U	catalog number	KC635M	catalog number	KC635M
2,80	6	4,0	36	50	3	F3AU0280ADK30	●	F3AU0280BDK30	●
3,80	6	5,0	36	50	3	F3AU0380ADK30	●	F3AU0380BDK30	●
4,80	6	6,0	36	54	3	F3AU0480ADK30	●	–	
5,75	6	7,0	36	54	3	F3AU0575ADK30	●	–	
7,75	8	9,0	36	58	3	F3AU0775ADK30	●	F3AU0775BDK30	●
9,70	10	11,0	40	58	3	F3AU0970ADK30	●	F3AU0970BDK30	●
11,70	12	12,0	45	66	3	F3AU1170ADK30	●	F3AU1170BDK30	●
13,70	14	14,0	45	73	3	F3AU1370ADK30	●	F3AU1370BDK30	●
15,70	16	16,0	48	75	3	F3AU1570ADK30	●	F3AU1570BDK30	●
17,70	18	18,0	48	84	3	F3AU1770ADK30	●	F3AU1770BDK30	●
19,70	20	20,0	50	92	3	F3AU1970ADK30	●	F3AU1970BDK30	●

For application data, see page 62.

	Corner Chamfer (Chamfer height)	
D1 h10	BCH	Tolerance
2 - 6.75	0,10	-0,05
6.76 - 9.7	0,20	-0,10
9.71 - 15.7	0,30	-0,10
15.71 - 25	0,40	-0,20

Ordering Example:
Shank form A (plain): F3AU0280ADK30 KC635M
Shank form B (Weldon): F3AU0280BDK30 KC635M

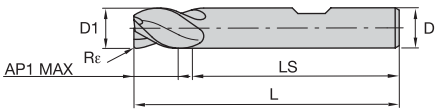
Features

- DIN 6527 short.
- Weldon shank.
- Corner radius - center cutting.

Operations

- Side cutting, slotting, and ramping.
- For aerospace, general engineering, and medical applications.







3-Flute, 35° Helix

● first choice
○ alternate choice

H	
S	○
N	
K	
M	●
P	●

D1	D	Ap1 max	LS	L	Rε	Z U	catalog number	KC633M
3,00	6	4,0	43	50	0,25	3	F3AS0300BDK35	●
4,00	6	5,0	45	54	0,25	3	F3AS0400BDK35	●
5,00	6	6,0	44	54	0,25	3	F3AS0500BDK35	●
6,00	6	7,0	41	54	0,45	3	F3AS0600BDK35	●
8,00	8	9,0	42	58	0,45	3	F3AS0800BDK35	●
10,00	10	11,0	45	66	0,45	3	F3AS1000BDK35	●
12,00	12	12,0	51	73	0,45	3	F3AS1200BDK35	●
14,00	14	14,0	51	75	0,45	3	F3AS1400BDK35	●
16,00	16	16,0	55	82	0,45	3	F3AS1600BDK35	●
18,00	18	18,0	55	84	0,45	3	F3AS1800BDK35	●
20,00	20	20,0	60	92	0,45	3	F3AS2000BDK35	●

For application data, see page 62.

Ordering Example:
F3AS0300BDK35 KC633M

High-Performance Finishing End Mills

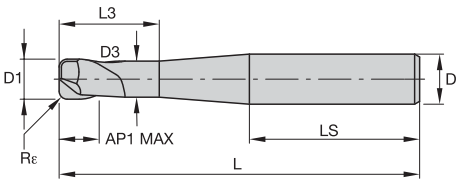
F2AT...WM-WL-WX — Toroidal End for Long Reach

Features

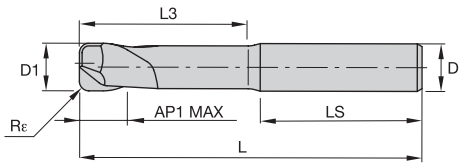
- Factory standard.
- Plain shank.
- Toroidal - center cutting.

Operations

- Side cutting, slotting, and 3 dimensional milling.
- For die and mold, heavy equipment, and general engineering applications.



smaller than 6 mm





larger than 6 mm

● first choice
○ alternate choice

H ●
S
N
K ●
M
P ●

2-Flute, 20° Helix

D1	D3	D	Ap1 max	L3	LS	L	Rε	Z U	catalog number	KC637M
2,00	1,70	6	2,0	18	36	70	0,30	2	F2AT0200AWM20R003	●
2,00	1,70	6	2,0	18	36	70	0,50	2	F2AT0200AWM20R005	●
3,00	2,50	6	3,0	19	36	70	0,50	2	F2AT0300AWM20R005	●
3,00	2,50	6	3,0	19	36	70	1,00	2	F2AT0300AWM20R010	●
4,00	3,50	6	4,0	20	36	80	0,50	2	F2AT0400AWL20R005	●
4,00	3,50	6	4,0	20	36	80	1,00	2	F2AT0400AWL20R010	●
5,00	4,50	6	5,0	44	36	80	0,50	2	F2AT0500AWL20R005	●
5,00	4,50	6	5,0	44	36	80	1,00	2	F2AT0500AWL20R010	●
6,00	5,50	6	6,0	44	36	80	0,50	2	F2AT0600AWL20R005	●
6,00	5,50	6	6,0	44	36	80	1,00	2	F2AT0600AWL20R010	●
6,00	5,50	6	6,0	44	36	80	1,50	2	F2AT0600AWL20R015	●
8,00	7,00	8	8,0	54	36	90	1,00	2	F2AT0800AWL20R010	●
8,00	7,00	8	8,0	54	36	90	2,00	2	F2AT0800AWL20R020	●
8,00	7,00	8	8,0	54	36	90	1,50	2	F2AT0800AWL20R015	●
10,00	9,00	10	10,0	60	40	100	2,00	2	F2AT1000AWL20R020	●
10,00	9,00	10	10,0	60	40	100	3,00	2	F2AT1000AWL20R030	●
10,00	9,00	10	10,0	60	40	100	0,50	2	F2AT1000AWL20R005	●
10,00	9,00	10	10,0	60	40	100	1,00	2	F2AT1000AWL20R010	●
12,00	11,00	12	12,0	65	45	110	3,00	2	F2AT1200AWX20R030	●
12,00	11,00	12	12,0	65	45	110	4,00	2	F2AT1200AWX20R040	●
12,00	11,00	12	12,0	65	45	110	0,50	2	F2AT1200AWX20R005	●
12,00	11,00	12	12,0	65	45	110	1,00	2	F2AT1200AWX20R010	●

For application data, see page 63.

Ordering Example:
F2AT0200AWM20R003 KC637M

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

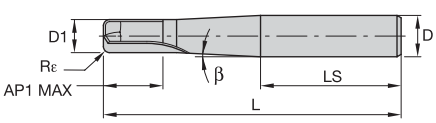
Features

- Factory standard.
- Plain shank.
- Toroidal - center cutting.

Operations

- Side cutting, slotting, and 3 dimensional milling.
- For die and mold, heavy equipment, and general engineering applications.







2-Flute, 0° Helix

● first choice
○ alternate choice

H		●
S		
N		
K		●
M		
P		●

D1	D	Ap1 max	LS	L	Rε	BETA	Z U	catalog number	KC637M
3,00	6	4,0	36	100	0,50	1.65	2	F2AT0300AWL00R005	●
3,00	6	4,0	36	75	0,50	2.85	2	F2AT0300AWM00R005	●
4,00	6	5,0	36	100	0,50	1.18	2	F2AT0400AWL00R005	●
4,00	6	5,0	36	75	0,50	2.67	2	F2AT0400AWM00R005	●
5,00	6	6,0	36	75	0,50	1.33	2	F2AT0500AWM00R005	●
5,00	8	6,0	36	100	0,50	1.75	2	F2AT0500AWL00R005	●
6,00	8	8,0	36	75	1,00	2.38	2	F2AT0600AWM00R010	●
6,00	10	8,0	40	100	1,00	2.52	2	F2AT0600AWL00R010	●
8,00	10	12,0	40	100	2,00	1.52	2	F2AT0800AWL00R020	●
8,00	12	12,0	45	150	2,00	1.40	2	F2AT0800AWX00R020	●
10,00	12	15,0	45	100	3,00	1.83	2	F2AT1000AWL00R030	●
10,00	12	15,0	45	150	3,00	.80	2	F2AT1000AWX00R030	●

For application data, see page 63.

Ordering Example:
F2AT0300AWL00R005 KC637M

High-Performance Finishing End Mills

KENNAMETAL

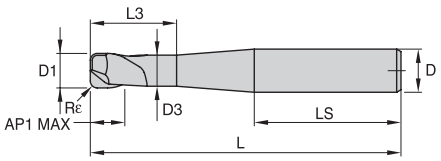
F4AT...WS-WM-WL — Toroidal End

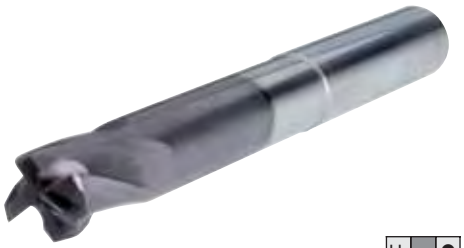
Features

- Factory standard.
- Plain shank.
- Toroidal - center cutting.

Operations

- Side cutting, slotting, ramping, and 3 dimensional milling.
- For die and mold, heavy equipment, and medical applications.





● first choice
○ alternate choice

H		●
S		
N		
K		●
M		
P		●

4-Flute, 20° Helix

D1	D3	D	Ap1 max	L3	LS	L	Rε	Z U	catalog number	KC637M
4,00	3,80	6	2,0	10	32	45	0,50	4	F4AT0400AWS20R005	●
4,00	3,80	6	2,0	10	32	45	1,00	4	F4AT0400AWS20R010	●
5,00	4,80	6	2,5	12	36	50	0,50	4	F4AT0500AWS20R005	●
5,00	4,80	6	2,5	12	36	50	1,00	4	F4AT0500AWS20R010	●
6,00	5,80	6	3,0	12	36	50	0,50	4	F4AT0600AWS20R005	●
6,00	5,80	6	3,0	12	36	50	2,00	4	F4AT0600AWS20R020	●
6,00	5,80	6	6,0	42	36	80	0,30	4	F4AT0600AWL20R003	●
6,00	5,80	6	6,0	42	36	80	0,50	4	F4AT0600AWL20R005	●
6,00	5,80	6	6,0	42	36	80	1,00	4	F4AT0600AWL20R010	●
8,00	7,80	8	4,0	20	36	60	0,50	4	F4AT0800AWM20R005	●
8,00	7,80	8	4,0	20	36	60	1,00	4	F4AT0800AWM20R010	●
8,00	7,80	8	4,0	20	36	60	2,00	4	F4AT0800AWM20R020	●
8,00	7,80	8	8,0	52	36	90	0,50	4	F4AT0800AWL20R005	●
8,00	7,80	8	8,0	52	36	90	1,00	4	F4AT0800AWL20R010	●
8,00	7,80	8	8,0	52	36	90	1,50	4	F4AT0800AWL20R015	●
8,00	7,80	8	8,0	52	36	90	2,00	4	F4AT0800AWL20R020	●
10,00	9,70	10	10,0	58	40	100	0,50	4	F4AT1000AWL20R005	●
10,00	9,70	10	10,0	58	40	100	1,00	4	F4AT1000AWL20R010	●
10,00	9,70	10	10,0	58	40	100	1,50	4	F4AT1000AWL20R015	●
10,00	9,70	10	10,0	58	40	100	2,00	4	F4AT1000AWL20R020	●
10,00	9,70	10	10,0	58	40	100	2,50	4	F4AT1000AWL20R025	●
10,00	9,80	10	5,0	24	40	70	0,50	4	F4AT1000AWM20R005	●
10,00	9,80	10	5,0	24	40	70	1,00	4	F4AT1000AWM20R010	●
10,00	9,80	10	5,0	24	40	70	1,50	4	F4AT1000AWM20R015	●
10,00	9,80	10	5,0	24	40	70	2,00	4	F4AT1000AWM20R020	●
10,00	9,80	10	5,0	24	40	70	2,50	4	F4AT1000AWM20R025	●
12,00	11,70	12	12,0	62	45	110	1,00	4	F4AT1200AWX20R010	●
12,00	11,70	12	12,0	62	45	110	1,50	4	F4AT1200AWX20R015	●
12,00	11,70	12	12,0	62	45	110	2,00	4	F4AT1200AWX20R020	●
12,00	11,70	12	12,0	62	45	110	3,00	4	F4AT1200AWX20R030	●
12,00	11,80	12	6,0	24	45	75	0,50	4	F4AT1200AWL20R005	●
12,00	11,80	12	6,0	24	45	75	1,00	4	F4AT1200AWL20R010	●
12,00	11,80	12	6,0	24	45	75	1,50	4	F4AT1200AWL20R015	●
12,00	11,80	12	6,0	24	45	75	2,00	4	F4AT1200AWL20R020	●
12,00	11,80	12	6,0	24	45	75	3,00	4	F4AT1200AWL20R030	●

For application data, see page 63.

Ordering Example:
F4AT1000AWM20R010 KC637M

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

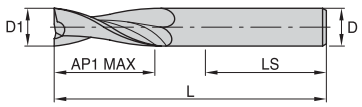
Features

- DIN 6528.
- Plain shank.
- Corner chamfer - center cutting.

Operations

- Side cutting, slotting, and ramping.







2-Flute, 30° Helix

● first choice
○ alternate choice

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

D1	D	Ap1 max	LS	L	Z	U	catalog number	KC625M	KC633M
2,00	2	8,0	20	32	2		F2AH0200ADN30	●	
2,50	3	8,0	20	32	2		F2AH0250ADN30	●	
3,00	3	12,0	15	32	2		F2AH0300ADN30	●	
3,50	4	7,0	28	50	2		F2AH0350ADN30	●	
4,00	4	8,0	28	50	2		F2AH0400ADN30	●	●
4,50	5	8,0	28	50	2		F2AH0450ADN30		●
5,00	5	10,0	28	50	2		F2AH0500ADN30	●	●
5,50	6	10,0	36	57	2		F2AH0550ADN30		●
6,00	6	10,0	36	57	2		F2AH0600ADN30	●	●
6,50	7	13,0	36	60	2		F2AH0650ADN30	●	●
7,00	7	13,0	36	60	2		F2AH0700ADN30		●
7,50	8	16,0	36	63	2		F2AH0750ADN30		●
8,00	8	16,0	36	63	2		F2AH0800ADN30	●	●
8,50	9	16,0	40	67	2		F2AH0850ADN30		●
9,00	9	16,0	40	67	2		F2AH0900ADN30		●
9,50	10	19,0	40	72	2		F2AH0950ADN30		●
10,00	10	19,0	40	72	2		F2AH1000ADN30	●	●
11,00	11	22,0	40	83	2		F2AH1100ADN30		●
12,00	12	22,0	45	83	2		F2AH1200ADN30	●	●
13,00	13	22,0	45	83	2		F2AH1300ADN30		●
14,00	14	22,0	45	83	2		F2AH1400ADN30		●
15,00	15	26,0	45	92	2		F2AH1500ADN30		●
16,00	16	26,0	48	92	2		F2AH1600ADN30		●
18,00	18	26,0	48	92	2		F2AH1800ADN30		●
20,00	20	32,0	50	104	2		F2AH2000ADN30		●

For application data, see page 64.

	Corner Chamfer (Chamfer height)	
D1 h10	BCH	Tolerance
2 - 6.75	0,10	-0,05
6.76 - 9.7	0,20	-0,10
9.71 - 15.7	0,30	-0,10
15.71 - 25	0,40	-0,20

Ordering Example:
F2AH0200ADN30 KC625M

General Application Finishing End Mills

KENNAMETAL

F3AH...DN — DIN 6528

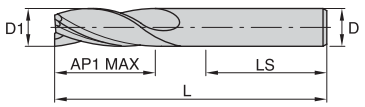
Features

- DIN 6528.
- Plain shank.
- Corner chamfer - center cutting.

Operations

- Side cutting, slotting, and ramping.

KENNA UNIVERSAL





3-Flute, 30° Helix

● first choice
○ alternate choice

							KC625M	KC633M
H								
S							●	●
N							○	○
K							●	●
M							●	●
P							●	●

D1	D	Ap1 max	LS	L	Z U	catalog number	KC625M	KC633M
2,00	2	8,0	20	32	3	F3AH0200ADN30	●	
2,50	3	8,0	20	32	3	F3AH0250ADN30	●	
3,00	3	12,0	15	32	3	F3AH0300ADN30	●	
3,50	4	7,0	28	50	3	F3AH0350ADN30	●	
4,00	4	8,0	28	50	3	F3AH0400ADN30	●	●
4,50	5	8,0	28	50	3	F3AH0450ADN30		●
5,00	5	10,0	28	50	3	F3AH0500ADN30	●	●
5,50	6	10,0	36	57	3	F3AH0550ADN30		●
6,00	6	10,0	36	57	3	F3AH0600ADN30	●	●
6,50	7	13,0	36	60	3	F3AH0650ADN30	●	●
7,00	7	13,0	36	60	3	F3AH0700ADN30	●	●
7,50	8	16,0	36	63	3	F3AH0750ADN30		●
8,00	8	16,0	36	63	3	F3AH0800ADN30	●	●
8,50	9	16,0	36	67	3	F3AH0850ADN30		●
9,00	9	16,0	40	67	3	F3AH0900ADN30		●
9,50	10	19,0	40	72	3	F3AH0950ADN30		●
10,00	10	19,0	40	72	3	F3AH1000ADN30	●	●
11,00	11	22,0	45	83	3	F3AH1100ADN30		●
12,00	12	22,0	45	83	3	F3AH1200ADN30	●	●
13,00	13	22,0	45	83	3	F3AH1300ADN30		●
14,00	14	22,0	45	83	3	F3AH1400ADN30	●	●
15,00	15	26,0	45	92	3	F3AH1500ADN30		●
16,00	16	26,0	48	92	3	F3AH1600ADN30	●	●
18,00	18	26,0	48	92	3	F3AH1800ADN30		●
20,00	20	32,0	50	104	3	F3AH2000ADN30		●

For application data, see page 64.

	Corner Chamfer (Chamfer height)	
D1 h10	BCH	Tolerance
2 - 6.75	0,10	-0,05
6.76 - 9.7	0,20	-0,10
9.71 - 15.7	0,30	-0,10
15.71 - 25	0,40	-0,20

Ordering Example:
F3AH0200ADN30 KC625M

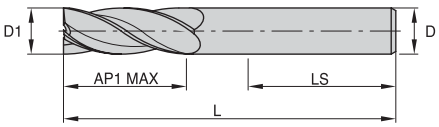
Features

- DIN 6528.
- Plain shank.
- Corner chamfer - center cutting.

Operations

- Side cutting and ramping.







● first choice
○ alternate choice

H		
S		●
N		○
K		●
M		●
P		●

4-Flute, 30° Helix

D1	D	Ap1 max	LS	L	Z U	catalog number	KC625M	KC633M
2,00	2	8,0	20	32	4	F4AJ0200ADN30	●	
2,50	3	8,0	20	32	4	F4AJ0250ADN30	●	
3,00	3	12,0	15	32	4	F4AJ0300ADN30	●	
3,50	4	12,0	15	32	4	F4AJ0350ADN30	●	
4,00	4	11,0	28	50	4	F4AJ0400ADN30	●	●
4,50	5	11,0	28	50	4	F4AJ0450ADN30	●	●
5,00	5	13,0	28	50	4	F4AJ0500ADN30	●	●
5,50	6	13,0	36	57	4	F4AJ0550ADN30		●
6,00	6	13,0	36	57	4	F4AJ0600ADN30	●	●
6,50	7	16,0	36	60	4	F4AJ0650ADN30		●
7,00	7	16,0	36	60	4	F4AJ0700ADN30		●
7,50	8	19,0	36	63	4	F4AJ0750ADN30		●
8,00	8	19,0	36	63	4	F4AJ0800ADN30	●	●
8,50	9	19,0	36	67	4	F4AJ0850ADN30		●
9,00	9	19,0	40	67	4	F4AJ0900ADN30		●
9,50	10	22,0	40	72	4	F4AJ0950ADN30		●
10,00	10	22,0	40	72	4	F4AJ1000ADN30	●	●
11,00	11	26,0	40	83	4	F4AJ1100ADN30	●	
12,00	12	26,0	45	83	4	F4AJ1200ADN30	●	●
13,00	13	26,0	45	83	4	F4AJ1300ADN30		●
14,00	14	26,0	45	83	4	F4AJ1400ADN30	●	●
15,00	15	32,0	45	92	4	F4AJ1500ADN30	●	●
16,00	16	32,0	48	92	4	F4AJ1600ADN30	●	●
18,00	18	32,0	48	92	4	F4AJ1800ADN30		●
20,00	20	38,0	50	104	4	F4AJ2000ADN30	●	●

For application data, see page 64.

	Corner Chamfer (Chamfer height)	
D1 h10	BCH	Tolerance
2 - 6.75	0,10	-0,05
6.76 - 9.7	0,20	-0,10
9.71 - 15.7	0,30	-0,10
15.71 - 25	0,40	-0,20

Ordering Example:
F4AJ0200ADN30 KC625M

General Application Finishing End Mills

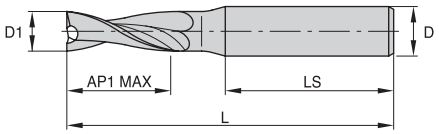
F2AH...DL — DIN 6527 — Long

Features

- DIN 6527 long.
- Plain and Weldon shank.
- Corner chamfer - center cutting.

Operations

- Side cutting, slotting, and ramping.





● first choice
○ alternate choice

2-Flute, 30° Helix

D1	D	Ap1 max	LS	L	Z U	catalog number	H	S	N	K	M	P	catalog number	H	S	N	K	M	P
							KC633M							KC633M						
2,50	6	7,0	39	57	2	F2AH0250ADL30	●						F2AH0250BDL30	●						
3,00	6	7,0	39	57	2	F2AH0300ADL30	●						F2AH0300BDL30	●						
4,00	6	8,0	38	57	2	F2AH0400ADL30	●						F2AH0400BDL30	●						
4,50	6	8,0	38	57	2	F2AH0450ADL30	●						F2AH0450BDL30	●						
5,00	6	10,0	37	57	2	F2AH0500ADL30	●						F2AH0500BDL30	●						
5,50	6	10,0	37	57	2	F2AH0550ADL30	●						F2AH0550BDL30	●						
6,00	6	10,0	36	57	2	F2AH0600ADL30	●						F2AH0600BDL30	●						
7,00	8	13,0	36	63	2	F2AH0700ADL30	●						F2AH0700BDL30	●						
8,00	8	16,0	36	63	2	F2AH0800ADL30	●						F2AH0800BDL30	●						
9,00	10	16,0	40	72	2	F2AH0900ADL30	●						F2AH0900BDL30	●						
10,00	10	19,0	40	72	2	F2AH1000ADL30	●						F2AH1000BDL30	●						
11,00	12	22,0	45	83	2	F2AH1100ADL30	●						F2AH1100BDL30	●						
12,00	12	22,0	45	83	2	F2AH1200ADL30	●						F2AH1200BDL30	●						
14,00	14	22,0	45	83	2	F2AH1400ADL30	●						F2AH1400BDL30	●						
15,00	16	26,0	48	92	2	F2AH1500ADL30	●						F2AH1500BDL30	●						
16,00	16	26,0	48	92	2	F2AH1600ADL30	●						F2AH1600BDL30	●						
18,00	18	26,0	48	92	2	F2AH1800ADL30	●						F2AH1800BDL30	●						
20,00	20	32,0	50	104	2	F2AH2000ADL30	●						F2AH2000BDL30	●						

For application data, see page 65.

	Corner Chamfer (Chamfer height)	
D1 h10	BCH	Tolerance
2 - 6.75	0,10	-0,05
6.76 - 9.7	0,20	-0,10
9.71 - 15.7	0,30	-0,10
15.71 - 25	0,40	-0,20

Ordering Example:
Shank form A (Plain): F2AH0250ADL30 KC625M
Shank form B (Weldon): F2AH0250BDL30 KC625M

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

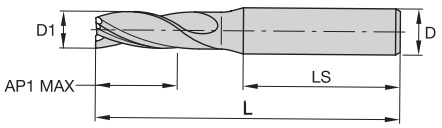
Features

- DIN 6527 long.
- Plain and Weldon shank.
- Corner chamfer - center cutting.

Operations

- Side cutting, slotting, and ramping.





3-Flute, 30° Helix

● first choice
○ alternate choice

	KC625M	KC633M
H		
S	●	●
N	○	○
K	●	●
M	●	●
P	●	●

D1	D	Ap1 max	LS	L	Z U	catalog number	KC625M	KC633M	catalog number	KC625M	KC633M
3,00	6	7,0	39	57	3	F3AH0300ADL30	●		F3AH0300BDL30	●	
4,00	6	8,0	38	57	3	F3AH0400ADL30	●	●	F3AH0400BDL30	●	●
4,50	6	8,0	38	57	3	F3AH0450ADL30	●	●	F3AH0450BDL30		●
4,80	6	10,0	38	57	3	F3AH0480ADL30	●	●	F3AH0480BDL30		●
5,00	6	10,0	37	57	3	F3AH0500ADL30	●	●	F3AH0500BDL30	●	●
5,50	6	10,0	37	57	3	F3AH0550ADL30	●	●	F3AH0550BDL30	●	●
5,75	6	10,0	37	57	3	F3AH0575ADL30	●	●	F3AH0575BDL30		●
6,00	6	10,0	36	57	3	F3AH0600ADL30	●	●	F3AH0600BDL30	●	●
6,50	8	13,0	36	63	3	F3AH0650ADL30	●	●	F3AH0650BDL30		●
6,75	8	13,0	36	63	3	F3AH0675ADL30	●	●	F3AH0675BDL30		●
7,00	8	13,0	36	63	3	F3AH0700ADL30	●	●	F3AH0700BDL30		●
7,75	8	16,0	36	63	3	F3AH0775ADL30	●	●	F3AH0775BDL30		●
8,00	8	16,0	36	63	3	F3AH0800ADL30	●	●	F3AH0800BDL30	●	●
8,50	10	16,0	40	72	3	F3AH0850ADL30	●	●	F3AH0850BDL30		●
8,70	10	16,0	40	72	3	F3AH0870ADL30		●	F3AH0870BDL30		●
9,00	10	16,0	40	72	3	F3AH0900ADL30	●	●	F3AH0900BDL30	●	●
9,70	10	19,0	40	72	3	F3AH0970ADL30	●	●	F3AH0970BDL30		●
10,00	10	19,0	40	72	3	F3AH1000ADL30	●	●	F3AH1000BDL30	●	●
11,00	12	22,0	45	83	3	F3AH1100ADL30	●	●	F3AH1100BDL30	●	●
11,70	12	22,0	45	83	3	F3AH1170ADL30	●	●	F3AH1170BDL30		●
12,00	12	22,0	45	83	3	F3AH1200ADL30	●	●	F3AH1200BDL30	●	●
13,00	14	22,0	45	83	3	F3AH1300ADL30	●	●	F3AH1300BDL30		●
13,70	14	22,0	45	83	3	F3AH1370ADL30		●	F3AH1370BDL30		●
14,00	14	22,0	45	83	3	F3AH1400ADL30	●	●	F3AH1400BDL30	●	
15,00	16	26,0	48	92	3	F3AH1500ADL30	●	●	F3AH1500BDL30		●
15,70	16	26,0	48	92	3	F3AH1570ADL30		●	F3AH1570BDL30		●
16,00	16	26,0	48	92	3	F3AH1600ADL30	●	●	F3AH1600BDL30	●	●
18,00	18	26,0	48	92	3	F3AH1800ADL30	●	●	F3AH1800BDL30	●	
20,00	20	32,0	50	104	3	F3AH2000ADL30	●	●	F3AH2000BDL30	●	●

For application data, see page 65.

	Corner Chamfer (Chamfer height)	
D1 h10	BCH	Tolerance
2 - 6.75	0,10	-0,05
6.76 - 9.7	0,20	-0,10
9.71 - 15.7	0,30	-0,10
15.71 - 25	0,40	-0,20

Ordering Example:
Shank form A (Plain): F3AH0300ADL30 KC625M
Shank form B (Weldon): F3AH0300BDL30 KC625M

General Application Finishing End Mills

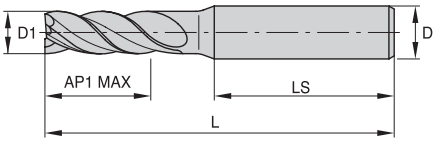
F3AH...DL — DIN 6527 — Long

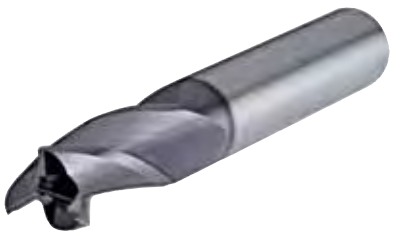
Features

- DIN 6527 long.
- Plain and Weldon shank.
- Corner chamfer - center cutting.

Operations

- Side cutting, slotting, and ramping.





3-Flute, 45° Helix

● first choice
○ alternate choice

D1	D	Ap1 max	LS	L	Z U	catalog number	H S N K M P KC633M	catalog number	H S N K M P KC633M
3,00	6	7,0	36	57	3	F3AH0300ADL45	●	F3AH0300BDL45	●
3,50	6	7,0	36	57	3	F3AH0350ADL45	●	F3AH0350BDL45	●
4,00	6	8,0	36	57	3	F3AH0400ADL45	●	F3AH0400BDL45	●
4,50	6	8,0	36	57	3	F3AH0450ADL45	●	F3AH0450BDL45	●
5,00	6	10,0	36	57	3	F3AH0500ADL45	●	F3AH0500BDL45	●
6,00	6	10,0	36	57	3	F3AH0600ADL45	●	F3AH0600BDL45	●
7,00	8	13,0	36	63	3	F3AH0700ADL45	●	F3AH0700BDL45	●
8,00	8	16,0	36	63	3	F3AH0800ADL45	●	F3AH0800BDL45	●
9,00	10	16,0	40	72	3	F3AH0900ADL45	●	F3AH0900BDL45	●
10,00	10	19,0	40	72	3	F3AH1000ADL45	●	F3AH1000BDL45	●
12,00	12	22,0	45	83	3	F3AH1200ADL45	●	F3AH1200BDL45	●
14,00	14	22,0	45	83	3	F3AH1400ADL45	●	F3AH1400BDL45	●
16,00	16	26,0	48	92	3	F3AH1600ADL45	●	F3AH1600BDL45	●
18,00	18	26,0	48	92	3	F3AH1800ADL45	●	F3AH1800BDL45	●
20,00	20	32,0	50	104	3	F3AH2000ADL45	●	F3AH2000BDL45	●

For application data, see page 65.

	Corner Chamfer (Chamfer height)	
D1 h10	BCH	Tolerance
2 - 6.75	0,10	-0,05
6.76 - 9.7	0,20	-0,10
9.71 - 15.7	0,30	-0,10
15.71 - 25	0,40	-0,20

Ordering Example:
Shank form A (Plain): F3AH0300BDL45 KC625M
Shank form B (Weldon): F3AH0300BDL45 KC625M

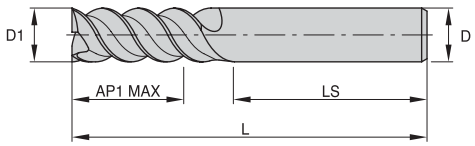
Features

- DIN 6527 long.
- Plain shank.
- Corner chamfer - center cutting.

Operations

- Side cutting.







3-Flute, 60° Helix

● first choice
○ alternate choice

H	○
S	●
N	○
K	●
M	●
P	●

D1	D	Ap1 max	LS	L	Z U	catalog number	KC625M
6,00	6	13,0	36	57	3	F3AJ0600ADL60	●
8,00	8	19,0	36	63	3	F3AJ0800ADL60	●
10,00	10	22,0	40	72	3	F3AJ1000ADL60	●
12,00	12	26,0	45	83	3	F3AJ1200ADL60	●
14,00	14	26,0	45	83	3	F3AJ1400ADL60	●
16,00	16	32,0	48	92	3	F3AJ1600ADL60	●
18,00	18	32,0	48	92	3	F3AJ1800ADL60	●
20,00	20	38,0	50	104	3	F3AJ2000ADL60	●

For application data, see page 66.

	Corner Chamfer (Chamfer height)	
D1 h10	BCH	Tolerance
2 - 6.75	0,10	-0,05
6.76 - 9.7	0,20	-0,10
9.71 - 15.7	0,30	-0,10
15.71 - 25	0,40	-0,20

Ordering Example:
F3AJ0600ADL60 KC625M

General Application Finishing End Mills

F4AJ...DL — DIN 6527 — Long

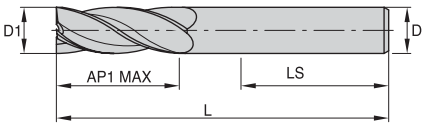
Features

- DIN 6527 long.
- Plain and Weldon shank.
- Corner chamfer - center cutting.

Operations

- Side cutting and ramping.







4-Flute, 30° Helix

● first choice
○ alternate choice

H	S	N	K	M	P
	●	○	●	●	●

D1	D	Ap1 max	LS	L	Z U	catalog number	KC633M	catalog number	KC633M
4,00	6	11,0	38	57	4	F4AJ0400ADL30	●	F4AJ0400BDL30	●
4,50	6	11,0	38	57	4	F4AJ0450ADL30	●	F4AJ0450BDL30	●
5,00	6	13,0	37	57	4	F4AJ0500ADL30	●	F4AJ0500BDL30	●
6,00	6	13,0	36	57	4	F4AJ0600ADL30	●	F4AJ0600BDL30	●
7,00	8	16,0	36	63	4	F4AJ0700ADL30	●	F4AJ0700BDL30	●
8,00	8	19,0	36	63	4	F4AJ0800ADL30	●	F4AJ0800BDL30	●
9,00	10	19,0	40	72	4	F4AJ0900ADL30	●	F4AJ0900BDL30	●
10,00	10	22,0	40	72	4	F4AJ1000ADL30	●	F4AJ1000BDL30	●
11,00	12	26,0	45	83	4	F4AJ1100ADL30	●	F4AJ1100BDL30	●
12,00	12	26,0	45	83	4	F4AJ1200ADL30	●	F4AJ1200BDL30	●
13,00	14	26,0	45	83	4	F4AJ1300ADL30	●	F4AJ1300BDL30	●
14,00	14	26,0	45	83	4	F4AJ1400ADL30	●	F4AJ1400BDL30	●
15,00	16	32,0	48	92	4	F4AJ1500ADL30	●	F4AJ1500BDL30	●
16,00	16	32,0	48	92	4	F4AJ1600ADL30	●	F4AJ1600BDL30	●
18,00	18	32,0	48	92	4	F4AJ1800ADL30	●	F4AJ1800BDL30	●
20,00	20	38,0	50	104	4	F4AJ2000ADL30	●	F4AJ2000BDL30	●

For application data, see page 66.

	Corner Chamfer (Chamfer height)	
D1 h10	BCH	Tolerance
2 - 6.75	0,10	-0,05
6.76 - 9.7	0,20	-0,10
9.71 - 15.7	0,30	-0,10
15.71 - 25	0,40	-0,20

Ordering Example:
Shank form A (Plain): F4AJ0400ADL30 KC633M
Shank form B (Weldon): F4AJ0400BDL30 KC633M

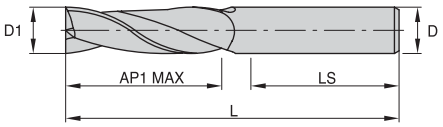
Features

- Factory standard.
- Plain shank.
- Corner chamfer - center cutting.

Operations

- Slotting, side cutting and ramping.







2-Flute, 30° Helix

● first choice
○ alternate choice

H	●	●
S	●	●
N		
K	●	●
M	●	●
P	●	●

D1	D	Ap1 max	LS	L	Z U	catalog number	K600	KC625M
0,40	3	0,8	28	38	2	F2AH0040AWS30	●	●
0,50	3	1,0	28	38	2	F2AH0050AWS30	●	●
0,60	3	1,0	28	38	2	F2AH0060AWS30	●	●
0,80	3	2,0	28	38	2	F2AH0080AWS30	●	●
1,00	3	2,0	28	38	2	F2AH0100AWS30	●	●
1,20	3	2,0	28	38	2	F2AH0120AWS30		●
1,50	3	3,0	28	38	2	F2AH0150AWS30	●	●
1,80	3	4,0	28	38	2	F2AH0180AWS30	●	●
2,00	3	6,0	28	38	2	F2AH0200AWS30	●	●
2,50	3	7,0	28	38	2	F2AH0250AWS30	●	●
3,00	3	7,0	28	38	2	F2AH0300AWS30		●
3,00	3	20,0	28	75	2	F2AH0300AWM30	●	●
4,00	4	25,0	28	75	2	F2AH0400AWM30	●	●
5,00	5	30,0	28	75	2	F2AH0500AWM30	●	●
6,00	6	30,0	36	75	2	F2AH0600AWM30	●	●
8,00	8	40,0	36	100	2	F2AH0800AWL30	●	●
10,00	10	40,0	40	100	2	F2AH1000AWL30	●	●
12,00	12	45,0	45	150	2	F2AH1200AWX30	●	
14,00	14	45,0	45	150	2	F2AH1400AWX30	●	●
16,00	16	65,0	48	150	2	F2AH1600AWX30	●	●
18,00	18	65,0	48	150	2	F2AH1800AWX30	●	●
20,00	20	65,0	50	150	2	F2AH2000AWX30	●	●

For application data, see page 67.

	Corner Chamfer (Chamfer height)	
D1 h10	BCH	Tolerance
2 - 6.75	0,10	-0,05
6.76 - 9.7	0,20	-0,10
9.71 - 15.7	0,30	-0,10
15.71 - 25	0,40	-0,20

Ordering Example:
F2AH0300AWM30 K600

General Application Finishing End Mills

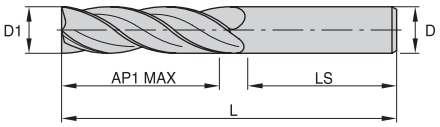
F4AJ...WM-WL-WX — Extra-Long Flute

Features

- Factory standard.
- Plain shank.
- Corner chamfer - center cutting.

Operations

- Side cutting, slotting and ramping.





● first choice
○ alternate choice

H		
S	●	●
N	○	○
K	●	●
M	●	●
P	●	●

4-Flute, 30° Helix

D1	D	Ap1 max	LS	L	Z U	catalog number	K600	KC625M
3,00	3	20,0	28	75	4	F4AJ0300AWM30	●	●
4,00	4	25,0	28	75	4	F4AJ0400AWM30	●	●
5,00	5	30,0	28	75	4	F4AJ0500AWM30	●	●
6,00	6	30,0	36	75	4	F4AJ0600AWM30	●	●
8,00	8	40,0	36	100	4	F4AJ0800AWL30	●	●
10,00	10	40,0	40	100	4	F4AJ1000AWL30	●	●
12,00	12	45,0	45	150	4	F4AJ1200AWX30	●	●
14,00	14	45,0	45	150	4	F4AJ1400AWX30	●	●
16,00	16	65,0	48	150	4	F4AJ1600AWX30	●	●
18,00	18	65,0	48	150	4	F4AJ1800AWX30	●	●
20,00	20	65,0	50	150	4	F4AJ2000AWX30	●	●

For application data, see page 67.

	Corner Chamfer (Chamfer height)	
D1 h10	BCH	Tolerance
2 - 6.75	0,10	-0,05
6.76 - 9.7	0,20	-0,10
9.71 - 15.7	0,30	-0,10
15.71 - 25	0,40	-0,20

Ordering Example:
F4AJ0300AWM30 K600

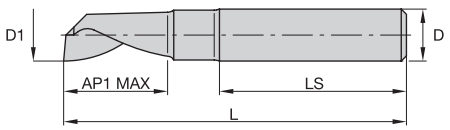
To place an order, contact Kennametal or your authorized Kennametal distributor, or visit www.kennametal.com.

Features

- Factory standard.
- Plain shank.
- Sharp corner - center cutting.

Operations

- Side cutting, slotting and ramping.
- For aerospace, general engineering, and automotive applications.





1-Flute, 30° Helix

● first choice
○ alternate choice

D1	D	Ap1 max	LS	L	Z U	catalog number	K600
2,00	2	10,0	20	40	1	F1AA0200AWS30	●
3,00	3	10,0	20	40	1	F1AA0300AWS30	●
4,00	4	14,0	28	50	1	F1AA0400AWS30	●
5,00	5	16,0	28	60	1	F1AA0500AWS30	●
6,00	6	20,0	36	60	1	F1AA0600AWS30	●
8,00	8	25,0	36	75	1	F1AA0800AWM30	●
10,00	10	25,0	40	75	1	F1AA1000AWM30	●
12,00	12	25,0	45	75	1	F1AA1200AWM30	●

For application data, see page 68.

Ordering Example:
F1AA0200AWS30 K600

High-Performance Finishing End Mills

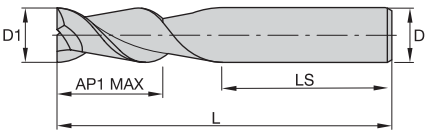
F2AA...DL — DIN 6527 — Long — for Aluminium

Features

- DIN 6527 long.
- Plain shank.
- Corner chamfer - center cutting.

Operations

- Side cutting, slotting and ramping.
- For aerospace, general engineering, and automotive applications.





2-Flute, 45° Helix

● first choice
○ alternate choice

D1	D	Ap1 max	LS	L	Z U	catalog number	K600	KC631M
4,00	6	12,0	36	50	2	F2AA0400ADL45	●	●
5,00	6	14,0	36	50	2	F2AA0500ADL45	●	●
6,00	6	16,0	36	50	2	F2AA0600ADL45	●	●
8,00	8	20,0	36	63	2	F2AA0800ADL45	●	●
10,00	10	22,0	40	76	2	F2AA1000ADL45	●	●
12,00	12	25,0	45	76	2	F2AA1200ADL45	●	●
14,00	14	32,0	45	83	2	F2AA1400ADL45	●	●
16,00	16	32,0	48	89	2	F2AA1600ADL45	●	●
18,00	18	38,0	48	100	2	F2AA1800ADL45	●	●
20,00	20	38,0	50	104	2	F2AA2000ADL45	●	●

For application data, see page 68.

	Corner Chamfer (Chamfer height)	
D1 h10	BCH	Tolerance
2 - 3	0.08	-0.05
3.01 - 10	0.1	-0.05
10,01 - 20	0.2	-0.1

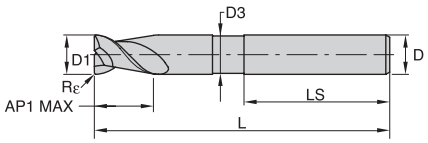
Ordering Example:
F2AA0400ADL45 K600

Features

- Factory standard.
- Plain shank.
- Corner radius - center cutting.

Operations

- Side cutting, slotting and ramping.
- For aerospace, general engineering, and automotive applications.





2-Flute, 45° Helix

● first choice
○ alternate choice

H		
S		
N		●
K		
M		
P		

D1	D3	D	Ap1 max	LS	L	Rε	Z U	catalog number	K600
6,0	5,80	6	9,0	—	63	0,50	2	F2AA0600AWM45R050	●
6,0	5,80	6	9,0	—	63	1,00	2	F2AA0600AWM45R100	●
8,0	7,80	8	12,0	—	68	0,50	2	F2AA0800AWM45R050	●
8,0	7,80	8	12,0	—	68	1,00	2	F2AA0800AWM45R100	●
10,0	9,50	10	15,0	40	76	0,50	2	F2AA1000AWL45R050	●
10,0	9,50	10	15,0	40	76	1,00	2	F2AA1000AWL45R100	●
10,0	9,50	10	15,0	40	76	2,00	2	F2AA1000AWL45R200	●
10,0	9,50	10	15,0	40	76	3,00	2	F2AA1000AWL45R300	●
10,0	9,50	10	15,0	40	76	4,00	2	F2AA1000AWL45R400	●
12,0	11,50	12	18,0	45	84	0,50	2	F2AA1200AWL45R050	●
12,0	11,50	12	18,0	45	84	1,00	2	F2AA1200AWL45R100	●
12,0	11,50	12	18,0	45	84	2,00	2	F2AA1200AWL45R200	●
12,0	11,50	12	18,0	45	84	3,00	2	F2AA1200AWL45R300	●
12,0	11,50	12	18,0	45	84	4,00	2	F2AA1200AWL45R400	●
16,0	15,00	16	24,0	48	100	0,50	2	F2AA1600AWX45R050	●
16,0	15,00	16	24,0	48	100	1,00	2	F2AA1600AWX45R100	●
16,0	15,00	16	24,0	48	100	2,00	2	F2AA1600AWX45R200	●
16,0	15,00	16	24,0	48	100	3,00	2	F2AA1600AWX45R300	●
16,0	15,00	16	24,0	48	100	4,00	2	F2AA1600AWX45R400	●
20,0	19,00	20	30,0	50	115	0,50	2	F2AA2000AWX45R050	●
20,0	19,00	20	30,0	50	115	1,00	2	F2AA2000AWX45R100	●
20,0	19,00	20	30,0	50	115	2,00	2	F2AA2000AWX45R200	●
20,0	19,00	20	30,0	50	115	3,00	2	F2AA2000AWX45R300	●
20,0	19,00	20	30,0	50	115	4,00	2	F2AA2000AWX45R400	●
25,0	24,00	25	37,5	56	135	0,50	2	F2AA2500AWX45R050	●
25,0	24,00	25	37,5	56	135	1,00	2	F2AA2500AWX45R100	●
25,0	24,00	25	37,5	56	135	2,00	2	F2AA2500AWX45R200	●
25,0	24,00	25	37,5	56	135	3,00	2	F2AA2500AWX45R300	●
25,0	24,00	25	37,5	56	135	4,00	2	F2AA2500AWX45R400	●

For application data, see page 68.

Ordering Example:
F2AA0600AWM45R050 K600

High-Performance Finishing End Mills

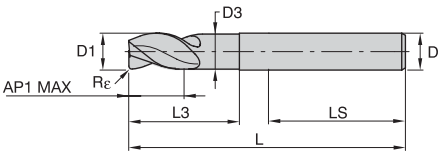
F3AA...WS-WM-WL-WX — for Aluminium

Features

- Factory standard.
- Plain shank.
- Corner radius - center cutting.

Operations

- Side cutting, slotting and ramping.
- For aerospace, general engineering, and automotive applications.





● first choice
○ alternate choice

H		
S		
N		●
K		
M		
P		

3-Flute, 45° Helix

D1	D3	D	Ap1 max	L3	LS	L	Rε	Z U	catalog number	K600
6,00	5,80	6	9,0	18	36	63	0,50	3	F3AA0600AWM45R050	●
6,00	5,80	6	9,0	18	36	63	1,00	3	F3AA0600AWM45R100	●
8,00	7,80	8	12,0	24	36	68	0,50	3	F3AA0800AWM45R050	●
8,00	7,80	8	12,0	24	36	68	1,00	3	F3AA0800AWM45R100	●
10,00	9,50	10	15,0	30	40	76	0,50	3	F3AA1000AWL45R050	●
10,00	9,50	10	15,0	30	40	76	1,00	3	F3AA1000AWL45R100	●
10,00	9,50	10	15,0	30	40	76	2,00	3	F3AA1000AWL45R200	●
10,00	9,50	10	15,0	30	40	76	3,00	3	F3AA1000AWL45R300	●
10,00	9,50	10	15,0	30	40	76	4,00	3	F3AA1000AWL45R400	●
12,00	11,50	12	18,0	36	45	84	0,50	3	F3AA1200AWL45R050	●
12,00	11,50	12	18,0	36	45	84	1,00	3	F3AA1200AWL45R100	●
12,00	11,50	12	18,0	36	45	84	2,00	3	F3AA1200AWL45R200	●
12,00	11,50	12	18,0	36	45	84	3,00	3	F3AA1200AWL45R300	●
12,00	11,50	12	18,0	36	45	84	4,00	3	F3AA1200AWL45R400	●
16,00	15,00	16	24,0	48	48	100	0,50	3	F3AA1600AWX45R050	●
16,00	15,00	16	24,0	48	48	100	1,00	3	F3AA1600AWX45R100	●
16,00	15,00	16	24,0	48	48	100	2,00	3	F3AA1600AWX45R200	●
16,00	15,00	16	24,0	48	48	100	3,00	3	F3AA1600AWX45R300	●
16,00	15,00	16	24,0	48	48	100	4,00	3	F3AA1600AWX45R400	●
20,00	19,00	20	30,0	60	50	115	0,50	3	F3AA2000AWX45R050	●
20,00	19,00	20	30,0	60	50	115	1,00	3	F3AA2000AWX45R100	●
20,00	19,00	20	30,0	60	50	115	2,00	3	F3AA2000AWX45R200	●
20,00	19,00	20	30,0	60	50	115	3,00	3	F3AA2000AWX45R300	●
20,00	19,00	20	30,0	60	50	115	4,00	3	F3AA2000AWX45R400	●
25,00	24,00	25	37,5	75	56	135	0,50	3	F3AA2500AWX45R050	●
25,00	24,00	25	37,5	75	56	135	1,00	3	F3AA2500AWX45R100	●
25,00	24,00	25	37,5	75	56	135	2,00	3	F3AA2500AWX45R200	●
25,00	24,00	25	37,5	75	56	135	3,00	3	F3AA2500AWX45R300	●
25,00	24,00	25	37,5	75	56	135	4,00	3	F3AA2500AWX45R400	●

For application data, see page 69.

Ordering Example:
F3AA0600AWM45R050 K600

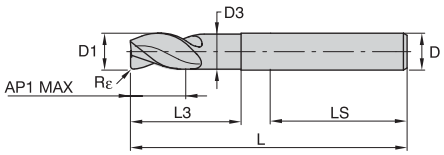
To place an order, contact Kennametal or your authorized Kennametal distributor, or visit www.kennametal.com.

Features

- Factory standard.
- Plain shank.
- Sharp corner - center cutting.

Operations

- Side cutting, slotting and ramping.
- For aerospace, general engineering, and automotive applications.





3-Flute, 45° Helix

● first choice
○ alternate choice

H	S	N	K	M	P
		●			

D1	D	Ap1 max	LS	L	Z U	catalog number	K600	KC631M
3,00	3	12,0	24	38	3	F3AA0300AWS45	●	●
4,00	4	12,0	35	50	3	F3AA0400AWS45	●	●
5,00	6	14,0	33	50	3	F3AA0500AWS45	●	●
6,00	6	16,0	30	50	3	F3AA0600AWS45	●	●
8,00	8	20,0	38	63	3	F3AA0800AWM45	●	●
10,00	10	22,0	46	76	3	F3AA1000AWL45	●	●
12,00	12	25,0	42	76	3	F3AA1200AWL45	●	●
14,00	14	32,0	46	89	3	F3AA1400AWL45	●	●
16,00	16	32,0	45	89	3	F3AA1600AWL45	●	●
18,00	18	38,0	48	100	3	F3AA1800AWL45	●	
20,00	20	38,0	54	104	3	F3AA2000AWX45	●	●

For application data, see page 68.

Ordering Example:
F3AA0300AWS45 K600

High-Performance Finishing End Mills

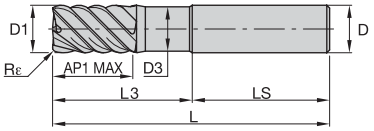
F8AJ-F10AJ...DK — DIN 6527 — Short — Multiflute with Extended Neck

Features

- DIN 6527 long.
- Plain shank.
- Corner radius - center cutting.

Operations

- Side cutting.
- For aerospace and general engineering applications.





8 & 10-Flute, 45° Helix

● first choice
○ alternate choice

H	○
S	●
N	
K	●
M	●
P	●

D1	D3	D	Ap1 max	L3	LS	L	Rε	Z U	catalog number	KC633M
8,00	7,00	8	8,0	16	42	58	1,00	8	F8AJ0800ADK45E160	●
10,00	9,00	10	10,0	20	46	66	1,00	8	F8AJ1000ADK45E200	●
12,00	11,00	12	12,0	24	49	73	1,00	8	F8AJ1200ADK45E240	●
16,00	15,00	16	16,0	32	50	82	1,00	10	F10AJ1600ADK45E320	●
20,00	19,00	20	20,0	40	52	92	1,00	10	F10AJ2000ADK45E400	●

For application data, see page 69.

Ordering Example:
F8AJ0800ADK45E160 KC633M

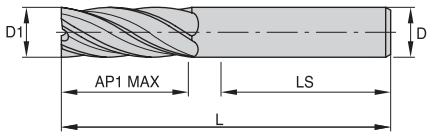
To place an order, contact Kennametal or your authorized Kennametal distributor, or visit www.kennametal.com.

Features

- DIN 6527 long.
- Plain shank.
- Corner chamfer - center cutting.

Operations

- Side cutting.
- For aerospace, general engineering, medical, and automotive applications.





6-Flute, 30° Helix

● first choice
○ alternate choice

							KC625M
D1	D	Ap1 max	LS	L	Z U	catalog number	
6,00	6	13,0	36	57	6	F6AJ0600ADL30	●
8,00	8	19,0	36	63	6	F6AJ0800ADL30	●
10,00	10	22,0	40	72	6	F6AJ1000ADL30	●
12,00	12	26,0	45	83	6	F6AJ1200ADL30	●
14,00	14	26,0	45	83	6	F6AJ1400ADL30	●
16,00	16	32,0	48	92	6	F6AJ1600ADL30	●
18,00	18	32,0	48	92	6	F6AJ1800ADL30	●
20,00	20	38,0	50	104	6	F6AJ2000ADL30	●

For application data, see page 71.

	Corner Chamfer (Chamfer height)	
D1 h10	BCH	Tolerance
2 - 6.75	0,10	-0,05
6.76 - 9.7	0,20	-0,10
9.71 - 15.7	0,30	-0,10
15.71 - 25	0,40	-0,20

Ordering Example:
F6AJ0600ADL30 KC625M

High-Performance Finishing End Mills

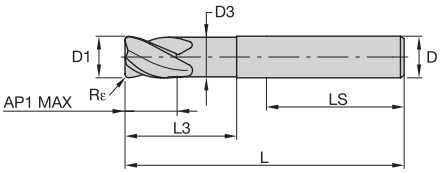
F4AS...WM-WL-WX — Extended Neck — Unequal Flute Spacing

Features

- Factory standard.
- Plain and Weldon shank.
- Corner radius - center cutting.

Operations

- Side cutting, slotting and ramping.
- For aerospace, general engineering, medical, and automotive applications.





4-Flute, 38° Helix

● first choice
○ alternate choice

D1	D3	D	Ap1 max	L3	LS	L	Rε	Z U	catalog number	H S N K M P KC633M	catalog number	H S N K M P KC633M
6,00	5,80	6	9,0	18	36	63	0,50	4	F4AS0600AWM38R050	●	F4AS0600BWM38R050	●
6,00	5,80	6	9,0	18	36	63	1,00	4	F4AS0600AWM38R100	●	F4AS0600BWM38R100	●
8,00	7,80	8	12,0	24	36	68	0,50	4	F4AS0800AWM38R050	●	F4AS0800BWM38R050	●
8,00	7,80	8	12,0	24	36	68	1,00	4	F4AS0800AWM38R100	●	F4AS0800BWM38R100	●
10,00	9,50	10	15,0	30	40	76	0,50	4	F4AS1000AWL38R050	●	F4AS1000BWL38R050	●
10,00	9,50	10	15,0	30	40	76	1,00	4	F4AS1000AWL38R100	●	F4AS1000BWL38R100	●
10,00	9,50	10	15,0	30	40	76	2,00	4	F4AS1000AWL38R200	●	F4AS1000BWL38R200	●
10,00	9,50	10	15,0	30	40	76	3,00	4	F4AS1000AWL38R300	●	F4AS1000BWL38R300	●
10,00	9,50	10	15,0	30	40	76	4,00	4	F4AS1000AWL38R400	●	F4AS1000BWL38R400	●
12,00	11,50	12	18,0	36	45	84	0,50	4	F4AS1200AWL38R050	●	F4AS1200BWL38R050	●
12,00	11,50	12	18,0	36	45	84	1,00	4	F4AS1200AWL38R100	●	F4AS1200BWL38R100	●
12,00	11,50	12	18,0	36	45	84	2,00	4	F4AS1200AWL38R200	●	F4AS1200BWL38R200	●
12,00	11,50	12	18,0	36	45	84	3,00	4	F4AS1200AWL38R300	●	F4AS1200BWL38R300	●
12,00	11,50	12	18,0	36	45	84	4,00	4	F4AS1200AWL38R400	●	F4AS1200BWL38R400	●
16,00	15,00	16	24,0	48	48	100	0,50	4	F4AS1600AWX38R050	●	F4AS1600BWX38R050	●
16,00	15,00	16	24,0	48	48	100	1,00	4	F4AS1600AWX38R100	●	F4AS1600BWX38R100	●
16,00	15,00	16	24,0	48	48	100	2,00	4	F4AS1600AWX38R200	●	F4AS1600BWX38R200	●
16,00	15,00	16	24,0	48	48	100	3,00	4	F4AS1600AWX38R300	●	F4AS1600BWX38R300	●
16,00	15,00	16	24,0	48	48	100	4,00	4	F4AS1600AWX38R400	●	F4AS1600BWX38R400	●
20,00	19,00	20	30,0	60	50	115	0,50	4	F4AS2000AWX38R050	●	F4AS2000BWX38R050	●
20,00	19,00	20	30,0	60	50	115	1,00	4	F4AS2000AWX38R100	●	F4AS2000BWX38R100	●
20,00	19,00	20	30,0	60	50	115	2,00	4	F4AS2000AWX38R200	●	F4AS2000BWX38R200	●
20,00	19,00	20	30,0	60	50	115	3,00	4	F4AS2000AWX38R300	●	F4AS2000BWX38R300	●
20,00	19,00	20	30,0	60	50	115	4,00	4	F4AS2000AWX38R400	●	F4AS2000BWX38R400	●
25,00	24,00	25	37,5	75	56	135	0,50	4	F4AS2500AWX38R050	●	F4AS2500BWX38R050	●
25,00	24,00	25	37,5	75	56	135	1,00	4	F4AS2500AWX38R100	●	F4AS2500BWX38R100	●
25,00	24,00	25	37,5	75	56	135	2,00	4	F4AS2500AWX38R200	●	F4AS2500BWX38R200	●
25,00	24,00	25	37,5	75	56	135	3,00	4	F4AS2500AWX38R300	●	F4AS2500BWX38R300	●
25,00	24,00	25	37,5	75	56	135	4,00	4	F4AS2500AWX38R400	●	F4AS2500BWX38R400	●

For application data, see page 70.

Ordering Example:
Shank form A (Plain): F4AS0600AWM38R050 KC633M
Shank form B (Weldon):F4AS0600BWM38R050 KC633M

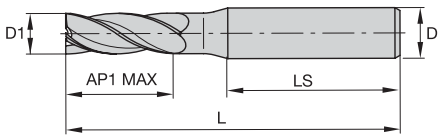
To place an order, contact Kennametal or your authorized Kennametal distributor, or visit www.kennametal.com.

Features

- DIN 6527 long.
- Plain shank.
- Corner chamfer - center cutting.

Operations

- Side cutting, slotting and ramping.
- For aerospace, general engineering, medical, and automotive applications.





4-Flute, 38° Helix

● first choice
○ alternate choice

D1	D	Ap1 max	LS	L	Z U	catalog number	KC633M	catalog number	KC633M
4,00	6	12,0	36	55	4	F4AS0400ADL38	●	F4AS0400BDL38	●
5,00	6	13,0	36	57	4	F4AS0500ADL38	●	F4AS0500BDL38	●
6,00	6	13,0	36	57	4	F4AS0600ADL38	●	F4AS0600BDL38	●
8,00	8	16,0	36	63	4	F4AS0800ADL38	●	F4AS0800BDL38	●
10,00	10	22,0	40	72	4	F4AS1000ADL38	●	F4AS1000BDL38	●
12,00	12	26,0	45	83	4	F4AS1200ADL38	●	F4AS1200BDL38	●
14,00	14	26,0	45	83	4	F4AS1400ADL38	●	F4AS1400BDL38	●
16,00	16	32,0	48	92	4	F4AS1600ADL38	●	F4AS1600BDL38	●
18,00	18	32,0	48	92	4	F4AS1800ADL38	●	F4AS1800BDL38	●
20,00	20	38,0	50	104	4	F4AS2000ADL38	●	F4AS2000BDL38	●
25,00	25	45,0	56	121	4	F4AS2500ADL38	●	F4AS2500BDL38	●

For application data, see page 70.

	Corner Chamfer (Chamfer height)	
D1 e8	BCH	Tolerance
2 - 8,99	0,4	± 0,1
9 - 25	0,5	± 0,1

Ordering Example:
F4AS0400ADL38 KC633M

High-Performance Finishing End Mills

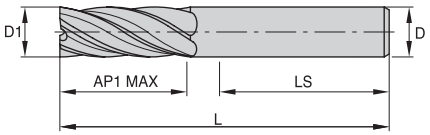
F6AJ...DL — DIN 6527 — Long, Multiflute

Features

- DIN 6527 long.
- Weldon shank.
- Corner chamfer - center cutting.

Operations

- Side cutting.
- For aerospace, general engineering, medical, and automotive applications.





6-Flute, 30° Helix

● first choice
○ alternate choice

H							
S							●
N							○
K							●
M							●
P							●

D1	D	Ap1 max	LS	L	Z U	catalog number	KC625M
6,00	6,00	13	36	57	6	F6AJ0600BDL30	●
16,00	16,00	32	48	92	6	F6AJ1600BDL30	●
20,00	20,00	38	50	104	6	F6AJ2000BDL30	●

For application data, see page 71.

	Corner Chamfer (Chamfer height)	
D1 h10	BCH	Tolerance
2 - 6.75	0,10	-0,05
6.76 - 9.7	0,20	-0,10
9.71 - 15.7	0,30	-0,10
15.71 - 25	0,40	-0,20

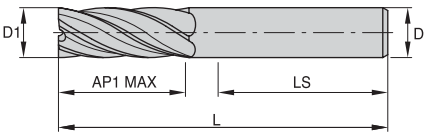
Ordering Example:
F6AJ0600BDL30 KC625M

Features

- DIN 6527 long.
- Plain and Weldon shank.
- Corner chamfer - center cutting.

Operations

- Side cutting.
- For aerospace, medical, and general engineering applications.





6-Flute, 45° Helix

● first choice
○ alternate choice

							KC633M	KC625M		KC633M
D1	D	Ap1 max	LS	L	Z U	catalog number			catalog number	
6,00	6	13,0	36	57	6	F6AJ0600ADL45	●	●	F6AJ0600BDL45	●
8,00	8	19,0	36	63	6	F6AJ0800ADL45	●	●	F6AJ0800BDL45	●
10,00	10	22,0	40	72	6	F6AJ1000ADL45	●		F6AJ1000BDL45	●
12,00	12	26,0	45	83	6	F6AJ1200ADL45	●	●	F6AJ1200BDL45	●
14,00	14	26,0	45	83	6	F6AJ1400ADL45	●		F6AJ1400BDL45	●
16,00	16	32,0	48	92	6	F6AJ1600ADL45	●	●	F6AJ1600BDL45	●
18,00	18	32,0	48	92	8	F8AJ1800ADL45	●		F8AJ1800BDL45	●
20,00	20	32,0	50	104	8	F8AJ2000ADL45	●	●	F8AJ2000BDL45	●
25,00	25	46,0	56	121	8	F8AJ2500ADL45	●		F8AJ2500BDL45	●

For application data, see page 71.

	Corner Chamfer (Chamfer height)	
D1 h10	BCH	Tolerance
2 - 6.75	0,10	-0,05
6.76 - 9.7	0,20	-0,10
9.71 - 15.7	0,30	-0,10
15.71 - 25	0,40	-0,20

Ordering Example:
Shank form A (Plain): F6AJ0600ADL45 KC633M
Shank form B (Weldon): F6AJ0600BDL45 KC633M

High-Performance Finishing End Mills

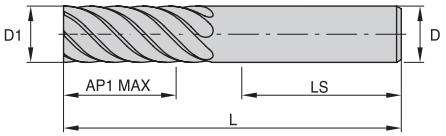
F6AJ-F8AJ...WM-WL-WX — Extra-Long, Multiflute

Features

- Factory standard.
- Plain shank.
- Corner chamfer - center cutting.

Operations

- Side cutting.
- For aerospace, medical, and general engineering applications.





6 & 8-Flute, 45° Helix

● first choice
○ alternate choice

H							
S							●
N							○
K							●
M							●
P							●

D1	D	Ap1 max	LS	L	Z U	catalog number	KC633M
6,00	6	18,0	36	62	6	F6AJ0600AWM45	●
8,00	8	24,0	36	68	6	F6AJ0800AWM45	●
10,00	10	30,0	40	80	6	F6AJ1000AWL45	●
12,00	12	36,0	45	93	6	F6AJ1200AWL45	●
16,00	16	48,0	48	108	6	F6AJ1600AWX45	●
20,00	20	60,0	50	126	8	F8AJ2000AWX45	●
25,00	25	75,0	56	150	8	F8AJ2500AWX45	●

For application data, see page 72.

	Corner Chamfer (Chamfer height)	
D1 h10	BCH	Tolerance
2 - 6.75	0,10	-0,05
6.76 - 9.7	0,20	-0,10
9.71 - 15.7	0,30	-0,10
15.71 - 25	0,40	-0,20

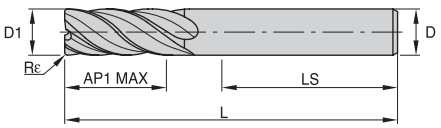
Ordering Example:
F6AJ0600AWM45 KC633M

Features

- DIN 6527 long.
- Plain shank.
- Corner radius - center cutting.

Operations

- Side cutting.
- For die & mold applications.





6 & 8-Flute, 45° Helix

● first choice
○ alternate choice

H	●
S	
N	
K	
M	
P	●

D1	D	Ap1 max	LS	L	Rε	Z U	catalog number	KC637M
6,00	6	13,0	36	57	0,50	6	F6AV0600ADL45	●
8,00	8	19,0	36	63	0,50	6	F6AV0800ADL45	●
10,00	10	22,0	40	72	0,50	6	F6AV1000ADL45	●
12,00	12	26,0	45	83	1,00	6	F6AV1200ADL45	●
16,00	16	32,0	48	92	1,00	6	F6AV1600ADL45	●
20,00	20	38,0	50	104	1,00	8	F8AV2000ADL45	●
25,00	25	45,0	56	121	1,50	8	F8AV2500ADL45	●

For application data, see page 72.

Ordering Example:
F6AV0600ADL45 KC637M

High-Performance Finishing End Mills

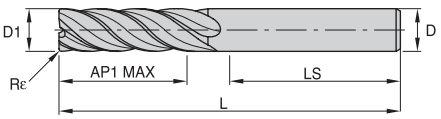
F6AV-F8AV...WM-WL-WX — Extra-Long, Multiflute — for Hardened Steel

Features

- Factory standard.
- Plain shank.
- Corner radius - center cutting.

Operations

- Side cutting.
- For die & mold applications.





6 & 8-Flute, 45° Helix

● first choice
○ alternate choice

H		●
S		
N		
K		
M		
P		○

D1	D	Ap1 max	LS	L	Rε	Z U	catalog number	KC637M
6,00	6	18,0	36	62	0,50	6	F6AV0600AWM45	●
8,00	8	24,0	36	68	0,50	6	F6AV0800AWM45	●
10,00	10	30,0	40	80	0,50	6	F6AV1000AWL45	●
12,00	12	36,0	45	93	1,00	6	F6AV1200AWL45	●
16,00	16	48,0	48	108	1,00	6	F6AV1600AWX45	●
20,00	20	60,0	50	126	1,00	8	F8AV2000AWX45	●
25,00	25	75,0	56	150	1,50	8	F8AV2500AWX45	●

For application data, see page 72.

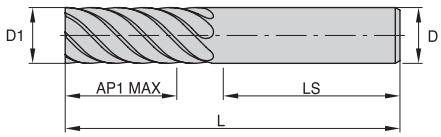
Ordering Example:
F6AV0600AWM45 KC637M

Features

- Factory standard.
- Plain shank.
- Sharp corner - center cutting.

Operations

- Side cutting.
- For die & mold applications.





Multi-flute, 50° Helix

● first choice
○ alternate choice

							KC633M	KC635M
H							●	●
S								
N								
K								
M								
P							●	●

D1	D	Ap1 max	LS	L	Z U	catalog number	KC633M	KC635M
6,00	6	9,0	36	50	4	F4AJ0600AWS50L090	●	
6,00	6	9,0	64	76	4	F4AJ0600AWL50L090		●
6,00	6	15,0	59	76	4	F4AJ0600AWL50L150		●
6,00	6	21,0	53	76	4	F4AJ0600AWL50L210		●
8,00	8	12,0	36	63	4	F4AJ0800AWM50L120	●	
8,00	8	12,0	84	100	4	F4AJ0800AWL50L120		●
8,00	8	20,0	78	100	4	F4AJ0800AWL50L200		●
10,00	10	15,0	40	76	4	F4AJ1000AWM50L150	●	
10,00	10	15,0	80	100	4	F4AJ1000AWL50L150		●
10,00	10	25,0	72	100	5	F5AJ1000AWL50L250		●
10,00	10	35,0	72	100	5	F5AJ1000AWL50L350		●
12,00	12	18,0	45	76	4	F4AJ1200AWL50L180	●	
12,00	12	18,0	101	125	4	F4AJ1200AWX50L180		●
12,00	12	30,0	91	125	6	F6AJ1200AWX50L300		●
12,00	12	42,0	79	125	6	F6AJ1200AWX50L420		●
16,00	16	24,0	48	89	4	F4AJ1600AWL50L240	●	
16,00	16	24,0	93	125	4	F4AJ1600AWX50L240		●
16,00	16	40,0	80	125	6	F6AJ1600AWX50L400		●
16,00	16	56,0	64	125	6	F6AJ1600AWX50L560		●
20,00	20	30,0	50	104	4	F4AJ2000AWL50L300	●	
20,00	20	30,0	110	150	4	F4AJ2000AWX50L300		●
20,00	20	50,0	93	150	6	F6AJ2000AWX50L500		●
20,00	20	70,0	73	150	6	F6AJ2000AWX50L700		●
25,00	25	38,0	56	121	5	F5AJ2500AWX50L380	●	

For application data, see page 73.

Ordering Example:
F4AJ0600AWS50L090 KC633M

High-Performance Finishing End Mills

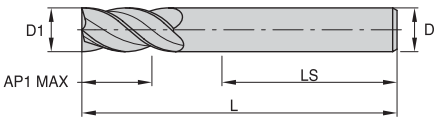
F4AJ-F5AJ...WS-WM-WL-WX — Short — for Medium and Hardened Steels

Features

- Factory standard.
- Plain shank.
- Sharp corner - center cutting.

Operations

- Side cutting.
- For die & mold applications.





4 & 5-flute, 50° Helix

● first choice
○ alternate choice

D1	D	Ap1 max	LS	L	Z U	catalog number	KC633M
6,00	6	9,0	36	50	4	F4AJ0600AWS50L090	●
8,00	8	12,0	36	63	4	F4AJ0800AWM50L120	●
10,00	10	15,0	40	76	4	F4AJ1000AWM50L150	●
12,00	12	18,0	45	76	4	F4AJ1200AWL50L180	●
16,00	16	24,0	48	89	4	F4AJ1600AWL50L240	●
20,00	20	30,0	50	104	4	F4AJ2000AWL50L300	●
25,00	25	38,0	56	121	5	F5AJ2500AWX50L380	●

For application data, see page 73.

Ordering Example:
F4AJ0600AWS50L090 KC633M

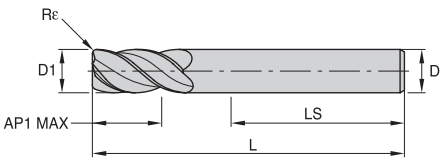
Features

- Factory standard.
- Plain shank.
- Corner radius - center cutting.

Operations

- Side cutting.
- For die & mold applications.







4 & 5-flute, 50° Helix

● first choice
○ alternate choice

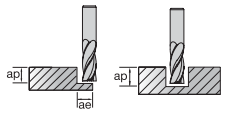
H	●
S	
N	
K	○
M	
P	●

D1	D	Ap1 max	LS	L	Rε	Z U	catalog number	KC633M
6,00	6	9,0	36	50	0,25	4	F4AJ0600AWS50R025	●
6,00	6	9,0	36	50	0,50	4	F4AJ0600AWS50R050	●
8,00	8	12,0	36	63	0,50	4	F4AJ0800AWM50R050	●
8,00	8	12,0	36	63	1,00	4	F4AJ0800AWM50R100	●
10,00	10	15,0	40	76	0,50	4	F4AJ1000AWL50R050	●
10,00	10	15,0	40	76	1,00	4	F4AJ1000AWL50R100	●
12,00	12	18,0	45	76	0,50	4	F4AJ1200AWL50R050	●
12,00	12	18,0	45	76	1,50	4	F4AJ1200AWL50R150	●
16,00	16	24,0	48	89	0,50	4	F4AJ1600AWL50R050	●
16,00	16	24,0	48	89	1,50	4	F4AJ1600AWL50R150	●
20,00	20	30,0	50	104	0,50	4	F4AJ2000AWX50R050	●
20,00	20	30,0	50	104	2,00	4	F4AJ2000AWX50R200	●
25,00	25	38,0	56	121	0,50	5	F5AJ2500AWX50R050	●
25,00	25	38,0	56	121	3,00	5	F5AJ2500AWX50R300	●

For application data, see page 73.

Ordering Example:
F4AJ0600AWS50R025 KC633M

F2AH...AWS30L...



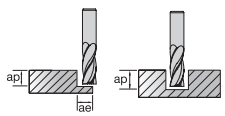
Reduce speed by 20% for slotting applications



	Application			Vc KC637M	Recommended fz- Feed Per Tooth (mm/th) for side cutting operations. For slotting operations, reduce fz by 20%. D1 - Diameter (mm)								
	Side Milling		Slotting										
Group	ap	ae	ap	m/min	0,3	0,4	0,5	0,6	0,8	1	1,5	2	2,5
P2	0.2XD	0.5XD~D	0.1XD	50~90	0,003	0,004	0,005	0,005	0,007	0,008	0,013	0,018	0,023
P3	0.2XD	0.5XD~D	0.1XD	40~80	0,003	0,004	0,005	0,005	0,007	0,008	0,013	0,018	0,023
P4	0.2XD	0.5XD~D	0.1XD	40~70	0,002	0,003	0,004	0,005	0,006	0,007	0,012	0,015	0,020
P5	0.2XD	0.5XD~D	0.1XD	40~70	0,002	0,003	0,004	0,005	0,006	0,007	0,012	0,015	0,020
P6	0.2XD	0.5XD~D	0.1XD	40~70	0,002	0,003	0,004	0,005	0,006	0,007	0,012	0,015	0,020
K1	0.2XD	0.5XD~D	0.1XD	40~80	0,003	0,004	0,005	0,005	0,007	0,008	0,013	0,018	0,023
K2	0.2XD	0.5XD~D	0.1XD	30~70	0,003	0,004	0,005	0,005	0,007	0,008	0,013	0,018	0,023
H1	0.2XD	0.5XD~D	0.02XD	40~70	0,002	0,003	0,004	0,005	0,006	0,007	0,012	0,015	0,020
H2	0.2XD	0.5XD~D	0.02XD	30~50	0,0014	0,0019	0,0025	0,0029	0,035	0,045	0,007	0,009	0,01
H3	0.2XD	0.5XD~D	0.01XD	15~30	0,0011	0,0014	0,0017	0,0019	0,0025	0,003	0,005	0,0068	0,0082

These guidelines may require possible variations to achieve optimum results.

F2AH...AWS30...

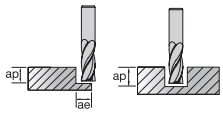


Reduce speed by 20% for slotting applications



	Application			Vc K600	Vc KC625M	Recommended fz- Feed Per Tooth (mm/th) for side cutting operations. For slotting operations, reduce fz by 20%. D1 - Diameter (mm)										
	Side Milling		Slotting													
Group	ap	ae	ap	m/min	m/min	0,3	0,5	0,6	0,8	1,0	1,2	1,5	1,8	2,0	2,5	3,0
P2	0.2XD	0.5XD~D	0.2XD	50	70	0,003	0,005	0,060	0,070	0,015	0,016	0,017	0,020	0,025	0,027	0,030
P3	0.2XD	0.5XD~D	0.2XD	40	65	0,003	0,005	0,060	0,070	0,015	0,016	0,017	0,020	0,025	0,027	0,030
P4	0.2XD	0.5XD~D	0.2XD	25	35	0,003	0,005	0,060	0,070	0,015	0,016	0,017	0,020	0,025	0,027	0,030
P5	0.2XD	0.5XD~D	0.2XD	30	45	0,002	0,003	0,005	0,007	0,010	0,012	0,015	0,018	0,020	0,023	0,025
P6	0.2XD	0.5XD~D	0.2XD	30	45	0,002	0,003	0,005	0,007	0,010	0,012	0,015	0,018	0,020	0,023	0,025
M1	0.2XD	0.5XD~D	0.2XD	40	65	0,002	0,003	0,005	0,007	0,010	0,012	0,015	0,018	0,020	0,023	0,025
M2	0.2XD	0.5XD~D	0.2XD	30	45	0,002	0,003	0,005	0,007	0,010	0,012	0,015	0,018	0,020	0,023	0,025
K1	0.2XD	0.5XD~D	0.2XD	60	90	0,003	0,005	0,060	0,070	0,015	0,016	0,017	0,020	0,025	0,027	0,030
K2	0.2XD	0.5XD~D	0.2XD	55	80	0,003	0,005	0,060	0,070	0,015	0,016	0,017	0,020	0,025	0,027	0,030
S1	0.2XD	0.5XD~D	0.2XD	40	65	0,002	0,003	0,005	0,007	0,010	0,012	0,015	0,018	0,020	0,023	0,025
S2	0.2XD	0.5XD~D	0.2XD	35	55	0,002	0,003	0,005	0,007	0,010	0,012	0,015	0,018	0,020	0,023	0,025
S3	0.2XD	0.5XD~D	0.2XD	25	40	0,002	0,003	0,005	0,007	0,010	0,012	0,015	0,018	0,020	0,023	0,025
S4	0.2XD	0.5XD~D	0.2XD	30	45	0,002	0,003	0,005	0,007	0,010	0,012	0,015	0,018	0,020	0,023	0,025
H1	0.2XD	0.5XD~D	0.2XD	25	35	0,003	0,005	0,060	0,070	0,015	0,016	0,017	0,020	0,025	0,027	0,030
H2	0.2XD	0.5XD~D	0.2XD	25	35	0,002	0,003	0,005	0,007	0,010	0,012	0,015	0,018	0,020	0,023	0,025
H3	0.2XD	0.5XD~D	0.2XD	20	25	0,003	0,005	0,060	0,070	0,015	0,016	0,017	0,020	0,025	0,027	0,030

F3AH...AWS30...

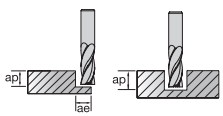


Reduce speed by 20% for slotting applications



	Application			Vc K600	Vc KC635M	Recommended fz- Feed Per Tooth (mm/th) for side cutting operations. For slotting operations, reduce fz by 20%. D1 - Diameter (mm)										
	Side Milling		Slotting													
Group	ap	ae	ap	m/min	m/min	0,3	0,5	0,6	0,8	1,0	1,2	1,5	1,8	2,0	2,5	3,0
P2	0.2XD	0.5XD~D	0.2XD	50	80	0,003	0,005	0,060	0,070	0,015	0,016	0,017	0,020	0,025	0,027	0,030
P3	0.2XD	0.5XD~D	0.2XD	40	70	0,003	0,005	0,060	0,070	0,015	0,016	0,017	0,020	0,025	0,027	0,030
P4	0.2XD	0.5XD~D	0.2XD	25	40	0,003	0,005	0,060	0,070	0,015	0,016	0,017	0,020	0,025	0,027	0,030
P5	0.2XD	0.5XD~D	0.2XD	30	50	0,002	0,003	0,005	0,007	0,010	0,012	0,015	0,018	0,020	0,023	0,025
P6	0.2XD	0.5XD~D	0.2XD	30	50	0,002	0,003	0,005	0,007	0,010	0,012	0,015	0,018	0,020	0,023	0,025
M1	0.2XD	0.5XD~D	0.2XD	40	70	0,002	0,003	0,005	0,007	0,010	0,012	0,015	0,018	0,020	0,023	0,025
M2	0.2XD	0.5XD~D	0.2XD	30	50	0,002	0,003	0,005	0,007	0,010	0,012	0,015	0,018	0,020	0,023	0,025
K1	0.2XD	0.5XD~D	0.2XD	60	100	0,003	0,005	0,060	0,070	0,015	0,016	0,017	0,020	0,025	0,027	0,030
K2	0.2XD	0.5XD~D	0.2XD	55	90	0,003	0,005	0,060	0,070	0,015	0,016	0,017	0,020	0,025	0,027	0,030
S1	0.2XD	0.5XD~D	0.2XD	40	70	0,002	0,003	0,005	0,007	0,010	0,012	0,015	0,018	0,020	0,023	0,025
S2	0.2XD	0.5XD~D	0.2XD	35	60	0,002	0,003	0,005	0,007	0,010	0,012	0,015	0,018	0,020	0,023	0,025
S3	0.2XD	0.5XD~D	0.2XD	25	45	0,002	0,003	0,005	0,007	0,010	0,012	0,015	0,018	0,020	0,023	0,025
S4	0.2XD	0.5XD~D	0.2XD	30	50	0,002	0,003	0,005	0,007	0,010	0,012	0,015	0,018	0,020	0,023	0,025
H1	0.2XD	0.5XD~D	0.2XD	25	40	0,003	0,005	0,060	0,070	0,015	0,016	0,017	0,020	0,025	0,027	0,030
H2	0.2XD	0.5XD~D	0.2XD	25	40	0,002	0,003	0,005	0,007	0,010	0,012	0,015	0,018	0,020	0,023	0,025
H3	0.2XD	0.5XD~D	0.2XD	20	30	0,003	0,005	0,060	0,070	0,015	0,016	0,017	0,020	0,025	0,027	0,030

F2AH...A/BDK30

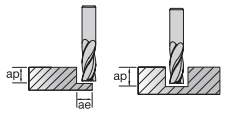


Reduce speed by 20% for slotting applications



	Application			Vc KC633M	Recommended fz- Feed Per Tooth (mm/th) for side cutting operations. For slotting operations, reduce fz by 20%. D1 - Diameter (mm)									
	Side Milling		Slotting											
Group	ap	ae	ap	m/min	2	4	6	8	10	12	14	16	18	20
P2	1XD	0.5XD	0.5XD	140	0,015	0,020	0,040	0,045	0,060	0,070	0,075	0,080	0,090	0,100
P3	1XD	0.5XD	0.5XD	120	0,015	0,020	0,040	0,045	0,060	0,070	0,075	0,080	0,090	0,100
P4	1XD	0.5XD	0.5XD	105	0,015	0,020	0,040	0,045	0,060	0,070	0,075	0,080	0,090	0,100
P5	1XD	0.5XD	0.5XD	80	0,010	0,020	0,030	0,035	0,050	0,057	0,065	0,070	0,075	0,085
P6	1XD	0.5XD	0.5XD	80	0,010	0,020	0,030	0,035	0,050	0,057	0,065	0,070	0,075	0,085
M1	1XD	0.5XD	0.5XD	100	0,010	0,020	0,030	0,035	0,050	0,057	0,065	0,070	0,075	0,085
M2	1XD	0.5XD	0.5XD	80	0,010	0,020	0,030	0,035	0,050	0,057	0,065	0,070	0,075	0,085
M3	1XD	0.5XD	0.5XD	75	0,010	0,020	0,030	0,035	0,050	0,057	0,065	0,070	0,075	0,085
K1	1XD	0.5XD	0.5XD	200	0,015	0,020	0,040	0,045	0,060	0,070	0,075	0,080	0,090	0,100
K2	1XD	0.5XD	0.5XD	180	0,015	0,020	0,040	0,045	0,060	0,070	0,075	0,080	0,090	0,100
N1	1XD	0.5XD	0.5XD	780	0,020	0,040	0,060	0,075	0,100	0,110	0,120	0,145	0,150	0,160
N2	1XD	0.5XD	0.5XD	720	0,020	0,040	0,060	0,075	0,100	0,110	0,120	0,145	0,150	0,160
S1	1XD	0.5XD	0.5XD	80	0,010	0,020	0,030	0,035	0,050	0,057	0,065	0,070	0,075	0,085
S2	1XD	0.5XD	0.5XD	75	0,010	0,020	0,030	0,035	0,050	0,057	0,065	0,070	0,075	0,085
S3	1XD	0.5XD	0.5XD	70	0,010	0,020	0,030	0,035	0,050	0,057	0,065	0,070	0,075	0,085
S4	1XD	0.5XD	0.5XD	75	0,010	0,020	0,030	0,035	0,050	0,057	0,065	0,070	0,075	0,085

F3AH...A/BDK30/45...

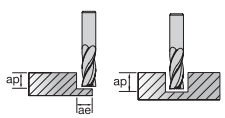


Reduce speed by 20% for slotting applications



	Application			Vc KC633M	Recommended fz- Feed Per Tooth (mm/th) for side cutting operations. For slotting operations, reduce fz by 20%. D1 - Diameter (mm)									
	Side Milling		Slotting											
Group	ap	ae	ap	m/min	2	4	6	8	10	12	14	16	18	20
P2	1XD	0.5XD	0.5XD	140	0,015	0,020	0,040	0,045	0,060	0,070	0,075	0,080	0,090	0,100
P3	1XD	0.5XD	0.5XD	120	0,015	0,020	0,040	0,045	0,060	0,070	0,075	0,080	0,090	0,100
P4	1XD	0.5XD	0.5XD	105	0,015	0,020	0,040	0,045	0,060	0,070	0,075	0,080	0,090	0,100
P5	1XD	0.5XD	0.5XD	80	0,010	0,020	0,030	0,035	0,050	0,057	0,065	0,070	0,075	0,085
P6	1XD	0.5XD	0.5XD	80	0,010	0,020	0,030	0,035	0,050	0,057	0,065	0,070	0,075	0,085
M1	1XD	0.5XD	0.5XD	100	0,010	0,020	0,030	0,035	0,050	0,057	0,065	0,070	0,075	0,085
M2	1XD	0.5XD	0.5XD	80	0,010	0,020	0,030	0,035	0,050	0,057	0,065	0,070	0,075	0,085
M3	1XD	0.5XD	0.5XD	75	0,010	0,020	0,030	0,035	0,050	0,057	0,065	0,070	0,075	0,085
K1	1XD	0.5XD	0.5XD	200	0,015	0,020	0,040	0,045	0,060	0,070	0,075	0,080	0,090	0,100
K2	1XD	0.5XD	0.5XD	180	0,015	0,020	0,040	0,045	0,060	0,070	0,075	0,080	0,090	0,100
N1	1XD	0.5XD	0.5XD	780	0,020	0,040	0,060	0,075	0,100	0,110	0,120	0,145	0,150	0,160
N2	1XD	0.5XD	0.5XD	720	0,020	0,040	0,060	0,075	0,100	0,110	0,120	0,145	0,150	0,160
S1	1XD	0.5XD	0.5XD	80	0,010	0,020	0,030	0,035	0,050	0,057	0,065	0,070	0,075	0,085
S2	1XD	0.5XD	0.5XD	75	0,010	0,020	0,030	0,035	0,050	0,057	0,065	0,070	0,075	0,085
S3	1XD	0.5XD	0.5XD	70	0,010	0,020	0,030	0,035	0,050	0,057	0,065	0,070	0,075	0,085
S4	1XD	0.5XD	0.5XD	75	0,010	0,020	0,030	0,035	0,050	0,057	0,065	0,070	0,075	0,085

F4AJ...A/BDK30...



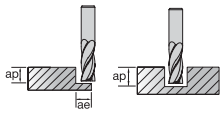
Reduce speed by 20% for slotting applications



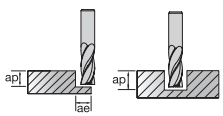
	Application			Vc KC633M	Recommended fz- Feed Per Tooth (mm/th) for side cutting operations. For slotting operations, reduce fz by 20%. D1 - Diameter (mm)									
	Side Milling		Slotting											
Group	ap	ae	ap	m/min	2	4	6	8	10	12	14	16	18	20
P2	1XD	0.5XD	0.5XD	140	0,015	0,020	0,040	0,045	0,060	0,070	0,075	0,080	0,090	0,100
P3	1XD	0.5XD	0.5XD	120	0,015	0,020	0,040	0,045	0,060	0,070	0,075	0,080	0,090	0,100
P4	1XD	0.5XD	0.5XD	105	0,015	0,020	0,040	0,045	0,060	0,070	0,075	0,080	0,090	0,100
P5	1XD	0.5XD	0.5XD	80	0,010	0,020	0,030	0,035	0,050	0,057	0,065	0,070	0,075	0,085
P6	1XD	0.5XD	0.5XD	80	0,010	0,020	0,030	0,035	0,050	0,057	0,065	0,070	0,075	0,085
M1	1XD	0.5XD	0.5XD	100	0,010	0,020	0,030	0,035	0,050	0,057	0,065	0,070	0,075	0,085
M2	1XD	0.5XD	0.5XD	80	0,010	0,020	0,030	0,035	0,050	0,057	0,065	0,070	0,075	0,085
M3	1XD	0.5XD	0.5XD	75	0,010	0,020	0,030	0,035	0,050	0,057	0,065	0,070	0,075	0,085
K1	1XD	0.5XD	0.5XD	200	0,015	0,020	0,040	0,045	0,060	0,070	0,075	0,080	0,090	0,100
K2	1XD	0.5XD	0.5XD	180	0,015	0,020	0,040	0,045	0,060	0,070	0,075	0,080	0,090	0,100
N1	1XD	0.5XD	0.5XD	780	0,020	0,040	0,060	0,075	0,100	0,110	0,120	0,145	0,150	0,160
N2	1XD	0.5XD	0.5XD	720	0,020	0,040	0,060	0,075	0,100	0,110	0,120	0,145	0,150	0,160
S1	1XD	0.5XD	0.5XD	80	0,010	0,020	0,030	0,035	0,050	0,057	0,065	0,070	0,075	0,085
S2	1XD	0.5XD	0.5XD	75	0,010	0,020	0,030	0,035	0,050	0,057	0,065	0,070	0,075	0,085
S3	1XD	0.5XD	0.5XD	70	0,010	0,020	0,030	0,035	0,050	0,057	0,065	0,070	0,075	0,085
S4	1XD	0.5XD	0.5XD	75	0,010	0,020	0,030	0,035	0,050	0,057	0,065	0,070	0,075	0,085

These guidelines may require possible variations to achieve optimum results.

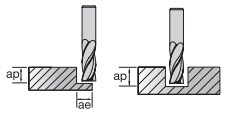
F3AR...BWS30...

				Reduce speed by 20% for slotting applications							
	Application			Vc KC625M	Recommended fz- Feed Per Tooth (mm/th) for side cutting operations. For slotting operations, reduce fz by 20%. D1 - Diameter (mm)						
	Side Milling		Slotting								
Group	ap	ae	ap	m/min	2	3	4	5	6	8	10
P2	1XD	0.5XD	0.5XD	135	0,015	0,020	0,040	0,045	0,060	0,070	0,075
P3	1XD	0.5XD	0.5XD	125	0,015	0,020	0,040	0,045	0,060	0,070	0,075
P4	1XD	0.5XD	0.5XD	95	0,015	0,020	0,040	0,045	0,060	0,070	0,075
P5	1XD	0.5XD	0.5XD	70	0,010	0,020	0,030	0,035	0,050	0,057	0,065
P6	1XD	0.5XD	0.5XD	70	0,010	0,020	0,030	0,035	0,050	0,057	0,065
M1	1XD	0.5XD	0.5XD	90	0,010	0,020	0,030	0,035	0,050	0,057	0,065
M2	1XD	0.5XD	0.5XD	70	0,010	0,020	0,030	0,035	0,050	0,057	0,065
M3	1XD	0.5XD	0.5XD	65	0,010	0,020	0,030	0,035	0,050	0,057	0,065
K1	1XD	0.5XD	0.5XD	160	0,015	0,020	0,040	0,045	0,060	0,070	0,075
K2	1XD	0.5XD	0.5XD	145	0,015	0,020	0,040	0,045	0,060	0,070	0,075
N1	1XD	0.5XD	0.5XD	700	0,020	0,040	0,060	0,075	0,100	0,110	0,120
N2	1XD	0.5XD	0.5XD	650	0,020	0,040	0,060	0,075	0,100	0,110	0,120
S1	1XD	0.5XD	0.5XD	70	0,010	0,020	0,030	0,035	0,050	0,057	0,065
S2	1XD	0.5XD	0.5XD	65	0,010	0,020	0,030	0,035	0,050	0,057	0,065
S3	1XD	0.5XD	0.5XD	65	0,010	0,020	0,030	0,035	0,050	0,057	0,065
S4	1XD	0.5XD	0.5XD	65	0,010	0,020	0,030	0,035	0,050	0,057	0,065

F2AU...A/BDK30...

				Reduce speed by 20% for slotting applications										
	Application			Vc KC635M	Recommended fz- Feed Per Tooth (mm/th) for side cutting operations. For slotting operations, reduce fz by 20%. D1 - Diameter (mm)									
	Side Milling		Slotting											
Group	ap	ae	ap	m/min	2	4	6	8	10	12	14	16	18	20
P2	1XD	0.5XD	0.5XD	140	0,015	0,020	0,040	0,045	0,060	0,070	0,075	0,080	0,090	0,100
P3	1XD	0.5XD	0.5XD	120	0,015	0,020	0,040	0,045	0,060	0,070	0,075	0,080	0,090	0,100
P4	1XD	0.5XD	0.5XD	105	0,015	0,020	0,040	0,045	0,060	0,070	0,075	0,080	0,090	0,100
P5	1XD	0.5XD	0.5XD	80	0,010	0,020	0,030	0,035	0,050	0,057	0,065	0,070	0,075	0,085
P6	1XD	0.5XD	0.5XD	80	0,010	0,020	0,030	0,035	0,050	0,057	0,065	0,070	0,075	0,085
M1	1XD	0.5XD	0.5XD	100	0,010	0,020	0,030	0,035	0,050	0,057	0,065	0,070	0,075	0,085
M2	1XD	0.5XD	0.5XD	80	0,010	0,020	0,030	0,035	0,050	0,057	0,065	0,070	0,075	0,085
M3	1XD	0.5XD	0.5XD	75	0,010	0,020	0,030	0,035	0,050	0,057	0,065	0,070	0,075	0,085
K1	1XD	0.5XD	0.5XD	200	0,015	0,020	0,040	0,045	0,060	0,070	0,075	0,080	0,090	0,100
K2	1XD	0.5XD	0.5XD	180	0,015	0,020	0,040	0,045	0,060	0,070	0,075	0,080	0,090	0,100
N1	1XD	0.5XD	0.5XD	780	0,020	0,040	0,060	0,075	0,100	0,110	0,120	0,145	0,150	0,160
N2	1XD	0.5XD	0.5XD	720	0,020	0,040	0,060	0,075	0,100	0,110	0,120	0,145	0,150	0,160
S1	1XD	0.5XD	0.5XD	80	0,010	0,020	0,030	0,035	0,050	0,057	0,065	0,070	0,075	0,085
S2	1XD	0.5XD	0.5XD	75	0,010	0,020	0,030	0,035	0,050	0,057	0,065	0,070	0,075	0,085
S3	1XD	0.5XD	0.5XD	70	0,010	0,020	0,030	0,035	0,050	0,057	0,065	0,070	0,075	0,085
S4	1XD	0.5XD	0.5XD	75	0,010	0,020	0,030	0,035	0,050	0,057	0,065	0,070	0,075	0,085

F3AU...A/BDK30...

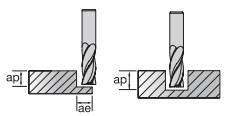


Reduce speed by 20% for slotting applications

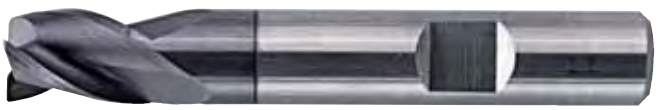


	Application			Vc KC635M	Recommended fz- Feed Per Tooth (mm/th) for side cutting operations. For slotting operations, reduce fz by 20%. D1 - Diameter (mm)									
	Side Milling		Slotting											
Group	ap	ae	ap	m/min	2	4	6	8	10	12	14	16	18	20
P2	1XD	0.5XD	0.5XD	140	0,015	0,020	0,040	0,045	0,060	0,070	0,075	0,080	0,090	0,100
P3	1XD	0.5XD	0.5XD	120	0,015	0,020	0,040	0,045	0,060	0,070	0,075	0,080	0,090	0,100
P4	1XD	0.5XD	0.5XD	105	0,015	0,020	0,040	0,045	0,060	0,070	0,075	0,080	0,090	0,100
P5	1XD	0.5XD	0.5XD	80	0,010	0,020	0,030	0,035	0,050	0,057	0,065	0,070	0,075	0,085
P6	1XD	0.5XD	0.5XD	80	0,010	0,020	0,030	0,035	0,050	0,057	0,065	0,070	0,075	0,085
M1	1XD	0.5XD	0.5XD	100	0,010	0,020	0,030	0,035	0,050	0,057	0,065	0,070	0,075	0,085
M2	1XD	0.5XD	0.5XD	80	0,010	0,020	0,030	0,035	0,050	0,057	0,065	0,070	0,075	0,085
M3	1XD	0.5XD	0.5XD	75	0,010	0,020	0,030	0,035	0,050	0,057	0,065	0,070	0,075	0,085
K1	1XD	0.5XD	0.5XD	200	0,015	0,020	0,040	0,045	0,060	0,070	0,075	0,080	0,090	0,100
K2	1XD	0.5XD	0.5XD	180	0,015	0,020	0,040	0,045	0,060	0,070	0,075	0,080	0,090	0,100
N1	1XD	0.5XD	0.5XD	780	0,020	0,040	0,060	0,075	0,100	0,110	0,120	0,145	0,150	0,160
N2	1XD	0.5XD	0.5XD	720	0,020	0,040	0,060	0,075	0,100	0,110	0,120	0,145	0,150	0,160
S1	1XD	0.5XD	0.5XD	80	0,010	0,020	0,030	0,035	0,050	0,057	0,065	0,070	0,075	0,085
S2	1XD	0.5XD	0.5XD	75	0,010	0,020	0,030	0,035	0,050	0,057	0,065	0,070	0,075	0,085
S3	1XD	0.5XD	0.5XD	70	0,010	0,020	0,030	0,035	0,050	0,057	0,065	0,070	0,075	0,085
S4	1XD	0.5XD	0.5XD	75	0,010	0,020	0,030	0,035	0,050	0,057	0,065	0,070	0,075	0,085

F3AS...BDK35...

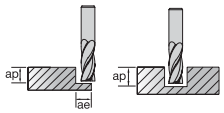


Reduce speed by 20% for slotting applications



	Application			Vc KC633M	Recommended fz- Feed Per Tooth (mm/th) for side cutting operations. For slotting operations, reduce fz by 20%. D1 - Diameter (mm)									
	Side Milling		Slotting											
Group	ap	ae	ap	m/min	3	4	5	6	8	10	12	16	18	20
P2	1XD	0.5XD	0.5XD	150~170	0,018	0,023	0,027	0,036	0,054	0,054	0,063	0,068	0,072	0,081
P3	1XD	0.5XD	0.5XD	130~150	0,018	0,023	0,027	0,036	0,054	0,054	0,063	0,068	0,072	0,081
M1	1XD	0.5XD	0.5XD	100~115	0,020	0,022	0,025	0,030	0,035	0,045	0,055	0,070	0,080	0,090
M2	1XD	0.3XD	0.5XD	80~90	0,015	0,018	0,020	0,025	0,030	0,040	0,050	0,065	0,075	0,080
M3	1XD	0.5XD	0.5XD	70~80	0,015	0,018	0,020	0,025	0,030	0,040	0,050	0,065	0,075	0,080
S4	1XD	0.5XD	1XD	50~60	0,009	0,011	0,014	0,018	0,027	0,027	0,036	0,041	0,045	0,054

F2AT...AWL/M/X20R...



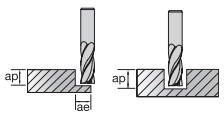
Reduce speed by 20% for slotting applications



	Application		Vc KC637M	Recommended fz- Feed Per Tooth (mm/th) for side cutting operations. For slotting operations, reduce fz by 20%. D1 - Diameter (mm)							
	3D Milling										
Group	ap	ae	m/min	2	3	4	5	6	8	10	12
P4	0.05XD	0.05XD	210	0,030	0,030	0,050	0,050	0,080	0,120	0,120	0,150
P5	0.05XD	0.05XD	200	0,030	0,030	0,050	0,050	0,080	0,120	0,120	0,150
P6	0.05XD	0.05XD	195	0,030	0,030	0,050	0,050	0,080	0,120	0,120	0,150
K1	0.05XD	0.05XD	410	0,050	0,050	0,080	0,080	0,120	0,180	0,180	0,220
K2	0.05XD	0.05XD	400	0,050	0,050	0,080	0,080	0,120	0,180	0,180	0,220
H1	0.05XD	0.05XD	210	0,030	0,030	0,050	0,050	0,080	0,120	0,120	0,150
H2	0.05XD	0.05XD	190	0,030	0,030	0,050	0,050	0,080	0,120	0,120	0,150
H3	0.05XD	0.05XD	150	0,030	0,030	0,050	0,050	0,080	0,120	0,120	0,150
H4	0.05XD	0.05XD	100	0,030	0,030	0,050	0,050	0,080	0,120	0,120	0,150

These guidelines may require possible variations to achieve optimum results.

F2AT...AWL/MX00R...

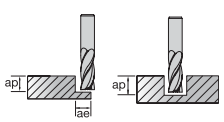


Reduce speed by 20% for slotting applications



	Application		Vc KC637M	Recommended fz- Feed Per Tooth (mm/th) for side cutting operations. For slotting operations, reduce fz by 20%. D1 - Diameter (mm)					
	3D Milling								
Group	ap	ae	m/min	3	4	5	6	8	10
P4	0.05XD	0.05XD	210	0,030	0,050	0,050	0,080	0,120	0,120
P5	0.05XD	0.05XD	200	0,030	0,050	0,050	0,080	0,120	0,120
P6	0.05XD	0.05XD	195	0,030	0,050	0,050	0,080	0,120	0,120
K1	0.05XD	0.05XD	410	0,050	0,080	0,080	0,120	0,180	0,180
K2	0.05XD	0.05XD	400	0,050	0,080	0,080	0,120	0,180	0,180
H1	0.05XD	0.05XD	210	0,030	0,050	0,050	0,080	0,120	0,120
H2	0.05XD	0.05XD	190	0,030	0,050	0,050	0,080	0,120	0,120
H3	0.05XD	0.05XD	150	0,030	0,050	0,050	0,080	0,120	0,120
H4	0.05XD	0.05XD	100	0,030	0,050	0,050	0,080	0,120	0,120

F4AT...AWS/M/L/X20/30R...

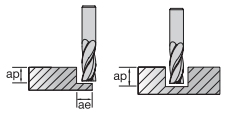


Reduce speed by 20% for slotting applications



	Application		Vc KC637M	Recommended fz- Feed Per Tooth (mm/th) for side cutting operations. For slotting operations, reduce fz by 20%. D1 - Diameter (mm)					
	3D Milling								
Group	ap	ae	m/min	4	5	6	8	10	12
P4	0.05XD	0.05XD	210	0,050	0,050	0,080	0,120	0,120	0,150
P5	0.05XD	0.05XD	200	0,050	0,050	0,080	0,120	0,120	0,150
P6	0.05XD	0.05XD	195	0,050	0,050	0,080	0,120	0,120	0,150
K1	0.05XD	0.05XD	410	0,080	0,080	0,120	0,180	0,180	0,220
K2	0.05XD	0.05XD	400	0,080	0,080	0,120	0,180	0,180	0,220
H1	0.05XD	0.05XD	210	0,050	0,050	0,080	0,120	0,120	0,150
H2	0.05XD	0.05XD	190	0,050	0,050	0,080	0,120	0,120	0,150
H3	0.05XD	0.05XD	150	0,050	0,050	0,080	0,120	0,120	0,150
H4	0.05XD	0.05XD	100	0,050	0,050	0,080	0,120	0,120	0,150

F2/3AH...ADN30...

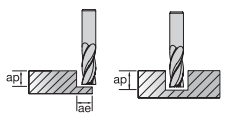


Reduce speed by 20% for slotting applications



	Application			Vc KC625M	Vc KC633M	Recommended fz- Feed Per Tooth (mm/th) for side cutting operations. For slotting operations, reduce fz by 20%. D1 - Diameter (mm)									
	Side Milling		Slotting												
Group	ap	ae	ap	m/min	m/min	2	4	6	8	10	12	14	16	18	20
P2	1XD	0.5XD	0.5XD	110	120	0,010	0,020	0,040	0,045	0,060	0,070	0,075	0,080	0,090	0,100
P3	1XD	0.5XD	0.5XD	95	105	0,010	0,020	0,040	0,045	0,060	0,070	0,075	0,080	0,090	0,100
P4	1XD	0.5XD	0.5XD	80	90	0,010	0,020	0,040	0,045	0,060	0,070	0,075	0,080	0,090	0,100
P5	1XD	0.5XD	0.5XD	65	70	0,005	0,020	0,030	0,035	0,050	0,057	0,065	0,070	0,075	0,085
P6	1XD	0.5XD	0.5XD	65	70	0,005	0,020	0,030	0,035	0,050	0,057	0,065	0,070	0,075	0,085
M1	1XD	0.5XD	0.5XD	75	85	0,005	0,020	0,030	0,035	0,050	0,057	0,065	0,070	0,075	0,085
M2	1XD	0.5XD	0.5XD	65	70	0,005	0,020	0,030	0,035	0,050	0,057	0,065	0,070	0,075	0,085
M3	1XD	0.5XD	0.5XD	60	65	0,005	0,020	0,030	0,035	0,050	0,057	0,065	0,070	0,075	0,085
K1	1XD	0.5XD	0.5XD	160	180	0,010	0,020	0,040	0,045	0,060	0,070	0,075	0,080	0,090	0,100
K2	1XD	0.5XD	0.5XD	145	160	0,010	0,020	0,040	0,045	0,060	0,070	0,075	0,080	0,090	0,100
N1	1XD	0.5XD	0.5XD	610	680	0,020	0,040	0,060	0,075	0,100	0,110	0,120	0,145	0,150	0,160
N2	1XD	0.5XD	0.5XD	560	620	0,020	0,040	0,060	0,075	0,100	0,110	0,120	0,145	0,150	0,160
S1	1XD	0.5XD	0.5XD	70	80	0,005	0,020	0,030	0,035	0,050	0,057	0,065	0,070	0,075	0,085
S2	1XD	0.5XD	0.5XD	65	70	0,005	0,020	0,030	0,035	0,050	0,057	0,065	0,070	0,075	0,085
S3	1XD	0.5XD	0.5XD	55	60	0,005	0,020	0,030	0,035	0,050	0,057	0,065	0,070	0,075	0,085
S4	1XD	0.5XD	0.5XD	70	80	0,005	0,020	0,030	0,035	0,050	0,057	0,065	0,070	0,075	0,085

F4AJ...ADN30...

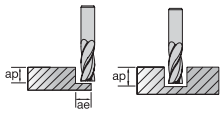


Reduce speed by 20% for slotting applications

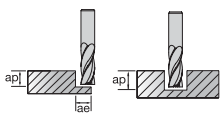


	Application			Vc KC625M	Vc KC633M	Recommended fz- Feed Per Tooth (mm/th) for side cutting operations. For slotting operations, reduce fz by 20%. D1 - Diameter (mm)									
	Side Milling		Slotting												
Group	ap	ae	ap	m/min	m/min	2	4	6	8	10	12	14	16	18	20
P2	1XD	0.5XD	0.5XD	110	120	0,010	0,020	0,040	0,045	0,060	0,070	0,075	0,080	0,090	0,100
P3	1XD	0.5XD	0.5XD	95	105	0,010	0,020	0,040	0,045	0,060	0,070	0,075	0,080	0,090	0,100
P4	1XD	0.5XD	0.5XD	80	90	0,010	0,020	0,040	0,045	0,060	0,070	0,075	0,080	0,090	0,100
P5	1XD	0.5XD	0.5XD	65	70	0,005	0,020	0,030	0,035	0,050	0,057	0,065	0,070	0,075	0,085
P6	1XD	0.5XD	0.5XD	65	70	0,005	0,020	0,030	0,035	0,050	0,057	0,065	0,070	0,075	0,085
M1	1XD	0.5XD	0.5XD	75	85	0,005	0,020	0,030	0,035	0,050	0,057	0,065	0,070	0,075	0,085
M2	1XD	0.5XD	0.5XD	65	70	0,005	0,020	0,030	0,035	0,050	0,057	0,065	0,070	0,075	0,085
M3	1XD	0.5XD	0.5XD	60	65	0,005	0,020	0,030	0,035	0,050	0,057	0,065	0,070	0,075	0,085
K1	1XD	0.5XD	0.5XD	160	180	0,010	0,020	0,040	0,045	0,060	0,070	0,075	0,080	0,090	0,100
K2	1XD	0.5XD	0.5XD	145	160	0,010	0,020	0,040	0,045	0,060	0,070	0,075	0,080	0,090	0,100
N1	1XD	0.5XD	0.5XD	610	680	0,020	0,040	0,060	0,075	0,100	0,110	0,120	0,145	0,150	0,160
N2	1XD	0.5XD	0.5XD	560	620	0,020	0,040	0,060	0,075	0,100	0,110	0,120	0,145	0,150	0,160
S1	1XD	0.5XD	0.5XD	70	80	0,005	0,020	0,030	0,035	0,050	0,057	0,065	0,070	0,075	0,085
S2	1XD	0.5XD	0.5XD	65	70	0,005	0,020	0,030	0,035	0,050	0,057	0,065	0,070	0,075	0,085
S3	1XD	0.5XD	0.5XD	55	60	0,005	0,020	0,030	0,035	0,050	0,057	0,065	0,070	0,075	0,085
S4	1XD	0.5XD	0.5XD	70	80	0,005	0,020	0,030	0,035	0,050	0,057	0,065	0,070	0,075	0,085

F2AH...A/BDL30...

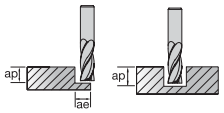
				Reduce speed by 20% for slotting applications										
	Application			Vc KC633M	Recommended fz- Feed Per Tooth (mm/th) for side cutting operations. For slotting operations, reduce fz by 20%.									
	Side Milling		Slotting		D1 - Diameter (mm)									
Group	ap	ae	ap	m/min	3	4	6	8	10	12	14	16	18	20
P2	1XD	0.5XD	0.5XD	120	0,010	0,020	0,040	0,045	0,060	0,070	0,075	0,080	0,090	0,100
P3	1XD	0.5XD	0.5XD	105	0,010	0,020	0,040	0,045	0,060	0,070	0,075	0,080	0,090	0,100
P4	1XD	0.5XD	0.5XD	90	0,010	0,020	0,040	0,045	0,060	0,070	0,075	0,080	0,090	0,100
P5	1XD	0.5XD	0.5XD	70	0,005	0,020	0,030	0,035	0,050	0,057	0,065	0,070	0,075	0,085
P6	1XD	0.5XD	0.5XD	70	0,005	0,020	0,030	0,035	0,050	0,057	0,065	0,070	0,075	0,085
M1	1XD	0.5XD	0.5XD	85	0,005	0,020	0,030	0,035	0,050	0,057	0,065	0,070	0,075	0,085
M2	1XD	0.5XD	0.5XD	70	0,005	0,020	0,030	0,035	0,050	0,057	0,065	0,070	0,075	0,085
M3	1XD	0.5XD	0.5XD	65	0,005	0,020	0,030	0,035	0,050	0,057	0,065	0,070	0,075	0,085
K1	1XD	0.5XD	0.5XD	180	0,010	0,020	0,040	0,045	0,060	0,070	0,075	0,080	0,090	0,100
K2	1XD	0.5XD	0.5XD	160	0,010	0,020	0,040	0,045	0,060	0,070	0,075	0,080	0,090	0,100
N1	1XD	0.5XD	0.5XD	680	0,020	0,040	0,060	0,075	0,100	0,110	0,120	0,145	0,150	0,160
N2	1XD	0.5XD	0.5XD	620	0,020	0,040	0,060	0,075	0,100	0,110	0,120	0,145	0,150	0,160
S1	1XD	0.5XD	0.5XD	80	0,005	0,020	0,030	0,035	0,050	0,057	0,065	0,070	0,075	0,085
S2	1XD	0.5XD	0.5XD	70	0,005	0,020	0,030	0,035	0,050	0,057	0,065	0,070	0,075	0,085
S3	1XD	0.5XD	0.5XD	60	0,005	0,020	0,030	0,035	0,050	0,057	0,065	0,070	0,075	0,085
S4	1XD	0.5XD	0.5XD	80	0,005	0,020	0,030	0,035	0,050	0,057	0,065	0,070	0,075	0,085

F3AH...A/BDL30

				Reduce speed by 20% for slotting applications											
	Application			Vc KC625M	Vc KC633M	Recommended fz- Feed Per Tooth (mm/th) for side cutting operations. For slotting operations, reduce fz by 20%.									
	Side Milling		Slotting			D1 - Diameter (mm)									
Group	ap	ae	ap	m/min	m/min	3	4	6	8	10	12	14	16	18	20
P2	1XD	0.5XD	0.5XD	110	120	0,010	0,020	0,040	0,045	0,060	0,070	0,075	0,080	0,090	0,100
P3	1XD	0.5XD	0.5XD	95	105	0,010	0,020	0,040	0,045	0,060	0,070	0,075	0,080	0,090	0,100
P4	1XD	0.5XD	0.5XD	80	90	0,010	0,020	0,040	0,045	0,060	0,070	0,075	0,080	0,090	0,100
P5	1XD	0.5XD	0.5XD	65	70	0,005	0,020	0,030	0,035	0,050	0,057	0,065	0,070	0,075	0,085
P6	1XD	0.5XD	0.5XD	65	70	0,005	0,020	0,030	0,035	0,050	0,057	0,065	0,070	0,075	0,085
M1	1XD	0.5XD	0.5XD	75	85	0,005	0,020	0,030	0,035	0,050	0,057	0,065	0,070	0,075	0,085
M2	1XD	0.5XD	0.5XD	65	70	0,005	0,020	0,030	0,035	0,050	0,057	0,065	0,070	0,075	0,085
M3	1XD	0.5XD	0.5XD	60	65	0,005	0,020	0,030	0,035	0,050	0,057	0,065	0,070	0,075	0,085
K1	1XD	0.5XD	0.5XD	160	180	0,010	0,020	0,040	0,045	0,060	0,070	0,075	0,080	0,090	0,100
K2	1XD	0.5XD	0.5XD	145	160	0,010	0,020	0,040	0,045	0,060	0,070	0,075	0,080	0,090	0,100
N1	1XD	0.5XD	0.5XD	610	680	0,020	0,040	0,060	0,075	0,100	0,110	0,120	0,145	0,150	0,160
N2	1XD	0.5XD	0.5XD	560	620	0,020	0,040	0,060	0,075	0,100	0,110	0,120	0,145	0,150	0,160
S1	1XD	0.5XD	0.5XD	70	80	0,005	0,020	0,030	0,035	0,050	0,057	0,065	0,070	0,075	0,085
S2	1XD	0.5XD	0.5XD	65	70	0,005	0,020	0,030	0,035	0,050	0,057	0,065	0,070	0,075	0,085
S3	1XD	0.5XD	0.5XD	55	60	0,005	0,020	0,030	0,035	0,050	0,057	0,065	0,070	0,075	0,085
S4	1XD	0.5XD	0.5XD	70	80	0,005	0,020	0,030	0,035	0,050	0,057	0,065	0,070	0,075	0,085

These guidelines may require possible variations to achieve optimum results.

F3AJ...ADL60...

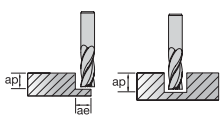


Reduce speed by 20% for slotting applications



	Application		Vc KC625M	Recommended fz- Feed Per Tooth (mm/th) for side cutting operations. For slotting operations, reduce fz by 20%. D1 - Diameter (mm)							
	Side Milling										
Group	ap	ae	m/min	6	8	10	12	14	16	18	20
P2	1XD	0.5XD	180	0,027	0,033	0,051	0,068	0,086	0,104	0,119	0,135
P3	1XD	0.5XD	160	0,027	0,033	0,051	0,068	0,086	0,104	0,119	0,135
P4	1XD	0.5XD	135	0,023	0,028	0,043	0,056	0,071	0,086	0,099	0,113
P5	1XD	0.5XD	45~55	0,008	0,009	0,011	0,013	0,018	0,020	0,023	0,028
P6	1XD	0.5XD	45~55	0,008	0,009	0,011	0,013	0,018	0,020	0,023	0,028
M1	1XD	0.5XD	55~70	0,011	0,013	0,014	0,017	0,024	0,026	0,031	0,038
M2	1XD	0.5XD	45~55	0,008	0,009	0,011	0,013	0,018	0,020	0,023	0,028
M3	1XD	0.5XD	45~55	0,008	0,009	0,011	0,013	0,018	0,020	0,023	0,028
K1	1XD	0.5XD	180	0,030	0,037	0,056	0,074	0,094	0,114	0,131	0,149
K2	1XD	0.5XD	145	0,030	0,037	0,056	0,074	0,094	0,114	0,131	0,149
N1	1XD	0.5XD	225	0,037	0,046	0,071	0,093	0,118	0,142	0,163	0,186
N2	1XD	0.5XD	160	0,027	0,033	0,051	0,068	0,086	0,104	0,119	0,135
S1	1XD	0.5XD	55~70	0,011	0,013	0,014	0,017	0,024	0,026	0,031	0,038
S2	1XD	0.5XD	45~55	0,008	0,009	0,011	0,013	0,018	0,020	0,023	0,028
S3	1XD	0.5XD	35~45	0,007	0,009	0,010	0,012	0,017	0,018	0,021	0,026
S4	1XD	0.5XD	45~55	0,008	0,009	0,011	0,013	0,018	0,020	0,023	0,028
H1	1XD	0.1XD	135	0,023	0,028	0,043	0,056	0,071	0,086	0,099	0,113
H2	1XD	0.1XD	95	0,014	0,016	0,018	0,022	0,030	0,033	0,039	0,047
H3	1XD	0.1XD	80	0,014	0,016	0,018	0,022	0,030	0,033	0,039	0,047
H3	1XD	0.1XD	60	0,014	0,016	0,018	0,022	0,030	0,033	0,039	0,047

F4AJ...A/BDL30...

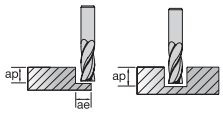


Reduce speed by 20% for slotting applications



	Application		Vc KC633M	Recommended fz- Feed Per Tooth (mm/th) for side cutting operations. For slotting operations, reduce fz by 20%. D1 - Diameter (mm)								
	Side Milling											
Group	ap	ae	m/min	4	6	8	10	12	14	16	18	20
P2	1XD	0.5XD	120	0,020	0,040	0,045	0,060	0,070	0,075	0,080	0,090	0,100
P3	1XD	0.5XD	105	0,020	0,040	0,045	0,060	0,070	0,075	0,080	0,090	0,100
P4	1XD	0.5XD	90	0,020	0,040	0,045	0,060	0,070	0,075	0,080	0,090	0,100
P5	1XD	0.5XD	70	0,020	0,030	0,035	0,050	0,057	0,065	0,070	0,075	0,085
P6	1XD	0.5XD	70	0,020	0,030	0,035	0,050	0,057	0,065	0,070	0,075	0,085
M1	1XD	0.5XD	85	0,020	0,030	0,035	0,050	0,057	0,065	0,070	0,075	0,085
M2	1XD	0.5XD	70	0,020	0,030	0,035	0,050	0,057	0,065	0,070	0,075	0,085
M3	1XD	0.5XD	65	0,020	0,030	0,035	0,050	0,057	0,065	0,070	0,075	0,085
K1	1XD	0.5XD	180	0,020	0,040	0,045	0,060	0,070	0,075	0,080	0,090	0,100
K2	1XD	0.5XD	160	0,020	0,040	0,045	0,060	0,070	0,075	0,080	0,090	0,100
N1	1XD	0.5XD	680	0,040	0,060	0,075	0,100	0,110	0,120	0,145	0,150	0,160
N2	1XD	0.5XD	620	0,040	0,060	0,075	0,100	0,110	0,120	0,145	0,150	0,160
S1	1XD	0.5XD	80	0,020	0,030	0,035	0,050	0,057	0,065	0,070	0,075	0,085
S2	1XD	0.5XD	70	0,020	0,030	0,035	0,050	0,057	0,065	0,070	0,075	0,085
S3	1XD	0.5XD	60	0,020	0,030	0,035	0,050	0,057	0,065	0,070	0,075	0,085
S4	1XD	0.5XD	80	0,020	0,030	0,035	0,050	0,057	0,065	0,070	0,075	0,085

F2AH...AWM/L/X30...

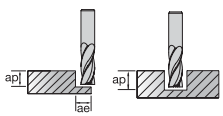


Reduce speed by 20% for slotting applications



	Application			Vc K600	Vc KC625M	Recommended fz- Feed Per Tooth (mm/th) for side cutting operations. For slotting operations, reduce fz by 20%. D1 - Diameter (mm)									
	Side Milling		Slotting												
Group	ap	ae	ap	m/min	m/min	2	4	6	8	10	12	14	16	18	20
P2	1XD	0.5XD	0.5XD	65	100	0,01	0,02	0,04	0,045	0,06	0,07	0,075	0,08	0,09	0,1
P3	1XD	0.5XD	0.5XD	55	80	0,01	0,02	0,04	0,045	0,06	0,07	0,075	0,08	0,09	0,1
P4	1XD	0.5XD	0.5XD	40	65	0,01	0,02	0,04	0,045	0,06	0,07	0,075	0,08	0,09	0,1
P5	1XD	0.5XD	0.5XD	40	65	0,005	0,02	0,03	0,035	0,05	0,057	0,065	0,07	0,075	0,085
P6	1XD	0.5XD	0.5XD	40	65	0,005	0,02	0,03	0,035	0,05	0,057	0,065	0,07	0,075	0,085
M1	1XD	0.5XD	0.5XD	50	75	0,005	0,02	0,03	0,035	0,05	0,057	0,065	0,07	0,075	0,085
M2	1XD	0.5XD	0.5XD	40	65	0,005	0,02	0,03	0,035	0,05	0,057	0,065	0,07	0,075	0,085
M3	1XD	0.5XD	0.5XD	40	60	0,005	0,02	0,03	0,035	0,05	0,057	0,065	0,07	0,075	0,085
K1	1XD	0.5XD	0.5XD	95	140	0,01	0,02	0,04	0,045	0,06	0,07	0,075	0,08	0,09	0,1
K2	1XD	0.5XD	0.5XD	90	130	0,01	0,02	0,04	0,045	0,06	0,07	0,075	0,08	0,09	0,1
N1	1XD	0.5XD	0.5XD	350	520	0,02	0,04	0,06	0,075	0,1	0,11	0,12	0,145	0,15	0,16
N2	1XD	0.5XD	0.5XD	320	475	0,02	0,04	0,06	0,075	0,1	0,11	0,12	0,145	0,15	0,16
S1	1XD	0.5XD	0.5XD	40	65	0,005	0,02	0,03	0,035	0,05	0,057	0,065	0,07	0,075	0,085
S2	1XD	0.5XD	0.5XD	35	55	0,005	0,02	0,03	0,035	0,05	0,057	0,065	0,07	0,075	0,085
S3	1XD	0.5XD	0.5XD	30	45	0,005	0,02	0,03	0,035	0,05	0,057	0,065	0,07	0,075	0,085
S4	1XD	0.5XD	0.5XD	35	50	0,005	0,02	0,03	0,035	0,05	0,057	0,065	0,07	0,075	0,085

F4AJ...AWM/L/X30...

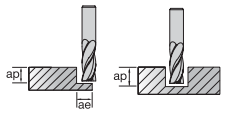


Reduce speed by 20% for slotting applications



	Application			Vc K600	Vc K625M	Recommended fz- Feed Per Tooth (mm/th) for side cutting operations. For slotting operations, reduce fz by 20%. D1 - Diameter (mm)									
	Side Milling		Slotting												
Group	ap	ae	ap	m/min	m/min	2	4	6	8	10	12	14	16	18	20
P2	1XD	0.5XD	0.5XD	65	100	0,01	0,02	0,04	0,045	0,06	0,07	0,075	0,08	0,09	0,1
P3	1XD	0.5XD	0.5XD	55	80	0,01	0,02	0,04	0,045	0,06	0,07	0,075	0,08	0,09	0,1
P4	1XD	0.5XD	0.5XD	40	65	0,01	0,02	0,04	0,045	0,06	0,07	0,075	0,08	0,09	0,1
P5	1XD	0.5XD	0.5XD	40	65	0,005	0,02	0,03	0,035	0,05	0,057	0,065	0,07	0,075	0,085
P6	1XD	0.5XD	0.5XD	40	65	0,005	0,02	0,03	0,035	0,05	0,057	0,065	0,07	0,075	0,085
M1	1XD	0.5XD	0.5XD	50	75	0,005	0,02	0,03	0,035	0,05	0,057	0,065	0,07	0,075	0,085
M2	1XD	0.5XD	0.5XD	40	65	0,005	0,02	0,03	0,035	0,05	0,057	0,065	0,07	0,075	0,085
M3	1XD	0.5XD	0.5XD	40	60	0,005	0,02	0,03	0,035	0,05	0,057	0,065	0,07	0,075	0,085
K1	1XD	0.5XD	0.5XD	95	140	0,01	0,02	0,04	0,045	0,06	0,07	0,075	0,08	0,09	0,1
K2	1XD	0.5XD	0.5XD	90	130	0,01	0,02	0,04	0,045	0,06	0,07	0,075	0,08	0,09	0,1
N1	1XD	0.5XD	0.5XD	350	520	0,02	0,04	0,06	0,075	0,1	0,11	0,12	0,145	0,15	0,16
N2	1XD	0.5XD	0.5XD	320	475	0,02	0,04	0,06	0,075	0,1	0,11	0,12	0,145	0,15	0,16
S1	1XD	0.5XD	0.5XD	40	65	0,005	0,02	0,03	0,035	0,05	0,057	0,065	0,07	0,075	0,085
S2	1XD	0.5XD	0.5XD	35	55	0,005	0,02	0,03	0,035	0,05	0,057	0,065	0,07	0,075	0,085
S3	1XD	0.5XD	0.5XD	30	45	0,005	0,02	0,03	0,035	0,05	0,057	0,065	0,07	0,075	0,085
S4	1XD	0.5XD	0.5XD	35	50	0,005	0,02	0,03	0,035	0,05	0,057	0,065	0,07	0,075	0,085

F1AA...AWS/M30...



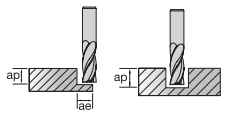
Reduce speed by 20% for slotting applications



	Application			Vc K600	Recommended fz- Feed Per Tooth (mm/th) for side cutting operations. For slotting operations, reduce fz by 20%. D1 - Diameter (mm)							
	Side Milling		Slotting									
Group	ap	ae	ap	m/min	2	3	4	5	6	8	10	12
N1	1XD	0.5XD	0.7XD	465	0,020	0,030	0,040	0,050	0,060	0,075	0,100	0,110
N2	1XD	0.5XD	0.7XD	410	0,020	0,030	0,040	0,050	0,060	0,075	0,100	0,110

These guidelines may require possible variations to achieve optimum results.

F2AA...ADL45...

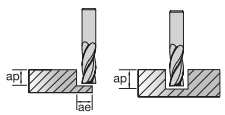


Reduce speed by 20% for slotting applications



	Application			Vc KC637M	Recommended fz- Feed Per Tooth (mm/th) for side cutting operations. For slotting operations, reduce fz by 20%. D1 - Diameter (mm)								
	Side Milling		Slotting										
Group	ap	ae	ap	m/min	4	6	8	10	12	14	16	18	20
N1	1XD	0.5XD	0.7XD	465	650	0,020	0,030	0,040	0,050	0,060	0,075	0,100	0,110
N2	1XD	0.5XD	0.7XD	410	575	0,020	0,030	0,040	0,050	0,060	0,075	0,100	0,110

F2AA...AWM/L/X45R...

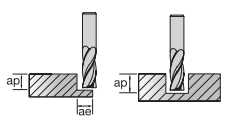


Reduce speed by 20% for slotting applications



	Application			Vc K600	Recommended fz- Feed Per Tooth (mm/th) for side cutting operations. For slotting operations, reduce fz by 20%. D1 - Diameter (mm)							
	Side Milling		Slotting									
Group	ap	ae	ap	m/min	6	8	10	12	16	18	20	25
N1	1XD	0.5XD	0.7XD	465	0,030	0,040	0,050	0,060	0,100	0,110	0,120	0,200
N2	1XD	0.5XD	0.7XD	410	0,030	0,040	0,050	0,060	0,100	0,110	0,120	0,200

F3AA...AWS/L45...

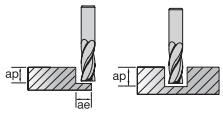


Reduce speed by 20% for slotting applications

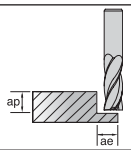


	Application			Vc K600	Recommended fz- Feed Per Tooth (mm/th) for side cutting operations. For slotting operations, reduce fz by 20%. D1 - Diameter (mm)								
	Side Milling		Slotting										
Group	ap	ae	ap	m/min	4	6	8	10	12	14	16	18	20
N1	1XD	0.5XD	0.7XD	465	0,020	0,030	0,040	0,050	0,060	0,075	0,100	0,110	0,120
N2	1XD	0.5XD	0.7XD	410	0,020	0,030	0,040	0,050	0,060	0,075	0,100	0,110	0,120

F3AA...AWM/L/X45R...

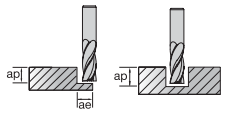
				Reduce speed by 20% for slotting applications							
	Application			Vc K600	Recommended fz- Feed Per Tooth (mm/th) for side cutting operations. For slotting operations, reduce fz by 20%.						
	Side Milling		Slotting		D1 - Diameter (mm)						
Group	ap	ae	ap	m/min	6	8	10	12	18	20	25
N1	1XD	0.5XD	0.7XD	465	650	0,030	0,040	0,050	0,060	0,110	0,120
N2	1XD	0.5XD	0.7XD	410	575	0,030	0,040	0,050	0,060	0,110	0,120

F8/10AJ...ADK45E...

								
	Application		Vc KC633M	Recommended fz- Feed Per Tooth (mm/th) for side cutting operations.				
	Side Milling			D1 - Diameter (mm)				
Group	ap	ae	m/min	8	10	12	16	20
P2	1XD	0.2XD	210	0,040	0,050	0,060	0,090	0,120
P3	1XD	0.2XD	200	0,040	0,050	0,060	0,090	0,120
P4	1XD	0.1XD	150	0,035	0,042	0,055	0,082	0,100
P5	1XD	0.1XD	120	0,031	0,042	0,050	0,076	0,082
P6	1XD	0.1XD	120	0,031	0,042	0,050	0,076	0,082
M1	1XD	0.1XD	150	0,035	0,042	0,055	0,082	0,100
M2	1XD	0.1XD	120	0,031	0,042	0,050	0,076	0,082
M3	1XD	0.1XD	110	0,031	0,042	0,050	0,076	0,082
K1	1XD	0.5XD	220	0,050	0,062	0,075	0,110	0,120
K2	1XD	0.5XD	200	0,050	0,062	0,075	0,110	0,120
S1	1XD	0.1XD	150	0,035	0,042	0,055	0,082	0,100
S2	1XD	0.1XD	120	0,031	0,042	0,050	0,076	0,082
S3	1XD	0.1XD	100	0,031	0,042	0,050	0,076	0,082
S4	1XD	0.1XD	175	0,035	0,042	0,055	0,082	0,100
H2	1XD	0.1XD	120	0,031	0,042	0,050	0,076	0,082

These guidelines may require possible variations to achieve optimum results.

F4AS...ADL38...

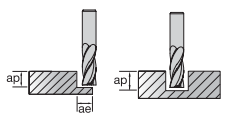


Reduce speed by 20% for slotting applications



	Application			Vc KC633M	Recommended fz- Feed Per Tooth (mm/th) for side cutting operations. For slotting operations, reduce fz by 20%. D1 - Diameter (mm)										
	Side Milling		Slotting												
Group	ap	ae	ap	m/min	4	5	6	8	10	12	14	16	18	20	25
P2	1xD	0.5XD	1xD	200	0,025	0,030	0,040	0,060	0,060	0,070	0,072	0,075	0,080	0,090	1,090
P3	1xD	0.5XD	1xD	180	0,025	0,030	0,040	0,060	0,060	0,070	0,072	0,075	0,080	0,090	1,090
P4	1xD	0.5XD	1xD	150	0,023	0,027	0,036	0,054	0,054	0,063	0,065	0,068	0,072	0,081	0,981
P5	1xD	0.5XD	1xD	60~80	0,015	0,025	0,030	0,040	0,045	0,050	0,052	0,055	0,060	0,060	0,060
P6	1xD	0.5XD	1xD	60~80	0,015	0,025	0,030	0,040	0,045	0,050	0,052	0,055	0,060	0,060	0,060
M1	1xD	0.5XD	1xD	90~115	0,025	0,030	0,040	0,050	0,060	0,065	0,067	0,070	0,072	0,075	0,075
M2	1xD	0.5XD	1xD	60~80	0,015	0,025	0,030	0,040	0,045	0,050	0,052	0,055	0,060	0,060	0,060
M3	1xD	0.5XD	1xD	60~80	0,015	0,025	0,030	0,040	0,045	0,050	0,052	0,055	0,060	0,060	0,060
K1	1xD	0.5XD	1xD	120~150	0,025	0,030	0,040	0,060	0,060	0,070	0,072	0,075	0,080	0,090	0,100
K2	1xD	0.5XD	1xD	110~140	0,025	0,030	0,040	0,060	0,060	0,070	0,072	0,075	0,080	0,090	0,100
S1	1xD	0.5XD	1xD	90~115	0,025	0,030	0,040	0,050	0,060	0,065	0,067	0,070	0,072	0,075	0,075
S2	1xD	0.5XD	1xD	60~80	0,015	0,025	0,030	0,040	0,045	0,050	0,052	0,055	0,060	0,060	0,060
S3	1xD	0.2XD	0.3XD	25~35	0,011	0,011	0,017	0,027	0,027	0,038	0,043	0,049	0,055	0,055	0,055
S4	1xD	0.5XD	1xD	50~60	0,012	0,015	0,020	0,030	0,030	0,040	0,042	0,045	0,050	0,060	0,070

F4AS...A/BWM/L/X38R...

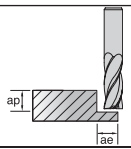


Reduce speed by 20% for slotting applications



	Application			Vc KC633M	Recommended fz- Feed Per Tooth (mm/th) for side cutting operations. For slotting operations, reduce fz by 20%. D1 - Diameter (mm)										
	Side Milling		Slotting												
Group	ap	ae	ap	m/min	4	5	6	8	10	12	14	16	18	20	25
P2	1xD	0.5XD	1xD	200	0,025	0,030	0,040	0,060	0,060	0,070	0,072	0,075	0,080	0,090	1,090
P3	1xD	0.5XD	1xD	180	0,025	0,030	0,040	0,060	0,060	0,070	0,072	0,075	0,080	0,090	1,090
P4	1xD	0.5XD	1xD	150	0,023	0,027	0,036	0,054	0,054	0,063	0,065	0,068	0,072	0,081	0,981
P5	1xD	0.5XD	1xD	60~80	0,015	0,025	0,030	0,040	0,045	0,050	0,052	0,055	0,060	0,060	0,060
P6	1xD	0.5XD	1xD	60~80	0,015	0,025	0,030	0,040	0,045	0,050	0,052	0,055	0,060	0,060	0,060
M1	1xD	0.5XD	1xD	90~115	0,025	0,030	0,040	0,050	0,060	0,065	0,067	0,070	0,072	0,075	0,075
M2	1xD	0.5XD	1xD	60~80	0,015	0,025	0,030	0,040	0,045	0,050	0,052	0,055	0,060	0,060	0,060
M3	1xD	0.5XD	1xD	60~80	0,015	0,025	0,030	0,040	0,045	0,050	0,052	0,055	0,060	0,060	0,060
K1	1xD	0.5XD	1xD	120~150	0,025	0,030	0,040	0,060	0,060	0,070	0,072	0,075	0,080	0,090	0,100
K2	1xD	0.5XD	1xD	110~140	0,025	0,030	0,040	0,060	0,060	0,070	0,072	0,075	0,080	0,090	0,100
S1	1xD	0.5XD	1xD	90~115	0,025	0,030	0,040	0,050	0,060	0,065	0,067	0,070	0,072	0,075	0,075
S2	1xD	0.5XD	1xD	60~80	0,015	0,025	0,030	0,040	0,045	0,050	0,052	0,055	0,060	0,060	0,060
S3	1xD	0.2XD	0.3XD	25~35	0,011	0,011	0,017	0,027	0,027	0,038	0,043	0,049	0,055	0,055	0,055
S4	1xD	0.5XD	1xD	50~60	0,012	0,015	0,020	0,030	0,030	0,040	0,042	0,045	0,050	0,060	0,070

F6AJ...A/BDL30...

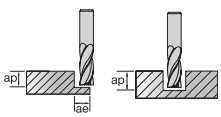


Reduce speed by 20% for slotting applications



	Application		Vc KC637M	Recommended fz- Feed Per Tooth (mm/th) for side cutting operations. For slotting operations, reduce fz by 20%. D1 - Diameter (mm)							
	Side Milling										
Group	ap	ae	m/min	6	8	10	12	14	16	18	20
P2	1XD	0.1XD	100	0,030	0,040	0,050	0,050	0,060	0,060	0,080	0,100
P3	1XD	0.2XD	120	0,030	0,040	0,050	0,050	0,060	0,060	0,080	0,100
P4	1XD	0.1XD	100	0,030	0,040	0,050	0,050	0,060	0,060	0,080	0,100
P5	1XD	0.1XD	65	0,020	0,030	0,040	0,040	0,050	0,050	0,060	0,060
P6	1XD	0.1XD	65	0,020	0,030	0,040	0,040	0,050	0,050	0,060	0,060
M1	1XD	0.1XD	80	0,020	0,030	0,040	0,040	0,050	0,050	0,060	0,060
M2	1XD	0.1XD	65	0,020	0,030	0,040	0,040	0,050	0,050	0,060	0,060
M3	1XD	0.1XD	65	0,020	0,030	0,040	0,040	0,050	0,050	0,060	0,060
K1	1XD	0.5XD	170	0,030	0,040	0,050	0,050	0,060	0,060	0,080	0,100
K2	1XD	0.5XD	155	0,030	0,040	0,050	0,050	0,060	0,060	0,080	0,100
N1	1XD	0.5XD	645	0,050	0,060	0,080	0,090	0,100	0,110	0,120	0,130
N2	1XD	0.5XD	590	0,050	0,060	0,080	0,090	0,100	0,110	0,120	0,130
S1	1XD	0.1XD	80	0,020	0,030	0,040	0,040	0,050	0,050	0,060	0,060
S2	1XD	0.1XD	65	0,020	0,030	0,040	0,040	0,050	0,050	0,060	0,060
S3	1XD	0.1XD	50	0,020	0,030	0,040	0,040	0,050	0,050	0,060	0,060
S4	1XD	0.1XD	65	0,020	0,030	0,040	0,040	0,050	0,050	0,060	0,060

F6/8AJ...A/BDL45...

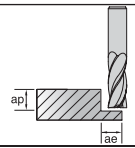


Reduce speed by 20% for slotting applications



	Application		Vc KC625M	Vc KC633M	Recommended fz- Feed Per Tooth (Inch/th) for side cutting operations. For slotting operations, reduce fz by 20%. D1- Diameter (Inch)								
	Side Milling												
Group	ap	ae	SFM	SFM	6	8	10	12	14	16	18	20	25
P2	1XD	0.2XD	130	145	0,030	0,040	0,050	0,050	0,060	0,060	0,080	0,100	0,120
P3	1XD	0.2XD	120	135	0,030	0,040	0,050	0,050	0,060	0,060	0,080	0,100	0,120
P4	1XD	0.1XD	100	110	0,030	0,040	0,050	0,050	0,060	0,060	0,080	0,100	0,120
P5	1XD	0.1XD	65	75	0,020	0,030	0,040	0,040	0,050	0,050	0,060	0,060	0,080
P6	1XD	0.1XD	65	75	0,020	0,030	0,040	0,040	0,050	0,050	0,060	0,060	0,080
M1	1XD	0.1XD	80	90	0,020	0,030	0,040	0,040	0,050	0,050	0,060	0,060	0,080
M2	1XD	0.1XD	65	75	0,020	0,030	0,040	0,040	0,050	0,050	0,060	0,060	0,080
M3	1XD	0.1XD	65	70	0,020	0,030	0,040	0,040	0,050	0,050	0,060	0,060	0,080
K1	1XD	0.5XD	170	190	0,030	0,040	0,050	0,050	0,060	0,060	0,080	0,100	0,120
K2	1XD	0.5XD	155	175	0,030	0,040	0,050	0,050	0,060	0,060	0,080	0,100	0,120
N1	1XD	0.5XD	645	715	0,050	0,060	0,080	0,090	0,100	0,110	0,120	0,130	0,140
N2	1XD	0.5XD	590	655	0,050	0,060	0,080	0,090	0,100	0,110	0,120	0,130	0,140
S1	1XD	0.1XD	80	90	0,020	0,030	0,040	0,040	0,050	0,050	0,060	0,060	0,080
S2	1XD	0.1XD	65	75	0,020	0,030	0,040	0,040	0,050	0,050	0,060	0,060	0,080
S3	1XD	0.1XD	50	55	0,020	0,030	0,040	0,040	0,050	0,050	0,060	0,060	0,070
S4	1XD	0.1XD	65	70	0,020	0,030	0,040	0,040	0,050	0,050	0,060	0,060	0,070

F6/8AJ...A/BWM/I/X45...



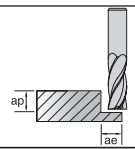
Reduce speed by 20% for slotting applications



	Application		Vc KC633M	Recommended fz- Feed Per Tooth (mm/th) for side cutting operations. For slotting operations, reduce fz by 20%. D1 - Diameter (mm)								
	Side Milling											
Group	ap	ae	m/min	6	8	10	12	14	16	18	20	25
P2	1XD	0.2XD	145	0,030	0,040	0,050	0,050	0,060	0,060	0,080	0,100	0,120
P3	1XD	0.2XD	135	0,030	0,040	0,050	0,050	0,060	0,060	0,080	0,100	0,120
P4	1XD	0.1XD	110	0,030	0,040	0,050	0,050	0,060	0,060	0,080	0,100	0,120
P5	1XD	0.1XD	75	0,020	0,030	0,040	0,040	0,050	0,050	0,060	0,060	0,080
P6	1XD	0.1XD	75	0,020	0,030	0,040	0,040	0,050	0,050	0,060	0,060	0,080
M1	1XD	0.1XD	90	0,020	0,030	0,040	0,040	0,050	0,050	0,060	0,060	0,080
M2	1XD	0.1XD	75	0,020	0,030	0,040	0,040	0,050	0,050	0,060	0,060	0,080
M3	1XD	0.1XD	70	0,020	0,030	0,040	0,040	0,050	0,050	0,060	0,060	0,080
K1	1XD	0.5XD	190	0,030	0,040	0,050	0,050	0,060	0,060	0,080	0,100	0,120
K2	1XD	0.5XD	175	0,030	0,040	0,050	0,050	0,060	0,060	0,080	0,100	0,120
N1	1XD	0.5XD	715	0,050	0,060	0,080	0,090	0,100	0,110	0,120	0,130	0,140
N2	1XD	0.5XD	655	0,050	0,060	0,080	0,090	0,100	0,110	0,120	0,130	0,140
S1	1XD	0.1XD	90	0,020	0,030	0,040	0,040	0,050	0,050	0,060	0,060	0,080
S2	1XD	0.1XD	75	0,020	0,030	0,040	0,040	0,050	0,050	0,060	0,060	0,080
S3	1XD	0.1XD	55	0,020	0,030	0,040	0,040	0,050	0,050	0,060	0,060	0,070
S4	1XD	0.1XD	70	0,020	0,030	0,040	0,040	0,050	0,050	0,060	0,060	0,070

These guidelines may require possible variations to achieve optimum results.

F6/8AV...ADL45...

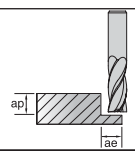


Reduce speed by 20% for slotting applications



	Application		Vc KC637M	Recommended fz- Feed Per Tooth (mm/th) for side cutting operations. For slotting operations, reduce fz by 20%. D1 - Diameter (mm)						
	Side Milling									
Group	ap	ae	m/min	6	8	10	12	16	20	25
H1	1.5XD	0.1XD	90	0,020	0,030	0,040	0,040	0,050	0,060	0,080
H2	1.5XD	0.1XD	65	0,020	0,030	0,040	0,040	0,050	0,060	0,080
H3	1.5XD	0.1XD	40	0,020	0,030	0,040	0,040	0,050	0,060	0,080
H4	1.5XD	0.1XD	30	0,020	0,030	0,040	0,040	0,050	0,060	0,080

F6/8AV...AWM/L/X...

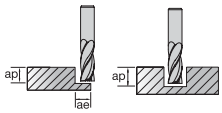


Reduce speed by 20% for slotting applications

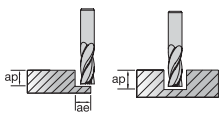


	Application		Vc KC637M	Recommended fz- Feed Per Tooth (mm/th) for side cutting operations. For slotting operations, reduce fz by 20%. D1 - Diameter (mm)						
	Side Milling									
Group	ap	ae	m/min	6	8	10	12	16	20	25
H1	1XD	0.1XD	100	0,020	0,030	0,040	0,040	0,050	0,055	0,060
H2	1XD	0.1XD	90	0,020	0,030	0,040	0,040	0,050	0,055	0,060
H3	1XD	0.1XD	60	0,020	0,030	0,040	0,040	0,050	0,055	0,060
H4	1XD	0.1XD	45	0,020	0,030	0,040	0,040	0,050	0,055	0,060

F4/5/6AJ...A/BWS/M/LX50L...

			Reduce speed by 20% for slotting applications								
	Application		Vc KC633M	Vc KC635M	Recommended fz- Feed Per Tooth (mm/th) for side cutting operations. For slotting operations, reduce fz by 20%.						
	Side Milling				D1 - Diameter (mm)						
Group	ap	ae	m/min	m/min	6	8	10	12	16	20	25
P4	1.5XD	0.1XD	160~180	160~180	0,040	0,055	0,070	0,080	0,110	0,130	0,170
P5	1.5XD	0.1XD	150~170	150~170	0,040	0,055	0,070	0,080	0,110	0,130	0,170
P6	1.5XD	0.1XD	140~160	140~160	0,040	0,055	0,070	0,080	0,110	0,130	0,170
H1	1.5XD	0.1XD	160~180	160~180	0,040	0,055	0,070	0,080	0,110	0,130	0,170
H2	1.5XD	0.1XD	120	120	0,03	0,045	0,055	0,07	0,09	0,11	0,14
H3	1.5XD	0.1XD	70~80	70~80	0,015	0,02	0,03	0,035	0,05	0,06	0,07
H4	1.5XD	0.1XD	60~70	60~70	0,015	0,02	0,03	0,035	0,05	0,06	0,07

F4/5AJ...AWS/M/LX50R...

			Reduce speed by 20% for slotting applications							
	Application		Vc KC633M	Recommended fz- Feed Per Tooth (mm/th) for side cutting operations. For slotting operations, reduce fz by 20%.						
	Side Milling			D1 - Diameter (mm)						
Group	ap	ae	m/min	6	8	10	12	16	20	25
P4	1.5XD	0.1XD	160~180	0,040	0,055	0,070	0,080	0,110	0,130	0,170
P5	1.5XD	0.1XD	150~170	0,040	0,055	0,070	0,080	0,110	0,130	0,170
P6	1.5XD	0.1XD	140~160	0,040	0,055	0,070	0,080	0,110	0,130	0,170
K1	1.5XD	0.1XD	200	0,055	0,070	0,090	0,110	0,150	0,180	0,200
H1	1.5XD	0.1XD	160~180	0,040	0,055	0,070	0,080	0,110	0,130	0,170
H2	1.5XD	0.1XD	120	0,030	0,045	0,055	0,070	0,090	0,110	0,140
H3	1.5XD	0.1XD	70~80	0,015	0,020	0,030	0,035	0,050	0,060	0,070
H4	1.5XD	0.1XD	60~70	0,015	0,020	0,030	0,035	0,050	0,060	0,070

KENNAMETAL®
Engineering Your Competitive Edge



Square End Mills — Roughing & Semi-Finishing

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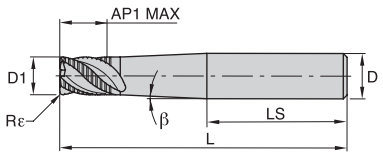
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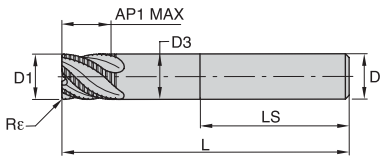
Features

- Factory standard.
- Plain shank.
- Corner radius - center cutting.
- Flat shallow-pitch profile.

Operations

- Side cutting, slotting, ramping, and 3D milling.
- For general engineering and die & mold applications.







Multi-flute, 45° Helix

● first choice
○ alternate choice

H	○
S	●
N	○
K	●
M	●
P	●

D1	D3	D	Ap1 max	LS	L	Rε	Z U	catalog number	KC633M
4,00	—	6	4,0	68	75	0,75	3	F3BT0400AWM45R075	●
5,00	—	6	5,0	64	75	0,75	3	F3BT0500AWM45R075	●
6,00	—	10	6,0	80	100	0,75	4	F4BT0600AWL45R075	●
8,00	—	10	8,0	80	100	0,75	4	F4BT0800AWL45R075	●
10,00	—	12	10,0	94	125	0,75	4	F4BT1000AWX45R075	●
12,00	—	16	12,0	94	125	1,00	4	F4BT1200AWX45R100	●
20,00	19,00	20	20,0	90	150	1,25	6	F6BT2000AWX45R125	●
25,00	24,00	25	25,0	92	150	1,25	6	F6BT2500AWX45R125	●

For application data, see page 89.

Ordering Example:
F4AJ0600AWS50R025 KC633M

High-Performance Semi-Finishing End Mills

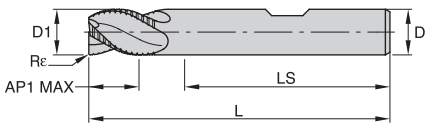
F3BS...DK-DL — DIN 6527 — Short — for Soft Steel and Stainless Steel

Features

- DIN 6527 short.
- Weldon shank.
- Corner radius - center cutting.
- Chipbreaker profile.

Operations

- Side cutting, slotting, and ramping.
- For aerospace and medical applications.





3-flute, 35° Helix

● first choice
○ alternate choice

D1	D	Ap1 max	LS	L	Rε	Z U	catalog number	KC633M
6,00	6	7,0	41	54	0,45	3	F3BS0600BDK35	●
8,00	8	9,0	42	58	0,45	3	F3BS0800BDK35	●
10,00	10	11,0	45	66	0,45	3	F3BS1000BDK35	●
12,00	12	12,0	51	73	0,45	3	F3BS1200BDK35	●
14,00	14	14,0	51	75	0,45	3	F3BS1400BDK35	●
16,00	16	16,0	55	82	0,45	3	F3BS1600BDK35	●
20,00	20	20,0	60	92	0,45	3	F3BS2000BDK35	●

For application data, see page 89.

Ordering Example:
F3BS0600BDK35 KC633M

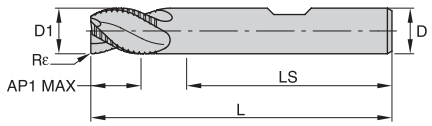
To place an order, contact Kennametal or your authorized Kennametal distributor, or visit www.kennametal.com.

Features

- DIN 6527 long.
- Weldon shank.
- Corner radius - center cutting.
- Chipbreaker profile.

Operations

- Side cutting, slotting, and ramping.
- For aerospace, automotive, and medical applications.





3-flute, 35° Helix

● first choice
○ alternate choice

	KC633M
H	
S	
N	
K	
M	●
P	●

D1	D	Ap1 max	LS	L	Z U	Rε	catalog number	KC633M
6,00	6	7,0	36	57	3	0,45	F3BS0600BDL35	●
8,00	8	16,0	36	63	3	0,45	F3BS0800BDL35	●
10,00	10	19,0	40	72	3	0,45	F3BS1000BDL35	●
12,00	12	22,0	45	83	3	0,45	F3BS1200BDL35	●
14,00	14	22,0	45	83	3	0,45	F3BS1400BDL35	●
16,00	16	26,0	48	92	3	0,45	F3BS1600BDL35	●
20,00	20	32,0	50	104	3	0,45	F3BS2000BDL35	●

For application data, see page 89.

Ordering Example:
F3BS0600BDL35 KC633M

High-Performance Semi-Finishing End Mills

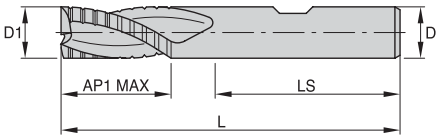
F3BH...DL — DIN 6527 — Long — for Soft and Medium Steel

Features

- DIN 6527 long.
- Weldon shank.
- Corner chamfer - center cutting.
- Semi-finishing profile.

Operations

- Side cutting, slotting, and ramping.
- For general engineering applications.
- Die & mold.





3-flute, 30° Helix

● first choice
○ alternate choice

							KC633M	KC643M
H								
S								
N								
K								
M							●	●
P							○	○
D1	D	Ap1 max	LS	L	Z	U	catalog number	
4,00	6	8,0	36	57	3		F3BH0400BDL30	●
5,00	6	13,0	36	57	3		F3BH0500BDL30	●
6,00	6	10,0	36	57	3		F3BH0600BDL30	● ●
8,00	8	16,0	36	63	3		F3BH0800BDL30	● ●
10,00	10	19,0	40	72	3		F3BH1000BDL30	●
12,00	12	22,0	45	83	3		F3BH1200BDL30	●
16,00	16	26,0	48	92	3		F3BH1600BDL30	●
20,00	20	32,0	50	104	3		F3BH2000BDL30	●
25,00	25	45,0	56	121	3		F3BH2500BDL30	●

For application data, see page 90.

	Corner Chamfer (Chamfer height)	
D1 h10	BCH	Tolerance
2 - 6.75	0,10	-0,05
6.76 - 9.7	0,20	-0,10
9.71 - 15.7	0,30	-0,10
15.71 - 25	0,40	-0,20

Ordering Example:
F3BH0600BDL30 KC633M

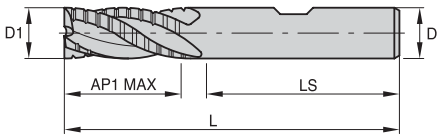
To place an order, contact Kennametal or your authorized Kennametal distributor, or visit www.kennametal.com.

Features

- DIN 6527 long.
- Weldon shank.
- Corner chamfer - center cutting.
- Semi-finishing profile.

Operations

- Side cutting, slotting, and ramping.
- For general engineering applications.





4-flute, 30° Helix

● first choice
○ alternate choice

H								
S								
N								
K							●	●
M								
P							●	●

D1	D	Ap1 max	LS	L	Z U	catalog number	KC633M	KC643M
6,00	6	13,0	36	57	4	F4BJ0600BDL30	●	
8,00	8	19,0	36	63	4	F4BJ0800BDL30	●	
10,00	10	22,0	40	72	4	F4BJ1000BDL30	●	●
12,00	12	26,0	45	83	4	F4BJ1200BDL30	●	●
14,00	14	26,0	45	83	4	F4BJ1400BDL30		●
16,00	16	32,0	48	92	4	F4BJ1600BDL30	●	●
18,00	18	32,0	48	92	4	F4BJ1800BDL30		●
20,00	20	38,0	50	104	4	F4BJ2000BDL30	●	●

For application data, see page 90.

	Corner Chamfer (Chamfer height)	
D1 h10	BCH	Tolerance
2 - 6.75	0,10	-0,05
6.76 - 9.7	0,20	-0,10
9.71 - 15.7	0,30	-0,10
15.71 - 25	0,40	-0,20

Ordering Example:
F4BJ0600BDL30 KC633M

High-Performance Semi-Finishing End Mills

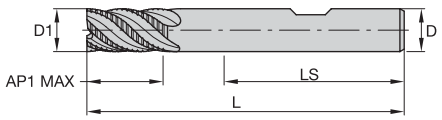
F4BJ-F6BJ...DL — DIN 6527 — Long — for Soft and Medium Steel

Features

- DIN 6527 long.
- Weldon shank.
- Corner chamfer - center cutting.
- Shallow-pitch profile.

Operations

- Side cutting, slotting, and ramping.
- For general engineering and die & mold applications.





4 & 6-flute, 45° Helix

● first choice
○ alternate choice

							KC633M
H							●
S							
N							
K							○
M							●
P							●

D1	D	Ap1 max	LS	L	Z U	catalog number	KC633M
6,00	6	13,0	36	57	4	F4BJ0600BDL45	●
8,00	8	19,0	36	63	4	F4BJ0800BDL45	●
10,00	10	22,0	40	72	4	F4BJ1000BDL45	●
12,00	12	26,0	45	83	4	F4BJ1200BDL45	●
16,00	16	32,0	48	92	6	F6BJ1600BDL45	●
20,00	20	38,0	50	104	6	F6BJ2000BDL45	●
25,00	25	45,0	56	121	6	F6BJ2500BDL45	●

For application data, see page 90.

	Corner Chamfer (Chamfer height)	
D1 h10	BCH	Tolerance
2 - 6.75	0,10	-0,05
6.76 - 9.7	0,20	-0,10
9.71 - 15.7	0,30	-0,10
15.71 - 25	0,40	-0,20

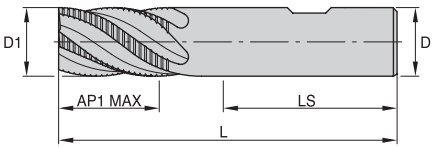
Ordering Example:
F4BJ0600BDL45 KC633M

Features

- DIN 6527 long.
- Weldon shank.
- Corner chamfer - center cutting.
- Rouging profile.

Operations

- Side cutting, slotting, and ramping.
- For general engineering and die & mold applications.





Multi-flute, 30° Helix

● first choice
○ alternate choice

H	S	N	K	M	P
			●		●

D1	D	Ap1 max	LS	L	Z U	catalog number	KC643M
4,00	6	8,0	36	57	3	F3BH0400BDL30	●
5,00	6	13,0	36	57	3	F3BH0500BDL30	●
6,00	6	13,0	36	57	3	F3BH0600BDL30	●
8,00	8	16,0	36	63	3	F3BH0800BDL30	●
10,00	10	22,0	40	72	4	F4BJ1000BDL30	●
12,00	12	26,0	45	83	4	F4BJ1200BDL30	●
14,00	14	26,0	45	83	4	F4BJ1400BDL30	●
16,00	16	32,0	48	92	4	F4BJ1600BDL30	●
18,00	18	32,0	48	92	4	F4BJ1800BDL30	●
20,00	20	38,0	50	104	4	F4BJ2000BDL30	●
25,00	25	45,0	56	121	5	F5BJ2500BDL30	●

For application data, see page 90.

	Corner Chamfer (Chamfer height)	
D1 d11	BCH	Tolerance
2 - 8,99	0,3	± 0,1
9 - 25	0,5	± 0,1

Ordering Example:
F3BH0400BDL30 KC643M

High-Performance Roughing End Mills

F4BJ-F6BJ...DL — DIN 6527 — Long — for Medium and Hardened Steel

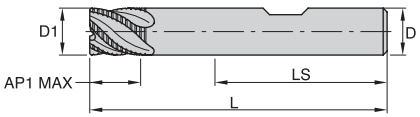
Features

- DIN 6527 long.
- Weldon shank.
- Corner chamfer - center cutting.
- Shallow-pitch profile.

Operations

- Side cutting and ramping.
- For general engineering and die & mold applications.







4 & 6-flute, 45° Helix

● first choice
○ alternate choice

H	●
S	
N	
K	○
M	●
P	●

D1	D	Ap1 max	LS	L	Z U	catalog number	KC633M
6,00	6	6,0	36	57	4	F4BJ0600BDL45L060	●
8,00	8	8,0	36	63	4	F4BJ0800BDL45L080	●
10,00	10	10,0	40	72	4	F4BJ1000BDL45L100	●
12,00	12	12,0	45	83	4	F4BJ1200BDL45L120	●
16,00	16	16,0	48	92	6	F6BJ1600BDL45L160	●
20,00	20	20,0	50	104	6	F6BJ2000BDL45L200	●
25,00	25	25,0	56	121	6	F6BJ2500BDL45L250	●

For application data, see page 91.

	Corner Radius (Chamfer height)	
D1 d11	R	Tolerance
6 - 11,99	0,75	± 0,01
12 - 19,99	1,00	± 0,01
20 - 25	1,25	± 0,01

Ordering Example:
F4BJ0600BDL45L060 KC633M

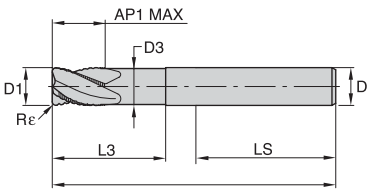
To place an order, contact Kennametal or your authorized Kennametal distributor, or visit www.kennametal.com.

Features

- Factory standard.
- Plain shank.
- Corner radius - center cutting.
- Chipbreaker profile.

Operations

- Side cutting, slotting, and ramping.
- For aerospace and automotive applications.





4-flute, 38° Helix

● first choice
○ alternate choice

H		
S		●
N		
K		●
M		●
P		●

D1	D3	D	Ap1 max	L3	LS	L	Rε	Z U	catalog number	KC633M
6,00	5,80	6	9,0	18	36	63	0,50	4	F4BS0600AWM38R050	●
6,00	5,80	6	9,0	18	36	63	1,00	4	F4BS0600AWM38R100	●
8,00	7,80	8	12,0	24	36	68	0,50	4	F4BS0800AWM38R050	●
8,00	7,80	8	12,0	24	36	68	1,00	4	F4BS0800AWM38R100	●
10,00	9,50	10	15,0	30	40	76	0,50	4	F4BS1000AWL38R050	●
10,00	9,50	10	15,0	30	40	76	1,00	4	F4BS1000AWL38R100	●
10,00	9,50	10	15,0	30	40	76	2,00	4	F4BS1000AWL38R200	●
10,00	9,50	10	15,0	30	40	76	3,00	4	F4BS1000AWL38R300	●
10,00	9,50	10	15,0	30	40	76	4,00	4	F4BS1000AWL38R400	●
12,00	11,50	12	18,0	36	45	84	0,50	4	F4BS1200AWL38R050	●
12,00	11,50	12	18,0	36	45	84	1,00	4	F4BS1200AWL38R100	●
12,00	11,50	12	18,0	36	45	84	2,00	4	F4BS1200AWL38R200	●
12,00	11,50	12	18,0	36	45	84	3,00	4	F4BS1200AWL38R300	●
12,00	11,50	12	18,0	36	45	84	4,00	4	F4BS1200AWL38R400	●
16,00	15,00	16	24,0	48	48	100	0,50	4	F4BS1600AWX38R050	●
16,00	15,00	16	24,0	48	48	100	1,00	4	F4BS1600AWX38R100	●
16,00	15,00	16	24,0	48	48	100	2,00	4	F4BS1600AWX38R200	●
16,00	15,00	16	24,0	48	48	100	3,00	4	F4BS1600AWX38R300	●
16,00	15,00	16	24,0	48	48	100	4,00	4	F4BS1600AWX38R400	●
20,00	19,00	20	30,0	60	50	115	0,50	4	F4BS2000AWX38R050	●
20,00	19,00	20	30,0	60	50	115	1,00	4	F4BS2000AWX38R100	●
20,00	19,00	20	30,0	60	50	115	2,00	4	F4BS2000AWX38R200	●
20,00	19,00	20	30,0	60	50	115	3,00	4	F4BS2000AWX38R300	●
20,00	19,00	20	30,0	60	50	115	4,00	4	F4BS2000AWX38R400	●
25,00	24,00	25	37,5	75	56	135	0,50	4	F4BS2500AWX38R050	●
25,00	24,00	25	37,5	75	56	135	1,00	4	F4BS2500AWX38R100	●
25,00	24,00	25	37,5	75	56	135	2,00	4	F4BS2500AWX38R200	●
25,00	24,00	25	37,5	75	56	135	3,00	4	F4BS2500AWX38R300	●
25,00	24,00	25	37,5	75	56	135	4,00	4	F4BS2500AWX38R400	●

For application data, see page 92.

Ordering Example:
F4BS0600AWM38R050 KC633M

High-Performance Roughing End Mills

KENNAMETAL

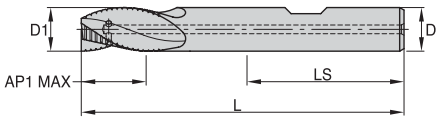
F3BH-F4BJ...WS-WM-WL-WX — with Internal Coolant Supply — for General Steel

Features

- Factory standard.
- Weldon shank.
- Corner chamfer - center cutting.
- Fine-pitch profile.

Operations

- Side cutting, slotting, and ramping.
- For general engineering applications.





4 & 6-flute, 45° Helix

● first choice
○ alternate choice

H	
S	
N	
K	●
M	
P	●

D1	D	Ap1 max	LS	L	Z U	catalog number	KC633M
8,00	8	11,0	40	58	3	F3BH0800BWS20C110	●
8,00	8	16,0	39	63	3	F3BH0800BWM20C160	●
10,00	10	13,0	47	66	4	F4BJ1000BWM20C130	●
10,00	10	22,0	45	72	4	F4BJ1000BWM20C220	●
12,00	12	16,0	52	73	4	F4BJ1200BWM20C160	●
12,00	12	26,0	51	83	4	F4BJ1200BWL20C260	●
16,00	16	19,0	56	82	4	F4BJ1600BWL20C190	●
16,00	16	32,0	51	92	4	F4BJ1600BWL20C320	●
20,00	20	22,0	59	92	4	F4BJ2000BWL20C220	●
20,00	20	38,0	59	104	4	F4BJ2000BWX20C380	●

For application data, see page 91.

	Corner Chamfer (Chamfer height)	
D1 d11	BCH	Tolerance
2 - 8,99	0,3	± 0,1
9 - 25	0,5	± 0,1

Ordering Example:
F3BH0800BWS20C110 KC633M

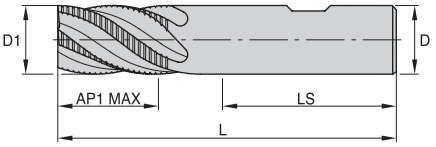
To place an order, contact Kennametal or your authorized Kennametal distributor, or visit www.kennametal.com.

Features

- Factory standard.
- Weldon shank.
- Corner chamfer - center cutting.
- Fine-pitch profile.

Operations

- Side cutting, slotting, and ramping.
- For general engineering applications.





4 & 6-flute, 45° Helix

● first choice
○ alternate choice

D1	D	Ap1 max	LS	L	Z U	catalog number	KC633M
4,00	6	11,0	36	55	3	F3BH0400BWS20L110	●
5,00	6	13,0	33	57	3	F3BH0500BWS20L130	●
6,00	6	8,0	41	54	3	F3BH0600BWS20L080	●
6,00	6	13,0	39	57	3	F3BH0600BWS20L130	●
8,00	8	11,0	40	58	3	F3BH0800BWS20L110	●
8,00	8	16,0	39	63	3	F3BH0800BWM20L160	●
10,00	10	13,0	47	66	4	F4BJ1000BWM20L130	●
10,00	10	22,0	45	72	4	F4BJ1000BWM20L220	●
12,00	12	16,0	52	73	4	F4BJ1200BWM20L160	●
12,00	12	26,0	51	83	4	F4BJ1200BWL20L260	●
14,00	14	26,0	50	83	4	F4BJ1400BWL20L260	●
16,00	16	19,0	56	82	4	F4BJ1600BWL20L190	●
16,00	16	32,0	51	92	4	F4BJ1600BWL20L320	●
20,00	20	22,0	59	92	4	F4BJ2000BWL20L220	●
20,00	20	38,0	59	104	4	F4BJ2000BWX20L380	●
25,00	25	45,0	69	121	5	F5BJ2500BWX20L450	●

For application data, see page 91.

	Corner Chamfer (Chamfer height)	
D1 d11	BCH	Tolerance
2 - 8,99	0,3	± 0,1
9 - 25	0,5	± 0,1

Ordering Example:
F3BH0400BWS20L110 KC633M

High-Performance Roughing End Mills

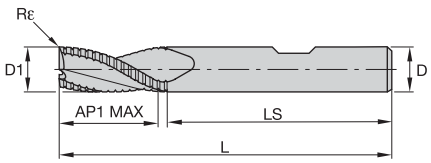
F3BA...WS-WM-WL-WX — for Aluminium

Features

- Factory standard.
- Weldon shank.
- Corner radius - center cutting.
- Aluminium profile.

Operations

- Side cutting, slotting, and ramping.
- For aerospace applications.





3-flute, 30° Helix

● first choice
○ alternate choice

H	S	N	K	M	P
		●			

D1	D	Ap1 max	LS	L	Rε	Z U	catalog number	K600
6,00	6	13,0	39	57	0,25	3	F3BA0600BWS30	●
8,00	8	16,0	41	63	0,25	3	F3BA0800BWM30	●
10,00	10	22,0	42	72	0,50	3	F3BA1000BWM30	●
12,00	12	26,0	47	83	0,50	3	F3BA1200BWL30	●
16,00	16	32,0	55	92	1,00	3	F3BA1600BWL30	●
20,00	20	38,0	53	104	1,00	3	F3BA2000BWX30	●
25,00	25	45,0	60	121	1,50	3	F3BA2500BWX30	●

For application data, see page 92.

Ordering Example:
F3BA0600BWS30 K600

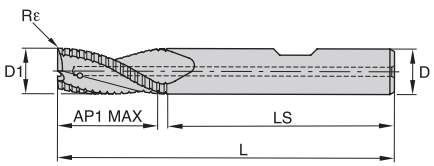
To place an order, contact Kennametal or your authorized Kennametal distributor, or visit www.kennametal.com.

Features

- Factory standard.
- Weldon shank.
- Corner radius - center cutting.
- Aluminium profile.

Operations

- Side cutting, slotting, and ramping.
- For aerospace applications.





3-flute, 30° Helix

● first choice
○ alternate choice

H	S	N	K	M	P
		●			

D1	D	Ap1 max	LS	L	Rε	Z U	catalog number	K600
8,00	8	16,0	41	63	0,25	3	F3BA0800BWM30C160	●
10,00	10	22,0	42	72	0,50	3	F3BA1000BWM30C220	●
12,00	12	26,0	47	83	0,50	3	F3BA1200BWL30C260	●
16,00	16	32,0	55	92	1,00	3	F3BA1600BWL30C320	●
20,00	20	38,0	53	104	1,00	3	F3BA2000BWX30C380	●
25,00	25	45,0	60	121	1,50	3	F3BA2500BWX30C450	●

For application data, see page 92.

Ordering Example:
F3BA0800BWM30C160 K600

High-Performance Roughing End Mills

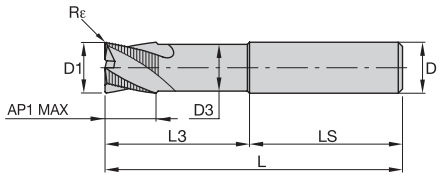
F3BA...DL — DIN 6527 — Long — with Extended Neck for Aluminium

Features

- DIN 6527 long.
- Plain shank.
- Corner radius - center cutting.
- Aluminium profile.

Operations

- Side cutting, slotting, and ramping.
- For aerospace applications.





3-flute, 40° Helix

● first choice
○ alternate choice

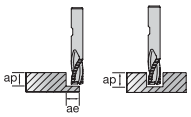
D1	D3	D	Ap1 max	L3	LS	L	Rε	Z U	catalog number	K600
6,00	5,00	6	8,0	18	36	57	0,25	3	F3BA0600ADL40E180	●
8,00	7,00	8	10,0	24	36	63	0,25	3	F3BA0800ADL40E240	●
10,00	9,00	10	12,0	30	40	72	0,25	3	F3BA1000ADL40E300	●
12,00	11,00	12	15,0	36	45	83	0,25	3	F3BA1200ADL40E360	●
16,00	15,00	16	20,0	48	48	92	1,00	3	F3BA1600ADL40E480	●
20,00	19,00	20	24,0	60	50	104	1,00	3	F3BA2000ADL40E600	●

For application data, see page 92.

Ordering Example:
F3BA0600ADL40E180 K600

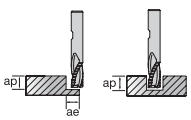
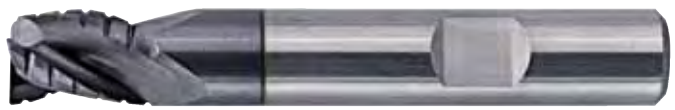
To place an order, contact Kennametal or your authorized Kennametal distributor, or visit www.kennametal.com.

F3/4/6BT...AWM/L/X45R...

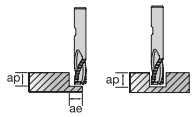
				Reduce speed by 20% for slotting applications								
	Application			Vc KC633M	Recommended fz- Feed Per Tooth (mm/th) for side cutting operations. For slotting operations, reduce fz by 20%.							
	Side Milling		Slotting		D1 - Diameter (mm)							
Group	ap	ae	ap	m/min	4	5	6	8	10	12	20	25
P2	0.8XD	0.5XD	0.8XD	200	0,020	0,025	0,030	0,040	0,060	0,060	0,100	0,120
P3	0.8XD	0.5XD	0.8XD	180	0,020	0,025	0,030	0,040	0,060	0,060	0,100	0,120
P4	0.8XD	0.4XD	0.8XD	120	0,015	0,020	0,025	0,030	0,040	0,045	0,080	0,100
P5	0.8XD	0.4XD	0.8XD	70	0,009	0,014	0,018	0,023	0,027	0,036	0,054	0,063
P6	0.8XD	0.4XD	0.8XD	70	0,009	0,014	0,018	0,023	0,027	0,036	0,054	0,063
M1	0.8XD	0.5XD	0.8XD	90	0,011	0,017	0,022	0,028	0,033	0,044	0,066	0,077
M2	0.8XD	0.4XD	0.8XD	70	0,009	0,014	0,018	0,023	0,027	0,036	0,054	0,063
M3	0.8XD	0.4XD	0.8XD	65	0,009	0,014	0,018	0,023	0,027	0,036	0,054	0,063
K1	0.8XD	0.5XD	0.8XD	180	0,020	0,025	0,030	0,040	0,060	0,060	0,100	0,120
K2	0.8XD	0.5XD	0.8XD	160	0,020	0,025	0,030	0,040	0,060	0,060	0,100	0,120
N1	0.8XD	0.5XD	0.8XD	200	0,022	0,028	0,033	0,044	0,066	0,066	0,110	0,132
N2	0.8XD	0.5XD	0.8XD	200	0,022	0,028	0,033	0,044	0,066	0,066	0,110	0,132
S1	0.8XD	0.5XD	0.8XD	90	0,011	0,017	0,022	0,028	0,033	0,044	0,066	0,077
S2	0.8XD	0.4XD	0.8XD	70	0,009	0,014	0,018	0,023	0,027	0,036	0,054	0,063
S3	0.8XD	0.2XD	0.25XD	40	0,006	0,007	0,010	0,010	0,015	0,020	0,030	0,035
S4	0.8XD	0.25XD	0.3XD	60	0,007	0,008	0,010	0,015	0,020	0,025	0,040	0,045
H1	0.8XD	0.4XD	0.8XD	120	0,015	0,020	0,025	0,030	0,040	0,045	0,080	0,100
H2	0.8XD	0.25XD	0.3XD	60	0,007	0,008	0,010	0,015	0,020	0,025	0,040	0,045
H3	0.8XD	0.2XD	0.25XD	40	0,006	0,007	0,010	0,010	0,015	0,020	0,030	0,035
H4	0.8XD	0.2XD	0.25XD	35	0,006	0,007	0,010	0,010	0,015	0,020	0,030	0,035

These guidelines may require possible variations to achieve optimum results.

F3BS...BDK/L35..

				Reduce speed by 20% for slotting applications							
	Application			Vc KC633M	Recommended fz- Feed Per Tooth (mm/th) for side cutting operations. For slotting operations, reduce fz by 20%.						
	Side Milling		Slotting		D1 - Diameter (mm)						
Group	ap	ae	ap	m/min	6	8	10	12	14	16	20
P2	1XD	0.5XD	1XD	165	0,030	0,036	0,041	0,061	0,061	0,061	0,066
P3	1XD	0.5XD	1XD	150	0,030	0,036	0,041	0,061	0,061	0,061	0,066
M1	1XD	0.5XD	1XD	120	0,030	0,036	0,041	0,061	0,061	0,061	0,066
M2	1XD	0.5XD	1XD	80	0,020	0,025	0,030	0,041	0,043	0,046	0,051
M3	1XD	0.5XD	1XD	70	0,020	0,025	0,030	0,041	0,043	0,046	0,051

F3/4BH/J...BDL30...

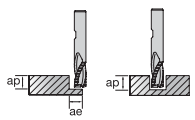


Reduce speed by 20% for slotting applications



	Application			Vc KC633M	Recommended fz- Feed Per Tooth (mm/th) for side cutting operations. For slotting operations, reduce fz by 20%. D1 - Diameter (mm)						
	Side Milling		Slotting								
Group	ap	ae	ap	m/min	6	8	10	12	16	20	25
P2	1XD	0.5XD	1XD	145	0,030	0,040	0,050	0,050	0,061	0,080	0,090
P3	1XD	0.5XD	1XD	135	0,030	0,040	0,050	0,050	0,061	0,080	0,090
P4	1XD	0.5XD	1XD	120	0,030	0,040	0,050	0,050	0,061	0,080	0,090
P5	1XD	0.5XD	1XD	70	0,020	0,030	0,041	0,045	0,050	0,061	0,080
P6	1XD	0.5XD	1XD	70	0,020	0,030	0,041	0,045	0,050	0,061	0,080
M1	1XD	0.5XD	1XD	85	0,030	0,036	0,041	0,061	0,061	0,061	0,066
M2	1XD	0.5XD	1XD	70	0,020	0,030	0,041	0,045	0,050	0,061	0,080

F4/6BJ...BDL45...

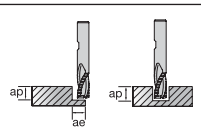


Reduce speed by 20% for slotting applications



	Application			Vc KC633M	Recommended fz- Feed Per Tooth (mm/th) for side cutting operations. For slotting operations, reduce fz by 20%. D1 - Diameter (mm)						
	Side Milling		Slotting								
Group	ap	ae	ap	m/min	6	8	10	12	16	20	25
P2	1XD	0.5XD	1XD	145	0,030	0,040	0,050	0,050	0,061	0,080	0,090
P3	1XD	0.5XD	1XD	135	0,030	0,040	0,050	0,050	0,061	0,080	0,090
P4	1XD	0.5XD	1XD	120	0,030	0,040	0,050	0,050	0,061	0,080	0,090
P5	1XD	0.5XD	1XD	70	0,020	0,030	0,041	0,045	0,050	0,061	0,080
P6	1XD	0.5XD	1XD	70	0,020	0,030	0,041	0,045	0,050	0,061	0,080
M1	1XD	0.5XD	1XD	85	0,030	0,036	0,041	0,061	0,061	0,061	0,066
M2	1XD	0.5XD	1XD	70	0,020	0,030	0,041	0,045	0,050	0,061	0,080

F3/4/5BH...BDL30...



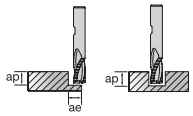
Reduce speed by 20% for slotting applications



	Application			Vc KC643M	Recommended fz- Feed Per Tooth (mm/th) for side cutting operations. For slotting operations, reduce fz by 20%. D1 - Diameter (mm)										
	Side Milling		Slotting												
Group	ap	ae	ap	m/min	4	5	6	8	10	12	14	16	18	20	25
P2	1XD	0.5XD	1XD	180~220	0,025	0,028	0,030	0,035	0,045	0,050	0,052	0,055	0,065	0,080	0,100
P3	1XD	0.5XD	1XD	160~200	0,025	0,028	0,030	0,035	0,045	0,050	0,052	0,055	0,065	0,080	0,100
P4	1XD	0.3XD	1XD	120~160	0,020	0,022	0,025	0,030	0,040	0,045	0,050	0,060	0,062	0,066	0,070
P5	1XD	0.3XD	1XD	120~160	0,020	0,022	0,025	0,030	0,040	0,045	0,050	0,060	0,062	0,066	0,070
P6	1XD	0.3XD	1XD	110~150	0,020	0,022	0,025	0,030	0,040	0,045	0,050	0,060	0,062	0,066	0,070
K1	1XD	0.5XD	1XD	120~180	0,030	0,032	0,035	0,040	0,045	0,050	0,051	0,052	0,053	0,055	0,060
K2	1XD	0.5XD	1XD	110~170	0,030	0,032	0,035	0,040	0,045	0,050	0,051	0,052	0,053	0,055	0,060

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F4/6BJ...BDL45L...

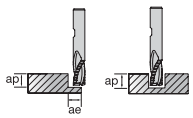


Reduce speed by 20% for slotting applications

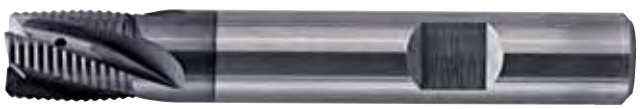


	Application			Vc KC633M	Recommended fz- Feed Per Tooth (mm/th) for side cutting operations. For slotting operations, reduce fz by 20%. D1 - Diameter (mm)						
	Side Milling		Slotting								
Group	ap	ae	ap	m/min	6	8	10	12	16	20	25
P4	1.5XD	0.4XD	0.5XD	150	0,020	0,025	0,030	0,040	0,050	0,065	0,070
P5	1.5XD	0.4XD	0.5XD	100	0,014	0,018	0,023	0,027	0,036	0,045	0,050
P6	1.5XD	0.4XD	0.5XD	100	0,014	0,018	0,023	0,027	0,036	0,045	0,050
M1	1.5XD	0.4XD	0.5XD	100	0,014	0,018	0,023	0,027	0,036	0,045	0,050
K1	1.5XD	0.5XD	0.5XD	150	0,020	0,025	0,030	0,040	0,050	0,065	0,070
K2	1.5XD	0.5XD	0.5XD	135	0,020	0,025	0,030	0,040	0,050	0,065	0,070
H1	1.5XD	0.4XD	0.5XD	150	0,020	0,025	0,030	0,040	0,050	0,065	0,070
H2	1.5XD	0.33XD	0.5XD	110	0,015	0,020	0,025	0,030	0,040	0,050	0,055
H3	1.5XD	0.25XD	0.3XD	90	0,010	0,015	0,020	0,025	0,030	0,040	0,045
H4	1.5XD	0.25XD	0.3XD	65	0,010	0,015	0,020	0,025	0,030	0,040	0,045

F3/4B/JH...BWS/M/L/X20C...

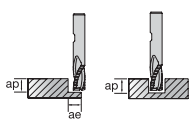


Reduce speed by 20% for slotting applications



	Application			Vc KC633M	Recommended fz- Feed Per Tooth (mm/th) for side cutting operations. For slotting operations, reduce fz by 20%. D1 - Diameter (mm)				
	Side Milling		Slotting						
Group	ap	ae	ap	m/min	8	10	12	16	20
P2	1.5XD	0.4XD	0.75XD	200	0,030	0,040	0,045	0,060	0,080
P3	1.5XD	0.4XD	0.75XD	180	0,030	0,040	0,045	0,060	0,080
P4	1.5XD	0.4XD	0.6XD	120	0,022	0,027	0,032	0,042	0,047
P5	1.5XD	0.4XD	0.6XD	120	0,022	0,027	0,032	0,042	0,047
P6	1.5XD	0.4XD	0.6XD	120	0,022	0,027	0,032	0,042	0,047
K1	1.5XD	0.5XD	1XD	180	0,036	0,048	0,054	0,072	0,096
K2	1.5XD	0.5XD	1XD	165	0,036	0,048	0,054	0,072	0,096

F3/4/5BH/J...BWS/M/L/X20L...

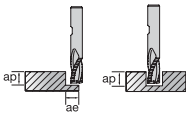


Reduce speed by 20% for slotting applications

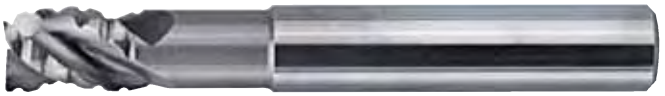


	Application			Vc KC633M	Recommended fz- Feed Per Tooth (mm/th) for side cutting operations. For slotting operations, reduce fz by 20%. D1 - Diameter (mm)									
	Side Milling		Slotting											
Group	ap	ae	ap	m/min	4	5	6	8	10	12	14	16	20	25
P2	1.5XD	0.4XD	0.75XD	180	0,020	0,022	0,025	0,030	0,040	0,045	0,052	0,060	0,080	0,100
P3	1.5XD	0.4XD	0.75XD	180	0,020	0,022	0,025	0,030	0,040	0,045	0,052	0,060	0,080	0,100
P4	1.5XD	0.4XD	0.6XD	120	0,013	0,015	0,017	0,022	0,027	0,032	0,037	0,042	0,047	0,052
P5	1.5XD	0.4XD	0.6XD	120	0,013	0,015	0,017	0,022	0,027	0,032	0,037	0,042	0,047	0,052
P6	1.5XD	0.4XD	0.6XD	120	0,013	0,015	0,017	0,022	0,027	0,032	0,037	0,042	0,047	0,052
K1	1.5XD	0.5XD	1XD	180	0,020	0,025	0,030	0,036	0,048	0,054	0,062	0,072	0,096	0,120
K2	1.5XD	0.5XD	1XD	165	0,020	0,025	0,030	0,036	0,048	0,054	0,062	0,072	0,096	0,120

F3BA...ADL40E...



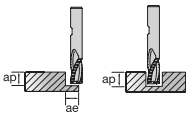
Reduce speed by 20% for slotting applications



	Application			Vc K600	Recommended fz- Feed Per Tooth (mm/th) for side cutting operations. For slotting operations, reduce fz by 20%. D1 - Diameter (mm)					
	Side Milling		Slotting							
Group	ap	ae	ap	m/min	6	8	10	12	16	20
N1	1XD	0.5XD	1XD	250~1000	0,071	0,120	0,150	0,170	0,200	0,220
N2	1XD	0.5XD	1XD	250~1000	0,071	0,120	0,150	0,170	0,200	0,220

These guidelines may require possible variations to achieve optimum results.

F3BA...BWS/M/L/X30...

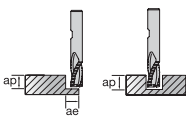


Reduce speed by 20% for slotting applications



	Application			Vc K600	Recommended fz- Feed Per Tooth (mm/th) for side cutting operations. For slotting operations, reduce fz by 20%. D1 - Diameter (mm)						
	Side Milling		Slotting								
Group	ap	ae	ap	m/min	6	8	10	12	16	20	25
N1	1.5XD	0.5XD	1XD	250~1000	0,054	0,069	0,085	0,100	0,131	0,162	0,200
N2	1.5XD	0.5XD	1XD	150~250	0,045	0,058	0,071	0,083	0,109	0,135	0,167

F3BA..BWM/L/X30C...

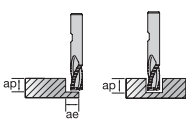


Reduce speed by 20% for slotting applications



	Application			Vc K600	Recommended fz- Feed Per Tooth (mm/th) for side cutting operations. For slotting operations, reduce fz by 20%. D1 - Diameter (mm)					
	Side Milling		Slotting							
Group	ap	ae	ap	m/min	8	10	12	16	20	25
N1	1.5XD	0.5XD	1XD	250~1000	0,069	0,085	0,100	0,131	0,162	0,200
N2	1.5XD	0.5XD	1XD	150~250	0,058	0,071	0,083	0,109	0,135	0,167

F4BS...AWM/L/X38R...



Reduce speed by 20% for slotting applications



	Application			Vc KC633M	Recommended fz- Feed Per Tooth (mm/th) for side cutting operations. For slotting operations, reduce fz by 20%. D1 - Diameter (mm)										
	Side Milling		Slotting												
Group	ap	ae	ap	m/min	4	5	6	8	10	12	14	16	18	20	25
P2	1xD	0.5XD	1xD	200	0,025	0,030	0,040	0,060	0,060	0,070	0,072	0,075	0,080	0,090	1,090
P3	1xD	0.5XD	1xD	180	0,025	0,030	0,040	0,060	0,060	0,070	0,072	0,075	0,080	0,090	1,090
P4	1xD	0.5XD	1xD	150	0,023	0,027	0,036	0,054	0,054	0,063	0,065	0,068	0,072	0,081	0,981
P5	1xD	0.5XD	1xD	60~80	0,015	0,025	0,030	0,040	0,045	0,050	0,052	0,055	0,060	0,060	0,060
P6	1xD	0.5XD	1xD	60~80	0,015	0,025	0,030	0,040	0,045	0,050	0,052	0,055	0,060	0,060	0,060
M1	1xD	0.5XD	1xD	90~115	0,025	0,030	0,040	0,050	0,060	0,065	0,067	0,070	0,072	0,075	0,075
M2	1xD	0.5XD	1xD	60~80	0,015	0,025	0,030	0,040	0,045	0,050	0,052	0,055	0,060	0,060	0,060
M3	1xD	0.5XD	1xD	60~80	0,015	0,025	0,030	0,040	0,045	0,050	0,052	0,055	0,060	0,060	0,060
K1	1xD	0.5XD	1xD	120~150	0,025	0,030	0,040	0,060	0,060	0,070	0,072	0,075	0,080	0,090	0,100
K2	1xD	0.5XD	1xD	110~140	0,025	0,030	0,040	0,060	0,060	0,070	0,072	0,075	0,080	0,090	0,100
S1	1xD	0.5XD	1xD	90~115	0,025	0,030	0,040	0,050	0,060	0,065	0,067	0,070	0,072	0,075	0,075
S2	1xD	0.5XD	1xD	60~80	0,015	0,025	0,030	0,040	0,045	0,050	0,052	0,055	0,060	0,060	0,060
S3	1xD	0.2XD	0.3XD	25~35	0,011	0,011	0,017	0,027	0,027	0,038	0,043	0,049	0,055	0,055	0,055
S4	1xD	0.5XD	1xD	50~60	0,012	0,015	0,020	0,030	0,030	0,040	0,042	0,045	0,050	0,060	0,070

KENNAMETAL®
Engineering Your Competitive Edge



Ball Nose End Mills — Finishing

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Application Data*. 115*



GMILLING
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MILLINGMI

High-Performance Ball Nose End Mills

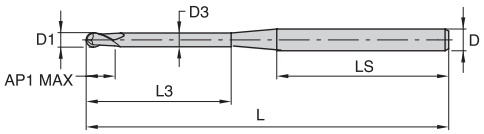
F2AL...WS — Micro — Long Ball Nose — Extended Neck

Features

- Factory standard.
- Plain shank.
- Ball nose.

Operations

- Side cutting and 3-dimensional milling.
- For die & mold and medical applications.





2-Flute, 30° Helix

● first choice
○ alternate choice

H	●
S	
N	
K	●
M	
P	●

D1	D3	D	Ap1 max	L3	LS	L	Z U	catalog number	KC637M
0,30	—	6	0,3	—	36	50	2	F2AL0030AWS30L030	●
0,40	—	6	0,4	—	36	50	2	F2AL0040AWS30L040	●
0,50	0,45	6	0,5	2	36	50	2	F2AL0050AWS30L050	●
0,60	0,55	6	0,6	2	36	50	2	F2AL0060AWS30L060	●
0,80	0,75	6	0,8	2	36	50	2	F2AL0080AWS30L080	●
1,00	0,95	6	1,0	3	36	50	2	F2AL0100AWS30L100	●
1,20	1,15	6	1,2	3	36	50	2	F2AL0120AWS30L120	●
1,40	1,35	6	1,4	4	36	50	2	F2AL0140AWS30L140	●
1,50	1,45	6	1,5	4	36	50	2	F2AL0150AWS30L150	●
1,60	1,55	6	1,6	4	36	50	2	F2AL0160AWS30L160	●
1,80	1,75	6	1,8	5	36	50	2	F2AL0180AWS30L180	●
2,00	1,95	6	2,0	5	36	50	2	F2AL0200AWS30L200	●
2,50	2,40	6	2,5	5	36	50	2	F2AL0250AWS30L250	●
3,00	2,85	6	3,0	6	36	50	2	F2AL0300AWS30L300	●
4,00	3,85	6	4,0	6	36	50	2	F2AL0400AWS30L400	●
6,00	5,85	6	6,0	9	36	50	2	F2AL0600AWS30L600	●

For application data, see page 115.

Ordering Example:
F2AL0030AWS30L030 KC637M

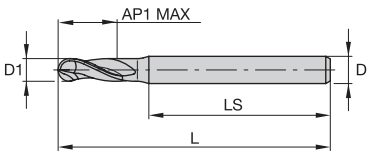
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Features

- Factory standard.
- Plain shank.
- Ball nose.

Operations

- Side cutting and 3-dimensional milling.
- For die & mold and medical applications.





● first choice
○ alternate choice

H		●
S		
N		
K		●
M		
P		●

2-Flute, 30° Helix

D1	D	Ap1 max	LS	L	Z U	catalog number	KC637M
0,50	3	1,5	28	38	2	F2AL0050AWS30	●
0,60	3	1,6	28	38	2	F2AL0060AWS30	●
0,80	3	1,8	28	38	2	F2AL0080AWS30	●
1,00	3	2,0	28	38	2	F2AL0100AWS30	●
1,20	3	2,2	28	38	2	F2AL0120AWS30	●
1,50	3	2,5	28	38	2	F2AL0150AWS30	●
2,00	3	3,0	28	38	2	F2AL0200AWS30	●
2,50	3	4,0	28	38	2	F2AL0250AWS30	●
3,00	3	5,0	28	38	2	F2AL0300AWS30	●

For application data, see page 115.

Ordering Example:
F2AL0050AWS30 KC637M

High-Performance Ball Nose End Mills

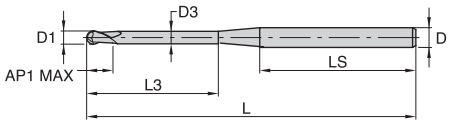
F2AL...WM — Micro — Ball Nose — Extended Neck

Features

- Factory standard.
- Plain shank.
- Ball nose.

Operations

- Side cutting and 3-dimensional milling.
- For die & mold and medical applications.





2-Flute, 30° Helix

● first choice
○ alternate choice

H		●
S		
N		
K		●
M		
P		●

D1	D3	D	Ap1 max	L3	LS	L	Z U	catalog number	KC637M
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0,50	0,46	4	1,0	8	28	65	2	F2AL0050AWM30E080	●
0,60	0,56	4	1,0	6	28	65	2	F2AL0060AWM30E060	●
0,60	0,56	4	1,0	9	28	65	2	F2AL0060AWM30E090	●
0,80	0,76	4	1,3	4	27	65	2	F2AL0080AWM30E040	●
0,80	0,76	4	1,3	8	28	65	2	F2AL0080AWM30E080	●
0,80	0,76	4	1,3	12	28	65	2	F2AL0080AWM30E120	●
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3,00	2,92	4	4,5	30	28	65	2	F2AL0300AWM30E0300	●
4,00	3,92	6	6,0	6	36	70	2	F2AL0400AWM30E060	●
4,00	3,92	6	6,0	10	36	70	2	F2AL0400AWM30E100	●
4,00	3,92	6	6,0	14	36	70	2	F2AL0400AWM30E140	●
4,00	3,92	6	6,0	16	36	70	2	F2AL0400AWM30E160	●

For application data, see page 120.

Ordering Example:
F2AL0050AWS30 KC637M

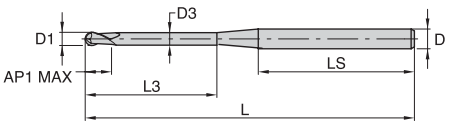
To place an order, contact Kennametal or your authorized Kennametal distributor, or visit www.kennametal.com.

Features

- Factory standard.
- Plain shank.
- Ball nose.

Operations

- Side cutting, slotting, and 3-dimensional milling.
- For die & mold applications.





2-Flute, 30° Helix

● first choice
○ alternate choice

H	
S	
N	●
K	
M	
P	

D1	D3	D	Ap1 max	L3	LS	L	Z U	catalog number	KDF310
0,50	0,47	3	0,7	4	28	40	2	F2AL0050AWS30E040	●
1,00	0,97	3	1,5	15	28	40	2	F2AL0100AWS30E150	●
1,00	0,97	3	1,5	20	28	40	2	F2AL0100AWS30E200	●
1,50	1,47	3	3,0	15	28	50	2	F2AL0150AWS30E150	●
1,50	1,47	3	3,0	30	28	50	2	F2AL0150AWS30E300	●
2,00	1,95	3	4,0	20	28	55	2	F2AL0200AWS30E200	●
2,00	1,95	3	4,0	30	28	55	2	F2AL0200AWS30E300	●
3,00	2,90	3	5,0	30	28	60	2	F2AL0300AWS30E300	●
3,00	2,90	3	5,0	40	28	60	2	F2AL0300AWS30E400	●

For application data, see page 115.

Ordering Example:
F2AL0050AWS30E040 KDF310

High-Performance Ball Nose End Mills

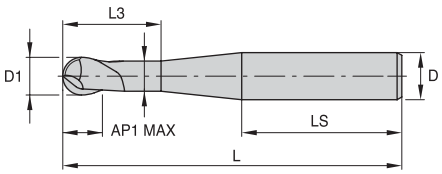
F2AL...WM-WL-WX — Ball Nose with Extended Neck — Diamond-Coated for Graphite

Features

- Factory standard.
- Plain shank.
- Ball nose.

Operations

- Side cutting, slotting, and 3-dimensional milling.
- For die & mold applications.





● first choice
○ alternate choice

H	
S	
N	●
K	
M	
P	

2-Flute, 20° Helix

D1	D3	D	Ap1 max	L3	LS	L	Z U	catalog number	KDF310
2,00	1,90	6	2,0	18	36	70	2	F2AL0200AWM20	●
3,00	2,90	6	3,0	19	36	70	2	F2AL0300AWM20	●
4,00	3,80	6	4,0	20	36	80	2	F2AL0400AWL20	●
5,00	4,80	6	5,0	5	36	80	2	F2AL0500AWL20	●
6,00	5,80	6	6,0	6	36	80	2	F2AL0600AWL20	●
8,00	7,80	8	8,0	8	36	90	2	F2AL0800AWL20	●
10,00	9,70	10	10,0	10	40	100	2	F2AL1000AWL20	●
12,00	11,70	12	12,0	12	45	110	2	F2AL1200AWX20	●

For application data, see page 116.

Ordering Example:
F2AL0200AWM20 KDF310

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

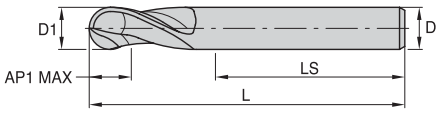
Features

- Factory standard.
- Plain shank.
- Ball nose.

Operations

- Side cutting, slotting, and 3-dimensional milling.
- For die & mold and medical applications.







2-Flute, 30° Helix

● first choice
○ alternate choice

D1	D	Ap1 max	LS	L	Z U	catalog number	KC637M
1,00	4	1,0	28	40	2	F2AL0100AWL30	●
1,50	4	1,5	28	40	2	F2AL0150AWL30	●
2,00	6	2,0	36	45	2	F2AL0200AWL30	●
3,00	6	3,0	36	45	2	F2AL0300AWL30	●
4,00	6	4,0	36	45	2	F2AL0400AWL30	●
5,00	6	5,0	36	50	2	F2AL0500AWL30	●
6,00	6	6,0	36	50	2	F2AL0600AWL30	●
8,00	8	8,0	36	60	2	F2AL0800AWL30	●
10,00	10	10,0	40	70	2	F2AL1000AWM30	●
12,00	12	12,0	45	75	2	F2AL1200AWM30	●
16,00	16	16,0	48	80	2	F2AL1600AWM30	●

For application data, see page 116.

Ordering Example:
F2AL0100AWL30 KC637M

General Application Ball Nose End Mills

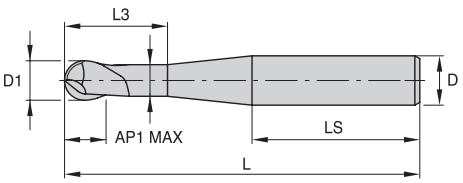
F2AL...WL-WM-WX — Ball Nose with Extended Neck — for Medium and Hardened Steels

Features

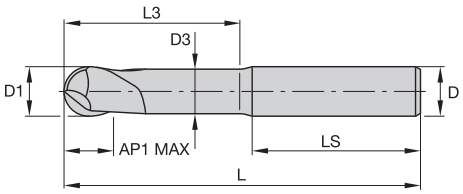
- Factory standard.
- Plain shank.
- Ball nose.

Operations

- Side cutting, slotting, and 3-dimensional milling.
- For die & mold and medical applications.



smaller than 6 mm



6 mm or larger



2-Flute, 20° Helix

● first choice
○ alternate choice

H	S	N	K	M	P
●			●	●	●

D1	D3	D	Ap1 max	L3	LS	L	Z U	catalog number	KC637M
2,00	1,70	6	2,0	18	36	70	2	F2AL0200AWM20	●
3,00	2,50	6	3,0	19	36	70	2	F2AL0300AWM20	●
4,00	3,50	6	4,0	20	36	80	2	F2AL0400AWL20	●
5,00	4,50	6	5,0	44	36	80	2	F2AL0500AWL20	●
6,00	5,50	6	6,0	44	36	80	2	F2AL0600AWL20	●
8,00	7,00	8	8,0	54	36	90	2	F2AL0800AWL20	●
10,00	9,00	10	10,0	60	40	100	2	F2AL1000AWL20	●
12,00	11,00	12	12,0	65	45	110	2	F2AL1200AWX20	●

For application data, see page 117.

Ordering Example:
F2AL0200AWM20 KC637M

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

F2AL...WL-WM-WX — Ball Nose — for Medium and Hardened Steels

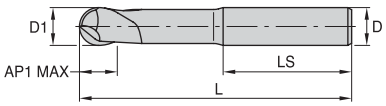
Features

- Factory standard.
- Plain shank.
- Ball nose.

Operations

- Side cutting, slotting, and 3-dimensional milling.
- For die & mold and medical applications.







2-Flute, 30° Helix

● first choice
○ alternate choice

H		●
S		
N		
K		●
M		●
P		●

D1	D	Ap1 max	LS	L	Z U	catalog number	KC637M
6,00	6	6,0	36	80	2	F2AL0600AWM30	●
8,00	8	8,0	36	90	2	F2AL0800AWM30	●
10,00	10	10,0	40	100	2	F2AL1000AWL30	●
12,00	12	12,0	45	110	2	F2AL1200AWX30	●
16,00	16	16,0	48	140	2	F2AL1600AWX30	●

For application data, see page 116.

Ordering Example:
F2AL0600AWM30 KC637M

High-Performance Ball Nose End Mills

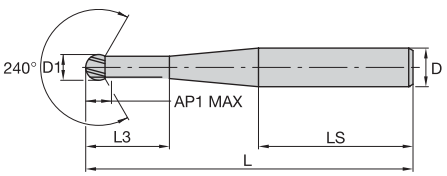
F2AB...WL-WM-WX 240° — Ball Nose — for Medium and Hardened Steels

Features

- Factory standard.
- Plain shank.
- Ball nose.

Operations

- Side cutting and 3-dimensional milling.
- For die & mold and medical applications.





2-Flute, 30° Helix

● first choice
○ alternate choice

D1	D	Ap1 max	L3	LS	L	Z U	catalog number	KC637M
2,00	6	1,0	17	36	70	2	F2AB0200AWM30	●
3,00	6	1,5	18	36	70	2	F2AB0300AWM30	●
4,00	6	2,0	19	36	80	2	F2AB0400AWL30	●
5,00	6	2,5	42	36	80	2	F2AB0500AWL30	●
6,00	6	3,0	42	36	80	2	F2AB0600AWL30	●
8,00	8	4,0	52	36	90	2	F2AB0800AWL30	●
10,00	10	5,0	58	40	100	2	F2AB1000AWL30	●
12,00	12	6,0	63	45	110	2	F2AB1200AWX30	●

For application data, see page 117.

Ordering Example:
F2AB0200AWM30 KC637M

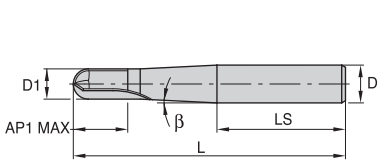
To place an order, contact Kennametal or your authorized Kennametal distributor, or visit www.kennametal.com.

Features

- Factory standard.
- Plain shank.
- Ball nose.

Operations

- Side cutting and 3-dimensional milling.
- For die & mold and medical applications.





2-Flute, 0° Helix

● first choice
○ alternate choice

D1	D	Ap1 max	LS	L	BETA	Z U	catalog number	KC637M
3,00	6	4,0	36	100	1.65	2	F2AL0300AWL00L040	●
3,00	6	4,0	36	75	2.85	2	F2AL0300AWM00L040	●
4,00	6	5,0	36	100	1.18	2	F2AL0400AWL00L050	●
4,00	6	5,0	36	75	2.67	2	F2AL0400AWM00L050	●
5,00	6	6,0	36	75	1.33	2	F2AL0500AWM00L060	●
5,00	8	6,0	36	100	1.75	2	F2AL0500AWL00L060	●
6,00	8	8,0	36	75	2.38	2	F2AL0600AWM00L080	●
6,00	10	8,0	40	100	2.52	2	F2AL0600AWL00L080	●
8,00	10	12,0	40	100	1.52	2	F2AL0800AWL00L120	●
8,00	12	12,0	45	150	1.40	2	F2AL0800AWX00L120	●
10,00	12	15,0	45	100	1.83	2	F2AL1000AWL00L150	●
10,00	12	15,0	45	150	.80	2	F2AL1000AWX00L150	●

For application data, see page 117.

Ordering Example:
F2AL0300AWL00L040 KC637M

High-Performance Ball Nose End Mills

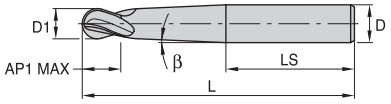
F4AL...WL-WM-WX — Ball Nose — Tapered Neck — for Medium and Hardened Steels

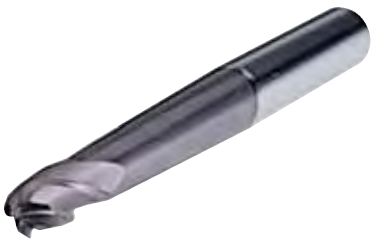
Features

- Factory standard.
- Plain shank.
- Ball nose.

Operations

- Side cutting and 3-dimensional milling.
- For die & mold and medical applications.





4-Flute, 30° Helix

● first choice
○ alternate choice

H	●
S	
N	
K	●
M	●
P	●

D1	D	Ap1 max	LS	L	BETA	Z U	catalog number	KC637M
3,00	6	4,0	36	100	1.65	4	F4AL0300AWL30L040	●
3,00	6	4,0	36	75	2.85	4	F4AL0300AWM30L040	●
4,00	6	5,0	36	100	1.18	4	F4AL0400AWL30L050	●
4,00	6	5,0	36	75	2.67	4	F4AL0400AWM30L050	●
5,00	6	6,0	36	75	1.33	4	F4AL0500AWM30L060	●
5,00	8	6,0	36	100	1.75	4	F4AL0500AWL30L060	●
6,00	8	8,0	36	75	2.38	4	F4AL0600AWM30L080	●
6,00	10	8,0	40	100	2.52	4	F4AL0600AWL30L080	●
8,00	10	12,0	40	100	1.52	4	F4AL0800AWL30L120	●
8,00	12	12,0	45	150	1.40	4	F4AL0800AWX30L120	●
10,00	12	15,0	45	100	1.83	4	F4AL1000AWL30L150	●
10,00	12	15,0	45	150	.80	4	F4AL1000AWX30L150	●

For application data, see page 118.

Ordering Example:
F4AL0300AWL30L040 KC637M

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

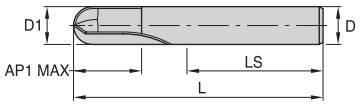
Features

- DIN 6528.
- Plain shank.
- Ball nose.

Operations

- Side cutting and 3-dimensional milling.
- For die & mold and medical applications.







2-Flute, 0° Helix

● first choice
○ alternate choice

H	●
S	
N	
K	●
M	●
P	●

D1	D	Ap1 max	LS	L	Z U	catalog number	KC637M
4,00	4	8,0	28	50	2	F2AL0400AWS00	●
5,00	5	10,0	28	50	2	F2AL0500AWS00	●
6,00	6	10,0	36	57	2	F2AL0600AWS00	●
8,00	8	16,0	36	63	2	F2AL0800AWM00	●
10,00	10	19,0	40	72	2	F2AL1000AWM00	●
12,00	12	22,0	45	83	2	F2AL1200AWL00	●

For application data, see page 118.

Ordering Example:
F2AL0400AWS00 KC637M

General Application Ball Nose End Mills

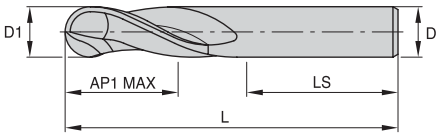
F2AL...DN DIN 6528 — Ball Nose

Features

- DIN 6528.
- Plain shank.
- Ball nose.

Operations

- Side cutting, slotting, and 3-dimensional milling.





2-Flute, 30° Helix

● first choice
○ alternate choice

H	○
S	●
N	
K	●
M	●
P	●

D1	D	Ap1 max	LS	L	Z U	catalog number	KC633M
2,00	2	6,0	20	32	2	F2AL0200ADN30	●
3,00	3	7,0	20	32	2	F2AL0300ADN30	●
4,00	4	8,0	28	50	2	F2AL0400ADN30	●
5,00	5	10,0	28	50	2	F2AL0500ADN30	●
6,00	6	10,0	36	57	2	F2AL0600ADN30	●
8,00	8	16,0	36	63	2	F2AL0800ADN30	●
10,00	10	19,0	40	72	2	F2AL1000ADN30	●
12,00	12	22,0	45	83	2	F2AL1200ADN30	●
16,00	16	26,0	48	92	2	F2AL1600ADN30	●
20,00	20	32,0	32	104	2	F2AL2000ADN30	●

For application data, see page 119.

Ordering Example:
F2AL0200ADN30 KC633M

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

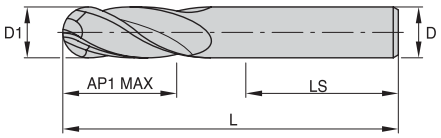
Features

- DIN 6528.
- Plain shank.
- Ball nose.

Operations

- Side cutting, slotting, and 3-dimensional milling.







4-Flute, 30° Helix

● first choice
○ alternate choice

H	○
S	●
N	
K	●
M	●
P	●

D1	D	Ap1 max	LS	L	Z U	catalog number	KC633M
2,00	2	7,0	20	32	4	F4AL0200ADN30	●
3,00	3	8,0	20	32	4	F4AL0300ADN30	●
4,00	4	11,0	28	50	4	F4AL0400ADN30	●
5,00	5	13,0	28	50	4	F4AL0500ADN30	●
6,00	6	13,0	36	57	4	F4AL0600ADN30	●
8,00	8	19,0	36	63	4	F4AL0800ADN30	●
10,00	10	22,0	40	72	4	F4AL1000ADN30	●
12,00	12	26,0	45	83	4	F4AL1200ADN30	●
16,00	16	32,0	48	92	4	F4AL1600ADN30	●
20,00	20	38,0	50	104	4	F4AL2000ADN30	●

For application data, see page 119.

Ordering Example:
F4AL0200ADN30 KC633M

General Application Ball Nose End Mills

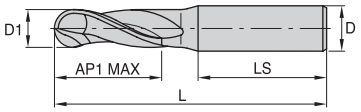
F2AL...DL DIN 6527 — Ball Nose — Long

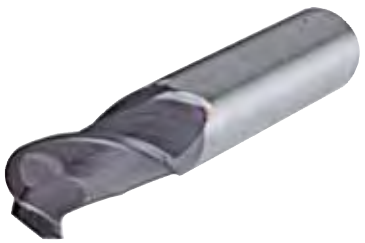
Features

- DIN 6527 long.
- Plain shank.
- Ball nose.

Operations

- Side cutting, slotting, and 3-dimensional milling.





2-Flute, 30° Helix

● first choice
○ alternate choice

H	○
S	●
N	
K	●
M	●
P	●

D1	D	Ap1 max	LS	L	Z U	catalog number	KC633M
2,00	6	6,0	36	57	2	F2AL0200ADL30	●
3,00	6	7,0	36	57	2	F2AL0300ADL30	●
4,00	6	8,0	36	57	2	F2AL0400ADL30	●
5,00	6	10,0	36	57	2	F2AL0500ADL30	●
6,00	6	10,0	36	57	2	F2AL0600ADL30	●
8,00	8	16,0	36	63	2	F2AL0800ADL30	●
10,00	10	19,0	40	72	2	F2AL1000ADL30	●
12,00	12	22,0	45	83	2	F2AL1200ADL30	●
16,00	16	26,0	48	92	2	F2AL1600ADL30	●
20,00	20	32,0	50	104	2	F2AL2000ADL30	●

For application data, see page 120.

Ordering Example:
F2AL0200ADL30 KC633M

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

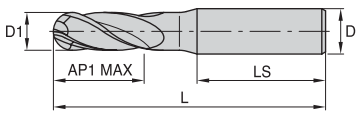
Features

- DIN 6527 long.
- Plain shank.
- Ball nose.

Operations

- Side cutting, slotting, and 3-dimensional milling.

KENNA UNIVERSAL





4-Flute, 30° Helix

● first choice
○ alternate choice

H		○
S		●
N		
K		●
M		●
P		●

D1	D	Ap1 max	LS	L	Z U	catalog number	KC633M
3,00	6	7,0	36	57	4	F4AL0300ADL30	●
4,00	6	8,0	36	57	4	F4AL0400ADL30	●
5,00	6	11,0	36	57	4	F4AL0500ADL30	●
6,00	6	13,0	36	57	4	F4AL0600ADL30	●
8,00	8	19,0	36	63	4	F4AL0800ADL30	●
10,00	10	22,0	40	72	4	F4AL1000ADL30	●
12,00	12	26,0	45	83	4	F4AL1200ADL30	●
14,00	14	26,0	45	83	4	F4AL1400ADL30	●
16,00	16	32,0	48	92	4	F4AL1600ADL30	●
20,00	20	38,0	50	104	4	F4AL2000ADL30	●

For application data, see page 121.

Ordering Example:
F4AL0300ADL30 KC633M

General Application Ball Nose End Mills

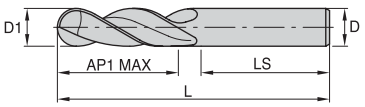
F2AL...WM-WL-WX — Ball Nose— Extra-Long Flute

Features

- Factory standard.
- Plain shank.
- Ball nose.

Operations

- Side cutting, slotting, and 3-dimensional milling.





● first choice
○ alternate choice

	KC633M
H	○
S	●
N	○
K	●
M	●
P	●

2-Flute, 30° Helix

D1	D	Ap1 max	LS	L	Z U	catalog number	KC633M
3,00	3	20,0	28	75	2	F2AL0300AWM30L200	●
4,00	4	25,0	28	75	2	F2AL0400AWM30L250	●
5,00	5	30,0	28	75	2	F2AL0500AWM30L300	●
6,00	6	30,0	36	75	2	F2AL0600AWM30L300	●
8,00	8	40,0	36	100	2	F2AL0800AWL30L400	●
10,00	10	40,0	40	100	2	F2AL1000AWL30L400	●
12,00	12	45,0	45	150	2	F2AL1200AWX30L450	●

For application data, see page 121.

Ordering Example:
F2AL0300AWM30L200 KC633M

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

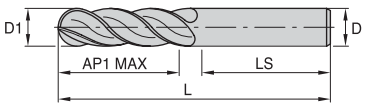
Features

- Factory standard.
- Plain shank.
- Ball nose.

Operations

- Side cutting and 3-dimensional milling.







4-Flute, 30° Helix

● first choice
○ alternate choice

H	○
S	●
N	○
K	●
M	●
P	●

D1	D	Ap1 max	LS	L	Z U	catalog number	KC633M
3,00	3	20,0	28	75	4	F4AL0300AWM30L200	●
4,00	4	25,0	28	75	4	F4AL0400AWM30L250	●
5,00	5	30,0	28	75	4	F4AL0500AWM30L300	●
6,00	6	30,0	36	75	4	F4AL0600AWM30L300	●
8,00	8	40,0	36	100	4	F4AL0800AWL30L400	●
10,00	10	40,0	40	100	4	F4AL1000AWL30L400	●
12,00	12	45,0	45	150	4	F4AL1200AWX30L450	●

For application data, see page 121.

Ordering Example:
F4AL0300AWM30L200 KC633M

High-Performance Ball Nose End Mills

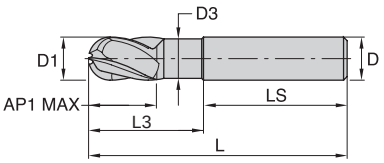
F3AW...WL-WX — Ball Nose — Extended Neck — for Soft Steels and Stainless Steels

Features

- Factory standard.
- Plain shank.
- Ball nose.

Operations

- Side cutting, slotting, and 3-dimensional milling.
- For die & mold and aerospace applications.





3-Flute, 35° Helix

● first choice
○ alternate choice

	KC633M
H	
S	○
N	
K	
M	●
P	●

D1	D3	D	Ap1 max	L3	LS	L	Z U	catalog number	KC633M
6,00	5,80	6	6,0	12	64	76	3	F3AW0600AWL35E120	●
8,00	7,80	8	8,0	16	84	100	3	F3AW0800AWL35E160	●
10,00	9,50	10	10,0	20	102	122	3	F3AW1000AWX35E200	●
12,00	11,50	12	12,0	24	101	125	3	F3AW1200AWX35E240	●
16,00	15,00	16	16,0	32	118	150	3	F3AW1600AWX35E320	●

For application data, see page 122.

Ordering Example:
F3AW0600AWL35E120 KC633M

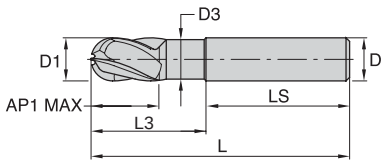
To place an order, contact Kennametal or your authorized Kennametal distributor, or visit www.kennametal.com.

Features

- Factory standard.
- Plain shank.
- Ball nose.

Operations

- Side cutting, slotting, and 3-dimensional milling.
- For die & mold and aerospace applications.





4-Flute, 38° Helix

● first choice
○ alternate choice

D1	D3	D	Ap1 max	L3	LS	L	Z U	catalog number	KC633M
6,00	5,80	6	6,0	12	64	76	4	F4AW0600AWL38E120	●
8,00	7,80	8	8,0	16	84	100	4	F4AW0800AWL38E160	●
10,00	9,50	10	10,0	20	102	122	4	F4AW1000AWX38E200	●
12,00	11,50	12	12,0	24	101	125	4	F4AW1200AWX38E240	●
16,00	15,00	16	16,0	32	118	150	4	F4AW1600AWX38E320	●

For application data, see page 122.

Ordering Example:
F4AW0600AWL38E120 KC633M

High-Performance Ball Nose Roughing End Mills

KENNAMETAL

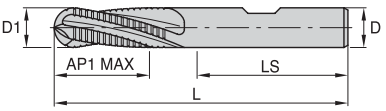
F3BL-F4BL...WS-WM-WL-WX — Ball Nose — for General Steels

Features

- Factory standard.
- Weldon shank.
- Ball nose.
- Roughing profile.

Operations

- Side cutting, slotting, and 3-dimensional milling.
- For general engineering applications.





3 & 4-Flute, 20° Helix

● first choice
○ alternate choice

H		
S		○
N		
K		○
M		○
P		○

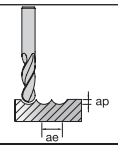
D1	D	Ap1 max	LS	L	Z U	catalog number	KC633M
6,00	6	13,0	38	57	3	F3BL0600BWS20	●
8,00	8	16,0	41	63	3	F3BL0800BWM20	●
10,00	10	22,0	45	72	4	F4BL1000BWM20	●
12,00	12	26,0	52	83	4	F4BL1200BWL20	●
14,00	14	26,0	50	83	4	F4BL1400BWL20	●
16,00	16	32,0	53	92	4	F4BL1600BWL20	●
20,00	20	38,0	54	104	4	F4BL2000BWX20	●

For application data, see page 122.

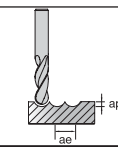
Ordering Example:
F3BL0600BWS20 KC633M

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

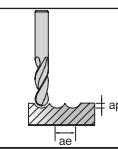
F2AL...AWS30L...

			Reduce speed by 20% for slotting applications															
	Application		Vc KC637M	Recommended fz- Feed Per Tooth (mm/th) for side cutting operations. For slotting operations, reduce fz by 20%.														
	3D Milling			D1 - Diameter (mm)														
Group	ap	ae	m/min	0,3	0,4	0,5	0,6	0,8	1,0	1,2	1,4	1,5	1,6	1,8	2,0	2,5	3,0	4,0	6,0
P2	0.2XD	0.05XD~0.1XD	60~200	0,008	0,009	0,010	0,011	0,013	0,015	0,017	0,019	0,022	0,025	0,027	0,030	0,031	0,032	0,040	0,050
P3	0.2XD	0.05XD~0.1XD	40~150	0,008	0,009	0,010	0,011	0,013	0,015	0,017	0,019	0,022	0,025	0,027	0,030	0,031	0,032	0,040	0,050
P4	0.2XD	0.05XD~0.1XD	40~120	0,007	0,008	0,009	0,010	0,012	0,013	0,015	0,017	0,020	0,022	0,023	0,025	0,027	0,030	0,040	0,050
P5	0.2XD	0.05XD~0.1XD	40~120	0,007	0,008	0,009	0,010	0,012	0,013	0,015	0,017	0,020	0,022	0,023	0,025	0,027	0,030	0,040	0,050
P6	0.2XD	0.05XD~0.1XD	40~120	0,007	0,008	0,009	0,010	0,012	0,013	0,015	0,017	0,020	0,022	0,023	0,025	0,027	0,030	0,040	0,050
K1	0.2XD	0.05XD~0.1XD	40~150	0,008	0,009	0,010	0,011	0,013	0,015	0,017	0,019	0,022	0,025	0,027	0,030	0,031	0,032	0,040	0,050
K2	0.2XD	0.05XD~0.1XD	40~150	0,008	0,009	0,010	0,011	0,013	0,015	0,017	0,019	0,022	0,025	0,027	0,030	0,031	0,032	0,040	0,050
H1	0.2XD	0.05XD~0.1XD	40~120	0,007	0,008	0,009	0,010	0,012	0,013	0,015	0,017	0,020	0,022	0,023	0,025	0,027	0,030	0,040	0,050
H2	0.2XD	0.05XD~0.1XD	40~100	0,004	0,005	0,006	0,007	0,010	0,012	0,013	0,014	0,015	0,017	0,019	0,020	0,023	0,025	0,030	0,040
H3	0.2XD	0.05XD~0.1XD	40~80	0,002	0,004	0,005	0,006	0,008	0,010	0,012	0,013	0,014	0,016	0,017	0,018	0,020	0,022	0,030	0,040
H4	0.2XD	0.05XD~0.1XD	40~60	0,002	0,004	0,005	0,006	0,008	0,010	0,012	0,013	0,014	0,016	0,017	0,018	0,020	0,022	0,030	0,040

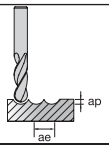
F2AL...AWS30...

			Reduce speed by 20% for slotting applications								
	Application		Vc KC637M	Recommended fz- Feed Per Tooth (mm/th) for side cutting operations. For slotting operations, reduce fz by 20%.							
	3D Milling			D1 - Diameter (mm)							
Group	ap	ae	m/min	0,5	0,6	0,8	1,0	1,2	1,5	2,0	2,5	3,0
P2	0.05XD	0.05XD	140	0,020	0,020	0,020	0,020	0,020	0,020	0,050	0,050	0,050
P3	0.05XD	0.05XD	120	0,020	0,020	0,020	0,020	0,020	0,020	0,050	0,050	0,050
P4	0.05XD	0.05XD	100	0,020	0,020	0,020	0,020	0,020	0,020	0,050	0,050	0,050
P5	0.05XD	0.05XD	120	0,020	0,020	0,020	0,020	0,020	0,020	0,050	0,050	0,050
P6	0.05XD	0.05XD	100	0,020	0,020	0,020	0,020	0,020	0,020	0,050	0,050	0,050
K1	0.05XD	0.05XD	170	0,020	0,020	0,020	0,020	0,020	0,020	0,050	0,050	0,050
K2	0.05XD	0.05XD	150	0,020	0,020	0,020	0,020	0,020	0,020	0,050	0,050	0,050
H1	0.05XD	0.05XD	100	0,020	0,020	0,020	0,020	0,020	0,020	0,050	0,050	0,050
H2	0.05XD	0.05XD	90	0,010	0,010	0,010	0,010	0,010	0,010	0,030	0,030	0,030
H3	0.05XD	0.05XD	60	0,010	0,010	0,010	0,010	0,010	0,010	0,030	0,030	0,030
H4	0.05XD	0.05XD	40	0,010	0,010	0,010	0,010	0,010	0,010	0,030	0,030	0,030

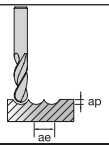
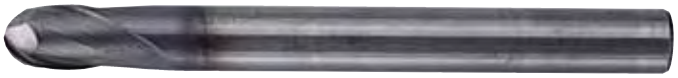
F2AL...AWS30E...

			Reduce speed by 20% for slotting applications					
	Application		Vc KDF310	Recommended fz- Feed Per Tooth (mm/th) for side cutting operations. For slotting operations, reduce fz by 20%.				
	3D Milling			D1 - Diameter (mm)				
Group	ap	ae	m/min	0,5	1,0	1,5	2,0	3,0
N2	0.05XD	0.05XD	400~800	0,020	0,020	0,020	0,050	0,050

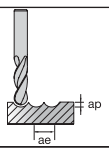
F2AL...AWM/L/X20...

			Reduce speed by 20% for slotting applications								
	Application 3D Milling		Vc KDF310	Recommended fz- Feed Per Tooth (mm/th) for side cutting operations. For slotting operations, reduce fz by 20%. D1 - Diameter (mm)							
Group	ap	ae	m/min	2	3	4	5	6	8	10	12
N2	0.05XD	0.05XD	400~800	0,050	0,050	0,080	0,080	0,120	0,180	0,180	0,220

F2AL...AWL/M30..

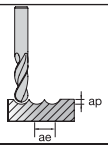
			Reduce speed by 20% for slotting applications										
	Application 3D Milling		Vc KC637M	Recommended fz- Feed Per Tooth (mm/th) for side cutting operations. For slotting operations, reduce fz by 20%. D1 - Diameter (mm)									
Group	ap	ae	m/min	1	2	3	4	5	6	8	10	12	16
P4	0.05XD	0.05XD	250	0,020	0,050	0,050	0,080	0,080	0,120	0,120	0,180	0,220	0,270
P5	0.05XD	0.05XD	170	0,010	0,030	0,030	0,050	0,050	0,080	0,120	0,120	0,150	0,210
P6	0.05XD	0.05XD	170	0,010	0,030	0,030	0,050	0,050	0,080	0,120	0,120	0,150	0,210
M1	0.05XD	0.05XD	200	0,010	0,030	0,030	0,050	0,050	0,080	0,120	0,120	0,150	0,210
K1	0.05XD	0.05XD	430	0,020	0,050	0,050	0,080	0,080	0,120	0,120	0,180	0,220	0,270
K2	0.05XD	0.05XD	400	0,020	0,050	0,050	0,080	0,080	0,120	0,120	0,180	0,220	0,270
H1	0.05XD	0.05XD	250	0,020	0,050	0,050	0,080	0,080	0,120	0,120	0,180	0,220	0,270
H2	0.05XD	0.05XD	200	0,010	0,030	0,030	0,050	0,050	0,080	0,120	0,120	0,150	0,210
H3	0.05XD	0.05XD	160	0,010	0,030	0,030	0,050	0,050	0,080	0,120	0,120	0,150	0,210
H4	0.05XD	0.05XD	115	0,010	0,030	0,030	0,050	0,050	0,080	0,120	0,120	0,150	0,210

F2AL...AWM/L/X30...

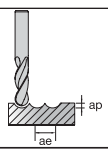
			Reduce speed by 20% for slotting applications					
	Application 3D Milling		Vc KC637M	Recommended fz- Feed Per Tooth (mm/th) for side cutting operations. For slotting operations, reduce fz by 20%. D1 - Diameter (mm)				
Group	ap	ae	m/min	6	8	10	12	16
P4	0.05XD	0.05XD	240	0,090	0,140	0,160	0,180	0,240
P5	0.05XD	0.05XD	160	0,080	0,120	0,130	0,150	0,210
P6	0.05XD	0.05XD	160	0,080	0,120	0,130	0,150	0,210
M1	0.05XD	0.05XD	190	0,080	0,120	0,130	0,150	0,210
K1	0.05XD	0.05XD	410	0,120	0,180	0,200	0,220	0,270
K2	0.05XD	0.05XD	400	0,120	0,180	0,200	0,220	0,270
H1	0.05XD	0.05XD	240	0,090	0,140	0,160	0,180	0,240
H2	0.05XD	0.05XD	190	0,080	0,120	0,130	0,150	0,210
H3	0.05XD	0.05XD	150	0,080	0,120	0,130	0,150	0,210
H4	0.05XD	0.05XD	105	0,080	0,120	0,130	0,150	0,210

These guidelines may require possible variations to achieve optimum results.

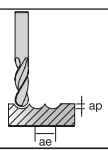
F2AL...AWM/L/X20...

			Reduce speed by 20% for slotting applications					
	Application 3D Milling		Vc KC637M	Recommended fz- Feed Per Tooth (mm/th) for side cutting operations. For slotting operations, reduce fz by 20%. D1 - Diameter (mm)				
Group	ap	ae	m/min	6	8	10	12	16
P4	0.05XD	0.05XD	240	0,090	0,140	0,160	0,180	0,240
P5	0.05XD	0.05XD	160	0,080	0,120	0,130	0,150	0,210
P6	0.05XD	0.05XD	160	0,080	0,120	0,130	0,150	0,210
M1	0.05XD	0.05XD	190	0,080	0,120	0,130	0,150	0,210
K1	0.05XD	0.05XD	410	0,120	0,180	0,200	0,220	0,270
K2	0.05XD	0.05XD	400	0,120	0,180	0,200	0,220	0,270
H1	0.05XD	0.05XD	240	0,090	0,140	0,160	0,180	0,240
H2	0.05XD	0.05XD	190	0,080	0,120	0,130	0,150	0,210
H3	0.05XD	0.05XD	150	0,080	0,120	0,130	0,150	0,210
H4	0.05XD	0.05XD	105	0,080	0,120	0,130	0,150	0,210

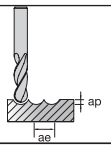
F2AB...AWM/L/X30...

			Reduce speed by 20% for slotting applications						
	Application 3D Milling		Vc KC637M	Recommended fz- Feed Per Tooth (mm/th) for side cutting operations. For slotting operations, reduce fz by 20%. D1 - Diameter (mm)					
Group	ap	ae	m/min	2	4	6	8	10	12
P4	0.05XD	0.05XD	240	0,070	0,080	0,090	0,140	0,160	0,180
P5	0.05XD	0.05XD	160	0,060	0,070	0,080	0,120	0,130	0,150
P6	0.05XD	0.05XD	160	0,060	0,070	0,080	0,120	0,130	0,150
M1	0.05XD	0.05XD	190	0,060	0,070	0,080	0,120	0,130	0,150
K1	0.05XD	0.05XD	410	0,100	0,110	0,120	0,180	0,200	0,220
K2	0.05XD	0.05XD	400	0,100	0,110	0,120	0,180	0,200	0,220
H1	0.05XD	0.05XD	240	0,070	0,080	0,090	0,140	0,160	0,180
H2	0.05XD	0.05XD	190	0,060	0,070	0,080	0,120	0,130	0,150
H3	0.05XD	0.05XD	150	0,060	0,070	0,080	0,120	0,130	0,150
H4	0.05XD	0.05XD	105	0,060	0,070	0,080	0,120	0,130	0,150

F2AL...AWS/M/L00...

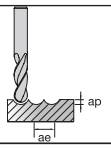
			Reduce speed by 20% for slotting applications						
	Application 3D Milling		Vc KC637M	Recommended fz- Feed Per Tooth (mm/th) for side cutting operations. For slotting operations, reduce fz by 20%. D1 - Diameter (mm)					
Group	ap	ae	m/min	3	4	5	6	8	10
P4	0.05XD	0.05XD	245	0,060	0,060	0,075	0,090	0,140	0,160
P5	0.05XD	0.05XD	160	0,050	0,050	0,065	0,080	0,120	0,135
P6	0.05XD	0.05XD	160	0,050	0,050	0,065	0,080	0,120	0,135
M1	0.05XD	0.05XD	190	0,050	0,050	0,065	0,080	0,120	0,135
K1	0.05XD	0.05XD	410	0,080	0,080	0,100	0,120	0,180	0,200
K2	0.05XD	0.05XD	400	0,080	0,080	0,100	0,120	0,180	0,200
H1	0.05XD	0.05XD	245	0,060	0,060	0,075	0,090	0,140	0,160
H2	0.05XD	0.05XD	190	0,050	0,050	0,065	0,080	0,120	0,135
H3	0.05XD	0.05XD	150	0,050	0,050	0,065	0,080	0,120	0,135
H4	0.05XD	0.05XD	105	0,050	0,050	0,065	0,080	0,120	0,135

F4AL...AWM/L/X30L...

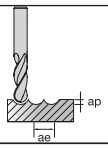
			Reduce speed by 20% for slotting applications						
	Application 3D Milling		Vc KC637M	Recommended fz- Feed Per Tooth (mm/th) for side cutting operations. For slotting operations, reduce fz by 20%. D1 - Diameter (mm)					
Group	ap	ae	m/min	3	4	5	6	8	10
P4	0.05XD	0.05XD	245	0,060	0,060	0,075	0,090	0,140	0,160
P5	0.05XD	0.05XD	160	0,050	0,050	0,065	0,080	0,120	0,135
P6	0.05XD	0.05XD	160	0,050	0,050	0,065	0,080	0,120	0,135
M1	0.05XD	0.05XD	190	0,050	0,050	0,065	0,080	0,120	0,135
K1	0.05XD	0.05XD	410	0,080	0,080	0,100	0,120	0,180	0,200
K2	0.05XD	0.05XD	400	0,080	0,080	0,100	0,120	0,180	0,200
H1	0.05XD	0.05XD	245	0,060	0,060	0,075	0,090	0,140	0,160
H2	0.05XD	0.05XD	190	0,050	0,050	0,065	0,080	0,120	0,135
H3	0.05XD	0.05XD	150	0,050	0,050	0,065	0,080	0,120	0,135
H4	0.05XD	0.05XD	105	0,050	0,050	0,065	0,080	0,120	0,135

These guidelines may require possible variations to achieve optimum results.

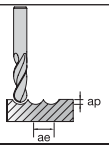
F2AL...AWS/M/L00...

			Reduce speed by 20% for slotting applications						
	Application 3D Milling		Vc KC637M	Recommended fz- Feed Per Tooth (mm/th) for side cutting operations. For slotting operations, reduce fz by 20%. D1 - Diameter (mm)					
Group	ap	ae	m/min	4	5	6	8	10	12
P4	0.05XD	0.05XD	260	0,060	0,075	0,090	0,140	0,160	0,180
P5	0.05XD	0.05XD	170	0,050	0,065	0,080	0,120	0,135	0,150
P6	0.05XD	0.05XD	170	0,050	0,065	0,080	0,120	0,135	0,150
M1	0.05XD	0.05XD	200	0,050	0,065	0,080	0,120	0,135	0,150
K1	0.05XD	0.05XD	430	0,080	0,100	0,120	0,180	0,200	0,220
K2	0.05XD	0.05XD	410	0,080	0,100	0,120	0,180	0,200	0,220
H1	0.05XD	0.05XD	260	0,060	0,075	0,090	0,140	0,160	0,180
H2	0.05XD	0.05XD	200	0,050	0,065	0,080	0,120	0,135	0,150
H3	0.05XD	0.05XD	160	0,050	0,065	0,080	0,120	0,135	0,150
H4	0.05XD	0.05XD	115	0,050	0,065	0,080	0,120	0,135	0,150

F2/4AL...ADN30...

			Reduce speed by 20% for slotting applications										
	Application		Vc KC633M	Recommended fz- Feed Per Tooth (mm/th) for side cutting operations. For slotting operations, reduce fz by 20%.									
	3D Milling			D1 - Diameter (mm)									
Group	ap	ae	m/min	2	4	6	8	10	12	14	16	18	20
P2	0.05XD	0.05XD	175	0,050	0,080	0,120	0,180	0,200	0,220	0,250	0,270	0,290	0,300
P3	0.05XD	0.05XD	160	0,050	0,080	0,120	0,180	0,200	0,220	0,250	0,270	0,290	0,300
P4	0.05XD	0.05XD	155	0,050	0,080	0,120	0,180	0,200	0,220	0,250	0,270	0,290	0,300
P5	0.05XD	0.05XD	85	0,030	0,050	0,080	0,120	0,135	0,150	0,190	0,210	0,230	0,250
P6	0.05XD	0.05XD	85	0,030	0,050	0,080	0,120	0,135	0,150	0,190	0,210	0,230	0,250
M1	0.05XD	0.05XD	100	0,030	0,050	0,080	0,120	0,135	0,150	0,190	0,210	0,230	0,250
M2	0.05XD	0.05XD	85	0,030	0,050	0,080	0,120	0,135	0,150	0,190	0,210	0,230	0,250
M3	0.05XD	0.05XD	80	0,030	0,050	0,080	0,120	0,135	0,150	0,190	0,210	0,230	0,250
K1	0.05XD	0.05XD	215	0,050	0,080	0,120	0,180	0,200	0,220	0,250	0,270	0,290	0,300
K2	0.05XD	0.05XD	205	0,050	0,080	0,120	0,180	0,200	0,220	0,250	0,270	0,290	0,300
S1	0.05XD	0.05XD	85	0,030	0,050	0,080	0,120	0,135	0,150	0,190	0,210	0,230	0,250
S2	0.05XD	0.05XD	80	0,030	0,050	0,080	0,120	0,135	0,150	0,190	0,210	0,230	0,250
S3	0.05XD	0.05XD	70	0,030	0,050	0,080	0,120	0,135	0,150	0,190	0,210	0,230	0,250
S4	0.05XD	0.05XD	80	0,030	0,050	0,080	0,120	0,135	0,150	0,190	0,210	0,230	0,250
H1	0.05XD	0.05XD	155	0,050	0,080	0,120	0,180	0,200	0,220	0,250	0,270	0,290	0,300

F2AL...AWM30E...

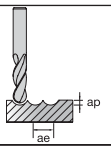


Reduce speed by 20% for slotting applications



	Application		Vc KC637M	Recommended fz- Feed Per Tooth (mm/th) for side cutting operations. For slotting operations, reduce fz by 20%. D1 - Diameter (mm)							
	3D Milling										
Group	ap	ae	m/min	0,5	0,6	0,8	1,0	1,5	2,0	3,0	4,0
P2	0.05XD	0.05XD	140	0,020	0,020	0,020	0,020	0,020	0,050	0,050	0,050
P3	0.05XD	0.05XD	120	0,020	0,020	0,020	0,020	0,020	0,050	0,050	0,050
P4	0.05XD	0.05XD	100	0,020	0,020	0,020	0,020	0,020	0,050	0,050	0,050
P5	0.05XD	0.05XD	120	0,020	0,020	0,020	0,020	0,020	0,050	0,050	0,050
P6	0.05XD	0.05XD	100	0,020	0,020	0,020	0,020	0,020	0,050	0,050	0,050
K1	0.05XD	0.05XD	170	0,020	0,020	0,020	0,020	0,020	0,050	0,050	0,050
K2	0.05XD	0.05XD	150	0,020	0,020	0,020	0,020	0,020	0,050	0,050	0,050
H1	0.05XD	0.05XD	100	0,020	0,020	0,020	0,020	0,020	0,050	0,050	0,050
H2	0.05XD	0.05XD	90	0,010	0,010	0,010	0,010	0,010	0,030	0,030	0,030
H3	0.05XD	0.05XD	60	0,010	0,010	0,010	0,010	0,010	0,030	0,030	0,030
H4	0.05XD	0.05XD	40	0,010	0,010	0,010	0,010	0,010	0,030	0,030	0,030

F2AL...A/BDL30...

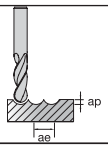


Reduce speed by 20% for slotting applications



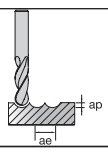
	Application		Vc KC633M	Recommended fz- Feed Per Tooth (mm/th) for side cutting operations. For slotting operations, reduce fz by 20%. D1 - Diameter (mm)									
	3D Milling												
Group	ap	ae	m/min	2	4	6	8	10	12	14	16	18	20
P2	0.05XD	0.05XD	175	0,050	0,080	0,120	0,180	0,200	0,220	0,250	0,270	0,290	0,300
P3	0.05XD	0.05XD	160	0,050	0,080	0,120	0,180	0,200	0,220	0,250	0,270	0,290	0,300
P4	0.05XD	0.05XD	155	0,050	0,080	0,120	0,180	0,200	0,220	0,250	0,270	0,290	0,300
P5	0.05XD	0.05XD	85	0,030	0,050	0,080	0,120	0,135	0,150	0,190	0,210	0,230	0,250
P6	0.05XD	0.05XD	85	0,030	0,050	0,080	0,120	0,135	0,150	0,190	0,210	0,230	0,250
M1	0.05XD	0.05XD	100	0,030	0,050	0,080	0,120	0,135	0,150	0,190	0,210	0,230	0,250
M2	0.05XD	0.05XD	85	0,030	0,050	0,080	0,120	0,135	0,150	0,190	0,210	0,230	0,250
M3	0.05XD	0.05XD	80	0,030	0,050	0,080	0,120	0,135	0,150	0,190	0,210	0,230	0,250
K1	0.05XD	0.05XD	215	0,050	0,080	0,120	0,180	0,200	0,220	0,250	0,270	0,290	0,300
K2	0.05XD	0.05XD	205	0,050	0,080	0,120	0,180	0,200	0,220	0,250	0,270	0,290	0,300
S1	0.05XD	0.05XD	85	0,030	0,050	0,080	0,120	0,135	0,150	0,190	0,210	0,230	0,250
S2	0.05XD	0.05XD	80	0,030	0,050	0,080	0,120	0,135	0,150	0,190	0,210	0,230	0,250
S3	0.05XD	0.05XD	70	0,030	0,050	0,080	0,120	0,135	0,150	0,190	0,210	0,230	0,250
S4	0.05XD	0.05XD	80	0,030	0,050	0,080	0,120	0,135	0,150	0,190	0,210	0,230	0,250
H1	0.05XD	0.05XD	155	0,050	0,080	0,120	0,180	0,200	0,220	0,250	0,270	0,290	0,300

F4AL...A/BDL30...

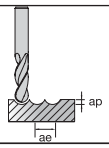
			Reduce speed by 20% for slotting applications										
	Application		Vc KC633M	Recommended fz- Feed Per Tooth (mm/th) for side cutting operations. For slotting operations, reduce fz by 20%.									
	3D Milling			D1 - Diameter (mm)									
Group	ap	ae	m/min	3	4	6	8	10	12	14	16	18	20
P2	0.05XD	0.05XD	175	0,050	0,080	0,120	0,180	0,200	0,220	0,250	0,270	0,290	0,300
P3	0.05XD	0.05XD	160	0,050	0,080	0,120	0,180	0,200	0,220	0,250	0,270	0,290	0,300
P4	0.05XD	0.05XD	155	0,050	0,080	0,120	0,180	0,200	0,220	0,250	0,270	0,290	0,300
P5	0.05XD	0.05XD	85	0,030	0,050	0,080	0,120	0,135	0,150	0,190	0,210	0,230	0,250
P6	0.05XD	0.05XD	85	0,030	0,050	0,080	0,120	0,135	0,150	0,190	0,210	0,230	0,250
M1	0.05XD	0.05XD	100	0,030	0,050	0,080	0,120	0,135	0,150	0,190	0,210	0,230	0,250
M2	0.05XD	0.05XD	85	0,030	0,050	0,080	0,120	0,135	0,150	0,190	0,210	0,230	0,250
M3	0.05XD	0.05XD	80	0,030	0,050	0,080	0,120	0,135	0,150	0,190	0,210	0,230	0,250
K1	0.05XD	0.05XD	215	0,050	0,080	0,120	0,180	0,200	0,220	0,250	0,270	0,290	0,300
K2	0.05XD	0.05XD	205	0,050	0,080	0,120	0,180	0,200	0,220	0,250	0,270	0,290	0,300
S1	0.05XD	0.05XD	85	0,030	0,050	0,080	0,120	0,135	0,150	0,190	0,210	0,230	0,250
S2	0.05XD	0.05XD	80	0,030	0,050	0,080	0,120	0,135	0,150	0,190	0,210	0,230	0,250
S3	0.05XD	0.05XD	70	0,030	0,050	0,080	0,120	0,135	0,150	0,190	0,210	0,230	0,250
S4	0.05XD	0.05XD	80	0,030	0,050	0,080	0,120	0,135	0,150	0,190	0,210	0,230	0,250
H1	0.05XD	0.05XD	155	0,050	0,080	0,120	0,180	0,200	0,220	0,250	0,270	0,290	0,300

These guidelines may require possible variations to achieve optimum results.

F2/4AL...AWM/L/X30L...

			Reduce speed by 20% for slotting applications							
	Application		Vc KC633M	Recommended fz- Feed Per Tooth (mm/th) for side cutting operations. For slotting operations, reduce fz by 20%.						
	3D Milling			D1 - Diameter (mm)						
Group	ap	ae	m/min	3	4	5	6	8	10	12
P2	0.05XD	0.05XD	140	0,050	0,080	0,100	0,120	0,180	0,200	0,220
P3	0.05XD	0.05XD	125	0,050	0,080	0,100	0,120	0,180	0,200	0,220
P4	0.05XD	0.05XD	100	0,040	0,060	0,075	0,090	0,140	0,160	0,180
P5	0.05XD	0.05XD	70	0,030	0,050	0,065	0,080	0,120	0,135	0,150
P6	0.05XD	0.05XD	70	0,030	0,050	0,065	0,080	0,120	0,135	0,150
M1	0.05XD	0.05XD	80	0,030	0,050	0,065	0,080	0,120	0,135	0,150
M2	0.05XD	0.05XD	70	0,030	0,050	0,065	0,080	0,120	0,135	0,150
M3	0.05XD	0.05XD	65	0,030	0,050	0,065	0,080	0,120	0,135	0,150
K1	0.05XD	0.05XD	170	0,080	0,080	0,100	0,120	0,180	0,200	0,220
K2	0.05XD	0.05XD	160	0,080	0,080	0,100	0,120	0,180	0,200	0,220
N1	0.05XD	0.05XD	600	0,080	0,100	0,130	0,150	0,200	0,230	0,250
N2	0.05XD	0.05XD	600	0,080	0,100	0,130	0,150	0,200	0,230	0,250
S1	0.05XD	0.05XD	80	0,030	0,050	0,065	0,080	0,120	0,135	0,150
S2	0.05XD	0.05XD	70	0,030	0,050	0,065	0,080	0,120	0,135	0,150
S3	0.05XD	0.05XD	55	0,030	0,050	0,065	0,080	0,120	0,135	0,150
S4	0.05XD	0.05XD	65	0,030	0,050	0,065	0,080	0,120	0,135	0,150
H4	0.05XD	0.05XD	100	0,040	0,060	0,075	0,090	0,140	0,160	0,180

F3AW...AWL/X35E...

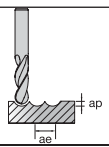


Reduce speed by 20% for slotting applications



	Application 3D Milling		Vc KC633M	Recommended fz- Feed Per Tooth (mm/th) for side cutting operations. For slotting operations, reduce fz by 20%. D1 - Diameter (mm)				
Group	ap	ae	m/min	6	8	10	12	16
P3	0.5XD	0.5XD	145~175	0,036	0,045	0,054	0,059	0,063
M1	0.5XD	0.5XD	80~100	0,032	0,041	0,045	0,050	0,054
M2	0.5XD	0.5XD	60~75	0,027	0,036	0,041	0,045	0,050
M3	0.5XD	0.5XD	55~65	0,027	0,036	0,041	0,045	0,050
S1	0.5XD	0.5XD	80~100	0,032	0,041	0,045	0,050	0,054
S2	0.5XD	0.5XD	60~75	0,027	0,036	0,041	0,045	0,050
S3	0.5XD	0.5XD	22~30	0,015	0,024	0,025	0,034	0,044
S4	0.5XD	0.5XD	45~55	0,018	0,027	0,029	0,036	0,041

F4AW...AWL/X38E...

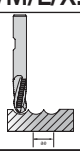


Reduce speed by 20% for slotting applications

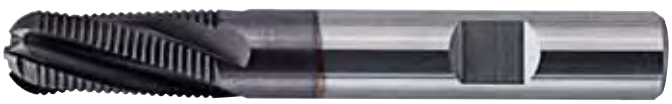


	Application 3D Milling		Vc KC633M	Recommended fz- Feed Per Tooth (mm/th) for side cutting operations. For slotting operations, reduce fz by 20%. D1 - Diameter (mm)				
Group	ap	ae	m/min	6	8	10	12	16
M1	0.5XD	0.5XD	80~100	0,032	0,041	0,045	0,050	0,054
M2	0.5XD	0.5XD	60~75	0,027	0,036	0,041	0,045	0,050
M3	0.5XD	0.5XD	55~65	0,027	0,036	0,041	0,045	0,050
S1	0.5XD	0.5XD	80~100	0,032	0,041	0,045	0,050	0,054
S2	0.5XD	0.5XD	60~75	0,027	0,036	0,041	0,045	0,050
S3	0.5XD	0.5XD	22~30	0,015	0,024	0,025	0,034	0,044
S4	0.5XD	0.5XD	45~55	0,018	0,027	0,029	0,036	0,041

F3/4BL...BWS/M/L/X...



Reduce speed by 20% for slotting applications



	Application 3D Milling		Vc KC633M	Recommended fz- Feed Per Tooth (mm/th) for side cutting operations. For slotting operations, reduce fz by 20%. D1 - Diameter (mm)						
Group	ap	ae	m/min	6	8	10	12	14	16	20
P2	1.5XD	0.4XD	200	0,025	0,030	0,040	0,045	0,052	0,060	0,080
P3	1.5XD	0.4XD	180	0,025	0,030	0,040	0,045	0,052	0,060	0,080
P4	1.5XD	0.4XD	120	0,017	0,022	0,027	0,032	0,037	0,042	0,047
P5	1.5XD	0.4XD	60	0,012	0,015	0,018	0,021	0,024	0,027	0,030
P6	1.5XD	0.4XD	60	0,012	0,015	0,018	0,021	0,024	0,027	0,030
M1	1.5XD	0.4XD	60	0,012	0,015	0,018	0,021	0,024	0,027	0,030
M2	1.5XD	0.4XD	55	0,012	0,015	0,018	0,021	0,024	0,027	0,030
M3	1.5XD	0.4XD	60	0,012	0,015	0,018	0,021	0,024	0,027	0,030
K1	1.5XD	0.5XD	180	0,030	0,036	0,048	0,054	0,062	0,072	0,096
K2	1.5XD	0.5XD	160	0,030	0,036	0,048	0,054	0,062	0,072	0,096
S1	1.5XD	0.4XD	80	0,012	0,015	0,018	0,021	0,024	0,027	0,030
S2	1.5XD	0.4XD	70	0,012	0,015	0,018	0,021	0,024	0,027	0,030
S3	1.5XD	0.4XD	55	0,012	0,015	0,018	0,021	0,024	0,027	0,030
S4	1.5XD	0.4XD	65	0,012	0,015	0,018	0,021	0,024	0,027	0,030
H2	1XD	0.3XD	80	0,012	0,015	0,018	0,021	0,024	0,027	0,030

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Airframe



Landing Gear



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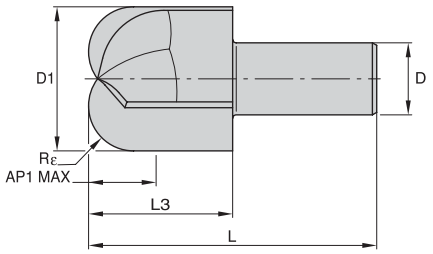
THINK **MILLING,** THINK **KENNAMETAL.**

Features

- Factory standard.
- Plain shank.
- Toroidal.

Operations

- Side cutting and 3-dimensional milling.





2-Flute, 0° Helix

● first choice
○ alternate choice

	KB1615	KC637M
H		●
S		
N		
K		●
M		
P	○	●

D1	D	Ap1 max	L3	L	Rε	Z U	catalog number	KB1615	KC637M
10,00	5	5,0	10	20	3,00	2	F2AT1000ABT00R030	●	●
12,00	6	6,0	12	24	4,00	2	F2AT1200ABT00R040	●	●
16,00	8	8,0	16	32	5,00	2	F2AT1600ABT00R050	●	●
20,00	10	10,0	20	40	6,00	2	F2AT2000ABT00R060	●	●
25,00	12	12,5	25	50	8,00	2	F2AT2500ABT00R080	●	●

For application data, see page 136.

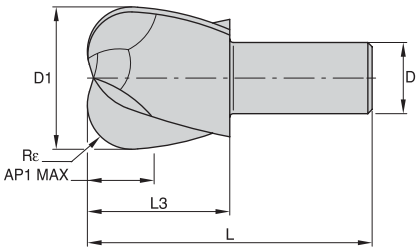
Ordering Example:
F2AT1000ABT00R030 KC637M

Features

- Factory standard.
- Plain shank.
- Toroidal.

Operations

- Side cutting and 3-dimensional milling.





2-Flute, 30° Helix

● first choice
○ alternate choice

H	●
S	
N	
K	●
M	
P	●

D1	D	Ap1 max	L3	L	Rε	Z U	catalog number	KC637M
10,00	5	5,0	10	20	3,00	2	F2AT1000ABT30R030	●
12,00	6	6,0	12	24	4,00	2	F2AT1200ABT30R040	●
16,00	8	8,0	16	32	5,00	2	F2AT1600ABT30R050	●
20,00	10	10,0	20	40	6,00	2	F2AT2000ABT30R060	●
25,00	12	12,5	25	50	8,00	2	F2AT2500ABT30R080	●

For application data, see page 136.

Ordering Example:
F2AT1000ABT30R030 KC637M

KENNAMETAL

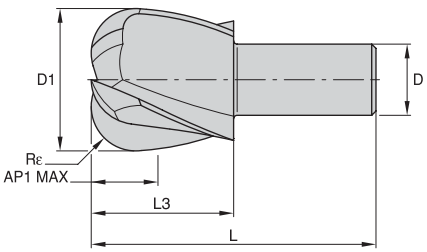
F4AT...BT — Toroidal End — Button-Head Cutters

Features

- Factory standard.
- Plain shank.
- Toroidal.

Operations

- Side cutting and 3-dimensional milling.





4-Flute, 30° Helix

● first choice
○ alternate choice

H	●
S	
N	
K	●
M	
P	●

D1	D	Ap1 max	L3	L	Rε	Z U	catalog number	KC637M
10,00	5	5,0	10	20	3,00	4	F4AT1000ABT30R030	●
12,00	6	6,0	12	24	4,00	4	F4AT1200ABT30R040	●
16,00	8	8,0	16	32	5,00	4	F4AT1600ABT30R050	●
20,00	10	10,0	20	40	6,00	4	F4AT2000ABT30R060	●
25,00	12	12,5	25	50	8,00	4	F4AT2500ABT30R080	●

For application data, see page 136.

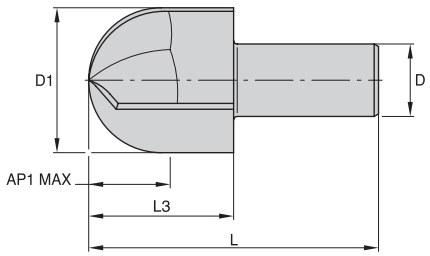
Ordering Example:
F4AT1000ABT30R030 KC637M

Features

- Factory standard.
- Plain shank.
- Ballnose.

Operations

- Side cutting and 3-dimensional milling.





2-Flute, 0° Helix

● first choice
○ alternate choice

H			●					
S								
N								
K			●					
M								
P			●	●				

D1	D	Ap1 max	L3	L	Z U	catalog number	KB1615	KC637M
10,00	5	6,0	10	20	2	F2AL1000ABT00	●	●
12,00	6	7,0	12	24	2	F2AL1200ABT00	●	●
16,00	8	9,0	16	32	2	F2AL1600ABT00	●	●
20,00	10	11,0	20	40	2	F2AL2000ABT00	●	●
25,00	12	14,0	25	50	2	F2AL2500ABT00	●	●

For application data, see page 137.

Ordering Example:
F2AL1000ABT00 KC637M

Specialty Application Finishing End Mills

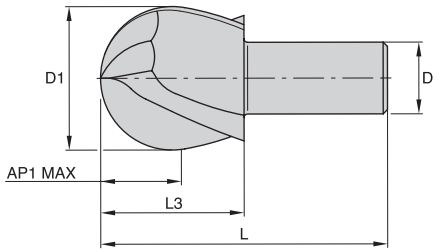
F2AL...BT — Ball Nose — Button-Head Cutters

Features

- Factory standard.
- Plain shank.
- Ball nose.

Operations

- Side cutting and 3-dimensional milling.





2-Flute, 30° Helix

● first choice
○ alternate choice

H	S	N	K	M	P
●			●		●

D1	D	Ap1 max	L3	L	Z U	catalog number	KC637M
10,00	5	6,0	10	20	2	F2AL1000ABT30	●
12,00	6	7,0	12	24	2	F2AL1200ABT30	●
16,00	8	9,0	16	32	2	F2AL1600ABT30	●
20,00	10	11,0	20	40	2	F2AL2000ABT30	●
25,00	12	14,0	25	50	2	F2AL2500ABT30	●

For application data, see page 137.

Ordering Example:
F2AL1000ABT30 KC637M

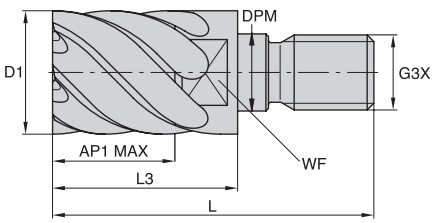
To place an order, contact Kennametal or your authorized Kennametal distributor, or visit www.kennametal.com.

Features

- Factory standard.
- Screw-on shank.
- Corner chamfer - center cutting.

Operations

- Side cutting.





6 & 8-Flute, 45° Helix

● first choice
○ alternate choice

D1	Ap1 max	L3	L	DPM	G3X	WF	Z U.	catalog number	KC637M
8,00	8,0	18	33	6,5	M6	7	6	F6AJ0800M0645	●
10,00	10,0	20	35	6,5	M6	8	6	F6AJ1000M0645	●
12,00	12,0	22	39	8,5	M8	10	6	F6AJ1200M0845	●
16,00	16,0	26	45	10,5	M10	13	6	F6AJ1600M1045	●
20,00	20,0	30	52	12,5	M12	17	8	F8AJ2000M1245	●

For application data, see page 138.

	Corner Chamfer (Chamfer height)	
D1 h10	BCH	Tolerance
2 - 3	0.08	-0.05
3.01 - 10	0.1	-0.05
10,01 - 20	0.2	-0.1

Ordering Example:
F6AJ0800M0645 KC637M

Specialty Application Finishing End Mills

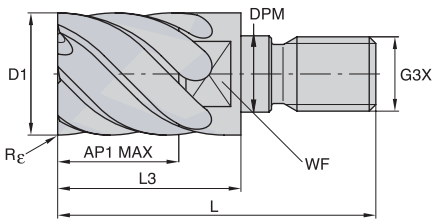
F6AJ-F8AJ...M — Button-Head Cutters — Screw-On Style — for Hardened Steels

Features

- Factory standard.
- Screw-on shank.
- Corner radius - center cutting.

Operations

- Side cutting.





6 & 8-Flute, 45° Helix

● first choice
○ alternate choice

H	●
S	
N	
K	
M	
P	

D1	Ap1 max	L3	L	Rε	DPM	G3X	WF	Z U	catalog number	KC637M
8,00	8,0	18	33	0,50	6,5	M6	7	6	F6AJ0800M0645R005	●
10,00	10,0	20	35	0,50	6,5	M6	8	6	F6AJ1000M0645R005	●
12,00	12,0	22	39	1,00	8,5	M8	10	6	F6AJ1200M0845R010	●
16,00	16,0	26	45	1,00	10,5	M10	13	6	F6AJ1600M1045R010	●
20,00	20,0	30	52	1,00	12,5	M12	17	8	F8AJ2000M1245R010	●

For application data, see page 138.

Ordering Example:
F6AJ0800M0645R005 KC637M

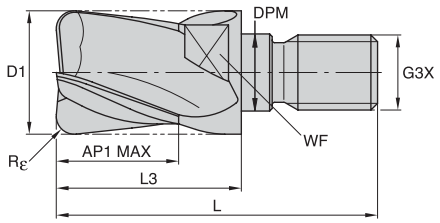
To place an order, contact Kennametal or your authorized Kennametal distributor, or visit www.kennametal.com.

Features

- Factory standard.
- Screw-on shank.
- Toroidal.

Operations

- Side cutting and 3 dimensional milling.





4 & 6-Flute, 20° Helix

● first choice
○ alternate choice

H	●
S	
N	
K	●
M	
P	●

D1	Ap1 max	L3	L	Rε	DPM	G3X	WF	Z U	catalog number	KC637M
8,00	8,0	18	33	0,20	6,5	M6	7	4	F4AT0800M0620R002	●
8,00	8,0	18	33	0,50	6,5	M6	7	4	F4AT0800M0620R005	●
8,00	8,0	18	33	1,00	6,5	M6	7	4	F4AT0800M0620R010	●
10,00	10,0	20	35	0,20	6,5	M6	8	4	F4AT1000M0620R002	●
10,00	10,0	20	35	0,50	6,5	M6	8	4	F4AT1000M0620R005	●
10,00	10,0	20	35	1,00	6,5	M6	8	4	F4AT1000M0620R010	●
12,00	12,0	22	39	0,50	8,5	M8	10	4	F4AT1200M0820R005	●
12,00	12,0	22	39	1,00	8,5	M8	10	4	F4AT1200M0820R010	●
12,00	12,0	22	39	1,50	8,5	M8	10	4	F4AT1200M0820R015	●
16,00	16,0	26	45	1,00	10,5	M10	13	6	F6AT1600M1020R010	●
16,00	16,0	26	45	1,50	10,5	M10	13	6	F6AT1600M1020R015	●
16,00	16,0	26	45	2,00	10,5	M10	13	6	F6AT1600M1020R020	●
20,00	20,0	30	52	1,50	12,5	M12	17	6	F6AT2000M1220R015	●
20,00	20,0	30	52	2,00	12,5	M12	17	6	F6AT2000M1220R020	●
20,00	20,0	30	52	3,00	12,5	M12	17	6	F6AT2000M1220R030	●

For application data, see page 138.

Ordering Example:
Shank form A (straight): F4AT0800M0620R002 KC637M

Specialty Application Finishing End Mills

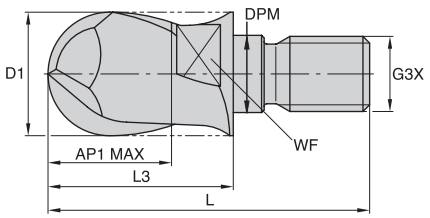
F2AL...M — Ball Nose — Button-Head Cutters — Screw-On Style

Features

- Factory standard.
- Screw-on shank.
- Ball nose.

Operations

- Side cutting and 3 dimensional milling.





2-Flute, 30° Helix

● first choice
○ alternate choice

H	●
S	
N	
K	●
M	
P	●

D1	Ap1 max	L3	L	DPM	G3X	WF	Z U	catalog number	KC637M
8,00	8,0	18	33	7	M6	7	2	F2AL0800M0630	●
10,00	10,0	20	35	7	M6	8	2	F2AL1000M0630	●
12,00	12,0	22	39	9	M8	10	2	F2AL1200M0830	●
16,00	16,0	26	45	11	M10	13	2	F2AL1600M1030	●
20,00	20,0	30	52	13	M12	17	2	F2AL2000M1230	●

For application data, see page 139.

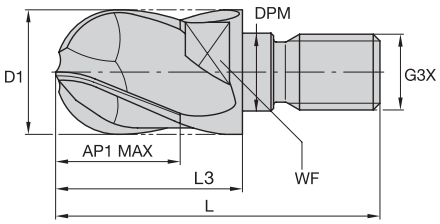
Ordering Example:
F2AL0800M0630 KC637M

Features

- Factory standard.
- Screw-on shank.
- Ball nose.

Operations

- Side cutting and 3-dimensional milling.





4-Flute, 30° Helix

● first choice
○ alternate choice

H	●
S	
N	
K	●
M	
P	●

D1	Ap1 max	L3	L	DPM	G3X	WF	Z U	catalog number	KC637M
8,00	8,0	18	33	6,5	M6	7	4	F4AL0800M0630	●
10,00	10,0	20	35	6,5	M6	8	4	F4AL1000M0630	●
12,00	12,0	22	39	8,5	M8	10	4	F4AL1200M0830	●
16,00	16,0	26	45	10,5	M10	13	4	F4AL1600M1030	●
20,00	20,0	30	52	12,5	M12	17	4	F4AL2000M1230	●

For application data, see page 139.

Ordering Example:
F4AL0800M0630 KC637M

Specialty Application Finishing End Mills

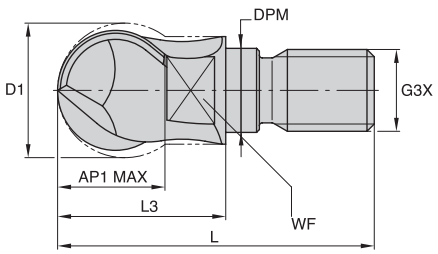
F2AB...M 240° — Ball Nose — Button-Head Cutters — Screw-On Style

Features

- Factory standard.
- Screw-on shank.
- Ball nose.

Operations

- Side cutting and 3-dimensional milling.





2-Flute, 30° Helix

● first choice
○ alternate choice

H	S	N	K	M	P
●			●		●

D1	Ap1 max	L3	L	DPM	G3X	WF	Z U	catalog number	KC637M
10,00	7,5	20	35	6,5	M6	6	2	F2AB1000M0630	●
12,00	9,0	22	39	6,5	M6	8	2	F2AB1200M0830	●
16,00	12,0	26	45	8,5	M8	10	2	F2AB1600M1030	●
20,00	15,0	30	52	10,5	M10	13	2	F2AB2000M1230	●

For application data, see page 139.

Ordering Example:
F2AB1000M0630 KC637M

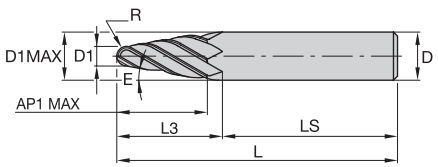
To place an order, contact Kennametal or your authorized Kennametal distributor, or visit www.kennametal.com.

Features

- Factory standard.
- Screw-on shank.
- Ball nose - tapered.

Operations

- Side cutting, slotting, and 3-dimensional milling.





4-Flute, 30° Helix

● first choice
○ alternate choice

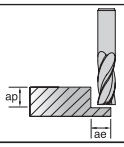
H		
S		●
N		
K		
M		●
P		

D1	D	Ap1 max	L3	LS	L	R	E	Z U	catalog number	KC633M
4,00	8	30,5	36	40	76	2	8.000	4	F4AW0400AWL30W040	●
4,00	10	30,5	49	40	89	2	12.000	4	F4AW0400AWL30W060	●
5,00	10	38,0	44	45	89	3	8.000	4	F4AW0500AWL30W040	●
5,00	12	35,7	55	45	100	3	12.000	4	F4AW0500AWL30W060	●
6,00	12	45,8	55	45	100	3	8.000	4	F4AW0600AWL30W040	●
6,00	16	50,4	62	48	110	3	12.000	4	F4AW0600AWL30W060	●
8,00	16	42,0	62	48	110	4	12.000	4	F4AW0800AWL30W060	●
8,00	16	61,0	52	48	100	4	8.000	4	F4AW0800AWL30W040	●
10,00	16	47,7	60	50	110	5	8.000	4	F4AW1000AWX30W040	●
10,00	20	52,3	75	50	125	5	12.000	4	F4AW1000AWX30W060	●

For application data, see page 139.

Ordering Example:
F4AW0400AWL30W040 K633M

F2AT...ABT00R...



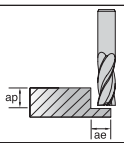
Reduce speed by 20% for slotting applications



	Application		Vc KC637M	Vc KB1615	Recommended fz- Feed Per Tooth (mm/th) for side cutting operations. For slotting operations, reduce fz by 20%. D1 - Diameter (mm)				
	Side Milling								
Group	ap	ae	m/min	m/min	10	12	16	20	25
P2	0.05XD	0.05XD	180~220		0,090	0,100	0,140	0,180	0,250
P3	0.05XD	0.05XD	160~200		0,090	0,100	0,140	0,180	0,250
P4	0.05XD	0.05XD	150~180		0,090	0,100	0,140	0,180	0,250
P5	0.05XD	0.05XD	150~180		0,090	0,100	0,140	0,180	0,250
P6	0.05XD	0.05XD	150~180		0,090	0,100	0,140	0,180	0,250
K1	0.05XD	0.05XD	250		0,090	0,100	0,140	0,180	0,250
K2	0.05XD	0.05XD	235		0,090	0,100	0,140	0,180	0,250
H1	0.05XD	0.05XD	150~180	355	0,090	0,100	0,140	0,180	0,250
H2	0.05XD	0.05XD	145	310	0,080	0,090	0,100	0,140	0,180
H3	0.05XD	0.05XD	120	245	0,060	0,070	0,080	0,090	0,100
H4	0.05XD	0.05XD	85	215	0,060	0,070	0,080	0,090	0,100

These guidelines may require possible variations to achieve optimum results.

F2/4AT...ABT30R...

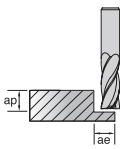


Reduce speed by 20% for slotting applications



	Application		Vc KC637M	Recommended fz- Feed Per Tooth (mm/th) for side cutting operations. For slotting operations, reduce fz by 20%. D1 - Diameter (mm)				
	Side Milling							
Group	ap	ae	m/min	10	12	16	20	25
P2	0.05XD	0.05XD	180~220	0,090	0,100	0,140	0,180	0,250
P3	0.05XD	0.05XD	160~200	0,090	0,100	0,140	0,180	0,250
P4	0.05XD	0.05XD	150~180	0,090	0,100	0,140	0,180	0,250
P5	0.05XD	0.05XD	150~180	0,090	0,100	0,140	0,180	0,250
P6	0.05XD	0.05XD	150~180	0,090	0,100	0,140	0,180	0,250
K1	0.05XD	0.05XD	250	0,090	0,100	0,140	0,180	0,250
K2	0.05XD	0.05XD	235	0,090	0,100	0,140	0,180	0,250
H1	0.05XD	0.05XD	150~180	0,090	0,100	0,140	0,180	0,250
H2	0.05XD	0.05XD	145	0,080	0,090	0,100	0,140	0,180
H3	0.05XD	0.05XD	120	0,060	0,070	0,080	0,090	0,100
H4	0.05XD	0.05XD	85	0,060	0,070	0,080	0,090	0,100

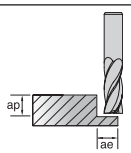
F2AL...ABT00...





	Application Side Milling		Vc KB1615	Recommended fz- Feed Per Tooth (mm/th) for side cutting operations. D1 - Diameter (mm)			
Group	ap	ae	m/min	10	12	16	20
P2	0.05XD	0.05XD	180~220	0,100	0,140	0,180	0,250
P3	0.05XD	0.05XD	160~200	0,100	0,140	0,180	0,250
P4	0.05XD	0.05XD	150~180	0,100	0,140	0,180	0,250
P5	0.05XD	0.05XD	150~180	0,100	0,140	0,180	0,250
P6	0.05XD	0.05XD	150~180	0,100	0,140	0,180	0,250
K1	0.05XD	0.05XD	250	0,100	0,140	0,180	0,250
K2	0.05XD	0.05XD	235	0,100	0,140	0,180	0,250
H1	0.05XD	0.05XD	150~180	0,100	0,140	0,180	0,250
H2	0.05XD	0.05XD	145	0,090	0,100	0,140	0,180
H3	0.05XD	0.05XD	120	0,070	0,080	0,090	0,100
H4	0.05XD	0.05XD	85	0,070	0,080	0,090	0,100

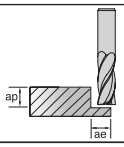
F2AL...ABT30...





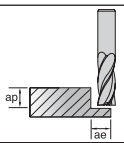
	Application Side Milling		Vc KC637M	Recommended fz- Feed Per Tooth (mm/th) for side cutting operations. D1 - Diameter (mm)			
Group	ap	ae	m/min	10	12	16	20
P2	0.05XD	0.05XD	180~220	0,100	0,140	0,180	0,250
P3	0.05XD	0.05XD	160~200	0,100	0,140	0,180	0,250
P4	0.05XD	0.05XD	150~180	0,100	0,140	0,180	0,250
P5	0.05XD	0.05XD	150~180	0,100	0,140	0,180	0,250
P6	0.05XD	0.05XD	150~180	0,100	0,140	0,180	0,250
K1	0.05XD	0.05XD	250	0,100	0,140	0,180	0,250
K2	0.05XD	0.05XD	235	0,100	0,140	0,180	0,250
H1	0.05XD	0.05XD	150~180	0,100	0,140	0,180	0,250
H2	0.05XD	0.05XD	145	0,090	0,100	0,140	0,180
H3	0.05XD	0.05XD	120	0,070	0,080	0,090	0,100
H4	0.05XD	0.05XD	85	0,070	0,080	0,090	0,100

F6/8AJ...M...

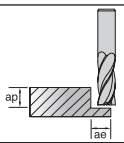
			Reduce speed by 20% for slotting applications					
	Application Side Milling		Vc KC637M	Recommended fz- Feed Per Tooth (mm/th) for side cutting operations. For slotting operations, reduce fz by 20%. D1 - Diameter (mm)				
Group	ap	ae	m/min	8	10	12	16	20
H1	0.8XD	0.1XD	155	0,060	0,070	0,080	0,110	0,130
H2	0.8XD	0.1XD	145	0,060	0,070	0,080	0,110	0,130
H3	0.8XD	0.1XD	120	0,060	0,070	0,080	0,110	0,130
H3	0.8XD	0.1XD	100	0,060	0,070	0,080	0,110	0,130

These guidelines may require possible variations to achieve optimum results.

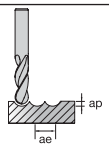
F6/8AJ...M...R...

			Reduce speed by 20% for slotting applications					
	Application Side Milling		Vc KC637M	Recommended fz- Feed Per Tooth (mm/th) for side cutting operations. For slotting operations, reduce fz by 20%. D1 - Diameter (mm)				
Group	ap	ae	m/min	8	10	12	16	20
H1	0.8XD	0.1XD	155	0,060	0,070	0,080	0,110	0,130
H2	0.8XD	0.1XD	145	0,060	0,070	0,080	0,110	0,130
H3	0.8XD	0.1XD	120	0,060	0,070	0,080	0,110	0,130
H3	0.8XD	0.1XD	100	0,060	0,070	0,080	0,110	0,130

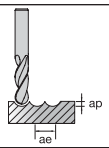
F4/6AT...M...R...

			Reduce speed by 20% for slotting applications					
	Application Side Milling		Vc KC637M	Recommended fz- Feed Per Tooth (mm/th) for side cutting operations. For slotting operations, reduce fz by 20%. D1 - Diameter (mm)				
Group	ap	ae	m/min	8	10	12	16	20
P2	0.5XD	0.01XD	200	0,090	0,150	0,170	0,200	0,300
P3	0.5XD	0.01XD	180	0,090	0,150	0,170	0,200	0,300
P4	0.5XD	0.01XD	150	0,090	0,150	0,170	0,200	0,300
P5	0.5XD	0.01XD	145	0,090	0,150	0,170	0,200	0,300
P6	0.5XD	0.01XD	145	0,090	0,150	0,170	0,200	0,300
K1	0.5XD	0.01XD	300	0,090	0,150	0,170	0,200	0,300
K2	0.5XD	0.01XD	285	0,090	0,150	0,170	0,200	0,300
H1	0.5XD	0.01XD	150	0,090	0,150	0,170	0,200	0,300
H2	0.5XD	0.01XD	145	0,090	0,150	0,170	0,200	0,300
H3	0.5XD	0.01XD	120	0,090	0,150	0,170	0,200	0,300
H3	0.5XD	0.01XD	100	0,090	0,150	0,170	0,200	0,300

F2/4AL...M...

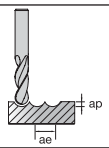
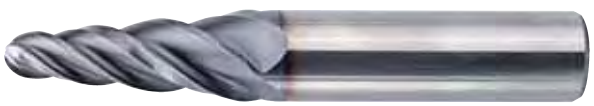
		Reduce speed by 20% for slotting applications					
	Application 3D Milling	Vc KC637M	Recommended fz- Feed Per Tooth (mm/th) for side cutting operations. For slotting operations, reduce fz by 20%. D1 - Diameter (mm)				
Group	ap	ae	m/min	8	10	12	16	20
P4	0.5XD	0.01XD	150	0,090	0,150	0,170	0,200	0,300
P5	0.5XD	0.01XD	145	0,090	0,150	0,170	0,200	0,300
P6	0.5XD	0.01XD	145	0,090	0,150	0,170	0,200	0,300
K1	0.5XD	0.01XD	300	0,090	0,150	0,170	0,200	0,300
K2	0.5XD	0.01XD	285	0,090	0,150	0,170	0,200	0,300
H1	0.5XD	0.01XD	150	0,090	0,150	0,170	0,200	0,300
H2	0.5XD	0.01XD	145	0,090	0,150	0,170	0,200	0,300
H3	0.5XD	0.01XD	120	0,090	0,150	0,170	0,200	0,300
H3	0.5XD	0.01XD	100	0,090	0,150	0,170	0,200	0,300

F2AB...M...

		Reduce speed by 20% for slotting applications				
	Application 3D Milling	Vc KC637M	Recommended fz- Feed Per Tooth (mm/th) for side cutting operations. For slotting operations, reduce fz by 20%. D1 - Diameter (mm)			
Group	ap	ae	m/min	10	12	16	20
P2	0.5XD	0.01XD	200	0,150	0,170	0,200	0,300
P3	0.5XD	0.01XD	180	0,150	0,170	0,200	0,300
P4	0.5XD	0.01XD	150	0,150	0,170	0,200	0,300
P5	0.5XD	0.01XD	145	0,150	0,170	0,200	0,300
P6	0.5XD	0.01XD	145	0,150	0,170	0,200	0,300
K1	0.5XD	0.01XD	300	0,150	0,170	0,200	0,300
K2	0.5XD	0.01XD	285	0,150	0,170	0,200	0,300
H1	0.5XD	0.01XD	150	0,150	0,170	0,200	0,300
H2	0.5XD	0.01XD	145	0,150	0,170	0,200	0,300
H3	0.5XD	0.01XD	120	0,150	0,170	0,200	0,300
H3	0.5XD	0.01XD	100	0,150	0,170	0,200	0,300

These guidelines may require possible variations to achieve optimum results.

F4AW...AWL/X30W...

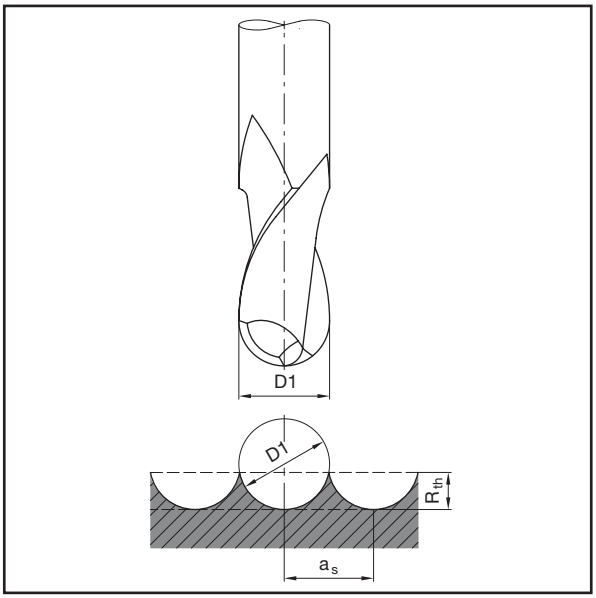
		Reduce speed by 20% for slotting applications					
	Application 3D Milling	Vc TiAlN	Recommended fz- Feed Per Tooth (mm/th) for side cutting operations. For slotting operations, reduce fz by 20%. D1 - Diameter (mm)				
Group	ap	ae	m/min	4	5	6	8	10
M1	1XD	0.01XD	135	0,025	0,030	0,040	0,050	0,060
M2	1XD	0.01XD	100	0,015	0,025	0,030	0,040	0,045
M3	1XD	0.01XD	90	0,015	0,025	0,030	0,040	0,045
S1	1XD	0.01XD	100	0,015	0,025	0,030	0,040	0,045
S2	1XD	0.01XD	90	0,015	0,025	0,030	0,040	0,045
S3	1XD	0.01XD	50	0,011	0,012	0,017	0,027	0,030
S4	1XD	0.01XD	80	0,012	0,015	0,020	0,030	0,040

Number of Cutting Edges

	Main Application	Comment
	Plunging (drilling)	 Very suitable for full slot milling, greater dimensional accuracy in feather key slot milling (F2AU ... DK30, F3AU ... DK30)
	Full slot (Feather key slot)	 Better for full slot milling and helical end milling; combined ⟶ machining more efficient
	Face milling Roughing/finishing Helical end milling	Smaller chip chambers With two cutting edges in the center Plunging possible, but small plunge depth$_{max.}$ (0,1 x d) ⟶ Steps
	Contouring Helical end milling Finishing	High form and positioning tolerance, surface quality, feed rates (efficiency)
	(small a_e with increasing number of teeth)	Higher a_e ⟶ Poor chip evacuation ⟶ Chip chambers become clogged

Helix angle

0°	• Small a_p and a_e • Trimming • Contouring	E.g. de-burr elbow, trimming of cast iron parts
20° 30° 45°	• Full cut	E.g. the 45° twist enables approximately 30% - 40% higher feed rates than the 30° twist
60°	• Progressive cut	• Progressive cut • High surface quality • High axial forces • Low radial forces • (low drift) • Not suitable for plunging
General principle: The greater the helix, the lower the radial forces, and the greater the axial forces.		



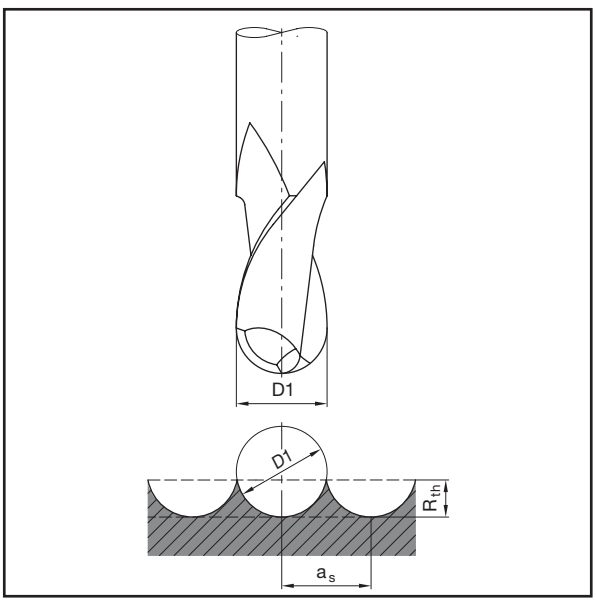
Calculating the row distance a_e

d_1 = Cutting edge diameter [mm]

R_{th} = Theoretical raw depth [mm]

a_e = Row distance

$$R_{th} = \frac{d_1}{2} - \frac{\sqrt{d_1^2 - a_e^2}}{4}$$



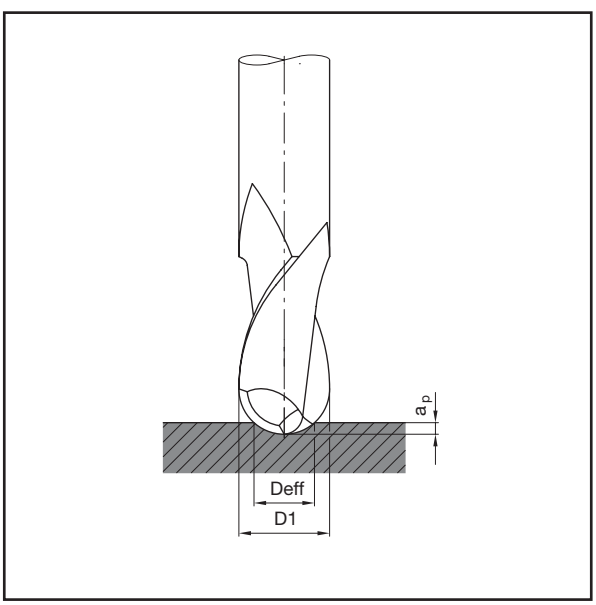
Calculating the theoretical raw depth R_{th}

d_1 = Cutting edge diameter [mm]

R_{th} = Theoretical raw depth [mm]

a_e = Row distance

$$a_s = 2\sqrt{R_{th}(d_1 - R_{th})}$$



Calculating the effective diameter d_{eff}

d_1 = Cutting edge diameter [mm]

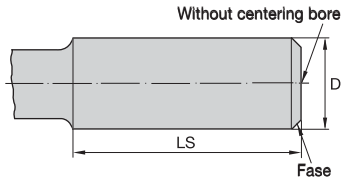
d_{eff} = Effective diameter [mm]

a_p = Axial adjustment depth

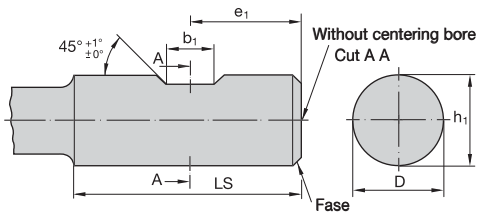
$$d_{eff} = 2\sqrt{a_p(d_1 - a_p)}$$

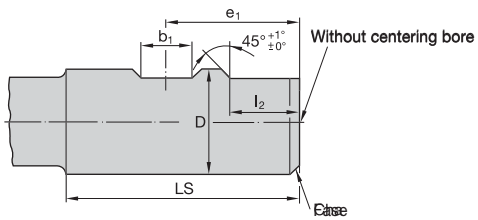
Cutting problems in solid carbide milling	Suggested remedy
Splintering of the cutting edge (thermal load)	– Decrease feed per tooth – Increase cutting speed
Crumbling of the cutting edge (mechanical load)	– Check rigidity of machine, workpiece, and workpiece clamping – Reduce feed per tooth – Shorten protrude length – Climb milling – Check tool clamping – Check spindle movement
Mill breakage	– Ensure free cutting process – Increase cutting speed – Reduce feed rate and cutting depth – Check tool clamping – Shorten protrude length – Reduce cutting depth – Improve chip evacuation
Heavy crater wear	– Reduce cutting speed – Use more wear-resistant carbide grade
Heavy flank wear	– Increase feed per tooth – Reduce cutting speed – Use coated version – Use more wear-resistant carbide grade
Edge build-up	– Increase cutting speed and /or feed rate – Improve cooling
Vibrations (chatter)	– Check clamping and machine stability – Select a different cutting geometry – Check alignment of milling cutter and workpiece – Climb milling
Inadequate surface on the workpiece	– Reduce feed per tooth – Check clamping and machine stability – Increase cutting speed – Select a different cutting geometry, with larger twist angle – Use milling cutter with more of teeth
Splintering on the workpiece	– Reduce feed per tooth – Use milling cutter with more teeth
Chip buildup	– Use tool with larger chip chambers (less teeth) – Modify cutting geometry – Modify cutting values – Reduce cutting depth – Use milling cutter with less teeth

Straight shanks to DIN 6535, Form HA
without lateral clamping flat
for use in expansion chucks

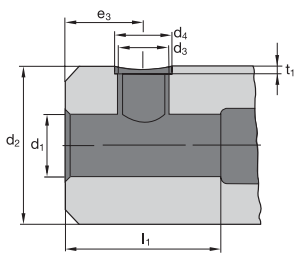


Straight shanks to DIN 6535, Form HB
with lateral clamping flat:
One clamping flat for d_1 = 6 to 20 mm

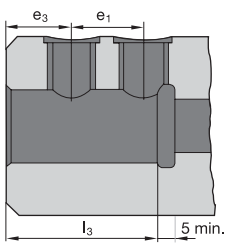




Chuck for straight shanks
(Form B and Form HB)
with lateral clamping flats
For d_1 = 6 to 20 mm



For d_1 = 25 to 32 mm



Fitting dimensions
End mill body with straight shank
to DIN 6535/form HA and HB

D	without pulling face LS	with lateral clamping flat b_1	h_1 h_{11}	LS	l_2	e_1
6	36	4,2	5,1	36	-	18,0
8	36	5,5	6,9	36	-	18,0
10	40	7,0	8,5	40	-	20,0
12	45	8,0	10,4	45	-	22,5
14	45	8,0	12,7	45	-	22,5
16	48	10,0	14,2	48	-	24,0
18	48	10,0	16,2	48	-	24,0
20	50	11,0	18,2	50	-	25,0
25	56	12,0	23,0	56	17	32,0
32	60	14,0	30,0	60	19	35,0

Fitting dimensions
Chucks for straight shanks
to DIN 1835 Part 2 /Form B
(Extended by d_1 = 14 and = 18 mm)

d_1H5	D	d_3	d_4	e_3	e_4	t_1	l_3
6	25	M 6	8	18,0	-	1,0	35
8	28	M 8	10	18,0	-	1,3	35
10	35	M10	12	20,0	-	1,5	39
12	42	M12	14	22,5	-	1,6	44
14	44	M12	14	22,5	-	1,6	44
16	48	M14	16	24,0	-	1,7	47
18	50	M14	16	24,0	-	1,7	47
20	52	M16	18	25,0	-	2,1	49
25	65	M18x2	20	24,0	25	2,1	54
32	72	M20x2	22	24,0	28	2,2	58

Recommended torques
for solid carbide tool shanks

clamping screw	torque
M 6	5 Nm
M 8	10 Nm
M10	16 Nm
M12	28 Nm
M14	42 Nm
M16	50 Nm
M18	60 Nm
M20	60 Nm

Tolerances, shanks

tolerances	nominal size in mm													
	over	up to	over	up to	over	up to	over	up to	over	up to	over	up to	over	up to
	-	3	3	6	6	10	10	18	18	30	30	50	50	80
	in µm													
e8	-14		-20		-25		-32		-40		-50		-60	
	-28		-38		-47		-59		-73		-89		-106	
h6	0		0		0		0		0		0		0	
	-6		-8		-9		-11		-13		-16		-19	
h7	0		0		0		0		0		0		0	
	-10		-12		-15		-18		-21		-25		-30	
h8	0		0		0		0		0		0		0	
	-14		-18		-22		-27		-33		-39		-46	
h9	0		0		0		0		0		0		0	
	-25		-30		-36		-43		-52		-62		-74	
h10	0		0		0		0		0		0		0	
	-40		-48		-58		-70		-84		-100		-120	
h11	0		0		0		0		0		0		0	
	-60		-75		-90		-110		-130		-160		-190	
k8	+14		+18		+22		+27		+33		+39		+46	
	0		0		0		0		0		0		0	
k9	+25		+30		+36		+43		+52		+62		+74	
	0		0		0		0		0		0		0	
k10	+40		+48		+58		+70		+84		+100		+120	
	0		0		0		0		0		0		0	
m7	+12		+16		+21		+25		+29		+34		+41	
	+2		+4		+6		+7		+8		+9		+11	

Tolerances, holes

tolerances	nominal size in mm													
	over	up to	over	up to	over	up to	over	up to	over	up to	over	up to	over	up to
	-	3	3	6	6	10	10	18	18	30	30	50	50	80
	in µm													
P9	-6		-12		-15		-18		-22		-26		-32	
	-31		-40		-51		-61		-74		-88		-106	
H6	+6		+8		+9		+11		+13		+16		+19	
	0		0		0		0		0		0		0	
H7	+10		+12		+15		+18		+21		+25		+30	
	0		0		0		0		0		0		0	
H8	+14		+18		+22		+27		+33		+39		+46	
	0		0		0		0		0		0		0	
H9	+25		+30		+36		+43		+52		+62		+74	
	0		0		0		0		0		0		0	
H10	+40		+48		+58		+70		+84		+100		+120	
	0		0		0		0		0		0		0	
H11	+60		+75		+90		+110		+130		+160		+190	
	0		0		0		0		0		0		0	
H12	+0,1		+0,12		+0,15		+0,18		+0,21		+0,25		+0,3	
	0		0		0		0		0		0		0	
H13	+0,14		+0,18		+0,22		+0,27		+0,33		+0,39		+0,46	
	0		0		0		0		0		0		0	

TOOL RECONDITIONING



Tool Reconditioning

It's as easy as 1-2-3!

Here's all you have to do:

1) Contact your Kennametal representative to locate your nearest reconditioning center. Complete your order form and enclose it within your shipping package.

2) Place tools in a Kennametal Blue Box or your own container. Affix the peel-off, pre-addressed mailing label to your shipping package and let Kennametal pick up the charges.

3) You can count on an exceptionally rapid response to your requirements — as we restore your used tooling to like-new condition!

For further information, contact Kennametal or your authorized Kennametal distributor, or visit www.kennametal.com

KENNAMETAL®

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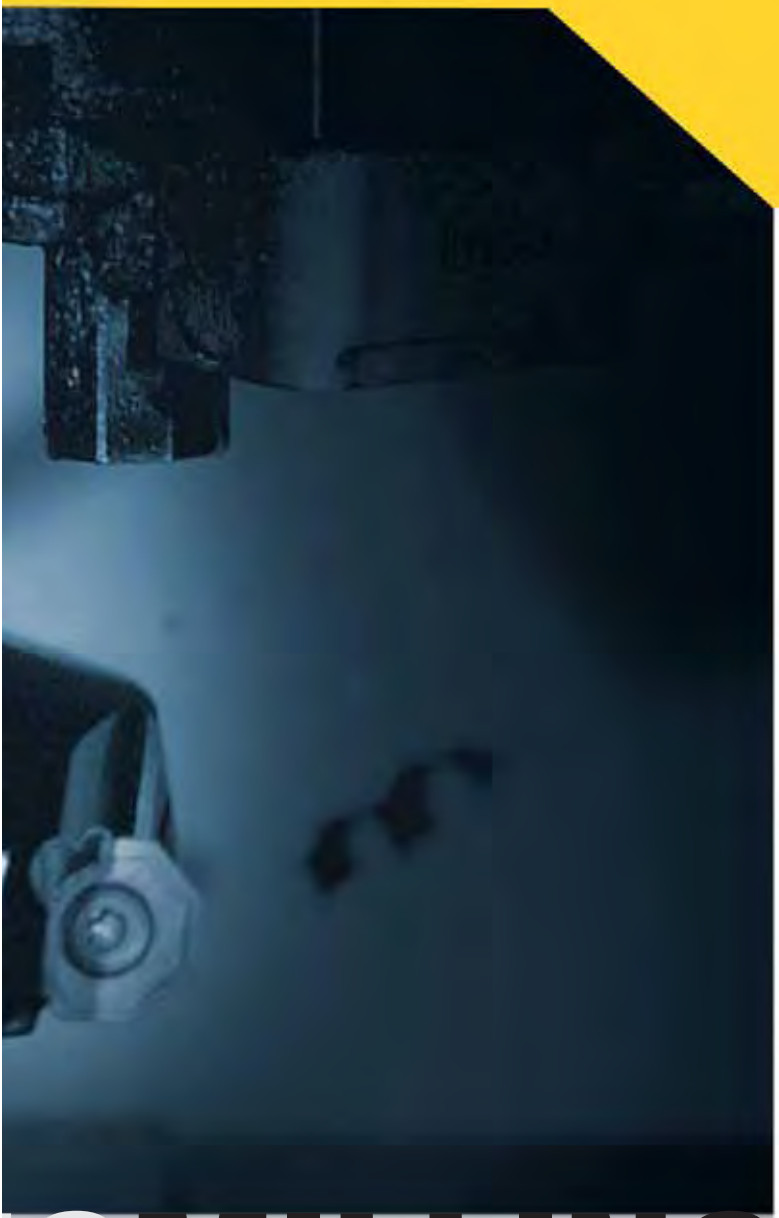
THINK **MILLING,** THINK **KENNAMETAL.**



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Indexable Milling

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Indexable Milling



Mill™ 1
Attain the metalcutting industry's top speeds!
One tool for circular plunging, ramping…and 3D-milling, face-milling,
and shoulder-milling!
Available in 14mm, 18mm, and 25mm depths-of-cut.
See Page 367



Dodeka™ Face Mills
Boost your productivity with 12 cutting edges per insert!
Provides smooth cutting action!
See Page 289



KenFEED™
Reach feed rates of 3mm per tooth! Also exceptional in plunging and ramping operations. Extremely stable clamping mechanism!
See Page 437



KSSM™ Slotting Cutters
Perform right-hand, left-hand, and full slotting with one cutter!
See Page 417



HexaCut™ Face Mills
Achieve unbeatable efficiency and surface finish with 12 cutting edges — ideal for cast and ductile iron!
See Page 324



KSSM™ Helical Cutter
Prevent chip packing, reduce harmonics, with unique helical design!
See Page 387



KDMB™ Die & Mold Cutters
Get consistent, measurable performance at high speeds — and long tool life!
See Page 469

Application Selection Steps

1) Choose the Application

- Face milling
- Chamfer milling
- 90° milling
- Die and mold milling
- Slotting
- High-temp alloy milling with ceramics
- Thread milling

2) Choose the Depth of Cut (AP1)

- Example: 5 mm

3) Find the Appropriate Application and AP1 in the Chart

Example: Face milling and 5 mm AP1.

Any milling tool located after your selected AP1 value in that application section is suitable for your operation.

Tools that come before the selected AP1 value in that application section are not applicable to your operation.

4) Choose the Material Group

Each tool has a material grid marked with a solid dot for the appropriate material for that tool.

Example: Cast iron

When you select the proper tool from Step 3, you can apply that tool with confidence in any material group designated with a solid dot.

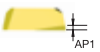
Face Mills

FIX-PERFECT Finisher Cast Iron

k = 90°



4 cutting edges



AP1 = 1,0 mm

Page 321 | Dia: 63 - 250 mm

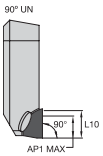
KSCM PCD Shell Mills

NEW!

k = 90°

1 cutting edge





AP1 = 3,0 mm

Page 345 | Dia: 63 - 315 mm

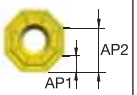
KSOM Mini

NEW!

k = 43°



8 cutting edges



AP1 = 3,5 mm
AP2 = 9,0 mm

Page 293 | Dia: 32 - 160 mm

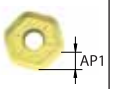
Dodeka KSHR

NEW!

k = 45°



12 cutting edges



AP1 = 4,5 mm

Page 289 | Dia: 40 - 160 mm

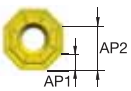
KSOM

NEW!

k = 43°



8 cutting edges



AP1 = 5,0 mm
AP2 = 11,0 mm

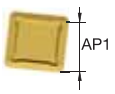
Page 299 | Dia: 63 - 160 mm

KSSR

k = 84°



8 cutting edges



AP1 = 5,0 mm

Page 341 | Dia: 63 - 250 mm

FIX-PERFECT 70° IC 12 Cast Iron

k = 70°



8 cutting edges



AP1 = 5,9 mm (8 cutting edges)
AP1 = 9,5 mm (4 cutting edges)

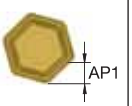
Page 315 | Dia: 50 - 250 mm

HexaCut 45° — Cast Iron

k = 45°



12 cutting edges



AP1 = 6,5 mm

Page 327 | Dia: 80 - 315 mm

FIX-PERFECT 70° IC 15 Cast Iron

k = 70°



8 cutting edges

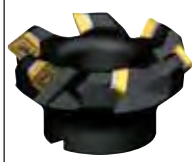


AP1 = 6,5 mm (8 cutting edges)
AP1 = 12,0 mm (4 cutting edges)

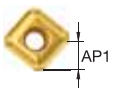
Page 317 | Dia: 50 - 250 mm

KSSM 45°

k = 45°



4 cutting edges



AP1 = 6,6 mm

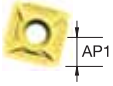
Page 305 | Dia: 40 - 160 mm

KSSM 75°

k = 75°



4 cutting edges



AP1 = 8,0 mm

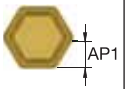
Page 309 | Dia: 50 - 160 mm

HexaCut 60° — Cast Iron

k = 60°



12 cutting edges



AP1 = 8,0 mm

Page 331 | Dia: 80 - 315 mm

Chamfer Mills

Chamfer Mills 30°

k = 30°



4 cutting edges



AP1 = 6,5 mm

Page 357 | Dia: 32 mm

Chamfer Mills 45°

k = 45°



4 cutting edges



AP1 = 6,5 mm (SD09)
AP1 = 9,0 mm (SD12)

Page 357 | Dia: 10 - 32 mm

Chamfer Mills 60°

k = 60°



4 cutting edges



AP1 = 10,0 mm

Page 357 | Dia: 32 mm

P Steel	M Stainless Steel	K Cast Iron	N Non-Ferrous Materials	S High-Temp Alloys	H Hardened Materials

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k = 90°

KENDEX Mini Mill

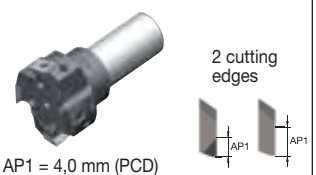


AP1 = 8,0 mm

Page 353 | Dia: 12 to 125 mm

k = 90°

FIX-PERFECT — Aluminum HPM Line

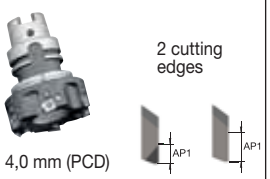


AP1 = 4,0 mm (PCD)
AP1 = 10,0 mm

Page 399-400 | Dia: 40 - 315 mm

k = 90°

FIX-PERFECT — Aluminum PM Line

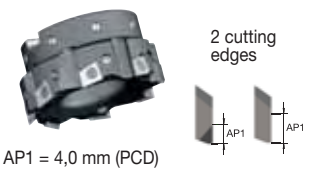


AP1 = 4,0 mm (PCD)
AP1 = 10,0 mm

Page 398 | Dia: 40 - 250 mm

k = 90°

FIX-PERFECT — Aluminum M-Line



AP1 = 4,0 mm (PCD)
AP1 = 10,0 mm

Page 397 | Dia: 40 - 315 mm

k = 90°

FIX-PERFECT 90° IC 12 Cast Iron



AP1 = 6,0 - 10,0 mm

Page 391 | Dia: 50 - 200 mm

k = 90°

KSSM 90° IC 10



AP1 = 7,0 mm

Page 381 | Dia: 25 - 100 mm

k = 90°

FIX-PERFECT 90° IC 15 Cast Iron



AP1= 8,0 - 13,5 mm

Page 393 | Dia: 50 - 200 mm

k = 90°

KSSM 90° IC 12



AP1 = 9,0 mm

Page 386 | Dia: 50 - 160 mm

k = 90°

NGE-A



AP1 = 9,0 mm

Page 363 | Dia: 12 - 63 mm

k = 90°

NEW!

Mill 1-14



AP1 = 14,0 mm

Page 367 | Dia: 20 - 160 mm

k = 90°

NEW!

Mill 1-18



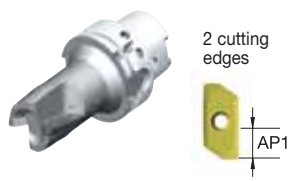
AP1 =18,0 mm

Page 373 | Dia: 25 - 160 mm

k = 90°

NEW!

Mill 1 — MAX



AP1 = 25,0 mm

Page 377 | Dia: 40 - 100 mm

k =90°

NEW!

KSSM — Helical 90° IC 12



AP1 = 32 - 61 mm

Page 387 | Dia: 50 - 80 mm

P Steel	M Stainless Steel	K Cast Iron	N Non-Ferrous Materials	S High-Temp Alloys	H Hardened Materials

Application Selection Steps

1) Choose the Application

- Face milling
- Chamfer milling
- 90° milling
- Die and mold milling
- Slotting
- High-temp alloy milling with ceramics
- Thread milling

2) Choose the Depth of Cut (AP1)

- Example: 5 mm

3) Find the Appropriate Application and AP1 in the Chart

Example: Face milling and 5 mm AP1.

Any milling tool located after your selected AP1 value in that application section is suitable for your operation.

Tools that come before the selected AP1 value in that application section are not applicable to your operation.

4) Choose the Material Group

Each tool has a material grid marked with a solid dot for the appropriate material for that tool.

Example: Cast iron

When you select the proper tool from Step 3, you can apply that tool with confidence in any material group designated with a solid dot.

Slotting

A2 Slotting Cutters

k = 90°



W = 1,6 - 4,0 mm slot width

Page 407 | Dia: 63 - 250 mm

90° SN Slotting Cutters

k = 90°

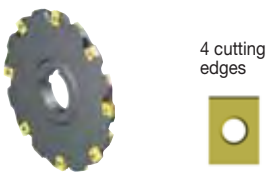


W = 4,0 - 14,0 mm slot width

Page 411 | Dia: 80 - 250 mm

90° LN Slotting Cutters

k = 90°



W = 6,0 - 13,0 mm slot width

Page 413 | Dia: 80 - 200 mm

NEW! KSSM Slotters IC 10 adjustable

k = 90°



W = 14,0 - 18,0 mm slot width

Page 417 | Dia: 100 - 315 mm

NEW! KSSM Slotters IC 10 adjustable

k = 90°



W = 14,0 - 18,0 mm slot width

Page 420 | Dia: 100 - 315 mm

NEW! KSSM Slotters IC 12 adjustable

k = 90°



W = 18,0 - 23,3 mm slot width

Page 426 | Dia: 125 - 315 mm

NEW! KSSM Slotters IC 12 adjustable

k = 90°



W = 18,0 - 23,3 mm slot width

Page 427 | Dia: 125 - 315 mm

Die and Mold

NEW! KSWM KenFEED WP05

k = 95°



AP1 = 1,0 mm

Page 437 | Dia: 20 - 42 mm

NEW! KSWM KenFEED WP06

k = 95°



AP1 = 1,5 mm

Page 437 | Dia: 32 - 42 mm

NEW! KSWM KenFEED WP08

k = 95°



AP1 = 1,5 mm

Page 437 | Dia: 35 - 42 mm

KMM DCGT 07

k = 95°



AP1 = 1,0 mm

Page 446 | Dia: 16 to 20 mm

KMM XDHX 04/06/10

k = 95°



AP1 = 1,5 mm

Page 449 | Dia: 10 to 52 mm

KDM End Mills RD..05...

k = 95°



AP1 = 2,5 mm

Page 452 | Dia: 12 - 25 mm

NEW! KDMT/KDMS Flat Bottom and Back Draft Finisher

k = 95°



AP1 = 3,0 - 8,0 mm

Page 479 | Dia: 12 - 32 mm

KDM End Mills RD..07...

k = 95°



AP1 = 3,5 mm

Page 455 | Dia: 12 - 35 mm

P Steel	M Stainless Steel	K Cast Iron	N Non-Ferrous Materials	S High-Temp Alloys	H Hardened Materials

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Die and Mold

KDM End Mills RD.X10...



AP1 = 5,0 mm

Page 457 | Dia: 20 - 52 mm

KMS Face Mill PDHX

k = 36°



AP1 = 5,5 mm

Page 443 | Dia: 66 to 160 mm

KDMB Ball Nose Finisher

NEW!



AP1 = 6,0 - 16,0 mm

Page 469 | Dia: 8 - 32 mm

KDM End Mills RD.X12...



AP1 = 6,0 mm

Page 459 | Dia: 24 - 80 mm

KDM End Mills RD.X16...

k = 66°



AP1 = 8,0 mm

Page 461 | Dia: 32 - 100 mm

KMS Face Mill PDHX



AP1 = 8,0 mm

Page 443 | Dia: 66 to 160 mm

KSRM RCGT 20

NEW!



AP1 = 10,0 mm

Page 466 | Dia: 63 - 200 mm

Ceramics

Ceramic KSSR-RN

NEW!



Kyon inserts

AP1 = 6,0 mm

Page 486 | Dia: 50 - 160 mm

Ceramic KIPR-RP

NEW!



Kyon inserts

AP1 = 6,4 mm

Page 485 | Dia: 32 mm

Ceramic KIPR-RP

NEW!



Kyon inserts

AP1 = 6,4 mm

Page 485 | Dia: 40 mm

Ceramic KIPR-RP

NEW!



Kyon inserts

AP1 = 6,4 mm

Page 485 | Dia: 50 - 100 mm

Thread Milling

Thread Mills



Inserts:

Long	STN 16 STN 27 STN 38	**Normal**	STN 11 STN 16 STN 27 STN 38
		Mini	STN 10

Page 513 | Dia: 9 - 46 mm

Thread Mills — Double Insert



Inserts:

STN 16
STN 27

Page 515 | Dia: 26 - 42 mm

Thread Mills TM25

NEW!



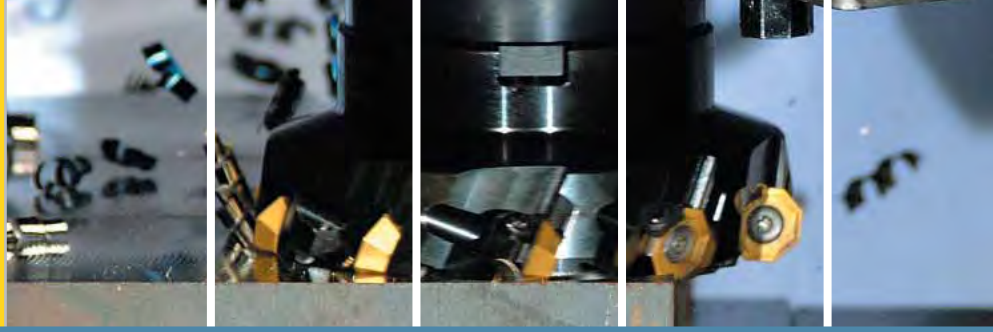
Inserts:

TM 25

Page 505 | Dia: 17 - 42 mm

P Steel	M Stainless Steel	K Cast Iron	N Non-Ferrous Materials	S High-Temp Alloys	H Hardened Materials

Engineering Your Competitive Edge
IN MILLING



Kennametal "M" Grade Advantage

Substrates and Coatings Engineered Specifically for Milling

KC410M



- *carbide substrate and advanced PVD coating*
- *for aluminum*

KC520M



- *carbide substrate and TiAlN coating*
- *for ductile iron*

KC522M



- *carbide substrate and ALTiN coating*
- *for general machining of high-temp alloys and stainless steel*

KC525M



- *carbide substrate and TiAlN coating*
- *for steels, stainless steel, and high-temp alloys*

KT530M



- *tough milling coated cermet substrate*
- *for carbon, alloy, and stainless steel*

KC715M



- *carbide substrate and TiCN coating*
- *for high speed, dry milling of carbon and alloy steels*

KC725M



- *carbide substrate and multi-layer PVD coating*
- *for steels, stainless steel, and high-temp alloys*

KC915M



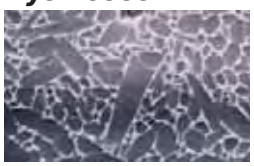
- *carbide substrate and CVD alumina (ceramic) coating*
- *for gray cast iron*

KC935M



- *carbide substrate and CVD alumina (ceramic) coating*
- *for general purpose milling of steels, stainless steels, and ductile irons*

Kyon 3500



- *ultra-pure silicon nitride substrate*
- *for high-speed cast iron*

New topography inserts that provide a variety of rake angles to optimize your metal-removal process!

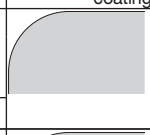
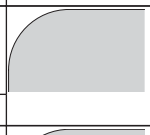
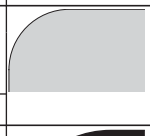
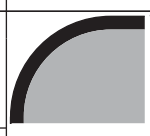
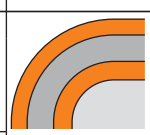
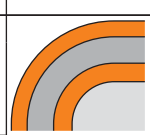
OPERATION UPGRADE
Proven Milling Performance

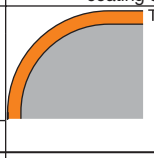
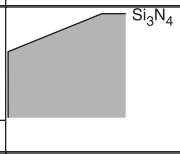
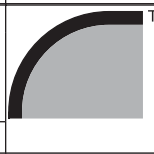
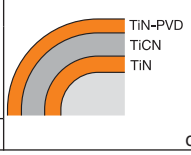
OPERATION UPGRADE™ PROGRAM
Kennametal's unsurpassed grade technology and reliability is built into every one of our industry-standard shapes and sizes! No matter what your milling application or workpiece, our inserts will deliver second-to-none results! Make a change for the better today!

THINK **MILLING,**
THINK **KENNAMETAL.**

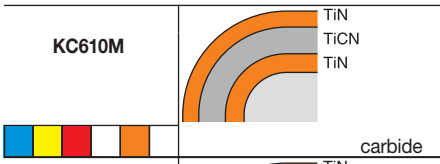
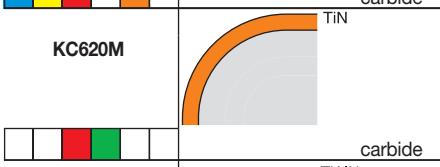
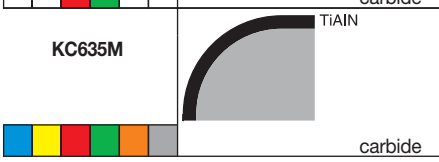
Kennametal will significantly improve your milling productivity!
Let us prove it.
www.kennametal.com

KENNAMETAL®
Engineering Your Competitive Edge

grades	coating composition	recommended use
K110M	 uncoated carbide	Uncoated carbide grade K110M is a universal grade for machining non-ferrous material. For use in light and general machining. K110M can be used with or without coolant.
K115M	 uncoated carbide	Uncoated fine grade carbide. K115M is a premium uncoated grade designed for high edge-wear resistance in non-ferrous and cast iron materials. Recommended to be used with coolant.
K125M	 uncoated carbide	Uncoated carbide grade K125M is particularly suitable for dry machining of steel. Primarily for use in light and general machining of steel.
KC410M	 PVD TiB_2 carbide	The PVD TiB2 coating on grade KC410M is extremely hard and provides very good wear characteristics at high cutting speeds. KC410M resists built up edge, can help reduce burring, and generates excellent surface finish. This grade is best suited for aluminum with <10% silicon and other non-ferrous materials.
KC510M	 TiAlN carbide	Coated carbide grade with a TiAlN coating (PVD). KC510M is a highly wear-resistant grade. Primarily for use in milling aluminum and high-temp alloys in light machining applications.
KC515M	 TiAlN carbide	Premium coated grade K10 substrate with built in wear resistance. TiAlN coating for extended life during finishing applications. Used in finish ball nose and back draft inserts for the die & mold industry. Capable of running at moderate to high cutting speeds. Recommended to be used dry or with an air blast.
KC520M	 TiAlN carbide	Coated carbide grade with a TiAlN coating (PVD). KC520M is a carbide grade developed specifically for general machining of ductile cast iron. This grade can be used wet or dry.
KC522M	 TiAlN carbide	Coated carbide grade with a TiAlN (PVD) coating. KC522M is engineered to provide better performance in general machining of high-temp alloys and stainless steel. KC522M resists breakage and offers improved wear resistance and increased strength.
KC525M	 TiAlN carbide	Coated carbide grade with a TiAlN coating (PVD). New universal carbide grade for milling steel, stainless steel, and high-temperature alloys. KC525M can be used with or without coolant. Primarily for use in light and general machining.
KC530M	 TiAlN carbide	Premium PVD-coated carbide grade (P40) with a TiAlN coating. Enables extended tool life at moderate feeds and high cutting speeds. First choice for milling in all steels, including die & mold steels. Recommended to use without coolant.
KC715M	 TiN TiCN TiN carbide	KC715M is ideal for dry machining. The deformation substrate combined with a PVD coating can handle high temperatures and high surface speeds. It is primarily for use in light and general machining of steels, stainless steel, and cast steel.
KC725M	 TiN TiCN TiN carbide	Coated carbide grade with an advanced PVD TiAlN coating. KC725M is a high-performance grade for milling steel, stainless steel, and ductile cast iron. The good thermal shock resistance of the substrate makes this grade ideal for both wet and dry machining. Primarily for use in general and heavy machining.

grades	coating composition	recommended use
KC735M		PVD/TiN coated carbide grade. This grade offers an unusual combination of high toughness and wear resistance. Even under extreme toughness requirements, KC735M achieves outstanding results in general and heavy machining applications. This grade is suitable for milling with or without coolant.
KC915M		Coated carbide grade with a CVD multi-layer coating (TiN/MT TiCN/Al_2O_3). KC915M is a universal grade for milling cast iron. This cutting material is the first choice for light and general machining. KC915M can be used in wet and dry machining, although dry is preferred.
KC935M		Coated carbide grade with CVD multi-layer coating (TiN/MT TiCN/Al_2O_3). KC935M is extremely well suited for wet or dry general purpose milling. KC935M can be used effectively across a wide range of materials such as steel, stainless steel, and ductile iron. Performs best dry at surface speeds in excess of 600 sfm or 180 meters.
KY3500		Ceramic cutting material based on micro-grain Si_3N_4. Primarily for use in light to general machining of gray cast iron and ferritic ductile cast iron. Dry machining is preferred while using KY3500.
KT530M		Cermet with TiAlN coating. KT530M is a universal milling cermet grade. This cutting material is the first choice for light machining of steel and stainless steel. KT530M can be used with or without coolant.
KD1410		PCD-tip brazed to carbide. For cutting aluminum with a very high silicon content, abrasive non-ferrous materials, and fiber-reinforced plastics. KD1410 can be used at very high cutting speeds, even where good surface finishes are required. This grade can be used wet or dry.
KD1415		PCD-tip brazed to carbide. For general machining of aluminum with a low silicon content, non-ferrous heavy metals and plastics. KD1415 can be used at high cutting speeds and for continuous cutting, even where outstanding surface finishes are required. KD1415 is suitable for wet and dry machining.
KB1340		PCBN cutting material with micro-grain structure for machining gray cast iron and hard materials. KB1340 grade has good wear resistance and is ideal for finishing. For use in light and general machining.
K313		Uncoated carbide grade. K313 is suitable for machining cast iron, high-temp alloys, and non-ferrous materials. This grade can be used both wet and dry and is designed for light and general machining.
KC792M		Coated carbide grade with an 8µm thick multi-layer coating (TiN/TiCN/TiN). High-performance grade for machining steel, particularly at high cutting speeds. Primarily for use in light and general applications. KC792M is ideal for dry machining.

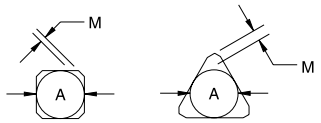
Thread Milling

KC610M		PVD (TiN/TiCN/TiN) coated carbide grade. KC610M is a high-performance grade for milling all types of material and is the first choice for steel. This grade is characterized by good hardness and wear resistance. This grade should be used with coolant or minimal lubrication.
KC620M		Coated carbide grade with a PVD coating (TiN). KC620M is suitable for machining cast iron, non-ferrous material, and aluminum alloys. This grade can be used wet or dry.
KC635M		Coated carbide grade with PVD TiAlN coating. KC635M is a high-performance grade for higher surface speeds and is a first choice for stainless steels. KC635M grade is characterized by high hardness and wear resistance. This grade is suitable for cutting hard materials (up to 65 HRC).

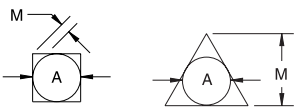
NOTE:

Kennametal's milling insert identification system is provided as a general reference. The dimensional tables associated with each insert should be used for specific values. This system is based on the latest ANSI and ISO insert identification guidelines.

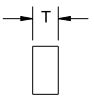
Dimensions shown in this catalog are prior to supplemental coating and edge modifications.



indexable inserts with facets/wipers



indexable inserts with corner radii



insert thickness

A	tolerances on "A" classes J, K, L, M, N	tolerances on "A" class U	tolerances on "M" classes M & N	tolerances on "M" class U
4,76 through 10,00	0,051	0,076	0,076	0,127
11,11 through 14,29	0,076	0,127	0,127	0,203
15,00 through 20,64	0,102	0,178	0,152	0,279
22,00 through 31,16	0,127	0,254	0,178	0,381
31,75 through 35,00	0,152	0,254	0,203	0,381

symbol shape	insert	shape	nose angle (degree)
A		parallelogram	85
C		rhomboid	80
E		rhomboid	75
H		hexagon	120
L		rectangle	90
O		octagon	135
R		round	–
S		square	90
T		triangle	60
X		standard Kennametal form	–

	A	M	T		A	M	T
A	0,025	0,005	0,025	J	*0,05-0,13	0,005	0,025
B	0,025	0,005	0,13	K	*0,05-0,13	0,013	0,025
C	0,025	0,013	0,025	L	*0,05-0,13	0,025	0,025
D	0,025	0,013	0,13	M	*0,05-0,10	*0,05-0,25	0,13
E	0,025	0,025	0,025	N	*0,05-0,10	*0,05-0,25	0,025
F	0,013	0,005	0,025	**P	0,038	0,038	0,038
G	0,025	0,025	0,13	U	*0,08-0,25	*0,13-0,30	0,13
H	0,013	0,013	0,025				

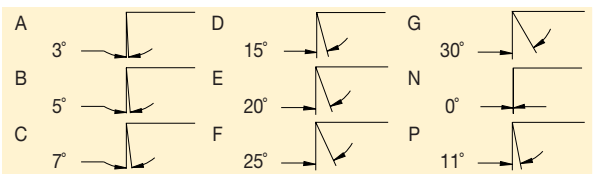
* *See table above for tolerances according to insert size and class.*
** *Kennametal standard only.*

Insert Shape

Tolerance Class (+/-)

S **E** **K** **R**

Clearance Angle

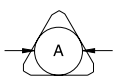


Geometry and Clamping Type

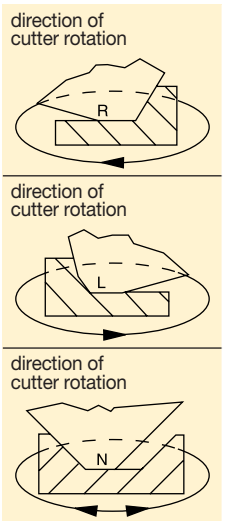
symbol	hole	shape of hole	chipbreaker	shape of insert's section
N	without		without	
R			single sided	
F			double sided	
A	with	cylindrical hole	without	
M			single sided	
G			double sided	
W		partly cylindrical hole, 40–60° countersink	without	
T			single sided	
Q		partly cylindrical hole, 40–60° double countersink	without	
U			double sided	
B		partly cylindrical hole, 70–90° countersink	without	
H			single sided	
C		partly cylindrical hole, 70–90° double countersink	without	
J			double sided	
X	special design			

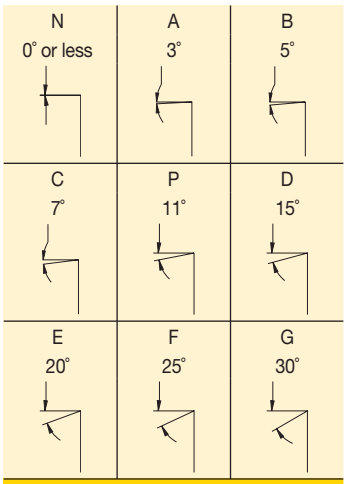
(a) For shapes A, L and X, see position #1; use length of leading cutting edge.

A	"L" for shapes						
	S	T	R	O	C	H	E
6,00	–	–	06	–	–	–	–
6,35	06	11	06	02	06	03	06
8,00	–	–	08	–	–	–	–
9,52	09	16	09	04	09	05	09
10,00	–	–	10	–	–	–	–
12,00	–	–	12	–	–	–	–
12,70	12	22	12	05	12	07	13
15,88	15	27	15	06	16	09	16
16,00	–	–	16	–	–	–	–
19,05	19	33	19	07	19	11	19
20,00	–	–	20	–	–	–	–
25,00	–	–	25	–	–	–	–
25,40	25	44	25	10	25	14	26



inscribed circle "A" versus cutting edge length "L"





nominal or average angle of rake on insert face at leading cutting edge before edge prep and before installation

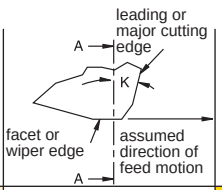
P	discontinuous T-land
J	"polished" rake face
W	wiper/ radiused facet

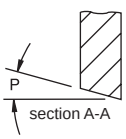
Size (a) | Insert Hand | Rake Face Angle | Added Info

12 03 AF T N G D □

Thickness | Corner Configuration (b) | Cutting Edge Form | Edge Prep Size

T	
2,38	02
3,18	03
3,97	T3
4,76	04
5,56	05
6,35	06
7,94	07





radius		
M0	round insert	
01	0,1 mm	
02	0,2 mm	
04	0,4 mm	
05	0,5 mm	
08	0,8 mm	
10	1,0 mm	
12	1,2 mm	
15	1,5 mm	
16	1,6 mm	
24	2,4mm	
32	3,2 mm	

(b) If letter is replaced by number(s), refer to table for radius "r".

lead angle K	
A	45°
D	60°
E	75°
P	90°

wiper edge clearance P	
A	3°
B	5°
C	7°
D	15°
E	20°
F	25°
G	30°
N	0°
P	11°

F sharp	
E honed	
T T-land	
S honed T-land	

L	Light — sharp or lightly honed and/or T-landed
G	General — medium hone and/or T-land
H	Heavy — large hone and/or T-land

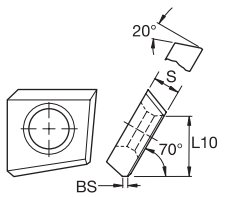
● first choice
○ alternate choice

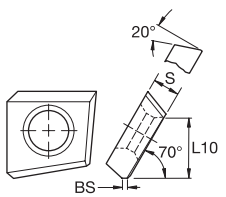
	ISO catalog number	ANSI catalog number	K110M	K125M	KC410M	KC510M	KC515M	KC520M	KC522M	KC525M	KC530M	KC715M	KC725M	KC735M	KC915M	KC935M	KT530M	KY1540	KY2100	KY3500	KB1340	KD1410	KD1415	KD1420
H							●														●			
S									●				●	●				●	●					
N			●		●	○			○													●	●	●
K						●	○	●	○						●	○				●	●				
M							○		●	○	●		●	●		○			●					
P				●			●		○	●	●	●	●	○		●	●	●	●					
4.21-601	4.21503R601	4.21503R601	●													●								
4.21-602	4.21503R602	4.21503R602														●								
4.21-611	4.21103L611	4.21103L611	●	●											●	●	●							
	4.21103R611	4.21103R611	●	●											●	●	●							
	4.21523L611	4.21523L611														●								
	4.21523R611	4.21523R611														●								
	4.21503L611	4.21503L611	●	●											●	●								
	4.21503R611	4.21503R611	●	●											●	●	●							
4.21-612	4.21503L612	4.21503L612														●								
	4.21503R612	4.21503R612	●	●												●								

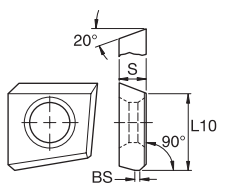
Pg. 493
Pg. 496, 497

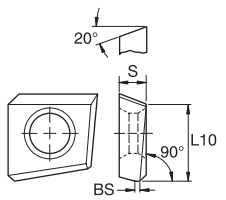
To place an order, contact Kennametal or your authorized Kennametal distributor, or visit www.kennametal.com.

ISO catalog number	dimensions														
	LI		W		S		D		L10		BS		Rε		
	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
4.21503R601	–	–	–	–	5,00	.197	–	–	13,00	.512	1,20	.047	–	–	4.21-601
4.21503R602	–	–	–	–	5,00	.197	–	–	13,00	.512	1,20	.047	–	–	4.21-602
4.21103L611	–	–	–	–	4,00	.158	–	–	10,50	.413	0,60	.024	–	–	4.21-611
4.21103R611	–	–	–	–	4,00	.158	–	–	10,50	.413	0,60	.024	–	–	
4.21523L611	–	–	–	–	5,00	.197	–	–	14,50	.570	0,70	.027	–	–	
4.21523R611	–	–	–	–	5,00	.197	–	–	14,50	.570	0,70	.027	–	–	
4.21503L611	–	–	–	–	5,00	.197	–	–	14,50	.570	0,70	.028	–	–	
4.21503R611	–	–	–	–	5,00	.197	–	–	14,50	.570	0,70	.028	–	–	
4.21503L612	–	–	–	–	5,00	.197	–	–	14,50	.570	0,70	.027	–	–	4.21-612
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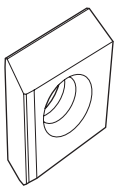
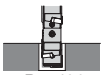
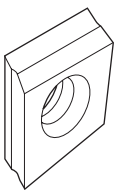
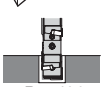
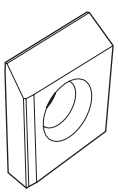
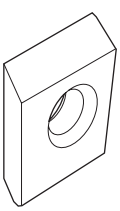
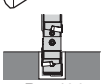






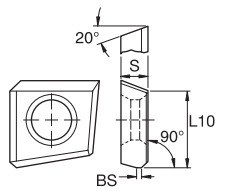


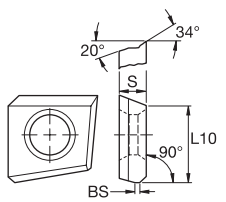
● first choice
○ alternate choice

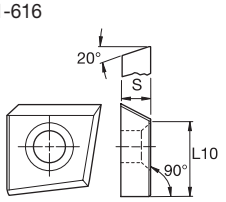
		ISO catalog number	ANSI catalog number	K110M	K125M	KC410M	KC510M	KC515M	KC520M	KC522M	KC525M	KC530M	KC715M	KC725M	KC735M	KC915M	KC935M	KT530M	KY1540	KY2100	KY3500	KB1340	KD1410	KD1415	KD1420
H								●														●			
S										●				●	●				●	●					
N		●		●	○					○													●	●	●
K					●	○	●	○								●	○				●	●				
M						○		●	○	●	○	●		●	●		○			●						
P			●			●		●		○	●	●	●	●	○		●	●	●	●						
4.21-614		4.21103R614	4.21103R614	●	●												●								
		4.21503R614	4.21503R614	●	●												●								
		4.21523R614	4.21523R614														●								
																									
	 Pg. 493	 Pg. 496, 497																							
4.21-615		4.21103L615	4.21103L615	●																					
		4.21103R615	4.21103R615	●																					
		4.21503L615	4.21503L615	●																					
		4.21503R615	4.21503R615	●																					
																									
	 Pg. 493	 Pg. 496, 497																							
4.21-616		4.21107R616	4.21107R616	●																					
		4.21507R616	4.21507R616	●	●													●							
																									
	 Pg. 493																								
4.21-619		4.21103L619	4.21103L619													●									
		4.21103R619	4.21103R619	●												●									
		4.21503L619	4.21503L619													●									
		4.21503R619	4.21503R619	●												●									
																									
	 Pg. 493	 Pg. 496, 497																							

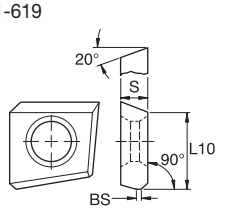
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ISO catalog number	dimensions														
	LI		W		S		D		L10		BS		Rε		
	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
4.21103R614	–	–	–	–	4,00	.158	–	–	10,50	.413	0,60	.024	–	–	4.21-614
4.21503R614	–	–	–	–	5,00	.197	–	–	14,50	.570	0,70	.028	–	–	
4.21523R614	–	–	–	–	5,00	.197	–	–	14,50	.570	0,70	.027	–	–	
4.21103L615	–	–	–	–	4,00	.158	–	–	10,50	.413	0,60	.024	–	–	4.21-615
4.21103R615	–	–	–	–	4,00	.158	–	–	10,50	.413	0,60	.024	–	–	
4.21503L615	–	–	–	–	5,00	.197	–	–	14,50	.570	0,70	.027	–	–	
4.21503R615	–	–	–	–	5,00	.197	–	–	14,50	.570	0,70	.028	–	–	
4.21107R616	–	–	–	–	4,00	.158	–	–	10,50	.413	–	–	–	–	4.21-616
4.21507R616	–	–	–	–	5,00	.197	–	–	14,50	.570	–	–	–	–	
4.21103L619	–	–	–	–	4,00	.158	–	–	10,50	.413	0,60	.024	–	–	4.21-619
4.21103R619	–	–	–	–	4,00	.158	–	–	10,50	.413	0,60	.024	–	–	
4.21503L619	–	–	–	–	5,00	.197	–	–	14,50	.570	0,70	.027	–	–	
4.21503R619	–	–	–	–	5,00	.197	–	–	14,50	.570	0,70	.028	–	–	









● first choice
○ alternate choice

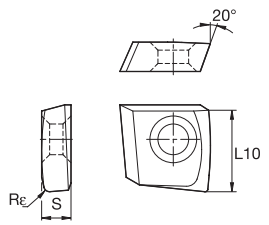
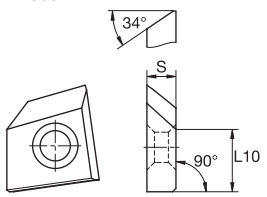
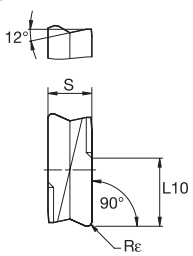
	ISO catalog number	ANSI catalog number	K110M	K125M	KC410M	KC510M	KC515M	KC520M	KC522M	KC525M	KC530M	KC715M	KC725M	KC735M	KC915M	KC935M	KT530M	KY1540	KY2100	KY3500	KB1340	KD1410	KD1415	KD1420
H							●														●			
S									●				●	●				●	●					
N			●		●	○			○													●	●	●
K						●	○	●	○						●	○				●	●				
M			`				○		●	○	●		●	●		○			●						
P				●			●		○	●	●	●	●	○		●	●	●	●						
4.21-621	4.21103L621	4.21103L621	●												●									
4.21-666	4.21508R666	4.21508R666	●																					
4.81-011	4.81201R011	4.81201R011													●	●								

Pg. 398, 399, 400, 401

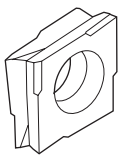
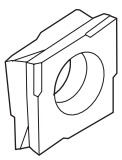
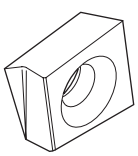
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K110M K125M KC410M KC510M KC515M KC520M KC522M KC525M KC530M KC715M KC725M KC735M KC915M KC935M KT530M KY1540 KY2100 KY3500 KB1340 KD1410 KD1415 KD1420

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ISO catalog number	dimensions														
	LI		W		S		D		L10		BS		Rε		
	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
4.21103L621	–	–	–	–	4,00	.158	–	–	11,00	.433	–	–	0,5	.020	4.21-621 
4.21508R666	–	–	–	–	5,00	.197	–	–	10,50	.413	–	–	–	–	4.21-666 
4.81201R011	–	–	–	–	5,50	.217	–	–	6,50	.256	–	–	0,8	.031	4.81-011 

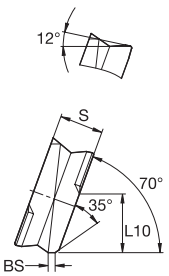
● first choice
○ alternate choice

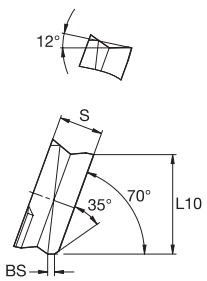
	ISO catalog number	ANSI catalog number	K110M	K125M	KC410M	KC510M	KC515M	KC520M	KC522M	KC525M	KC530M	KC715M	KC725M	KC735M	KC915M	KC935M	KT530M	KY1540	KY2100	KY3500	KB1340	KD1410	KD1415	KD1420
H							●														●			
S									●				●	●				●	●					
N			●		●	○			○													●	●	●
K						●	○	●	○						●	○				●	●				
M							○		●	○	●		●	●		○			●					
P				●			●		○	●	●	●	●	○		●	●	●	●					
4.81-631   Pg. 315	4.81201R631	4.81201R631	●	●									●											
4.81-634   Pg. 317	4.81501R634	4.81501R634	●	●																				
4.81-636   Pg. 315	4.81207L636	4.81207L636													●									
	4.81207R636	4.81207R636	●										●		●	●	●			●				
	4.81507R636	4.81507R636	●												●	●								

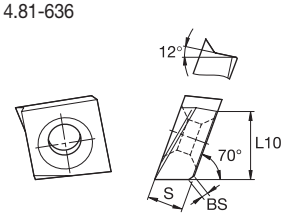
K110M K125M KC410M KC510M KC515M KC520M KC522M KC525M KC530M KC715M KC725M KC735M KC915M KC935M KT530M KY1540 KY2100 KY3500 KB1340 KD1410 KD1415 KD1420

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ISO catalog number	dimensions														
	l1		W		S		D		L10		BS		Rε		
	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
4.81201R631	–	–	–	–	5,50	.217	–	–	6,00	.236	0,70	.027	–	–	4.81-631
4.81501R634	–	–	–	–	6,60	.260	–	–	12,50	.492	1,30	.051	–	–	4.81-634
4.81207L636	–	–	–	–	5,50	.217	–	–	12,50	.492	1,20	.047	–	–	4.81-636
4.81207R636	–	–	–	–	5,50	.217	–	–	12,50	.492	1,20	.047	–	–	
4.81507R636	–	–	–	–	6,60	.260	–	–	12,50	.492	1,20	.047	–	–	





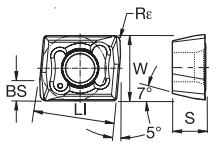
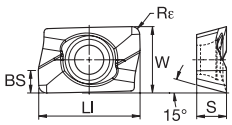
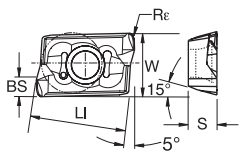
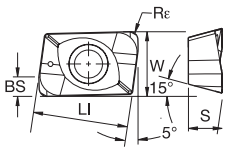


● first choice
○ alternate choice

	ISO catalog number	ANSI catalog number	K110M	K125M	KC410M	KC510M	KC515M	KC520M	KC522M	KC525M	KC530M	KC715M	KC725M	KC735M	KC915M	KC935M	KT530M	KY1540	KY2100	KY3500	KB1340	KD1410	KD1415	KD1420
H							●														●			
S									●				●	●				●	●					
N			●		●	○			○													●	●	●
K						●	○	●	○						●	○				●	●				
M							○		●	○	●		●	●		○			●					
P				●			●		○	●	●	●	●	○		●	●	●	●					
ACET-GC	ACET150612PPERGC	ACET2343PPER9GC											●											
ADCT-LD	ADCT1545PDERLD	ADCT2328PDER5LD								●			●											
	ADCT1545PDFRLDJ	ADCT2328PDFR5LDJ			●																			
	ADCT1545PDSRLD	ADCT2328PDSR5LD								●						●								
	ADCT154512PDERLD	ADCT23283PDER5LD											●											
	ADCT154516PDSRLD	ADCT23284PDSR5LD											●											
	ADCT154524PDERLD	ADCT23286PDER5LD											●											
	ADCT154532PDERLD	ADCT23288PDER5LD											●											
	ADCT154532PDSRLD	ADCT23288PDSR5LD											●											
ADKT-GB	ADKT1545PDERGB	ADKT2328PDER5GB						●		●			●			●								
	ADKT1545PDSRGB	ADKT2328PDSR5GB						●		●			●			●								
	ADKT154512PDERGB	ADKT23283PDER5GB						●		●														
ADKT-LC	ADKT103504PDERLC	ADKT16221PDERLC						●		●			●			●								
	ADKT103504PDFRLC	ADKT16221PDFR5LC			●	●																		
	ADKT103504PDSRLC	ADKT16221PDSRLC											●			●								
	ADKT1035PDERLC	ADKT1622PDER5LC						●	●	●			●		●	●								
	ADKT1035PDFRLC	ADKT1622PDFR5LC			●																			
	ADKT1035PDSRLC	ADKT1622PDSR5LC						●		●			●			●								
	ADKT103512PDERLC	ADKT16223PDERLC							●				●			●								
	ADKT103516PDERLC	ADKT16224PDERLC							●	●			●			●								
	ADKT103524PDERLC	ADKT16226PDERLC							●				●			●								
	ADKT103532PDERLC	ADKT16228PDERLC							●	●			●			●								

Pg. 364 Pg. 363

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ISO catalog number	dimensions														
	LI		W		S		D		L10		BS		Rε		
	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
ACET150612PPERGC	15,24	.600	12,70	.500	6,35	.250	–	–	–	–	3,92	.154	1,2	.047	ACET-GC 
ADCT1545PDERLD	15,34	.604	10,00	.394	4,50	.177	–	–	–	–	3,45	.136	0,8	.031	ADCT-LD 
ADCT1545PDFRLDJ	15,34	.604	10,00	.394	4,50	.177	–	–	–	–	3,45	.136	0,8	.031	
ADCT1545PDSRLD	15,34	.604	10,00	.394	4,50	.177	–	–	–	–	3,45	.136	0,8	.031	
ADCT154512PDERLD	15,34	.604	10,00	.394	4,50	.177	–	–	–	–	3,44	.135	1,2	.047	
ADCT154516PDSRLD	15,34	.604	10,00	.394	4,50	.177	–	–	–	–	3,43	.135	1,6	.062	
ADCT154524PDERLD	15,35	.604	10,00	.394	4,50	.177	–	–	–	–	3,41	.134	2,4	.094	
ADCT154532PDERLD	15,35	.604	10,00	.394	4,50	.177	–	–	–	–	3,41	.134	3,2	.125	
ADCT154532PDSRLD	15,35	.604	10,00	.394	4,50	.177	–	–	–	–	3,41	.134	3,2	.125	
ADKT1545PDERGB	15,00	.591	10,00	.394	4,50	.177	–	–	–	–	2,64	.104	0,8	.031	ADKT-GB 
ADKT1545PDSRGB	15,00	.591	10,00	.394	4,50	.177	–	–	–	–	2,63	.103	0,8	.031	
ADKT154512PDERGB	15,00	.591	10,00	.394	4,50	.177	–	–	–	–	2,64	.104	1,2	.047	
ADKT103504PDERLC	10,00	.394	6,70	.264	3,50	.138	–	–	–	–	2,00	.079	0,4	.016	ADKT-LC 
ADKT103504PDFRLC	10,00	.394	6,70	.264	3,50	.138	–	–	–	–	2,00	.079	0,4	.016	
ADKT103504PDSRLC	10,00	.394	6,70	.264	3,50	.138	–	–	–	–	2,00	.079	0,4	.016	
ADKT1035PDERLC	10,00	.394	6,70	.264	3,50	.138	–	–	–	–	2,00	.079	0,8	.031	
ADKT1035PDFRLC	10,00	.394	6,70	.264	3,50	.138	–	–	–	–	2,00	.079	0,8	.031	
ADKT1035PDSRLC	10,00	.394	6,70	.264	3,50	.138	–	–	–	–	2,00	.079	0,8	.031	
ADKT103512PDERLC	10,00	.394	6,70	.264	3,50	.138	–	–	–	–	2,00	.079	1,2	.047	
ADKT103516PDERLC	10,00	.394	6,70	.264	3,50	.138	–	–	–	–	2,00	.079	1,6	.063	
ADKT103524PDERLC	10,00	.394	6,61	.260	3,50	.138	–	–	–	–	2,00	.079	2,4	.094	
ADKT103532PDERLC	10,00	.394	6,70	.264	3,50	.138	–	–	–	–	2,00	.079	3,2	.125	

● first choice
○ alternate choice

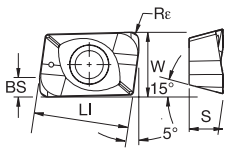
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H							●														●			
S									●				●	●				●	●					
N			●		●	○			○													●	●	●
K						●	○	●	○						●	○				●	●				
M							○		●	○	●		●	●		○			●					
P				●			●		○	●	●	●	●	○		●	●	●	●					
ADPT-GC	ADPT1035PDERGC	ADPT1622PDERGC							●	●			●											
	ADPT1035PDSRGC	ADPT1622PDSRGC								●		●	●											
ADPT-GD	ADPT1505PDERGD	ADPT1505PDERGD						●					●			●								
	ADPT150516ERGD	ADPT150516ERGD						●					●			●								
	ADPT150524ERGD	ADPT150524ERGD						●					●			●								
	ADPT150532ERGD	ADPT150532ERGD						●					●			●								
	ADPT150540ERGD	ADPT150540ERGD						●					●			●								
	ADPT150550ERGD	ADPT150550ERGD						●					●			●								
	ADPT150564ERGD	ADPT150564ERGD						●					●			●								
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	ANGT1003PPFRLGJ	ANGT1623PPFR3LGJ				●																		
	ANGT100308PPERLG	ANGT16232PPER3LG						●		●			●		●	●								
	ANGT100308PPFRLGJ	ANGT16232PPFR3LGJ				●																		
	ANGT100316PPERLG	ANGT16234PPER5LG						●		●			●			●								
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	ANGT100324PPERLG	ANGT16236PPER7LG											●											
	ANGT100324PPFRLGJ	ANGT16236PPFR7LGJ				●																		
	ANGT100332PPERLG	ANGT16238PPER9LG								●			●			●								
	ANGT100332PPFRLGJ	ANGT16238PPFR9LGJ				●																		
ANGT16-LG	ANGT1606PPERLG	ANGT254PPER6LG						●		●			●											
	ANGT1606PPFRLGJ	ANGT254PPFR6LGJ				●																		
	ANGT160605PPERLG	ANGT25413PPER6LG														●								
	ANGT160608PPERLG	ANGT2542PPER6LG						●		●			●			●								
	ANGT160608PPFRLGJ	ANGT2542PPFR6LGJ				●																		
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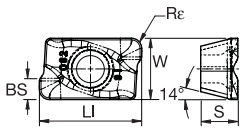
Pg. 363

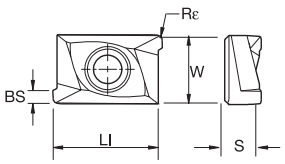
OPERATION UPGRADE

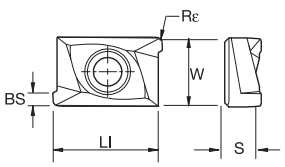
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ISO catalog number	dimensions														
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	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
ADPT1035PDERGC	9,82	.387	6,70	.264	3,50	.138	–	–	–	–	2,00	.079	0,8	.030	ADPT-GC
ADPT1035PDSRGC	9,82	.387	6,70	.264	3,50	.138	–	–	–	–	2,00	.079	0,8	.031	
ADPT1505PDERGD	16,12	.635	9,65	.380	5,84	.230	–	–	–	–	3,15	.124	0,8	.031	ADPT-GD
ADPT150516ERGD	16,12	.635	9,65	.380	5,84	.230	–	–	–	–	3,15	.124	1,6	.062	
ADPT150524ERGD	15,55	.612	9,65	.380	5,84	.230	–	–	–	–	3,30	.130	2,4	.094	
ADPT150532ERGD	15,41	.607	9,65	.380	5,84	.230	–	–	–	–	3,50	.138	3,2	.125	
ADPT150540ERGD	15,09	.594	9,65	.380	5,75	.226	–	–	–	–	–	–	4,0	.157	
ADPT150550ERGD	15,09	.594	9,65	.380	5,75	.226	–	–	–	–	–	–	5,0	.197	
ADPT150564ERGD	14,59	.575	9,65	.380	5,64	.222	–	–	–	–	–	–	6,4	.250	
ANGT1003PPERLG	10,40	.409	6,80	.268	3,60	.142	–	–	–	–	1,30	.051	0,5	.020	ANGT10-LG
ANGT1003PPFRLGJ	10,40	.409	6,80	.268	3,60	.142	–	–	–	–	1,30	.051	0,5	.020	
ANGT100308PPERLG	10,40	.409	6,80	.268	3,60	.142	–	–	–	–	1,30	.051	0,8	.031	
ANGT100308PPFRLGJ	10,40	.409	6,80	.268	3,60	.142	–	–	–	–	1,30	.051	0,8	.031	
ANGT100316PPERLG	10,40	.409	6,80	.268	3,60	.142	–	–	–	–	2,07	.081	1,6	.063	
ANGT100316PPFRLGJ	10,40	.409	6,80	.268	3,60	.142	–	–	–	–	2,07	.081	1,6	.063	
ANGT100324PPERLG	10,40	.409	6,80	.268	3,60	.142	–	–	–	–	2,88	.113	2,4	.094	
ANGT100324PPFRLGJ	10,40	.409	6,80	.268	3,60	.142	–	–	–	–	2,88	.113	2,4	.094	
ANGT100332PPERLG	10,40	.409	6,80	.268	3,60	.142	–	–	–	–	3,68	.145	3,2	.125	
ANGT100332PPFRLGJ	10,40	.409	6,80	.268	3,60	.142	–	–	–	–	3,68	.145	3,2	.125	
ANGT1606PPERLG	16,00	.630	11,00	.433	6,35	.250	–	–	–	–	2,50	.098	0,4	.016	ANGT16-LG
ANGT1606PPFRLGJ	16,00	.630	11,00	.433	6,35	.250	–	–	–	–	2,50	.098	0,4	.016	
ANGT160605PPERLG	16,00	.630	11,00	.433	6,35	.250	–	–	–	–	2,50	.098	0,5	.020	
ANGT160608PPERLG	16,00	.630	11,00	.433	6,35	.250	–	–	–	–	2,50	.098	0,8	.031	
ANGT160608PPFRLGJ	16,00	.630	11,00	.433	6,35	.250	–	–	–	–	2,50	.098	0,8	.031	
ANGT160616PPERLG	16,00	.630	11,00	.433	6,35	.250	–	–	–	–	2,50	.098	1,6	.063	
ANGT160616PPFRLGJ	16,00	.630	11,00	.433	6,35	.250	–	–	–	–	2,50	.098	1,6	.063	
ANGT160624PPERLG	16,00	.630	11,00	.433	6,35	.250	–	–	–	–	3,15	.124	2,5	.097	
ANGT160632PPERLG	16,00	.630	11,00	.433	6,35	.250	–	–	–	–	3,90	.154	3,2	.125	
ANGT160648PPERLG	16,00	.630	11,00	.433	6,35	.250	–	–	–	–	5,39	.212	4,8	.188	
ANGT160664PPERLG	16,00	.630	11,00	.433	6,35	.250	–	–	–	–	6,80	.268	6,4	.250	









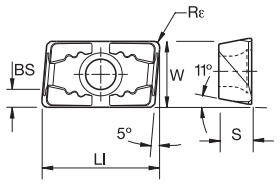
● first choice
○ alternate choice

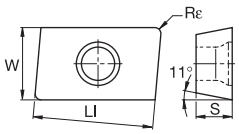
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H							●														●			
S									●				●	●				●	●					
N			●		●	○			○													●	●	●
K						●	○	●	○						●	○				●	●				
M							○		●	○	●		●	●		○			●					
P				●			●		○	●	●	●	●	○		●	●	●	●					
APFT-PDR	APFT1604PDR	APFT263PDR						●					●											
	APFT1604PDTR	APFT263PDTR											●			●								
APFX-PD1R	APFX1604PD1R	APFX1604PD1R		●												●								
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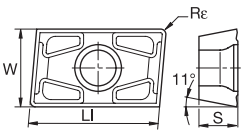
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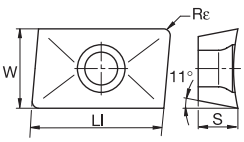
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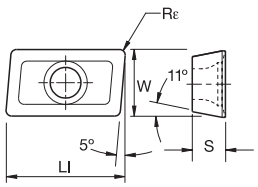
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	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
APFT1604PDR	17,00	.669	9,53	.375	4,76	.188	–	–	–	–	3,06	.120	0,8	.031	APFT-PDR
APFT1604PDTR	17,00	.669	9,53	.375	4,76	.188	–	–	–	–	3,06	.120	0,8	.031	
APFX1604PD1R	16,44	.647	9,53	.375	4,76	.188	–	–	–	–	–	–	0,8	.031	APFX-PD1R
APFX1604PD2R	16,44	.647	9,53	.375	4,76	.188	–	–	–	–	–	–	0,8	.031	APFX-PD2R
APFX1604PD8R	16,44	.647	9,53	.375	4,76	.188	–	–	–	–	–	–	0,8	.031	APFX-PD8R
APKT1604PDR	17,45	.687	10,00	.394	4,95	.195	–	–	–	–	–	–	1,0	.039	APKT-PDR
APKT160416R	17,00	.669	9,52	.375	4,76	.188	–	–	–	–	–	–	1,6	.062	
APKT160424R	16,99	.669	9,52	.375	4,76	.188	–	–	–	–	–	–	2,4	.094	
APKT160432R	16,86	.664	9,52	.375	4,76	.188	–	–	–	–	–	–	3,2	.125	
APKT1604635R	16,30	.642	9,52	.375	4,76	.188	–	–	–	–	–	–	6,4	.250	











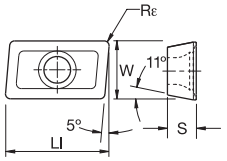
● first choice
○ alternate choice

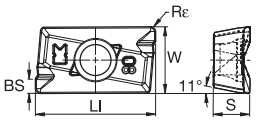
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H							●														●			
S									●				●	●				●	●					
N			●		●	○			○													●	●	●
K						●	○	●	○						●	○				●	●			
M							○		●	○	●		●	●		○			●					
P				●			●		○	●	●	●	●	○		●	●	●	●					
APKT-PDTR	APKT1604PDTR	APKT263PDTR						●					●			●								
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	APPT160416PDERGD	APPT160416PDERGD						●		●			●			●								
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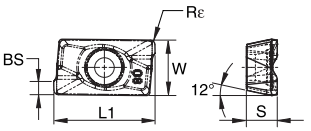
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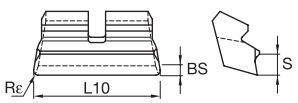
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ISO catalog number	dimensions														
	LI		W		S		D		L10		BS		Rε		
	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
APKT1604PDTR	17,45	.687	10,00	.394	4,95	.195	–	–	–	–	–	–	1,0	.039	APKT-PDRT
APKT160416TR	17,00	.669	9,52	.375	4,76	.188	–	–	–	–	–	–	1,6	.063	
APKT160424TR	17,00	.669	9,52	.375	4,76	.188	–	–	–	–	–	–	2,4	.094	
APKT160432TR	16,86	.664	9,52	.375	4,76	.188	–	–	–	–	–	–	3,2	.125	
APPT120308PDERGD	13,10	.516	8,00	.315	3,80	.150	–	–	–	–	2,06	.081	0,8	.031	APPT12-GD
APPT1604PDERGD	17,24	.679	9,43	.371	5,26	.207	–	–	–	–	1,47	.058	0,8	.031	APPT16-GD
APPT1604PDSRGD	17,24	.679	9,43	.371	5,26	.207	–	–	–	–	1,43	.056	0,8	.031	
APPT160416PDERGD	17,22	.678	9,43	.371	5,27	.207	–	–	–	–	1,43	.056	1,6	.062	
APPT160416PDSRGD	17,22	.678	9,43	.371	5,27	.207	–	–	–	–	1,43	.056	1,6	.062	
APPT160424PDERGD	17,10	.673	9,43	.371	5,27	.207	–	–	–	–	1,16	.046	2,4	.094	
APPT160432PDERGD	16,87	.664	9,43	.371	5,26	.207	–	–	–	–	–	–	3,2	.125	
APPT160448PDERGD	16,22	.639	9,43	.371	5,01	.197	–	–	–	–	–	–	4,8	.188	
APPT160464PDERGD	15,88	.625	9,43	.371	4,98	.196	–	–	–	–	–	–	6,4	.250	
BDHX0802APFNLD1S	–	–	–	–	2,30	.091	–	–	7,80	.307	0,90	.035	–	–	BDHX08
BDHX0802APFNLNT1S	–	–	–	–	2,30	.091	–	–	7,80	.307	0,90	.035	–	–	
BDHX0802PPFNLD1S	–	–	–	–	2,30	.091	–	–	7,80	.307	–	–	0,4	.016	
BDHX0802PPFNLNT1S	–	–	–	–	2,30	.091	–	–	7,80	.307	–	–	0,4	.016	









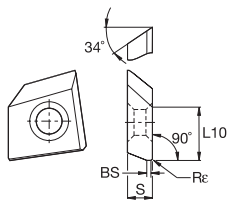
● first choice
○ alternate choice

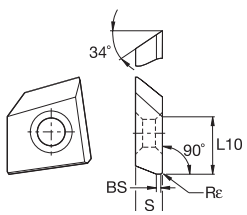
		ISO catalog number	ANSI catalog number	K110M	K125M	KC410M	KC510M	KC515M	KC520M	KC522M	KC525M	KC530M	KC715M	KC725M	KC735M	KC915M	KC935M	KT530M	KY1540	KY2100	KY3500	KB1340	KD1410	KD1415	KD1420
H								●														●			
S										●				●	●				●	●					
N				●		●	○			○													●	●	●
K							●	○	●	○						●	○				●	●			
M								○		●	○	●		●	●		○			●					
P					●			●		○	●	●	●	●	○		●	●	●	●					
BGHX-PCFLGG		BGHX15L5PCFLGG	BGHX15L5PCFLGG	●			●																		
BGHX-PCFRGG		BGHX15L504PCFRGG	BGHX15L504PCFRGG	●																					
		BGHX15L508PCFRGG	BGHX15L508PCFRGG	●			●																		
		BGHX15L512PCFRGG	BGHX15L512PCFRGG	●																					
		BGHX15L515PCFRGG	BGHX15L515PCFRGG	●			●																		
		BGHX15L5PCFRGG	BGHX15L5PCFRGG	●			●																		
BGHX-PCTRGG		BGHX15L5PCTRGG	BGHX15L5PCTRGG	●			●																		
BGHX-GG1W		BGHX15L5PCFLGG1W	BGHX15L5PCFLGG1W	●																					
		BGHX15L5PCFRGG1W	BGHX15L5PCFRGG1W	●			●																		
		BGHX15L5PCTRGG1W	BGHX15L5PCTRGG1W	●			●																		

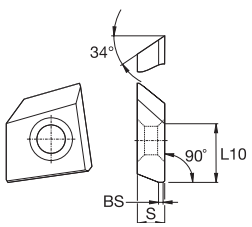
Pg. 397
Pg. 397
Pg. 398

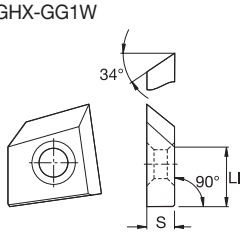
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ISO catalog number	dimensions														
	LI		W		S		D		L10		BS		Rε		
	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
BGHX15L5PCFLGG	–	–	–	–	5,00	.197	–	–	10,50	.413	1,22	.048	–	–	BGHX-PCFLGG
BGHX15L504PCFRGG	–	–	–	–	5,00	.197	–	–	10,50	.413	1,20	.047	0,4	.016	BGHX-PCFRGG
BGHX15L508PCFRGG	–	–	–	–	5,00	.197	–	–	10,50	.413	1,20	.047	0,8	.031	
BGHX15L512PCFRGG	–	–	–	–	5,00	.197	–	–	10,50	.413	1,20	.047	1,2	.047	
BGHX15L515PCFRGG	–	–	–	–	5,00	.197	–	–	10,50	.413	1,20	.047	1,5	.059	
BGHX15L5PCFRGG	–	–	–	–	5,00	.197	–	–	10,50	.413	1,22	.048	–	–	
BGHX15L5PCTRGG	–	–	–	–	5,00	.197	–	–	10,50	.413	1,22	.048	–	–	BGHX-PCTRGG
BGHX15L5PCFLGG1W	10,50	.413	–	–	5,00	.197	–	–	–	–	–	–	–	–	BGHX-GG1W
BGHX15L5PCFRGG1W	10,50	.413	–	–	5,00	.197	–	–	–	–	–	–	–	–	
BGHX15L5PCTRGG1W	10,50	.413	–	–	5,00	.197	–	–	–	–	–	–	–	–	







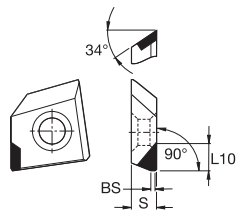
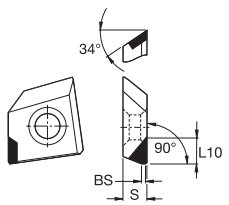
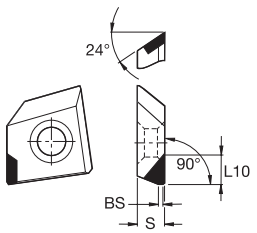
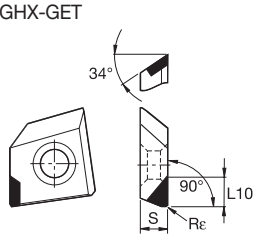


● first choice
○ alternate choice

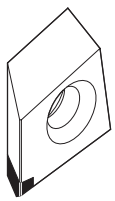
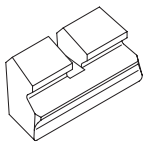
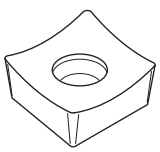
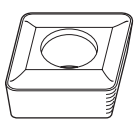
	ISO catalog number	ANSI catalog number	K110M	K125M	KC410M	KC510M	KC515M	KC520M	KC522M	KC525M	KC530M	KC715M	KC725M	KC735M	KC915M	KC935M	KT530M	KY1540	KY2100	KY3500	KB1340	KD1410	KD1415	KD1420
H							●														●			
S									●				●	●				●	●					
N			●		●	○			○													●	●	●
K						●	○	●	○						●	○				●	●			
M							○		●	○	●		●	●		○			●					
P				●			●		○	●	●	●	●	○		●	●	●	●					
BGHX-PCE-GGT	BGHX15L5PCELGGT	BGHX15L5PCELGGT																					●	
BGHX-PCE-GGTM	BGHX15L5PCERGGTM	BGHX15L5PCERGGTM																				●		
BGHX-LET	BGHX15L5PCSRLET	BGHX15L5PCSRLET																				●	●	
BGHX-GET	BGHX15L504ERGET	BGHX15L504ERGET																					●	

Pg. 398, 401, 400
Pg. 399

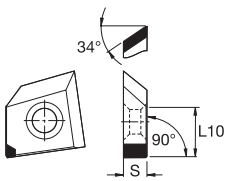
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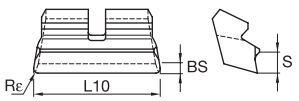
ISO catalog number	dimensions														
	LI		W		S		D		L10		BS		Rε		
	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
BGHX15L5PCELGGT	–	–	–	–	5,00	.197	–	–	6,00	.236	0,90	.035	–	–	BGHX-PCE-GGT 
BGHX15L5PCERGGTM	–	–	–	–	5,00	.197	–	–	2,50	.098	1,20	.047	–	–	BGHX-PCE-GGTM 
BGHX15L5PCSRLET	–	–	–	–	5,00	.197	–	–	8,00	.320	0,90	.035	–	–	BGHX-LET 
BGHX15L504ERGET	–	–	–	–	5,00	.197	–	–	5,20	.205	–	–	0,4	.016	BGHX-GET 

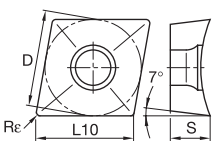
● first choice
○ alternate choice

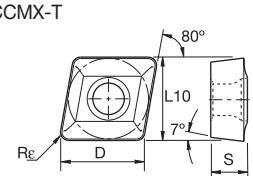
	ISO catalog number	ANSI catalog number	K110M	K125M	KC410M	KC510M	KC515M	KC520M	KC522M	KC525M	KC530M	KC715M	KC725M	KC735M	KC915M	KC935M	KT530M	KY1540	KY2100	KY3500	KB1340	KD1410	KD1415	KD1420
H							●														●			
S									●				●	●				●	●					
N			●		●	○			○													●	●	●
K						●	○	●	○						●	○				●	●			
M							○		●	○	●		●	●		○			●					
P				●			●		○	●	●	●	●	○		●	●	●	●					
BGHX-GT1W	BGHX15L5PCELGGT1W	BGHX15L5PCELGGT1W																					●	
	BGHX15L5PCERGGT1W	BGHX15L5PCERGGT1W																					●	
 Pg. 398, 401, 400  Pg. 399																								
BPHX120	BPHX1202PDFRLNC1S	BPHX1202PDFRLNC1S																					●	
	BPHX1203ADFNLD1S	BPHX1203ADFNLD1S	●																					
	BPHX1203ADFNLT1S	BPHX1203ADFNLT1S																					●	
	BPHX1203ADFRLT1S	BPHX1203ADFRLT1S																					●	
	BPHX1203PDFNLD1S	BPHX1203PDFNLD1S	●																					
	BPHX1203PDFNLT1S	BPHX1203PDFNLT1S																					●	
	BPHX1203PDFRLT1S	BPHX1203PDFRLT1S																					●	
 Pg. 353																								
CCGX	CCGX060204N	CCGX060204														●								
	CCGX0603022R	CCGX0603022R	●																					
	CCGX0905041R	CCGX0905041R														●								
	CCGX0905042R	CCGX0905042R	●																					
	CCGX09T308R	CCGX09T308														●								
	CCGX120412R	CCGX120412R														●								
CCMX-T	CCMX060204T77	CCMX2151T77											●											
	CCMX080308T77	CCMX2522T77													●									
	CCMX09T308T77	CCMX3252T77													●									
OPERATION UPGRADE																								
			K110M	K125M	KC410M	KC510M	KC515M	KC520M	KC522M	KC525M	KC530M	KC715M	KC725M	KC735M	KC915M	KC935M	KT530M	KY1540	KY2100	KY3500	KB1340	KD1410	KD1415	KD1420

ISO catalog number	dimensions														
	LI		W		S		D		L10		BS		Rε		
	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
BGHX15L5PCELGGT1W	–	–	–	–	5,00	.197	–	–	10,00	.394	–	–	–	–	BGHX-GT1W
BGHX15L5PCERGGT1W	–	–	–	–	5,00	.197	–	–	10,00	.394	–	–	–	–	
BPHX1202PDFRLNC1S	–	–	–	–	2,30	.091	–	–	12,00	.472	0,80	.032	0,4	.016	BPHX120
BPHX1203ADFNLD1S	–	–	–	–	3,08	.121	–	–	12,00	.472	1,00	.039	–	–	
BPHX1203ADFNLT1S	–	–	–	–	3,08	.121	–	–	12,00	.472	1,00	.039	–	–	
BPHX1203ADFRLT1S	–	–	–	–	3,08	.121	–	–	7,00	.276	1,00	.039	–	–	
BPHX1203PDFNLD1S	–	–	–	–	3,08	.121	–	–	12,00	.472	–	–	0,4	.016	
BPHX1203PDFNLT1S	–	–	–	–	3,08	.121	–	–	12,00	.472	–	–	0,4	.016	
BPHX1203PDFRLT1S	–	–	–	–	3,08	.121	–	–	7,00	.276	–	–	0,4	.016	
CCGX060204N	–	–	–	–	2,38	.094	6,35	.250	6,40	.252	–	–	0,4	.016	CCGX
CCGX0603022R	–	–	–	–	3,18	.125	6,54	.258	6,64	.262	–	–	0,2	.008	
CCGX0905041R	–	–	–	–	5,56	.219	9,92	.391	10,07	.397	–	–	0,4	.016	
CCGX0905042R	–	–	–	–	5,56	.219	9,92	.391	10,07	.397	–	–	0,4	.016	
CCGX09T308R	–	–	–	–	3,97	.156	9,53	.375	9,70	.382	–	–	0,8	.032	
CCGX120412R	–	–	–	–	4,76	.188	12,70	.500	12,90	.508	–	–	1,2	.047	
CCMX060204T77	–	–	–	–	2,38	.094	6,45	.254	6,35	.250	–	–	0,4	.016	CCMX-T
CCMX080308T77	–	–	–	–	3,18	.125	8,06	.318	7,94	.313	–	–	0,8	.031	
CCMX09T308T77	–	–	–	–	3,97	.156	9,67	.381	9,53	.375	–	–	0,8	.031	









● first choice
○ alternate choice

	ISO catalog number	ANSI catalog number	K110M	K125M	KC410M	KC510M	KC515M	KC520M	KC522M	KC525M	KC530M	KC715M	KC725M	KC735M	KC915M	KC935M	KT530M	KY1540	KY2100	KY3500	KB1340	KD1410	KD1415	KD1420
H							●														●			
S									●				●	●				●	●					
N			●		●	○			○													●	●	●
K						●	○	●	○						●	○				●	●				
M							○		●	○	●		●	●		○			●					
P				●			●		○	●	●	●	●	○		●	●	●	●					
CDE-322	CDE322R10	CDE322R10							●															
	CDE322L05	CDE322L05						●	●				●		●									
	CDE322R05	CDE322R05						●					●			●								
	CDE322R02	CDE322R02											●		●	●								
	CDE322R04	CDE322R04							●				●											
CDE-323	CDE323L05	CDE323L05						●																
	CDE323R05	CDE323R05						●																
CNHQ	CNHQ1005	CNHQ1005												●										
	CNHQ1205	CNHQ1205										●		●										
CNHQ-R	CNHQ1005R08	CNHQ1005R08											●		●	●								
	CNHQ1205R08	CNHQ1205R08											●		●									
	CNHQ1606R08	CNHQ1606R08											●		●									

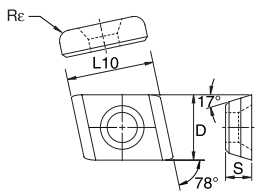
Pg. 494

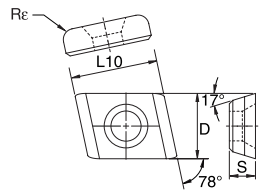
Pg. 494

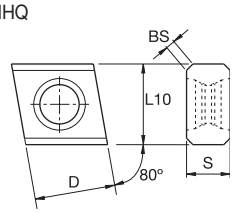
K110M K125M KC410M KC510M KC515M KC520M KC522M KC525M KC530M KC715M KC725M KC735M KC915M KC935M KT530M KY1540 KY2100 KY3500 KB1340 KD1410 KD1415 KD1420

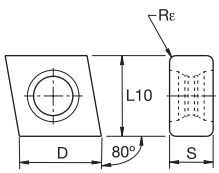
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ISO catalog number	dimensions														
	LI		W		S		D		L10		BS		Rε		
	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
CDE322R10	—	—	—	—	3,81	.150	9,52	.375	12,98	.511	—	—	0,4	.016	CDE-322
CDE322L05	—	—	—	—	3,81	.150	9,52	.375	12,98	.511	—	—	0,8	.031	
CDE322R05	—	—	—	—	3,81	.150	9,52	.375	12,98	.511	—	—	0,8	.031	
CDE322R02	—	—	—	—	3,81	.150	9,52	.375	12,98	.511	—	—	1,6	.063	
CDE322R04	—	—	—	—	3,81	.150	9,52	.375	12,98	.511	—	—	3,2	.125	
CDE323L05	—	—	—	—	4,76	.188	9,52	.375	12,70	.500	—	—	0,8	.031	CDE-323
CDE323R05	—	—	—	—	4,76	.188	9,52	.375	12,70	.500	—	—	0,8	.031	
CNHQ1005	—	—	—	—	5,40	.213	10,00	.394	10,00	.394	0,72	.028	—	—	CNHQ
CNHQ1205	—	—	—	—	5,40	.213	10,00	.394	12,70	.500	0,72	.028	—	—	
CNHQ1005R08	—	—	—	—	5,40	.213	10,00	.394	10,00	.394	—	—	0,8	.031	CNHQ-R
CNHQ1205R08	—	—	—	—	5,40	.213	12,70	.500	10,00	.394	—	—	0,8	.031	
CNHQ1606R08	—	—	—	—	6,40	.252	16,00	.630	12,00	.472	—	—	0,8	.031	









● first choice
○ alternate choice

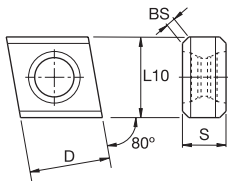
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H								●														●			
S										●				●	●				●	●					
N				●		●	○			○													●	●	●
K							●	○	●	○						●	○				●	●			
M								○		●	○	●		●	●		○			●					
P					●			●		○	●	●	●	●	○		●	●	●	●					
CNHU		CNHU1005	CNHU1005										●		●										
		CNHU1205	CNHU1205										●		●										
		CNHU1606	CNHU1606										●		●										
CNHU-GP		CNHU1005R08SGP	CNHU1005R08SGP											●											
		CNHU1005R16SGP	CNHU1005R16SGP											●											
		CNHU1205R08SGP	CNHU1205R08SGP											●											
		CNHU1606R08SGP	CNHU1606R08SGP											●											
		CNHU1606R16SGP	CNHU1606R16SGP												●		●								
CNHU-R		CNHU1005R08	CNHU1005R08						●				●	●	●		●								
		CNHU1005R16	CNHU1005R16						●					●											
		CNHU1205R08	CNHU1205R08						●					●	●		●								
		CNHU1205R16	CNHU1205R16						●					●											
		CNHU1606R08	CNHU1606R08						●				●	●			●								
		CNHU1606R16	CNHU1606R16						●				●		●										
		CNHU1606R24	CNHU1606R24											●											
		CNHU1606R32	CNHU1606R32											●											
CPMT-MF		CPMT060204MF	CPMT2151MF											●			●								
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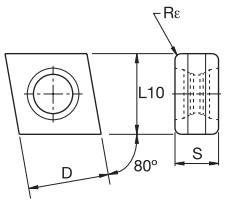
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Pg. 494
Pg. 494

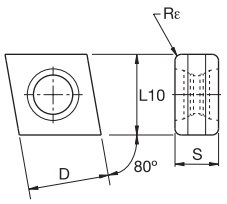
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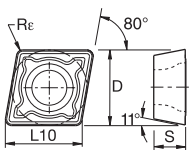
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ISO catalog number	dimensions														
	LI		W		S		D		L10		BS		Rε		
	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
CNHU1005	–	–	–	–	5,40	.213	10,06	.396	10,00	.394	0,71	.028	–	–	CNHU
CNHU1205	–	–	–	–	5,40	.213	10,06	.396	12,70	.500	0,71	.028	–	–	
CNHU1606	–	–	–	–	6,40	.252	12,06	.475	16,00	.630	0,71	.028	–	–	
CNHU1005R08SGP	–	–	–	–	5,40	.213	10,06	.396	10,00	.394	–	–	0,8	.031	CNHU-GP
CNHU1005R16SGP	–	–	–	–	5,40	.213	10,06	.396	10,00	.394	–	–	1,6	.063	
CNHU1205R08SGP	–	–	–	–	5,40	.213	10,06	.396	12,70	.500	–	–	0,8	.031	
CNHU1606R08SGP	–	–	–	–	6,40	.252	12,06	.475	16,00	.630	–	–	0,8	.031	
CNHU1606R16SGP	–	–	–	–	6,40	.252	12,06	.475	16,00	.630	–	–	1,6	.063	
CNHU1005R08	–	–	–	–	5,40	.213	10,00	.394	10,06	.396	–	–	0,8	.031	CNHU-R
CNHU1005R16	–	–	–	–	5,40	.213	10,00	.394	10,06	.396	–	–	1,6	.062	
CNHU1205R08	–	–	–	–	5,40	.213	12,70	.500	10,06	.396	–	–	0,8	.031	
CNHU1205R16	–	–	–	–	5,40	.213	12,70	.500	10,06	.396	–	–	1,6	.062	
CNHU1606R08	–	–	–	–	6,40	.252	16,00	.630	12,06	.475	–	–	0,8	.031	
CNHU1606R16	–	–	–	–	6,40	.252	16,00	.630	12,06	.475	–	–	1,6	.063	
CNHU1606R24	–	–	–	–	6,40	.252	16,00	.630	12,06	.475	–	–	2,4	.079	
CNHU1606R32	–	–	–	–	6,40	.252	16,00	.630	12,06	.475	–	–	3,2	.125	
CPMT060204MF	–	–	6,35	.250	2,38	.094	6,35	.250	6,45	.254	–	–	0,4	.016	CPMT-MF
CPMT060208MF	–	–	6,35	.250	2,38	.094	6,35	.250	6,45	.254	–	–	0,8	.031	
CPMT09T308MF	–	–	9,53	.375	3,97	.156	9,53	.375	9,67	.381	–	–	0,8	.031	









● first choice
○ alternate choice

	ISO catalog number	ANSI catalog number	K110M	K125M	KC410M	KC510M	KC515M	KC520M	KC522M	KC525M	KC530M	KC715M	KC725M	KC735M	KC915M	KC935M	KT530M	KY1540	KY2100	KY3500	KB1340	KD1410	KD1415	KD1420
H							●														●			
S									●				●	●				●	●					
N			●		●	○			○													●	●	●
K						●	○	●	○						●	○				●	●				
M							○		●	○	●		●	●		○			●					
P				●			●		○	●	●	●	●	○		●	●	●	●					
EDCT14-GD	EDCT140404PDERGD	EC1404EGD											●											
	EDCT140408PDERGD	EC1408EGD											●											
	EDCT140412PDERGD	EC1412EGD											●											
	EDCT140416PDERGD	EC1416EGD											●											
	EDCT140431PDERGD	EC1431EGD											●											
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	EDCT140416PDERLD	EC1416ELD							●															
	EDCT140431PDERLD	EC1431ELD							●															
EDCT14-LDJ	EDCT140404PDFRLDJ	EC1404FLDJ			●																			
	EDCT140408PDFRLDJ	EC1408FLDJ			●																			
	EDCT140412PDFRLDJ	EC1412FLDJ			●																			
	EDCT140416PDFRLDJ	EC1416FLDJ			●																			
	EDCT140431PDFRLDJ	EC1431FLDJ			●																			
EDPT14-GD	EDPT140408PDSRGD	EP1408SGD						●					●			●								
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	EDPT140416PDSRGD	EP1416SGD						●					●			●								

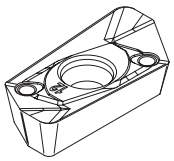
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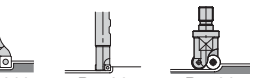
K110M K125M KC410M KC510M KC515M KC520M KC522M KC525M KC530M KC715M KC725M KC735M KC915M KC935M KT530M KY1540 KY2100 KY3500 KB1340 KD1410 KD1415 KD1420

ISO catalog number	dimensions														
	LI		W		S		D		L10		BS		Rε		
	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
EDCT140404PDERGD	17,46	.687	8,49	.334	4,50	.177	–	–	–	–	2,95	.116	0,4	.016	EDCT14-GD
EDCT140408PDERGD	17,47	.688	8,48	.334	4,50	.177	–	–	–	–	2,56	.101	0,8	.031	
EDCT140412PDERGD	17,48	.688	8,46	.333	4,50	.177	–	–	–	–	2,17	.085	1,2	.047	
EDCT140416PDERGD	17,49	.688	8,45	.333	4,50	.177	–	–	–	–	1,77	.070	1,6	.062	
EDCT140431PDERGD	17,50	.689	8,40	.331	4,50	.177	–	–	–	–	0,26	.010	3,1	.122	
EDCT140404PDERLD	17,46	.687	8,49	.334	4,50	.177	–	–	–	–	2,95	.116	0,4	.016	EDCT14-LD
EDCT140408PDERLD	17,47	.688	8,48	.334	4,50	.177	–	–	–	–	2,56	.101	0,8	.031	
EDCT140412PDERLD	17,48	.688	8,46	.333	4,50	.177	–	–	–	–	2,17	.085	1,2	.047	
EDCT140416PDERLD	17,49	.688	8,45	.333	4,50	.177	–	–	–	–	1,77	.070	1,6	.062	
EDCT140431PDERLD	17,50	.689	8,40	.331	4,50	.177	–	–	–	–	0,26	.010	3,1	.122	
EDCT140404PDFRLDJ	17,46	.687	8,49	.334	4,50	.177	–	–	–	–	2,95	.116	0,4	.016	EDCT14-LDJ
EDCT140408PDFRLDJ	17,47	.688	8,48	.334	4,50	.177	–	–	–	–	2,56	.101	0,8	.031	
EDCT140412PDFRLDJ	17,47	.688	8,46	.333	4,50	.177	–	–	–	–	2,17	.085	1,2	.047	
EDCT140416PDFRLDJ	17,49	.688	8,45	.333	4,50	.177	–	–	–	–	1,77	.070	1,6	.062	
EDCT140431PDFRLDJ	17,50	.689	8,40	.331	4,50	.177	–	–	–	–	0,26	.010	3,1	.122	
EDPT140408PDSRGD	17,47	.688	8,37	.330	4,50	.177	–	–	–	–	2,55	.101	0,8	.031	EDPT14-GD
EDPT140412PDSRGD	17,48	.688	8,35	.329	4,50	.177	–	–	–	–	2,17	.085	1,2	.047	
EDPT140416PDSRGD	17,49	.688	8,35	.329	4,50	.177	–	–	–	–	1,77	.070	1,6	.062	

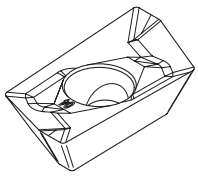
● first choice
○ alternate choice

	ISO catalog number	ANSI catalog number	K110M	K125M	KC410M	KC510M	KC515M	KC520M	KC522M	KC525M	KC530M	KC715M	KC725M	KC735M	KC915M	KC935M	KT530M	KY1540	KY2100	KY3500	KB1340	KD1410	KD1415	KD1420
H							●														●			
S									●				●	●				●	●					
N			●		●	○			○													●	●	●
K						●	○	●	○						●	○				●	●			
M							○		●	○	●		●	●		○			●					
P				●			●		○	●	●	●	●	○		●	●	●	●					
EDPT14-HD	EDPT140404PDERHD	EP1404EHD						●	●				●		●	●								
	EDPT140408PDERHD	EP1408EHD						●	●				●		●	●								
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	EDPT140424PDERHD	EP1424EHD							●				●			●								
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	EDCT180512PDFRLDJ	EC1812FJ			●																			
	EDCT180516PDFRLDJ	EC1816FJ			●																			
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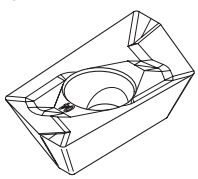


Pg. 369 Pg. 367 Pg. 367



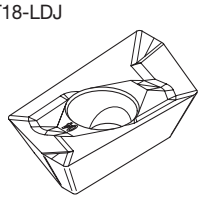


Pg. 374 Pg. 373





Pg. 374 Pg. 373

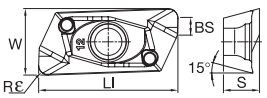


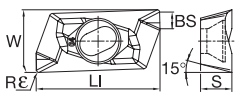


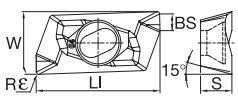
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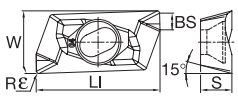
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ISO catalog number	dimensions														
	LI		W		S		D		L10		BS		Rε		
	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
EDPT140404PDERHD	17,46	.687	8,39	.330	4,50	.177	–	–	–	–	2,95	.116	0,4	.016	EDPT14-HD
EDPT140408PDERHD	17,47	.688	8,38	.330	4,50	.177	–	–	–	–	2,56	.101	0,8	.031	
EDPT140412PDERHD	17,48	.688	8,36	.329	4,50	.177	–	–	–	–	2,16	.085	1,2	.047	
EDPT140416PDERHD	17,49	.688	8,36	.329	4,50	.177	–	–	–	–	1,77	.070	1,6	.062	
EDPT140420PDERHD	17,49	.688	8,35	.329	4,50	.177	–	–	–	–	1,37	.054	2,0	.079	
EDPT140424PDERHD	17,50	.689	8,32	.328	4,50	.177	–	–	–	–	0,99	.039	2,4	.094	
EDPT140431PDERHD	17,51	.689	8,30	.327	4,50	.177	–	–	–	–	0,26	.010	3,1	.122	
EDPT140440PDERHD	16,53	.651	8,26	.325	4,50	.177	–	–	–	–	–	–	4,0	.157	
EDCT180504PDERGD	21,75	.856	10,98	.432	5,50	.217	–	–	–	–	3,07	.121	0,4	.016	EDCT18-GD
EDCT180508PDERGD	21,76	.857	10,97	.432	5,50	.217	–	–	–	–	2,69	.106	0,8	.031	
EDCT180512PDERGD	21,77	.857	10,97	.432	5,50	.217	–	–	–	–	2,29	.090	1,2	.047	
EDCT180508PDERLD	21,76	.857	10,97	.432	5,50	.217	–	–	–	–	2,69	.106	0,8	.031	EDCT18-LD
EDCT180516PDERLD	21,78	.858	10,96	.431	5,50	.217	–	–	–	–	1,90	.075	1,6	.062	
EDCT180532PDERLD	21,79	.858	10,91	.430	5,50	.217	–	–	–	–	0,32	.013	3,2	.125	
EDCT180540PDERLD	20,78	.818	10,87	.428	5,50	.217	–	–	–	–	–	–	4,0	.157	
EDCT180548PDERLD	20,20	.795	10,83	.426	5,50	.217	–	–	–	–	–	–	4,8	.188	
EDCT180564PDERLD	18,72	.737	10,73	.422	5,50	.217	–	–	–	–	–	–	6,4	.250	
EDCT180504PDFRLDJ	21,75	.856	10,98	.432	5,50	.217	–	–	–	–	3,07	.121	0,4	.016	EDCT18-LDJ
EDCT180508PDFRLDJ	21,76	.857	10,97	.432	5,50	.217	–	–	–	–	2,69	.106	0,8	.031	
EDCT180512PDFRLDJ	21,77	.857	10,97	.432	5,50	.217	–	–	–	–	2,29	.090	1,2	.047	
EDCT180516PDFRLDJ	21,78	.858	10,96	.431	5,50	.217	–	–	–	–	1,90	.075	1,6	.062	
EDCT180520PDFRLDJ	21,79	.858	10,95	.431	5,50	.217	–	–	–	–	1,49	.059	2,0	.079	
EDCT180524PDFRLDJ	21,79	.858	10,93	.430	5,50	.217	–	–	–	–	1,11	.044	2,4	.095	
EDCT180532PDFRLDJ	21,79	.858	10,91	.430	5,50	.217	–	–	–	–	0,32	.013	3,2	.125	
EDCT180540PDFRLDJ	20,78	.818	10,87	.428	5,50	.217	–	–	–	–	–	–	4,0	.157	
EDCT180548PDFRLDJ	20,20	.795	10,83	.426	5,50	.217	–	–	–	–	–	–	4,8	.188	
EDCT180564PDFRLDJ	18,72	.737	10,73	.422	5,50	.217	–	–	–	–	–	–	6,4	.250	









● first choice
○ alternate choice

		K110M	K125M	KC410M	KC510M	KC515M	KC520M	KC522M	KC525M	KC530M	KC715M	KC725M	KC735M	KC915M	KC935M	KT530M	KY1540	KY2100	KY3500	KB1340	KD1410	KD1415	KD1420
	H					●														●			
	S							●				●	●				●	●					
	N	●		●	○			○													●	●	●
	K				●	○	●	○						●	○				●	●				
	M					○		●	○	●		●	●		○			●						
	P		●			●		○	●	●	●	●	○		●	●	●	●						
	ISO catalog number	ANSI catalog number																						
EDCT18-PDFLLDJ	EDCT180508PDFLLDJ	EC1808FJL			●																			
	EDCT180532PDFLLDJ	EC1832FJL			●																			
	EDCT180548PDFLLDJ	EC1848FJL			●																			
	EDCT180564PDFLLDJ	EC1864FJL			●																			
EDPT18-GD	EDPT180508PDERGD	EP1808E						●		●		●				●								
	EDPT180508PDSRGD	EP1808S										●		●	●									
	EDPT180512PDERGD	EP1812E										●												
	EDPT180512PDSRGD	EP1812S										●		●	●									
	EDPT180516PDERGD	EP1816E						●	●	●		●			●									
	EDPT180516PDSRGD	EP1816S										●		●	●									
	EDPT180524PDERGD	EP1824E										●												
	EDPT180532PDERGD	EP1832E						●	●	●		●			●									
	EDPT180532PDSRGD	EP1832S										●			●									
	EDPT180548PDERGD	EP1848E							●	●		●												
	EDPT180564PDERGD	EP1864E							●	●		●			●									
EDPT18-HD	EDPT180508PDERHD	EP1808EHD										●			●									
	EDPT180512PDERHD	EP1812EHD										●			●									
	EDPT180516PDERHD	EP1816EHD										●			●									
	EDPT180532PDERHD	EP1832EHD										●			●									
	EDPT180548PDERHD	EP1848EHD										●			●									
GD	GD2004L	GD2004L										●			●									
	GD2004R	GD2004R									●	●		●										

Pg. 374 Pg. 373

Pg. 374 Pg. 373

K110M K125M KC410M KC510M KC515M KC520M KC522M KC525M KC530M KC715M KC725M KC735M KC915M KC935M KT530M KY1540 KY2100 KY3500 KB1340 KD1410 KD1415 KD1420

ISO catalog number	dimensions														
	LI		W		S		D		L10		BS		Rε		
	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
EDCT180508PDFLLDJ	21,76	.857	10,97	.432	5,50	.217	–	–	–	–	2,69	.106	0,8	.031	EDCT18-PDFLLDJ
EDCT180532PDFLLDJ	21,79	.858	10,91	.430	5,50	.217	–	–	–	–	0,32	.013	3,2	.125	
EDCT180548PDFLLDJ	20,20	.795	10,83	.426	5,50	.217	–	–	–	–	–	–	4,8	.188	
EDCT180564PDFLLDJ	18,72	.737	10,73	.422	5,50	.217	–	–	–	–	–	–	6,4	.250	
EDPT180508PDERGD	21,76	.857	10,97	.432	5,50	.217	–	–	–	–	2,69	.106	0,8	.031	EDPT18-GD
EDPT180508PDSRGD	21,77	.857	10,97	.432	5,50	.217	–	–	–	–	2,69	.106	0,8	.031	
EDPT180512PDERGD	21,77	.857	11,00	.433	5,50	.217	–	–	–	–	2,29	.090	1,2	.047	
EDPT180512PDSRGD	21,77	.857	10,96	.431	5,50	.217	–	–	–	–	2,29	.090	1,2	.047	
EDPT180516PDERGD	21,78	.858	10,94	.431	5,50	.217	–	–	–	–	1,90	.075	1,6	.062	
EDPT180516PDSRGD	21,78	.858	10,94	.431	5,50	.217	–	–	–	–	1,90	.075	1,6	.062	
EDPT180524PDERGD	21,79	.858	10,93	.430	5,50	.217	–	–	–	–	1,11	.044	2,4	.095	
EDPT180532PDERGD	21,79	.858	10,91	.430	5,50	.217	–	–	–	–	0,32	.013	3,2	.125	
EDPT180532PDSRGD	21,78	.858	10,87	.428	5,50	.217	–	–	–	–	0,32	.013	3,2	.125	
EDPT180548PDERGD	20,20	.795	10,83	.426	5,50	.217	–	–	–	–	–	–	4,8	.189	
EDPT180564PDERGD	18,79	.740	10,73	.422	5,50	.217	–	–	–	–	–	–	6,4	.250	
EDPT180508PDERHD	21,77	.857	10,89	.429	5,50	.217	–	–	–	–	2,69	.106	0,8	.031	EDPT18-HD
EDPT180512PDERHD	21,77	.857	10,88	.428	5,50	.217	–	–	–	–	2,29	.090	1,2	.047	
EDPT180516PDERHD	21,78	.857	10,87	.428	5,50	.217	–	–	–	–	1,90	.075	1,6	.062	
EDPT180532PDERHD	21,79	.858	10,83	.426	5,50	.217	–	–	–	–	0,31	.012	3,2	.125	
EDPT180548PDERHD	20,16	.794	10,75	.423	5,50	.217	–	–	–	–	–	–	4,8	.188	
GD2004L	20,40	.803	12,70	.500	4,76	.188	–	–	–	–	1,06	.042	–	–	GD
GD2004R	20,40	.803	12,70	.500	4,76	.188	–	–	–	–	1,06	.042	–	–	

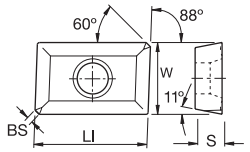
● first choice
○ alternate choice

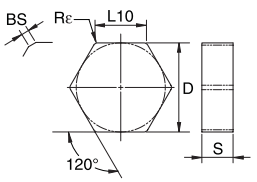
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H							●														●			
S									●				●	●				●	●					
N			●		●	○			○													●	●	●
K						●	○	●	○						●	○				●	●			
M							○		●	○	●		●	●		○			●					
P				●			●		○	●	●	●	●	○		●	●	●	●					
GDXMP	GDXMP2004L	GDXMP2004L								●			●	●		●								
	GDXMP2004R	GDXMP2004R											●	●		●								
HNEN-SN	HNEN090508MSN	HNEN090508S																		●				
	HNEN0905AMSN	HNEN0905ANSN																		●				
	HNEN0905XMSN	HNEN0905XNSN																		●				
HNGF-MF	HNGF090512MF	HNGF090512MF													●	●								
HNGF-MT	HNGF090512MT	HNGF090512MT													●	●								
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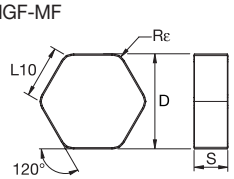
Pg. 328
Pg. 331, 328
Pg. 333
Pg. 289

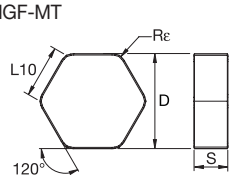
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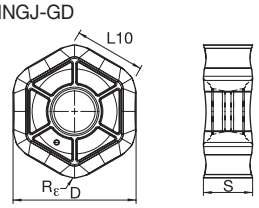
ISO catalog number	dimensions														
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	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
GDXMP2004L	20,40	.803	12,70	.500	4,77	.187	–	–	–	–	1,08	.042	–	–	GDXMP
GDXMP2004R	20,40	.803	12,70	.500	4,77	.187	–	–	–	–	1,08	.042	–	–	
HNEN090508MSN	–	–	–	–	5,56	.219	15,88	.625	9,17	.361	–	–	0,8	.031	HNEN-SN
HNEN0905AMSN	–	–	–	–	5,65	.222	15,88	.625	9,17	.361	–	–	–	–	
HNEN0905XMSN	–	–	–	–	5,56	.219	16,20	.638	9,35	.368	1,30	.051	–	–	
HNGF090512MF	–	–	–	–	5,56	.219	15,88	.625	9,16	.361	–	–	1,2	.047	HNGF-MF
HNGF090512MT	–	–	–	–	5,56	.219	15,88	.625	9,16	.361	–	–	1,2	.047	HNGF-MT
HNGJ0905ANSNGD	–	–	–	–	5,56	.219	15,88	.625	9,00	.338	1,80	.071	1,2	.047	HNGJ-GD







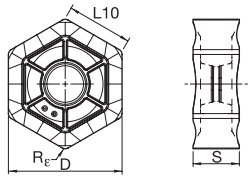
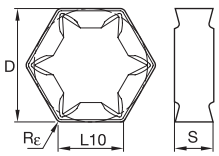
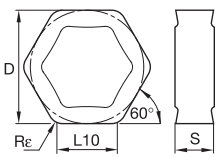
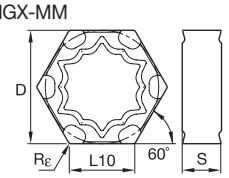
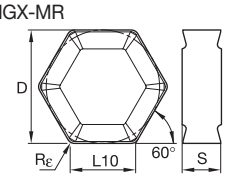




● first choice
○ alternate choice

	ISO catalog number	ANSI catalog number	K110M	K125M	KC410M	KC510M	KC515M	KC520M	KC522M	KC525M	KC530M	KC715M	KC725M	KC735M	KC915M	KC935M	KT530M	KY1540	KY2100	KY3500	KB1340	KD1410	KD1415	KD1420
H							●														●			
S									●				●	●				●	●					
N			●		●	○			○													●	●	●
K						●	○	●	○						●	○				●	●				
M							○		●	○	●		●	●		○			●					
P				●			●		○	●	●	●	●	○		●	●	●	●					
HNGJ-LD	HNGJ0905ANENLD	HNGJ535ANENLD						●	●				●		●	●								
HNGX-MH	HNGX090508MH	HNGX5352MH													●	●								
HNGX-ML	HNGX090520ML	HNGX5355ML													●	●								
HNGX-MM	HNGX090520MM	HNGX5355MM													●	●								
HNGX-MR	HNGX090516MR	HNGX5354MR													●	●								
	HNGX090530MR	HNGX5358MR													●	●								

HNGJ-LD Pg. 289
HNGX-MH Pg. 328, 331
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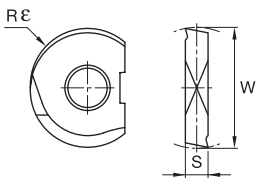
ISO catalog number	dimensions														
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	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
HNGJ0905ANENLD	–	–	–	–	5,56	.219	15,88	.625	9,00	.338	1,80	.071	1,2	.047	HNGJ-LD 
HNGX090508MH	–	–	–	–	5,56	.219	16,20	.638	9,35	.368	–	–	0,8	.031	HNGX-MH 
HNGX090520ML	–	–	–	–	5,56	.219	16,20	.638	9,35	.368	–	–	2,0	.079	HNGX-ML 
HNGX090520MM	–	–	–	–	5,56	.219	16,20	.638	9,35	.368	–	–	2,0	.079	HNGX-MM 
HNGX090516MR	–	–	–	–	5,56	.219	16,20	.638	9,35	.368	–	–	1,6	.063	HNGX-MR 
HNGX090530MR	–	–	–	–	5,56	.219	16,20	.638	9,35	.368	–	–	3,0	.118	

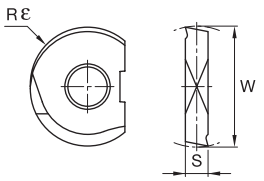
● first choice
○ alternate choice

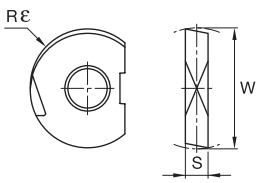
	ISO catalog number	ANSI catalog number	K110M	K125M	KC410M	KC510M	KC515M	KC520M	KC522M	KC525M	KC530M	KC715M	KC725M	KC735M	KC915M	KC935M	KT530M	KY1540	KY2100	KY3500	KB1340	KD1410	KD1415	KD1420
H							●														●			
S									●				●	●				●	●					
N			●		●	○			○													●	●	●
K						●	○	●	○						●	○				●	●			
M							○		●	○	●		●	●		○			●					
P				●			●		○	●	●	●	●	○		●	●	●	●					
KDMB-GC	KDMB08M0ERGC	KDMB08M0ERGC					●																	
	KDMB10M0ERGC	KDMB10M0ERGC					●				●													
	KDMB12M0ERGC	KDMB12M0ERGC					●				●													
	KDMB16M0ERGC	KDMB16M0ERGC					●				●													
	KDMB20M0ERGC	KDMB20M0ERGC					●				●													
	KDMB25M0ERGC	KDMB25M0ERGC					●				●													
	Pg. 469 Pg. 469																							
KDMB-GC	KDMB0312M0ERGC	KDMB0312M0ERGC					●																	
	KDMB0375M0ERGC	KDMB0375M0ERGC					●																	
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	Pg. 469																							
KDMB-GN	KDMB08M0ERGN	KDMB08M0ERGN					●				●													
	KDMB10M0ERGN	KDMB10M0ERGN					●				●													
	KDMB12M0ERGN	KDMB12M0ERGN					●				●													
	KDMB16M0ERGN	KDMB16M0ERGN					●				●													
	KDMB20M0ERGN	KDMB20M0ERGN					●				●													
	KDMB25M0ERGN	KDMB25M0ERGN					●				●													
	KDMB32M0ERGN	KDMB32M0ERGN					●				●													
	Pg. 469 Pg. 469																							
KDMB-GN	KDMB0500M0ERGN	KDMB0500M0ERGN					●																	
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	KDMB1000M0ERGN	KDMB1000M0ERGN					●																	
	Pg. 469																							
			K110M	K125M	KC410M	KC510M	KC515M	KC520M	KC522M	KC525M	KC530M	KC715M	KC725M	KC735M	KC915M	KC935M	KT530M	KY1540	KY2100	KY3500	KB1340	KD1410	KD1415	KD1420

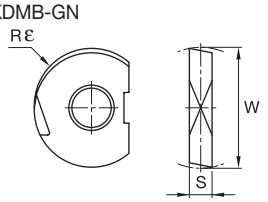
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ISO catalog number	dimensions														
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	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
KDMB08M0ERGC	–	–	8,00	.315	2,00	.079	–	–	–	–	–	–	4,0	.158	KDMB-GC
KDMB10M0ERGC	–	–	10,00	.394	2,50	.098	–	–	–	–	–	–	5,0	.197	
KDMB12M0ERGC	–	–	12,00	.472	2,50	.098	–	–	–	–	–	–	6,0	.236	
KDMB16M0ERGC	–	–	16,00	.630	3,00	.118	–	–	–	–	–	–	8,0	.315	
KDMB20M0ERGC	–	–	20,00	.787	3,00	.118	–	–	–	–	–	–	10,0	.394	
KDMB25M0ERGC	–	–	25,00	.984	4,00	.158	–	–	–	–	–	–	12,5	.492	
KDMB0312M0ERGC	–	–	7,93	.312	2,00	.079	–	–	–	–	–	–	4,0	.156	KDMB-GC
KDMB0375M0ERGC	–	–	9,53	.375	2,50	.098	–	–	–	–	–	–	4,8	.188	
KDMB0500M0ERGC	–	–	12,70	.500	2,50	.098	–	–	–	–	–	–	6,4	.250	
KDMB0625M0ERGC	–	–	15,88	.625	3,00	.118	–	–	–	–	–	–	7,9	.313	
KDMB0750M0ERGC	–	–	19,05	.750	3,00	.118	–	–	–	–	–	–	9,5	.375	
KDMB1000M0ERGC	–	–	25,40	1.000	4,00	.158	–	–	–	–	–	–	12,7	.500	
KDMB1250M0ERGC	–	–	31,75	1.250	5,00	.197	–	–	–	–	–	–	15,9	.625	
KDMB08M0ERGN	–	–	8,00	.315	2,00	.079	–	–	–	–	–	–	4,0	.158	KDMB-GN
KDMB10M0ERGN	–	–	10,00	.394	2,50	.098	–	–	–	–	–	–	5,0	.197	
KDMB12M0ERGN	–	–	12,00	.472	2,50	.098	–	–	–	–	–	–	6,0	.236	
KDMB16M0ERGN	–	–	16,00	.630	3,00	.118	–	–	–	–	–	–	8,0	.315	
KDMB20M0ERGN	–	–	20,00	.787	3,00	.118	–	–	–	–	–	–	10,0	.394	
KDMB25M0ERGN	–	–	25,00	.984	4,00	.158	–	–	–	–	–	–	12,5	.492	
KDMB32M0ERGN	–	–	32,00	1.260	5,00	.197	–	–	–	–	–	–	16,0	.630	
KDMB0500M0ERGN	–	–	12,70	.500	2,50	.098	–	–	–	–	–	–	6,4	.250	KDMB-GN
KDMB0750M0ERGN	–	–	19,05	.750	3,00	.118	–	–	–	–	–	–	9,5	.375	
KDMB1000M0ERGN	–	–	25,40	1.000	4,00	.158	–	–	–	–	–	–	12,7	.500	





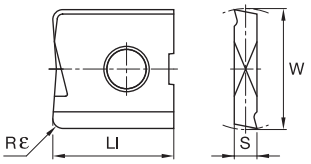


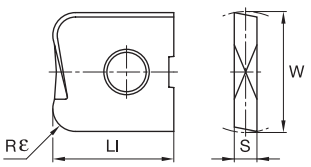


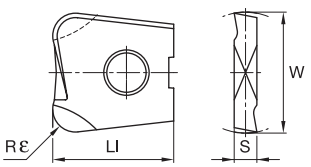
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○ alternate choice

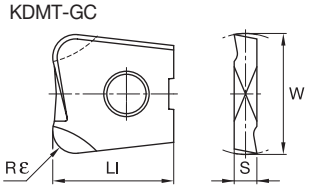
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	H					●														●			
	S							●				●	●				●	●					
	N	●		●	○			○													●	●	●
	K				●	○	●	○						●	○				●	●				
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	P		●			●		○	●	●	●	●	○		●	●	●	●						
ISO catalog number	ANSI catalog number																						
KDMS-GC																							
KDMS0806ERGC	KDMS0806ERGC					●				●													
KDMS1008ERGC	KDMS1008ERGC					●				●													
KDMS1210ERGC	KDMS1210ERGC									●													
KDMS1613ERGC	KDMS1613ERGC					●				●													
KDMS2016ERGC	KDMS2016ERGC					●																	
KDMS2520ERGC	KDMS2520ERGC					●				●													
Pg. 479 Pg. 479																							
KDMS-GN																							
KDMS0806ERGN	KDMS0806ERGN					●																	
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KDMS1210ERGN	KDMS1210ERGN					●				●													
KDMS1613ERGN	KDMS1613ERGN					●				●													
KDMS2016ERGN	KDMS2016ERGN					●				●													
KDMS2520ERGN	KDMS2520ERGN					●				●													
KDMS3220ERGN	KDMS3220ERGN					●																	
Pg. 479 Pg. 479																							
KDMT-GC																							
KDMT05002ERGC	KDMT05002ERGC					●																	
KDMT05004ERGC	KDMT05004ERGC					●																	
KDMT06252ERGC	KDMT06252ERGC					●																	
KDMT06254ERGC	KDMT06254ERGC					●																	
KDMT07502ERGC	KDMT07502ERGC					●																	
KDMT07504ERGC	KDMT07504ERGC					●																	
KDMT10002ERGC	KDMT10002ERGC					●																	
KDMT10004ERGC	KDMT10004ERGC					●																	
KDMT10008ERGC	KDMT10008ERGC					●																	
Pg. 479 Pg. 479																							
KDMT-GC																							
KDMT1610ERGC	KDMT1610ERGC					●																	
KDMT2010ERGC	KDMT2010ERGC					●																	
KDMT2510ERGC	KDMT2510ERGC					●																	
Pg. 479 Pg. 479																							

ISO catalog number	dimensions														
	LI		W		S		D		L10		BS		Rε		
	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
KDMS0806ERGC	9,50	.374	8,00	.315	2,00	.079	–	–	–	–	–	–	0,6	.024	KDMS-GC
KDMS1008ERGC	11,50	.453	10,00	.394	2,50	.098	–	–	–	–	–	–	0,8	.032	
KDMS1210ERGC	14,00	.551	12,00	.472	2,50	.098	–	–	–	–	–	–	1,0	.039	
KDMS1613ERGC	16,00	.630	16,00	.630	3,00	.118	–	–	–	–	–	–	1,3	.051	
KDMS2016ERGC	18,00	.709	20,00	.787	3,00	.118	–	–	–	–	–	–	1,6	.063	
KDMS2520ERGC	23,50	.925	25,00	.984	4,00	.158	–	–	–	–	–	–	2,0	.079	
KDMS0806ERGN	9,50	.374	8,00	.315	2,00	.079	–	–	–	–	–	–	0,6	.024	KDMS-GN
KDMS1008ERGN	11,50	.453	10,00	.394	2,50	.098	–	–	–	–	–	–	0,8	.032	
KDMS1210ERGN	14,00	.551	12,00	.472	2,50	.098	–	–	–	–	–	–	1,0	.039	
KDMS1613ERGN	16,00	.630	16,00	.630	3,00	.118	–	–	–	–	–	–	1,3	.051	
KDMS2016ERGN	18,00	.709	20,00	.787	3,00	.118	–	–	–	–	–	–	1,6	.063	
KDMS2520ERGN	23,50	.925	25,00	.984	4,00	.158	–	–	–	–	–	–	2,0	.079	
KDMS3220ERGN	28,00	1.102	32,00	1.260	5,00	.197	–	–	–	–	–	–	2,0	.079	
KDMT05002ERGC	13,97	.550	12,70	.500	2,50	.098	–	–	–	–	–	–	0,8	.032	KDMT-GC
KDMT05004ERGC	13,97	.550	12,70	.500	2,50	.098	–	–	–	–	–	–	1,6	.063	
KDMT06252ERGC	15,88	.625	15,88	.625	3,00	.118	–	–	–	–	–	–	0,8	.032	
KDMT06254ERGC	15,88	.625	15,88	.625	3,00	.118	–	–	–	–	–	–	1,6	.063	
KDMT07502ERGC	17,78	.700	19,05	.750	3,00	.118	–	–	–	–	–	–	0,8	.032	
KDMT07504ERGC	17,78	.700	19,05	.750	3,00	.118	–	–	–	–	–	–	1,6	.063	
KDMT10002ERGC	23,50	.925	25,40	1.000	4,00	.157	–	–	–	–	–	–	0,8	.032	
KDMT10004ERGC	23,50	.925	25,40	1.000	4,00	.157	–	–	–	–	–	–	1,6	.063	
KDMT10008ERGC	23,50	.925	25,40	1.000	4,00	.157	–	–	–	–	–	–	3,2	.125	
KDMT1610ERGC	16,00	.630	16,00	.630	3,00	.118	–	–	–	–	–	–	1,0	.039	KDMT-GC
KDMT2010ERGC	18,00	.709	20,00	.787	3,00	.118	–	–	–	–	–	–	1,0	.039	
KDMT2510ERGC	23,50	.925	25,00	.984	4,00	.158	–	–	–	–	–	–	1,0	.039	







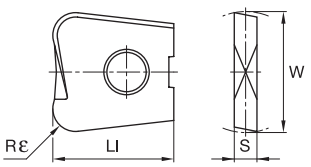


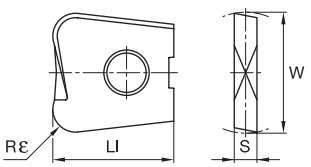
● first choice
○ alternate choice

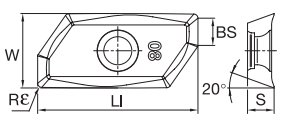
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		H				●														●			
		S						●				●	●				●	●					
		N	●		●	○			○												●	●	●
		K				●	○	●	○						●	○			●	●			
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		P		●			●		○	●	●	●	●	○		●	●	●	●				
	ISO catalog number	ANSI catalog number																					
KDMT-GN	KDMT05002ERGN	KDMT05002ERGN					●																
	KDMT05004ERGN	KDMT05004ERGN					●																
	KDMT06252ERGN	KDMT06252ERGN					●																
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	KDMT10004ERGN	KDMT10004ERGN					●																
	KDMT10008ERGN	KDMT10008ERGN					●																
Pg. 479																							
KDMT-GN	KDMT1210ERGN	KDMT1210ERGN					●																
	KDMT1220ERGN	KDMT1220ERGN					●																
	KDMT1610ERGN	KDMT1610ERGN					●																
	KDMT1630ERGN	KDMT1630ERGN					●																
	KDMT2010ERGN	KDMT2010ERGN					●																
	KDMT2040ERGN	KDMT2040ERGN					●																
	KDMT2510ERGN	KDMT2510ERGN					●																
Pg. 479 Pg. 479																							
KEGT-LDJ	KEGT25L508PEERLDJ	KG2508ELDJ			●																		
	KEGT25L512PEERLDJ	KG2512ELDJ			●																		
	KEGT25L516PEERLDJ	KG2516ELDJ			●																		
	KEGT25L520PEERLDJ	KG2520ELDJ			●																		
	KEGT25L524PEERLDJ	KG2524ELDJ			●																		
	KEGT25L531PEERLDJ	KG2531ELDJ			●																		
	KEGT25L540PEERLDJ	KG2540ELDJ			●																		
	KEGT25L547PEERLDJ	KG2547ELDJ			●																		
	KEGT25L550PEERLDJ	KG2550ELDJ			●																		
	KEGT25L560PEERLDJ	KG2560ELDJ			●																		
	KEGT25L564PEERLDJ	KG2564ELDJ			●																		
Pg. 377 Pg. 378																							

K110M K125M KC410M KC510M KC515M KC520M KC522M KC525M KC530M KC715M KC725M KC735M KC915M KC935M KT530M KY1540 KY2100 KY3500 KB1340 KD1410 KD1415 KD1420

ISO catalog number	dimensions														
	LI		W		S		D		L10		BS		Rε		
	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
KDMT05002ERGN	13,97	.550	12,70	.500	2,50	.098	–	–	–	–	–	–	0,8	.032	KDMT-GN
KDMT05004ERGN	13,97	.550	12,70	.500	2,50	.098	–	–	–	–	–	–	1,6	.063	
KDMT06252ERGN	15,88	.625	15,88	.625	3,00	.118	–	–	–	–	–	–	0,8	.032	
KDMT06254ERGN	15,88	.625	15,88	.625	3,00	.118	–	–	–	–	–	–	1,6	.063	
KDMT07502ERGN	17,78	.700	19,05	.750	3,00	.118	–	–	–	–	–	–	0,8	.032	
KDMT07504ERGN	17,78	.700	19,05	.750	3,00	.118	–	–	–	–	–	–	1,6	.063	
KDMT10002ERGN	23,50	.925	25,40	1.000	4,00	.157	–	–	–	–	–	–	0,8	.032	
KDMT10004ERGN	23,50	.925	25,40	1.000	4,00	.157	–	–	–	–	–	–	1,6	.063	
KDMT10008ERGN	23,50	.925	25,40	1.000	4,00	.157	–	–	–	–	–	–	3,2	.125	
KDMT1210ERGN	14,00	.551	12,00	.472	2,50	.098	–	–	–	–	–	–	1,0	.039	KDMT-GN
KDMT1220ERGN	14,00	.551	12,00	.472	2,50	.098	–	–	–	–	–	–	2,0	.079	
KDMT1610ERGN	16,00	.630	16,00	.630	3,00	.118	–	–	–	–	–	–	1,0	.039	
KDMT1630ERGN	16,00	.630	16,00	.630	3,00	.118	–	–	–	–	–	–	3,0	.118	
KDMT2010ERGN	18,00	.709	20,00	.787	3,00	.118	–	–	–	–	–	–	1,0	.039	
KDMT2040ERGN	18,00	.709	20,00	.787	3,00	.118	–	–	–	–	–	–	4,0	.158	
KDMT2510ERGN	23,50	.925	25,00	.984	4,00	.158	–	–	–	–	–	–	1,0	.039	
KEGT25L508PEERLDJ	31,47	1.239	14,60	.575	5,21	.205	–	–	–	–	5,34	.210	0,8	.031	KEGT-LDJ
KEGT25L512PEERLDJ	31,47	1.239	14,60	.575	5,21	.205	–	–	–	–	4,94	.195	1,2	.047	
KEGT25L516PEERLDJ	31,47	1.239	14,60	.575	5,21	.205	–	–	–	–	4,55	.179	1,6	.063	
KEGT25L520PEERLDJ	31,47	1.239	14,60	.575	5,21	.205	–	–	–	–	4,15	.164	2,0	.079	
KEGT25L524PEERLDJ	31,47	1.239	14,60	.575	5,21	.205	–	–	–	–	3,78	.149	2,4	.094	
KEGT25L531PEERLDJ	31,47	1.239	14,60	.575	5,21	.205	–	–	–	–	3,06	.120	3,1	.122	
KEGT25L540PEERLDJ	31,47	1.239	14,60	.575	5,21	.205	–	–	–	–	2,16	.085	4,0	.157	
KEGT25L547PEERLDJ	31,47	1.239	14,60	.575	5,21	.205	–	–	–	–	1,40	.055	4,8	.188	
KEGT25L550PEERLDJ	31,47	1.239	14,60	.575	5,21	.205	–	–	–	–	1,14	.045	5,0	.197	
KEGT25L560PEERLDJ	31,47	1.239	14,60	.575	5,21	.205	–	–	–	–	0,13	.005	6,0	.236	
KEGT25L564PEERLDJ	29,99	1.181	14,60	.575	5,21	.205	–	–	–	–	–	–	6,4	.252	







● first choice
○ alternate choice

	ISO catalog number	ANSI catalog number	K110M	K125M	KC410M	KC510M	KC515M	KC520M	KC522M	KC525M	KC530M	KC715M	KC725M	KC735M	KC915M	KC935M	KT530M	KY1540	KY2100	KY3500	KB1340	KD1410	KD1415	KD1420
H							●														●			
S									●				●	●				●	●					
N			●		●	○			○													●	●	●
K						●	○	●	○						●	○				●	●				
M							○		●	○	●		●	●		○			●					
P				●			●		○	●	●	●	●	○		●	●	●	●					
LFEW-SNGN	LFEW150348SNGN	LFEW25212SNGN											●											
	LFEW220480SNGN	LFEW35320SNGN											●											
LFEW-SRGN	LFEW150304SRGN	LFEW2521SRGN											●											
	LFEW150308SRGN	LFEW2522SRGN											●											
	LFEW150312SRGN	LFEW2523SRGN											●											
	LFEW150316SRGN	LFEW2524SRGN											●											
	LFEW150332SRGN	LFEW2528SRGN											●											
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	LFEW220432SRGN	LFEW3538SRGN											●											
LFEW-NLN	LFEW150348ENLN	LFEW25212ENLN											●											
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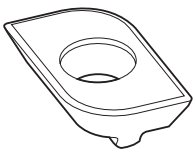
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LFEW-SRGN





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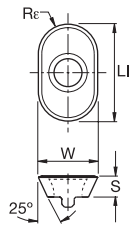
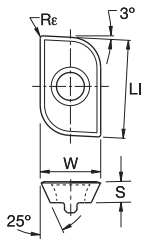
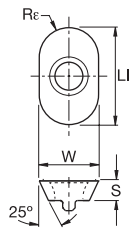
LFEW-NLN





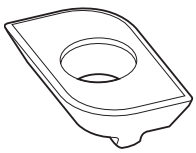
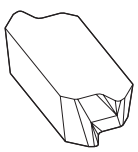
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To place an order, contact Kennametal or your authorized Kennametal distributor, or visit www.kennametal.com.

ISO catalog number	dimensions														
	LI		W		S		D		L10		BS		Rε		
	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
LFEW150348SNGN	15,45	.608	9,53	.375	3,30	.130	–	–	–	–	–	–	4,8	.188	LFEW-SNGN
LFEW220480SNGN	22,23	.875	15,88	.625	4,76	.188	–	–	–	–	–	–	7,9	.313	
LFEW150304SRGN	15,44	.608	9,53	.375	3,30	.130	–	–	–	–	–	–	0,4	.016	LFEW-SRGN
LFEW150308SRGN	15,44	.608	9,53	.375	3,30	.130	–	–	–	–	–	–	0,8	.031	
LFEW150312SRGN	15,44	.608	9,53	.375	3,30	.130	–	–	–	–	–	–	1,2	.047	
LFEW150316SRGN	15,44	.608	9,53	.375	3,30	.130	–	–	–	–	–	–	1,6	.063	
LFEW150332SRGN	15,44	.608	9,53	.375	3,30	.130	–	–	–	–	–	–	3,2	.125	
LFEW220408SRGN	21,45	.845	15,88	.625	4,76	.188	–	–	–	–	–	–	0,8	.031	
LFEW220416SRGN	21,45	.845	15,88	.625	4,76	.188	–	–	–	–	–	–	1,6	.063	
LFEW220432SRGN	21,45	.845	15,88	.625	4,76	.188	–	–	–	–	–	–	3,2	.125	
LFEW150348ENLN	15,45	.608	9,53	.375	3,30	.130	–	–	–	–	–	–	4,8	.188	LFEW-NLN
LFEW150348FNLN	15,45	.608	9,53	.375	3,30	.130	–	–	–	–	–	–	4,8	.188	
LFEW220480ENLN	22,22	.875	15,88	.625	4,76	.188	–	–	–	–	–	–	7,9	.313	
LFEW220480FNLN	22,22	.875	15,88	.625	4,76	.188	–	–	–	–	–	–	7,9	.313	

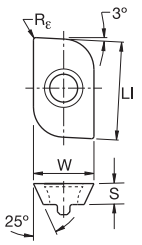
● first choice
○ alternate choice

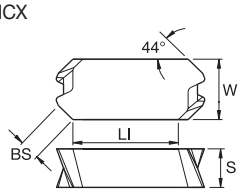
H					●							●	●						●			
S							●				●	●				●	●					
N	●		●	○			○													●	●	●
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P		●			●		○	●	●	●	●	○		●	●	●	●					

ISO catalog number	ANSI catalog number	K110M	K125M	KC410M	KC510M	KC515M	KC520M	KC522M	KC525M	KC530M	KC715M	KC725M	KC735M	KC915M	KC935M	KT530M	KY1540	KY2100	KY3500	KB1340	KD1410	KD1415	KD1420
LFEW-RLN																							
																							
LFEW150304FRLN	LFEW2521FRLN				●																		
LFEW150304ERLN	LFEW2521ERLN											●											
LFEW150308ERLN	LFEW2522ERLN											●											
LFEW150308FRLN	LFEW2522FRLN				●																		
LFEW150312ERLN	LFEW2523ERLN											●											
LFEW150312FRLN	LFEW2523FRLN				●																		
LFEW150316ERLN	LFEW2524ERLN								●			●	●										
LFEW150316FRLN	LFEW2524FRLN				●																		
LFEW150320ERLN	LFEW2525ERLN											●											
LFEW150324ERLN	LFEW2526ERLN											●											
LFEW150332FRLN	LFEW2528FRLN				●																		
LFEW150332ERLN	LFEW2528ERLN											●			●								
LFEW150340ERLN	LFEW25210ERLN											●											
LFEW150340FRLN	LFEW25210FRLN				●																		
LFEW220408ERLN	LFEW3532ERLN											●											
LFEW220408FRLN	LFEW3532FRLN				●																		
LFEW220412ERLN	LFEW3533ERLN											●											
LFEW220412FRLN	LFEW3533FRLN				●																		
LFEW220416ERLN	LFEW3534ERLN											●											
LFEW220416FRLN	LFEW3534FRLN				●																		
LFEW220432ERLN	LFEW3538ERLN											●											
LFEW220432FRLN	LFEW3538FRLN				●																		
LFEW220448ERLN	LFEW35312ERLN											●											
LFEW220464FRLN	LFEW35316FRLN				●																		
LFEW220464ERLN	LFEW35316ERLN											●											
 Pg. 498  Pg. 498																							
LNCX																							
																							
LNCX1806AZR11	LNCX1806AZR11											●		●	●								
LNCX1806AZR11T	LNCX1806AZR11T											●											
OPERATION UPGRADE																							

K110M K125M KC410M KC510M KC515M KC520M KC522M KC525M KC530M KC715M KC725M KC735M KC915M KC935M KT530M KY1540 KY2100 KY3500 KB1340 KD1410 KD1415 KD1420

ISO catalog number	dimensions														
	LI		W		S		D		L10		BS		Rε		
	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
LFEW150304FRLN	15,92	.627	9,53	.375	3,30	.130	–	–	–	–	–	–	0,4	.016	LFEW-RLN
LFEW150304ERLN	15,92	.627	9,53	.375	3,30	.130	–	–	–	–	–	–	0,4	.016	
LFEW150308ERLN	15,87	.625	9,53	.375	3,30	.130	–	–	–	–	–	–	0,8	.031	
LFEW150308FRLN	15,87	.625	9,53	.375	3,30	.130	–	–	–	–	–	–	0,8	.031	
LFEW150312ERLN	15,83	.623	9,53	.375	3,30	.130	–	–	–	–	–	–	1,2	.047	
LFEW150312FRLN	15,83	.623	9,53	.375	3,30	.130	–	–	–	–	–	–	1,2	.047	
LFEW150316ERLN	15,79	.622	9,53	.375	3,30	.130	–	–	–	–	–	–	1,6	.063	
LFEW150316FRLN	15,79	.622	9,53	.375	3,30	.130	–	–	–	–	–	–	1,6	.063	
LFEW150320ERLN	15,75	.620	9,53	.375	3,30	.130	–	–	–	–	–	–	2,0	.078	
LFEW150324ERLN	15,70	.618	9,53	.375	3,30	.130	–	–	–	–	–	–	2,4	.094	
LFEW150332FRLN	15,44	.608	9,53	.375	3,30	.130	–	–	–	–	–	–	3,2	.125	
LFEW150332ERLN	15,44	.608	9,53	.375	3,30	.130	–	–	–	–	–	–	3,2	.125	
LFEW150340ERLN	15,53	.611	9,53	.375	3,30	.130	–	–	–	–	–	–	4,0	.157	
LFEW150340FRLN	15,53	.611	9,53	.375	3,30	.130	–	–	–	–	–	–	4,0	.157	
LFEW220408ERLN	22,23	.875	15,88	.625	4,76	.188	–	–	–	–	–	–	0,8	.031	
LFEW220408FRLN	22,23	.875	15,88	.625	4,76	.188	–	–	–	–	–	–	0,8	.031	
LFEW220412ERLN	22,18	.873	15,88	.625	4,76	.188	–	–	–	–	–	–	1,2	.047	
LFEW220412FRLN	22,18	.873	15,88	.625	4,76	.188	–	–	–	–	–	–	1,2	.047	
LFEW220416ERLN	22,14	.872	15,88	.625	4,76	.188	–	–	–	–	–	–	1,6	.063	
LFEW220416FRLN	22,14	.872	15,88	.625	4,76	.188	–	–	–	–	–	–	1,6	.063	
LFEW220432ERLN	21,97	.865	15,88	.625	4,76	.188	–	–	–	–	–	–	3,2	.125	
LFEW220432FRLN	21,97	.865	15,88	.625	4,76	.188	–	–	–	–	–	–	3,2	.125	
LFEW220448ERLN	21,80	.858	15,88	.625	4,76	.188	–	–	–	–	–	–	4,8	.188	
LFEW220464FRLN	21,63	.852	15,88	.625	4,76	.188	–	–	–	–	–	–	6,4	.250	
LFEW220464ERLN	21,63	.852	15,88	.625	4,76	.188	–	–	–	–	–	–	6,4	.250	
LNCX1806AZR11	18,50	.728	10,00	.394	6,40	.252	–	–	–	–	2,16	.085	–	–	LNCX
LNCX1806AZR11T	18,50	.728	10,00	.394	6,40	.252	–	–	–	–	2,16	.085	–	–	





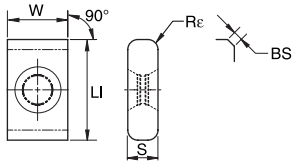
● first choice
○ alternate choice

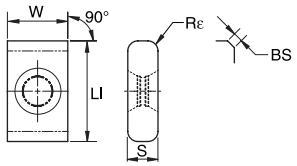
	ISO catalog number	ANSI catalog number	K110M	K125M	KC410M	KC510M	KC515M	KC520M	KC522M	KC525M	KC530M	KC715M	KC725M	KC735M	KC915M	KC935M	KT530M	KY1540	KY2100	KY3500	KB1340	KD1410	KD1415	KD1420
H							●														●			
S								●					●	●				●	●					
N			●		●	○			○													●	●	●
K						●	○	●	○						●	○				●	●			
M							○		●	○	●		●	●		○			●					
P				●			●		○	●	●	●	●	○		●	●	●	●					
LNE323	LNE32302	LNE32302						●					●			●								
	LNE32304	LNE32304				●		●					●			●								
LNE324	LNE32401	LNE32401						●								●								
	LNE32405	LNE32405						●							●	●								
LNE434	LNE43402	LNE43402											●											
	LNE43420	LNE43420														●								
LNEQ	LNEQ1240	LNEQ1240												●										
	LNEQ1245	LNEQ1245												●										
	LNEQ1255	LNEQ1255												●										

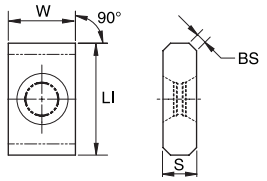
Pg. 413

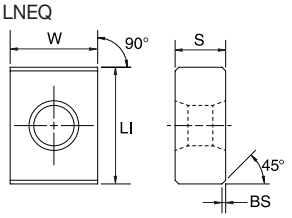
To place an order, contact Kennametal or your authorized Kennametal distributor, or visit www.kennametal.com.

ISO catalog number	dimensions														
	LI		W		S		D		L10		BS		Rε		
	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
LNE32302	15,88	.625	9,53	.375	4,76	.188	–	–	–	–	1,08	.042	–	–	LNE323
LNE32304	15,88	.625	9,53	.375	4,76	.188	–	–	–	–	–	–	1,5	.060	
LNE32401	15,88	.625	9,53	.375	6,35	.250	–	–	–	–	–	–	1,5	.060	LNE324
LNE32405	15,88	.625	9,53	.375	6,35	.250	–	–	–	–	1,08	.042	–	–	
LNE43402	19,05	.750	14,29	.563	6,35	.250	–	–	–	–	1,08	.042	–	–	LNE434
LNE43420	19,05	.750	12,70	.500	6,35	.250	–	–	–	–	1,08	.042	–	–	
LNEQ1240	12,70	.500	9,53	.375	4,00	.158	–	–	–	–	0,3	.012	–	–	LNEQ
LNEQ1245	12,70	.500	9,53	.375	4,50	.177	–	–	–	–	0,4	.016	–	–	
LNEQ1255	12,70	.500	9,53	.375	5,50	.217	–	–	–	–	0,4	.016	–	–	





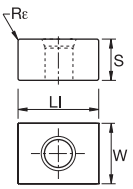
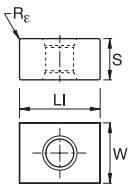
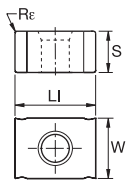
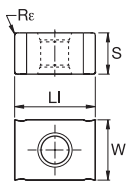




● first choice
○ alternate choice

	ISO catalog number	ANSI catalog number	K110M	K125M	KC410M	KC510M	KC515M	KC520M	KC522M	KC525M	KC530M	KC715M	KC725M	KC735M	KC915M	KC935M	KT530M	KY1540	KY2100	KY3500	KB1340	KD1410	KD1415	KD1420
H							●														●			
S									●				●	●				●	●					
N			●		●	○			○													●	●	●
K						●	○	●	○						●	○				●	●				
M							○		●	○	●		●	●		○			●					
P				●			●		○	●	●	●	●	○		●	●	●	●					
LNEQ-R03	LNEQ1235R03	LNEQ1235R03											●	●	●									
	LNEQ1240R03	LNEQ1240R03											●		●	●								
Pg. 413																								
Single-sided insert with 2 cutting edges																								
LNEQ-R04	LNEQ1245R04	LNEQ1245R04						●					●		●	●								
	LNEQ1250R04	LNEQ1250R04												●	●	●								
	LNEQ1255R04	LNEQ1255R04						●					●		●									
	LNEQ1260R04	LNEQ1260R04											●		●									
Pg. 413																								
4 cutting edges																								
LNEU-GP	LNEU1235R03SGP	LNEU1235R03SGP											●	●										
	LNEU1240R03SGP	LNEU1240R03SGP											●	●										
	LNEU1240R16SGP	LNEU1240R16SGP												●										
Pg. 413																								
Single-sided insert with 2 cutting edges																								
LNEU-GP	LNEU1245R04SGP	LNEU1245R04SGP											●	●		●								
	LNEU1245R08SGP	LNEU1245R08SGP											●	●										
	LNEU1245R16SGP	LNEU1245R16SGP											●			●								
	LNEU1250R04SGP	LNEU1250R04SGP											●											
	LNEU1250R08SGP	LNEU1250R08SGP											●											
	LNEU1255R04SGP	LNEU1255R04SGP											●											
	LNEU1260R04SGP	LNEU1260R04SGP												●										
Pg. 413																								
4 cutting edges																								

K110M K125M KC410M KC510M KC515M KC520M KC522M KC525M KC530M KC715M KC725M KC735M KC915M KC935M KT530M KY1540 KY2100 KY3500 KB1340 KD1410 KD1415 KD1420

ISO catalog number	dimensions														
	LI		W		S		D		L10		BS		Rε		
	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
LNEQ1235R03	12,70	.500	9,53	.375	3,50	.138	–	–	–	–	–	–	0,3	.012	LNEQ-R03
LNEQ1240R03	12,70	.500	9,53	.375	4,00	.158	–	–	–	–	–	–	0,3	.012	
LNEQ1245R04	12,70	.500	9,53	.375	4,50	.177	–	–	–	–	–	–	0,4	.016	LNEQ-R04
LNEQ1250R04	12,70	.500	9,53	.375	5,00	.197	–	–	–	–	–	–	0,4	.016	
LNEQ1255R04	12,70	.500	9,53	.375	5,50	.217	–	–	–	–	–	–	0,4	.016	
LNEQ1260R04	12,70	.500	9,53	.375	6,00	.236	–	–	–	–	–	–	0,4	.016	
LNEU1235R03SGP	12,70	.500	9,60	.378	3,50	.138	–	–	–	–	–	–	0,3	.012	LNEU-GP
LNEU1240R03SGP	12,70	.500	9,60	.378	4,00	.157	–	–	–	–	–	–	0,3	.012	
LNEU1240R16SGP	12,70	.500	9,60	.378	4,00	.157	–	–	–	–	–	–	1,6	.063	
LNEU1245R04SGP	12,70	.500	9,60	.378	4,50	.177	–	–	–	–	–	–	0,4	.016	LNEU-GP
LNEU1245R08SGP	12,70	.500	9,60	.378	4,50	.177	–	–	–	–	–	–	0,8	.031	
LNEU1245R16SGP	12,70	.500	9,60	.378	4,50	.177	–	–	–	–	–	–	1,6	.063	
LNEU1250R04SGP	12,70	.500	9,60	.378	5,00	.197	–	–	–	–	–	–	0,4	.016	
LNEU1250R08SGP	12,70	.500	9,60	.378	5,00	.197	–	–	–	–	–	–	0,8	.031	
LNEU1255R04SGP	12,70	.500	9,60	.378	5,50	.217	–	–	–	–	–	–	0,4	.016	
LNEU1260R04SGP	12,70	.500	9,60	.378	6,00	.236	–	–	–	–	–	–	0,4	.016	

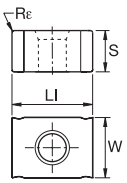
● first choice
○ alternate choice

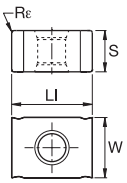
	ISO catalog number	ANSI catalog number	K110M	K125M	KC410M	KC510M	KC515M	KC520M	KC522M	KC525M	KC530M	KC715M	KC725M	KC735M	KC915M	KC935M	KT530M	KY1540	KY2100	KY3500	KB1340	KD1410	KD1415	KD1420
H							●														●			
S									●				●	●				●	●					
N			●		●	○			○													●	●	●
K						●	○	●	○						●	○				●	●			
M							○		●	○	●		●	●		○			●					
P				●			●		○	●	●	●	●	○		●	●	●	●					
LNEU-R	LNEU1235R03	LNEU1235R03						●					●	●										
	LNEU1240R03	LNEU1240R03						●					●	●										
	LNEU1240R08	LNEU1240R08						●				●	●											
	LNEU1240R16	LNEU1240R16										●	●											
Pg. 413																								
Single-sided insert with 2 cutting edges																								
LNEU-R	LNEU1245R04	LNEU1245R04						●					●	●		●								
	LNEU1245R08	LNEU1245R08						●					●											
	LNEU1245R16	LNEU1245R16						●					●											
	LNEU1245R32	LNEU1245R32						●					●											
	LNEU1250R04	LNEU1250R04						●					●											
	LNEU1250R08	LNEU1250R08											●											
	LNEU1255R04	LNEU1255R04											●											
	LNEU1255R08	LNEU1255R08						●					●											
	LNEU1255R16	LNEU1255R16											●											
	LNEU1255R32	LNEU1255R32											●											
	LNEU1260R04	LNEU1260R04											●											
Pg. 413																								
4 cutting edges																								
LPE324	LPE32403	LPE32403						●																
	LPE32403G	LPE32403G														●								
	LPE324128	LPE324128						●																
OPERATION UPGRADE																								
LPE	LPE43404	LPE43404											●											
OPERATION UPGRADE																								

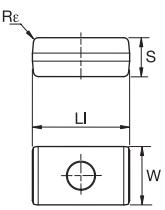
K110M K125M KC410M KC510M KC515M KC520M KC522M KC525M KC530M KC715M KC725M KC735M KC915M KC935M KT530M KY1540 KY2100 KY3500 KB1340 KD1410 KD1415 KD1420

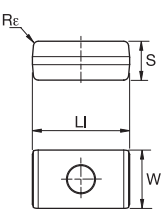
To place an order, contact Kennametal or your authorized Kennametal distributor, or visit www.kennametal.com.

ISO catalog number	dimensions														
	LI		W		S		D		L10		BS		Rε		
	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
LNEU1235R03	12,70	.500	9,60	.378	3,50	.138	–	–	–	–	–	–	0,3	.012	LNEU-R
LNEU1240R03	12,70	.500	9,60	.378	4,00	.158	–	–	–	–	–	–	0,3	.012	
LNEU1240R08	12,70	.500	9,60	.378	4,00	.158	–	–	–	–	–	–	0,8	.031	
LNEU1240R16	12,70	.500	9,60	.378	4,00	.158	–	–	–	–	–	–	1,6	.062	
LNEU1245R04	12,70	.500	9,60	.378	4,50	.177	–	–	–	–	–	–	0,4	.016	LNEU-R
LNEU1245R08	12,70	.500	9,60	.378	4,50	.177	–	–	–	–	–	–	0,8	.031	
LNEU1245R16	12,70	.500	9,60	.378	4,50	.177	–	–	–	–	–	–	1,6	.062	
LNEU1245R32	12,70	.500	9,60	.378	4,50	.177	–	–	–	–	–	–	3,2	.125	
LNEU1250R04	12,70	.500	9,60	.378	5,00	.197	–	–	–	–	–	–	0,4	.016	
LNEU1250R08	12,70	.500	9,60	.378	5,00	.197	–	–	–	–	–	–	0,8	.031	
LNEU1255R04	12,70	.500	9,60	.378	5,50	.217	–	–	–	–	–	–	0,4	.016	
LNEU1255R08	12,70	.500	9,60	.378	5,50	.217	–	–	–	–	–	–	0,8	.031	
LNEU1255R16	12,70	.500	9,60	.378	5,50	.217	–	–	–	–	–	–	1,6	.062	
LNEU1255R32	12,70	.500	9,60	.378	5,50	.217	–	–	–	–	–	–	3,2	.125	
LNEU1260R04	12,70	.500	9,60	.378	6,00	.236	–	–	–	–	–	–	0,4	.016	
LPE32403	15,88	.625	9,52	.375	6,35	.250	–	–	–	–	–	–	0,8	.031	LPE324
LPE32403G	15,88	.625	9,52	.375	6,35	.250	–	–	–	–	–	–	0,8	.031	
LPE324128	15,88	.625	9,52	.375	6,35	.250	–	–	–	–	–	–	0,8	.031	
LPE43404	19,05	.750	14,29	.563	6,35	.250	–	–	–	–	–	–	1,6	.063	LPE







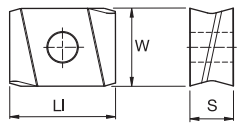
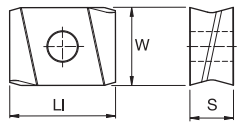
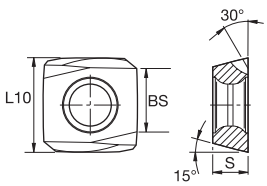
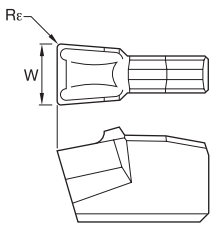


● first choice
○ alternate choice

	ISO catalog number	ANSI catalog number	K110M	K125M	KC410M	KC510M	KC515M	KC520M	KC522M	KC525M	KC530M	KC715M	KC725M	KC735M	KC915M	KC935M	KT530M	KY1540	KY2100	KY3500	KB1340	KD1410	KD1415	KD1420
H							●														●			
S									●				●	●				●	●					
N			●		●	○			○													●	●	●
K						●	○	●	○						●	○				●	●				
M							○		●	○	●		●	●		○			●					
P				●			●		○	●	●	●	●	○		●	●	●	●					
LSE	LSE424R01	LSE424R01											●			●								
	LSE424R05	LSE424R05											●											
LSE	LSE444R01	LSE444R01											●			●								
	LSE446L09	LSE446L09										●												
	LSE446R09	LSE446R09										●												
MDHX-GD	MDHX1004ZDERGD	MDHX1004ZDERGD	●					●									●							
	MDHX1004ZDERGD4W	MDHX1004ZDERGD4W	●					●									●							
	MDHX1004ZDFLGD4W	MDHX1004ZDFLGD4W	●					●																
	MDHX1004ZDFRGD4W	MDHX1004ZDFRGD4W	●					●									●							
OD	3.90016SNGB	ODG1063ISGB												●		●								
	3.90016SNGD	ODG1063ISGD												●		●								
	3.90022SNGB	ODG2087ISGB												●		●								
	3.90022SNGD	ODG2087ISGD												●		●								
	3.90030SNGB	ODG3125ISGB												●		●								
	3.90030SNGD	ODG3125ISGD												●		●								
	3.90040SNGB	ODG4158ISGB												●		●								
	3.90040SNGD	ODG4158ISGD												●		●								
	3.90050SNGB	ODG5197ISGB												●		●								
	3.90060SNGB	ODG6236ISGB												●		●								
	3.90060SNGD	ODG6236ISGD												●		●								

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Pg. 407

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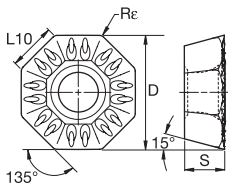
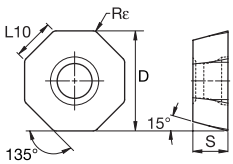
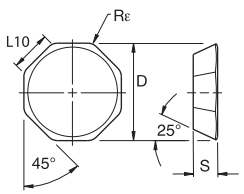
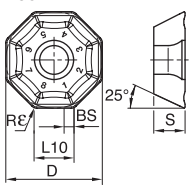
ISO catalog number	dimensions														
	LI		W		S		D		L10		BS		Rε		
	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
LSE424R01	17,27	.680	12,70	.500	7,11	.280	–	–	–	–	–	–	–	–	LSE
LSE424R05	17,27	.680	12,64	.498	7,11	.280	–	–	–	–	–	–	–	–	
LSE444R01	24,13	.950	12,73	.501	7,11	.280	–	–	–	–	–	–	–	–	LSE
LSE446L09	28,58	1.125	14,27	.562	9,52	.375	–	–	–	–	–	–	–	–	
LSE446R09	28,58	1.125	14,27	.562	9,52	.375	–	–	–	–	–	–	–	–	
MDHX1004ZDERGD	–	–	–	–	4,76	.187	–	–	10,80	.425	0,80	.031	–	–	MDHX-GD
MDHX1004ZDERGD4W	–	–	–	–	4,76	.187	–	–	10,80	.425	8,50	.335	–	–	
MDHX1004ZDFLGD4W	–	–	–	–	4,76	.187	–	–	10,80	.425	8,50	.335	–	–	
MDHX1004ZDFRGD4W	–	–	–	–	4,76	.187	–	–	10,80	.425	8,50	.335	–	–	
3.90016SNGB	–	–	1,60	.063	–	–	–	–	–	–	–	–	0,2	.006	OD
3.90016SNGD	–	–	1,60	.063	–	–	–	–	–	–	–	–	0,2	.006	
3.90022SNGB	–	–	2,20	.087	–	–	–	–	–	–	–	–	0,2	.008	
3.90022SNGD	–	–	2,25	.089	–	–	–	–	–	–	–	–	0,2	.008	
3.90030SNGB	–	–	3,05	.120	–	–	–	–	–	–	–	–	0,2	.008	
3.90030SNGD	–	–	3,05	.120	–	–	–	–	–	–	–	–	0,2	.008	
3.90040SNGB	–	–	4,05	.160	–	–	–	–	–	–	–	–	0,2	.008	
3.90040SNGD	–	–	4,05	.160	–	–	–	–	–	–	–	–	0,2	.008	
3.90050SNGB	–	–	5,05	.199	–	–	–	–	–	–	–	–	0,3	.012	
3.90060SNGB	–	–	6,05	.238	–	–	–	–	–	–	–	–	0,3	.012	
3.90060SNGD	–	–	6,05	.238	–	–	–	–	–	–	–	–	0,3	.012	

● first choice
○ alternate choice

	ISO catalog number	ANSI catalog number	K110M	K125M	KC410M	KC510M	KC515M	KC520M	KC522M	KC525M	KC530M	KC715M	KC725M	KC735M	KC915M	KC935M	KT530M	KY1540	KY2100	KY3500	KB1340	KD1410	KD1415	KD1420
H							●														●			
S									●				●	●				●	●					
N			●		●	○			○													●	●	●
K						●	○	●	○						●	○				●	●				
M							○		●	○	●		●	●		○			●					
P				●			●		○	●	●	●	●	○		●	●	●	●					
ODPT	ODPT060508ENGPW	ODPT5352ENGPW								●			●											
ODPW	ODPW060508ENGN	ODPW5352ENGN				●									●									
OFHN-SLN	OFHN060412SLN	OFHN533SLN											●											
OFKT06	OFKT06L5AFENGB	OFKT53AFEN4GB						●	●				●		●	●								
	OFKT06L5AFENLB	OFKT53AFEN6LB						●	●				●		●	●								
	OFKT06L5AFFNLNJ	OFKT53AFFN4LNJ			●																			
	OFKT06L5AFSNHB	OFKT53AFSN4HB						●	●				●		●	●								
	OFKT06L5AFSNLB	OFKT53AFSN6LB						●	●				●		●	●								

OPERATION UPGRADE

Pg. 295 Pg. 295

ISO catalog number	dimensions														
	LI		W		S		D		L10		BS		Rε		
	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
ODPT060508ENGPW	–	–	–	–	5,56	.219	15,88	.625	6,55	.258	–	–	0,8	.031	ODPT 
ODPW060508ENGN	–	–	–	–	5,56	.219	15,88	.625	6,58	.259	–	–	0,8	.031	ODPW 
OFHN060412SLN	–	–	–	–	4,76	.188	15,88	.625	6,58	.259	–	–	1,2	.047	OFHN-SLN 
OFKT06L5AFENGB	–	–	–	–	5,00	.197	14,70	.579	6,00	.236	–	–	0,8	.031	OFKT06 
OFKT06L5AFENLB	–	–	–	–	5,00	.197	14,70	.579	6,00	.236	1,23	.048	0,8	.031	
OFKT06L5AFFNLNJ	–	–	–	–	5,00	.197	14,70	.579	6,00	.236	–	–	0,8	.031	
OFKT06L5AFSNHB	–	–	–	–	5,00	.197	14,70	.579	6,00	.236	–	–	0,8	.031	
OFKT06L5AFSNLB	–	–	–	–	5,00	.197	14,70	.579	6,00	.236	1,21	.048	0,8	.031	

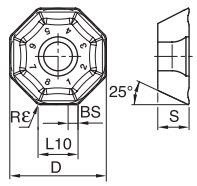
● first choice
○ alternate choice

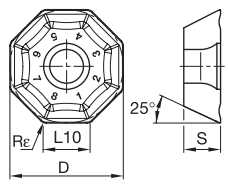
	ISO catalog number	ANSI catalog number	K110M	K125M	KC410M	KC510M	KC515M	KC520M	KC522M	KC525M	KC530M	KC715M	KC725M	KC735M	KC915M	KC935M	KT530M	KY1540	KY2100	KY3500	KB1340	KD1410	KD1415	KD1420
H							●														●			
S									●				●	●				●	●					
N			●		●	○			○													●	●	●
K						●	○	●	○						●	○				●	●			
M							○		●	○	●		●	●		○			●					
P				●			●		○	●	●	●	●	○		●	●	●	●					
OFKT07	OFKT07L6AFENGB	OFKT64AFEN6GB						●	●				●		●	●								
	OFKT07L6AFENLB	OFKT64AFEN6LB						●	●				●		●	●								
	OFKT07L6AFFNLNJ	OFKT64AFFN6LNJ			●																			
	OFKT07L6AFSNHB	OFKT64AFSN6HB						●	●				●		●	●								
	OFKT07L6AFSNLB	OFKT64AFSN6LB						●	●				●		●	●								
OFPT06	OFPT06L5AFENGB	OFPT53AFEN4GB						●					●		●	●								
	OFPT06L5AFSNHB	OFPT53AFSN4HB						●					●		●	●								
OFPT07	OFPT07L6AFENGB	OFPT64AFEN6GB						●	●				●		●	●								
	OFPT07L6AFSNHB	OFPT64AFSN6HB						●	●				●		●	●								
PDHX	PDHX120410SNGN	PDHX120410SNGN				●				●		●	●											
	PDHX120420SNGN	PDHX120420SNGN				●			●	●		●	●											

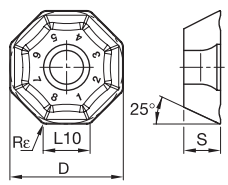
Pg. 300
Pg. 295
Pg. 295
Pg. 300
Pg. 443

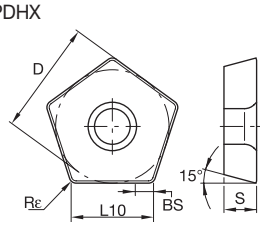
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ISO catalog number	dimensions														
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	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
OFKT07L6AFENGB	—	—	—	—	6,00	.236	18,70	.736	7,50	.295	—	—	1,2	.047	OFKT07
OFKT07L6AFENLB	—	—	—	—	6,00	.236	18,70	.736	7,50	.295	2,10	.083	1,2	.047	
OFKT07L6AFFNLNJ	—	—	—	—	6,00	.236	18,70	.736	7,50	.295	—	—	1,2	.047	
OFKT07L6AFSNHB	—	—	—	—	6,00	.236	18,70	.736	7,50	.295	—	—	1,2	.047	
OFKT07L6AFSNLB	—	—	—	—	6,00	.236	18,70	.736	7,50	.295	2,10	.083	1,2	.047	
OFPT06L5AFENGB	—	—	—	—	5,00	.197	14,70	.579	6,00	.236	—	—	0,8	.031	OFPT06
OFPT06L5AFSNHB	—	—	—	—	5,00	.197	14,70	.579	6,00	.236	—	—	0,8	.031	
OFPT07L6AFENGB	—	—	—	—	6,00	.236	18,70	.736	7,50	.295	—	—	1,2	.047	OFPT07
OFPT07L6AFSNHB	—	—	—	—	6,00	.236	18,70	.736	7,50	.295	—	—	1,2	.047	
PDHX120410SNGN	—	—	—	—	4,76	.188	16,54	.651	12,00	.472	1,99	.078	1,0	.039	PDHX
PDHX120420SNGN	—	—	—	—	4,76	.188	16,54	.651	12,00	.472	2,00	.079	2,0	.079	









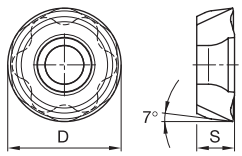
● first choice
○ alternate choice

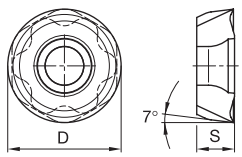
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H							●														●			
S									●				●	●				●	●					
N			●		●	○			○													●	●	●
K						●	○	●	○						●	○				●	●				
M							○		●	○	●		●	●		○			●					
P				●			●		○	●	●	●	●	○		●	●	●	●					
RCGT-HF	RCGT190600SHF	RCGT64SHF										●	●			●								
	RCGT250900SHF	RCGT86SHF										●	●			●								
RCGT-LF	RCGT190600ELF	RCGT64ELF							●			●	●			●								
	RCGT250900ELF	RCGT86ELF							●			●	●			●								
	RCGT2006M0ELF	RCGT2006M0ELF											●											
RCMT	RCMT10T3M0	RCMT10T3M0											●											
	RCMT1204M0	RCMT1204M0											●			●								
	RCMT2006M0	RCMT2006M0											●											
RDCW	RDCW10T3M0T	RDCW10T3M0T										●												
RDHX-ELN	RDHX0501M0ELN	RDHX0501M0ELN				●			●	●							●							

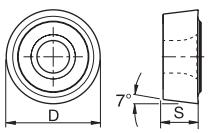
Pg. 466
Pg. 466
Pg. 452

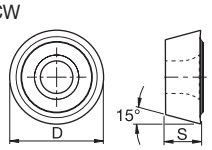
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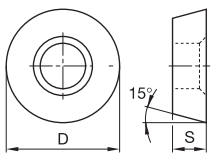
ISO catalog number	dimensions														
	LI		W		S		D		L10		BS		Rε		
	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
RCGT190600SHF	–	–	–	–	6,35	.250	19,05	.750	–	–	–	–	–	–	RCGT-HF
RCGT250900SHF	–	–	–	–	9,52	.375	25,40	1.000	–	–	–	–	–	–	
RCGT190600ELF	–	–	–	–	6,35	.250	19,05	.750	–	–	–	–	–	–	RCGT-LF
RCGT250900ELF	–	–	–	–	9,52	.375	25,40	1.000	–	–	–	–	–	–	
RCGT2006M0ELF	–	–	–	–	6,35	.250	20,00	.787	–	–	–	–	–	–	
RCMT10T3M0	–	–	–	–	3,97	.156	10,00	.394	–	–	–	–	–	–	RCMT
RCMT1204M0	–	–	–	–	4,76	.188	12,00	.472	–	–	–	–	–	–	
RCMT2006M0	–	–	–	–	6,35	.250	20,00	.787	–	–	–	–	–	–	
RDCW10T3M0T	–	–	–	–	3,97	.156	10,00	.394	–	–	–	–	–	–	RDCW
RDHX0501M0ELN	–	–	–	–	1,50	.059	5,00	.197	–	–	–	–	–	–	RDHX-ELN











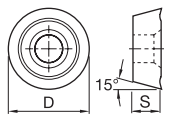
● first choice
○ alternate choice

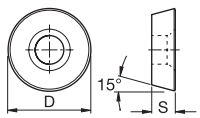
	ISO catalog number	ANSI catalog number	K110M	K125M	KC410M	KC510M	KC515M	KC520M	KC522M	KC525M	KC530M	KC715M	KC725M	KC735M	KC915M	KC935M	KT530M	KY1540	KY2100	KY3500	KB1340	KD1410	KD1415	KD1420
H							●														●			
S									●				●	●				●	●					
N			●		●	○			○													●	●	●
K						●	○	●	○						●	○				●	●				
M							○		●	○	●		●	●		○			●					
P				●			●		○	●	●	●	●	○		●	●	●	●					
RDHX-FLP	RDHX0702M0FLP	RDHX0702M0FLP	●			●			●				●											
	RDHX1003M0FLP	RDHX1003M0FLP	●			●			●				●											
	RDHX12T3M0FLP	RDHX12T3M0FLP	●			●			●				●											
	RDHX1604M0FLP	RDHX1604M0FLP	●			●			●				●											
RDHX-GN	RDHX1003M0SGN	RDHX1003M0SGN				●			●	●		●	●											
	RDHX1003M0TGN	RDHX1003M0TGN															●							
	RDHX12T3M0FGN	RDHX12T3M0FGN				●																		
	RDHX12T3M0SGN	RDHX12T3M0SGN				●			●	●		●	●											
	RDHX12T3M0TGN	RDHX12T3M0TGN															●							
	RDHX1604M0SGN	RDHX1604M0SGN				●			●	●			●											
RDHX-LN	RDHX07T1M0SLN	RDHX07T1M0SLN				●				●		●												
	RDHX0702M0SLN	RDHX0702M0SLN				●			●	●		●	●											
	RDHX0702M0TLN	RDHX0702M0TLN															●							
RDPX-SHN	RDPX1003M0SHN	RDPX1003M0SHN				●			●	●		●	●											
	RDPX12T3M0SHN	RDPX12T3M0SHN				●				●		●	●	●										
	RDPX1604M0SHN	RDPX1604M0SHN				●			●	●		●	●	●										
RDPX-SHP	RDPX1003M0SHP	RDPX1003M0SHP							●	●			●			●								
	RDPX12T3M0SHP	RDPX12T3M0SHP							●	●			●			●								
	RDPX1604M0SHP	RDPX1604M0SHP							●	●			●			●								

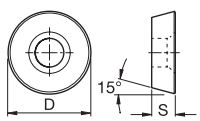
RDHX-FLP: Pg. 457 | Pg. 455 | Pg. 455
RDHX-GN: Pg. 457 | Pg. 455 | Pg. 455
RDHX-LN: Pg. 457 | Pg. 455 | Pg. 455
RDPX-SHN: Pg. 457 | Pg. 457 | Pg. 457
RDPX-SHP: Pg. 457 | Pg. 457 | Pg. 457

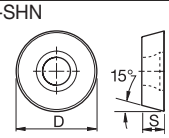
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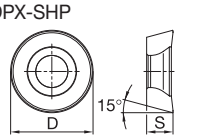
ISO catalog number	dimensions														
	LI		W		S		D		L10		BS		Rε		
	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
RDHX0702M0FLP	–	–	–	–	2,38	.094	7,00	.276	–	–	–	–	–	–	RDHX-FLP
RDHX1003M0FLP	–	–	–	–	3,18	.125	10,00	.394	–	–	–	–	–	–	
RDHX12T3M0FLP	–	–	–	–	3,97	.156	12,00	.472	–	–	–	–	–	–	
RDHX1604M0FLP	–	–	–	–	4,76	.188	16,00	.630	–	–	–	–	–	–	
RDHX1003M0SGN	–	–	–	–	3,18	.125	10,00	.394	–	–	–	–	–	–	RDHX-GN
RDHX1003M0TGN	–	–	–	–	3,18	.125	10,00	.394	–	–	–	–	–	–	
RDHX12T3M0FGN	–	–	–	–	3,97	.156	12,00	.472	–	–	–	–	–	–	
RDHX12T3M0SGN	–	–	–	–	3,97	.156	12,00	.472	–	–	–	–	–	–	
RDHX12T3M0TGN	–	–	–	–	3,97	.156	12,00	.472	–	–	–	–	–	–	
RDHX1604M0SGN	–	–	–	–	4,76	.188	16,00	.630	–	–	–	–	–	–	
RDHX0702M0SLN	–	–	–	–	1,98	.078	7,00	.276	–	–	–	–	–	–	RDHX-LN
RDHX0702M0TLN	–	–	–	–	2,38	.094	7,00	.276	–	–	–	–	–	–	
RDHX07T1M0SLN	–	–	–	–	2,38	.094	7,00	.276	–	–	–	–	–	–	
RDPX1003M0SHN	–	–	–	–	3,18	.125	10,00	.394	–	–	–	–	–	–	RDPX-SHN
RDPX12T3M0SHN	–	–	–	–	3,97	.156	12,00	.472	–	–	–	–	–	–	
RDPX1604M0SHN	–	–	–	–	4,76	.187	16,00	.630	–	–	–	–	–	–	
RDPX1003M0SHP	–	–	–	–	3,18	.125	10,00	.394	–	–	–	–	–	–	RDPX-SHP
RDPX12T3M0SHP	–	–	–	–	3,97	.156	12,00	.472	–	–	–	–	–	–	
RDPX1604M0SHP	–	–	–	–	4,76	.187	16,00	.630	–	–	–	–	–	–	











● first choice
○ alternate choice

	ISO catalog number	ANSI catalog number	K110M	K125M	KC410M	KC510M	KC515M	KC520M	KC522M	KC525M	KC530M	KC715M	KC725M	KC735M	KC915M	KC935M	KT530M	KY1540	KY2100	KY3500	KB1340	KD1410	KD1415	KD1420
H							●														●			
S									●				●	●				●	●					
N			●		●	○			○													●	●	●
K						●	○	●	○						●	○				●	●			
M							○		●	○	●		●	●		○			●					
P				●			●		○	●	●	●	●	○		●	●	●	●					
REHR	REHR1605M0T	REHR1605M0T											●											
RFCW-GN	RFCW150400SGN	RFCW53SGN											●			●								
RFCW-GNZ	RFCW150400TZ	RFCW53SGNZ											●	●										
RFCW-LN	RFCW150400ELN	RFCW53ELN								●			●											
RFCW-LNZ	RFCW150400ELNZ	RFCW53ELNZ														●								
RFHN-LN	RFHN150400ELN	RFHN53ELN											●											
	RFHN150400SLN	RFHN53SLN											●											

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ISO catalog number	dimensions														
	LI		W		S		D		L10		BS		Rε		
	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
REHR1605M0T	–	–	–	–	5,56	.219	16,00	.630	–	–	–	–	–	–	REHR
RFCW150400SGN	–	–	–	–	4,76	.188	15,88	.625	–	–	–	–	–	–	RFCW-GN
RFCW150400TZ	–	–	–	–	4,76	.188	15,88	.625	–	–	–	–	–	–	RFCW-GNZ
RFCW150400ELN	–	–	–	–	4,76	.188	15,88	.625	–	–	–	–	–	–	RFCW-LN
RFCW150400ELNZ	–	–	–	–	4,76	.188	15,88	.625	–	–	–	–	–	–	RFCW-LNZ
RFHN150400ELN	–	–	–	–	4,76	.188	15,88	.625	–	–	–	–	–	–	RFHN-LN
RFHN150400SLN	–	–	–	–	4,76	.188	15,88	.625	–	–	–	–	–	–	

● first choice
○ alternate choice

	ISO catalog number	ANSI catalog number	K110M	K125M	KC410M	KC510M	KC515M	KC520M	KC522M	KC525M	KC530M	KC715M	KC725M	KC735M	KC915M	KC935M	KT530M	KY1540	KY2100	KY3500	KB1340	KD1410	KD1415	KD1420
H							●														●			
S									●				●	●				●	●					
N			●		●	○			○													●	●	●
K						●	○	●	○						●	○				●	●			
M							○		●	○	●		●	●		○			●					
P				●			●		○	●	●	●	●	○		●	●	●	●					
RNG-T	RNGN120700T01020	RNG45T0420																●	●					
RPCW	RPCW1204M0	RPCW1204M0												●		●								
	RPCW1204M0T	RPCW1204M0T										●	●			●								
RPG	RPGN120400E	RPG43E																●	●					
RPGB	RPGB070200	RPGB2515											●			●								
	RPGB09T300	RPGB325										●	●											
RPHT-EN	RPHT0803M0EN	RPHT0803M0EN														●								
	RPHT10T3M0EN	RPHT10T3M0EN														●								
	RPHT1204M0EN	RPHT1204M0EN	●													●								

Pg. 486
Pg. 485
Pg. 485

OPERATION UPGRADE

OPERATION UPGRADE

K110M K125M KC410M KC510M KC515M KC520M KC522M KC525M KC530M KC715M KC725M KC735M KC915M KC935M KT530M KY1540 KY2100 KY3500 KB1340 KD1410 KD1415 KD1420

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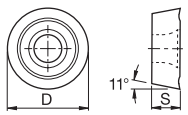
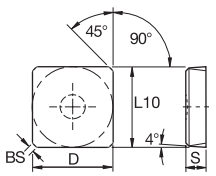
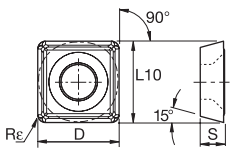
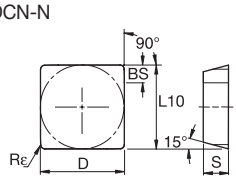
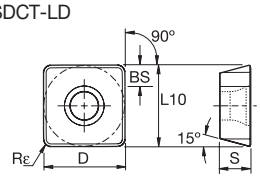
ISO catalog number	dimensions														
	LI		W		S		D		L10		BS		Rε		
	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
RNGN120700T01020	–	–	–	–	7,94	.313	12,70	.500	–	–	–	–	–	–	RNG-T
RPCW1204M0	–	–	–	–	4,76	.188	12,00	.472	–	–	–	–	–	–	RPCW
RPCW1204M0T	–	–	–	–	4,76	.188	12,00	.472	–	–	–	–	–	–	
RPGN120400E	–	–	–	–	4,76	.188	12,70	.500	–	–	–	–	–	–	RPG
RPGB070200	–	–	–	–	2,38	.094	7,94	.313	–	–	–	–	–	–	RPGB
RPGB09T300	–	–	–	–	3,97	.156	9,53	.375	–	–	–	–	–	–	
RPHT0803M0EN	–	–	–	–	3,18	.125	8,00	.315	–	–	–	–	–	–	RPHT-EN
RPHT10T3M0EN	–	–	–	–	3,97	.156	10,00	.394	–	–	–	–	–	–	
RPHT1204M0EN	–	–	–	–	4,76	.188	12,00	.472	–	–	–	–	–	–	

● first choice
○ alternate choice

	ISO catalog number	ANSI catalog number	K110M	K125M	KC410M	KC510M	KC515M	KC520M	KC522M	KC525M	KC530M	KC715M	KC725M	KC735M	KC915M	KC935M	KT530M	KY1540	KY2100	KY3500	KB1340	KD1410	KD1415	KD1420
H							●														●			
S									●				●	●				●	●					
N			●		●	○			○													●	●	●
K						●	○	●	○						●	○				●	●				
M							○		●	○	●		●	●		○			●					
P				●			●		○	●	●	●	●	○		●	●	●	●					
RPMT-T	RPMT1605M0T	RPMT1605M0T											●											
SBEX	SBEX1203ZZ	SBEX42ZZ													●									
SDCH-LD	SDCH080208ENLD	SDCH26152ENLD											●											
SDCN-N	SDCN1204PDELLN	SDCN43PDEL8LN													●									
	SDCN1204PDERLN	SDCN43PDER8LN													●									
	SDCN1204PDSRGN	SDCN43PDSR8GN																		●				
SDCT-LD	SDCT1504PDERLD	SDCT53PDER8LD											●											
	SDCT1504PDFRLD	SDCT53PDFR8LD				●																		
	SDCT150412PDERLD	SDCT533PDER8LD											●											
	SDCT150412PDFRLD	SDCT533PDFR8LD				●																		

K110M K125M KC410M KC510M KC515M KC520M KC522M KC525M KC530M KC715M KC725M KC735M KC915M KC935M KT530M KY1540 KY2100 KY3500 KB1340 KD1410 KD1415 KD1420

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ISO catalog number	dimensions														
	LI		W		S		D		L10		BS		Rε		
	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
RPMT1605M0T	–	–	–	–	5,56	.219	16,00	.630	–	–	–	–	–	–	RPMT-T 
SBEX1203ZZ	–	–	–	–	3,18	.125	12,65	.498	12,65	.498	0,86	.034	0,4	.016	SBEX 
SDCH080208ENLD	–	–	–	–	2,38	.094	8,31	.327	8,31	.327	–	–	0,8	.031	SDCH-LD 
SDCN1204PDELLN	–	–	–	–	4,76	.188	12,70	.500	12,70	.500	3,36	.132	0,8	.031	SDCN-N 
SDCN1204PDERLN	–	–	–	–	4,76	.188	12,70	.500	12,70	.500	3,36	.132	0,8	.031	
SDCN1204PDSRGN	–	–	–	–	4,76	.188	12,70	.500	12,70	.500	3,36	.132	0,8	.031	
SDCT1504PDERLD	–	–	–	–	4,76	.188	15,88	.625	15,88	.625	3,36	.132	0,8	.031	SDCT-LD 
SDCT1504PDFRLD	–	–	–	–	4,76	.188	15,88	.625	15,88	.625	3,36	.132	0,8	.031	
SDCT150412PDERLD	–	–	–	–	4,76	.188	15,88	.625	15,88	.625	3,36	.132	1,2	.047	
SDCT150412PDFRLD	–	–	–	–	4,76	.188	15,88	.625	15,88	.625	3,36	.132	1,2	.047	

● first choice
○ alternate choice

	ISO catalog number	ANSI catalog number	K110M	K125M	KC410M	KC510M	KC515M	KC520M	KC522M	KC525M	KC530M	KC715M	KC725M	KC735M	KC915M	KC935M	KT530M	KY1540	KY2100	KY3500	KB1340	KD1410	KD1415	KD1420
H							●														●			
S									●				●	●				●	●					
N			●		●	○			○													●	●	●
K						●	○	●	○						●	○				●	●				
M							○		●	○	●		●	●		○			●					
P				●			●		○	●	●	●	●	○		●	●	●	●					
SDCT-LD2	SDCT120404PDELLD2	SDCT431PDEL8LD2											●											
	SDCT120404PDERLD2	SDCT431PDER8LD2											●											
	SDCT1204PDELLD2	SDCT43PDEL8LD2											●											
	SDCT1204PDERLD2	SDCT43PDER8LD2						●					●											
	SDCT120412PDELLD2	SDCT433PDEL8LD2											●											
	SDCT120412PDERLD2	SDCT433PDER8LD2											●											
	SDCT120416ENLD2	SDCT434ENLD2											●											
	SDCT120420ENLD2	SDCT435ENLD2											●											
	SDCT120424ENLD2	SDCT436ENLD2											●											
	SDCT120432ENLD2	SDCT438ENLD2							●				●											
SDCT-LE	SDCT120404PDFLLE	SDCT431PDFL8LE			●																			
	SDCT120404PDFRLE	SDCT431PDFR8LE			●																			
	SDCT1204PDFLLE	SDCT43PDFL8LE			●																			
	SDCT1204PDFRLE	SDCT43PDFR8LE			●																			
	SDCT120412PDFLLE	SDCT433PDFL8LE			●																			
	SDCT120412PDFRLE	SDCT433PDFR8LE			●																			
	SDCT120416FNLE	SDCT434FNLE			●																			
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	SDCT120424FNLE	SDCT436FNLE			●																			
	SDCT120432FNLE	SDCT438FNLE			●																			
SDCW-ED-GN	SDCW43EDSR8GN	SDCW43EDSR8GN																		●				

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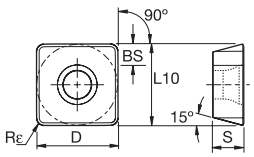
● first choice
○ alternate choice

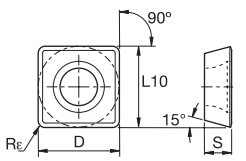
	ISO catalog number	ANSI catalog number	K110M	K125M	KC410M	KC510M	KC515M	KC520M	KC522M	KC525M	KC530M	KC715M	KC725M	KC735M	KC915M	KC935M	KT530M	KY1540	KY2100	KY3500	KB1340	KD1410	KD1415	KD1420
H							●														●			
S									●				●	●				●	●					
N			●		●	○			○													●	●	●
K						●	○	●	○						●	○				●	●			
M							○		●	○	●		●	●		○			●					
P				●			●		○	●	●	●	●	○		●	●	●	●					
SDCW-PD-GN	SDCW1204PDSRGN	SDCW43PDSR8GN																		●				
	SDCW120412PDSRGN	SDCW433PDSR8GN																		●				
Pg. 386																								
SDCW-T	SDCW090308	SDCW322											●		●	●								
	SDCW090308T	SDCW322T										●	●											
Pg. 357																								
SDEB	SDEB080201	SDEB26150						●				●	●											
	SDEB080204	SDEB26151						●				●	●			●								
	SDEB080208	SDEB26152						●				●	●			●								
Pg. 499																								
SDEB-D	SDEB080208D	SDEB26152D											●											
Pg. 499																								
SDER-GB	SDER1204PDERGB	SDER43PDER8GB											●											
	SDER1204PDSRGB	SDER43PDSR8GB											●											
	SDER1504PDERGB	SDER53PDER8GB											●											
OPERATION UPGRADE																								

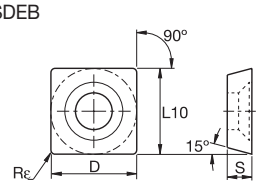
K110M K125M KC410M KC510M KC515M KC520M KC522M KC525M KC530M KC715M KC725M KC735M KC915M KC935M KT530M KY1540 KY2100 KY3500 KB1340 KD1410 KD1415 KD1420

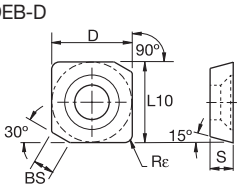
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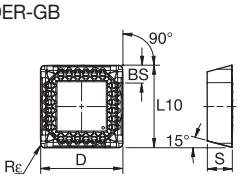
ISO catalog number	dimensions														
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	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
SDCW1204PDSRGN	–	–	–	–	4,76	.188	12,70	.500	12,70	.500	3,32	.131	0,8	.031	SDCW-PD-GN
SDCW120412PDSRGN	–	–	–	–	4,76	.188	12,70	.500	12,70	.500	3,05	.120	1,2	.047	
SDCW090308	–	–	–	–	3,18	.125	9,53	.375	9,53	.375	–	–	0,8	.031	SDCW-T
SDCW090308T	–	–	–	–	3,18	.125	9,53	.375	9,53	.375	–	–	0,8	.031	
SDEB080201	–	–	–	–	2,38	.094	8,31	.327	8,31	.327	–	–	0,1	.004	SDEB
SDEB080204	–	–	–	–	2,38	.094	8,31	.327	8,31	.327	–	–	0,4	.016	
SDEB080208	–	–	–	–	2,38	.094	8,31	.327	8,31	.327	–	–	0,8	.031	
SDEB080208D	–	–	–	–	2,38	.094	8,31	.327	8,31	.327	2,16	.085	0,8	.031	SDEB-D
SDER1204PDERGB	–	–	–	–	4,76	.188	12,70	.500	12,70	.500	3,36	.132	0,8	.031	SDER-GB
SDER1204PDSRGB	–	–	–	–	4,76	.188	12,70	.500	12,70	.500	3,36	.132	0,8	.031	
SDER1504PDERGB	–	–	–	–	4,76	.188	15,88	.625	15,88	.625	3,36	.132	0,8	.031	











● first choice
○ alternate choice

	ISO catalog number	ANSI catalog number	K110M	K125M	KC410M	KC510M	KC515M	KC520M	KC522M	KC525M	KC530M	KC715M	KC725M	KC735M	KC915M	KC935M	KT530M	KY1540	KY2100	KY3500	KB1340	KD1410	KD1415	KD1420
H							●														●			
S									●				●	●				●	●					
N			●		●	○			○													●	●	●
K						●	○	●	○						●	○				●	●				
M							○		●	○	●		●	●		○			●					
P				●			●		○	●	●	●	●	○		●	●	●	●					
SDET-GB	SDET1504PDERGB	SDET53PDER8GB											●		●	●								
	SDET1504PDSRGB	SDET53PDSR8GB											●			●								
	SDET150412PDERGB	SDET533PDER8GB						●					●		●	●								
	SDET150412PDSRGB	SDET533PDSR8GB											●		●	●								
SDET-GB2	SDET1204PDELGB2	SDET43PDEL8GB2						●					●		●	●								
	SDET1204PDERGB2	SDET43PDER8GB2						●					●		●	●								
	SDET1204PDSLGB2	SDET43PDSL8GB2						●					●		●	●								
	SDET1204PDSRGB2	SDET43PDSR8GB2						●					●		●	●								
	SDET120412PDELGB2	SDET433PDEL8GB2						●					●		●	●								
	SDET120412PDERGB2	SDET433PDER8GB2						●					●		●	●								
	SDET120416SNGB2	SDET434SNGB2						●					●		●	●								
	SDET120420SNGB2	SDET435SNGB2						●					●		●	●								
	SDET120424SNGB2	SDET436SNGB2						●					●		●	●								
	SDET120432SNGB2	SDET438SNGB2						●					●		●	●								
SDET-GB2	SDET120432XENGB2	SDET438XENGB2											●											
	SDET120432XSNGB2	SDET438XSNGB2											●											
SDKT-GP	SDKT1204EDERGP	SDKT43EDER8GP											●	●	●	●								
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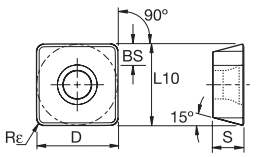
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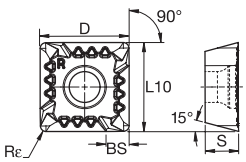
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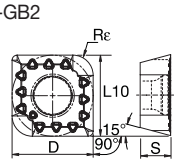
K110M K125M KC410M KC510M KC515M KC520M KC522M KC525M KC530M KC715M KC725M KC735M KC915M KC935M KT530M KY1540 KY2100 KY3500 KB1340 KD1410 KD1415 KD1420

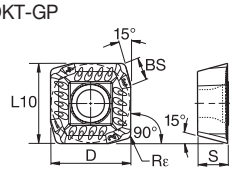
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ISO catalog number	dimensions														
	LI		W		S		D		L10		BS		Rε		
	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
SDET1504PDERGB	–	–	–	–	4,76	.188	15,88	.625	15,88	.625	3,36	.132	0,8	.031	SDET-GB
SDET1504PDSRGB	–	–	–	–	4,76	.188	15,88	.625	15,88	.625	3,36	.132	0,8	.031	
SDET150412PDERGB	–	–	–	–	4,76	.188	15,88	.625	15,88	.625	3,36	.132	1,2	.047	
SDET150412PDSRGB	–	–	–	–	4,76	.188	15,88	.625	15,88	.625	3,36	.132	1,2	.047	
SDET1204PDELGB2	–	–	–	–	4,76	.188	12,70	.500	12,70	.500	3,32	.130	0,8	.031	SDET-GB2
SDET1204PDERGB2	–	–	–	–	4,76	.188	12,70	.500	12,70	.500	3,32	.130	0,8	.031	
SDET1204PDSLGB2	–	–	–	–	4,76	.188	12,70	.500	12,70	.500	3,32	.130	0,8	.031	
SDET1204PDSRGB2	–	–	–	–	4,76	.188	12,70	.500	12,70	.500	3,32	.130	0,8	.031	
SDET120412PDELGB2	–	–	–	–	4,76	.188	12,70	.500	12,70	.500	3,05	.120	1,2	.047	
SDET120412PDERGB2	–	–	–	–	4,76	.188	12,70	.500	12,70	.500	3,05	.120	1,2	.047	
SDET120416SNGB2	–	–	–	–	4,76	.188	12,70	.500	12,70	.500	–	–	1,6	.063	
SDET120420SNGB2	–	–	–	–	4,76	.188	12,70	.500	12,70	.500	–	–	2,0	.078	
SDET120424SNGB2	–	–	–	–	4,76	.188	12,70	.500	12,70	.500	–	–	2,4	.094	
SDET120432SNGB2	–	–	–	–	4,76	.188	12,70	.500	12,70	.500	–	–	3,2	.125	
SDET120432XENGB2	–	–	–	–	4,76	.188	12,70	.500	12,70	.500	–	–	3,2	.125	SDET-GB2
SDET120432XSNGB2	–	–	–	–	4,76	.188	12,70	.500	12,70	.500	–	–	3,2	.125	
SDKT1204EDERGP	–	–	–	–	4,76	.188	12,70	.500	12,70	.500	3,51	.138	0,8	.031	SDKT-GP
SDKT1204EDSRGP	–	–	–	–	4,76	.188	12,70	.500	12,70	.500	3,51	.138	0,8	.031	









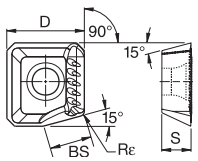
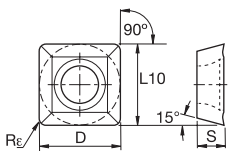
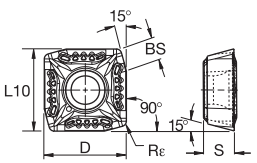
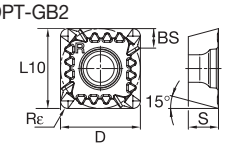
● first choice
○ alternate choice

	ISO catalog number	ANSI catalog number	K110M	K125M	KC410M	KC510M	KC515M	KC520M	KC522M	KC525M	KC530M	KC715M	KC725M	KC735M	KC915M	KC935M	KT530M	KY1540	KY2100	KY3500	KB1340	KD1410	KD1415	KD1420
H							●														●			
S									●				●	●				●	●					
N			●		●	○			○													●	●	●
K						●	○	●	○						●	○				●	●				
M							○		●	○	●		●	●		○			●					
P				●			●		○	●	●	●	●	○		●	●	●	●					
SDKT-GPW	SDKT1204EDERGP1W	SDKT43EDER17GPW						●				●	●											
SDMT	SDMT090308	SDMT322										●	●	●										
	SDMT090316	SDMT324											●											
SDPT-GB	SDPT1204EDERGB	SDPT43EDER8GB				●		●		●		●	●		●	●	●							
	SDPT1204EDSRGB	SDPT43EDSR8GB										●	●				●							
SDPT-GB2	SDPT1204PDERGB2	SDPT43PDER8GB2											●		●	●								
	SDPT1204PDSRGB2	SDPT43PDSR8GB2											●		●	●	●							

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K110M K125M KC410M KC510M KC515M KC520M KC522M KC525M KC530M KC715M KC725M KC735M KC915M KC935M KT530M KY1540 KY2100 KY3500 KB1340 KD1410 KD1415 KD1420

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ISO catalog number	dimensions														
	LI		W		S		D		L10		BS		Rε		
	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
SDKT1204EDERGP1W	–	–	–	–	4,76	.188	12,70	.500	–	–	7,01	.276	0,8	.031	SDKT-GPW 
SDMT090308	–	–	–	–	3,18	.125	9,53	.375	9,53	.375	–	–	0,8	.031	SDMT 
SDMT090316	–	–	–	–	3,18	.125	9,53	.375	9,53	.375	–	–	1,6	.063	
SDPT1204EDERGB	–	–	–	–	4,76	.188	12,70	.500	12,70	.500	3,51	.138	0,8	.031	SDPT-GB 
SDPT1204EDSRGB	–	–	–	–	4,76	.188	12,70	.500	12,70	.500	3,51	.138	0,8	.031	
SDPT1204PDERGB2	–	–	–	–	4,76	.188	12,70	.500	12,70	.500	3,32	.130	0,8	.031	SDPT-GB2 
SDPT1204PDSRGB2	–	–	–	–	4,76	.188	12,70	.500	12,70	.500	3,32	.130	0,8	.031	

● first choice
○ alternate choice

	ISO catalog number	ANSI catalog number	K110M	K125M	KC410M	KC510M	KC515M	KC520M	KC522M	KC525M	KC530M	KC715M	KC725M	KC735M	KC915M	KC935M	KT530M	KY1540	KY2100	KY3500	KB1340	KD1410	KD1415	KD1420
H							●														●			
S									●				●	●				●	●					
N			●		●	○			○													●	●	●
K						●	○	●	○						●	○				●	●				
M							○		●	○	●		●	●		○								
P				●			●		○	●	●	●	●	○		●	●	●	●					
SEAN-LN	SEAN1203AFENLN	SEAN42AFEN6LN											●											
	SEAN1203AFFNLN	SEAN42AFFN6LN				●																		
	SEAN1203AFN	SEAN42AFN														●								
	SEAN1203AFSNLN	SEAN42AFSN6LN											●											
	SEAN1204AFENLN	SEAN43AFEN6LN											●											
	SEAN1204AFSNLN	SEAN43AFSN6LN											●											
	SEAN1504AFENLN	SEAN53AFEN6LN											●											
	SEAN1504AFFNLN	SEAN53AFFN6LN				●																		
	SEAN1504AFSNLN	SEAN53AFSN6LN											●											
SECT-LD2	SECT1404AEENLD2	SECT443AEEN7LD2											●											
SECT-LE	SECT1404AEFNLE	SECT443AEFN7LE			●																			
SECW-GN	SECW1404AESNGN	SECW443AESN7GN																		●				

Pg. 305 Pg. 305
Pg. 305 Pg. 305
Pg. 305 Pg. 305

K110M K125M KC410M KC510M KC515M KC520M KC522M KC525M KC530M KC715M KC725M KC735M KC915M KC935M KT530M KY1540 KY2100 KY3500 KB1340 KD1410 KD1415 KD1420

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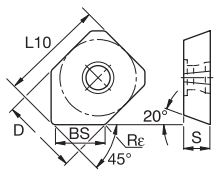
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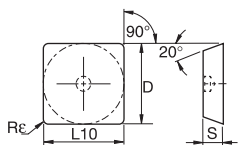
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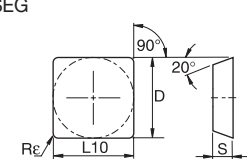
● first choice
○ alternate choice

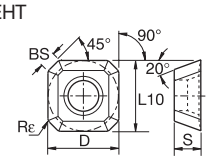
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			H				●														●			
			S						●				●	●				●	●					
			N	●		●	○			○												●	●	●
			K				●	○	●	○						●	○				●	●			
			M					○		●	○	●		●	●		○			●					
			P		●			●		○	●	●	●	●	○		●	●	●	●					
SECW-GNW	SECW1404AEENGNW	SECW443AEEN22GNW							●			●	●											
	SECW1404AESNGNW	SECW443AESN22GNW										●	●				●							

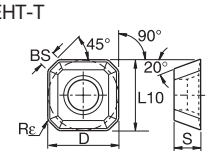
ISO catalog number	dimensions														
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	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
SECW1404AEENGNW	–	–	–	–	4,76	.188	14,00	.551	19,17	.755	8,26	.325	0,8	.063	SECW-GNW
SECW1404AESNGNW	–	–	–	–	4,76	.188	14,00	.551	19,17	.755	8,26	.325	0,8	.063	
SEEN120308J	–	–	–	–	3,18	.125	12,70	.500	12,70	.500	–	–	0,8	.031	SEEN-J
SEGN120308	–	–	–	–	3,18	.125	12,70	.500	12,70	.500	–	–	0,8	.031	SEG
SEHT1204AFN	–	–	–	–	4,76	.188	12,70	.500	12,70	.500	2,70	.106	1,0	.039	SEHT
SEHT1504AFN	–	–	–	–	4,76	.188	15,88	.625	15,88	.625	2,70	.106	1,0	.039	
SEHT1204AFTN	–	–	–	–	4,76	.188	12,70	.500	12,70	.500	2,70	.106	1,0	.039	SEHT-T











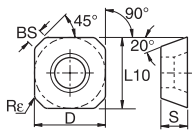
● first choice
○ alternate choice

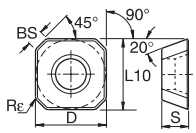
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N			●		●	○			○													●	●	●
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P				●			●		○	●	●	●	●	○		●	●	●	●					
SEHW	SEHW1204AFN	SEHW43A6				●		●		●		●	●	●	●	●								
	SEHW1204AFNW	SEHW43A6W				●									●									
	SEHW1504AFN	SEHW53A6											●	●	●									
	SEHW1504AFNW	SEHW53A6W													●									
SEHW-T	SEHW1204AFTN	SEHW43A6T						●		●		●	●	●	●	●								
	SEHW1504AFTN	SEHW53A6T											●	●		●								
SEKN-GN	SEKN1203AF3N	SEKN42AFTN													●		●							
	SEKN1203AFSNGN	SEKN42AFSN6GN											●		●	●								
	SEKN1203AFSNGNP	SEKN42AFSN6GNP																		●				
	SEKN1203AFTNGN	SEKN42AFTN6GN												●										
	SEKN1204AFSNGN	SEKN43AFSN6GN										●	●		●	●				●				
	SEKN1204AFSNGNP	SEKN43AFSN6GNP																		●				
	SEKN1204AFTNGN	SEKN43AFTN6GN												●										
	SEKN1504AFSNGN	SEKN53AFSN6GN										●	●			●								
	SEKN1504AFSNGNP	SEKN53AFSN6GNP																		●				
SEKN-LN	SEKN1203AFENLN	SEKN42AFEN6LN											●		●	●								
	SEKN1203AFFNLN	SEKN42AFFN6LN												●										
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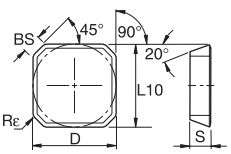
K110M K125M KC410M KC510M KC515M KC520M KC522M KC525M KC530M KC715M KC725M KC735M KC915M KC935M KT530M KY1540 KY2100 KY3500 KB1340 KD1410 KD1415 KD1420

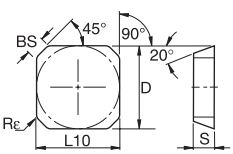
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ISO catalog number	dimensions														
	LI		W		S		D		L10		BS		Rε		
	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
SEHW1204AFN	–	–	–	–	4,76	.188	12,70	.500	12,70	.500	2,70	.106	1,0	.039	SEHW
SEHW1204AFNW	–	–	–	–	4,76	.188	12,70	.500	12,70	.500	2,62	.103	1,0	.039	
SEHW1504AFN	–	–	–	–	4,76	.188	15,88	.625	15,88	.625	2,70	.106	1,0	.039	
SEHW1504AFNW	–	–	–	–	4,76	.188	15,88	.625	15,88	.625	2,62	.103	1,0	.039	
SEHW1204AFTN	–	–	–	–	4,76	.188	12,70	.500	12,70	.500	2,70	.106	1,0	.039	SEHW-T
SEHW1504AFTN	–	–	–	–	4,76	.188	15,88	.625	15,88	.625	2,70	.106	1,0	.039	
SEKN1203AF3N	–	–	–	–	3,18	.125	12,70	.500	12,70	.500	2,39	.094	1,0	.039	SEKN-GN
SEKN1203AFSNGN	–	–	–	–	3,18	.125	12,70	.500	12,70	.500	2,39	.094	1,0	.039	
SEKN1203AFSNGNP	–	–	–	–	3,18	.125	12,70	.500	12,70	.500	2,39	.094	1,0	.039	
SEKN1203AFTNGN	–	–	–	–	3,18	.125	12,70	.500	12,70	.500	2,39	.094	1,0	.039	
SEKN1204AFSNGN	–	–	–	–	4,76	.188	12,70	.500	12,70	.500	2,39	.094	1,0	.039	
SEKN1204AFSNGNP	–	–	–	–	4,76	.188	12,70	.500	12,70	.500	2,39	.094	1,0	.039	
SEKN1204AFTNGN	–	–	–	–	4,76	.188	12,70	.500	12,70	.500	2,39	.094	1,0	.039	
SEKN1504AFSNGN	–	–	–	–	4,76	.188	15,88	.625	15,88	.625	2,57	.101	1,0	.039	
SEKN1504AFSNGNP	–	–	–	–	4,76	.188	15,88	.625	15,88	.625	2,57	.101	1,0	.039	
SEKN1203AFENLN	–	–	–	–	3,18	.125	12,70	.500	12,70	.500	2,39	.094	1,0	.039	SEKN-LN
SEKN1203AFFNLN	–	–	–	–	3,18	.125	12,70	.500	12,70	.500	2,39	.094	1,0	.039	
SEKN1204AFENLN	–	–	–	–	4,76	.188	12,70	.500	12,70	.500	2,39	.094	1,0	.039	
SEKN1504AFENLN	–	–	–	–	4,76	.188	15,88	.625	15,88	.625	2,57	.101	1,0	.039	









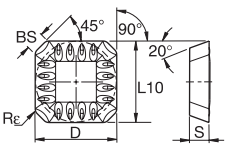
● first choice
○ alternate choice

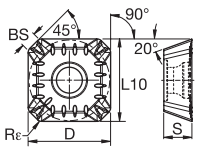
	ISO catalog number	ANSI catalog number	K110M	K125M	KC410M	KC510M	KC515M	KC520M	KC522M	KC525M	KC530M	KC715M	KC725M	KC735M	KC915M	KC935M	KT530M	KY1540	KY2100	KY3500	KB1340	KD1410	KD1415	KD1420
H							●														●			
S									●				●	●				●	●					
N			●		●	○			○													●	●	●
K						●	○	●	○						●	○				●	●				
M							○		●	○	●		●	●		○			●					
P				●			●		○	●	●	●	●	○		●	●	●	●					
SEKR-E-GP	SEKR1203AFENGP	SEKR42AFEN6GP				●				●			●			●								
	SEKR1203AFSNGP	SEKR42AFSN6GP								●		●	●											
	SEKR1204AFENGP	SEKR43AFEN6GP				●				●			●			●								
	SEKR1204AFSNGP	SEKR43AFSN6GP										●	●											
	SEKR1504AFENGP	SEKR53AFEN6GP											●											
	SEKR1504AFSNGP	SEKR53AFSN6GP								●			●		●									
SEKT-GP2	SEKT1404AEENGP2	SEKT443AEEN7GP2						●					●		●	●								
	SEKT1404AESNGP2	SEKT443AESN7GP2						●					●		●	●								
SEPN-GN	SEPN1203AFENGN	SEPN42AFEN6GN							●	●			●											
	SEPN1203AFSNGN	SEPN42AFSN6GN											●		●		●							
	SEPN1204AFENGN	SEPN43AFEN6GN								●			●											
	SEPN1204AFSNGN	SEPN43AFSN6GN											●											
	SEPN1504AFENGN	SEPN53AFEN6GN							●	●			●											
	SEPN1504AFSNGN	SEPN53AFSN6GN								●														
SEPR-GB	SEPR1203AFENGB	SEPR42AFEN6GB											●											
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	SEPR1204AFENGB	SEPR43AFEN6GB											●			●								
	SEPR1204AFSNGB	SEPR43AFSN6GB											●			●								
	SEPR1504AFENGB	SEPR53AFEN6GB											●											
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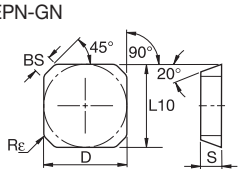
Pg. 305 Pg. 305

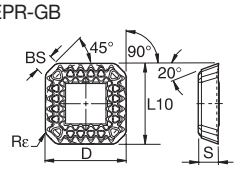
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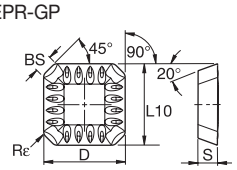
ISO catalog number	dimensions														
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	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
SEKR1203AFENGP	–	–	–	–	3,05	.120	12,70	.500	12,70	.500	2,39	.094	1,1	.043	SEKR-E-GP
SEKR1203AFSNGP	–	–	–	–	3,05	.120	12,70	.500	12,70	.500	2,39	.094	1,1	.043	
SEKR1204AFENGP	–	–	–	–	4,64	.182	12,70	.500	12,70	.500	2,39	.094	1,1	.043	
SEKR1204AFSNGP	–	–	–	–	4,64	.182	12,70	.500	12,70	.500	2,39	.094	1,1	.043	
SEKR1504AFENGP	–	–	–	–	4,64	.182	15,88	.625	15,88	.625	2,60	.102	1,1	.043	
SEKR1504AFSNGP	–	–	–	–	4,64	.182	15,88	.625	15,88	.625	2,68	.106	1,1	.043	
SEKT1404AEENGP2	–	–	–	–	4,76	.188	14,00	.551	14,00	.551	2,65	.104	1,0	.039	SEKT-GP2
SEKT1404AESNGP2	–	–	–	–	4,76	.188	14,00	.551	14,00	.551	2,65	.104	1,0	.039	
SEPN1203AFENGN	–	–	–	–	3,18	.125	12,70	.500	12,70	.500	2,39	.094	1,0	.039	SEPN-GN
SEPN1203AFSNGN	–	–	–	–	3,18	.125	12,70	.500	12,70	.500	2,39	.094	1,0	.039	
SEPN1204AFENGN	–	–	–	–	4,76	.188	12,70	.500	12,70	.500	2,39	.094	1,0	.039	
SEPN1204AFSNGN	–	–	–	–	4,76	.188	12,70	.500	12,70	.500	2,39	.094	1,0	.039	
SEPN1504AFENGN	–	–	–	–	4,76	.188	15,88	.625	15,88	.625	2,57	.101	1,0	.039	
SEPN1504AFSNGN	–	–	–	–	4,76	.188	15,88	.625	15,88	.625	2,57	.101	1,0	.039	
SEPR1203AFENGB	–	–	–	–	3,05	.120	12,70	.500	12,70	.500	2,39	.094	2,4	.094	SEPR-GB
SEPR1203AFSNGB	–	–	–	–	3,05	.120	12,70	.500	12,70	.500	2,39	.094	2,4	.094	
SEPR1204AFENGB	–	–	–	–	4,64	.182	12,70	.500	12,70	.500	2,39	.094	2,4	.094	
SEPR1204AFSNGB	–	–	–	–	4,64	.182	12,70	.500	12,70	.500	2,39	.094	2,4	.094	
SEPR1504AFENGB	–	–	–	–	4,64	.182	15,88	.625	15,88	.625	2,59	.102	2,4	.094	
SEPR1504AFSNGB	–	–	–	–	4,64	.182	15,88	.625	15,88	.625	2,59	.102	2,4	.094	
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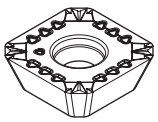
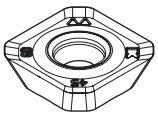
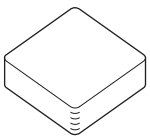
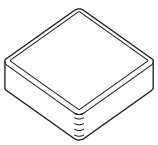






● first choice
○ alternate choice

	K110M	K125M	KC410M	KC510M	KC515M	KC520M	KC522M	KC525M	KC530M	KC715M	KC725M	KC735M	KC915M	KC935M	KT530M	KY1540	KY2100	KY3500	KB1340	KD1410	KD1415	KD1420
H					●														●			
S							●				●	●				●	●					
N	●		●	○			○													●	●	●
K				●	○	●	○						●	○				●	●			
M					○		●	○	●		●	●		○			●					
P		●			●		○	●	●	●	●	○		●	●	●	●					

	ISO catalog number	ANSI catalog number	K110M	K125M	KC410M	KC510M	KC515M	KC520M	KC522M	KC525M	KC530M	KC715M	KC725M	KC735M	KC915M	KC935M	KT530M	KY1540	KY2100	KY3500	KB1340	KD1410	KD1415	KD1420
SEPT-GB2	SEPT1404AEENGB2	SEPT443AEEN7GB2						●					●		●	●								
	SEPT1404AESNGB2	SEPT443AESN7GB2						●					●		●	●	●							
																								
 Pg. 305  Pg. 305																								
SEPT-GD	SEPT13T3AGENGD	SEPT13T3AGENGD							●				●		●	●								
																								
OPERATION UPGRADE																								
SNG	SNGN120412	SNG433											●		●									
	SNGN120416	SNG434													●									
	SNGN190412	SNG633											●		●									
	SNGN190416	SNG634											●		●									
OPERATION UPGRADE																								
SNG-T	SNGN090308T02020	SNG322T0820																		●				
	SNGN120408T02020	SNG432T0820																		●				
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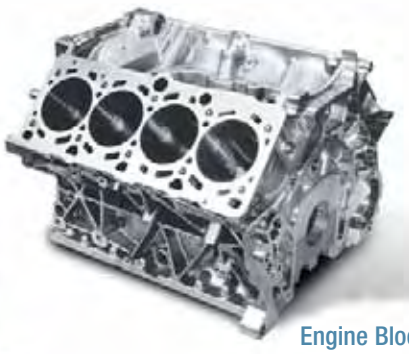


Automotive

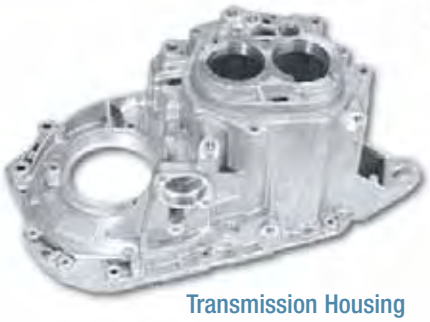
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	ISO catalog number	ANSI catalog number	K110M	K125M	KC410M	KC510M	KC515M	KC520M	KC522M	KC525M	KC530M	KC715M	KC725M	KC735M	KC915M	KC935M	KT530M	KY1540	KY2100	KY3500	KB1340	KD1410	KD1415	KD1420
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S									●				●	●				●	●					
N			●		●	○			○													●	●	●
K						●	○	●	○						●	○				●	●				
M							○		●	○	●		●	●		○			●					
P				●			●		○	●	●	●	●	○		●	●	●	●					
SNHX-GE	SNHX1102PZFNGE	SNHX1102PZFNGE	●																					
	SNHX11T3PZFNGE	SNHX11T3PZFNGE				●																		
	SNHX1203PZFNGE	SNHX1203PZFNGE	●			●																		
	SNHX12L5PZFNGE	SNHX12L5PZFNGE	●			●																		
SNHX-GP	SNHX1102PZTNGP	SNHX1102PZTNGP	●										●	●		●								
	SNHX11T3PZTNGP	SNHX11T3PZTNGP											●	●		●								
	SNHX1203PZTNGP	SNHX1203PZTNGP	●	●									●	●	●									
	SNHX1204PZTNGP	SNHX1204PZTNGP														●								
	SNHX12L4PZTNGP	SNHX12L4PZTNGP														●								
	SNHX12L5PZTNGP	SNHX12L5PZTNGP	●										●	●										
SNHX-T	SNHX1102T	SNHX1102T											●	●		●								
	SNHX1103T	SNHX1103T						●					●	●		●								
	SNHX1203T	SNHX1203T											●	●		●								
	SNHX1204T	SNHX1204T											●											
	SNHX12045T	SNHX12045T											●											
	SNHX1205T	SNHX1205T											●	●										
SPCH	SPCH090308	SPCH322											●	●	●									
SPCH-T	SPCH090308T	SPCH322T											●											

K110M	K125M	KC410M	KC510M	KC515M	KC520M	KC522M	KC525M	KC530M	KC715M	KC725M	KC735M	KC915M	KC935M	KT530M	KY1540	KY2100	KY3500	KB1340	KD1410	KD1415	KD1420

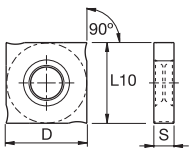
Pg. 411
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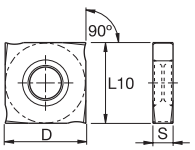
OPERATION UPGRADE

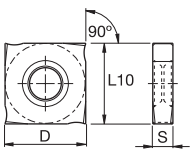
OPERATION UPGRADE

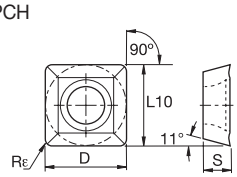
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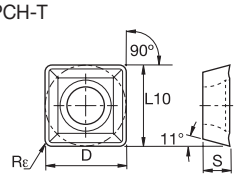
ISO catalog number	dimensions														
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	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
SNHX1102PZFNGE	–	–	–	–	0,23	.091	11,00	.433	11,00	.433	–	–	–	–	SNHX-GE
SNHX11T3PZFNGE	–	–	–	–	2,70	.106	11,00	.433	11,00	.433	–	–	–	–	
SNHX1203PZFNGE	–	–	–	–	3,20	.126	12,70	.500	12,70	.500	–	–	–	–	
SNHX12L5PZFNGE	–	–	–	–	5,40	.213	12,70	.500	12,70	.500	–	–	–	–	
SNHX1102PZTNGP	–	–	–	–	2,30	.091	11,00	.433	11,00	.433	–	–	–	–	SNHX-GP
SNHX11T3PZTNGP	–	–	–	–	2,70	.106	11,00	.433	11,00	.433	–	–	–	–	
SNHX1203PZTNGP	–	–	–	–	3,20	.126	12,70	.500	12,70	.500	–	–	–	–	
SNHX1204PZTNGP	–	–	–	–	4,00	.158	12,70	.500	12,70	.500	–	–	–	–	
SNHX12L4PZTNGP	–	–	–	–	4,50	.177	12,70	.500	12,70	.500	–	–	–	–	
SNHX12L5PZTNGP	–	–	–	–	5,40	.213	12,70	.500	12,70	.500	–	–	–	–	
SNHX1102T	–	–	–	–	2,38	.094	11,00	.433	11,00	.433	–	–	–	–	SNHX-T
SNHX1103T	–	–	–	–	2,70	.106	11,00	.433	11,00	.433	–	–	–	–	
SNHX1203T	–	–	–	–	3,20	.126	12,70	.500	12,70	.500	–	–	–	–	
SNHX1204T	–	–	–	–	4,00	.157	12,70	.500	12,70	.500	–	–	–	–	
SNHX12045T	–	–	–	–	4,50	.177	12,70	.500	12,70	.500	–	–	–	–	
SNHX1205T	–	–	–	–	5,40	.213	12,70	.500	12,70	.500	–	–	–	–	
SPCH090308	–	–	–	–	3,18	.125	9,53	.375	9,53	.375	–	–	0,8	.031	SPCH
SPCH090308T	–	–	–	–	3,18	.125	9,53	.375	9,53	.375	–	–	0,8	.031	SPCH-T











● first choice
○ alternate choice

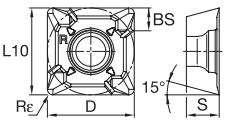
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SPCT-LD2	SPCT10T304PPELLD2	SPCT31251PPEL8LD2											●											
	SPCT10T304PPERLD2	SPCT31251PPER8LD2											●											
	SPCT10T3PPELLD2	SPCT3125PPEL8LD2											●											
	SPCT10T3PPERLD2	SPCT3125PPER8LD2						●					●											
	SPCT10T312PPELLD2	SPCT31253PPEL8LD2											●											
	SPCT10T312PPERLD2	SPCT31253PPER8LD2											●											
	SPCT10T316ENLD2	SPCT31254ENLD2											●											
	SPCT10T320ENLD2	SPCT31255ENLD2											●											
SPCT-LE	SPCT10T304PPFLLE	SPCT31251PPFL8LE			●																			
	SPCT10T304PPFRLE	SPCT31251PPFR8LE			●																			
	SPCT10T3PPFLLE	SPCT3125PPFL8LE			●																			
	SPCT10T3PPFRLE	SPCT3125PPFR8LE			●																			
	SPCT10T312PPFLLE	SPCT31253PPFL8LE			●																			
	SPCT10T312PPFRLE	SPCT31253PPFR8LE			●																			
	SPCT10T316FNLE	SPCT31254FNLE			●																			
	SPCT10T320FNLE	SPCT31255FNLE			●																			
SPCW	SPCW120408	SPCW432											●	●	●									
SPCW-GN	SPCW10T3PPSLGN	SPCW3125PPSL8GN																		●				
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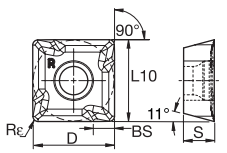
Pg. 381 Pg. 381 Pg. 418

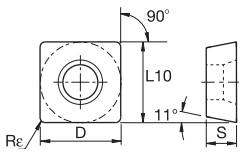
Pg. 381 Pg. 381 Pg. 418

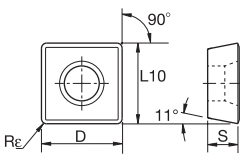
OPERATION UPGRADE

ISO catalog number	dimensions														
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	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
SPCT10T304PPELLD2	—	—	—	—	3,97	.156	10,00	.394	10,00	.394	2,70	.106	0,4	.016	SPCT-LD2
SPCT10T304PPERLD2	—	—	—	—	3,97	.156	10,00	.394	10,00	.394	2,70	.106	0,4	.016	
SPCT10T3PPELLD2	—	—	—	—	3,97	.156	10,00	.394	10,00	.394	2,70	.106	0,8	.031	
SPCT10T3PPERLD2	—	—	—	—	3,97	.156	10,00	.394	10,00	.394	2,70	.106	0,8	.031	
SPCT10T312PPELLD2	—	—	—	—	3,97	.156	10,00	.394	10,00	.394	2,70	.106	1,2	.047	
SPCT10T312PPERLD2	—	—	—	—	3,97	.156	10,00	.394	10,00	.394	2,70	.106	1,2	.047	
SPCT10T316ENLD2	—	—	—	—	3,97	.156	10,00	.394	10,00	.394	—	—	1,6	.063	
SPCT10T320ENLD2	—	—	—	—	3,97	.156	10,00	.394	10,00	.394	—	—	2,0	.078	
SPCT10T304PPFLLE	—	—	—	—	3,97	.156	10,00	.394	10,00	.394	2,70	.106	0,4	.016	SPCT-LE
SPCT10T304PPFRLE	—	—	—	—	3,97	.156	10,00	.394	10,00	.394	2,70	.106	0,4	.016	
SPCT10T3PPFLLE	—	—	—	—	3,97	.156	10,00	.394	10,00	.394	2,70	.106	0,8	.031	
SPCT10T3PPFRLE	—	—	—	—	3,97	.156	10,00	.394	10,00	.394	2,70	.106	0,8	.031	
SPCT10T312PPFLLE	—	—	—	—	3,97	.156	10,00	.394	10,00	.394	2,70	.106	1,2	.047	
SPCT10T312PPFRLE	—	—	—	—	3,97	.156	10,00	.394	10,00	.394	2,70	.106	1,2	.047	
SPCT10T316FNLE	—	—	—	—	3,97	.156	10,00	.394	10,00	.394	—	—	1,6	.063	
SPCT10T320FNLE	—	—	—	—	3,97	.156	10,00	.394	10,00	.394	—	—	2,0	.078	
SPCW120408	—	—	—	—	4,76	.188	12,70	.500	12,70	.500	—	—	0,8	.031	SPCW
SPCW10T3PPSLGN	—	—	—	—	3,97	.156	10,00	.394	10,00	.394	—	—	0,8	.031	SPCW-GN
SPCW10T3PPSRGN	—	—	—	—	3,97	.156	10,00	.394	10,00	.394	—	—	0,8	.031	









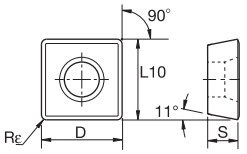
● first choice
○ alternate choice

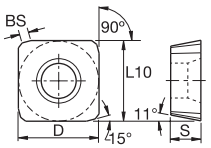
	ISO catalog number	ANSI catalog number	K110M	K125M	KC410M	KC510M	KC515M	KC520M	KC522M	KC525M	KC530M	KC715M	KC725M	KC735M	KC915M	KC935M	KT530M	KY1540	KY2100	KY3500	KB1340	KD1410	KD1415	KD1420
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M							○		●	○	●		●	●		○			●					
P				●			●		○	●	●	●	●	○		●	●	●	●					
SPCW-T	SPCW120408T	SPCW432T										●	●	●		●								
SPCW-4R	SPCW1204EDR	SPCW43E4R											●		●	●								
SPCW-4RT	SPCW1204EDTR	SPCW43E4RT										●	●		●	●								
SPEB	SPEB090308	SPEB322						●				●	●	●										
	SPEB120308	SPEB422						●				●		●										
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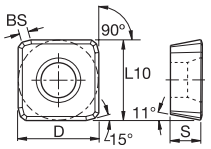
K110M K125M KC410M KC510M KC515M KC520M KC522M KC525M KC530M KC715M KC725M KC735M KC915M KC935M KT530M KY1540 KY2100 KY3500 KB1340 KD1410 KD1415 KD1420

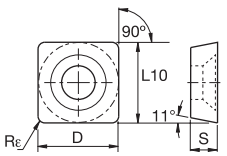
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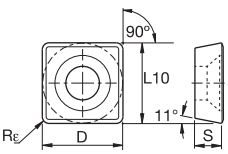
ISO catalog number	dimensions														
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	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
SPCW120408T	–	–	–	–	4,76	.188	12,70	.500	12,70	.500	–	–	0,8	.031	SPCW-T
SPCW1204EDR	–	–	–	–	4,76	.188	12,70	.500	12,70	.500	1,40	.055	–	–	SPCW-4R
SPCW1204EDTR	–	–	–	–	4,76	.188	12,70	.500	12,70	.500	1,40	.055	–	–	SPCW-4RT
SPEB090308	–	–	–	–	3,18	.125	9,53	.375	9,53	.375	–	–	0,8	.031	SPEB
SPEB120308	–	–	–	–	3,18	.125	12,70	.500	12,70	.500	–	–	0,8	.031	
SPEB090308T	–	–	–	–	3,18	.125	9,52	.375	9,52	.375	–	–	0,8	.031	SPEB-T
SPEB120308T	–	–	–	–	3,18	.125	12,70	.500	12,70	.500	–	–	0,8	.031	











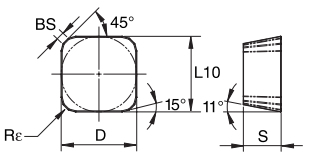
● first choice
○ alternate choice

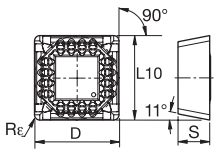
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H							●														●			
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K						●	○	●	○						●	○				●	●			
M							○		●	○	●		●	●		○			●					
P				●			●		○	●	●	●	●	○		●	●	●	●					
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	SPEN1206MPTN	SPEN4401																		●				
SPER-GB	SPER120416ENGB	SPER434ENGB														●								
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	SPER150416ENGB	SPER534ENGB											●											
SPET-GB2	SPET10T3PPELGB2	SPET3125PPEL8GB2						●					●		●	●								
	SPET10T3PPERGB2	SPET3125PPER8GB2						●					●		●	●								
	SPET10T3PPSLGB2	SPET3125PPSL8GB2						●					●		●	●								
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SPEX	SPEX120408	SPEX432										●												
SPG	SPGN090308	SPG322											●		●									
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	SPGN190416	SPG634											●		●									
	SPGN190424	SPG636													●									

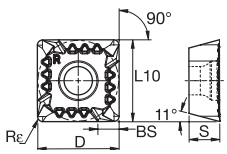
OPERATION UPGRADE

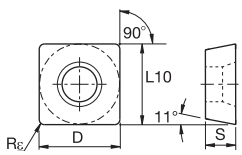
Pg. 381 Pg. 381 Pg. 418

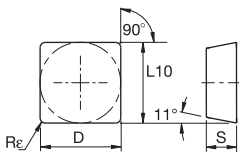
ISO catalog number	dimensions														
	LI		W		S		D		L10		BS		Rε		
	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
SPEN120608TN	–	–	–	–	6,35	.250	12,70	.500	12,70	.500	–	–	0,8	.030	SPEN
SPEN1206MPTN	–	–	–	–	6,35	.250	12,70	.500	12,70	.500	1,27	.050	–	–	
SPER120416ENGB	–	–	–	–	4,76	.188	12,70	.500	12,70	.500	–	–	1,6	.063	SPER-GB
SPER150408ENGB	–	–	–	–	4,76	.188	15,88	.625	15,88	.625	–	–	0,8	.031	
SPER150416ENGB	–	–	–	–	4,76	.188	15,88	.625	15,88	.625	–	–	1,6	.063	
SPET10T3PPELGB2	–	–	–	–	3,97	.156	10,00	.394	10,00	.394	2,70	.106	0,8	.031	SPET-GB2
SPET10T3PPERGB2	–	–	–	–	3,97	.156	10,00	.394	10,00	.394	2,70	.106	0,8	.031	
SPET10T3PPSLGB2	–	–	–	–	3,97	.156	10,00	.394	10,00	.394	2,70	.106	0,8	.031	
SPET10T3PPSRGB2	–	–	–	–	3,97	.156	10,00	.394	10,00	.394	2,70	.106	0,8	.031	
SPEX120408	–	–	–	–	4,76	.188	12,70	.500	12,70	.500	–	–	0,8	.031	SPEX
SPGN090308	–	–	–	–	3,18	.125	9,53	.375	9,53	.375	–	–	0,8	.031	SPG
SPGN120308	–	–	–	–	3,18	.125	12,70	.500	12,70	.500	–	–	0,8	.031	
SPGN120312	–	–	–	–	3,18	.125	12,70	.500	12,70	.500	–	–	1,2	.047	
SPGN120316	–	–	–	–	3,18	.125	12,70	.500	12,70	.500	–	–	1,6	.063	
SPGN120408	–	–	–	–	4,76	.188	12,70	.500	12,70	.500	–	–	0,8	.031	
SPGN120412	–	–	–	–	4,76	.188	12,70	.500	12,70	.500	–	–	1,2	.047	
SPGN120416	–	–	–	–	4,76	.188	12,70	.500	12,70	.500	–	–	1,6	.063	
SPGN190412	–	–	–	–	4,76	.188	19,05	.750	19,05	.750	–	–	1,2	.047	
SPGN190416	–	–	–	–	4,76	.188	19,05	.750	19,05	.750	–	–	1,6	.063	
SPGN190424	–	–	–	–	4,76	.188	19,05	.750	19,05	.750	–	–	2,4	.094	











● first choice
○ alternate choice

	ISO catalog number	ANSI catalog number	K110M	K125M	KC410M	KC510M	KC515M	KC520M	KC522M	KC525M	KC530M	KC715M	KC725M	KC735M	KC915M	KC935M	KT530M	KY1540	KY2100	KY3500	KB1340	KD1410	KD1415	KD1420
H							●														●			
S									●				●	●				●	●					
N			●		●	○			○													●	●	●
K						●	○	●	○						●	○				●	●			
M							○		●	○	●		●	●		○			●					
P				●			●		○	●	●	●	●	○		●	●	●	●					
SPG-RW	SPGN1204PPN4W	SPG438RW4													●									
SPG-T	SPGN120308T	SPG422T										●	●											
	SPGN120408T	SPG432T											●			●								
	SPGN120412T	SPG433T										●	●		●	●								
	SPGN120416T	SPG434T													●									
	SPGN190412T	SPG633T										●	●			●								
	SPGN190416T	SPG634T											●			●								
	SPGN120308T02020	SPG422T0820																		●				
	SPGN120312T02020	SPG423T0820																		●				
	SPGN120408T02020	SPG432T0820																		●				
	SPGN120412T02020	SPG433T0820																		●				
	SPGN120416T02020	SPG434T0820																		●				
	SPGN190416T02020	SPG634T0820																		●				
SPGX-AP	SPGX0602AP	SPGX0602AP		●																				
	SPGX0903AP	SPGX0903AP		●												●								
	SPGX12T3AP	SPGX12T3AP														●								
SPHX12-PC-GPB	SPHX1205PCERGPB	SPHX1205PCERGPB						●							●	●								
	SPHX1205PCSRGPB	SPHX1205PCSRGPB										●	●		●	●								
	SPHX1205PCTRGPB	SPHX1205PCTRGPB															●							
	SPHX1205PCTRGPBK	SPHX1205PCTRGPBK																		●				

OPERATION UPGRADE

Insert has radius edge.

OPERATION UPGRADE

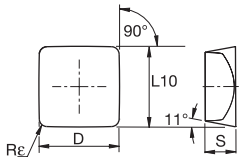
Pg. 499

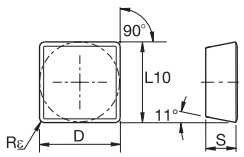
8-Edge

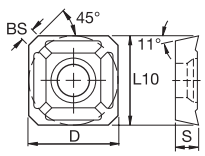
Pg. 391

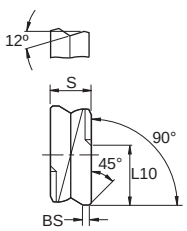
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ISO catalog number	dimensions														
	LI		W		S		D		L10		BS		Rε		
	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
SPGN1204PPN4W	–	–	–	–	4,76	.188	12,70	.500	12,70	.500	–	–	1,2	.047	SPG-RW
SPGN120308T	–	–	–	–	3,18	.125	12,70	.500	12,70	.500	–	–	0,8	.031	SPG-T
SPGN120408T	–	–	–	–	4,76	.188	12,70	.500	12,70	.500	–	–	0,8	.031	
SPGN120412T	–	–	–	–	4,76	.188	12,70	.500	12,70	.500	–	–	1,2	.047	
SPGN120416T	–	–	–	–	4,76	.188	12,70	.500	12,70	.500	–	–	1,6	.063	
SPGN190412T	–	–	–	–	4,76	.188	19,05	.750	19,05	.750	–	–	1,2	.047	
SPGN190416T	–	–	–	–	4,76	.188	19,05	.750	19,05	.750	–	–	1,6	.063	
SPGN120308T02020	–	–	–	–	3,18	.125	12,70	.500	12,70	.500	–	–	0,8	.031	
SPGN120312T02020	–	–	–	–	3,18	.125	12,70	.500	12,70	.500	–	–	1,2	.047	
SPGN120408T02020	–	–	–	–	4,76	.188	12,70	.500	12,70	.500	–	–	0,8	.031	
SPGN120412T02020	–	–	–	–	4,76	.188	12,70	.500	12,70	.500	–	–	1,2	.047	
SPGN120416T02020	–	–	–	–	4,76	.188	12,70	.500	12,70	.500	–	–	1,6	.063	
SPGN190416T02020	–	–	–	–	4,76	.188	19,05	.750	19,05	.750	–	–	1,6	.063	
SPGX0602AP	–	–	–	–	2,38	.094	6,35	.250	6,35	.250	0,99	.039	–	–	SPGX-AP
SPGX0903AP	–	–	–	–	3,18	.125	9,53	.375	9,53	.375	1,53	.060	–	–	
SPGX12T3AP	–	–	–	–	3,97	.156	12,70	.500	12,70	.500	2,02	.080	–	–	
SPHX1205PCERGPB	–	–	–	–	5,50	.217	–	–	6,57	.259	0,70	.028	–	–	SPHX12-PC-GPB
SPHX1205PCSRGPB	–	–	–	–	5,50	.217	–	–	6,57	.259	0,70	.028	–	–	
SPHX1205PCTRGPB	–	–	–	–	5,50	.217	–	–	6,57	.259	0,70	.028	–	–	
SPHX1205PCTRGPBK	–	–	–	–	5,50	.217	–	–	6,57	.259	0,70	.028	–	–	









● first choice
○ alternate choice

	ISO catalog number	ANSI catalog number	K110M	K125M	KC410M	KC510M	KC515M	KC520M	KC522M	KC525M	KC530M	KC715M	KC725M	KC735M	KC915M	KC935M	KT530M	KY1540	KY2100	KY3500	KB1340	KD1410	KD1415	KD1420
H							●														●			
S								●					●	●				●	●					
N			●		●	○			○													●	●	●
K						●	○	●	○						●	○				●	●			
M							○		●	○	●		●	●		○			●					
P				●			●		○	●	●	●	●	○		●	●	●	●					
SPHX12-PC-GP4SB	SPHX1205PCERGP4SB	SPHX1205PCERGP4SB						●							●	●								
	SPHX1205PCSRGP4SB	SPHX1205PCSRGP4SB											●											
	SPHX1205PCTRGP4SBK	SPHX1205PCTRGP4SBK																		●				
4-Edge																								
SPHX12-PC-GPB	SPHX1205PCELGPB	SPHX1205PCELGPB													●									
	SPHX1205PCTLGPBK	SPHX1205PCTLGPBK																		●				
8-Edge Left Hand																								
SPHX12-PC-GN1WB	SPHX1205PCERGN1WB	SPHX1205PCERGN1WB														●								
	SPHX1205PCFRGN1WB	SPHX1205PCFRGN1WB						●					●		●		●							
	SPHX1205PCFRGN1WBK	SPHX1205PCFRGN1WBK																		●				

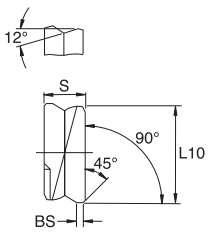
Pg. 391

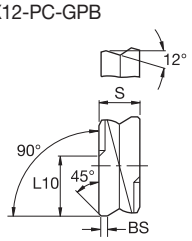
Pg. 391

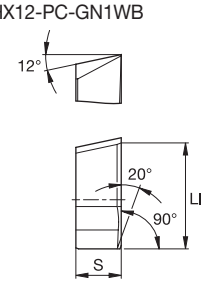
K110M K125M KC410M KC510M KC515M KC520M KC522M KC525M KC530M KC715M KC725M KC735M KC915M KC935M KT530M KY1540 KY2100 KY3500 KB1340 KD1410 KD1415 KD1420

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ISO catalog number	dimensions														
	Ll		W		S		D		L10		BS		Rε		
	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
SPHX1205PCERGP4SB	–	–	–	–	5,50	.217	–	–	11,07	.436	0,70	.028	–	–	SPHX12-PC-GP4SB
SPHX1205PCSRGP4SB	–	–	–	–	5,50	.217	–	–	11,07	.436	0,70	.028	–	–	
SPHX1205PCTRGP4SBK	–	–	–	–	5,50	.217	–	–	11,08	.436	0,70	.028	–	–	
SPHX1205PCELGPB	–	–	–	–	5,50	.217	–	–	6,57	.259	0,70	.028	–	–	SPHX12-PC-GPB
SPHX1205PCTLGPBK	–	–	–	–	5,50	.217	–	–	6,57	.259	0,70	.028	–	–	
SPHX1205PCERGN1WB	11,00	.433	–	–	5,20	.205	–	–	–	–	–	–	–	–	SPHX12-PC-GN1WB
SPHX1205PCFRGN1WB	11,00	.433	–	–	5,20	.205	–	–	–	–	–	–	–	–	
SPHX1205PCFRGN1WBK	11,00	.433	–	–	5,20	.205	–	–	–	–	–	–	–	–	

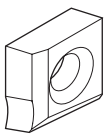




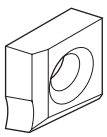


● first choice
○ alternate choice

	ISO catalog number	ANSI catalog number	K110M	K125M	KC410M	KC510M	KC515M	KC520M	KC522M	KC525M	KC530M	KC715M	KC725M	KC735M	KC915M	KC935M	KT530M	KY1540	KY2100	KY3500	KB1340	KD1410	KD1415	KD1420
H							●														●			
S									●				●	●				●	●					
N			●		●	○			○													●	●	●
K						●	○	●	○						●	○				●	●			
M							○		●	○	●		●	●		○			●					
P				●			●		○	●	●	●	●	○		●	●	●	●					
SPHX12-PC-GP1WB	SPHX1205PCER-GP1WB	SPHX1205PCER-GP1WB						●							●									
	SPHX1205PCSR-GP1WB	SPHX1205PCSR-GP1WB											●											
	SPHX1205PCTR-GP1WBK	SPHX1205PCTR-GP1WBK																		●				
SPHX12-PC-GNT1WB	SPHX1205PCERGNT1WB	SPHX1205PCERGNT1WB																			●			
SPHX12-PC-GN1WB	SPHX1205PCFLGN1WB	SPHX1205PCFLGN1WB													●									
	SPHX1205PCFLGN1WBK	SPHX1205PCFLGN1WBK																		●				

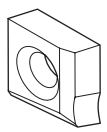


Pg. 391



Pg. 391

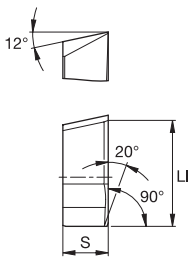
CBN Tipped

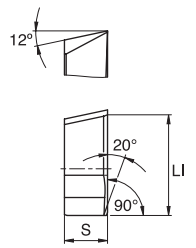


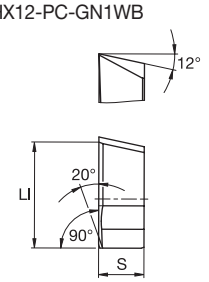
Left Hand

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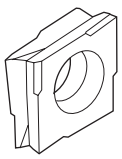
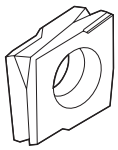
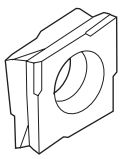
ISO catalog number	dimensions														
	LI		W		S		D		L10		BS		Rε		
	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
SPHX1205PCER-GP1WB	11,00	.433	–	–	5,50	.217	–	–	–	–	–	–	–	–	SPHX12-PC-GP1WB
SPHX1205PCSR-GP1WB	11,00	.433	–	–	5,50	.217	–	–	–	–	–	–	–	–	
SPHX1205PCTR-GP1WBK	11,00	.433	–	–	5,50	.217	–	–	–	–	–	–	–	–	
SPHX1205PCERGNT1WB	11,00	.433	–	–	5,50	.217	–	–	–	–	–	–	–	–	SPHX12-PC-GNT1WB
SPHX1205PCFLGN1WB	11,00	.433	–	–	5,50	.217	–	–	–	–	–	–	–	–	SPHX12-PC-GN1WB
SPHX1205PCFLGN1WBK	11,00	.433	–	–	5,50	.217	–	–	–	–	–	–	–	–	







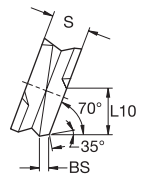
● first choice
○ alternate choice

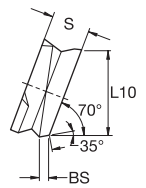
	ISO catalog number	ANSI catalog number	K110M	K125M	KC410M	KC510M	KC515M	KC520M	KC522M	KC525M	KC530M	KC715M	KC725M	KC735M	KC915M	KC935M	KT530M	KY1540	KY2100	KY3500	KB1340	KD1410	KD1415	KD1420
H							●														●			
S								●					●	●				●	●					
N			●		●	○			○													●	●	●
K						●	○	●	○						●	○				●	●			
M							○		●	○	●		●	●		○			●					
P				●			●		○	●	●	●	●	○		●	●	●	●					
SPHX12-ZC-GP	SPHX1205ZCERGP	SPHX1205ZCERGP						●							●	●								
	SPHX1205ZCSRGP	SPHX1205ZCSRGP										●	●		●	●								
	SPHX1205ZCTRGP	SPHX1205ZCTRGP															●							
	SPHX1205ZCTRGPK	SPHX1205ZCTRGPK																		●				
 Pg. 315																								
8-Edge																								
SPHX12-ZC-GP4S	SPHX1205ZCERGP4S	SPHX1205ZCERGP4S						●							●									
	SPHX1205ZCSRGP4S	SPHX1205ZCSRGP4S											●											
	SPHX1205ZCTRGP4SK	SPHX1205ZCTRGP4SK																		●				
 Pg. 315																								
4-Edge																								
SPHX12-ZC-GP	SPHX1205ZCEL-GP	SPHX1205ZCEL-GP													●									
	SPHX1205ZCELGP	SPHX1205ZCELGP						●																
	SPHX1205ZCTLGPK	SPHX1205ZCTLGPK																		●				
8-Edge Left Hand																								

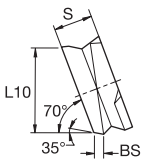
K110M K125M KC410M KC510M KC515M KC520M KC522M KC525M KC530M KC715M KC725M KC735M KC915M KC935M KT530M KY1540 KY2100 KY3500 KB1340 KD1410 KD1415 KD1420

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

ISO catalog number	dimensions														
	LI		W		S		D		L10		BS		Rε		
	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
SPHX1205ZCERGP	–	–	–	–	5,50	.217	–	–	5,41	.213	0,70	.028	–	–	SPHX12-ZC-GP
SPHX1205ZCSRGP	–	–	–	–	5,50	.217	–	–	5,41	.213	0,70	.028	–	–	
SPHX1205ZCTRGP	–	–	–	–	5,50	.217	–	–	5,41	.213	0,70	.028	–	–	
SPHX1205ZCTRGPK	–	–	–	–	5,50	.217	–	–	5,41	.213	0,70	.028	–	–	
SPHX1205ZCERGP4S	–	–	–	–	5,50	.217	–	–	10,04	.395	0,70	.028	–	–	SPHX12-ZC-GP4S
SPHX1205ZCSRGP4S	–	–	–	–	5,50	.217	–	–	10,05	.396	0,70	.028	–	–	
SPHX1205ZCTRGP4SK	–	–	–	–	5,50	.217	–	–	10,06	.396	0,70	.028	–	–	
SPHX1205ZCEL-GP	–	–	–	–	5,50	.217	–	–	5,41	.213	0,70	.028	–	–	SPHX12-ZC-GP
SPHX1205ZCELGP	–	–	–	–	5,50	.217	–	–	5,41	.213	0,70	.028	–	–	
SPHX1205ZCTLGPK	–	–	–	–	5,50	.217	–	–	5,41	.213	0,70	.028	–	–	







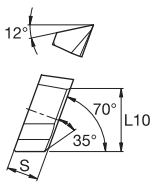
● first choice
○ alternate choice

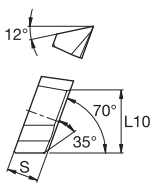
	ISO catalog number	ANSI catalog number	K110M	K125M	KC410M	KC510M	KC515M	KC520M	KC522M	KC525M	KC530M	KC715M	KC725M	KC735M	KC915M	KC935M	KT530M	KY1540	KY2100	KY3500	KB1340	KD1410	KD1415	KD1420
H							●														●			
S									●				●	●				●	●					
N			●		●	○			○													●	●	●
K						●	○	●	○						●	○				●	●				
M							○		●	○	●		●	●		○			●					
P				●			●		○	●	●	●	●	○		●	●	●	●					
SPHX-GN1W	SPHX1205ZCFRGN1W	SPHX1205ZCFRGN1W						●					●		●					●				
	SPHX1205ZCFRGN1WK	SPHX1205ZCFRGN1WK																						
SPHX-GP1W	SPHX1205ZCER-GP1W	SPHX1205ZCER-GP1W						●							●									
	SPHX1205ZCSR-GP1W	SPHX1205ZCSR-GP1W											●											
	SPHX1205ZCTR-GP1WK	SPHX1205ZCTR-GP1WK																		●				
SPHX-GNT1W	SPHX1205ZCERGNT1W	SPHX1205ZCERGNT1W																			●			

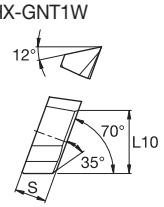
Pg. 315
Pg. 315
Pg. 315

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

ISO catalog number	dimensions														
	LI		W		S		D		L10		BS		Rε		
	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
SPHX1205ZCFRGN1W	—	—	—	—	5,50	.217	—	—	10,00	.394	—	—	—	—	SPHX-GN1W
SPHX1205ZCFRGN1WK	—	—	—	—	5,50	.217	—	—	10,00	.394	—	—	—	—	
SPHX1205ZCER-GP1W	—	—	—	—	5,50	.217	—	—	10,00	.394	—	—	—	—	SPHX-GP1W
SPHX1205ZCSR-GP1W	—	—	—	—	5,50	.217	—	—	10,00	.394	—	—	—	—	
SPHX1205ZCTR-GP1WK	—	—	—	—	5,50	.217	—	—	10,00	.394	—	—	—	—	
SPHX1205ZCERGNT1W	—	—	—	—	5,50	.217	—	—	10,00	.394	—	—	—	—	SPHX-GNT1W





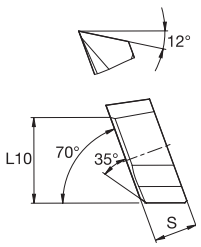
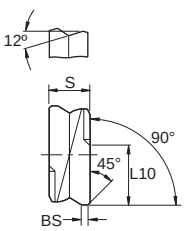
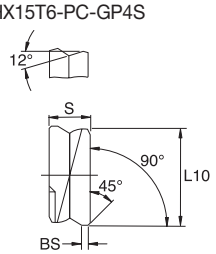


● first choice
○ alternate choice

	ISO catalog number	ANSI catalog number	K110M	K125M	KC410M	KC510M	KC515M	KC520M	KC522M	KC525M	KC530M	KC715M	KC725M	KC735M	KC915M	KC935M	KT530M	KY1540	KY2100	KY3500	KB1340	KD1410	KD1415	KD1420
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S									●				●	●				●	●					
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K						●	○	●	○						●	○				●	●			
M							○		●	○	●		●	●		○			●					
P				●			●		○	●	●	●	●	○		●	●	●	●					
SPHX12-ZC-GN1W	SPHX1205ZCFLGN1W	SPHX1205ZCFLGN1W													●									
	SPHX1205ZCFLGN1WK	SPHX1205ZCFLGN1WK																		●				
Left Hand																								
SPHX15T6-PC-GP	SPHX15T6PCERGP	SPHX15T6PCERGP						●							●	●								
	SPHX15T6PCSRGP	SPHX15T6PCSRGP										●	●			●								
	SPHX15T6PCTRGPK	SPHX15T6PCTRGPK																		●				
Pg. 317																								
SPHX15T6-PC-GP4S	SPHX15T6PCERGP4S	SPHX15T6PCERGP4S						●							●									
Pg. 317																								

K110M K125M KC410M KC510M KC515M KC520M KC522M KC525M KC530M KC715M KC725M KC735M KC915M KC935M KT530M KY1540 KY2100 KY3500 KB1340 KD1410 KD1415 KD1420

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ISO catalog number	dimensions														
	LI		W		S		D		L10		BS		Rε		
	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
SPHX1205ZCFLGN1W	—	—	—	—	5,50	.217	—	—	10,00	.394	—	—	—	—	SPHX12-ZC-GN1W
SPHX1205ZCFLGN1WK	—	—	—	—	5,50	.217	—	—	10,00	.394	—	—	—	—	
SPHX15T6PCERGP	—	—	—	—	6,60	.260	—	—	8,15	.321	1,20	.047	—	—	SPHX15T6-PC-GP
SPHX15T6PCSRGP	—	—	—	—	6,60	.260	—	—	8,16	.321	1,20	.047	—	—	
SPHX15T6PCTRGPK	—	—	—	—	6,60	.260	—	—	8,15	.321	1,20	.047	—	—	
SPHX15T6PCERGP4S	—	—	—	—	6,60	.260	—	—	13,88	.547	1,20	.047	—	—	SPHX15T6-PC-GP4S
															

● first choice
○ alternate choice

	ISO catalog number	ANSI catalog number	K110M	K125M	KC410M	KC510M	KC515M	KC520M	KC522M	KC525M	KC530M	KC715M	KC725M	KC735M	KC915M	KC935M	KT530M	KY1540	KY2100	KY3500	KB1340	KD1410	KD1415	KD1420
H							●														●			
S									●				●	●				●	●					
N			●		●	○			○													●	●	●
K						●	○	●	○						●	○				●	●			
M							○		●	○	●		●	●		○			●					
P				●			●		○	●	●	●	●	○		●	●	●	●					
SPHX15-PC-GN1W	SPHX15T6PCERGNT1W	SPHX15T6PCERGNT1W																			●			
	SPHX15T6PCFRGN1W	SPHX15T6PCFRGN1W													●									
Indexable Inserts																								
SPHX15T6-ZC-GP	SPHX15T6ZCERGP	SPHX15T6ZCERGP						●							●	●								
	SPHX15T6ZCSRGP	SPHX15T6ZCSRGP	●	●									●			●								
	SPHX15T6ZCTRGP	SPHX15T6ZCTRGP															●							
	SPHX15T6ZCTRGPK	SPHX15T6ZCTRGPK																		●				
SPHX15T6-ZC-GP4S	SPHX15T6ZCERGP4S	SPHX15T6ZCERGP4S						●							●									
	SPHX15T6ZCSRGP4S	SPHX15T6ZCSRGP4S											●											
	SPHX15T6ZCTRGP4SK	SPHX15T6ZCTRGP4SK																		●				

8-Edge

Pg. 317

4-Edge

Pg. 317

Pg. 317

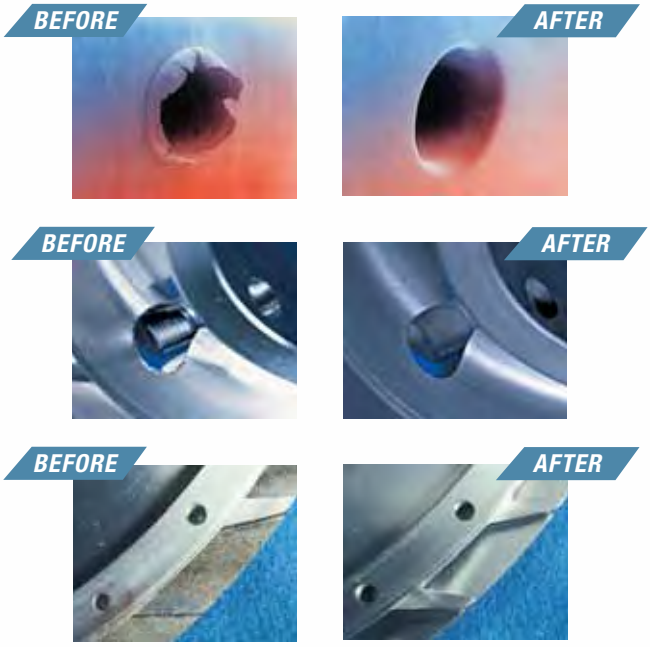
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- ***Abrasive Flow Machining (AFM)***
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A KENNAMETAL COMPANY

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○ alternate choice

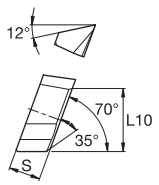
	ISO catalog number	ANSI catalog number	K110M	K125M	KC410M	KC510M	KC515M	KC520M	KC522M	KC525M	KC530M	KC715M	KC725M	KC735M	KC915M	KC935M	KT530M	KY1540	KY2100	KY3500	KB1340	KD1410	KD1415	KD1420
H							●														●			
S									●				●	●				●	●					
N			●		●	○			○													●	●	●
K						●	○	●	○						●	○				●	●				
M							○		●	○	●		●	●		○			●						
P				●			●		○	●	●	●	●	○		●	●	●	●						
SPHX-GN1W	SPHX15T6ZCFRGN1W	SPHX15T6ZCFRGN1W						●				●			●									
	SPHX15T6ZCFRGN1WK	SPHX15T6ZCFRGN1WK																		●				
SPKN-EDR	SPKN1203EDR	SPKN42EDR	●	●								●	●		●	●								
	SPKN1204EDR	SPKN43EDR											●		●									
	SPKN1504EDR	SPKN53EDR	●	●									●		●									
SPKN-EDTR	SPKN1203EDTR	SPKN42EDTR										●	●	●	●	●	●			●				
	SPKN1204EDTR	SPKN43EDTR											●	●	●	●				●				
	SPKN1504EDTR	SPKN53EDTR										●	●		●					●				
SPMT	SPMT120408	SPMT432										●	●	●		●								

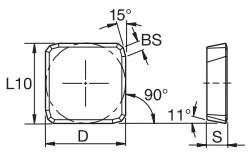
Pg. 317

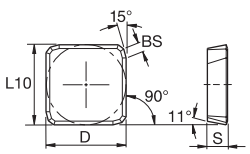
OPERATION UPGRADE

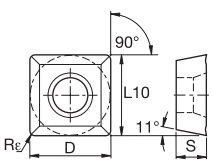
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ISO catalog number	dimensions														
	LI		W		S		D		L10		BS		Rε		
	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
SPHX15T6ZCFRGN1W	—	—	—	—	6,60	.260	—	—	11,00	.433	—	—	—	—	SPHX-GN1W
SPHX15T6ZCFRGN1WK	—	—	—	—	6,60	.260	—	—	11,00	.433	—	—	—	—	
SPKN1203EDR	—	—	—	—	3,18	.125	12,70	.500	12,70	.500	1,42	.056	—	—	SPKN-EDR
SPKN1204EDR	—	—	—	—	4,76	.188	12,70	.500	12,70	.500	1,42	.056	—	—	
SPKN1504EDR	—	—	—	—	4,76	.188	15,88	.625	15,88	.625	1,42	.056	—	—	
SPKN1203EDTR	—	—	—	—	3,18	.125	12,70	.500	12,70	.500	1,43	.056	—	—	SPKN-EDTR
SPKN1204EDTR	—	—	—	—	4,76	.188	12,70	.500	12,70	.500	1,43	.056	—	—	
SPKN1504EDTR	—	—	—	—	4,76	.188	15,88	.625	15,88	.625	1,43	.056	—	—	
SPMT120408	—	—	—	—	4,76	.188	12,70	.500	12,70	.500	—	—	0,8	.031	SPMT









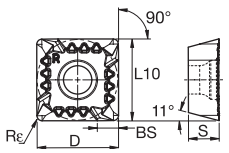
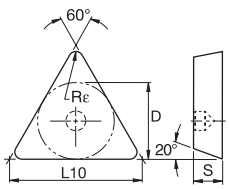
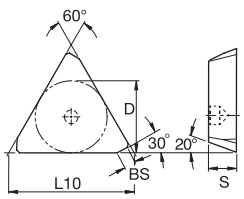
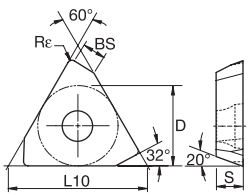
● first choice
○ alternate choice

	ISO catalog number	ANSI catalog number	K110M	K125M	KC410M	KC510M	KC515M	KC520M	KC522M	KC525M	KC530M	KC715M	KC725M	KC735M	KC915M	KC935M	KT530M	KY1540	KY2100	KY3500	KB1340	KD1410	KD1415	KD1420
H							●														●			
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N			●		●	○			○													●	●	●
K						●	○	●	○						●	○				●	●			
M							○		●	○	●		●	●		○			●					
P				●			●		○	●	●	●	●	○		●	●	●	●					
SPPT-GB2	SPPT10T3PPERGB2	SPPT3125PPER8GB2													●	●								
	SPPT10T3PPSRGB2	SPPT3125PPSR8GB2													●	●	●							
TEEN-J	TEEN160308J	TEEN322J				●						●	●									●		
TEEN-JW	TECN1603PERJW	TEEN32W3R20JW											●									●		
TEGA	TEGA453015PJ1S	TEGA453015PJ1S			●																			
	TEGA453031PJ1S	TEGA453031PJ1S			●																			
	TEGA453125PJ1S	TEGA453125PJ1S			●																			

Pg. 381 Pg. 381 Pg. 418

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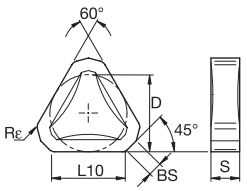
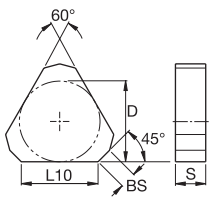
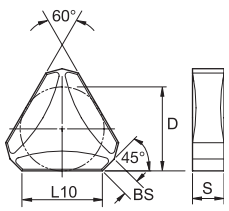
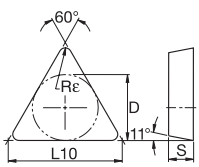
ISO catalog number	dimensions														
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	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
SPPT10T3PPERGB2	–	–	–	–	3,97	.156	10,00	.394	10,00	.394	2,70	.106	0,8	.031	SPPT-GB2 
SPPT10T3PPSRGB2	–	–	–	–	3,97	.156	10,00	.394	10,00	.394	2,70	.106	0,8	.031	
TEEN160308J	–	–	–	–	3,18	.125	9,53	.375	16,50	.650	–	–	0,79	.031	TEEN-J 
TECN1603PERJW	–	–	–	–	3,18	.125	9,53	.375	16,50	.650	2,44	.096	0,8	.031	TEEN-JW 
TEGA453015PJ1S	–	–	–	–	4,78	.188	14,29	.563	24,75	.974	4,93	.194	0,4	.016	TEGA 
TEGA453031PJ1S	–	–	–	–	4,78	.188	14,29	.563	24,75	.974	4,93	.194	0,8	.031	
TEGA453125PJ1S	–	–	–	–	4,78	.188	14,29	.563	24,75	.974	4,93	.194	3,2	.125	

● first choice
○ alternate choice

	ISO catalog number	ANSI catalog number	K110M	K125M	KC410M	KC510M	KC515M	KC520M	KC522M	KC525M	KC530M	KC715M	KC725M	KC735M	KC915M	KC935M	KT530M	KY1540	KY2100	KY3500	KB1340	KD1410	KD1415	KD1420
H							●														●			
S									●				●	●				●	●					
N			●		●	○			○													●	●	●
K						●	○	●	○						●	○				●	●				
M							○		●	○	●		●	●		○			●					
P				●			●		○	●	●	●	●	○		●	●	●	●					
TNHF-AN	TNHF2204AN3N	TNHF1204AN3N													●									
TNJN-ANN	TNJN1204ANN	TNJN43ANN													●					●				
TNKF-ANN	TNKN1204ANN	TNKF43ANN											●		●									
TPC	TPCN160308	TPC322											●											
	TPCN160308T	TPC322T											●											

K110M K125M KC410M KC510M KC515M KC520M KC522M KC525M KC530M KC715M KC725M KC735M KC915M KC935M KT530M KY1540 KY2100 KY3500 KB1340 KD1410 KD1415 KD1420

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ISO catalog number	dimensions														
	LI		W		S		D		L10		BS		Rε		
	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
TNHF2204AN3N	–	–	–	–	4,76	.188	12,70	.500	12,10	.476	2,60	.102	2,0	.078	TNHF-AN 
TNJN1204ANN	–	–	–	–	4,76	.188	12,70	.500	12,10	.476	2,56	.101	–	–	TNJN-ANN 
TNKN1204ANN	–	–	–	–	4,76	.188	12,70	.500	12,10	.476	2,55	.100	–	–	TNKF-ANN 
TPCN160308	–	–	–	–	3,18	.125	9,53	.375	16,50	.650	–	–	0,8	.031	TPC 
TPCN160308T	–	–	–	–	3,18	.125	9,53	.375	16,50	.650	–	–	0,8	.031	

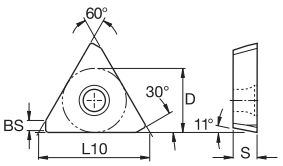
● first choice
○ alternate choice

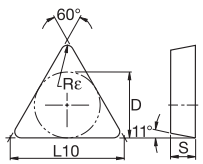
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H							●														●			
S									●				●	●				●	●					
N			●		●	○			○													●	●	●
K						●	○	●	○						●	○				●	●				
M							○		●	○	●		●	●		○			●					
P				●			●		○	●	●	●	●	○		●	●	●	●					
TPCW-PDR	TPCW1102PDR	TPCW215PDR											●											
	TPCW16T3PDR	TPCW325PDR											●	●										
	TPCW16T3PDTRP	TPCW325PDTRP										●	●	●		●								
TPG	TPGN160308	TPG322														●								
TPGM	TPGT110204HP	TPGT2151HP											●											
	TPGT110204K	TPGM2151											●											
TPG-T	TPGN160308T	TPG322T											●											
	TPGN160312T02020	TPG323T0820																		●				
	TPGN220408T	TPG432T											●											
	TPGN220408T02020	TPG432T0820																		●				
	TPGN220412T	TPG433T											●											
	TPGN220412T02020	TPG433T0820																		●				

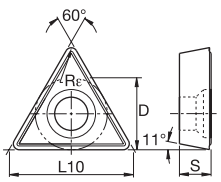
K110M K125M KC410M KC510M KC515M KC520M KC522M KC525M KC530M KC715M KC725M KC735M KC915M KC935M KT530M KY1540 KY2100 KY3500 KB1340 KD1410 KD1415 KD1420

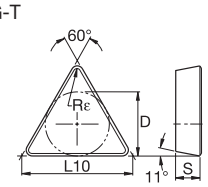
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ISO catalog number	dimensions														
	LI		W		S		D		L10		BS		Rε		
	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
TPCW1102PDR	–	–	–	–	2,38	.094	6,35	.250	11,00	.433	0,79	.031	–	–	TPCW-PDR
TPCW16T3PDR	–	–	–	–	3,97	.156	9,53	.375	16,50	.650	1,30	.051	–	–	
TPCW16T3PDTRP	–	–	–	–	3,97	.156	9,53	.375	16,50	.650	1,30	.051	–	–	
TPGN160308	–	–	–	–	3,18	.125	9,53	.375	16,50	.650	–	–	0,80	.031	TPG
TPGT110204HP	–	–	–	–	2,38	.094	6,35	.250	11,00	.433	–	–	0,4	.016	TPGM
TPGT110204K	–	–	–	–	2,38	.094	6,35	.250	11,00	.433	–	–	0,4	.016	
TPGN110304T01020	–	–	–	–	3,18	.125	6,35	.250	11,00	.433	–	–	0,4	.016	TPG-T
TPGN160312T02020	–	–	–	–	3,18	.125	9,53	.375	16,50	.650	–	–	1,2	.047	
TPGN220408T	–	–	–	–	4,76	.188	12,70	.500	22,00	.866	–	–	0,8	.031	
TPGN220408T02020	–	–	–	–	4,76	.188	12,70	.500	22,00	.866	–	–	0,8	.031	
TPGN220412T	–	–	–	–	4,76	.188	12,70	.500	22,00	.866	–	–	0,7	.047	
TPGN220412T02020	–	–	–	–	4,76	.188	12,70	.500	22,00	.866	–	–	1,2	.047	





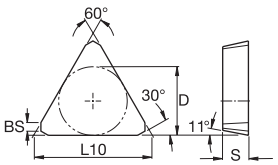


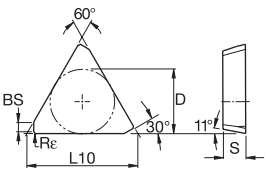


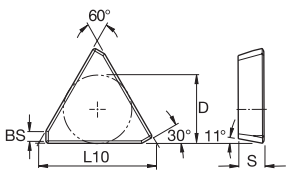
● first choice
○ alternate choice

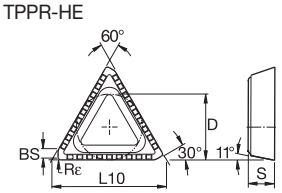
	ISO catalog number	ANSI catalog number	K110M	K125M	KC410M	KC510M	KC515M	KC520M	KC522M	KC525M	KC530M	KC715M	KC725M	KC735M	KC915M	KC935M	KT530M	KY1540	KY2100	KY3500	KB1340	KD1410	KD1415	KD1420
H							●														●			
S									●				●	●				●	●					
N			●		●	○			○													●	●	●
K						●	○	●	○						●	○				●	●			
M							○		●	○	●		●	●		○			●					
P				●			●		○	●	●	●	●	○		●	●	●	●					
TPKN	TPKN1603PPN	TPKN32P3														●								
TPKN-P-R	TPKN1603PDR	TPKN32P3R	●										●		●	●								
	TPKN2204PDR	TPKN43P3R	●	●								●	●	●	●	●								
TPKN-P-T	TPKN1603PDTR	TPKN32P3RT										●	●	●	●	●	●							
	TPKN2204PDTR	TPKN43P3RT											●	●	●	●	●			●				
TPPR-HE	TPPR2204PDERHE	TPPR43PDER4HE											●											
	TPPR2204PDSRHM	TPPR43PDSRHM											●											
WPGX-LD/GD	WPGX030204-LD080	WPGX030204-LD080														●								
	WPGXL4T204-LD100	WPGXL4T204-LD100														●								
	WPGX04T208-LD100	WPGX04T208-LD100														●								
	WPGX050304-GD125	WPGX050304-GD125														●								
	WPGXL7T312-GD200	WPGXL7T312-GD200														●								
	WPGX07T312-GD160	WPGX07T312-GD160														●								
	WPGX090412-GD250	WPGX090412-GD250														●								

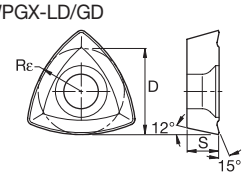
ISO catalog number	dimensions														
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	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
TPKN1603PPN	–	–	–	–	3,18	.125	9,53	.375	16,50	.650	1,20	.047	–	–	TPKN
TPKN1603PDR	–	–	–	–	3,18	.125	9,53	.375	16,50	.650	1,22	.408	1,1	.043	TPKN-P-R
TPKN2204PDR	–	–	–	–	4,76	.188	12,70	.500	22,00	.866	1,40	.055	–	–	
TPKN1603PDTR	–	–	–	–	3,18	.125	9,53	.375	16,50	.650	1,29	.051	–	–	TPKN-P-T
TPKN2204PDTR	–	–	–	–	4,76	.188	12,70	.500	22,00	.866	1,40	.055	–	–	
TPPR2204PDERHE	–	–	–	–	4,80	.189	12,70	.500	22,00	.866	1,94	.077	0,8	.031	TPPR-HE
TPPR2204PDSRHM	–	–	–	–	4,80	.189	12,70	.500	22,00	.866	1,94	.077	0,8	.031	
WPGX030204-LD080	–	–	–	–	2,38	.094	5,50	.217	–	–	–	–	8,0	.315	WPGX-LD/GD
WPGXL4T204-LD100	–	–	–	–	2,78	.109	6,40	.252	–	–	–	–	10,0	.394	
WPGX04T208-LD100	–	–	–	–	2,78	.109	7,06	.278	–	–	–	–	10,0	.394	
WPGX050304-GD125	–	–	–	–	3,18	.125	8,50	.335	–	–	–	–	12,5	.492	
WPGXL7T312-GD200	–	–	–	–	3,97	.156	10,80	.425	–	–	–	–	20,0	.787	
WPGX07T312-GD160	–	–	–	–	3,97	.156	11,18	.440	–	–	–	–	16,0	.630	
WPGX090412-GD250	–	–	–	–	4,76	.184	12,70	.500	–	–	–	–	25,0	.984	









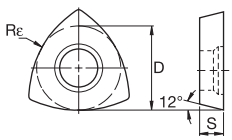


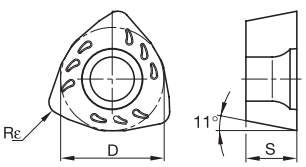
● first choice
○ alternate choice

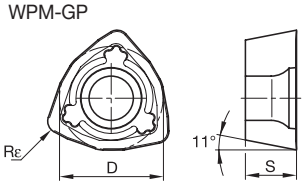
	ISO catalog number	ANSI catalog number	K110M	K125M	KC410M	KC510M	KC515M	KC520M	KC522M	KC525M	KC530M	KC715M	KC725M	KC735M	KC915M	KC935M	KT530M	KY1540	KY2100	KY3500	KB1340	KD1410	KD1415	KD1420
H							●														●			
S									●				●	●				●	●					
N			●		●	○			○													●	●	●
K						●	○	●	○						●	○				●	●				
M							○		●	○	●		●	●		○			●					
P				●			●		○	●	●	●	●	○		●	●	●	●					
WPGX-LN/GN	WPGXL4T204-LN100	WPGXL4T204-LN100														●								
	WPGX04T208-LN100	WPGX04T208-LN100	●																					
	WPGX07T312-GN160	WPGX07T312-GN160	●																					
	WPGXL7T312-GN200	WPGXL7T312-GN200														●								
	WPGX090412-GN250	WPGX090412-GN250														●								
WPM-HN	WPMW05X315ZZSRHN	WPMW05X315ZZSRHN							●	●														
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	WPMT080615ZZSRHN	WPMT080615ZZSRHN							●	●														
WPM-GP	WPMT05X315ZZERGP	WPMT05X315ZZERGP							●	●														
	WPMW06X415ZZERGP	WPMW06X415ZZERGP							●	●														
	WPMT080615ZZERGP	WPMT080615ZZERGP							●	●														
XDCW-R	XDCW150308R	XDCW2322R											●	●	●	●								
	XDCW150408R	XDCW2532R											●	●	●									
	XDCW150412R	XDCW2533R													●									
XDCW-RT	XDCW150308TR	XDCW2322RT										●	●	●	●									

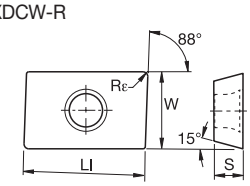
Pg. 439 Pg. 438 Pg. 437

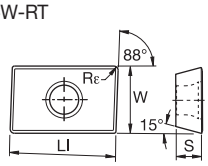
ISO catalog number	dimensions														
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	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
WPGXL4T204-LN100	–	–	–	–	2,78	.109	6,40	.252	–	–	–	–	10,0	.394	WPGX-LN/GN
WPGX04T208-LN100	–	–	–	–	2,78	.109	7,06	.278	–	–	–	–	10,0	.394	
WPGX07T312-GN160	–	–	–	–	3,97	.156	11,18	.440	–	–	–	–	16,0	.630	
WPGXL7T312-GN200	–	–	–	–	3,97	.156	10,80	.425	–	–	–	–	20,0	.787	
WPGX090412-GN250	–	–	–	–	4,76	.184	12,70	.500	–	–	–	–	25,0	.984	
WPMW05X315ZZSRHN	–	–	–	–	3,50	.138	7,94	.313	–	–	–	–	1,5	.059	WPM-HN
WPMW06X415ZZSRHN	–	–	–	–	4,20	.165	9,53	.375	–	–	–	–	1,5	.059	
WPMT080615ZZSRHN	–	–	–	–	6,35	.250	13,21	.520	–	–	–	–	1,5	.059	
WPMT05X315ZZERGP	–	–	–	–	3,50	.138	7,94	.313	–	–	–	–	1,5	.059	WPM-GP
WPMW06X415ZZERGP	–	–	–	–	4,20	.165	9,53	.375	–	–	–	–	1,5	.059	
WPMT080615ZZERGP	–	–	–	–	6,35	.250	12,87	.507	–	–	–	–	1,5	.059	
XDCW150308R	15,00	.591	9,53	.375	3,18	.125	–	–	–	–	–	–	0,8	.031	XDCW-R
XDCW150408R	15,88	.625	12,70	.500	4,76	.188	–	–	–	–	–	–	0,8	.031	
XDCW150412R	15,88	.625	12,70	.500	4,76	.188	–	–	–	–	–	–	1,2	.047	
XDCW150308TR	15,00	.591	9,53	.375	3,18	.125	–	–	–	–	–	–	0,8	.031	XDCW-RT











● first choice
○ alternate choice

	ISO catalog number	ANSI catalog number	K110M	K125M	KC410M	KC510M	KC515M	KC520M	KC522M	KC525M	KC530M	KC715M	KC725M	KC735M	KC915M	KC935M	KT530M	KY1540	KY2100	KY3500	KB1340	KD1410	KD1415	KD1420
H							●														●			
S									●				●	●				●	●					
N			●		●	○			○													●	●	●
K						●	○	●	○						●	○				●	●			
M							○		●	○	●		●	●		○			●					
P				●			●		○	●	●	●	●	○		●	●	●	●					
XDHX-GC Pg. 449	XDHX060210EGC	XDHX060210EGC	●			●							●											
	XDHX10T310EGC	XDHX10T310EGC	●			●			●				●											
XDHX-LN Pg. 449	XDHX040105ELN	XDHX040105ELN										●					●							
	XDHX040110ELN	XDHX040110ELN				●				●		●												
	XDHX060210SLN	XDHX060210SLN				●			●	●		●	●											
	XDHX060210TLN	XDHX060210TLN															●							
XDHX-GN Pg. 450	XDHX10T310SGN	XDHX10T310SGN				●			●	●		●												
	XDHX10T310TGN	XDHX10T310TGN															●							
XDMT-R	XDMT150308R	XDMT2322R						●				●	●	●										
	XDMT150316R	XDMT2324R											●	●										
	XDMT150332R	XDMT2328R											●	●										
XPCW-L	XPCW150412L	XPCW2533L											●	●	●	●								

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Get cash for your used carbide —
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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.

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THINK **MILLING,** THINK **KENNAMETAL.**

● first choice
○ alternate choice

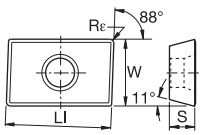
	ISO catalog number	ANSI catalog number	K110M	K125M	KC410M	KC510M	KC515M	KC520M	KC522M	KC525M	KC530M	KC715M	KC725M	KC735M	KC915M	KC935M	KT530M	KY1540	KY2100	KY3500	KB1340	KD1410	KD1415	KD1420
H							●														●			
S									●				●	●				●	●					
N			●		●	○			○													●	●	●
K						●	○	●	○						●	○				●	●				
M							○		●	○	●		●	●		○			●					
P				●			●		○	●	●	●	●	○		●	●	●	●					
XPCW-LT	XPCW150412TL	XPCW2533LT											●											
XPMT-R	XPMT1504APR	XPMT253A5R											●	●										
XPMT-R/L	XPMT150412L XPMT150412R	XPMT2533L XPMT2533R						●		●		● ●	● ●	● ●		●								
YCE	YCE43401	YCE43401						●																

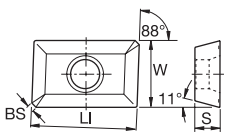
OPERATION UPGRADE

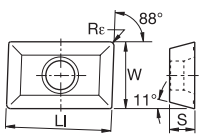
K110M K125M KC410M KC510M KC515M KC520M KC522M KC525M KC530M KC715M KC725M KC735M KC915M KC935M KT530M KY1540 KY2100 KY3500 KB1340 KD1410 KD1415 KD1420

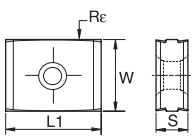
To place an order, contact Kennametal or your authorized Kennametal distributor, or visit www.kennametal.com.

ISO catalog number	dimensions														
	l1		W		S		D		L10		BS		Rε		
	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
XPCW150412TL	15,88	.625	12,70	.500	4,76	.188	–	–	–	–	–	–	1,2	.047	XPCW-LT
XPMT1504APR	16,22	.638	12,70	.500	4,76	.188	–	–	–	–	2,02	.080	–	–	XPMT-R
XPMT150412L	16,24	.639	12,70	.500	4,76	.188	–	–	–	–	–	–	1,2	.047	XPMT-R/L
XPMT150412R	16,24	.639	12,70	.500	4,76	.188	–	–	–	–	–	–	1,2	.047	
YCE43401	19,05	.750	14,29	.563	6,35	.250	–	–	–	–	–	–	154,4	6.000	YCE











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THINK **KENNAMETAL.**

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KENNAMETAL®
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Face Mills

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KENDEX Mini Mill 353
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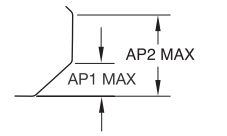


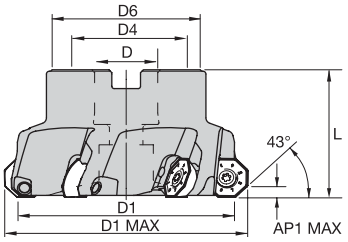
GMILLING
ILLINGMIL
GMILLING

Step 1: Choose the Milling Cutter

NEW!

- Available in diameters of 63 mm to 160 mm.
- Three geometries and six grades for use in most workpiece materials.
- Eight cutting edges.





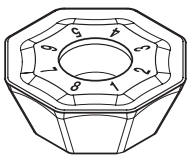


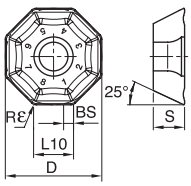
Shell Mills — Medium Pitch

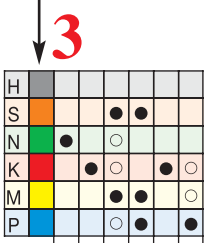
D1	order number	catalog number	Z	D	D1 max	D4	D6	L	Ap1 max	Max Ramp Angle	kg	Max RPM
63	3115873	KSOM63R04OF07	4	22	74	—	50	43	5,0	5.5°	0,6	10100
80	3115875	KSOM80R04OF07	4	27	91	—	60	50	5,0	4.0°	1,1	7900
100	3115877	KSOM100R05OF07	5	32	111	—	80	50	5,0	3.0°	1,7	6300
125	3115879	KSOM125R06OF07	6	40	136	—	90	63	5,0	2.3°	2,6	5000
160	3115881	KSOM160R07OF07	7	40	171	67	110	63	5,0	1.7°	4,2	3900

Step 2: Choose the Insert

1) Choose the insert style
2) Find the (hm) value in the chart. This will help you in defining the feed rate per tooth.
3) Determine the workpiece material. See pages 546- 551 of this catalog for material descriptions.
4) Determine the insert grade. The black dot in the material grid indicates first-choice grades for machining those materials.


OFKT





catalog number 1	cutting edges	D	S	L10	BS	Rε 2	hm	KC410M	KC520M	KC522M	KC725M	KC915M	KC935M
OFKT07L6AFENGB	8	18,70	6,00	7,50	—	1,20	0,10		●	●	●	●	●
OFKT07L6AFENLB	8	18,70	6,00	7,50	2,10	1,20	0,05		●	●	●	●	●
OFKT07L6AFFNLNJ	8	18,70	6,00	7,50	—	1,20	0,05	●					
OFKT07L6AFSNHB	8	18,70	6,00	7,50	—	1,20	0,20		●	●	●	●	●
OFKT07L6AFSNLB	8	18,70	6,00	7,50	2,10	1,20	0,20		●	●	●	●	●
OFPT07L6AFENGB	8	18,70	6,00	7,50	—	1,20	0,10		●	●	●	●	●
OFPT07L6AFSNHB	8	18,70	6,00	7,50	—	1,20	0,20		●	●	●	●	●

4

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Step 3: Determine the Cutting Speed

1) Choose the material group.
2) Choose the grade.
3) To determine the m/min for the chosen grade, go to the bold-type center column for that grade. These are first-choice recommended starting speeds.
4) Move down the bold-type column until you reach the value that is directly in line with the appropriate material in the first column on the left. The bold-type value that corresponds to the material on the left is your starting m/min value.

Recommended Starting Speeds [m/min]

43° approach angle

Material Group	KC410M			KC520M			KC522M			KC725M			KC915M			KC935M		
P1										310	**270**	250				470	**410**	380
P2										190	**180**	160				290	**260**	240
P3										180	**160**	140				260	**240**	220
P4							120	**110**	100	130	**120**	110				200	**180**	160
P5							155	**150**	135	160	**160**	150				265	**240**	215
P6							100	**80**	70	110	**90**					160	**140**	
M1							180	**160**	150	200	**180**	160				310	**270**	250
M2							170	**150**	140	180	**170**	150				280	**250**	230
M3							120	**110**	90	140	**120**					210	**180**	
K1				320	**290**	260				200	**180**	160	440	**400**	350	310	**280**	250
K2				250	**220**	210	240	**220**	200	160	**140**	130	350	**310**	290	240	**220**	200
K3				210	**190**	170	200	**180**	170	130	**120**	110	290	**260**	240	200	**180**	170
N1	1450	**1290**	1190															
N2																		
S1							40	**30**		40	**40**							
S2							30	**30**		40	**40**							
S3							40	**40**		50	**50**							
S4							50	**50**		60	**50**							
H1																		

FIRST choice starting speeds are in bold type.
As the average chip thickness value goes higher the speed should be decreased.

Step 4: Determine the Feed Rate

1) Choose the (hm) value in the feed chart that matches the (hm) value in the insert chart you selected in Step 1.
2) Define the radial width of cut as a percentage. To determine this, divide the radial width by the cutter diameter to achieve the percentage of engagement.

Example for full-width cutting or slotting:

Find the color code for your selected feed rate in the graph (i.e., purple for 0,1 mm). Use the graph or the boxes below the graph to determine the feed per tooth.

Example: When full-width cutting, use the 100% column to determine feed rate. Find the value in the 100% column that aligns with your color-coded chosen (hm) value. This value is your new feed per tooth.

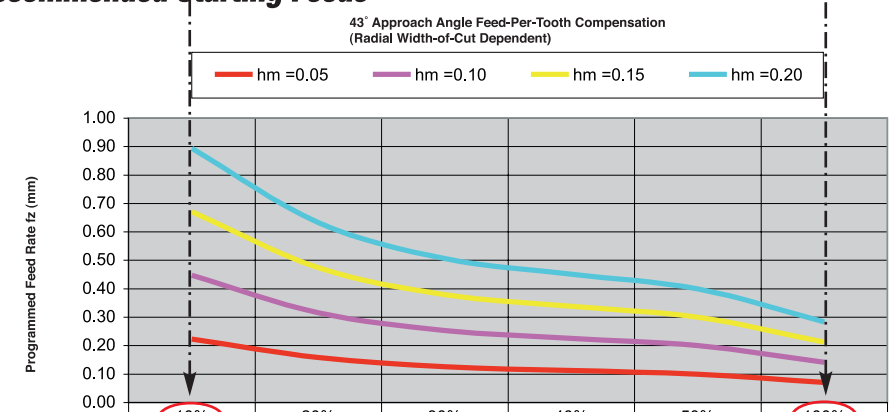
Note: When using less than 50% of the cutter diameter (radial width), there is a need to increase the feed rate.

Example for side or profile milling:

Define the radial width of cut, then divide this value by the cutter diameter. This will determine the percentage of the cutter in contact with the workpiece. This percentage is based on a linear cutter path.

Example: When profiling the percentage of radial cut has to be considered. The purple color code has a value of 0,1 mm in the chart. To determine feed rate, go to the 10% column and align the purple color-code value 0,1 mm with the value in the 10% column. The value in the 10% column is the new feed rate per tooth (0,45 mm). A 125% increase in feed per tooth is needed to maintain the same chip thickness value (hm) for both slotting and profiling.

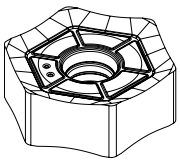
Recommended Starting Feeds



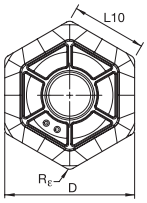
	10%	20%	30%	40%	50%	100%
hm =0.05	0.22	0.16	0.13	0.11	0.10	0.07
hm =0.10	0.45	0.32	0.25	0.23	0.20	0.14
hm =0.15	0.67	0.47	0.38	0.34	0.30	0.21
hm =0.20	0.89	0.63	0.51	0.45	0.40	0.28

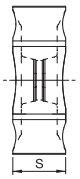
Percentage of the Cutter Diameter in Cut

Indexable Inserts for Dodeka HNGJ0905



HNGJ-LD

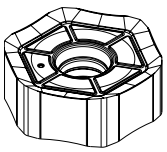




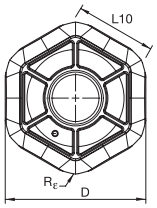
● first choice
○ alternate choice

	KC520M	KC522M	KC725M	KC915M	KC935M
H					
S		●	●		
N					
K	●	○		●	○
M		●	●		○
P		○	●		●

catalog number	cutting edges	D	S	L10	Rε	hm	KC520M	KC522M	KC725M	KC915M	KC935M
HNGJ0905ANENLD	12	15,88	5,56	9,00	1,2	0,10	●	●	●	●	●



HNGJ-GD





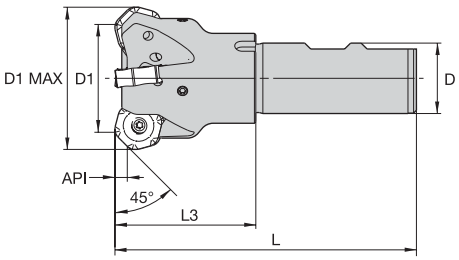
● first choice
○ alternate choice

	KC520M	KC522M	KC725M	KC915M	KC935M
H					
S		●	●		
N					
K	●	○		●	○
M		●	●		○
P		○	●		●

catalog number	cutting edges	D	S	L10	Rε	hm	KC520M	KC522M	KC725M	KC915M	KC935M
HNGJ0905ANSNGD	12	15,88	5,56	9,00	1,2	0,15			●	●	●

NEW!

- 4,5mm depth-of-cut capability.
- 40mm diameter.
- Two geometries and five grades for use in most workpiece materials.
- Twelve cutting edges.
- Soft cutting action.



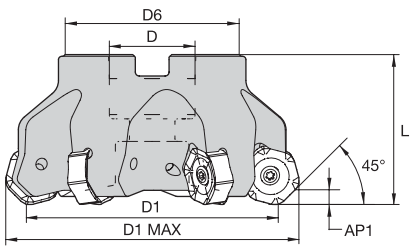


End Mills - Right Hand

D1	order number	catalog number	Z	D	D1 max	L3	L	Ap1 max	kg	Max RPM	Nm	insert screw
40	3324829	KSHR40D03R50B25SHN09	3	25	51	50	107	4,5	0,5	15800	3,5	193.492
40	3324830	KSHR40D04R50B25SHN09	4	25	51	50	107	4,5	0,5	15800	3,5	193.492

NEW!

- 4,5mm depth-of-cut capability.
- Available in diameters from 40mm to 160mm.
- Through-coolant standard.
- Two geometries and five grades for use in most workpiece materials.
- Twelve cutting edges.
- Soft cutting action.





Shell Mills - Right Hand - Coarse Pitch

D1	order number	catalog number	Z	D	D1 max	D4	D6	L	Ap1 max	kg	Max RPM
50	3324831	KSHR50A04RS45HN09	4	22	61,0	–	38	40	4,5	0,3	12700
63	3325163	KSHR63A06RS45HN09	6	22	74,0	–	50	40	4,5	0,6	10100
80	3325165	KSHR80A06RS45HN09	6	27	91,0	–	60	50	4,5	1,1	7900
100	3325167	KSHR100B08RS45HN09	8	32	111,0	–	80	40	4,5	1,7	6300
125	3325169	KSHR125B10RS45HN09	10	40	135,9	–	90	63	4,5	2,8	5050
160	3325171	KSHR160C12RS45HN09	12	40	171,0	66,7	110	63	4,5	4,6	3900

Spare Parts

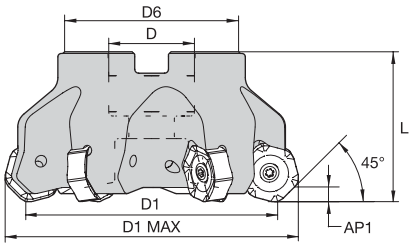
D1	insert screw	Nm	Torx wrench	low-head cap screw	socket-head cap screw	coolant screw	coolant cap
50	193.492	3,5	170.025	129.025	–	MS2072CG	–
63	193.492	3,5	170.025	–	125.025	MS1234CG	–
80	193.492	3,5	170.025	–	125.230	MS2038CG	–
100	193.492	3,5	170.025	–	–	MS2189CG	–
125	193.492	3,5	170.025	–	–	420.200	470.232
160	193.492	3,5	170.025	–	–	420.200	470.233

Dodeka 45°

Indexable Shell Mills

NEW!

- 4,5mm depth-of-cut capability.
- Available in diameters from 40mm to 160mm.
- Through-coolant standard.
- Two geometries and five grades for use in most workpiece materials.
- Twelve cutting edges.
- Soft cutting action.





Shell Mills - Right Hand - Medium Pitch

D1	order number	catalog number	Z	D	D1 max	D4	D6	L	Ap1 max	kg	Max RPM
50	3324832	KSHR50A05RS45HN09	5	22	61,0	–	38	40	4,5	0,3	12700
63	3325164	KSHR63A07RS45HN09	7	22	74,0	–	50	40	4,5	0,6	10100
80	3325166	KSHR80A09RS45HN09	9	27	91,0	–	60	50	4,5	1,1	7900
100	3325168	KSHR100B11RS45HN09	11	32	111,0	–	80	50	4,5	1,7	6300
125	3325170	KSHR125B14RS45HN09	14	40	136,0	–	90	63	4,5	2,9	5050
160	3325172	KSHR160C16RS45HN09	16	40	171,0	66,7	110	63	4,5	4,7	3900

Spare Parts

D1	insert screw	Nm	Torx wrench	low-head cap screw	socket-head cap screw	coolant screw	coolant cap
50	193.492	3,5	170.025	129.025	–	MS2072CG	–
63	193.492	3,5	170.025	–	125.025	MS1234CG	–
80	193.492	3,5	170.025	–	125.230	MS2038CG	–
100	193.492	3,5	170.025	–	–	MS2189CG	–
125	193.492	3,5	170.025	–	–	420.200	470.232
160	193.492	3,5	170.025	–	–	420.200	470.233

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

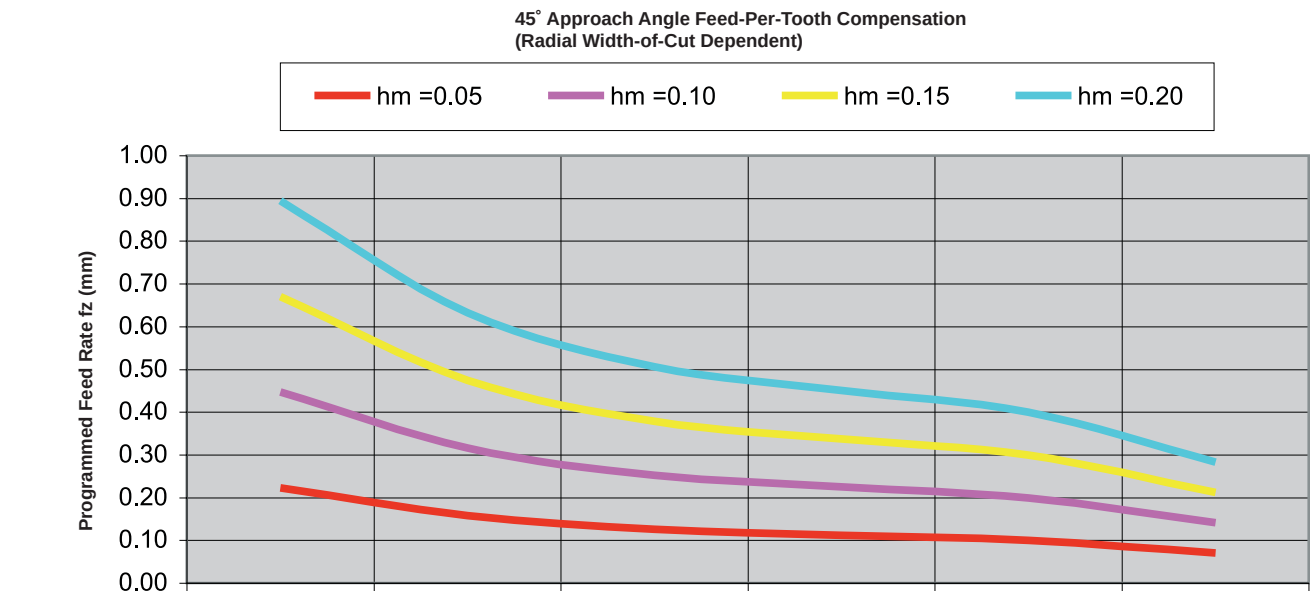
Recommended Starting Speeds [m/min]

45° approach angle

Material Group	KC520M			KC522M			KC725M			KC915M			KC935M		
P1							310	**270**	250				470	**410**	380
P2							190	**180**	160				290	**260**	240
P3							180	**160**	140				260	**240**	220
P4				120	**110**	100	130	**120**	110				200	**180**	160
P5				155	**150**	135	180	**160**	150				265	**240**	215
P6				100	**80**		110	**90**					160	**140**	
M1				180	**160**	150	200	**180**	160				310	**270**	250
M2				170	**150**	140	180	**170**	150				280	**250**	230
M3				120	**110**		140	**120**					210	**180**	
K1	320	**290**	260				200	**180**	160	440	**400**	350	310	**280**	250
K2	250	**220**	210	240	**220**	200	160	**140**	130	350	**310**	290	240	**220**	200
K3	210	**190**	170	200	**180**	170	130	**120**	110	290	**260**	240	200	**180**	170
N1															
N2															
S1				40	**30**		40	**40**							
S2				30	**30**		40	**40**							
S3				40	**40**		50	**50**							
S4				50	**50**		60	**50**							
H1															

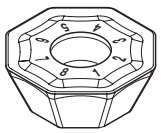
FIRST choice starting speeds are in bold type.
The speed should be decreased as the average chip thickness increases.

Recommended Starting Feeds

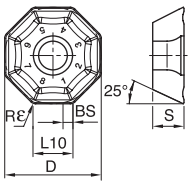


	10%	20%	30%	40%	50%	100%
hm =0.05	0.22	0.16	0.13	0.11	0.10	0.07
hm =0.10	0.45	0.32	0.25	0.23	0.20	0.14
hm =0.15	0.67	0.47	0.38	0.34	0.30	0.21
hm =0.20	0.89	0.63	0.51	0.45	0.40	0.28

Indexable Inserts for KSOM Mini OF.T06L5...



OFKT



● first choice
○ alternate choice

	KC410M	KC520M	KC522M	KC725M	KC915M	KC935M
H						
S			●	●		
N	●					
K		●	○		●	○
M			●	●		○
P			○	●		●

catalog number	cutting edges	D	S	L10	BS	Rε	hm	KC410M	KC520M	KC522M	KC725M	KC915M	KC935M
OFKT06L5AFENGB	8	14,70	5,00	6,00	–	0,80	0,10		●	●	●	●	●
OFKT06L5AFENLB	8	14,70	5,00	6,00	1,23	0,80	0,05		●	●	●	●	●
OFKT06L5AFFNLNJ	8	14,70	5,00	6,00	–	0,80	0,05	●					
OFKT06L5AFSNHB	8	14,70	5,00	6,00	–	0,80	0,20		●	●	●	●	●
OFKT06L5AFSNLB	8	14,70	5,00	6,00	1,21	0,80	0,20		●	●	●	●	●
OFPT06L5AFENGB	8	14,70	5,00	6,00	–	0,80	0,10		●		●	●	●
OFPT06L5AFSNHB	8	14,70	5,00	6,00	–	0,80	0,20		●		●	●	●

Proven Solution

KSOM Mini

Kennametal cutter: ***125B12RS450F06A***
Kennametal insert: ***OFPT06L5AFENGB***
Grade: ***KC725M***

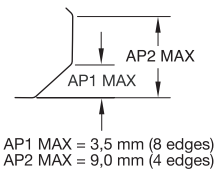
Operation: ***face milling high-temp alloys***

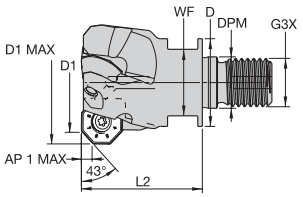
	Kennametal	*Competitor*
cutting speed (m/min):	***63***	***47***
feed per tooth:	***0,14 mm***	***0,09 mm***
axial cutting depth:	***2,7 mm***	***2,7 mm***
time per piece:	***18 min***	***37,5 min***
annual costs:	***$5.932,32***	***$20.166,85***

Annual Savings: $14.234,53

NEW!

- Available in diameters of 32 mm and 40 mm.
- Three geometries and six grades for use in most workpiece materials.
- Eight cutting edges.







End Mills — Screw-On

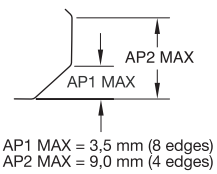
D1	order number	catalog number	Z	D	D1 max	L2	DPM	G3X	WF	Ap1 max	Max Ramp Angle	Max RPM
32	3115896	KSOM32R02M16OF06	2	29	41	40	17	M16	22	3,5	11.0°	19890
32	3115895	KSOM32R03M16OF06	3	29	41	40	17	M16	22	3,5	11.0°	19890
40	3115901	KSOM40R03M16OF06	3	29	49	40	17	M16	22	3,5	7.5°	15920
40	3115900	KSOM40R04M16OF06	4	29	49	40	17	M16	22	3,5	7.5°	15920

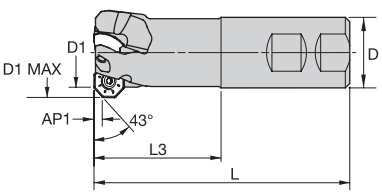
Spare Parts

D1	insert screw	Nm	Torx plus wrench
32	193.433	6	TTP15
40	193.433	6	TTP15

NEW!

- Available in diameters of 32 mm and 40 mm.
- Three geometries and six grades for use in most workpiece materials.
- Eight cutting edges.







End Mills — Medium Pitch

D1	order number	catalog number	Z	D	D1 max	L3	L	Ap1 max	Max Ramp Angle	Max RPM
32	3115894	KSOM32R02B20OF06	2	20	41	25	76	3,5	11.0°	19890
40	3115899	KSOM40R03B25OF06	3	25	49	25	82	3,5	7.5°	15920

End Mills — Fine Pitch

D1	order number	catalog number	Z	D	D1 max	L3	L	Ap1 max	Max Ramp Angle	Max RPM
32	3115893	KSOM32R03B20OF06	3	20	41	25	76	3,5	11.0°	19890
32	3115882	KSOM32R03B25OF06	3	25	41	25	82	3,5	11.0°	19890
40	3115898	KSOM40R04B25OF06	4	25	49	25	82	3,5	7.5°	15920
40	3115897	KSOM40R04B32OF06	4	32	49	49	110	3,5	7.5°	15920

Spare Parts

D1	insert screw	Nm	Torx plus wrench
32	193.433	6	TTP15
40	193.433	6	TTP15

Ordering Example:
1 x KSOM32R03M16OF06
10 x OFPT06L5AFENGB KC725M

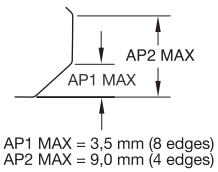
KSOM Mini Face Mills

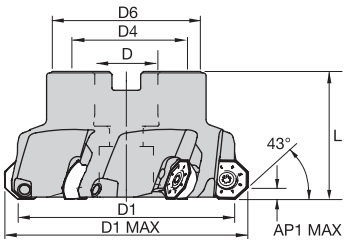
KENNAMETAL

Indexable Shell Mills

NEW!

- Available in diameters of 50 mm to 160 mm.
- Three geometries and six grades for use in most workpiece materials.
- Eight insert cutting edges.







Shell Mills — Medium Pitch

D1	order number	catalog number	Z	D	D1 max	D4	D6	L	Ap1 max	Max Ramp Angle	Max RPM
50	3115903	KSOM50R04OF06	4	22	59	—	38	43	3,5	5.0°	12730
63	3115905	KSOM63R05OF06	5	22	72	—	50	43	3,5	3.9°	10110
80	3115907	KSOM80R06OF06	6	27	89	—	60	50	3,5	2.9°	7960
100	3115909	KSOM100R07OF06	7	32	109	—	80	50	3,5	2.2°	6370
125	3115911	KSOM125R08OF06	8	40	134	—	94	63	3,5	1.7°	5090
160	3115913	KSOM160R10OF06	10	40	169	67	114	63	3,5	1.3°	3980

Spare Parts

D1	insert screw	torque (Nm)	wrench	mounting screw	coolant screw	coolant cap
50	193.433	6	TTP15	129.025	MS2072CG	—
63	193.433	6	TTP15	125.025	MS1234CG	—
80	193.433	6	TTP15	125.230	MS2038CG	—
100	193.433	6	TTP15	—	MS2189CG	—
125	193.433	6	TTP15	—	420.200	470.232
160	193.433	6	TTP15	—	420.200	470.233

Shell Mills — Fine Pitch

D1	order number	catalog number	Z	D	D1 max	D4	D6	L	Ap1 max	Max Ramp Angle	Max RPM
50	3115902	KSOM50R06OF06	6	22	59	—	38	43	3,5	5.0°	12730
63	3115904	KSOM63R07OF06	7	22	72	—	50	43	3,5	3.9°	10110
80	3115906	KSOM80R09OF06	9	27	89	—	60	50	3,5	2.9°	7960
100	3115908	KSOM100R10OF06	10	32	109	—	80	50	3,5	2.2°	6370
125	3115910	KSOM125R12OF06	12	40	134	—	94	63	3,5	1.7°	5090
160	3115912	KSOM160R16OF06	16	40	169	67	114	63	3,5	1.3°	3980

Spare Parts

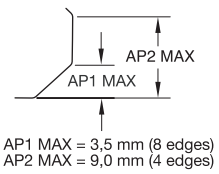
D1	insert screw	torque (Nm)	wrench	mounting screw	coolant screw	coolant cap
50	193.433	6	TTP15	129.025	MS2072CG	—
63	193.433	6	TTP15	125.025	MS1234CG	—
80	193.433	6	TTP15	125.230	MS2038CG	—
100	193.433	6	TTP15	—	MS2189CG	—
125	193.433	6	TTP15	—	420.200	470.232
160	193.433	6	TTP15	—	420.200	470.233

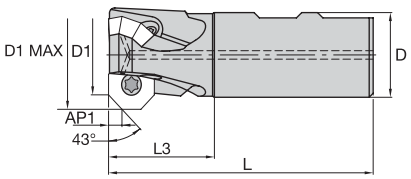
Ordering Example:
1 x KSOM50R06OF06
10 x OFPT06L5AFENGB KC725M

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

NEW!

- Cutting diameters are 32 mm and 40 mm.
- Three insert geometries and six grades to cut most workpiece materials.
- Eight insert cutting edges.





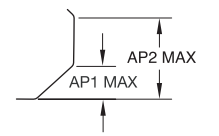
End Mills — Wedge Clamping

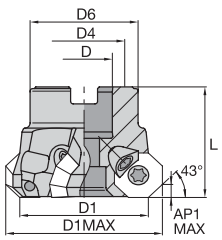
D1	order number	catalog number	Z	D	D1 max	L3	L	Ap1 max	Ap2 max	kg	Max RPM
32	2462846	32D03R040B32SOF04	3	32	41	40	100	3,5	9,0	0,6	19890
40	2488093	40D04R050B32SOF04	4	32	49	50	110	3,5	9,0	0,7	15920

Spare Parts

D1	insert screw	torque (Nm)	wedge	wedge screw	torque (Nm)	Torx plus wrench
32	193.433	6	470.264	193.434	6	TTP15
40	193.433	6	470.264	193.434	6	TTP15

- Cutting diameter ranges from 50 mm to 160 mm.
- Three insert geometries and six grades to cut most workpiece materials.
- Eight insert cutting edges.







Shell Mills — Wedge Clamping

D1	order number	catalog number	Z	D	D1 max	D4	D6	L	Ap1 max	Ap2 max	kgs	Max RPM
50	2487015	50A06RS45OF06A	6	22	59	—	42	43	3,5	9,0	0,4	12730
63	2462847	63A07RS45OF06A	7	22	72	—	54	43	3,5	9,0	0,7	10110
80	2465247	80A09RS45OF06A	9	27	89	—	64	50	3,5	9,0	1,2	7960
100	2462848	100B10RS45OF06A	10	32	109	—	84	50	3,5	9,0	2,1	6370
125	2488094	125B12RS45OF06A	12	40	134	—	94	63	3,5	9,0	3,0	5090
160	2488095	160C16RS45OF06A	16	40	169	67	114	63	3,5	9,0	4,7	3980

Spare Parts

D1	insert screw	torque (Nm)	wedge	wedge screw	torque (Nm)	wrench	mounting screw	coolant clamping screw	coolant cap
50	193.433	6	470.264	193.434	6	TTP15	129.025	MS2072CG	—
63	193.433	6	470.264	193.434	6	TTP15	125.025	420.100	—
80	193.433	6	470.264	193.434	6	TTP15	125.230	420.120	—
100	193.433	6	470.264	193.434	6	TTP15	—	420.160	—
125	193.433	6	470.264	193.434	6	TTP15	—	420.200	470.232
160	193.433	6	470.264	193.434	6	TTP15	—	420.200	470.233

Ordering Example:
1 x 32D03R040B32SOF04
10 x OFPT06L5AFENGB KC725M

Recommended Starting Speeds [m/min]

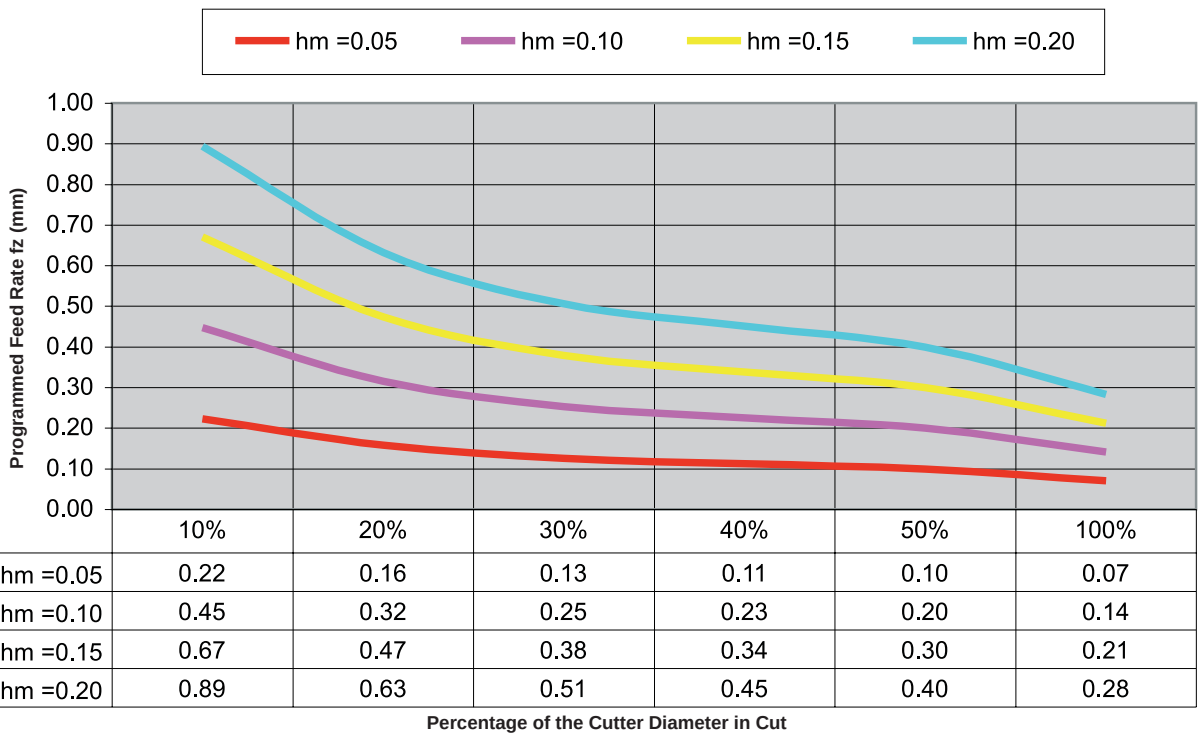
43° approach angle

Material Group	KC410M			KC520M			KC522M			KC725M			KC915M			KC935M		
P1										310	**270**	250				470	**410**	380
P2										190	**180**	160				290	**260**	240
P3										180	**160**	140				260	**240**	220
P4							120	**110**	100	130	**120**	110				200	**180**	160
P5							155	**150**	135	180	**160**	150				265	**240**	215
P6							100	**80**		110	**90**					160	**140**	
M1							180	**160**	150	200	**180**	160				310	**270**	250
M2							170	**150**	140	180	**170**	150				280	**250**	230
M3							120	**110**		140	**120**					210	**180**	
K1				320	**290**	260				200	**180**	160	440	**400**	350	310	**280**	250
K2				250	**220**	210	240	**220**	200	160	**140**	130	350	**310**	290	240	**220**	200
K3				210	**190**	170	200	**180**	170	130	**120**	110	290	**260**	240	200	**180**	170
N1	1450	**1290**	1190															
N2																		
S1							40	**30**		40	**40**							
S2							30	**30**		40	**40**							
S3							40	**40**		50	**50**							
S4							50	**50**		60	**50**							
H1																		

FIRST choice starting speeds are in bold type.
As the average chip thickness value goes higher the speed should be decreased.

Recommended Starting Feeds

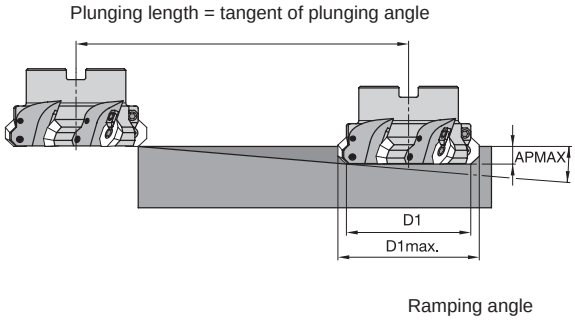
43° Approach Angle Feed-Per-Tooth Compensation (Radial Width-of-Cut Dependent)



	10%	20%	30%	40%	50%	100%
hm =0.05	0.22	0.16	0.13	0.11	0.10	0.07
hm =0.10	0.45	0.32	0.25	0.23	0.20	0.14
hm =0.15	0.67	0.47	0.38	0.34	0.30	0.21
hm =0.20	0.89	0.63	0.51	0.45	0.40	0.28

Percentage of the Cutter Diameter in Cut

Ramping



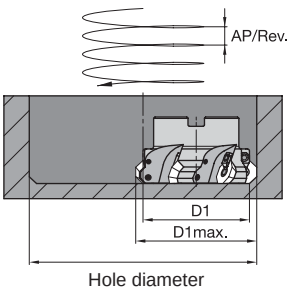
Metric version

D1 mm	D1 max. mm	max. ap mm	Ramping Angle (°)	Ramping Length mm
32	41,1	9	11,0	46,3
40	49,0	9	7,5	68,4
50	58,9	9	5,0	102,9
63	71,8	9	3,9	132,0
80	88,7	9	2,9	177,7
100	108,6	9	2,2	234,3
125	133,6	9	1,7	303,2
160	168,5	9	1,3	396,6

Inch version

D1 inch	D1 max. inch	max. ap inch	Ramping Angle (°)	Ramping Length inch
1.25	1.61	.354	11,0	1.82
1.50	1.85	.354	8,0	2.52
2.00	2.35	.354	5,2	3.89
2.50	2.85	.354	3,8	5.34
3.00	3.34	.354	3,0	6.76
4.00	4.34	.354	2,1	9.66
5.00	5.34	.354	1,6	12.69
6.00	6.34	.354	1,3	15.61

Helical Interpolation



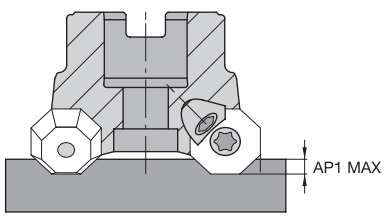
Metric version

D1 mm	D1 max. mm	Hole Diameter min. mm	Hole Diameter max. mm	AP/Rev. mm
32	41,1	61,7	81,7	4,7
40	49,0	77,5	97,6	4,7
50	58,9	97,4	117,4	4,7
63	71,8	123,3	143,3	4,7
80	88,7	157,2	177,2	4,7
100	108,6	197,2	217,1	4,7
125	133,6	247,1	267,0	4,7
160	168,5	317,1	377,0	4,7

Inch version

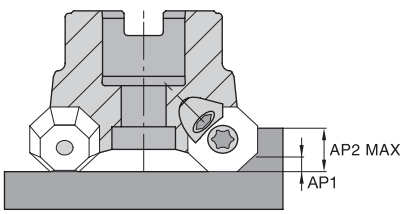
D1 inch	D1 max. inch	Hole Diameter min. inch	Hole Diameter max. inch	AP/Rev. inch
1.25	1.61	2.41	3.20	.185
1.50	1.85	2.91	3.69	.185
2.00	2.35	3.90	4.68	.185
2.50	2.85	4.93	5.68	.185
3.00	3.34	5.89	6.68	.185
4.00	4.34	7.89	8.67	.185
5.00	5.34	9.89	10.67	.185
6.00	6.34	11.89	12.67	.185

Plunging



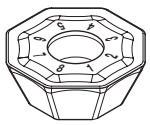
Max. Plunging Depth	mm	inch
AP1 MAX	3,2	.13

Face Milling

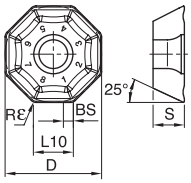


Max. DOC AP	mm	inch	Chipload (fz)
AP1 MAX	3,5	.14	1 x fz
AP2 MAX	9,0	.35	0,6 x fz

Indexable Inserts for KSOM OF.T07L6...



OFKT



● first choice
○ alternate choice

								KC410M	KC520M	KC522M	KC725M	KC915M	KC935M
H													
S										●	●		
N		●								○			
K			●	○		●	○						
M										●	●		○
P										○	●		●

catalog number	cutting edges	D	S	L10	BS	Rε	hm	KC410M	KC520M	KC522M	KC725M	KC915M	KC935M
OFKT07L6AFENGB	8	18,70	6,00	7,50	–	1,20	0,10		●	●	●	●	●
OFKT07L6AFENLB	8	18,70	6,00	7,50	2,10	1,20	0,05		●	●	●	●	●
OFKT07L6AFFNLNJ	8	18,70	6,00	7,50	–	1,20	0,05	●					
OFKT07L6AFSNHB	8	18,70	6,00	7,50	–	1,20	0,20		●	●	●	●	●
OFKT07L6AFSNLB	8	18,70	6,00	7,50	2,10	1,20	0,20		●	●	●	●	●
OFPT07L6AFENGB	8	18,70	6,00	7,50	–	1,20	0,10		●	●	●	●	●
OFPT07L6AFSNHB	8	18,70	6,00	7,50	–	1,20	0,20		●	●	●	●	●

Proven Solution

KSOM

Kennametal cutter: ***125B10RS450F07A***
Kennametal insert: ***OFKT07L6AFENGB***
Grade: ***KC725M***

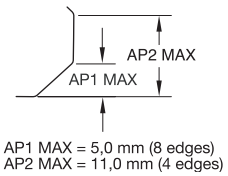
Operation: ***face milling stainless steel***

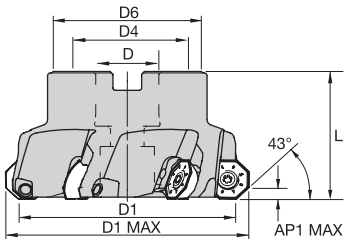
	Kennametal	*Competitor*
cutting speed (m/min):	***140***	***91***
feed per tooth:	***0,25 mm***	***0,20 mm***
axial cutting depth:	***2,54 mm***	***2,54 mm***
time per piece:	***23,16 min***	***44,40 min***
annual costs:	***$54.120,05***	***$101.661,30***

Annual Savings: $47.541,25

NEW!

- Available in diameters of 63 mm to 160 mm.
- Three geometries and six grades for use in most workpiece materials.
- Eight cutting edges.







Shell Mills — Medium Pitch

D1	order number	catalog number	Z	D	D1 max	D4	D6	L	Ap1 max	Max Ramp Angle	kg	Max RPM
63	3115873	KSOM63R04OF07	4	22	74	—	50	43	5,0	5.5°	0,6	10100
80	3115875	KSOM80R04OF07	4	27	91	—	60	50	5,0	4.0°	1,1	7900
100	3115877	KSOM100R05OF07	5	32	111	—	80	50	5,0	3.0°	1,7	6300
125	3115879	KSOM125R06OF07	6	40	136	—	90	63	5,0	2.3°	2,6	5000
160	3115881	KSOM160R07OF07	7	40	171	67	110	63	5,0	1.7°	4,2	3900

Spare Parts

D1	insert screw	Nm	wrench	mounting screw	coolant screw	coolant cap
63	193.409	6	TTP20	125.025	MS1234CG	—
80	193.409	6	TTP20	125.230	MS2038CG	—
100	193.409	6	TTP20	—	MS2189CG	—
125	193.409	6	TTP20	—	420.200	470.232
160	193.409	6	TTP20	—	420.200	470.233

Shell Mills — Fine Pitch

D1	order number	catalog number	Z	D	D1 max	D4	D6	L	Ap1 max	Max Ramp Angle	kg	Max RPM
63	3115582	KSOM63R05OF07	5	22	74	—	50	43	5,0	5.5°	0,6	10100
80	3115874	KSOM80R06OF07	6	27	91	—	60	50	5,0	4.0°	1,1	7900
100	3115876	KSOM100R08OF07	8	32	111	—	80	50	5,0	3.0°	1,6	6300
125	3115878	KSOM125R10OF07	10	40	136	—	90	63	5,0	2.3°	2,7	5000
160	3115880	KSOM160R12OF07	12	40	171	67	110	63	5,0	1.7°	4,3	3900

Spare Parts

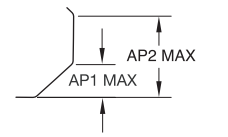
D1	insert screw	(Nm)	wrench	mounting screw	coolant screw	coolant cap
63	193.409	6	TTP20	125.025	MS1234CG	—
80	193.409	6	TTP20	125.230	MS2038CG	—
100	193.409	6	TTP20	—	MS2189CG	—
125	193.409	6	TTP20	—	420.200	470.232
160	193.409	6	TTP20	—	420.200	470.233

Ordering Example:
1 x KSOM63R04OF07
10 x OFPT07L6AFENGB KC935M

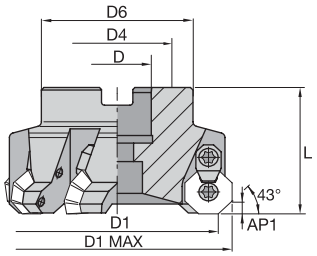
Indexable Shell Mills

NEW!

- 5 mm depth-of-cut capability.
- Cutting diameter ranges from 63 mm to 160 mm.
- Enables unsurpassed feed rates.
- Eight cutting edges for economy and reduced tooling inventory.
- Through-coolant standard.



AP1 MAX = 5,0 mm (8 edges)
AP2 MAX = 11,0 mm (4 edges)



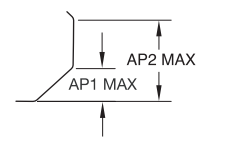
Shell Mills — Screw Clamping — Coarse Pitch

D1	order number	catalog number	Z	D	D1 max	D4	D6	L	Ap1 max	Ap2 max	kgs	Max RPM
63	2250670	63A05RS45OF07A	5	22	74	—	54	43	5,0	11,0	0,6	10100
80	2228047	80A06RS45OF07A	6	27	91	—	64	50	5,0	11,0	1,1	7900
100	2213791	100B08RS45OF07A	8	32	111	—	84	50	5,0	11,0	1,7	6300
125	2252793	125B10RS45OF07A	10	40	136	—	94	63	5,0	11,0	2,9	5000
160	2241172	160C12RS45OF07A	12	40	171	102	114	63	5,0	11,0	4,5	3900

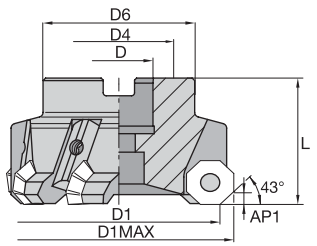
Spare Parts

D1	insert screw	torque (Nm)	clamp	clamp screw	torque (Nm)	wrench	mounting screw	coolant clamping screw	coolant cap
63	193.409	6	470.257	193.409	6	TTP20	125.025	420.100	—
80	193.409	6	470.257	193.409	6	TTP20	125.230	420.120	—
100	193.409	6	470.257	193.409	6	TTP20	—	420.160	—
125	193.409	6	470.257	193.409	6	TTP20	—	420.200	470.232
160	193.409	6	470.257	193.409	6	TTP20	—	420.200	470.233

NEW!



AP1 MAX = 5,0 mm (8 edges)
AP2 MAX = 11,0 mm (4 edges)



Shell Mills — Wedge Clamping — Fine Pitch

D1	order number	catalog number	Z	D	D1 max	D4	D6	L	Ap1 max	Ap2 max	kgs	Max RPM
63	2252910	63A07RF45OF07A	7	22	74,2	—	54	43	5,00	11,00	0,7	7580
80	2255272	80A09RF45OF07A	9	27	90,9	—	64	50	5,00	11,00	1,1	5970
100	2255333	100B11RF45OF07A	11	32	111,0	—	84	50	5,00	11,00	1,7	4770
125	2255334	125B13RF45OF07A	13	40	135,9	—	94	63	5,00	11,00	2,9	3820
160	2255335	160C17RF45OF07A	17	40	170,8	66,7	114	63	5,00	11,00	4,5	2980

Spare Parts

D1	wedge	wedge screw	torque (Nm)	wrench	mounting screw	coolant clamping screw	coolant cap
63	470.259	STCM1115IP	5	TTP15	125.025	420.100	—
80	470.259	STCM1115IP	5	TTP15	125.230	420.120	—
100	470.259	STCM1115IP	5	TTP15	—	420.160	—
125	470.259	STCM1115IP	5	TTP15	—	420.200	470.232
160	470.259	STCM1115IP	5	TTP15	—	420.200	470.233

Ordering Example:
1 x 63A05RS45OF07A
10 x OFKT07L6AFENGB KC725M

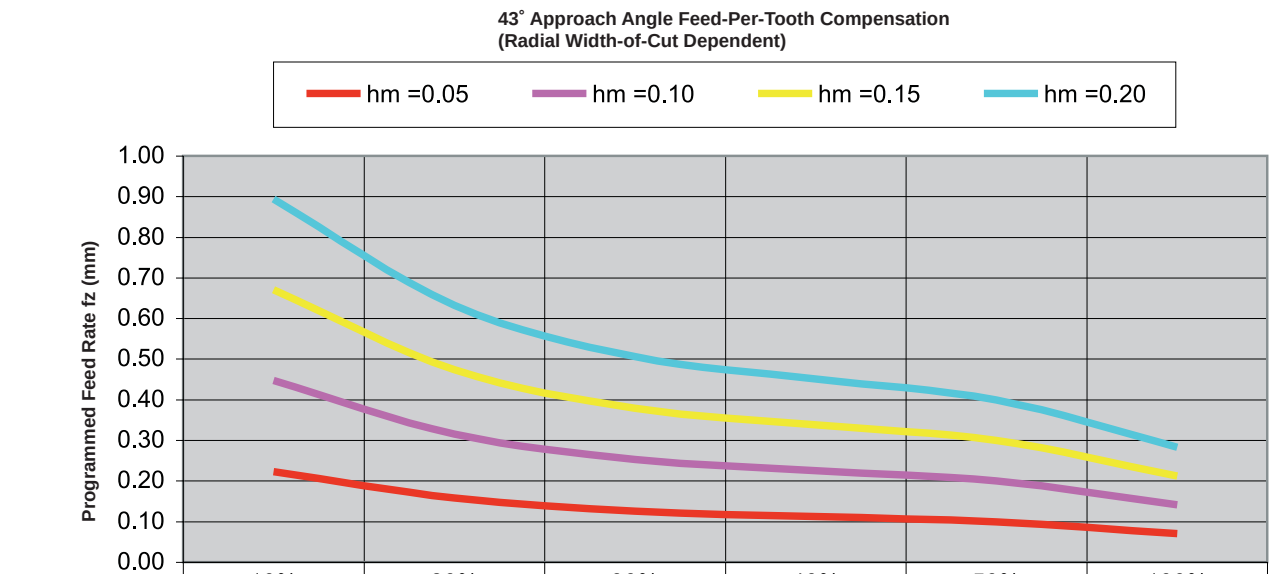
Recommended Starting Speeds [m/min]

43° approach angle

Material Group	KC410M			KC520M			KC522M			KC725M						KC935M		
P1										310	**270**	250				470	**410**	380
P2										190	**180**	160				290	**260**	240
P3										180	**160**	140				260	**240**	220
P4							120	**110**	100	130	**120**	110				200	**180**	160
P5							155	**150**	135	180	**160**	150				265	**240**	215
P6							100	**80**	70	110	**90**					160	**140**	
M1							180	**160**	150	200	**180**	160				310	**270**	250
M2							170	**150**	140	180	**170**	150				280	**250**	230
M3							120	**110**	90	140	**120**					210	**180**	
K1				320	**290**	260				200	**180**	160	440	**400**	350	310	**280**	250
K2				250	**220**	210	240	**220**	200	160	**140**	130	350	**310**	290	240	**220**	200
K3				210	**190**	170	200	**180**	170	130	**120**	110	290	**260**	240	200	**180**	170
N1	1450	**1290**	1190															
N2																		
S1							40	**30**		40	**40**							
S2							30	**30**		40	**40**							
S3							40	**40**		50	**50**							
S4							50	**50**		60	**50**							
H1																		

FIRST choice starting speeds are in bold type.
As the average chip thickness value goes higher the speed should be decreased.

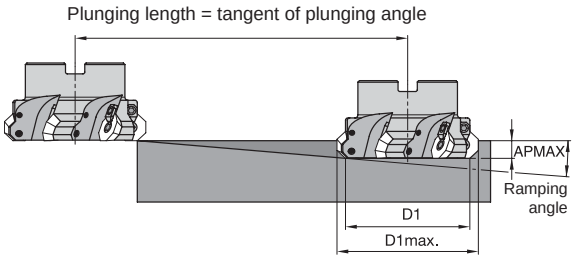
Recommended Starting Feeds



	10%	20%	30%	40%	50%	100%
hm =0.05	0.22	0.16	0.13	0.11	0.10	0.07
hm =0.10	0.45	0.32	0.25	0.23	0.20	0.14
hm =0.15	0.67	0.47	0.38	0.34	0.30	0.21
hm =0.20	0.89	0.63	0.51	0.45	0.40	0.28

Percentage of the Cutter Diameter in Cut

Ramping



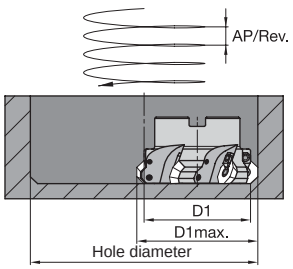
Metric version

D1 mm	D1 max. mm	max ap mm	Ramping Angle (°)	Ramping Length mm
63	74,2	11,7	5,5	121,5
80	91,1	11,7	4,0	167,3
100	111,0	11,7	3,0	223,2
125	135,9	11,7	2,3	291,3
160	170,8	11,7	1,7	394,2

Inch version

D1 inch	D1 max. inch	max ap inch	Ramping Angle (°)	Ramping Length inch
2.50	2.94	.46	5.5	4.78
3.00	3.44	.46	4.2	6.27
4.00	4.43	.46	2.9	9.09
5.00	5.43	.46	2.2	11.99
6.00	6.43	.46	1.8	14.65

Helical Interpolation



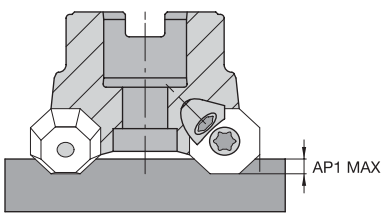
Metric version

D1 mm	D1 max. mm	Hole Diameter min. mm	Hole Diameter max. mm	AP/Rev. mm
63	74,2	122,7	145,0	6,3
80	91,1	156,6	178,0	6,3
100	111,0	196,5	218,7	6,3
125	135,9	246,4	268,7	6,3
160	170,8	316,3	338,6	6,3

Inch version

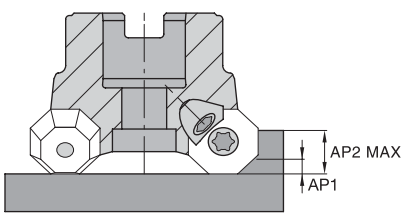
D1 inch	D1 max. inch	Hole Diameter min. inch	Hole Diameter max. inch	AP/Rev. inch
2.50	2.94	4.872	5.748	.248
3.00	3.44	5.868	6.744	.248
4.00	4.43	7.863	8.739	.248
5.00	5.43	9.859	10.736	.248
6.00	6.43	11.857	12.733	.248

Plunging



Max. Plunging Depth	mm
AP1 MAX	4,2

Face Milling



Max. DOC AP	mm	Chipload (fz)
AP1 MAX	5,0	1 x fz
AP2 MAX	11,7	0,6 x fz

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

KENNAMETAL COMPLETE









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- Reconditioning & Recycling
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KENNAMETAL® Complete

PARTNERS
- Machine Tool Builders
- Optimization Experts
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- Complementary Products & Services

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- Commercial
- Application Engineering

KENNAMETAL® Complete



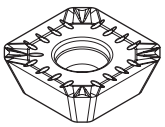
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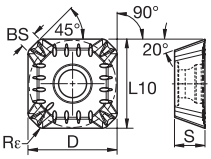
Contact Kennametal or visit www.kennametal.com

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Indexable Inserts for KSSM 45° SE..1404...



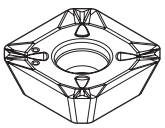
SEKT-GP2



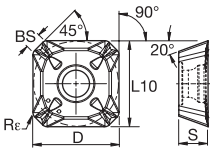
● first choice
○ alternate choice

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

catalog number	cutting edges	D	S	L10	BS	Rε	hm	KC410M	KC520M	KC715M	KC725M	KC915M	KC935M	KT530M	KY3500
SEKT1404AEENGP2	4	14,00	4,76	14,00	2,65	1,00	0,06		●		●	●	●		
SEKT1404AESNGP2	4	14,00	4,76	14,00	2,65	1,00	0,11		●		●	●	●		



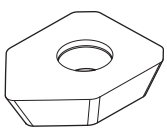
SECT-LD2-LE



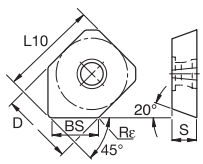
● first choice
○ alternate choice

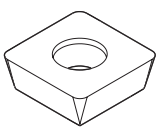
H	S	N	K	M	P
		●			
	●		●	●	
			●		●
	●		○	○	
			○		●
	○				
			●		●
			○		●
			●		●

catalog number	cutting edges	D	S	L10	BS	Rε	hm	KC410M	KC520M	KC715M	KC725M	KC915M	KC935M	KT530M	KY3500
SECT1404AEENLD2	4	14,00	4,76	14,00	2,65	1,00	0,05				●				
SECT1404AEFNLE	4	14,00	4,76	14,00	2,65	1,00	0,05	●							

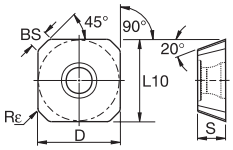


SECW-GNW





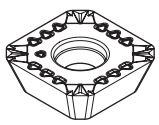
SECW-GN



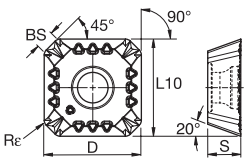
● first choice
○ alternate choice

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

catalog number	cutting edges	D	S	L10	BS	Rε	hm	KC410M	KC520M	KC715M	KC725M	KC915M	KC935M	KT530M	KY3500
SECW1404AEENGNW	2	14,00	4,76	19,17	8,26	0,8	–		●	●	●				
SECW1404AESNGNW	2	14,00	4,76	19,17	8,26	0,8	–							●	
SECW1404AESNGN	4	14,00	4,76	14,00	2,65	1,0	0,08								●



SEPT-GB2



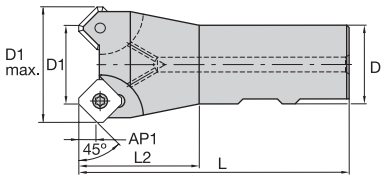
● first choice
○ alternate choice

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

catalog number	cutting edges	D	S	L10	BS	Rε	hm	KC410M	KC520M	KC715M	KC725M	KC915M	KC935M	KT530M	KY3500
SEPT1404AEENGB2	4	14,00	4,76	14,00	2,65	1,0	0,08		●		●	●	●		
SEPT1404AESNGB2	4	14,00	4,76	14,00	2,65	1,0	0,14		●		●	●	●	●	

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

- Consumes less power.
- Rapid insert changes.
- Economical to use.
- Suitable for a wide variety of workpiece materials.



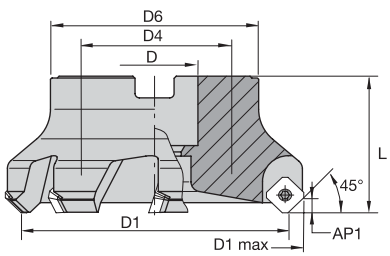


End Mills

D1	order number	catalog number	Z	D	D1 max	L2	L	Ap1 max	kgs	Max RPM
40	1926943	40D3R049B32SSE14G	3	32	54	49	110	7	0,7	26000

Spare Parts

D1	insert screw	Torx wrench	torque (Nm)
40	MS2078	DT15IP	4





Shell Mills — Coarse Pitch

D1	order number	catalog number	Z	D	D1 max	D4	D6	L	Ap1 max	kgs	Max RPM
40	1926850	40A03RS45SE14EG	3	16	54	—	44	40	6,6	0,3	26000
50	1926812	50A03RS45SE14EG	3	22	64	—	50	40	6,6	0,4	22500
63	1926899	63A04RS45SE14EG	4	22	77	—	50	40	6,6	0,5	20200
80	1926894	80A05RS45SE14EG	5	27	94	—	60	50	6,6	1,1	18000
100	1926926	100B05RS45SE14EG	5	32	114	—	80	50	6,6	1,7	16000
125	1926924	125B06RS45SE14EG	6	40	139	—	90	63	6,6	2,9	14400
160	1926909	160C07RS45SE14EG	7	40	174	67	100	63	6,6	4,1	12500

Shell Mills — Medium Pitch

D1	order number	catalog number	Z	D	D1 max	D6	L	Ap1 max	kgs	Max RPM
50	1926900	50A04RS45SE14EG	4	22	64	50	40	6,6	0,4	22500
63	1926897	63A05RS45SE14EG	5	22	77	50	40	6,6	0,6	20200
80	1926893	80A06RS45SE14EG	6	27	94	60	50	6,6	1,2	18000
100	1926925	100B07RS45SE14EG	7	32	114	80	50	6,6	1,8	16000
125	1926911	125B08RS45SE14EG	8	40	139	90	63	6,6	3,0	14400
160	1926908	160C10RS45SE14EG	10	40	174	100	63	6,6	4,3	12500

Spare Parts

D1	insert screw	Torx wrench	torque (Nm)	shim	shim screw	hex wrench	torque (Nm)	mounting screw	coolant screw	coolant cap
40	MS2078	DT15IP	4	—	—	—	—	MS2040	—	—
50	MS2078	DT15IP	4	—	—	—	—	129.025	—	—
63	MS2078	DT15IP	4	—	—	—	—	129.025	420.100	—
80	MS2078	DT15IP	4	SM455	SRS3	DH35M	4,5	MS2038	420.120	—
100	MS2078	DT15IP	4	SM455	SRS3	DH35M	4,5	—	420.160	—
125	MS2078	DT15IP	4	SM455	SRS3	DH35M	4,5	—	420.200	470.232
160	MS2078	DT15IP	4	SM455	SRS3	DH35M	4,5	—	420.200	470.233

Ordering Example:
1 x 40D3R049B32SSE14G
10 x SEKT1404AEENGP KC725M

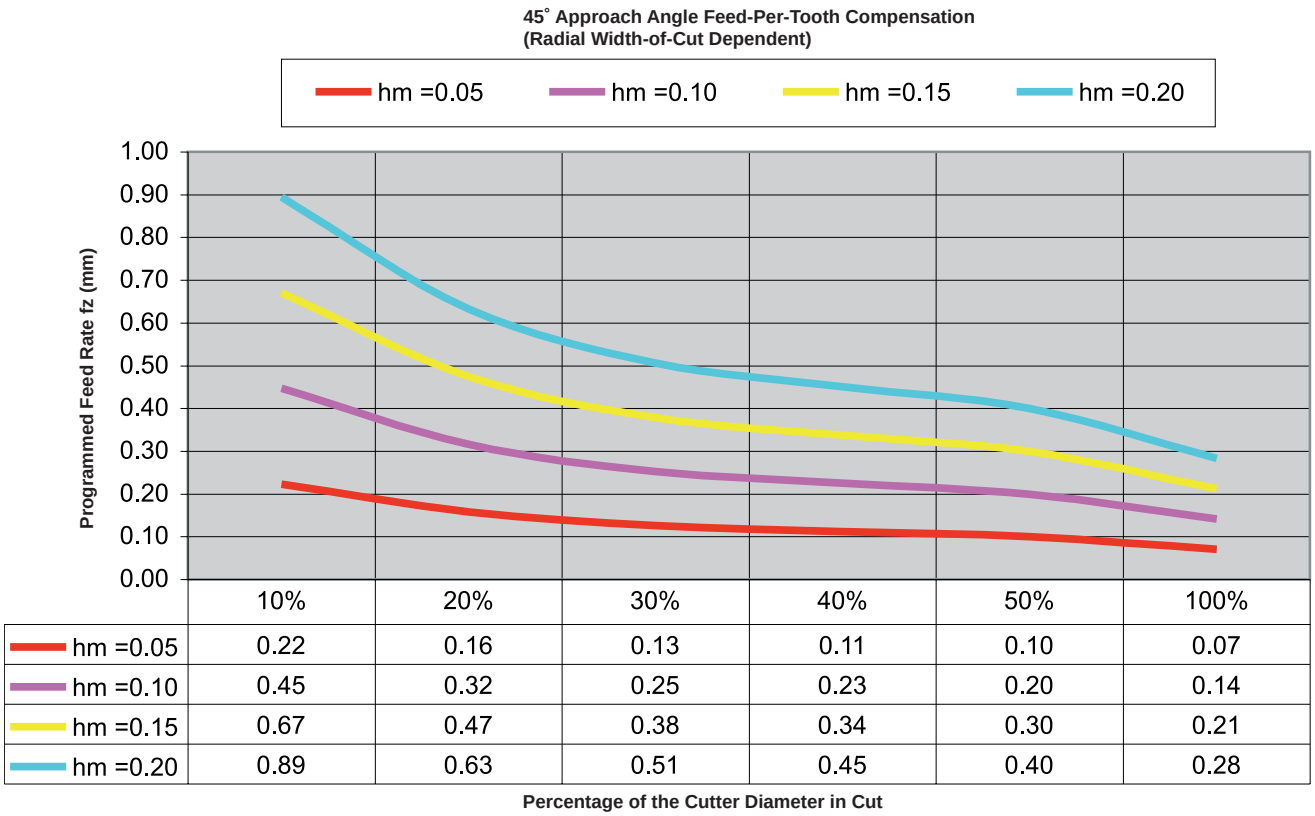
Recommended Starting Speeds [m/min]

45° approach angle

Material Group	KC410M			KC520M			KC715M			KC725M			KC915M			KC935M			KT530M			KY3500		
P1							410	**360**	330	310	**270**	250				470	**410**	380	350	**300**	280			
P2							250	**220**	200	190	**180**	160				290	**260**	240	210	**190**	170			
P3							220	**200**	180	180	**160**	140				260	**240**	220	190	**170**	160			
P4							170	**160**	140	130	**120**	110				200	**180**	160	150	**130**	120			
P5							230	**205**	180	180	**160**	150				265	**240**	215	200	**175**	160			
P6							140	**120**	100	110	**90**					160	**140**		120	**110**				
M1							270	**230**	220	200	**180**	160				310	**270**	250	220	**200**	180			
M2										180	**170**	150				280	**250**	230	200	**180**	170			
M3										140	**120**					210	**180**		150	**130**				
K1				320	**290**	260				200	**180**	160	440	**400**	350	310	**280**	250				800	**730**	650
K2				250	**220**	210				160	**140**	130	350	**310**	290	240	**220**	200				630	**570**	530
K3				210	**190**	170				130	**120**	110	290	**260**	240	200	**180**	170				530	**470**	430
N1	1450	**1290**	1190																					
N2																								
S1										40	**40**													
S2										40	**40**													
S3										50	**50**													
S4										60	**50**													
H1																								

FIRST choice starting speeds are in bold type.
As the average chip thickness value goes higher the speed should be decreased.

Recommended Starting Feeds



	10%	20%	30%	40%	50%	100%
hm =0.05	0.22	0.16	0.13	0.11	0.10	0.07
hm =0.10	0.45	0.32	0.25	0.23	0.20	0.14
hm =0.15	0.67	0.47	0.38	0.34	0.30	0.21
hm =0.20	0.89	0.63	0.51	0.45	0.40	0.28

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- set-up by more than 20%!
- tool-changing time by up to 70%!



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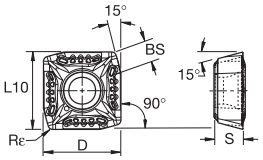
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Indexable Inserts for KSSM 75° SD.T1204...



SDKT-GP



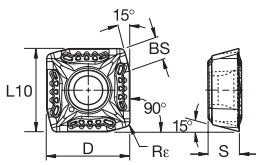
● first choice
○ alternate choice

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

catalog number	cutting edges	D	S	L10	BS	Rε	hm	KC725M	KC735M	KC915M	KC935M
SDKT1204EDERGP	4	12,70	4,76	12,70	3,51	0,8	0,06	●	●	●	●
SDKT1204EDSRGP	4	12,70	4,76	12,70	3,51	0,8	0,13	●		●	●



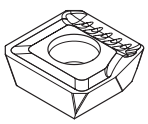
SDPT-GB



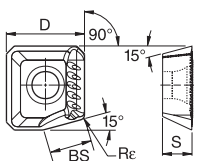
● first choice
○ alternate choice

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

catalog number	cutting edges	D	S	L10	BS	Rε	hm	KC510M	KC520M	KC525M	KC715M	KC725M	KC915M	KC935M	KT530M
SDPT1204EDERGB	4	12,70	4,76	12,70	3,51	0,8	0,10	●	●	●	●	●	●	●	●
SDPT1204EDSRGB	4	12,70	4,76	12,70	3,51	0,8	0,20				●	●			●



SDKT-W

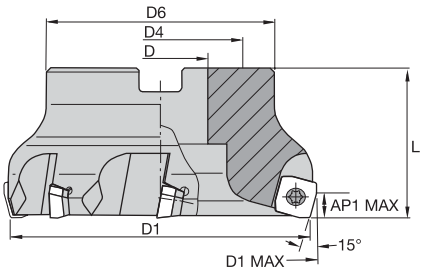


● first choice
○ alternate choice

H														
S														●
N														
K													●	
M														●
P														●

catalog number	cutting edges	D	S	BS	Rε	KC520M	KC725M
SDKT1204EDERGP1W	1	12,70	4,76	7,01	0,8	●	●

- Consumes less power.
- Rapid insert changes.
- Economical to use.
- Suitable for a wide variety of workpiece materials.





Shell Mills — Coarse Pitch

D1	order number	catalog number	Z	D	D1 max	D4	D6	L	Ap1 max	kg	Max RPM
50	1926892	50A03RS75SD12DG	3	22	54,2	—	49	40	8	0,3	20600
63	1926889	63A04RS75SD12DG	4	22	67,2	—	50	40	8	0,5	18300
80	1926913	80A05RS75SD12DG	5	27	84,2	—	60	50	8	1,1	16300
100	1926882	100B06RS75SD12DG	6	32	104,2	—	80	50	8	1,7	14600
125	1926937	125B07RS75SD12DG	7	40	129,2	—	90	63	8	3,0	13000
160	1926934	160C08RS75SD12DG	8	40	164,2	66,7	100	63	8	4,3	11500

Shell Mills — Fine Pitch

D1	order number	catalog number	Z	D	D1 max	D4	D6	L	Ap1 max	kg	Max RPM
50	1926891	50A04RS75SD12DG	4	22	54,2	—	50	40	8	0,4	20600
63	1926915	63A06RS75SD12DG	6	22	67,2	—	50	40	8	0,5	18300
80	1926842	80A06RS75SD12DG	6	27	84,2	—	60	50	8	1,1	16300
100	1926881	100B08RS75SD12DG	8	32	104,2	—	80	50	8	1,7	14600
125	1926935	125B09RS75SD12DG	9	40	129,2	—	90	63	8	3,1	13000
160	1926872	160C10RS75SD12DG	10	40	164,2	66,7	100	63	8	4,4	11500

Spare Parts

D1	insert screw	Torx wrench	torque (Nm)	shim	shim screw	hex wrench	torque (Nm)	mounting screw	coolant clamping screw	coolant cap
50	MS2078	DT15IP	4	—	—	—	—	MS1234	—	—
63	MS2078	DT15IP	4	—	—	—	—	MS1234	420.100	—
80	MS2078	DT15IP	4	SM451	SRS3	DH35M	4,5	MS2038	420.120	—
100	MS2078	DT15IP	4	SM451	SRS3	DH35M	4,5	—	420.160	—
125	MS2078	DT15IP	4	SM451	SRS3	DH35M	4,5	—	420.200	470.232
160	MS2078	DT15IP	4	SM451	SRS3	DH35M	4,5	—	420.200	470.233

Ordering Example:
1 x 50A04RS75SD12DG
10 x SDKT1204EDERGP KC725M

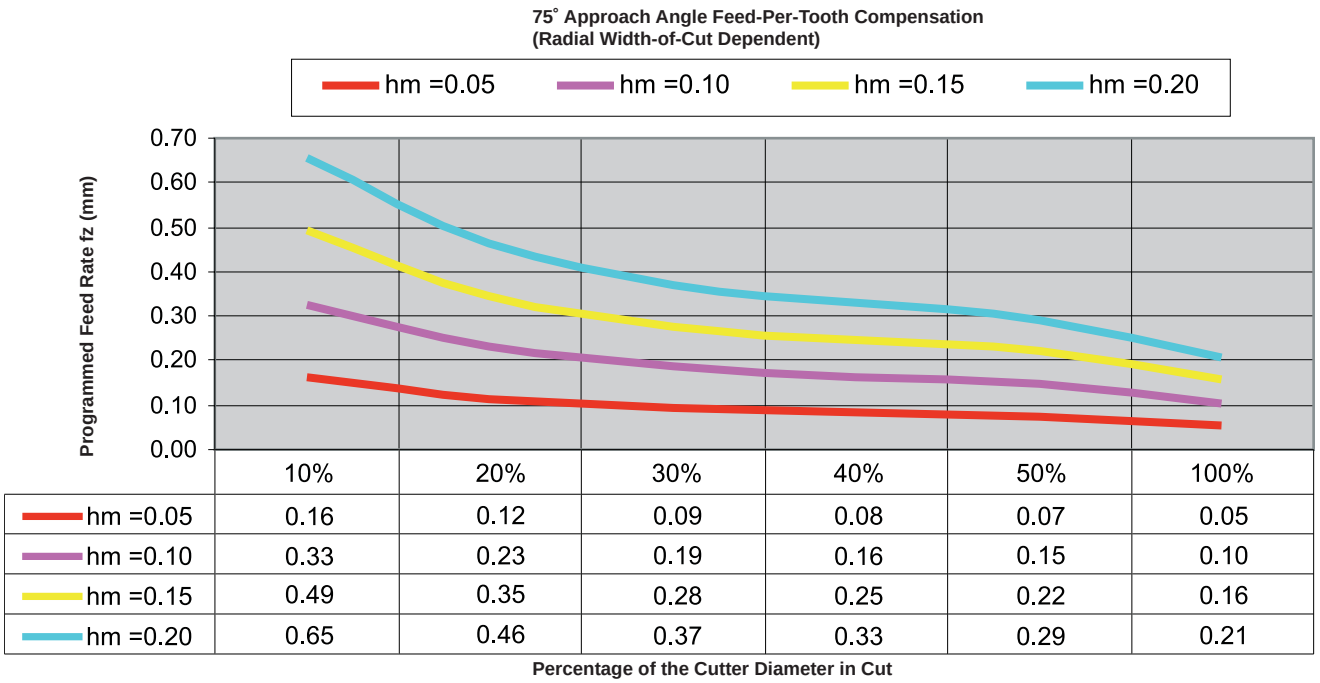
Recommended Starting Speeds [m/min]

75º approach angle

Material Group	KC510M			KC520M			KC525M			KC715M			KC725M			KC735M			KC915M			KC935M			KT530M		
P1										340	**300**	275	260	**230**	215							395	**345**	320	290	**250**	235
P2										210	**190**	170	165	**145**	130							245	**220**	200	180	**160**	140
P3										190	**170**	155	150	**130**	120							220	**200**	180	160	**140**	130
P4										145	**130**	120	110	**100**	90							165	**150**	140	125	**110**	100
P5										235	**210**	190	180	**160**	145							270	**245**	220	200	**180**	160
P6										120	**105**		90	**80**								140	**120**		100	**90**	
M1							215	**185**	150	225	**195**	180	170	**150**	140	105	**90**	80				260	**225**	210	190	**165**	150
M2							180	**150**	125				155	**140**	130	95	**85**	75				235	**210**	190	170	**155**	140
M3							150	**125**	110				120	**105**		70	**60**					175	**155**		130	**115**	
K1	295	**265**	240	270	**245**	215							165	**150**	130				365	**330**	295	260	**230**	210			
K2	230	**210**	190	210	**190**	180							130	**115**	110				290	**260**	240	205	**180**	170			
K3	195	**175**	160	180	**160**	145							110	**100**	90				240	**216**	200	170	**150**	140			
N1	650	**570**	520																								
N2																											
S1							50	**40**					40	**30**													
S2							40	**30**					30	**30**													
S3							30	**30**					40	**40**													
S4							25	**25**					50	**45**													
H1																											

FIRST choice starting speeds are in bold type.
As the average chip thickness value goes higher the speed should be decreased.

Recommended Starting Feeds



	10%	20%	30%	40%	50%	100%
hm =0.05	0.16	0.12	0.09	0.08	0.07	0.05
hm =0.10	0.33	0.23	0.19	0.16	0.15	0.10
hm =0.15	0.49	0.35	0.28	0.25	0.22	0.16
hm =0.20	0.65	0.46	0.37	0.33	0.29	0.21

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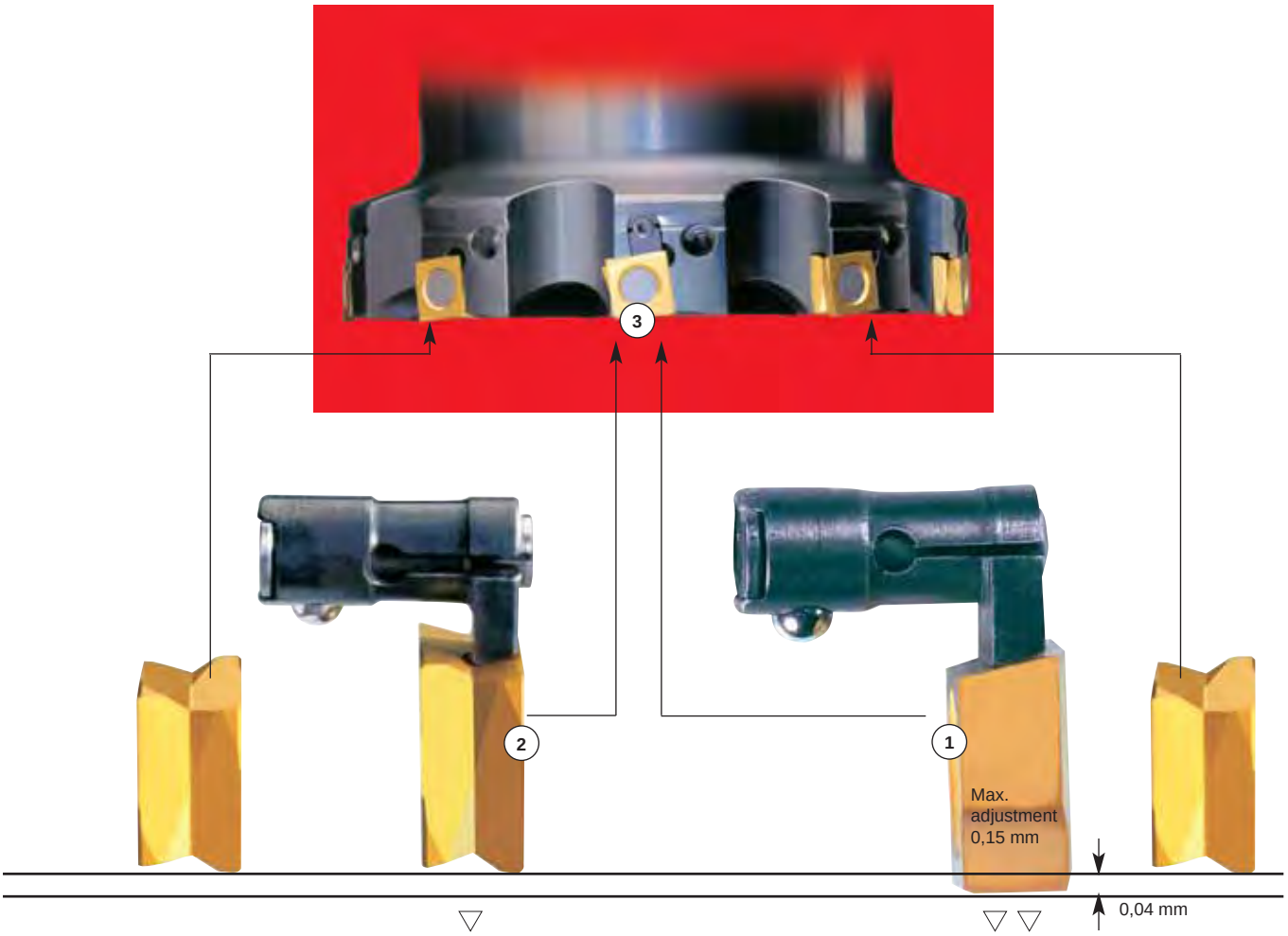
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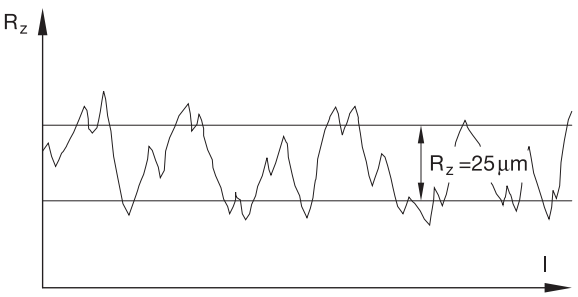
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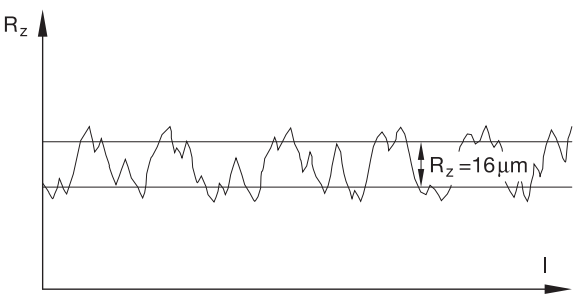
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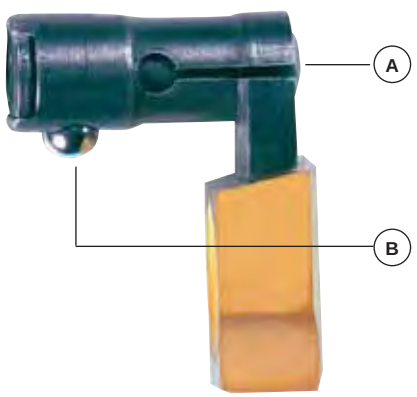
The Concept: Roughing and Finishing in One Work Cycle



For 70° and 90° milling cutters with standard pitch







The benefits

- µ-precise positioning (A) and easy handling using an Allen key.
- Same insert seat (3) for roughing (2) and finishing edges (1) with no additional elements required.
- Ball clamp for quick and easy interchangeability (B).

FIX-PERFECT Concept

8 x indexing

8 true cutting edges for face and shoulder milling.



Your Benefit

8 x cutting

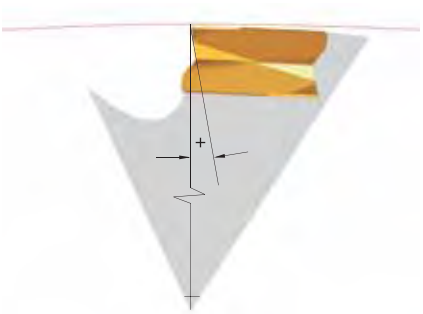
Best productivity and low costs per cutting edge.

Powerful cutting grades.
KC520M, KC715M, KC725M, KC915M, KC930M, KC935M, KT530M, KY3500



Performance booster with high consistency and reliability.

Positive rake angle.



Low cutting forces and soft cutting action.

Roughing and finishing in one single operation.

Adjustable wiper inserts.



Best in class surface quality and short cycle time.

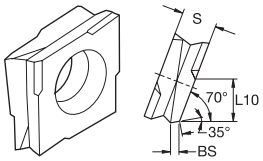
Tangential insert positioning.



Excellent cutting stability.

- easy and secure clamping mechanism.
- protection of non-cutting edges.
- perfect concept for high feed rates.

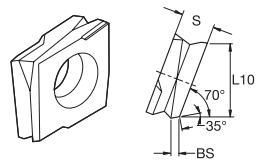
Indexable Inserts for FIX-PERFECT SPHX1205...



SPHX – GP
8 Cutting Edges

● first choice
○ alternate choice

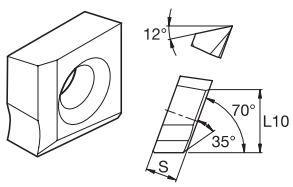
						KC520M	KC725M	KC915M	KC935M	KT530M	KY3500
catalog number	cutting edges	L10	S	BS	hm						
SPHX1205ZCERGP	8	5,41	5,50	0,70	0,10	●		●	●		
SPHX1205ZCSRGP	8	5,41	5,50	0,70	0,15		●	●	●		
SPHX1205ZCTRGP	8	5,41	5,50	0,70	0,10					●	
SPHX1205ZCTRGPK	8	5,41	5,50	0,70	0,10						●



SPHX – GP4S
4 Cutting Edges

● first choice
○ alternate choice

						KC520M	KC725M	KC915M	KY3500
catalog number	cutting edges	L10	S	BS	hm				
SPHX1205ZCERGP4S	4	10,04	5,50	0,70	0,10	●		●	
SPHX1205ZCSRGP4S	4	10,05	5,50	0,70	0,15		●		
SPHX1205ZCTRGP4SK	4	10,06	5,50	0,70	0,10				●

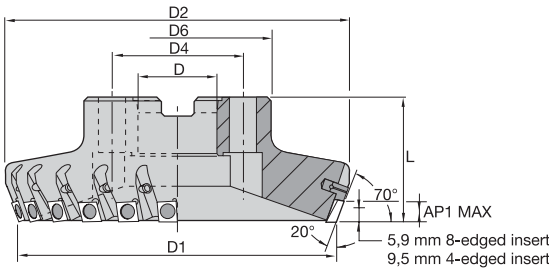


SPHX – W
Indexable Inserts - Finishing

● first choice
○ alternate choice

					KC520M	KC725M	KC915M	KY3500	KB1340
catalog number	cutting edges	L10	S	hm					
SPHX1205ZCER-GP1W	1	10,00	5,50	–	●		●		
SPHX1205ZCERGNT1W	1	10,00	5,50	–					●
SPHX1205ZCFRGN1W	1	10,00	5,50	–	●	●	●		
SPHX1205ZCFRGN1WK	1	10,00	5,50	–				●	
SPHX1205ZCSR-GP1W	1	10,00	5,50	–		●			
SPHX1205ZCTR-GP1WK	1	10,00	5,50	–				●	

- Rough and finish in one operation.
- Eight true cutting edges.
- Tangential mounted inserts deliver higher feed rates.
- Coarse, medium and fine pitch available.





Face Mills 70° — Coarse Pitch

D1	order number	catalog number	Z	Z ADJ	D	D2	D4	D6	L	Ap1 max	kgs	Max RPM
50	1503027	50A04RP70SP12CFP	4	0	22	62	—	42	43	5,9	0,5	6300
63	1503029	63B05RP70SP12CFP	5	0	22	75	—	54	40	5,9	0,7	5000
80	1503038	80B06RP70SP12C1WFP	6	1	27	92	—	64	50	5,9	1,2	4000
100	1503034	100B08RP70SP12C2WFP	8	2	32	112	—	84	50	5,9	2,0	3200
125	1503049	125B10RP70SP12C2WFP	10	2	40	137	—	94	63	5,9	3,2	2500
160	1503054	160C12RP70SP12C3WFP	12	3	40	173	66,7	94	63	5,9	4,2	2000
200	1503057	200C16RP70SP12C4WFP	16	4	60	212	101,6	134	63	5,9	6,5	1600
250	1503059	250C20RP70SP12C4WFP	20	4	60	262	101,6	134	63	5,9	10,0	1300

Face Mills 70° — Medium Pitch

D1	order number	catalog number	Z	Z ADJ	D	D2	D4	D6	L	Ap1 max	kgs	Max RPM
50	1887100	50A05RP70SP12CFP	5	0	22	62	—	42	43	5,9	0,5	6300
63	1887101	63B07RP70SP12CFP	7	0	22	75	—	54	40	5,9	0,8	5000
80	1887102	80B08RP70SP12C2WFP	8	2	27	92	—	64	50	5,9	1,3	4000
100	1887173	100B12RP70SP12C3WFP	12	3	32	112	—	84	50	5,9	2,1	3200
125	1887174	125B15RP70SP12C3WFP	15	3	40	137	—	94	63	5,9	3,3	2500
160	1887175	160C18RP70SP12C3WFP	18	3	40	173	66,7	94	63	5,9	4,4	2000
200	1887176	200C24RP70SP12C4WFP	24	4	60	212	101,6	134	63	5,9	6,7	1600
250	1887177	250C30RP70SP12C5WFP	30	5	60	262	101,6	134	63	5,9	10,2	1300

Face Mills 70° — Fine Pitch

D1	order number	catalog number	Z	D	D2	D6	L	Ap1 max	kgs	Max RPM
50	1501666	50A06RP70SP12CFP	5	22	62	42	43	5,9	0,5	6300
63	1501667	63B08RP70SP12CFP	8	22	75	54	40	5,9	0,8	5000
80	1501668	80B10RP70SP12CFP	10	27	92	64	50	5,9	1,3	4000
100	1501701	100B14RP70SP12CFP	14	32	112	84	50	5,9	2,0	3200
125	1501669	125B18RP70SP12CFP	18	40	137	94	63	5,9	3,3	2500

Spare Parts

D1	adj element	adj element screw	Torx wrench	clamp stud	set screw	hex wrench	torque (Nm)	mounting screw	coolant screw	coolant cap
50	—	—	—	410.081	121.612	170.003	5	125.025	420.100	—
63	—	—	—	410.081	121.612	170.003	5	—	420.102	—
80	479.100	193.300	KT9	410.081	121.612	170.003	5	—	420.122	—
100	479.100	193.300	KT9	410.081	121.612	170.003	5	—	420.160	—
125	479.100	193.300	KT9	410.081	121.612	170.003	5	—	420.200	470.232
160	479.100	193.300	KT9	410.081	121.612	170.003	5	—	420.200	470.233
200	479.100	193.300	KT9	410.081	121.612	170.003	5	—	—	470.234
250	479.100	193.300	KT9	410.081	121.612	170.003	5	—	—	470.235

For diameters of 125 mm and 160 mm, use the coolant screw and coolant cap spare parts together.

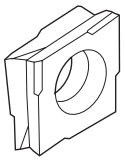
Spare parts must be ordered separately.

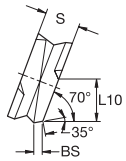


Torque wrench (KTW-45) and 3 mm hex bit (69709922164) may be purchased separately to ensure proper torque setting.

Ordering Example:
1 x 50A04RP70SP12CFP
10 x SPHX1205ZCERGP KC915M

Indexable Inserts for FIX-PERFECT SPHX15T6...



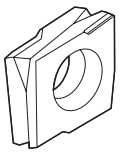


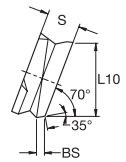
SPHX – GP
8 Cutting Edges

● first choice
○ alternate choice

	K110M	KC520M	KC725M	KC915M	KC935M	KT530M	KY3500
H							
S							
N							
K	●	●	○	●	●	●	●
M							
P							

catalog number	cutting edges	L10	S	BS	hm	K110M	KC520M	KC725M	KC915M	KC935M	KT530M	KY3500
SPHX15T6ZCERGP	8	6,52	6,60	1,20	0,10		●		●	●		
SPHX15T6ZCSRGP	8	6,52	6,60	1,20	0,15	●		●		●		
SPHX15T6ZCTRGP	8	6,50	6,60	1,20	0,10						●	
SPHX15T6ZCTRGPK	8	6,50	6,60	1,20	0,10							●



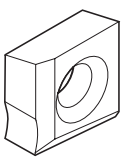


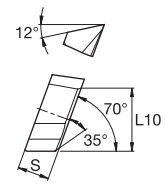
SPHX–GP4S
4 Cutting Edges

● first choice
○ alternate choice

	KC520M	KC725M	KC915M	KY3500
H				
S				
N				
K	●	○	●	●
M				
P				

catalog number	cutting edges	L10	S	BS	hm	KC520M	KC725M	KC915M	KY3500
SPHX15T6ZCERGP4S	4	12,49	6,60	1,20	0,10	●		●	
SPHX15T6ZCSRGP4S	4	12,49	6,60	1,20	0,15		●		
SPHX15T6ZCTRGP4SK	4	12,51	6,60	1,20	0,10				●





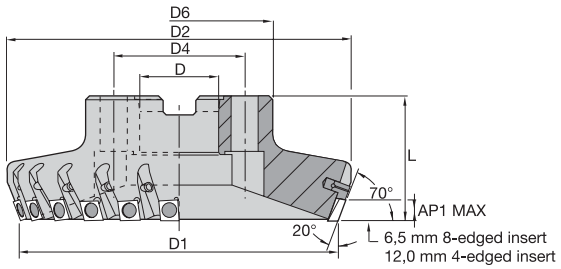
SPHX – W
Indexable Inserts - Finishing

● first choice
○ alternate choice

	KC520M	KC715M	KC915M	KY3500
H				
S				
N				
K	●	○	●	●
M				
P				

catalog number	cutting edges	L10	S	hm	KC520M	KC715M	KC915M	KY3500
SPHX15T6ZCFRGN1W	1	11,00	6,60	–	●	●	●	
SPHX15T6ZCFRGN1WK	1	11,00	6,60	–				●

- Rough and finish in one operation.
- Eight true cutting edges.
- Tangential mounted inserts deliver higher feed rates.
- Coarse and fine pitch available.





Face Mills 70° — Coarse Pitch

D1	order number	catalog number	Z	Z ADJ	D	D2	D4	D6	L	Ap1 max	kgs	Max RPM
125	1798198	125B08RP70SP15C2WFP	8	2	40	139	—	94	63	6,5	3,3	2500
160	1798199	160C10RP70SP15C2WFP	10	2	40	174	67	94	63	6,5	4,6	2000
200	1798200	200C12RP70SP15C2WFP	12	2	60	214	102	134	63	6,5	6,9	1600
250	1798201	250C15RP70SP15C3WFP	15	3	60	264	102	134	63	6,5	10,8	1300

Face Mills 70° — Fine Pitch

D1	order number	catalog number	Z	Z ADJ	D	D2	D4	D6	L	Ap1 max	kgs	Max RPM
80	1802594	80A07RP70SP15C1WFP	7	1	27	94	—	64	50	6,5	1,50	4000
100	1777661	100B09RP70SP15C2WFP	9	2	32	114	—	84	50	6,5	2,20	3200
125	1802595	125B12RP70SP15C2WFP	12	2	40	139	—	94	63	6,5	3,40	2500
160	1802596	160C16RP70SP15C4WFP	16	4	40	174	67	94	63	6,5	4,80	2000

Spare Parts

D1	adj. element	adj. element screw	Torx wrench	clamp stud	set screw	hex wrench	torque (Nm)	coolant screw	coolant cap
80	479.100	193.300	KT9	410.084	121.616	170.003	5	420.122	—
100	479.100	193.300	KT9	410.084	121.616	170.003	5	420.160	—
125	479.100	193.300	KT9	410.084	121.616	170.003	5	420.200	470.232
160	479.100	193.300	KT9	410.084	121.616	170.003	5	420.200	470.233
200	479.100	193.300	KT9	410.084	121.616	170.003	5	—	470.234
250	479.100	193.300	KT9	410.084	121.616	170.003	5	—	470.235

For diameters of 125 mm and 160 mm, use the coolant screw and coolant cap spare parts together.

Spare parts must be ordered separately



Torque wrench (KTW-45) and 3 mm hex bit (69709922164) may be purchased separately to ensure proper torque setting.

Ordering Example:
1 x 80A07RP70SP15C1WFP
10 x SPHX15T6ZCERGP KC915M

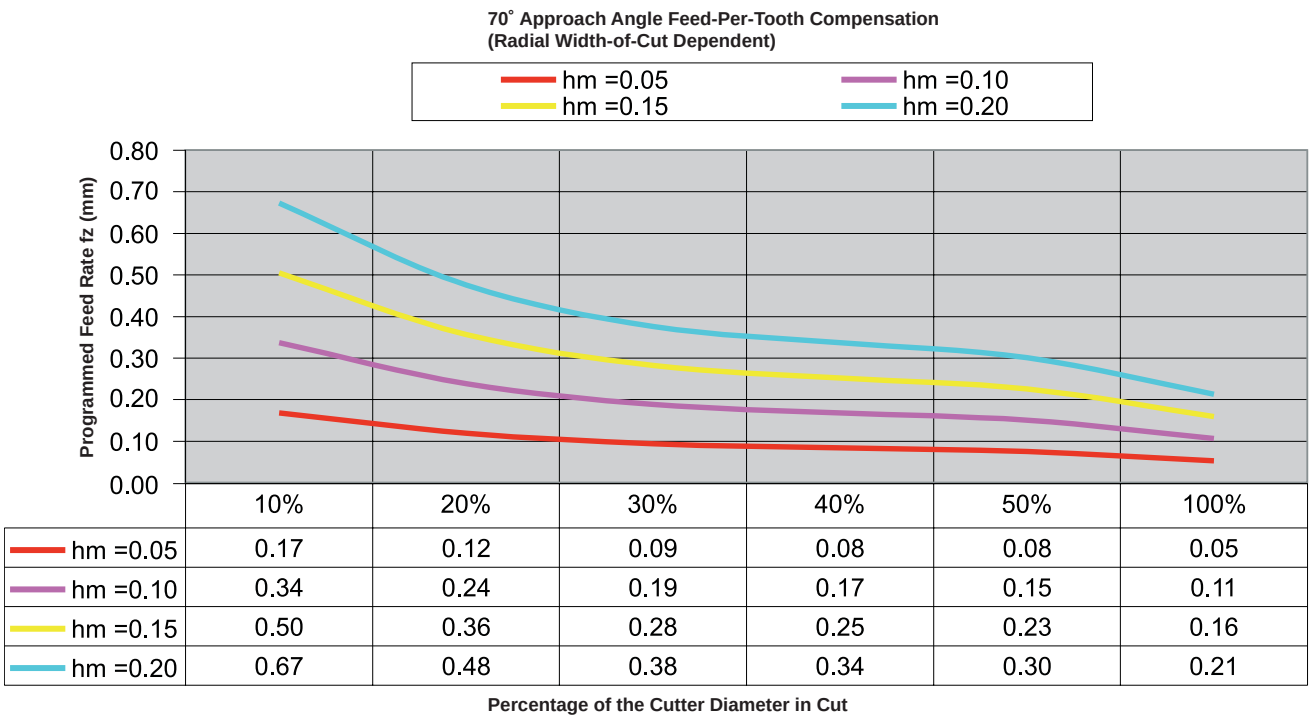
Recommended Starting Speeds [m/min]

70° approach angle

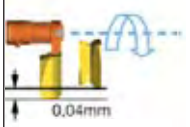
Material Group	K110M			KC520M			KC725M			KC915M			KC935M			KT530M			KY3500			KB1340		
P1																								
P2																								
P3																								
P4																								
P5																								
P6																								
M1																								
M2																								
M3																								
K1	240	**210**	180	265	**240**	210	160	**150**	130	360	**330**	290	250	**230**	210				800	**730**	650	1360	**900**	480
K2	180	**150**	120	210	**190**	175	130	**120**	110	290	**260**	240	200	**180**	170	450	**390**	330	630	**570**	530			
K3	150	**120**	105	175	**160**	140	110	**100**	90	240	**220**	200	170	**150**	140	390	**330**	270	530	**470**	430			
N1																								
N2																								
S1																								
S2																								
S3																								
S4																								
H1																								

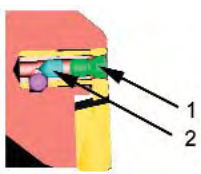
FIRST choice starting speeds are in bold type.
As the average chip thickness value goes higher the speed should be decreased.

Recommended Starting Feeds



	10%	20%	30%	40%	50%	100%
hm =0.05	0.17	0.12	0.09	0.08	0.08	0.05
hm =0.10	0.34	0.24	0.19	0.17	0.15	0.11
hm =0.15	0.50	0.36	0.28	0.25	0.23	0.16
hm =0.20	0.67	0.48	0.38	0.34	0.30	0.21

Roughing		Procedures	Roughing/Finishing	
				
Insert seat			Insert seat	
Standard	Adjustable		Standard	Adjustable
–		**1** Reset adjusting element T x T9	–	
		**2** Insert roughing insert Tighten SW 3 M_{An} = 5 Nm		–
–		**3** Tighten adjusting element gently	–	–
		4 Insert finishing insert and pre-tighten SW 3 M_{VG} = 1 Nm	–	
		5 The finishing insert is positioned 0,04 mm in front of the highest roughing insert	–	
		6 Tighten the finishing insert M_{An} = 5 Nm	–	



Note: This process must be repeated whenever an indexable insert is changed.

Attention: Reset adjusting element!

Changing the adjusting element

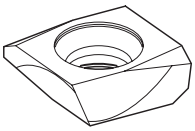
1. Remove the taper screw ①
2. Loosen the SW 1,5 screw ②
3. Remove the adjusting element

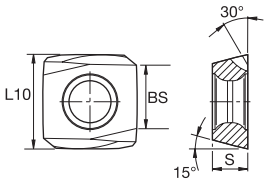
Note: The ball is loose.

Attention:

The maximum permissible cutting speed of the milling cutter heads is $V_{c\ max}$ = 1000 m/min. Only use original parts when clamping the indexable inserts.

Indexable Inserts for FIX-PERFECT MDHX1004...





MDHX - GD
Right Hand

● first choice
○ alternate choice

H	
S	
N	
K	● ● ●
M	
P	

catalog number	cutting edges	L10	S	BS	hm	K110M	KC520M	KT530M
MDHX1004ZDERGD	4	10,80	4,76	0,80	0,13	●	●	●
MDHX1004ZDERGD4W	4	10,80	4,76	8,50	0,13	●	●	●
MDHX1004ZDFRGD4W	4	10,80	4,76	8,50	0,13	●	●	●

Left Hand

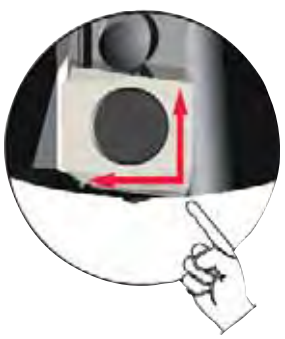
● first choice
○ alternate choice

H	
S	
N	
K	● ● ●
M	
P	

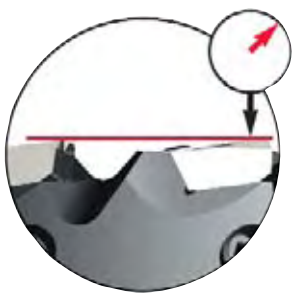
catalog number	cutting edges	L10	S	BS	hm	K110M	KC520M	KT530M
MDHX1004ZDFLGD4W	4	10,80	4,76	8,50	0,13		●	

Insert Loading Procedure

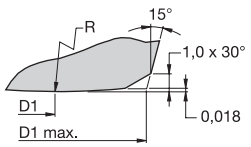
1. Clean insert and insert pocket seat.
2. Load insert – push insert against pin and axial pocket wall.
3. Tighten screw to a torque of 45 in.-lbs. (5 Nm).
4. Check the axial runout.
5. Do not exceed the maximum recommended rpm.

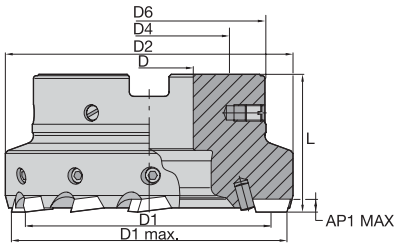






tool diameter (mm)	maximum axial runout	maximum rpm
(63)	10 µm	20000
(80)	10 µm	15900
(100)	10 µm	12750
(125)	10 µm	10200
(160)	15 µm	7950
(200)	15 µm	6350
(250)	15 µm	5100







Finishing Face Mills — Fine Pitch — Right Hand

D1	order number	catalog number	Z	D	D1 max	D2	D4	D6	L	Ap1 max	kg	Max RPM
51,5	1998358	63A06RP00MD10CF	6	22	63	65	—	55	40	1	0,7	20200
68,5	1886327	80A09RP00MD10CF	9	27	80	82	—	64	50	1	1,4	15900
88,5	1886328	100B12RP00MD10CF	12	32	100	102	—	84	50	1	2,2	12750
113,5	1886329	125B16RP00MD10CF	16	40	125	127	—	104	63	1	3,9	10200
148,5	1886330	160C20RP00MD10CF	20	40	160	162	66,7	140	63	1	6,8	7950
188,5	1886331	200C24RP00MD10CF	24	60	200	202	101,6	180	63	1	9,9	6350
238,5	1886332	250C30RP00MD10CF	30	60	250	252	101,6	230	63	1	16,9	5100

Finishing Face Mills — Medium Pitch — Right Hand

D1	order number	catalog number	Z	D	D1 max	D2	D4	D6	L	Ap1 max	kg	Max RPM
51,5	1998359	63A04RP00MD10CF	4	22	63	65	—	55	40	1	0,7	20200
68,5	1893753	80A06RP00MD10CF	6	27	80	82	—	64	50	1	1,3	15900
88,5	1893754	100B08RP00MD10CF	8	32	100	102	—	84	50	1	1,9	12750
113,5	1893755	125B10RP00MD10CF	10	40	125	127	—	104	63	1	3,8	10200
148,5	1893756	160C12RP00MD10CF	12	40	160	162	66,7	140	63	1	6,6	7950
188,5	1893757	200C14RP00MD10CF	14	60	200	202	101,6	180	63	1	9,7	6350
238,5	1893758	250C18RP00MD10CF	18	60	250	252	101,6	230	63	1	16,7	5100

For diameters of 125 mm and 160 mm, use the coolant screw and coolant cap spare parts together.

Spare Parts

D1 max	clamp stud	clamp screw	hex wrench	torque (Nm)	mounting screw	coolant screw	coolant cap
63	410.085	420.060	170.003	5	125.025	420.104	—
80	410.085	420.060	170.003	5	125.230	420.120	—
100	410.085	420.060	170.003	5	—	420.160	—
125	410.085	420.060	170.003	5	—	420.200	470.232
160	410.085	420.060	170.003	5	—	420.200	470.233
200	410.085	420.060	170.003	5	—	—	470.234
250	410.085	420.060	170.003	5	—	—	470.235

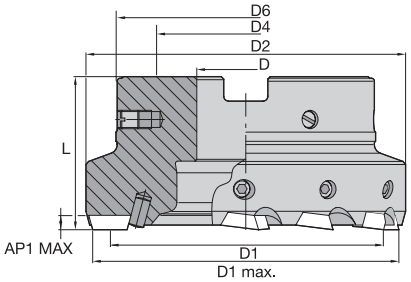
Spare parts must be ordered separately.



Torque wrench (KTW45) and 3 mm hex bit (69709922164) may be purchased separately to ensure proper torque setting

Ordering Example:
1 x 63A04RP00MD10CF
10 x MDHX1004ZDFRGD4W KC510M

Indexable Shell Mills for Finishing





Finishing Face Mills — Coarse Pitch — Left Hand

D1	order number	catalog number	Z	D	D1 max	D2	D6	L	Ap1 max	kg	Max RPM
68,5	2216242	80A06LP00MD10CF	6	27	80	82	64	50	1	1,3	15900
88,5	1982556	100B08LP00MD10CF	8	32	100	102	84	50	1	1,9	12750
113,5	2216693	125B10LP00MD10CF	10	40	125	127	104	63	1	3,8	10200

Finishing Face Mills — Fine Pitch — Left Hand

D1	order number	catalog number	Z	D	D1 max	D2	D4	D6	L	Ap1 max	kg	Max RPM
68,5	2216237	80A09LP00MD10CF	9	27	80	82	—	64	50	1	1,4	15900
88,5	2223773	100B12LP00MD10CF	12	32	100	102	—	84	50	1	2,2	12750
113,5	2223774	125B16LP00MD10CF	16	40	125	127	—	104	63	1	3,9	10200
188,5	2216239	200C24LP00MD10CF	24	60	200	202	102	180	63	1	9,9	6350

For diameters of 125 mm and 160 mm, use the coolant screw and coolant cap spare parts together.

Spare parts must be ordered separately.

Spare Parts

D1 max	clamp stud	clamp screw	hex wrench	torque (Nm)	mounting screw	coolant screw	coolant cap
80	410.085	420.060	170.003	5	125.230	420.120	—
100	410.085	420.060	170.003	5	—	420.160	—
125	410.085	420.060	170.003	5	—	—	470.232
200	410.085	420.060	170.003	5	—	—	470.234

Ordering Example:
1 x 80A09LP00MD10CF
10 x MDHX1004ZDFRGD4W KC510M

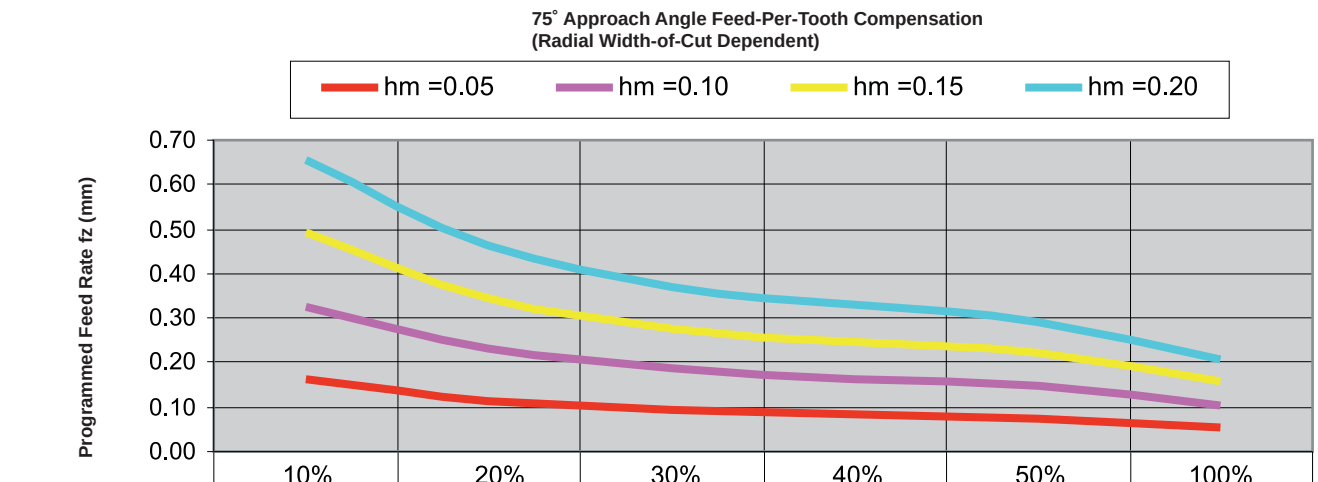
Recommended Starting Speeds [m/min]

FIX-PERFECT - Cast Iron Finisher, 75° approach angle

Material Group	K110M			KC520M			KT530M		
P1									
P2									
P3									
P4									
P5									
P6									
M1									
M2									
M3									
K1	365	**275**	180	270	**245**	220			
K2	260	**230**	200	210	**190**	175	460	**360**	305
K3	200	**150**	120	175	**160**	140	300	**175**	245
N1									
N2									
S1									
S2									
S3									
S4									
H1									

FIRST choice starting speeds are in bold type.
As the average chip thickness value goes higher the speed should be decreased.

Recommended Starting Feeds

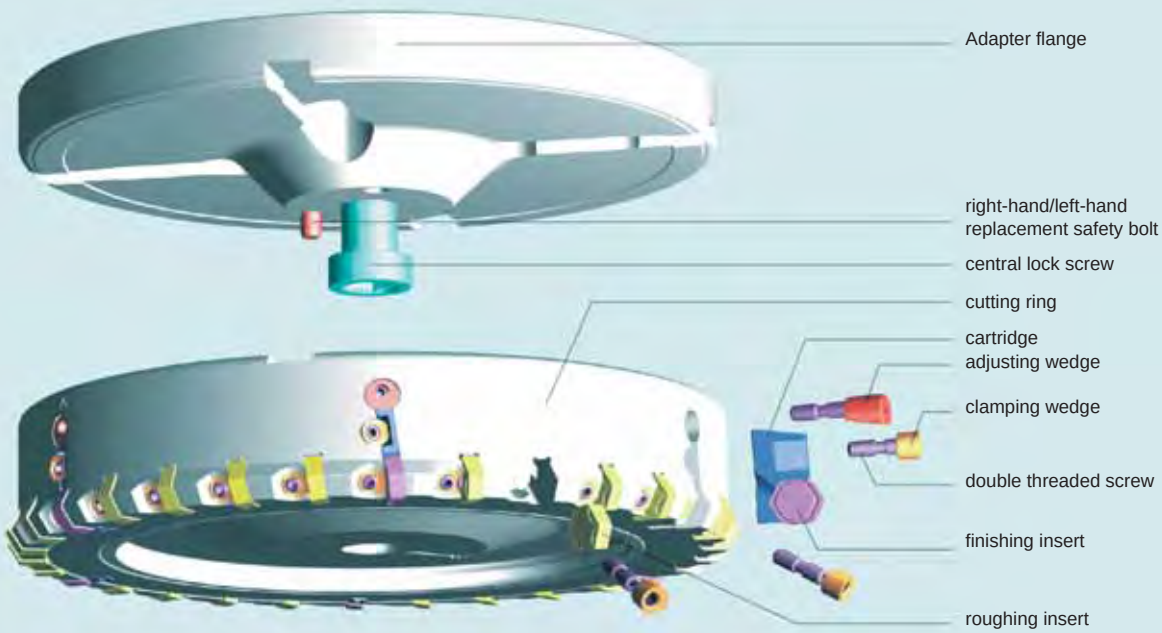


	10%	20%	30%	40%	50%	100%
hm =0.05	0.16	0.12	0.09	0.08	0.07	0.05
hm =0.10	0.33	0.23	0.19	0.16	0.15	0.10
hm =0.15	0.49	0.35	0.28	0.25	0.22	0.16
hm =0.20	0.65	0.46	0.37	0.33	0.29	0.21

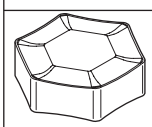
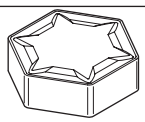
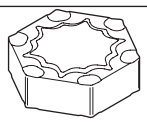
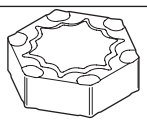
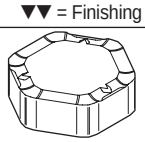
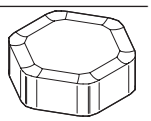
Percentage of the Cutter Diameter in Cut

Indexable Inserts for HexaCut HNG.0905...

The split version is shown.

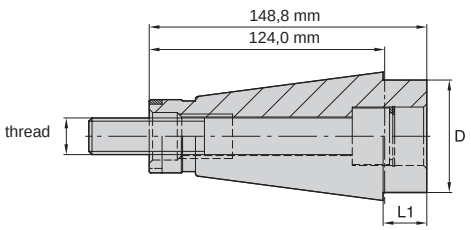


Attention:
When using the flange version, the specified centering adapter should be used.

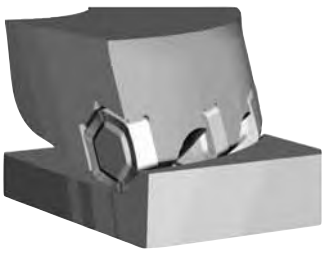
Recommended combination of standard indexable inserts and geometries			▼ = Roughing indexable insert					▼▼ = Finishing indexable insert	
									
			HNGX 090516 -MR 222.78.316 Z = 12	HNGX 090508 -MH 222.78.208 Z = 12	HNGX 090520 -ML 222.78.460 Z = 12	HNGX 090520 -MM 222.78.260 Z = 12	HNGX 090504 -MM 222.78.254 Z = 12	HNGF 090504 -MT 222.78.154 Z = 6+6	HNGF 090504 -MF 222.78.104 Z = 12
Operation	κr	ap max							
▼	45°	6	■ OR ■	OR ■	OR ■	OR ■			
▼	30°	8	■ OR ■	OR ■	OR ■	OR ■			
▼▼	30°	1			■ OR	■ OR	■		■
▼/▼▼	30°	8	■ OR ■	OR ■	OR ■	OR ■		■	

NOTE: Z = number of cutting edges

Centering plug



D	catalog number	L1	taper
60	1 229 75 290 00	22 mm	50



45° HexaCut milling cutter



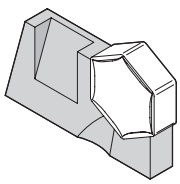
60° HexaCut milling cutter

Roughing face mill with fixed pockets

For a cutting depth of ≤ 6,5 mm
and an achievable surface finish of Ra > 3.2.

Roughing:
HNGX 090516-MR or HNGX 090508-MH or HNGX 090520-MM or HNGX 090520-ML

See 1.



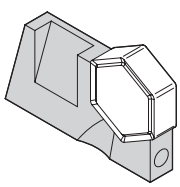
right-hand	1 274 85 002 00
left-hand	1 274 85 001 00

1. Roughing face mill with roughing cartridge (not marked)

For a cutting depth of < 8 mm and an achievable surface finish of Ra > 3.2.

Roughing insert: HNGX 090516-MR or HNGX 090508-MH or HNGX 090520-MM or HNGX 090520-ML in all insert seats

See 2.



right-hand	1 274 85 004 00
left-hand	1 274 85 003 00

2. Face mill for roughing/finishing with finishing cartridge (marked ●)

a) For a cutting depth of < 8 mm and an achievable surface finish of Ra 3.2.

Roughing insert: HNGX 090516-MR or HNGX 090508-MH or HNGX 090520-MM or HNGX 090520-ML in the fixed insert seats

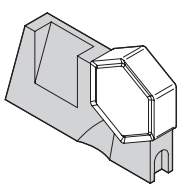
Finishing insert: HNGF 090504-MT in the finishing cartridge

b) For a cutting depth of < 1 mm and an achievable surface finish of Ra 1.6.

Roughing insert: HNGX 090504-MM or HNGX 090520-MM or HNGX 090520-ML in the fixed insert seats

Finishing insert: HNGF 090504-MF in the finishing cartridge

See 3.



right-hand	1 274 85 034 00
left-hand	1 274 85 035 00

3. Face mill for roughing/finishing using finishing cartridge with corrected straight cutting edge position to reduce axial force (marked ▬●)

a) For a cutting depth of < 8 mm and an achievable surface finish of Ra 3.2.

Use roughing insert: HNGX 090516-MR or HNGX 090508-MH or HNGX 090520-MM or HNGX 090520-ML in the fixed insert seats.

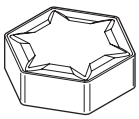
Use finishing insert: HNGF 090504-MT in the finishing cartridge.

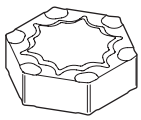
b) For a cutting depth of < 1 mm and an achievable surface finish of Ra 1.6. Use roughing insert: HNGX 090504-MM or HNGX 090520-MM or HNGX 090520-ML in the fixed insert seats.

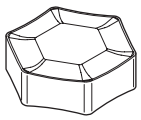
Use finishing insert: HNGF 090504-MF in the finishing cartridge.

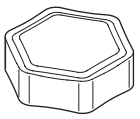
Note regarding 2 and 3. Loading order is always four roughing inserts and one finishing insert, which is mounted axially ≈ 0,03 mm in front of the roughing inserts.

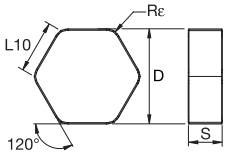
Indexable Inserts for HexaCut HN..0905...


HNGX-MH

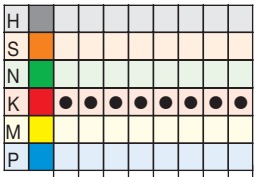

HNGX-MM


HNGX-MR

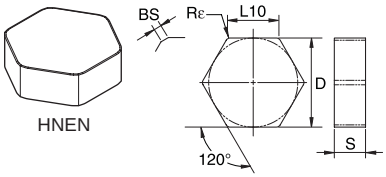

HNGX-ML



● first choice
○ alternate choice



catalog number	cutting edges	D	S	L10	Rε	hm	KC915M	KC935M	TN2510	TN5505	TN5515	TN5520	TN6510	TN6520
HNGX090504MM	12	16,20	5,56	9,35	0,4	0,15			●	●	●	●		
HNGX090508MH	12	16,20	5,56	9,35	0,8	0,10	●	●	●	●	●	●		
HNGX090516MR	12	16,20	5,56	9,35	1,6	0,15	●	●	●	●	●	●	●	●
HNGX090520ML	12	16,20	5,56	9,35	2,0	0,10	●	●		●	●	●	●	●
HNGX090520MM	12	16,20	5,56	9,35	2,0	0,15	●	●	●	●	●			
HNGX090530MR	12	16,20	5,56	9,35	3,0	0,15	●	●			●		●	●

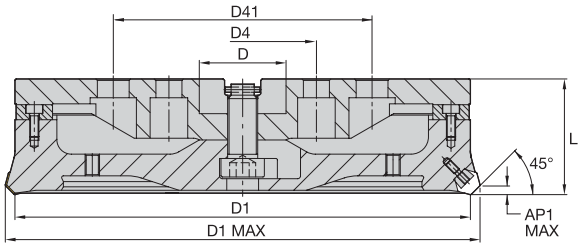


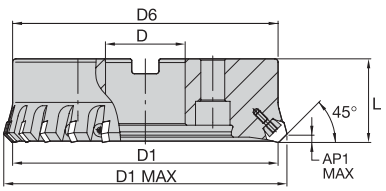
HNEN

● first choice
○ alternate choice



catalog number	cutting edges	D	S	L10	BS	Rε	hm	KY3500
HNEN090508MSN	12	15,88	5,56	9,17	–	0,8	0,10	●
HNEN0905AMSN	12	15,88	5,65	9,17	–	–	0,10	●
HNEN0905XMSN	12	16,20	5,56	9,35	1,30	–	0,10	●







HexaCut Face Mills — Right Hand

D1	order number	catalog number	Z	D	D1 max	D4	D6	D41	L	Ap1 max	kgs	Max RPM
80	2016107	80A10RF45HN09C	10	27	93	—	80	—	50	6,5	1,6	3900
100	2016109	100B14RF45HN09C	14	32	113	—	100	—	50	6,5	2,3	3400
125	2016111	125B18RF45HN09C	18	40	138	—	125	—	63	6,5	4,6	3000
160	2016133	160C22RF45HN09C	22	40	173	67	160	—	63	6,5	7,4	2600
250	2016137	250C36RF45HN09SA	36	60	263	102	—	178	80	6,5	21,2	2000
315	2016139	315C46RF45HN09SA	46	60	328	102	—	178	80	6,5	33,4	1800

Right-Hand Cutting Rings — for 250 mm and 315 mm diameter cutters

D1	order number	catalog number
250	2016141	250C36RF45HN09S
315	2016163	315C46RF45HN09S

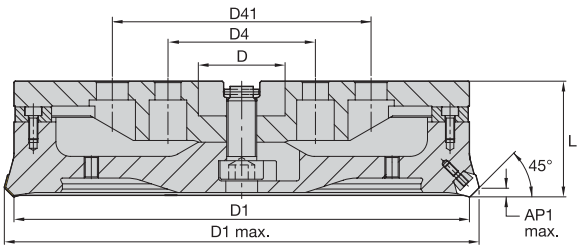
Right-Hand Adapter Flanges — for 250 mm and 315 mm diameter cutters

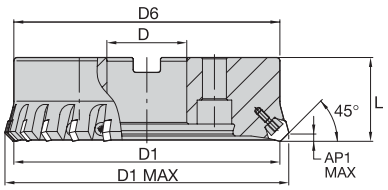
D1	order number	catalog number
250	2016103	12398500400
315	2016105	12398500600

Spare Parts

D1	clamping wedge	wedge screw	Nm	wrench (3mm)	drive key	drive key screw	wrench (17 mm)	central lock screw
80	12748358200	12748600900	7	12148044900	—	—	—	—
100	12748358200	12748600900	7	12148044900	—	—	—	—
125	12748358200	12748600900	7	12148044900	—	—	—	—
160	12748358200	12748600900	7	12148044900	—	—	—	—
200	12748358200	12748600900	7	12148044900	—	—	—	—
250	12748358200	12748600900	7	12148044900	12748580100	12748700400	12749725800	12748620500
315	12748358200	12748600900	7	12148044900	12748580100	12748700400	12749725800	12748620500

Ordering Example:
1 x 80A10RF45HN09C
10 x HNGX090508-MH TN5515







HexaCut Face Mills — Left Hand

D1	order number	catalog number	Z	D	D1 max	D4	D6	D41	L	Ap1 max	kgs	Max RPM
80	2016108	80A10LF45HN09C	10	27	93	—	80	—	50	6,5	1,6	3900
100	2016110	100B14LF45HN09C	14	32	113	—	100	—	50	6,5	2,3	3400
125	2016112	125B18LF45HN09C	18	40	138	—	125	—	63	6,5	4,6	3000
200	2016136	200C28LF45HN09C	28	60	213	102	200	—	63	6,5	11,6	2300
250	2016138	250C36LF45HN09SA	36	60	263	102	—	178	80	6,5	21,2	2000
315	2016140	315C46LF45HN09SA	46	60	328	102	—	178	80	6,5	33,4	1800

Left-Hand Cutting Rings — for 250 mm and 315 mm diameter cutters

D1	order number	catalog number
250	2016142	250C36LF45HN09S
315	2016164	315C46LF45HN09S

Left-Hand Adapter Flanges — for 250 mm and 315 mm diameter cutters

D1	order number	catalog number
250	2016104	12398500500
315	2016106	12398500700

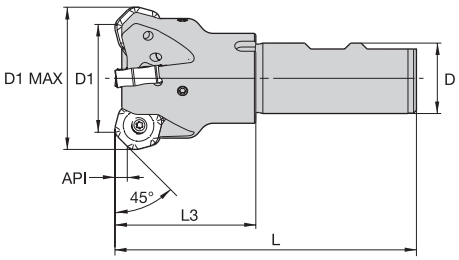
Spare Parts

D1	clamping wedge	wedge screw	Nm	wrench	drive key	drive key screw	wrench (17 mm)	central lock screw
80	12748358200	12748600900	7	12148044900	—	—	—	—
100	12748358200	12748600900	7	12148044900	—	—	—	—
125	12748358200	12748600900	7	12148044900	—	—	—	—
160	12748358200	12748600900	7	12148044900	—	—	—	—
200	12748358200	12748600900	7	12148044900	—	—	—	—
250	12748358200	12748600900	7	12148044900	12748580100	12748700400	12749725800	12748620500
315	12748358200	12748600900	7	12148044900	12748580100	12748700400	12749725800	12748620500

Ordering Example:
1 x 80A10LF45HN09C
10 x HNGX090508-MH TN5515

NEW!

- 4,5mm depth-of-cut capability.
- 40mm diameter.
- Two geometries and five grades for use in most workpiece materials.
- Twelve cutting edges.
- Soft cutting action.



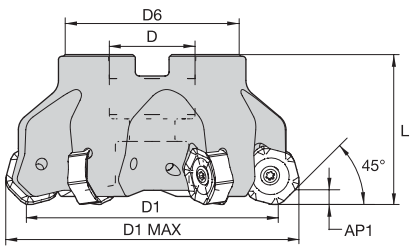


End Mills - Right Hand

D1	order number	catalog number	Z	D	D1 max	L3	L	Ap1 max	kg	Max RPM	Nm	insert screw
40	3324829	KSHR40D03R50B25SHN09	3	25	51	50	107	4,5	0,5	15800	3,5	193.492
40	3324830	KSHR40D04R50B25SHN09	4	25	51	50	107	4,5	0,5	15800	3,5	193.492

NEW!

- 4,5mm depth-of-cut capability.
- Available in diameters from 40mm to 160mm.
- Through-coolant standard.
- Two geometries and five grades for use in most workpiece materials.
- Twelve cutting edges.
- Soft cutting action.





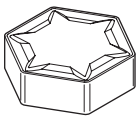
Shell Mills - Right Hand - Coarse Pitch

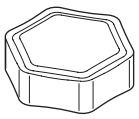
D1	order number	catalog number	Z	D	D1 max	D4	D6	L	Ap1 max	kg	Max RPM
50	3324831	KSHR50A04RS45HN09	4	22	61,0	–	38	40	4,5	0,3	12700
63	3325163	KSHR63A06RS45HN09	6	22	74,0	–	50	40	4,5	0,6	10100
80	3325165	KSHR80A06RS45HN09	6	27	91,0	–	60	50	4,5	1,1	7900
100	3325167	KSHR100B08RS45HN09	8	32	111,0	–	80	40	4,5	1,7	6300
125	3325169	KSHR125B10RS45HN09	10	40	135,9	–	90	63	4,5	2,8	5050
160	3325171	KSHR160C12RS45HN09	12	40	171,0	66,7	110	63	4,5	4,6	3900

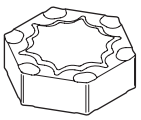
Spare Parts

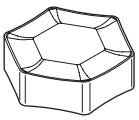
D1	insert screw	Nm	Torx wrench	low-head cap screw	socket-head cap screw	coolant screw	coolant cap
50	193.492	3,5	170.025	129.025	–	MS2072CG	–
63	193.492	3,5	170.025	–	125.025	MS1234CG	–
80	193.492	3,5	170.025	–	125.230	MS2038CG	–
100	193.492	3,5	170.025	–	–	MS2189CG	–
125	193.492	3,5	170.025	–	–	420.200	470.232
160	193.492	3,5	170.025	–	–	420.200	470.233

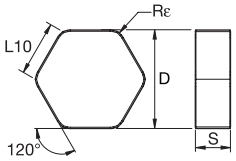
Indexable Inserts for Hexacut HN..0905...


HNGX-MH


HNGX-ML


HNGX-MM

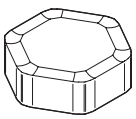

HNGX-MR

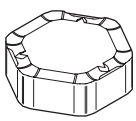


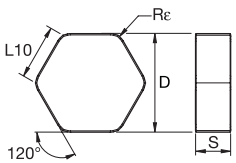
● first choice
○ alternate choice

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

catalog number	cutting edges	D	S	L10	Rε	hm	TN2510	TN5505	TN5515	TN5520	TN6510	TN6520	KC915M	KC935M
HNGX090504MM	12	16,20	5,56	9,35	0,4	0,15	●	●	●	●				
HNGX090508MH	12	16,20	5,56	9,35	0,8	0,10	●	●	●	●			●	●
HNGX090516MR	12	16,20	5,56	9,35	1,6	0,15	●	●	●	●	●	●	●	●
HNGX090520ML	12	16,20	5,56	9,35	2,0	0,10		●	●	●	●	●	●	●
HNGX090520MM	12	16,20	5,56	9,35	2,0	0,15	●	●	●				●	●
HNGX090530MR	12	16,20	5,56	9,35	3,0	0,15			●		●	●	●	●


HNGF-MF

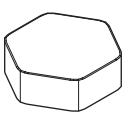

HNGF-MT

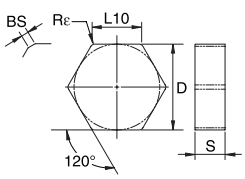


● first choice
○ alternate choice

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

catalog number	cutting edges	D	S	L10	Rε	hm	TN2510	TN5505	TN5515	TN5520	TN6510	TN6520	KC915M	KC935M
HNGF090504MF	12	15,88	5,56	9,16	0,4	0,10	●	●	●	●	●			
HNGF090504MT	6	15,88	5,56	9,16	1,2	0,10	●	●	●	●	●			
HNGF090512MF	12	15,88	5,56	9,16	1,2	0,10							●	●
HNGF090512MT	6	15,88	5,56	9,16	1,2	0,10							●	●

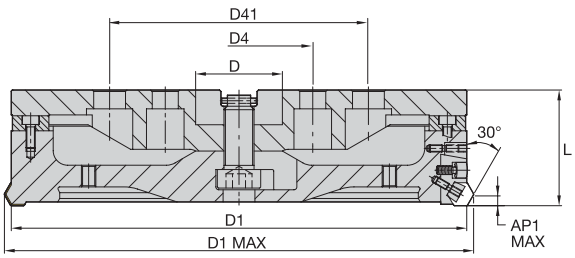

HNEN

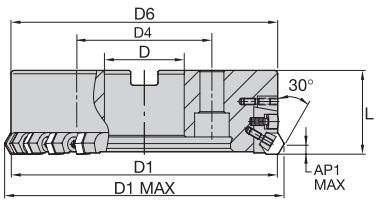


● first choice
○ alternate choice

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

catalog number	cutting edges	D	S	L10	BS	Rε	hm	KY3500
HNEN090508MSN	12	15,88	5,56	9,17	–	0,8	0,10	●
HNEN0905AMSN	12	15,88	5,65	9,17	–	–	0,10	●
HNEN0905XMSN	12	16,20	5,56	9,35	1,30	–	0,10	●







HexaCut Face Mills — Right Hand

D1	order number	catalog number	Z	D	D1 max	D4	D6	D41	L	Ap1 max	kg	Max RPM
80	2016287	80A62RF60HN09CA1	8	27	89	—	80	—	50	8,0	1,6	3900
100	2016289	100B82RF60HN09CA1	10	32	109	—	100	—	50	8,0	2,3	3400
125	2016291	125B123RF60HN09CA1	15	40	134	—	125	—	63	8,0	4,6	3000
160	2016313	160C164RF60HN09CA1	20	40	169	67	160	—	63	8,0	7,2	2600
200	2033283	200C205RF60HN09CA1	25	60	209	102	200	—	63	8,0	11,4	2300
250	2033284	250C246RF60HN09SA1A	30	60	259	102	—	178	80	8,0	20,9	2000
315	2016319	315C328RF60HN09SA1A	40	60	324	102	—	178	80	8,0	33,2	1800

Right-Hand Cutter Bodies

D1	order number	catalog number
80	2016165	80A62RF60HN09C
100	2016167	100B82RF60HN09C
125	2016169	125B123RF60HN09C
160	2016171	160C164RF60HN09C
200	2016193	200C205RF60HN09C
250	2016195	250C246RF60HN09S
315	2016197	315C328RF60HN09S

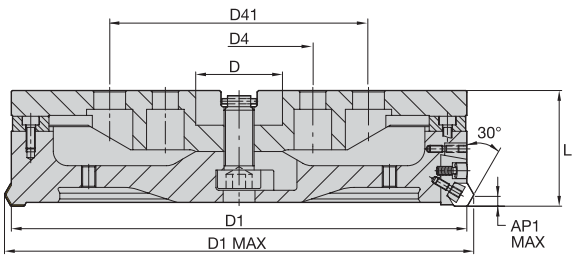
Right-Hand Adapter Flanges — for 250 mm and 315 mm diameter cutters

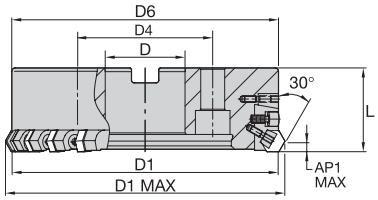
D1	order number	catalog number
250	2016103	12398500400
315	2016105	12398500600

Spare Parts

D1	cartridge	clamping wedge	axial adj wedge	wedge screw	Nm	wrench (3mm)	drive key	drive key screws	wrench (17 mm)	central lock screw
80	12748500200	12748358200	12748308500	12748600900	7	12148044900	—	—	—	—
100	12748500200	12748358200	12748308500	12748600900	7	12148044900	—	—	—	—
125	12748500200	12748358200	12748308500	12748600900	7	12148044900	—	—	—	—
160	12748500200	12748358200	12748308500	12748600900	7	12148044900	—	—	—	—
200	12748500200	12748358200	12748308500	12748600900	7	12148044900	—	—	—	—
250	12748500200	12748358200	12748308500	12748600900	7	12148044900	12748580100	12748700400	12749725800	12748620500
315	12748500200	12748358200	12748308500	12748600900	7	12148044900	12748580100	12748700400	12749725800	12748620500

Ordering Example:
1 x 80A62RF60HN09CA1
10 x HNGX090508-MH TN5515







HexaCut Face Mills — Left Hand

D1	order number	catalog number	Z	D	D1 max	D4	D6	D41	L	Ap1 max	kg	Max RPM
80	2016288	80A62LF60HN09CA1	8	27	89	—	80	—	50	8,0	1,6	3900
100	2016290	100B82LF60HN09CA1	10	32	109	—	100	—	50	8,0	2,3	3400
125	2016292	125B123LF60HN09CA1	15	40	134	—	125	—	63	8,0	4,6	3000
160	2016314	160C164LF60HN09CA1	20	40	169	67	160	—	63	8,0	7,2	2600
200	2016316	200C205LF60HN09CA1	25	60	209	102	200	—	63	8,0	11,4	2300
250	2033285	250C246LF60HN09SA1A	30	60	259	—	—	178	80	8,0	20,9	2000
315	2033286	315C328LF60HN09SA1A	40	60	324	102	—	178	80	8,0	33,2	1800

Left-Hand Cutter Bodies

D1	order number	catalog number
80	2016166	80A62LF60HN09C
100	2016168	100B82LF60HN09C
125	2016170	125B123LF60HN09C
160	2016172	160C164LF60HN09C
200	2016194	200C205LF60HN09C
250	2016196	250C246LF60HN09S
315	2016198	315C328LF60HN09S

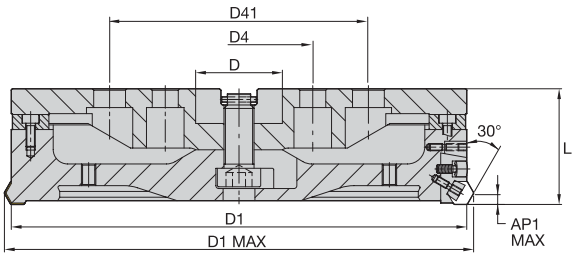
Left-Hand Adapter Flanges — for 250 mm and 315 mm diameter cutters

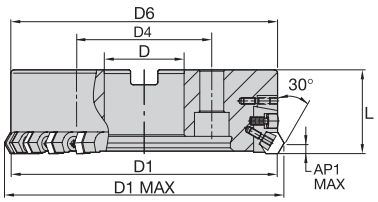
D1	order number	catalog number
250	2016104	12398500500
315	2016106	12398500700

Spare Parts

D1	cartridge	clamping wedge	axial adj wedge	wedge screw	Nm	wrench (3mm)	drive key	drive key screws	wrench (17 mm)	central lock screw
80	12748500100	12748358200	12748308500	12748600900	7	12148044900	—	—	—	—
100	12748500100	12748358200	12748308500	12748600900	7	12148044900	—	—	—	—
125	12748500100	12748358200	12748308500	12748600900	7	12148044900	—	—	—	—
160	12748500100	12748358200	12748308500	12748600900	7	12148044900	—	—	—	—
200	12748500100	12748358200	12748308500	12748600900	7	12148044900	—	—	—	—
250	12748500100	12748358200	12748308500	12748600900	7	12148044900	12748580100	12748700400	12749725800	12748620500
315	12748500100	12748358200	12748308500	12748600900	7	12148044900	12748580100	12748700400	12749725800	12748620500

Ordering Example:
1 x 80A62LF60HN09CA1
10 x HNGX090508-MH TN5515







HexaCut Face Mills — Right Hand

D1	order number	catalog number	Z	D	D1 max	D4	D6	D41	L	Ap1 max	kg	Max RPM
80	2016199	80A62RF60HN09CA2	8	27	89	—	80	—	50	8,0	1,6	3900
100	2016201	100B82RF60HN09CA2	10	32	109	—	100	—	50	8,0	2,3	3400
125	2016223	125B123RF60HN09CA2	15	40	134	—	125	—	63	8,0	4,6	3000
160	2016225	160C164RF60HN09CA2	20	40	169	—	160	—	63	8,0	7,2	2600
200	2016227	200C205RF60HN09CA2	25	60	209	101,6	200	—	63	8,0	11,4	2300
250	2016229	250C246RF60HN09SA2A	30	60	259	101,6	—	177,8	80	8,0	20,9	2000
315	2016231	315C328RF60HN09SA2A	40	60	324	101,6	—	177,8	80	8,0	33,2	1800

Right-Hand Cutter Bodies

D1	order number	catalog number
80	2016165	80A62RF60HN09C
100	2016167	100B82RF60HN09C
125	2016169	125B123RF60HN09C
160	2016171	160C164RF60HN09C
200	2016193	200C205RF60HN09C
250	2016195	250C246RF60HN09S
315	2016197	315C328RF60HN09S

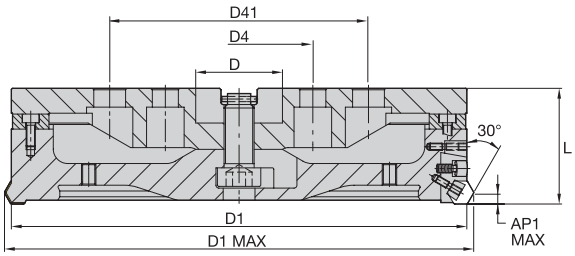
Right-Hand Adapter Flanges — for 250 mm and 315 mm diameter cutters

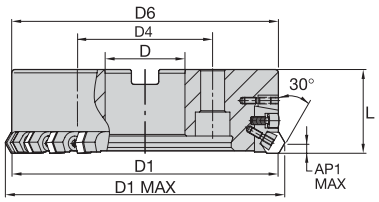
D1	order number	catalog number
250	2016103	12398500400
315	2016105	12398500600

Spare Parts

D1	finish cartridge	clamping wedge	axial adj wedge	wedge screw	Nm	wrench (3mm)	drive key	drive key screws	wrench (17 mm)	central lock screw
80	12748500400	12748358200	12748308500	12748600900	7	12148044900	—	—	—	—
100	12748500400	12748358200	12748308500	12748600900	7	12148044900	—	—	—	—
125	12748500400	12748358200	12748308500	12748600900	7	12148044900	—	—	—	—
160	12748500400	12748358200	12748308500	12748600900	7	12148044900	—	—	—	—
200	12748500400	12748358200	12748308500	12748600900	7	12148044900	—	—	—	—
250	12748500400	12748358200	12748308500	12748600900	7	12148044900	12748580100	12748700400	12749725800	12748620500
315	12748500400	12748358200	12748308500	12748600900	7	12148044900	12748580100	12748700400	12749725800	12748620500

Ordering Example:
1 x 80A62RF60HN09CA2
10 x HNGX090508-MH TN5515







HexaCut Face Mills — Left Hand

D1	order number	catalog number	Z	Z ADJ	D	D6	D1 max	D4	D41	L	Ap1 max	kg	Max RPM
80	2016200	80A62LF60HN09CA2	8	2	27	80	89	—	—	50,0	8	1,6	3900
100	2016202	100B82LF60HN09CA2	10	2	32	100	109	—	—	50,0	8	2,3	3400
125	2016224	125B123LF60HN09CA2	15	3	40	125	134	—	—	63,0	8	4,6	3000
160	2016226	160C164LF60HN09CA2	20	4	40	160	169	—	—	63,0	8	7,2	2600
200	2016228	200C205LF60HN09CA2	25	5	60	200	209	101,6	—	63,0	8	11,4	2300
250	2016230	250C246LF60HN09SA2A	30	6	60	—	259	101,6	—	80,0	8	20,9	2000
315	2016232	315C328LF60HN09SA2A	40	8	60	—	324	101,6	—	80,0	8	33,2	1800

Left-Hand Cutter Bodies

D1	order number	catalog number
80	2016166	80A62LF60HN09C
100	2016168	100B82LF60HN09C
125	2016170	125B123LF60HN09C
160	2016172	160C164LF60HN09C
200	2016194	200C205LF60HN09C
250	2016196	250C246LF60HN09S
315	2016198	315C328LF60HN09S

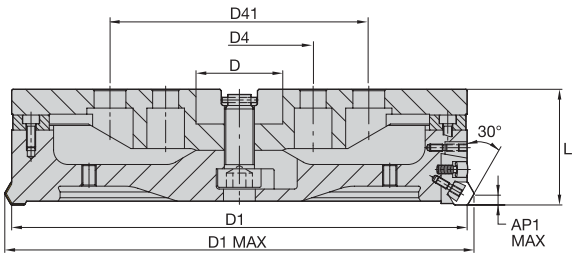
Left-Hand Adapter Flanges — for 250 mm and 315 mm diameter cutters

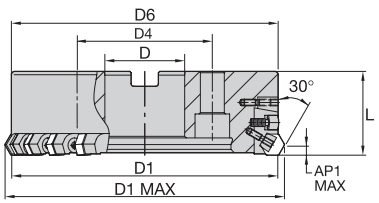
D1	order number	catalog number
250	2016104	12398500500
315	2016106	12398500700

Spare Parts

D1	cartridge	clamping wedge	axial adjustment wedge	wedge screw	wrench (3mm)	drive key	drive key screw	wrench (17mm)	central lock screw
80	12748500300	12748358200	12748308500	12748600900	12148044900	—	—	—	—
100	12748500300	12748358200	12748308500	12748600900	12148044900	—	—	—	—
125	12748500300	12748358200	12748308500	12748600900	12148044900	—	—	—	—
160	12748500300	12748358200	12748308500	12748600900	12148044900	—	—	—	—
200	12748500300	12748358200	12748308500	12748600900	12148044900	—	—	—	—
250	12748500300	12748358200	12748308500	12748600900	12148044900	12748580100	12748700400	12749725800	12748620500
315	12748500300	12748358200	12748308500	12748600900	12148044900	12748580100	12748700400	12749725800	12748620500

Ordering Example:
1 x 80A62LF60HN09CA2
10 x HNGX090508-MH TN5515







HexaCut Face Mills — With Corrected Straight Cutting Edge — Right Hand

D1	order number	catalog number	Z	D	D1 max	D4	D41	D6	L	Ap1 max	kg	Max RPM
80	2016253	80A62RF60HN09CA3	8	27	88,7	—	—	80	50	8,0	1,6	3900
100	2016255	100B82RF60HN09CA3	10	32	108,7	—	—	100	50	8,0	2,3	3400
125	2016257	125B123RF60HN09CA3	15	40	133,7	—	—	125	63	8,0	4,6	3000
160	2016259	160C164RF60HN09CA3	20	40	168,7	66,7	—	160	63	8,0	7,2	2600
200	2016261	200C205RF60HN09CA3	25	60	208,7	101,6	—	200	63	8,0	11,4	2300
250	2016283	250C246RF60HN09SA3A	30	60	258,7	101,6	177,8	—	80	8,0	20,9	2000
315	2016285	315C328RF60HN09SA3A	40	60	323,7	101,6	177,8	—	80	8,0	33,2	1800

Right-Hand Cutter Bodies

D1	order number	catalog number
80	2016165	80A62RF60HN09C
100	2016167	100B82RF60HN09C
125	2016169	125B123RF60HN09C
160	2016171	160C164RF60HN09C
200	2016193	200C205RF60HN09C
250	2016195	250C246RF60HN09S
315	2016197	315C328RF60HN09S

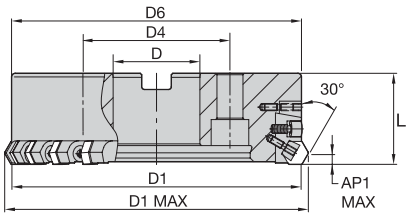
Right-Hand Adapter Flanges — for 250 mm and 315 mm diameter cutters

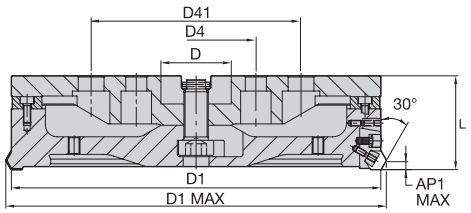
D1	order number	catalog number
250	2016103	12398500400
315	2016105	12398500600

Spare Parts

D1	finishing cartridge	clamping wedge	axial adj. wedge	wedge screw (3mm)	Nm	wrench	drive key	drive key screw	wrench (17 mm)	lock screw
80	12748503400	12748358200	12748308500	12748600900	7	12148044900	—	—	—	—
100	12748503400	12748358200	12748308500	12748600900	7	12148044900	—	—	—	—
125	12748503400	12748358200	12748308500	12748600900	7	12148044900	—	—	—	—
160	12748503400	12748358200	12748308500	12748600900	7	12148044900	—	—	—	—
200	12748503400	12748358200	12748308500	12748600900	7	12148044900	—	—	—	—
250	12748503400	12748358200	12748308500	12748600900	7	12148044900	12748580100	12748700400	12749725800	12748620500
315	12748503400	12748358200	12748308500	12748600900	7	12148044900	12748580100	12748700400	12749725800	12748620500

Ordering Example:
1 x 80A62RF60HN09CA3
10 x HNGX090508-MH TN5515







HexaCut Face Mills — Left Hand

D1	order number	catalog number	Z	Z ADJ	D	D6	D1 max	D4	D41	L	Ap1 max	kg	Max RPM
80	2016254	80A62LF60HN09CA3	8	2	27	80	89	—	—	50,0	8	1,6	3900
100	2016256	100B82LF60HN09CA3	10	2	32	100	109	—	—	50,0	8	2,3	3400
125	2016258	125B123LF60HN09CA3	15	3	40	125	134	—	—	63,0	8	4,6	3000
160	2016260	160C164LF60HN09CA3	20	4	40	160	169	—	—	63,0	8	7,2	2600
200	2016262	200C205LF60HN09CA3	25	5	60	200	209	101,6	—	63,0	8	11,4	2300
250	2016284	250C246LF60HN09SA3A	30	6	60	—	259	101,6	—	80,0	8	20,9	2000
315	2016286	315C328LF60HN09SA3A	40	8	60	—	324	101,6	—	80,0	8	33,2	1800

Left-Hand Cutter Bodies

D1	order number	catalog number
80	2016166	80A62LF60HN09C
100	2016168	100B82LF60HN09C
125	2016170	125B123LF60HN09C
160	2016172	160C164LF60HN09C
200	2016194	200C205LF60HN09C
250	2016196	250C246LF60HN09S
315	2016198	315C328LF60HN09S

Left-Hand Adapter Flanges — for 250 mm and 315 mm diameter cutters

D1	order number	catalog number
250	2016104	12398500500
315	2016106	12398500700

Spare Parts

D1	cartridge	clamping wedge	axial adjustment wedge	wedge screw	wrench (3mm)	drive key	drive key screw	wrench (17mm)	central lock screw
80	12748503500	12748358200	12748308500	12748600900	12148044900	—	—	—	—
100	12748503500	12748358200	12748308500	12748600900	12148044900	—	—	—	—
125	12748503500	12748358200	12748308500	12748600900	12148044900	—	—	—	—
160	12748503500	12748358200	12748308500	12748600900	12148044900	—	—	—	—
200	12748503500	12748358200	12748308500	12748600900	12148044900	—	—	—	—
250	12748503500	12748358200	12748308500	12748600900	12148044900	12748580100	12748700400	12749725800	12748620500
315	12748503500	12748358200	12748308500	12748600900	12148044900	12748580100	12748700400	12749725800	12748620500

Ordering Example:
1 x 80A62LF60HN09CA3
10 x HNGX090508-MH TN5515

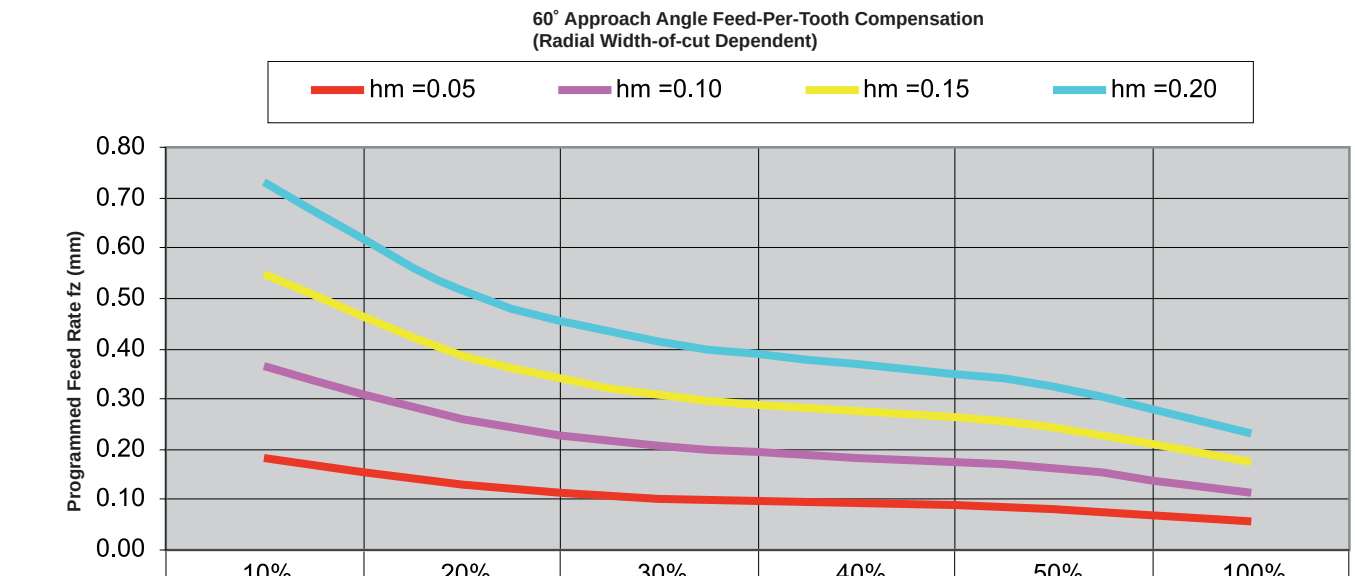
Recommended Starting Speeds [m/min]

60° approach angle

Material Group	TN2510			TN5505			TN5515			TN5520			TN6510			TN6520			KC915M			KC935M			KY3500		
P1																											
P2																											
P3																											
P4																											
P5																											
P6																											
M1																											
M2																											
M3																											
K1	490	**360**	300	410	**310**	260	380	**280**	235	350	**275**	200	480	**350**	250	450	**320**	230	440	**400**	350	310	**280**	250	800	**730**	650
K2	380	**300**	250	350	**260**	225	325	**235**	195	275	**220**	175	420	**280**	210	390	**250**	190	350	**310**	290	240	**220**	200	630	**570**	530
K3	300	**250**	200	260	**225**	175	235	**195**	155	220	**180**	140	340	**260**	200	300	**220**	160	290	**260**	240	200	**180**	170	530	**470**	430
N1																											
N2																											
S1																											
S2																											
S3																											
S4																											
H1																											

FIRST choice starting speeds are in bold type.
As the average chip thickness value goes higher the speed should be decreased.

Recommended Starting Feeds



	10%	20%	30%	40%	50%	100%
hm =0.05	0.18	0.13	0.10	0.09	0.08	0.06
hm =0.10	0.37	0.26	0.21	0.18	0.16	0.12
hm =0.15	0.55	0.39	0.31	0.28	0.24	0.17
hm =0.20	0.73	0.52	0.41	0.37	0.33	0.23

Percentage of the Cutter Diameter in Cut

Adjustment Instructions



- **Before being used for the first time,** the milling cutter must be carefully cleaned of anti-corrosive materials, dust, etc.
- The milling cutter should only be washed when all components have been dismantled.
- Only the double-threaded screws of the clamping or adjusting wedge should be lubricated with copper grease; all other components must have clean metallic surfaces.
- A torque wrench is recommended to tighten the double-threaded screws.
- When fitting indexable inserts on the milling cutter, ensure that they are inserted in the correct position in a clean insert seat, and that they are held in position during clamping.

For 45° roughing mills without anvils, the following rules must be observed:

- The double-threaded screws on the clamping wedges for the indexable inserts are first pre-tightened to approximately 2 Nm and then tightened to a final torque of 7 Nm.

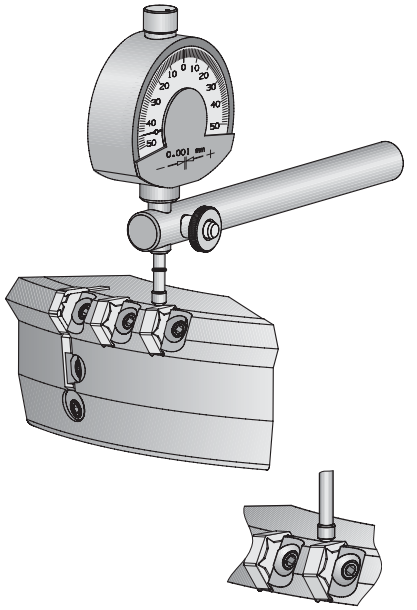
Attention:

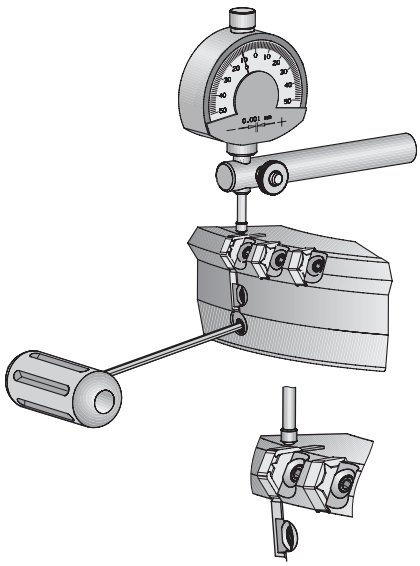
At each tool adjustment the body, indexable inserts, and spare parts must be checked and replaced, if necessary.

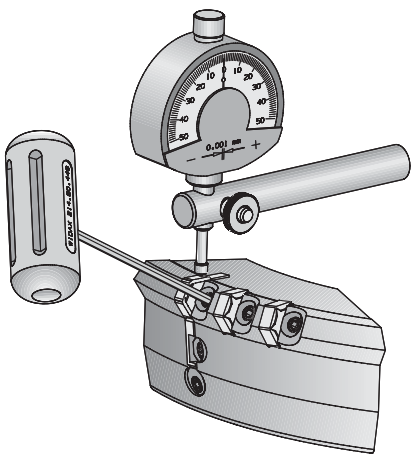
Before each tool use the double-threaded screws of the indexable inserts and the stops must be tightened in the specified order to a torque of 7 Nm. In addition, even if the catridges have not been adjusted, the double-threaded screws of the adjusting wedges must be checked to see if these have been tightened to a torque of 3 Nm. If not, they must be re-tightened to this torque.

The tools must only be used in accordance with their function. We accept no liability for their improper use.

Changes of any kind and/or printing errors are not valid grounds for claims.



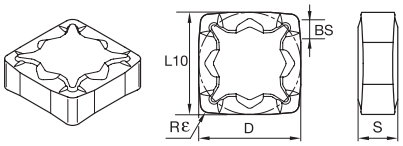




This procedure is to be used on all 60° lead roughing/finishing mills using the unmarked roughing cartridge, the finishing cartridge (marked ●), and the corrected edge cartridge (marked ▬). These steps must be followed when adjusting the cutters for finishing inserts.

1.) Clean all insert pockets.
2.) Mount all wedges and cartridges. Torque the cartridge lock wedge screw to 3 Nm.
3.) Mount all inserts, making sure they are seated properly in the pocket, and torque the insert lock wedge screws to 3 Nm.
4.) Torque the wedge screws for all fixed pocket inserts to 7 Nm.
5.) Loosen the cartridge insert wedge screw and the cartridge lock wedge screw.
6.) Pressing the insert into the cartridge pocket, adjust the cartridge to 0,20-0,30 mm below the fixed pocket inserts.
7.) Torque the insert lock wedge screw and the cartridge lock wedge screw to 3 Nm.
8.) Adjust the axial position to 0,03-0,04 mm above the fixed pocket inserts.
9.) Loosen the cartridge insert lock wedge screws and then re-torque to 3 Nm.
10.) Adjust the axial position to the final dimension, 0,04-0,05 mm above the highest fixed pocket insert.
11.) Torque the insert lock wedge screws and the cartridge lock wedge screws to 7 Nm.
12.) Conduct a final check of the axial run-out and position.

Indexable Inserts for KSSR SNXF 1204...



● first choice
○ alternate choice

								TN2510	TN450	TN5515	TN6510	TN6520	TN6525	TN6540	TN7525
H															
S															
N															
K								●	○	●	●	●			●
M															
P									●				●	●	●
catalog number	cutting edges	D	S	L10	BS	Rε	hm								
SNXF120412ENLD	8	12,70	4,76	12,70	—	1,2	0,05		●	●	●	●	●	●	●
SNXF120412SNGP	8	12,70	4,76	12,70	—	1,2	0,10		●	●	●	●	●	●	●
SNXF120412SNHE	8	12,70	4,76	12,70	—	1,2	0,15		●	●	●	●	●	●	●
SNXF1204ZNENLD	8	12,70	4,76	12,70	1,70	1,6	0,05	●		●	●	●	●	●	●
SNXF1204ZNSNGP	8	12,70	4,76	12,70	1,00	1,2	0,10		●	●	●	●	●	●	●
SNXF1204ZNSNHE	8	12,70	4,76	12,70	1,00	1,2	0,15		●	●	●	●	●	●	●

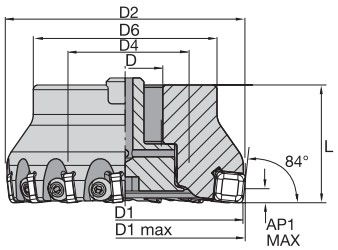
● first choice
○ alternate choice

									KY3500
H									
S									
N									
K									●
M									
P									
catalog number	cutting edges	D	S	L10	BS	Rε	LI	hm	
SNXF120412AMSN	8	12,70	4,76	12,70	—	1,2	12,70	0,1	●
SNXF1204ZNAMSN	8	12,70	4,76	12,70	1,00	1,2	12,70	0,1	●

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

NEW!

- Eight cutting edges.
- Fast and easy insert indexing.
- Highest feed rates.
- CGI specialist.





with coolant screw



without coolant screw

Shell Mills — Right Hand

D1	order number	catalog number	Z	D	D1 max	D2	D4	D6	L	Ap1 max	kg	Max RPM
63	2465831	63A09RF84SN12B	9	22	65	64	—	50	40	5	0,6	7600
80	2443937	80A12RF84SN12B	12	27	82	80	—	60	50	5	1,3	6000
100	2443938	100B15RF84SN12B	15	32	102	100	—	78	50	5	1,8	4800
125	2465832	125B18RF84SN12B	18	40	127	125	—	89	63	5	3,1	3800
160	2466093	160C24RF84SN12B	24	40	162	160	66,7	90	63	5	3,9	3000
200	2466094	200C30RF84SN12B	30	60	202	200	101,6	130	63	5	6,4	2400
250	2466095	250C36RF84SN12B	36	60	252	250	101,6	130	63	5	10,0	1900

Coolant screw and coolant cap must be ordered separately.

2466094 and 2466095 are non-stock standard.

Spare Parts

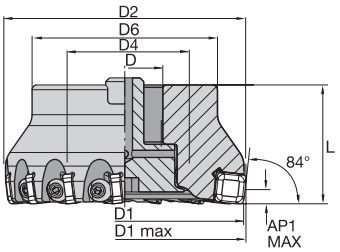
D1	wedge screw	clamping wedge	wrench (3mm)	Nm	coolant screw	coolant cap
63	12748600900	12748358200	12148044900	7	420.100	—
80	12748600900	12748358200	12148044900	7	420.120	—
100	12748600900	12748358200	12148044900	7	420.163	—
125	12748600900	12748358200	12148044900	7	420.200	470.232
160	12748600900	12748358200	12148044900	7	420.200	470.233
200	12748600900	12748358200	12148044900	7	—	470.234
250	12748600900	12748358200	12148044900	7	—	470.235

Ordering Example:
1 x 100B15RF84SN12B
10 x SNXF120412ENLD TN5515

Indexable Shell Mills for Steel and Cast Iron Machining

NEW!

- Eight cutting edges.
- Fast and easy insert indexing.
- Highest feed rates.
- CGI specialist.





without coolant screw



with coolant screw

Shell Mills — Left Hand

D1	order number	catalog number	Z	D	D2	D4	D6	L	Ap1 max	kg	Max RPM
63	2466096	63A09LF84SN12B	9	22	64	—	50	40	5	0,6	7600
80	2466097	80A12LF84SN12B	12	27	80	—	60	50	5	1,3	6000
100	2466098	100B15LF84SN12B	15	32	100	—	78	50	5	1,8	4800
125	2466099	125B18LF84SN12B	18	40	125	—	89	63	5	3,1	3800
160	2466100	160C24LF84SN12B	24	40	160	67	90	63	5	3,9	3000
200	2466101	200C30LF84SN12B	30	60	200	102	130	63	5	6,4	2400
250	2466102	250C36LF84SN12B	36	60	250	102	130	63	5	10,0	1900

°All left-hand KSSR cutter bodies are non-stocked standards.

Spare Parts

D1	wedge screw	clamping wedge	wrench (3mm)	Nm	coolant screw	coolant cap
63	12748600900	12748358200	12148044900	7	420.100	—
80	12748600900	12748358200	12148044900	7	420.120	—
100	12748600900	12748358200	12148044900	7	420.163	—
125	12748600900	12748358200	12148044900	7	420.200	470.232
160	12748600900	12748358200	12148044900	7	420.200	470.233
200	12748600900	12748358200	12148044900	7	—	470.234
250	12748600900	12748358200	12148044900	7	—	470.235

Coolant screw and coolant cap must be ordered separately.

Ordering Example:
1 x 100B15LF84SN12B
10 x SNXF120412ENLD TN5515

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

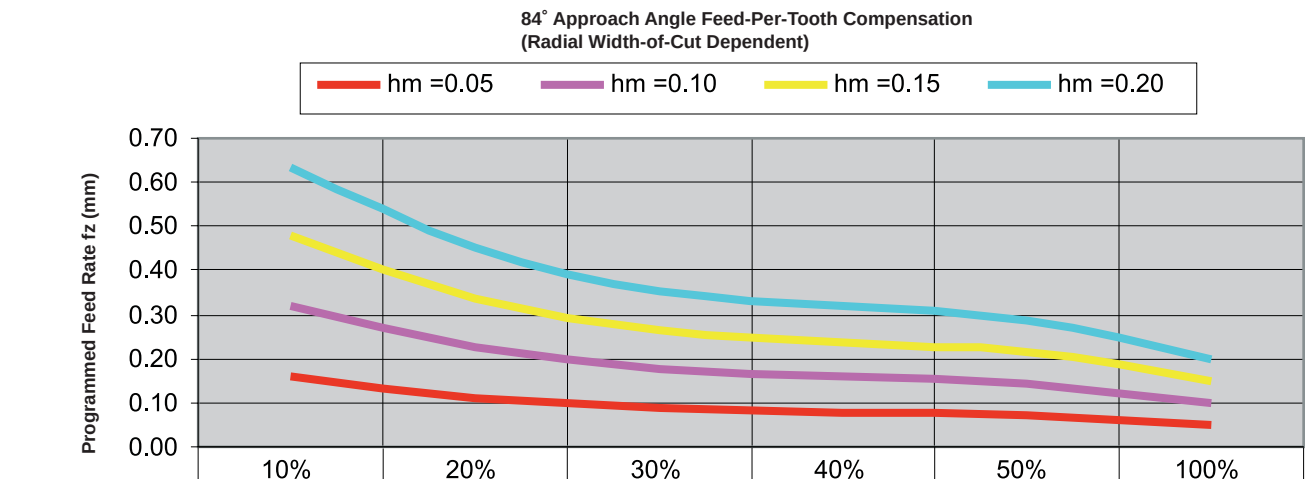
Recommended Starting Speeds [m/min]

84° approach angle

Material Group	TN2510			TN450			TN5515			TN6510			TN6520			TN6525			TN6540			TN7525			KY3500		
P1				250	**215**	200										410	**325**	280	360	**280**	240	410	**325**	280			
P2				180	**150**	140										325	**250**	215	250	**190**	165	325	**250**	215			
P3				160	**140**	130										280	**215**	185	215	**165**	140	280	**215**	185			
P4				130	**110**	100										235	**170**	145	180	**130**	110	235	**170**	145			
P5				180	**150**	140										315	**235**	195	240	**180**	150	315	**235**	195			
P6				120	**100**	90										210	**160**	130	160	**120**	100	210	**160**	130			
M1																											
M2																											
M3																											
K1	420	**360**	300	490	**360**	300	360	**300**	240	360	**300**	240	240	**180**	160							380	**280**	240	800	**730**	650
K2	360	**300**	250	380	**300**	250	300	**240**	200	300	**240**	200	180	**160**	140							320	**240**	200	630	**570**	530
K3	300	**250**	200	320	**250**	200	240	**200**	160	240	**200**	160	160	**140**	120							240	**200**	170	530	**470**	430
N1																											
N2																											
S1																											
S2																											
S3																											
S4																											
H1																											

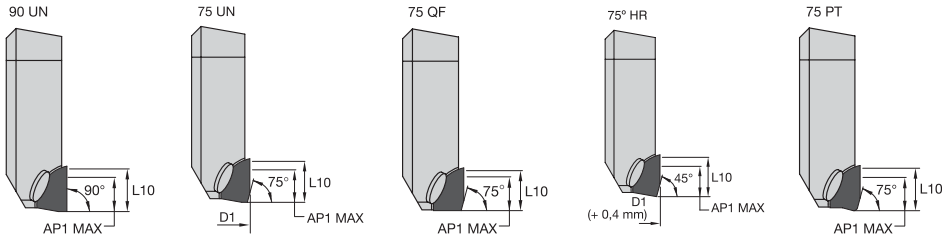
FIRST choice starting speeds are in bold type.
As the average chip thickness value goes higher the speed should be decreased.

Recommended Starting Feeds



	10%	20%	30%	40%	50%	100%
hm =0.05	0.16	0.11	0.09	0.08	0.07	0.05
hm =0.10	0.32	0.22	0.18	0.16	0.14	0.10
hm =0.15	0.48	0.34	0.27	0.24	0.21	0.15
hm =0.20	0.64	0.45	0.36	0.32	0.28	0.20

Cartridges for KSCM AluMill



-90° UN
AP1 MAX = 3 mm

-75° UN
AP1 MAX = 3 mm

-75° QF
AP1 MAX = 3 mm

-75° HR
AP1 MAX = 3 mm

-75° PT
AP1 MAX = 3 mm

● first choice
○ alternate choice

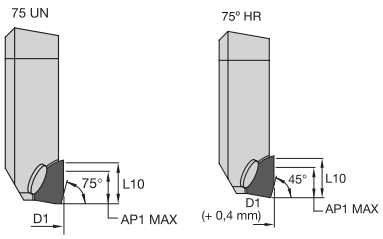
H	S	N	K	M	P
		●			

catalog number	Approach Angle	L10	hm	KD1420
KSCMCA90UN	90	6,10	0,06	●
KSCMCA75UN	75	6,10	0,06	●
KSCMCA75QF	75	6,10	0,06	●
KSCMCA75PT	75	6,10	0,06	●
KSCMCA75HR	45	5,40	0,06	●

Cutter configuration for roughing with extended depth of cut up to 5mm.

- Need to combine two different cartridges to achieve 5 mm axial depth of cut.
- Alternate the catridges, KSCMCA75UN followed by KSCMCA75HR; repeat this until the cutter body is complete.

Please note the effective number of teeth has been reduced by 50%.



-75° UN
AP1 MAX = 3 mm

-75° HR
AP1 MAX = 3 mm

● first choice
○ alternate choice

H	S	N	K	M	P
		●			

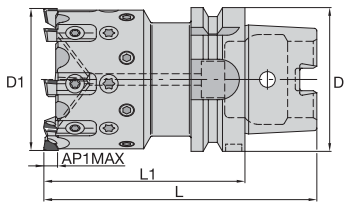
catalog number	Approach Angle	L10	hm	KD1420
KSCMCA75UN	75	6,10	0,06	●
KSCMCA75HR	45	5,40	0,06	●

Order Number:

KSCMCA

Blanks without PCD segment, if cutter is not fully presetted with cartridges. For low horse power machines and cutter configurations with less number of effective teeth.

NEW!





Monobloc HSK63A

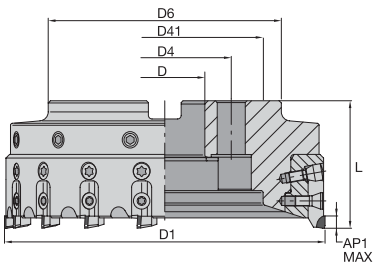
D1	N° de commande	Code	Z	Z S	CSMS system size	D	L1	L	Ap1 max	Poids Kgs	Max RPM
63	2880630	KSCM63R08CAH63A090	8	8	HSK63A	63	90	122	3	1,8	37900

Ap1 MAX dépend de la configuration de la cartouche ; voir les valeurs énumérées sous les cartouches.

Pièces détachées

D1	vis de réglage	vis de cartouche	embout	vis d'équilibrage
63,00	193.464	193.465	170.279	193.461

NEW!





Fraises à tenons

D1	N° de commande	Code	Z	Z ADJ	D	D4	D6	D41	L	Ap1 max	Poids Kgs	Max RPM
80	2881349	KSCM80R10CAB27	10	10	27	–	63	–	50	3	1,3	29900
100	2881352	KSCM100R12CAB32	12	12	32	–	96	–	50	3	1,5	23900
125	2881505	KSCM125R16CAB40	16	16	40	–	92	–	63	3	2,5	19100
160	2881509	KSCM160R18CAB40	18	18	40	67	116	–	63	3	3,7	15000
200	2881510	KSCM200R24CAB60	24	24	60	102	166	–	63	3	5,2	12000
250	2881511	KSCM250R30CAB60	30	30	60	102	166	–	63	3	7,9	9600
315	2881584	KSCM315R36CAB60	36	36	60	102	260	178	80	3	14,5	7600

Ap1 MAX dépend de la configuration de la cartouche ; voir les valeurs inscrites sous les cartouches.

Toutes les fraises sont bimétalliques, sauf la fraise de diamètre 80 mm.

Pièces détachées

D1	vis de réglage	vis de cartouche	embout	vis d'arrosage	capot d'arrosage	vis d'équilibrage
80	193.464	193.465	170.279	470.269	–	193.460
100	193.464	193.465	170.279	470.270	–	193.461
125	193.464	193.465	170.279	470.271	–	193.462
160	193.464	193.465	170.279	420.200	470.272	193.462
200	193.464	193.465	170.279	–	470.273	193.462
250	193.464	193.465	170.279	–	470.274	193.463
315	193.464	193.465	170.279	–	470.275	193.463

Exemple de commande :
1 x KSCM63R08CAH63A090
10 x KSCMCA75UN KD1420
Montage : KSCM63AA

Recommended Starting Speeds [m/min]

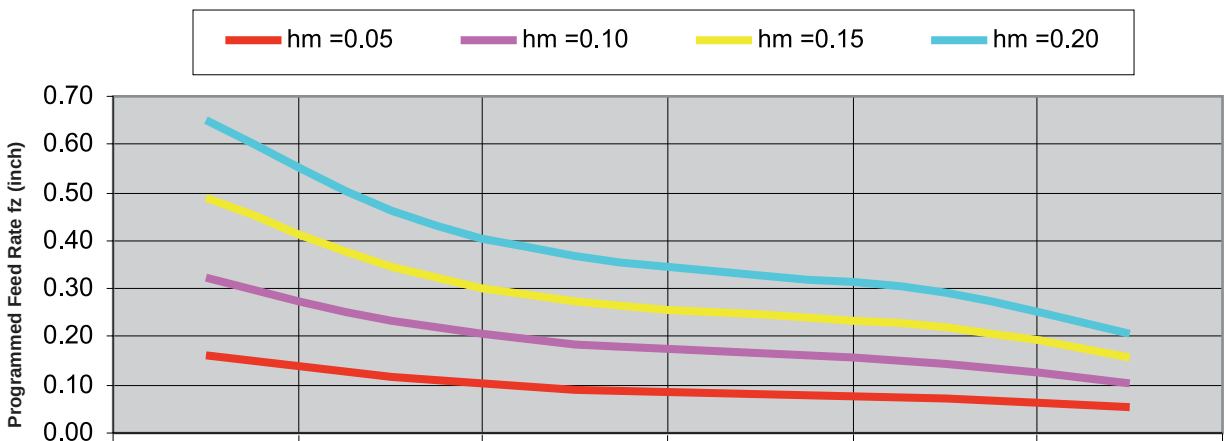
KSCM AluMill

Material Group	KD1420		
P1			
P2			
P3			
P4			
P5			
P6			
M1			
M2			
M3			
K1			
K2			
K3			
N1	4000	**3500**	3000
N2	1600	**1500**	1400
S1			
S2			
S3			
S4			
H1			

FIRST choice starting speeds are in bold type.
As the average chip thickness value goes higher the speed should be decreased.

Recommended Starting Feeds

15° Approach Angle Feed-Per-Tooth Compensation (Radial Width-of-Cut Dependent)



	10%	20%	30%	40%	50%	100%
hm =0.05	0.16	0.12	0.09	0.08	0.07	0.05
hm =0.10	0.32	0.23	0.18	0.16	0.15	0.10
hm =0.15	0.49	0.35	0.28	0.25	0.22	0.16
hm =0.20	0.65	0.46	0.37	0.33	0.29	0.21

Percentage of the Cutter Diameter in Cut

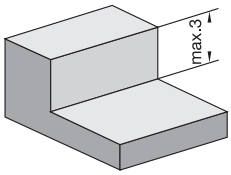
Tool configuration universal cartridge



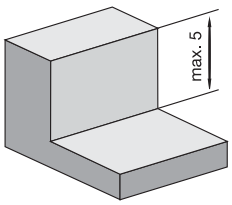
Face milling cutter fitted entirely with universal cartridges

Depth of Cut: max. 3 mm

Surface quality: Rz2 - Rz4



Contouring: PCD cutting edge length minimum 5 mm



Tool configuration universal cartridge



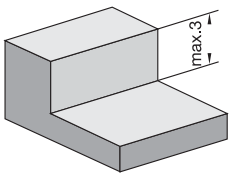
+ finishing cartridge



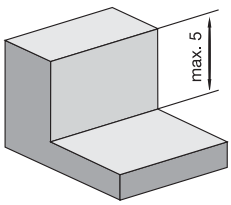
Fitting the face milling cutter with universal and finishing cartridges in a ratio of approx. 3:1

Depth of Cut: max. 3 mm

Surface quality: Rz1,5 - Rz2,5



Contouring: PCD cutting edge length minimum 5 mm



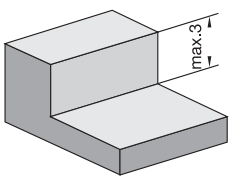
Tool configuration edge cartridge



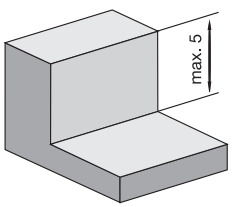
Fitting the face milling cutter entirely with edge cartridges

Depth of Cut: max. 3 mm

Surface quality: Rz2 - Rz4



Contouring: PCD cutting edge length minimum 5 mm



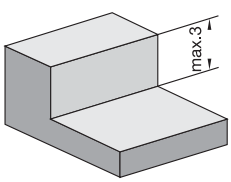
Tool configuration cartridge for defined surfaces



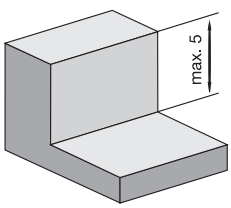
Fitting the face milling cutter entirely with cartridges for defined surfaces

Depth of Cut: max. 3 mm

Surface quality: Rz3,2 - Rz17



Contouring: PCD cutting edge length minimum 5 mm



Tool configuration universal cartridge



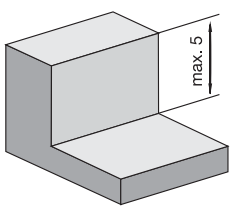
+ roughing cartridge



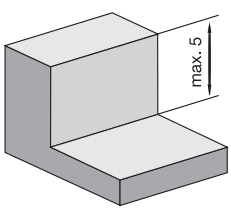
Fitting the face milling cutter with universal and roughing cartridges in a ratio of approx. 1:1

Depth of Cut: max. 5 mm

Surface quality: Rz2 - Rz4



Contouring: PCD cutting edge length minimum 5 mm



Tool configuration universal cartridge, 75° – face milling



1. Insert cartridges into the body.
2. Screw in the clamping screws (RH), and tighten to 10 Nm
3. Screw in the adjusting screws (RH), and tighten to 3 Nm



4. Determine which cartridge is in the highest axial position.
5. By turning the adjusting screws to the right, adjust the remaining cartridges for even running. Max. permitted run-out error 3 µm.



Tool configuration universal cartridge + finishing cartridge (ratio approx. 3:1), 75°



1. Insert universal cartridges at ratio of approx. 4:1 in the body. Make sure they are distributed evenly!
2. Screw in the clamping screws (RH), and tighten to 10 Nm
3. Screw in the adjusting screws (RH), and tighten to 3 Nm



4. Determine which cartridge is in the highest axial position.
5. By turning the adjusting screws to the right, adjust the remaining cartridges for even running. Max. permitted run-out error 3 µm.



6. Insert finishing cartridges as described in steps 1 – 5, but with an axial advance of 0,008 +0,002 mm. Max permitted run-out error of 3 µm with finishing cartridges.

Tool configuration edge cartridges, 90° – shoulder milling



1. Insert cartridges into the body.
2. Screw in the clamping screws (RH), and tighten to 10 Nm
3. Screw in the adjusting screws (RH), and tighten to 3 Nm



4. Determine which cartridge is in the highest axial position.
5. By turning the adjusting screws to the right, adjust the remaining cartridges for even running. Max. permitted run-out error 3 µm.



Tool configuration cartridge for defined surface, 75°



1. Insert cartridges into the body.
2. Screw in the clamping screws (RH), and tighten to 10 Nm.
3. Screw in the adjusting screws (RH), and tighten to 3 Nm.



4. Determine which cartridge is in the highest axial position.
5. By turning the adjusting screws to the right, adjust the remaining cartridges for even running. Max. permitted run-out error 3 µm.



Tool configuration universal cartridge + roughing cartridge (ratio approx. 1:1), 75°



Use cartridges KSCMCA75UN and KSCMCA75HR.

1. Insert universal cartridges into every second seating in the body.
2. Screw in the clamping screws (RH), and tighten to 10 Nm.
3. Screw in the adjusting screws (RH), and tighten to 3 Nm.



4. Determine which cartridge is in the highest axial position.
5. By turning the adjusting screws to the right, adjust the remaining cartridges for even running. Max. permitted run-out error 3 µm.



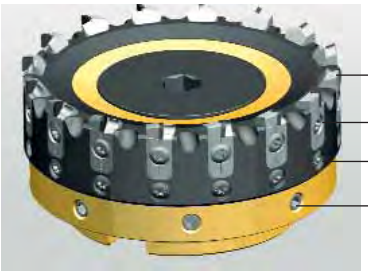
6. Insert roughing cartridges into the remaining seatings.
7. Screw in the clamping screws (RH), and tighten to 10 Nm.
8. Screw in the adjusting screws (RH), and tighten to 3 Nm.



Note:

The process must be repeated when the cartridges are changed. To dismantle, remove the adjusting element (Part 3), clamping screw (Part 2), and cartridge (Part 1).

Instruction for Mounting the Face Milling Cutter on the Appropriate Toolholder



User information:

- Tools conform to EN ISO 15641.
- Absolute cleanliness must be observed when assembling the face milling cutter.
- An optimum cutting result will only be achieved by adjusting and balancing the complete tool system (face milling cutter + toolholder).
- Balancing is achieved with the aid of the balancing screws. Quality class G2.5 DIN-ISO 1940.
- The balancing screw must not protrude above the body.
- The balancing and adjustment screws have an adhesive coating according to DIN 267, Part 28. If, after repeated use, the coating is no longer adequate to secure the screws, the screws must be replaced.
- The maximum permitted operating speed (quoted on the tool) must not be exceeded.
- The maximum permitted operating speed is only permitted with clamping systems manufactured by Kennametal in accordance with DIN 69982 Form B with enlarged plane bearing surface. Reduce the operating speed if clamping systems with increased projection length or made by other manufacturers are used.
- Tools and fittings are to be serviced and repaired by Kennametal.
- Screws sealed with lacquer have been adjusted by the manufacturer, and must not be moved.

Instructions for Fitting the Cutter Cartridge – Tool Construction

Mounting the face milling cutter (dimensions similar to DIN 8030 Form B)

Place the body of the face milling cutter on the arbor. Ensure that the contact faces are clean.
Screw in the cutter fastening bolt (RH) and tighten with the appropriate torque.

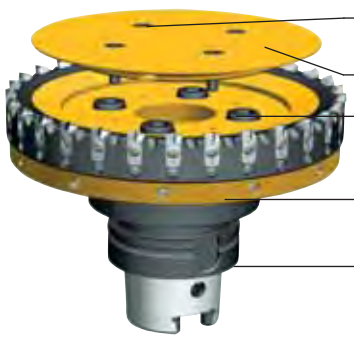


Tightening torque for the central cutter tightening screw

M20 (adapter diameter 40): **250 Nm**
M16 (adapter diameter 32): **150 Nm**
M12 (adapter diameter 27): **80 Nm**

Mounting the face milling cutter (dimensions similar to DIN 8030 Form C)

Place the body of the face milling cutter on the arbor. Ensure that the contact faces are clean. Screw in the fastening bolt (RH) and tighten with the appropriate torque. Put the aluminum coolant cover in place and fasten with the Torx fastening screws.



Tightening torque for the face milling cutter fastening screws

M20: 250 Nm
M16: 110 Nm
M12: 50 Nm

Tightening torque for the coolant cover fastening screws

M8: 18 Nm

New Supply



- On request, the face mill will be delivered with cartridges already mounted and adjusted.



Service Level 1
Reconditioning

- Tool diameter and tool length change

Service Level 2
PCD insert exchange

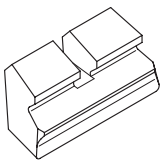
Reconditioning of PCD cartriges up to three times

- Tool diameter and length remain constant

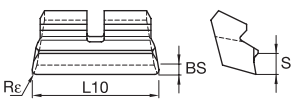


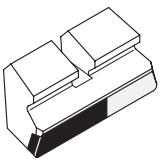
- Face mill will be delivered with exchanged cartridges already mounted, adjusted, and balanced.

Indexable Inserts for KENDEX Mini Mill BDHX...

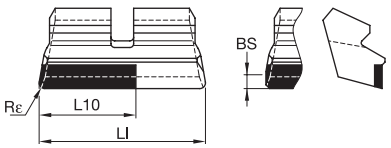


BDHX





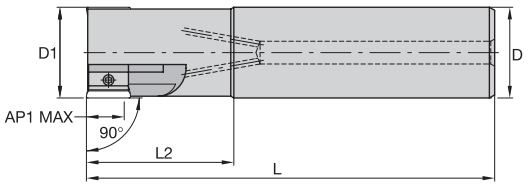
BDHX-Tipped



● first choice
○ alternate choice

H		
S		
N	●	●
K		
M		
P		

catalog number	cutting edges	L10	S	LI	BS	Rε	hm	K110M	KD1415
BDHX0802APFNLD1S	1	7,80	2,30	7,80	0,90	–	0,08	●	
BDHX0802APFNLNT1S	1	7,80	2,30	7,80	0,90	–	0,05		●
BDHX0802PPFNLD1S	1	7,80	2,30	7,80	–	0,4	0,08	●	
BDHX0802PPFNLNT1S	1	7,80	2,30	7,80	–	0,4	0,05		●
BPHX1203ADFNLD1S	1	12,00	3,08	12,00	1,00	–	0,05		●
BPHX1203ADFNLT1S	1	12,00	3,08	12,00	1,00	–	0,05		●
BPHX1203ADFRLT1S	1	7,00	3,08	12,00	1,00	–	0,05		●
BPHX1203PDFNLD1S	1	12,00	3,08	12,00	–	0,4	0,08	●	
BPHX1203PDFNLT1S	1	12,00	3,08	12,00	–	0,4	0,05		●
BPHX1203PDFRLT1S	1	7,00	3,08	12,00	–	0,4	0,05		●

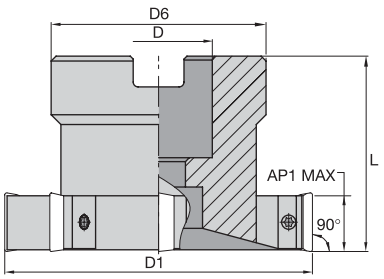


End Mills

D1	order number	catalog number	Z	Z ADJ	D	L2	L	Ap1 max	kg	Max RPM	insert 1
16	2438670	16A2R026A16CBD082W	2	2	16	26	75	7,8	0,1	50000	BDHX0802..
20	2438671	20A3R033A20CBD083W	3	3	20	33	85	7,8	0,2	35000	BDHX0802..
25	2438672	25A4R033A25CBD084W	4	4	25	33	90	7,8	0,3	30000	BDHX0802..
32	2439203	32A6R043A25CBD086W	6	6	25	43	100	7,8	4,0	25000	BDHX0802..

Spare Parts

D1	clamping set	adjustable torque wrench	drive bit	torque (Nm)	adj element
16	551.060	170.310	170.266	0,7	470.262
20	551.060	170.310	170.266	0,7	470.262
25	551.060	170.310	170.266	0,7	470.262
32	551.060	170.310	170.266	0,7	470.262



Shell Mills

D1	order number	catalog number	Z	Z ADJ	D	D6	L	Ap1 max	kg	Max RPM	insert 1
40	2439204	40A5RC90BP12D5W	5	5	16	32	40	12	0,2	28000	BPHX1203..
50	2439205	50A7RC90BP12D7W	7	7	22	40	40	12	0,3	26000	BPHX1203..
63	2439206	63A8RC90BP12D8W	8	8	22	42	40	12	0,4	25000	BPHX1203..
80	2439207	80A11RC90BP12D11W	11	11	27	51	50	12	0,8	20000	BPHX1203..
100	2439208	100A13RC90BP12D13W	13	13	32	58	50	12	1,1	18000	BPHX1203..
125	2439209	125A15RC90BP12D15W	15	15	40	71	63	12	2,0	16000	BPHX1203..

Spare Parts

D1	clamping set	adjustable torque wrench	drive bit	torque (Nm)	adj element	coolant screw
40	551.061	170.310	170.265	1,4	470.263	420.020
50	551.061	170.310	170.265	1,4	470.263	420.021
63	551.061	170.310	170.265	1,4	470.263	420.021
80	551.061	170.310	170.265	1,4	470.263	420.022
100	551.061	170.310	170.265	1,4	470.263	420.023
125	551.061	170.310	170.265	1,4	470.263	420.024

Ordering Example:
1 x 16A2R026A16CBD082W
10 x BDHX08T1PPFRLD1S K110M

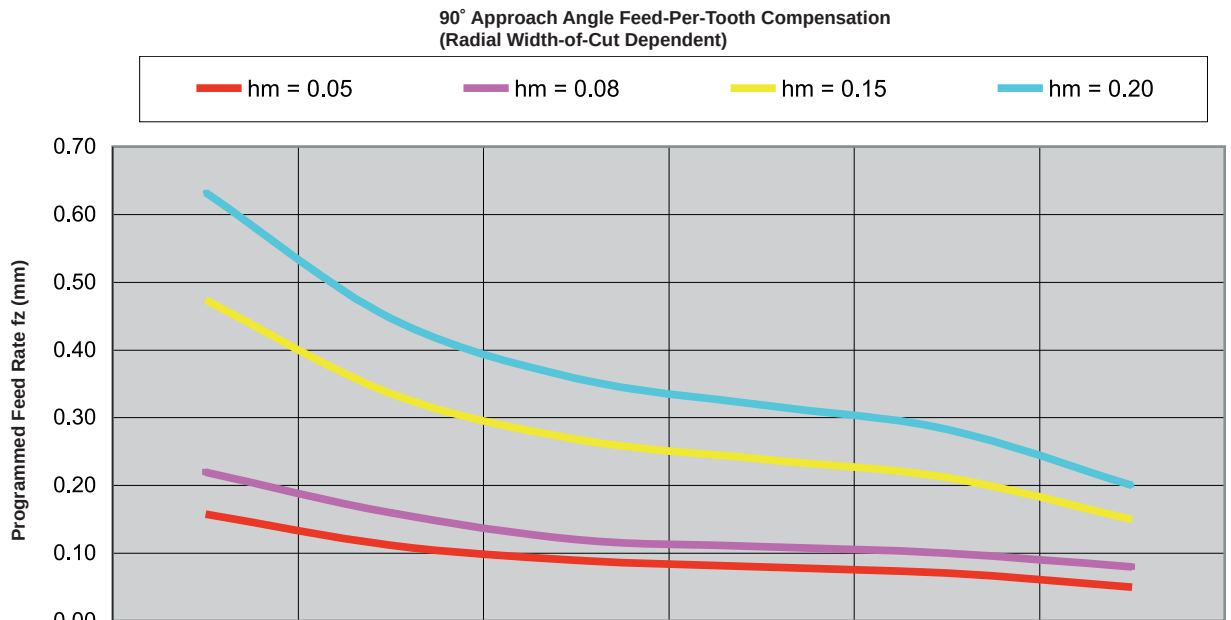
Recommended Starting Speeds [m/min]

90° approach angle

Material Group	KD1415		
P1			
P2			
P3			
P4			
P5			
P6			
M1			
M2			
M3			
K1			
K2			
K3			
N1	3050	**2270**	1820
N2	2540	**1540**	1090
S1			
S2			
S3			
S4			
H1			

FIRST choice starting speeds are in bold type.
As the average chip thickness value goes higher the speed should be decreased.

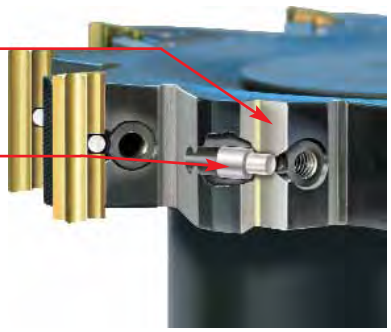
Recommended Starting Feeds



	10%	20%	30%	40%	50%	100%
hm = 0.05	0.16	0.11	0.09	0.08	0.07	0.05
hm = 0.08	0.22	0.16	0.12	0.11	0.10	0.08
hm = 0.15	0.47	0.34	0.27	0.24	0.21	0.15
hm = 0.20	0.63	0.45	0.36	0.32	0.28	0.20

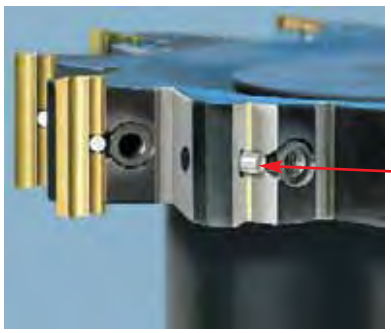
1. Loosen the clamp and thoroughly clean the seat.

The hole for the eccentric pin must have (copper or graphite based) assembly paste applied to it after the seat has been cleaned.

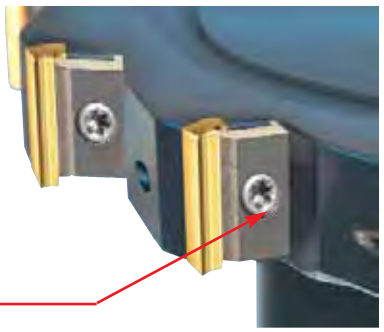


Eccentric pin for the micro adjustment of the insert.

2. Put the new insert into the seat.



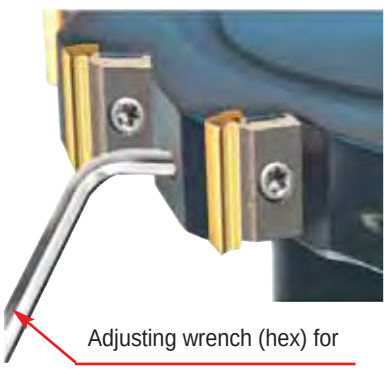
When doing this, care must be taken to ensure that the groove in the insert 'clicks home' into the eccentric pin.



3. Tighten the insert clamp lightly using a Torx screwdriver and then tighten it to the required torque.

4. Using the adjusting key (hexagonal wrench), the cutting edges can now be either set to each other and / or to an predetermined dimension.

The setting system allows continuous adjustment. Setting the cutting edges in 'TENSION ' is recommended. This means that all cutting edges should first be moved to the greatest possible width or height and then brought back to the required setting dimension.



Adjusting wrench (hex) for activating the eccentric pin

5. It is critical that setting is always carried out in a single direction!

If the desired dimension is either exceeded or fallen below the eccentric pin must be turned a full revolution once again.

6. Tightening the insert clamp is no longer required!

The tool is now ready to use.

Attention:

The friction coefficient between the insert and the seat may change. In such cases the insert clamp must be tightened with a slightly reduced value (about 80 %) in order to allow the insert to be set. The insert clamp can then be tightened to the recommended value.

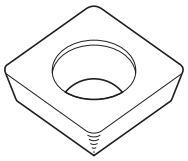
Safety note:

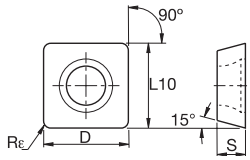
For safety reasons the milling cutter must be sent back to the manufacturer for checking and or repair! Only Kennametal original spares must be used!

tightening torques for clamping	diameter	tightening torque	Torx size
End mills	16 – 32 mm	70 Ncm	Tx 6
Shell mills and monoblock milling cutters	40 –125 mm	140 Ncm	Tx 8

KENNAMETAL

Indexable Inserts for Chamfer Mills SD..09... and SP..12...

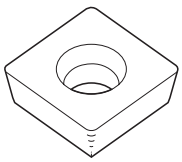


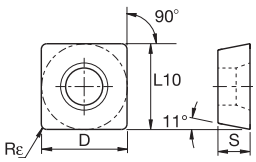


● first choice
○ alternate choice

							KC725M	KC735M	KC915M	KC935M
H										
S							●	●		
N										
K									●	○
M							●	●		○
P							●	○		●

catalog number	cutting edges	D	S	L10	Rε	hm	KC725M	KC735M	KC915M	KC935M
SDCW090308	4	9,53	3,18	9,53	0,8	0,05	●	●		●
SDCW090308T	4	9,53	3,18	9,53	0,8	0,10	●	●		
SDMT090308	4	9,53	3,18	9,53	0,8	0,05	●			



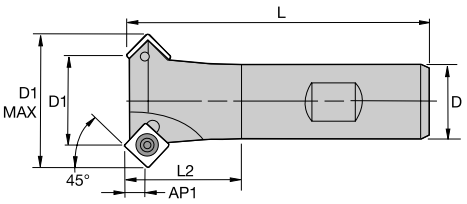


● first choice
○ alternate choice

							KC725M	KC735M	KC915M	KC935M
H										
S							●	●		
N										
K									●	○
M							●	●		○
P							●	○		●

catalog number	cutting edges	D	S	L10	Rε	hm	KC725M	KC735M	KC915M	KC935M
SPCW120408	4	12,70	4,76	12,70	0,8	0,05			●	
SPCW120408T	4	12,70	4,76	12,70	0,8	0,10	●	●		●
SPMT120408	4	12,70	4,76	12,70	0,8	0,08	●			●

- Countersinking-chamfering front and back.
- Four cutting edges per insert.
- Generous chip clearance.
- Smooth, quiet cutting.



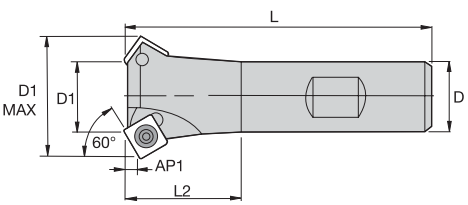


End Mills — 45°

D1	order number	catalog number	Z	D	D1 max	L2	L	Ap1 max	Max RPM	insert 1
10	1024578	10D1R032B16SSD09	1	16	22,0	34	83	6,5	33780	SD__0903___
12	1024579	12D1R032B16SSD09	1	16	24,0	34	83	6,5	30860	SD__0903___
16	1024580	16D1R025B16SSD09	1	16	28,0	27	76	6,5	26710	SD__0903___
20	1024581	20D2R030B20SSD09	2	20	32,0	32	83	6,5	23900	SD__0903___
32	1024609	32D3R138A32SSP12	3	32	49,0	40	200	9,0	14670	SP__1204___
32	1024583	32D3R038B32SSP12	3	32	49,0	40	101	9,0	14670	SP__1204___

Spare Parts

D1	insert screw	torque (Nm)	Torx wrench	Torx driver
10	MS1168	3	FT15	—
12	MS1168	3	FT15	—
16	MS1168	3	FT15	—
20	MS1168	3	FT15	—
32	MS1129	3	—	DT15
32	MS1129	3	—	DT15





End Mills — 30° Lead

D1	order number	catalog number	Z	D	D1 max	L2	L	Ap1 max	Max RPM	insert 1
32	1024604	32Y3R038B32SSP12	3	32	52	40,0	101	6,5	14670	SP__1204___

End Mills — 60° Lead

D1	order number	catalog number	Z	D	D1 max	L2	L	Ap1 max	Max RPM	insert 1
32	1024605	32C3R038B32SSP12	3	32	44	40	101	10,0	14670	SP__1204___

Spare Parts

D1	insert screw	torque (Nm)	Torx driver
32	MS1129	3	DT15

Ordering Example:
1 x 10D1R032B16SSD09
10 x SDCW090308 KC935M

Recommended Starting Speeds [m/min]

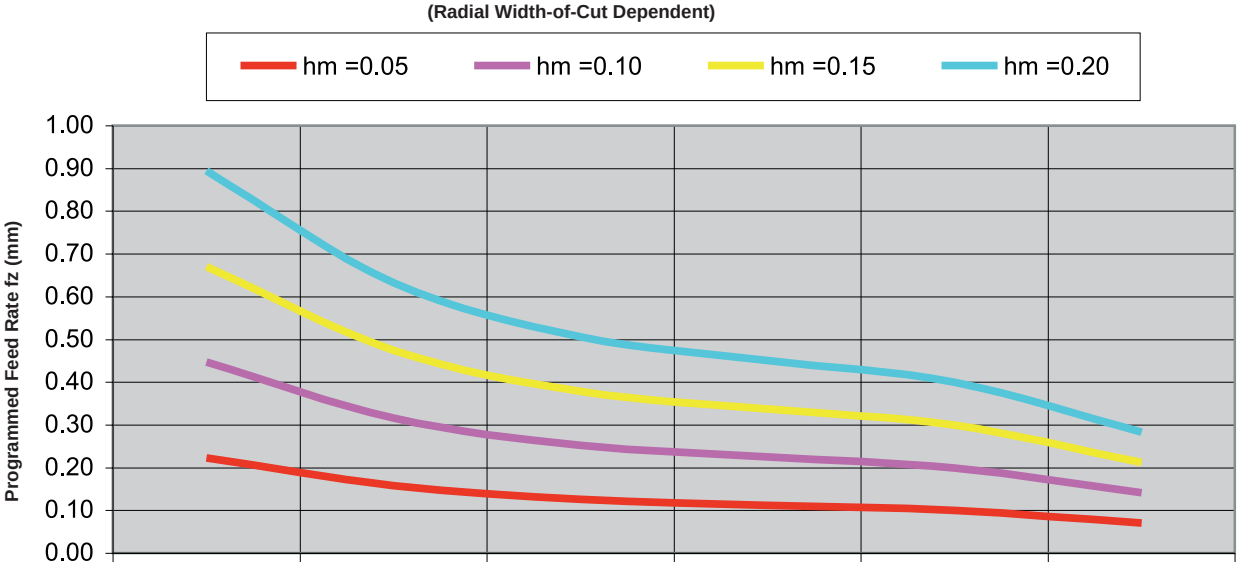
Chamfer Mills 30°, 45°, 60°

Material Group	KC725M			KC735M			KC915M			KC935M		
P1	310	**270**	250							470	**410**	380
P2	190	**180**	160							290	**260**	240
P3	180	**160**	140							260	**240**	220
P4	130	**120**	110							200	**180**	160
P5	180	**160**	150							265	**240**	215
P6	110	**90**								160	**140**	
M1	200	**180**	160	120	**110**	100				310	**270**	250
M2	180	**170**	150	110	**100**	90				280	**250**	230
M3	140	**120**		80	**70**					210	**180**	
K1	200	**180**	160				440	**400**	350	310	**280**	250
K2	160	**140**	130				350	**310**	290	240	**220**	200
K3	130	**120**	110				290	**260**	240	200	**180**	170
N1												
N2												
S1	40	**40**										
S2	40	**40**										
S3	50	**50**										
S4	60	**50**										
H1												

FIRST choice starting speeds are in bold type.
As the average chip thickness value goes higher the speed should be decreased.

Recommended Starting Feeds

30°, 45° Approach Angle Feed-Per-Tooth Compensation (Radial Width-of-Cut Dependent)

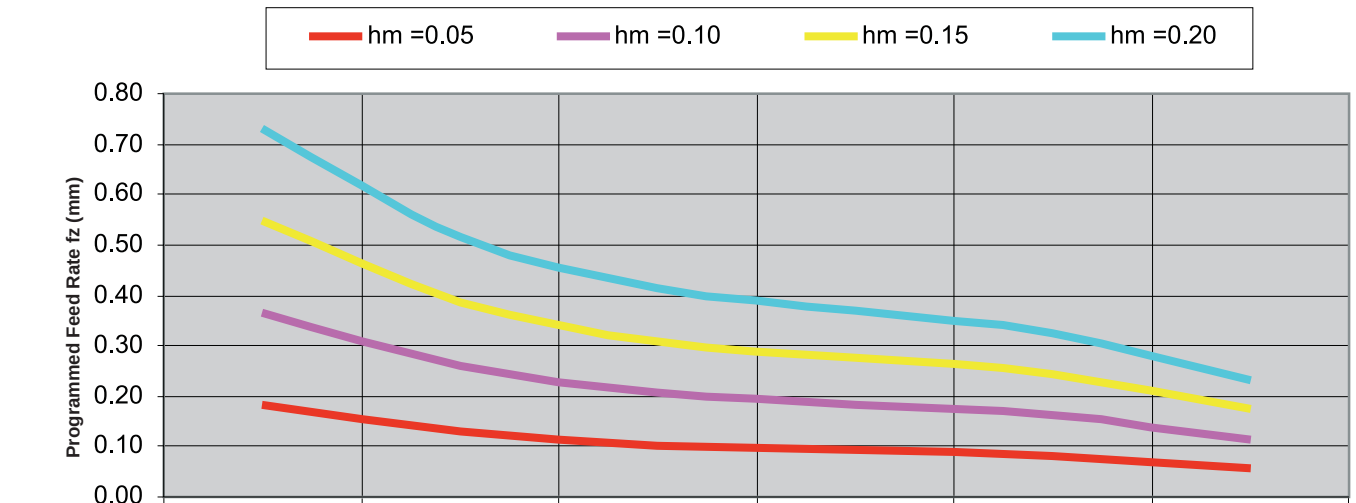


	10%	20%	30%	40%	50%	100%
hm =0.05	0.22	0.16	0.13	0.11	0.10	0.07
hm =0.10	0.45	0.32	0.25	0.23	0.20	0.14
hm =0.15	0.67	0.47	0.38	0.34	0.30	0.21
hm =0.20	0.89	0.63	0.51	0.45	0.40	0.28

Percentage of the Cutter Diameter in Cut

Recommended Starting Feeds

60° Approach Angle Feed-Per-Tooth Compensation
(Radial Width-of-Cut Dependent)



	10%	20%	30%	40%	50%	100%
hm =0.05	0.18	0.13	0.10	0.09	0.08	0.06
hm =0.10	0.37	0.26	0.21	0.18	0.16	0.12
hm =0.15	0.55	0.39	0.31	0.28	0.24	0.17
hm =0.20	0.73	0.52	0.41	0.37	0.33	0.23

Percentage of the Cutter Diameter in Cut



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THINK **KENNAMETAL.**



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KENNAMETAL®
Engineering Your Competitive Edge



90° Mills

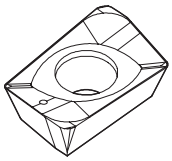
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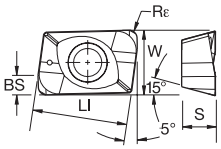
NGE-A 363
Mill 1 – 14 367
Mill 1 – 18 373
Mill 1 – 25 Max 377
KSSM 90° IC 10 mm.....381
KSSM 90° IC 12 mm.....386
FIX-PERFECT 90° Cast Iron 391
FIX-PERFECT 90° Aluminum 397



MILLING

Indexable Inserts for NGE-A ADKT10...





● first choice
○ alternate choice

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

catalog number	cutting edges	LI	W	S	BS	Rε	hm	KC410M	KC520M	KC522M	KC525M	KC725M	KC915M	KC935M
ADKT103504PDERLC	2	10,00	6,70	3,50	2,00	0,4	0,08		●		●	●		●
ADKT103504PDFRLC	2	10,00	6,70	3,50	2,00	0,4	0,05	●						
ADKT103504PDSRLC	2	10,00	6,70	3,50	2,00	0,4	0,10					●		●
ADKT1035PDERLC	2	10,00	6,70	3,50	2,00	0,8	0,08		●	●	●	●	●	●
ADKT1035PDFRLC	2	10,00	6,70	3,50	2,00	0,8	0,05	●						
ADKT1035PDSRLC	2	10,00	6,70	3,50	2,00	0,8	0,10		●		●	●		●
ADKT103512PDERLC	2	10,00	6,70	3,50	2,00	1,2	0,08			●		●		●
ADKT103516PDERLC	2	10,00	6,70	3,50	2,00	1,6	0,08			●	●	●		●
ADKT103524PDERLC	2	10,00	6,61	3,50	2,00	2,4	0,08			●		●		●
ADKT103532PDERLC	2	10,00	6,70	3,50	2,00	3,2	0,08			●	●	●		●

ADPT10-GC

catalog number	cutting edges	LI	W	S	BS	Rε	hm	KC410M	KC520M	KC522M	KC525M	KC725M	KC915M	KC935M
ADPT1035PDERGC	2	9,82	6,70	3,50	2,00	0,8	0,08		●	●		●		
ADPT1035PDSRGC	2	9,82	6,70	3,50	2,00	0,8	0,10				●	●		

ADPT10-GP

catalog number	cutting edges	LI	W	S	BS	Rε	hm	KC410M	KC520M	KC522M	KC525M	KC725M	KC915M	KC935M
ADPT1035PDERGP	2	10,00	6,70	3,50	2,16	0,8	0,08		●		●	●	●	●

Proven Solution

NGE-A

Kennametal cutter: ***20A03R031M10SAD10***
Kennametal insert: ***ADKT1035PDERLC***
Grade: ***KC725M***

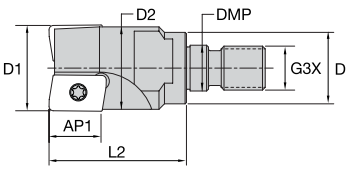
Operation: ***end milling low-alloy steel***

	Kennametal	*Competitor*
cutting speed (m/min):	***189***	***170***
feed per tooth:	***0,08 mm***	***0,05 mm***
axial cutting depth:	***3 mm***	***3 mm***
time per piece:	***1,68 s***	***2,94 s***
annual costs:	***$105.569,50***	***$143.754,-***

Annual Savings: $38.184,50

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

- 9 mm depth-of-cut capability.
- 90° shoulders.
- Through coolant.



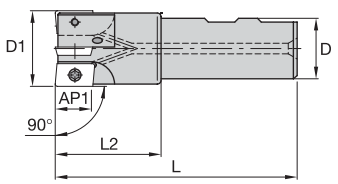
End Mills — Screw-On

D1	order number	catalog number	Z	G3X	DPM	D	D2	L2	Ap1 max	Max Ramp Angle	kg	Max RPM
12	1888425	12A01R025M08SAD10	1	M8	8,5	13	11,0	26	8,5	2.0°	0,03	18500
16	1888426	16A02R025M08SAD10	2	M8	8,5	13	14,9	25	8,5	3.0°	0,03	16000
20	1888427	20A03R031M10SAD10	3	M10	10,5	18	19,0	31	8,5	3.0°	0,06	14500
25	1888428	25A04R035M12SAD10	4	M12	12,5	21	23,6	35	8,5	4.0°	0,03	12000
32	1888429	32A05R040M16SAD10	5	M16	17,0	29	30,3	40	8,5	4.0°	0,21	11500

Spare Parts

D1	insert screw	Torx wrench	torque (Nm)
12	MS1861	KT8	1,7
16	MS1861	KT8	1,7
20	MS1861	KT8	1,7
25	MS1861	KT8	1,7
32	MS1861	KT8	1,7

- 9 mm depth-of-cut capability.
- 90° shoulders.
- Through coolant.



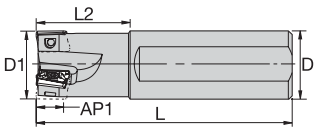


End Mills — Weldon Shank

D1	order number	catalog number	Z	D	L2	L	Ap1 max	kgs	Max RPM	insert screw	torque (Nm)	Torx wrench
12	1024341	12A1R026B16SAD10	1	16	26	75	9	0,10	18600	MS1861	1,7	KT8
14	1024342	14A1R026B16SAD10	1	16	26	75	9	0,10	17250	MS1861	1,7	KT8
16	1024343	16A2R026B16SAD10	2	16	26	75	9	0,10	16150	MS1861	1,7	KT8
18	1024374	18A2R031B20SAD10	2	20	31	82	9	0,10	15200	MS1861	1,7	KT8
20	1024383	20A3R031B20SAD10	3	20	31	82	9	0,14	14425	MS1861	1,7	KT8
20	1024375	20A2R031B20SAD10	2	20	31	82	9	0,10	14425	MS1861	1,7	KT8
22	1024376	22A3R039B25SAD10	3	25	39	96	9	0,30	13750	MS1861	1,7	KT8
25	1024404	25A4R039B25SAD10	4	25	39	96	9	0,28	12900	MS1974	1,7	KT8
25	1024377	25A3R039B25SAD10	3	25	39	96	9	0,30	12900	MS1861	1,7	KT8
28	1024378	28A4R039B25SAD10	4	25	39	96	9	0,30	12200	MS1974	1,7	KT8
30	1024379	30A4R043B25SAD10	4	25	41	100	9	0,40	11700	MS1861	1,7	KT8
32	1024380	32A4R039B32SAD10	4	32	39	100	9	0,50	11400	MS1974	1,7	KT8
32	1024381	32A5R039B32SAD10	5	32	39	100	9	0,50	11400	MS1974	1,7	KT8
40	1024382	40A6R049B32SAD10	6	32	49	110	9	0,70	10200	MS1974	1,7	KT8

Ordering Example:
1 x 12A01R025M08SAD10
10 x ADKT103504PDERLC KC725M

- 9 mm depth-of-cut capability.
- 90° shoulders.
- Through coolant.





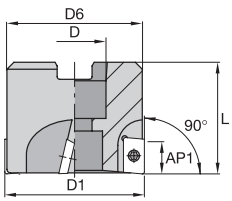
End Mills — Cylindrical Shank

D1	order number	catalog number	Z	D	L2	L	Ap1 max	kg	Max RPM
16	1888462	16A02R040A16SAD10	2	16	40	160	9	0,1	16150
20	1888459	20A02R050A20SAD10	2	20	50	200	9	0,1	14425

Spare Parts

D1	insert screw	Torx wrench	torque (Nm)
16	MS1861	KT8	1,7
20	MS1861	KT8	1,7

- 9 mm depth-of-cut capability.
- 90° shoulders.
- Through coolant.



Shell Mills — Coarse Pitch

D1	order number	catalog number	Z	D	D6	L	Ap1 max	kg	Max RPM
40	1566786	40A04RS90AD10D	4	16	32	40	9	0,25	10200
50	1566075	50A05RS90AD10D	5	22	42	40	9	0,35	6300
63	1566073	63A06RS90AD10D	6	22	51	40	9	0,60	5100

Spare Parts

D1	insert screw	Torx wrench	torque (Nm)
40	MS1974	KT8	1,7
50	MS1974	KT8	1,7
63	MS1974	KT8	1,7

Shell Mills — Fine Pitch

D1	order number	catalog number	Z	D	D6	L	Ap1 max	kg	Max RPM
40	1566076	40A06RS90AD10D	6	16	32	40	9	0,3	10200
50	1566074	50A07RS90AD10D	7	22	42	40	9	0,4	6300
63	1566072	63A08RS90AD10D	8	22	51	40	9	0,6	5100

Spare Parts

D1	insert screw	Torx wrench	torque (Nm)
40	MS1974	KT8	1,7
50	MS1974	KT8	1,7
63	MS1974	KT8	1,7

Ordering Example:
1 x 40A06RS90AD10D
10 x ADKT103504PDERLC KC725M

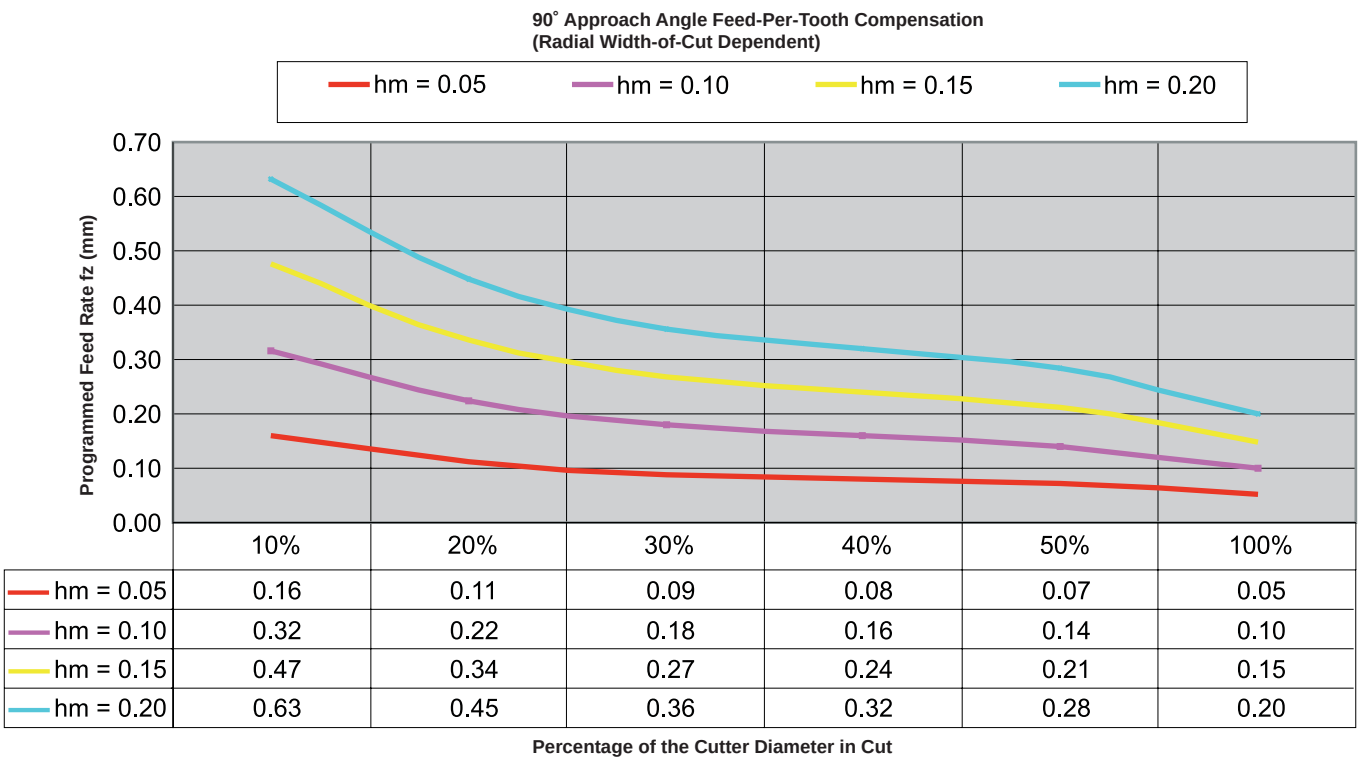
Recommended Starting Speeds [m/min]

90° approach angle

Material Group	KC410M			KC520M			KC522M			KC525M			KC725M			KC915M			KC935M		
P1													260	**230**	210				390	**340**	320
P2													160	**150**	130				240	**220**	200
P3													150	**130**	120				220	**200**	180
P4							100	**90**	80				110	**100**	90				160	**150**	140
P5							130	**125**	105				125	**110**	100				225	**200**	180
P6							80	**70**					90	**80**					140	**120**	
M1							150	**130**	120	200	**180**	165	170	**150**	140				250	**220**	210
M2							140	**120**	120	170	**155**	140	150	**140**	130				230	**210**	190
M3							100	**90**		140	**125**	105	120	**100**					170	**150**	
K1				270	**240**	220							160	**150**	130	360	**330**	290	250	**230**	210
K2				210	**190**	180	200	**180**	170				130	**120**	110	290	**260**	240	200	**180**	170
K3				180	**160**	140	170	**150**	140				110	**100**	90	240	**220**	200	170	**150**	140
N1	1210	**1080**	990																		
N2																					
S1							30	**30**		65	**55**	45	40	**30**							
S2							30	**30**		45	**35**	30	30	**30**							
S3							40	**40**		40	**35**	30	40	**40**							
S4							50	**40**		50	**45**	35	50	**50**							
H1																					

FIRST choice starting speeds are in bold type.
As the average chip thickness goes higher the speed should be decreased.

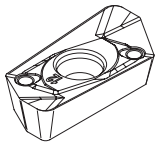
Recommended Starting Feeds



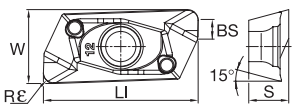
	10%	20%	30%	40%	50%	100%
hm = 0.05	0.16	0.11	0.09	0.08	0.07	0.05
hm = 0.10	0.32	0.22	0.18	0.16	0.14	0.10
hm = 0.15	0.47	0.34	0.27	0.24	0.21	0.15
hm = 0.20	0.63	0.45	0.36	0.32	0.28	0.20

KENNAMETAL

Indexable Inserts for Mill 1-14 ED.T1404



EDCT14-LD



NEW!

● first choice
○ alternate choice

	KC410M	KC520M	KC522M	KC725M	KC915M	KC935M
H						
S			●	●		
N	●					
K		●	○		●	○
M			●	●		○
P			○	●		●

catalog number	cutting edges	Ll	W	S	BS	Rε	hm	KC410M	KC520M	KC522M	KC725M	KC915M	KC935M
EDCT140404PDERGD	2	17,46	8,49	4,50	2,95	0,4	0,08				●		
EDCT140404PDERLD	2	17,46	8,49	4,50	2,95	0,4	0,06			●			
EDCT140404PDFRLDJ	2	17,46	8,49	4,50	2,95	0,4	0,05	●					
EDCT140408PDERGD	2	17,47	8,48	4,50	2,56	0,8	0,08				●		
EDCT140408PDERLD	2	17,47	8,48	4,50	2,56	0,8	0,06			●			
EDCT140408PDFRLDJ	2	17,47	8,48	4,50	2,56	0,8	0,05	●					
EDCT140412PDERGD	2	17,48	8,46	4,50	2,17	1,2	0,08				●		
EDCT140412PDERLD	2	17,48	8,46	4,50	2,17	1,2	0,06			●			
EDCT140412PDFRLDJ	2	17,47	8,46	4,50	2,17	1,2	0,05	●					
EDCT140416PDERGD	2	17,49	8,45	4,50	1,77	1,6	0,08				●		
EDCT140416PDERLD	2	17,49	8,45	4,50	1,77	1,6	0,06			●			
EDCT140416PDFRLDJ	2	17,49	8,45	4,50	1,77	1,6	0,05	●					
EDCT140431PDERGD	2	17,50	8,40	4,50	0,26	3,1	0,08				●		
EDCT140431PDERLD	2	17,50	8,40	4,50	0,26	3,1	0,06			●			
EDCT140431PDFRLDJ	2	17,50	8,40	4,50	0,26	3,1	0,05	●					
EDPT140404PDERHD	2	17,46	8,39	4,50	2,95	0,4	0,12		●	●	●	●	●
EDPT140408PDERHD	2	17,47	8,38	4,50	2,56	0,8	0,12		●	●	●	●	●
EDPT140408PDSRGD	2	17,47	8,37	4,50	2,55	0,8	0,15		●		●		●
EDPT140412PDERHD	2	17,48	8,36	4,50	2,16	1,2	0,12		●	●	●	●	●
EDPT140412PDSRGD	2	17,48	8,35	4,50	2,17	1,2	0,15		●		●		●
EDPT140416PDERHD	2	17,49	8,36	4,50	1,77	1,6	0,12		●	●	●	●	●
EDPT140416PDSRGD	2	17,49	8,35	4,50	1,77	1,6	0,15		●		●		●
EDPT140420PDERHD	2	17,49	8,35	4,50	1,37	2,0	0,12			●	●		●
EDPT140424PDERHD	2	17,50	8,32	4,50	0,99	2,4	0,12			●	●		●
EDPT140431PDERHD	2	17,51	8,30	4,50	0,26	3,1	0,12			●	●		●
EDPT140440PDERHD	2	16,53	8,26	4,50	–	4,0	0,12			●	●		●

Proven Solution

Mill 1-14

	Kennametal	Competitor
cutting speed (m/min):	***160***	***160***
feed per tooth:	***0,13 mm***	***0,13 mm***
axial cutting depth:	***3,20 mm***	***3,20 mm***
parts/index:	***90***	***30***
time per piece:	***6 s***	***6 s***
annual costs:	***$2.893,78***	***$6.256,-***

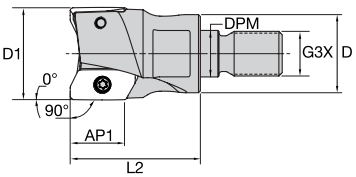
Kennametal cutter: ***25A02R044B25SED14***
Kennametal insert: ***EDCT140408PDERGD***
Grade: ***KC725M***

Operation: ***contour milling stainless steel***

Annual Savings: $3.362,22

NEW!

- 14 mm depth-of-cut capability.
- Aggressive ramping rates.
- Generates superior surface finish.
- Mill true 90° walls.
- High rpm capabilities.





End Mills - Screw-On

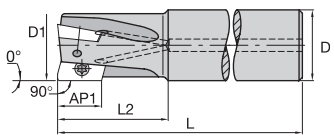
D1	order number	catalog number	Z	G3X	D	L2	DPM	Ap1 max	Max Ramp Angle	kg	Max RPM
20	2968370	20A02R035M10SED14	2	M10	18	35	10,5	14,7	16.8°	0,1	47500
25	2968371	25A02R035M12SED14	2	M12	21	35	12,5	14,6	10.7°	0,1	39700
32	2968372	32A03R040M16SED14	3	M16	29	40	17,0	14,6	7.0°	0,2	33300
40	2968373	40A04R040M16SED14	4	M16	29	40	17,0	14,4	5.1°	0,2	28700

Spare Parts

D1	insert screw	torque (Nm)	Torx plus driver
20	MS2167	2,3	DT9IP
25	MS2166	2,3	DT9IP
32	MS2166	2,3	DT9IP
40	MS2166	2,3	DT9IP

NEW!

- 14 mm depth-of-cut capability.
- Aggressive ramping rates.
- Generates superior surface finish.
- Mill true 90° walls.
- High rpm capabilities.



End Mills — Cylindrical Shank — Long Length

D1	order number	catalog number	Z	D	L2	L	Ap1 max	Max Ramp Angle	kg	Max RPM
20	2968363	20A02R050A20SED14-170	2	20	50	170	14,7	16.8°	0,3	47500
25	2968367	25A02R050A25SED14-170	2	25	50	170	14,6	10.7°	0,6	39700
25	2968364	25A03R050A25SED14-170	3	25	50	170	14,6	10.7°	0,6	39700
32	2968368	32A03R050A32SED14-200	3	32	50	200	14,6	7.0°	1,1	33300
32	2968365	32A04R050A32SED14-200	4	32	50	200	14,6	7.0°	1,1	33300
40	2968369	40A04R050A32SED14-200	4	32	50	200	14,4	5.1°	1,2	28700
40	2968366	40A05R050A32SED14-200	5	32	50	200	14,4	5.1°	1,3	28700

Spare Parts

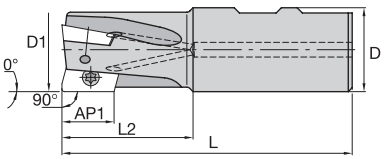
D1	insert screw	torque (Nm)	Torx plus driver
20	MS2167	2,3	DT9IP
25	MS2166	2,3	DT9IP
32	MS2166	2,3	DT9IP
40	MS2166	2,3	DT9IP

Ordering Example:
1 x 20A02R035M10SED14
10 x EDCT140404PDERLD KC725M

Indexable End Mills — Mill 1-14

NEW!

- 14 mm depth-of-cut capability.
- Aggressive ramping rates.
- Generates superior surface finish.
- Mill true 90° walls.
- High rpm capabilities.





End Mills — Weldon Shank

D1	order number	catalog number	Z	D	L2	L	Ap1 max	Max Ramp Angle	kgs	Max RPM
20	2622232	20A02R039B20SED14	2	20	39	90	14,7	16.8°	0,2	47500
25	2623937	25A02R044B25SED14	2	25	44	100	14,6	10.7°	0,3	39700
25	2478640	25A03R044B25SED14	3	25	44	101	14,6	10.7°	0,3	39700
32	2623938	32A03R050B32SED14	3	32	50	110	14,5	7.0°	0,6	33300
32	2478642	32A04R050B32SED14	4	32	50	110	14,5	7.0°	0,6	33300
40	2623939	40A04R050B32SED14	4	32	50	110	14,4	5.1°	0,7	28700
40	2623933	40A05R050B32SED14	5	32	50	110	14,4	5.1°	0,7	28700

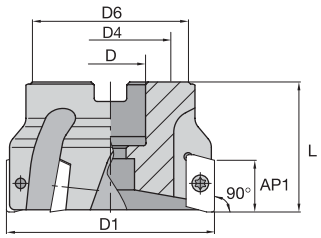
Spare Parts

D1	insert screw	torque (Nm)	Torx plus driver
20	MS2167	2,3	DT9IP
25	MS2166	2,3	DT9IP
32	MS2166	2,3	DT9IP
40	MS2166	2,3	DT9IP

Ordering Example:
1 x 20A02R039B20SED14
10 x EDCT140404PDERLD KC725M

NEW!

- 14 mm depth-of-cut capability.
- Aggressive ramping rates.
- Generates superior surface finish.
- Mill true 90° walls.
- High rpm capabilities.





Shell Mills — Coarse Pitch

D1	order number	catalog number	Z	D	D4	D6	L	Ap1 max	Max Ramp Angle	kgs	Max RPM
40	2623940	40A04RS90ED14D	4	16	—	37	40	14,4	5.1°	0,2	28700
50	2623941	50A05RS90ED14D	5	22	—	45	40	14,3	3.8°	0,3	25000
63	2623942	63A06RS90ED14D	6	22	—	50	40	14,3	2.8°	0,5	21800
80	2623963	80A07RS90ED14D	7	27	—	60	50	14,2	2.1°	1,0	19000
100	2623964	100A08RS90ED14D	8	32	—	80	50	14,2	1.7°	1,8	16800
125	2510390	125B09RS90ED14D	9	40	—	90	63	14,2	1.3°	2,9	14900
160	2623965	160C11RS90ED14D	11	40	66,70	100	63	14,2	1.0°	4,0	13100

Shell Mills — Fine Pitch

D1	order number	catalog number	Z	D	D4	D6	L	Ap1 max	Max Ramp Angle	kgs	Max RPM
40	2623934	40A05RS90ED14D	5	16	—	37	40	14,4	5.1°	0,20	28700
50	2478686	50A06RS90ED14D	6	22	—	45	40	14,3	3.8°	0,29	25000
63	2478689	63A07RS90ED14D	7	22	—	50	40	14,3	2.8°	0,53	21800
80	2478690	80A09RS90ED14D	9	27	—	60	50	14,2	2.1°	1,08	19000
100	2623935	100A10RS90ED14D	10	32	—	80	50	14,2	1.7°	1,86	16800
125	2623936	125B12RS90ED14D	12	40	—	90	63	14,2	1.3°	3,01	14900
160	2510391	160C15RS90ED14D	15	40	67	100	63	14,2	1.0°	4,20	13100

Spare Parts

D1	insert screw	Torx plus driver	torque (Nm)	mounting screw	coolant screw	coolant cap
40	MS2166	DT9IP	2,3	MS1294	MS1294CG	—
50	MS2166	DT9IP	2,3	—	MS2072CG	—
63	MS2166	DT9IP	2,3	—	MS2072CG	—
80	MS2166	DT9IP	2,3	—	MS2038CG	—
100	MS2166	DT9IP	2,3	—	MS1254CG	—
125	MS2166	DT9IP	2,3	—	420.200	470.232
160	MS2166	DT9IP	2,3	—	420.200	470.233

Ordering Example:
1 x 63A07RS90ED14D
10 x EDCT140404PDERLD KC725M

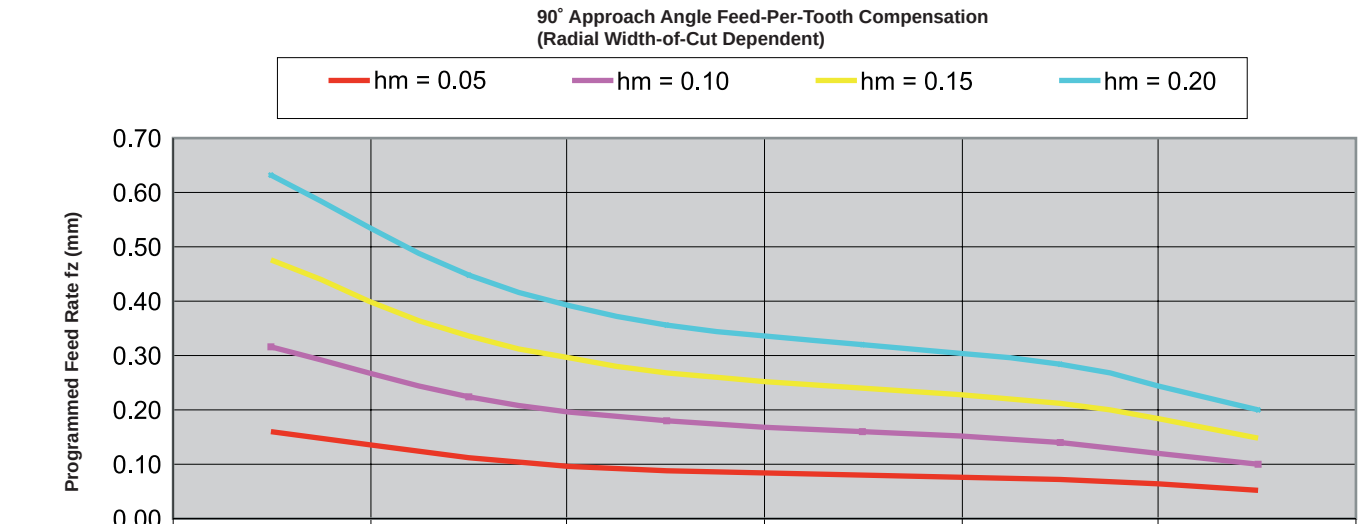
Recommended Starting Speeds [m/min]

90° approach angle

Material Group	KC410M			KC520M			KC522M			KC725M			KC915M			KC935M		
P1										260	**230**	210				390	**340**	320
P2										160	**150**	130				240	**220**	200
P3										150	**130**	120				220	**200**	180
P4							100	**90**	80	110	**100**	90				160	**150**	140
P5							130	**125**	105	125	**110**	100				225	**200**	180
P6							80	**70**		90	**80**					140	**120**	
M1							150	**130**	120	170	**150**	140				250	**220**	210
M2							140	**120**	120	150	**140**	130				230	**210**	190
M3							100	**90**		120	**100**					170	**150**	
K1				270	**240**	220				160	**150**	130	360	**330**	290	250	**230**	210
K2				210	**190**	180	200	**180**	170	130	**120**	110	290	**260**	240	200	**180**	170
K3				180	**160**	140	170	**150**	140	110	**100**	90	240	**220**	200	170	**150**	140
N1	1210	**1080**	990															
N2																		
S1							30	**30**		40	**30**							
S2							30	**30**		30	**30**							
S3							40	**40**		40	**40**							
S4							50	**40**		50	**50**							
H1																		

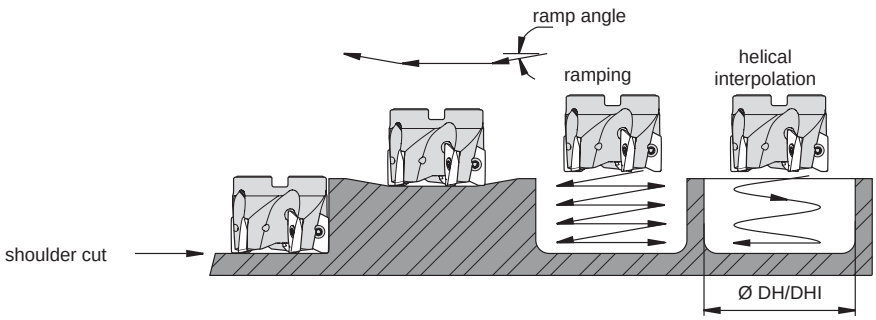
FIRST choice starting speeds are in bold type.
As the average chip thickness goes higher the speed should be decreased.

Recommended Starting Feeds



	10%	20%	30%	40%	50%	100%
hm = 0.05	0.16	0.11	0.09	0.08	0.07	0.05
hm = 0.10	0.32	0.22	0.18	0.16	0.14	0.10
hm = 0.15	0.47	0.34	0.27	0.24	0.21	0.15
hm = 0.20	0.63	0.45	0.36	0.32	0.28	0.20

Percentage of the Cutter Diameter in Cut



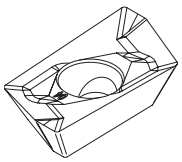
DH min. = Min. blind hole diameter with helical interpolation
DHI max. = Max. blind hole diameter with flat bottom

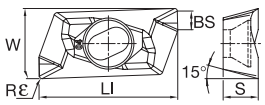
Insert Style	Cutting Diameter	Max. Ramp. Angle	Minimum Hole Diameter (DH min)	Maximum Flat-bottomed Hole Diameter, (DHI max)	Max Dia with No flat bottom
Mill 1-14	20	16°	23,74	35,62	40
Mill 1-14	25	11°	33,75	44,44	50
Mill 1-14	32	7°	47,80	59,79	64
Mill 1-14	40	5°	63,76	75,22	80
Mill 1-14	40	5°	64,00	75,47	80
Mill 1-14	50	4°	83,96	96,05	100
Mill 1-14	63	3°	109,93	121,47	126
Mill 1-14	80	2°	143,91	155,47	160
Mill 1-14	100	1°	183,89	199,47	200
Mill 1-14	125	1°	233,88	245,47	250
Mill 1-14	160	1°	303,88	315,47	320

Note: Max. ramp angle decreases as nose radius increases.

KENNAMETAL

Indexable Inserts for Mill 1-18 ED.T1805





NEW!

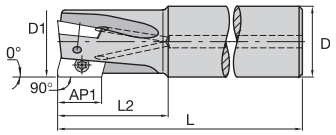
● first choice
○ alternate choice

								KC410M	KC520M	KC522M	KC525M	KC715M	KC725M	KC915M	KC935M
H										●	●		●		
S		●		○										●	○
N			●	○						●	○				
K										●	○			●	○
M										●	●		●		○
P				○		●	●			○		●	●		●
catalog number	cutting edges	Ll	W	S	BS	Rε	hm								
EDCT180504PDERGD	2	21,75	10,98	5,50	3,07	0,4	0,10						●		
EDCT180504PDFRLDJ	2	21,75	10,98	5,50	3,07	0,4	0,05	●							
EDCT180508PDERGD	2	21,76	10,97	5,50	2,69	0,8	0,10						●		
EDCT180508PDERLD	2	21,76	10,97	5,50	2,69	0,8	0,08			●					
EDCT180508PDFRLDJ	2	21,76	10,97	5,50	2,69	0,8	0,05	●							
EDCT180512PDERGD	2	21,77	10,97	5,50	2,29	1,2	0,10						●		
EDCT180512PDFRLDJ	2	21,77	10,97	5,50	2,29	1,2	0,05	●							
EDCT180516PDERLD	2	21,78	10,96	5,50	1,90	1,6	0,08			●					
EDCT180516PDFRLDJ	2	21,78	10,96	5,50	1,90	1,6	0,05	●							
EDCT180520PDFRLDJ	2	21,79	10,95	5,50	1,49	2,0	0,05	●							
EDCT180524PDFRLDJ	2	21,79	10,93	5,50	1,11	2,4	0,05	●							
EDCT180532PDERLD	2	21,79	10,91	5,50	0,32	3,2	0,08			●					
EDCT180532PDFRLDJ	2	21,79	10,91	5,50	0,32	3,2	0,05	●							
EDCT180540PDERLD	2	20,78	10,87	5,50	–	4,0	0,08			●					
EDCT180540PDFRLDJ	2	20,78	10,87	5,50	–	4,0	0,05	●							
EDCT180548PDERLD	2	20,20	10,83	5,50	–	4,8	0,08			●					
EDCT180548PDFRLDJ	2	20,20	10,83	5,50	–	4,8	0,05	●							
EDCT180564PDERLD	2	18,72	10,73	5,50	–	6,4	0,08			●					
EDCT180564PDFRLDJ	2	18,72	10,73	5,50	–	6,4	0,05	●							
EDPT180508PDERGD	2	21,76	10,97	5,50	2,69	0,8	0,10		●		●	●	●		●
EDPT180508PDERHD	2	21,77	10,89	5,50	2,69	0,8	0,12						●		●
EDPT180508PDSRGD	2	21,76	10,90	5,50	2,69	0,8	0,18						●	●	●
EDPT180512PDERGD	2	21,77	11,00	5,50	2,29	1,2	0,10						●		
EDPT180512PDERHD	2	21,77	10,88	5,50	2,29	1,2	0,12						●		●
EDPT180512PDSRGD	2	21,77	10,89	5,50	2,29	1,2	0,18						●	●	●
EDPT180516PDERGD	2	21,78	10,94	5,50	1,90	1,6	0,10		●	●	●		●		●
EDPT180516PDERHD	2	21,78	10,87	5,50	1,90	1,6	0,12						●		●
EDPT180516PDSRGD	2	21,78	10,88	5,50	1,90	1,6	0,18						●	●	●
EDPT180524PDERGD	2	21,79	10,93	5,50	1,11	2,4	0,10						●		
EDPT180532PDERGD	2	21,79	10,91	5,50	0,32	3,2	0,10		●	●	●		●		●
EDPT180532PDERHD	2	21,79	10,83	5,50	0,31	3,2	0,12						●		●
EDPT180532PDSRGD	2	21,79	10,83	5,50	0,32	3,2	0,18						●		●
EDPT180548PDERGD	2	20,20	10,83	5,50	–	4,8	0,10			●	●		●		
EDPT180548PDERHD	2	20,16	10,75	5,50	–	4,8	0,12						●		●
EDPT180564PDERGD	2	18,79	10,73	5,50	–	6,4	0,10			●	●		●		●

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

NEW!

- 18 mm depth-of-cut capability.
- Aggressive ramping rates.
- Generates superior surface finish.
- Mill true 90° walls.
- High rpm capabilities.



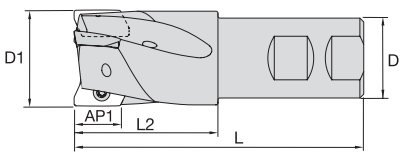
End Mills — Cylindrical Shank - Long Length

D1	order number	catalog number	Z	D	L2	L	Ap1 max	Max Ramp Angle	kg	Max RPM
25	2613785	25A02R050A25SED18-170	2	25	50	170	18,0	17.0°	0,5	37380
32	2613786	32A03R050A32SED18-200	3	32	50	200	18,0	10.5°	1,1	32140
32	2613788	32A02R050A32SED18-200	2	32	50	200	18,0	10.5°	1,1	32140
40	2613787	40A04R050A32SED18-200	4	32	50	200	17,8	7.5°	1,2	28220
40	2613789	40A03R050A32SED18-200	3	32	50	200	17,8	7.5°	1,2	28220

Spare Parts

D1	insert screw	Torx plus driver	torque (Nm)
25	MS2126	DT15IP	4,0
32	MS2126	DT15IP	4,0
40	MS2126	DT15IP	4,0

NEW!





End Mills — Weldon Shank

D1	order number	catalog number	Z	D	L2	L	Ap1 max	Max Ramp Angle	kg	Max RPM
25	2390446	25A02R044B25SED18	2	25	44	100	18,0	17.0°	0,3	37380
32	2390448	32A03R050B32SED18	3	32	50	110	18,0	10.5°	0,5	32140
40	2417191	40A03R050B32SED18	3	32	50	110	17,8	7.5°	0,7	28220
40	2390450	40A04R050B32SED18	4	32	50	110	17,8	7.5°	0,6	28220

Spare Parts

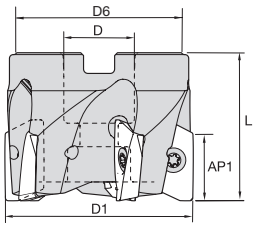
D1	insert screw	Torx plus wrench	torque (Nm)
25	MS2126	DT15IP	4,0
32	MS2126	DT15IP	4,0
40	MS2126	DT15IP	4,0

Ordering Example:
1 x 25A02R050A25SED18-170
10 x EDCT180504PDERGD KC725M

Indexable Shell Mills — Mill 1-18

- 18 mm depth-of-cut capability.
- Aggressive ramping rates.
- Generates superior surface finish.
- Mill true 90° walls.
- High rpm capabilities.

NEW!





Shell Mills — Coarse Pitch

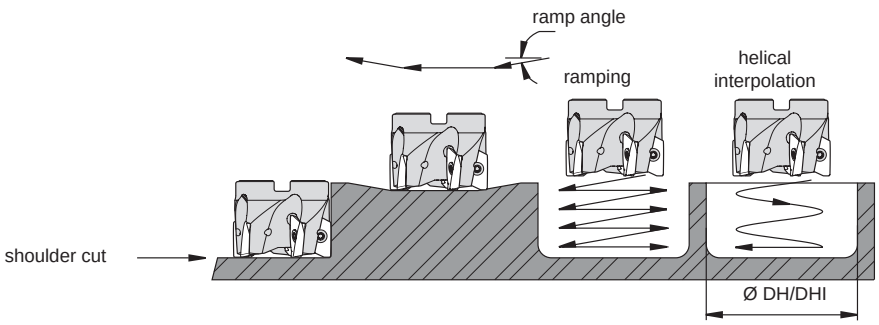
D1	order number	catalog number	Z	D	L	D6	Ap1 max	Max Ramp Angle	kgs	Max RPM
50	2417185	50A04RS90ED18D	4	22	40	45	17,7	5.0°	0,28	24890
63	2417186	63A05RS90ED18D	5	22	40	50	17,6	4.0°	0,51	21910
80	2417187	80A06RS90ED18D	6	27	50	60	17,5	3.0°	1,03	19270
100	2417188	100A07RS90ED18D	7	32	50	80	17,5	2.0°	1,77	17120
125	2417189	125B08RS90ED18D	8	40	63	90	17,5	1.5°	3,08	15230
160	2417190	160C10RS90ED18D	10	40	63	100	17,5	1.2°	4,15	13400

Shell Mills — Fine Pitch

D1	order number	catalog number	Z	D	L	D6	Ap1 max	Max Ramp Angle	kgs	Max RPM
50	2417183	50A05RS90ED18D	5	22	40	45	17,7	5.0°	0,3	24890
63	2390483	63A06RS90ED18D	6	22	40	50	17,6	4.0°	0,5	21910
80	2417184	80A07RS90ED18D	7	27	50	60	17,5	3.0°	1,1	19270
100	2390485	100A08RS90ED18D	8	32	50	80	18,0	2.0°	1,8	17120
125	2390486	125B09RS90ED18D	9	40	63	90	17,5	1.5°	3,2	15230
160	2390487	160C12RS90ED18D	12	40	63	100	17,5	1.2°	4,4	13400

Spare Parts

D1	insert screw	Torx plus wrench	torque (Nm)	mounting screw	coolant screw	coolant cap
50	MS2126	DT15IP	4,0	129.025	MS2072CG	—
63	MS2126	DT15IP	4,0	129.025	MS2072CG	—
80	MS2126	DT15IP	4,0	MS2038	MS2038CG	—
100	MS2126	DT15IP	4,0	MS1254	MS1254CG	—
125	MS2126	DT15IP	4,0	—	420.200	470.232
160	MS2126	DT15IP	4,0	—	420.200	470.233



DH min. = Min. blind hole diameter with helical interpolation
DHI max. = Max. blind hole diameter with flat bottom

Insert Style	Cutting Diameter	Max. Ramp. Angle	Minimum Hole Diameter (DH min)	Maximum Flat-bottomed Hole Diameter, (DHI max)	Max Dia with No flat bottom
Mill 1-18	25	17°	29,24	45,84	50
Mill 1-18	32	10°	42,98	59,84	64
Mill 1-18	40	7°	58,92	75,84	80
Mill 1-18	50	5°	78,88	95,84	100
Mill 1-18	63	4°	104,86	121,84	126
Mill 1-18	80	3°	139,02	156,50	160
Mill 1-18	100	2°	179,00	196,50	200
Mill 1-18	125	1°	228,98	246,50	250
Mill 1-18	160	1°	298,98	316,50	320

Ordering Example:
1 x 50A05RS90ED18D
10 x EDCT180504PDERGD KC725M

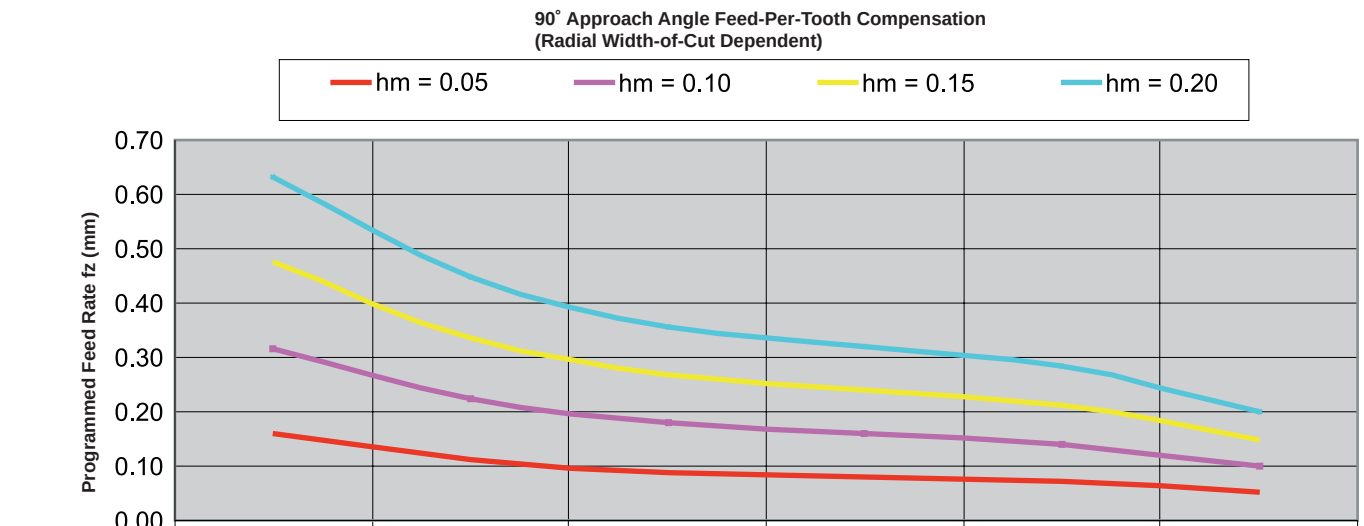
Recommended Starting Speeds [m/min]

90° approach angle

Material Group	KC410M			KC520M			KC522M			KC525M			KC715M			KC725M			KC915M			KC935M		
P1													340	**300**	280	260	**230**	210				390	**340**	320
P2													210	**190**	170	160	**150**	130				240	**220**	200
P3													190	**170**	150	150	**130**	120				220	**200**	180
P4							100	**90**	80				140	**130**	120	110	**100**	90				160	**150**	140
P5							130	**125**	105				190	**175**	155	125	**110**	100				225	**200**	180
P6							80	**70**					120	**100**		90	**80**					140	**120**	
M1							150	**130**	120	200	**180**	165	220	**190**	180	170	**150**	140				250	**220**	210
M2							140	**120**	120	170	**155**	140				150	**140**	130				230	**210**	190
M3							100	**90**		140	**125**	105				120	**100**					170	**150**	
K1				270	**240**	220										160	**150**	130	360	**330**	290	250	**230**	210
K2				210	**190**	180	200	**180**	170							130	**120**	110	290	**260**	240	200	**180**	170
K3				180	**160**	140	170	**150**	140							110	**100**	90	240	**220**	200	170	**150**	140
N1	1210	**1080**	990																					
N2																								
S1							30	**30**		65	**55**	45				40	**30**							
S2							30	**30**		45	**35**	30				30	**30**							
S3							40	**40**		40	**35**	30				40	**40**							
S4							50	**40**		50	**45**	35				50	**50**							
H1																								

FIRST choice starting speeds are in bold type.
As the average chip thickness goes higher the speed should be decreased.

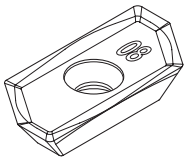
Recommended Starting Feeds



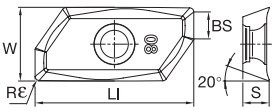
	10%	20%	30%	40%	50%	100%
hm = 0.05	0.16	0.11	0.09	0.08	0.07	0.05
hm = 0.10	0.32	0.22	0.18	0.16	0.14	0.10
hm = 0.15	0.47	0.34	0.27	0.24	0.21	0.15
hm = 0.20	0.63	0.45	0.36	0.32	0.28	0.20

Percentage of the Cutter Diameter in Cut

Indexable Inserts for Mill 1-25 KE..25L5..



KEGT-LDJ

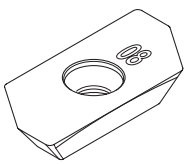


NEW!

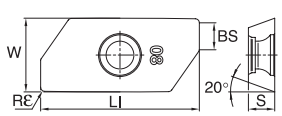
● first choice
○ alternate choice

H	S	N	K	M	P
		●			

catalog number	cutting edges	LI	W	S	BS	Rε	hm	KC410M
KEGT25L508PEERLDJ	2	31,47	14,60	5,21	5,34	0,8	0,13	●
KEGT25L512PEERLDJ	2	31,47	14,60	5,21	4,94	1,2	0,13	●
KEGT25L516PEERLDJ	2	31,47	14,60	5,21	4,55	1,6	0,13	●
KEGT25L520PEERLDJ	2	31,47	14,60	5,21	4,15	2,0	0,13	●
KEGT25L524PEERLDJ	2	31,47	14,60	5,21	3,78	2,4	0,13	●
KEGT25L531PEERLDJ	2	31,47	14,60	5,21	3,06	3,1	0,13	●
KEGT25L540PEERLDJ	2	31,47	14,60	5,21	2,16	4,0	0,13	●
KEGT25L547PEERLDJ	2	31,47	14,60	5,21	1,40	4,8	0,13	●
KEGT25L550PEERLDJ	2	31,47	14,60	5,21	1,14	5,0	0,13	●
KEGT25L560PEERLDJ	2	31,47	14,60	5,21	0,13	6,0	0,13	●
KEGT25L564PEERLDJ	2	29,99	14,60	5,21	–	6,4	0,13	●



KEEW-LNJ



NEW!

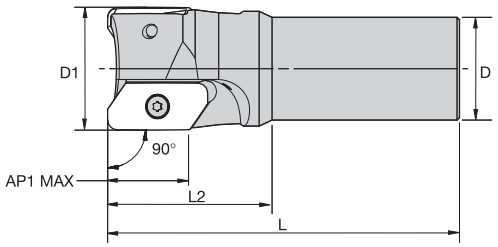
● first choice
○ alternate choice

H	S	N	K	M	P
		●	●		

catalog number	cutting edges	LI	W	S	BS	Rε	hm	K313
KEEW25L508PEFRLNJ	2	31,47	14,60	5,21	5,34	0,8	0,05	●
KEEW25L516PEFRLNJ	2	31,47	14,60	5,21	4,55	1,6	0,05	●
KEEW25L531PEFRLNJ	2	31,47	14,60	5,21	3,06	3,1	0,05	●
KEEW25L547PEFRLNJ	2	31,47	14,60	5,21	1,39	4,8	0,05	●

- 25 mm axial depth of cut, straight wall, true 90° cutting capability.
- High-speed capability: 40 mm cutting diameter = 24,300 max rpm.
- Rigid 5 mm thick insert, periphery ground for accuracy and consistency.
- Insert screws should be changed when inserts are changed.

NEW!



End Mills — Cylindrical Shank

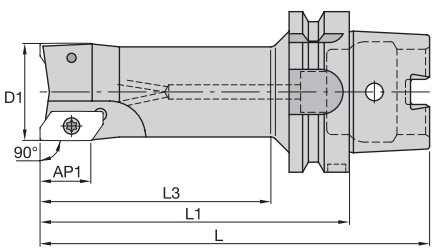
D1	order number	catalog number	Z	D	L2	L	Ap1 max	Max Ramp Angle	kgs	Max RPM
40	2649569	40A02R50A32SKE25	2	32	50	111	25,0	15.0°	0,6	24300
40	2479504	40A02R80A32SKE25	2	32	80	141	25,0	15.0°	0,9	24300
50	2649570	50A02R80A32SKE25	2	32	80	141	24,9	10.0°	1,2	20600
50	2500741	50A03R80A32SKE25	3	32	80	141	24,9	10.0°	1,1	20600
50	2649571	50A02R100A32SKE25	2	32	100	161	24,9	10.0°	1,4	20600
50	2649572	50A03R100A32SKE25	3	32	100	161	24,9	10.0°	1,4	20600

Spare Parts

D1	insert screw	Torx driver	torque (Nm)
40	MS1374	DT15	3,9
50	MS1374	DT15	3,9

- 25 mm axial depth of cut, straight wall, true 90° cutting capability.
- High-speed capability: 40 mm cutting diameter = 24,300 max rpm.
- Ramping up to 15°.
- All integral shank tools are balanced to G2.5 at 10.000 rpm.
- Insert screws should be changed when inserts are changed.

NEW!



Monoblocks — HSK63A

D1	order number	catalog number	Z	system size back	L3	L1	L	Ap1 max	Max Ramp Angle	kgs	Max RPM
40	2880434	40A02R110S63SKE25	2	HSK63	78	110	142	25	15.0°	1,2	24300
40	2880433	40A02R121S63SKE25	2	HSK63	89	121	153	25	15.0°	1,3	24300
40	2880435	40A02R140S63SKE25	2	HSK63	108	140	172	25	15.0°	1,2	24300
50	2880436	50A02R110S63SKE25	2	HSK63	84	110	142	25	10.0°	1,5	20600
50	2880437	50A02R140S63SKE25	2	HSK63	114	140	172	25	10.0°	1,9	20600
50	2880438	50A03R110S63SKE25	3	HSK63	84	110	142	25	10.0°	1,4	20600
50	2880439	50A03R140S63SKE25	3	HSK63	114	140	172	25	10.0°	1,8	20600

Spare Parts

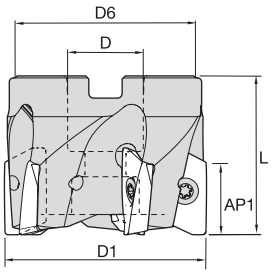
D1	insert screw	Torx driver	torque (Nm)	balancing screw
40	MS1374	DT15	3,9	KUAM27
50	MS1374	DT15	3,9	KUAM27

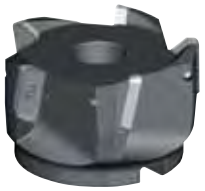
Ordering Example:
1 x 40A02R50A32SKE25
10 x KEGT25L508PEERLDJ KC410M

Indexable Shell Mills — Mill 1-25 — for Aluminium Machining

NEW!

- 25 mm axial depth of cut, straight wall, true 90° cutting capability.
- High-speed capability.
- Insert screws should be changed when inserts are changed.





Shell Mills

D1	order number	catalog number	Z	D	D6	L	Ap1 max	Max Ramp Angle	kgs	Max RPM
52	2878139	52A02RS90KE25	2	22	49	58	24,8	9.5°	0,5	20000
63	2954527	63A02RS90KE25	2	22	50	55	24,7	7.0°	0,7	17600
63	2954528	63A03RS90KE25	3	22	50	55	24,7	7.0°	0,6	17600
80	2496538	80A03RS90KE25	3	27	60	60	24,7	5.0°	1,2	15100
100	2954529	100B04RS90KE25	4	32	78	60	24,7	3.5°	1,8	13200

Spare Parts

D1	insert screw	Torx driver	torque (Nm)	coolant screw
52	MS1374	DT15	4,0	MS1235CG
63	MS1374	DT15	4,0	MS1242CG
80	MS1374	DT15	4,0	MS2038CG
100	MS1374	DT15	4,0	MS2169C

Ordering Example:
1 x 52A02RS90KE25
10 x KEGT25L508PEERLDJ KC410M

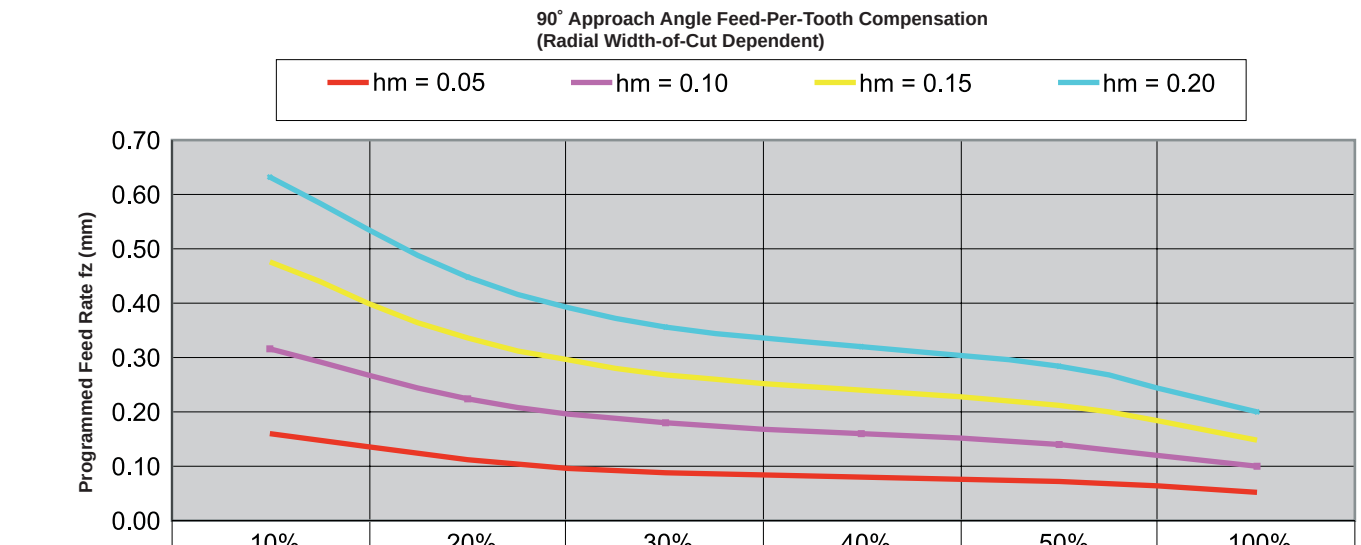
Recommended Starting Speeds [m/min]

90° approach angle

Material Group	K313			KC410M		
P1						
P2						
P3						
P4						
P5						
P6						
M1						
M2						
M3						
K1						
K2						
K3						
N1	800	**700**	600	1210	**1080**	990
N2	600	**500**	400			
S1						
S2						
S3						
S4						
H1						

FIRST choice starting speeds are in bold type.
As the average chip thickness goes higher the speed should be decreased.

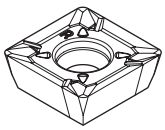
Recommended Starting Feeds

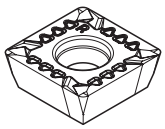


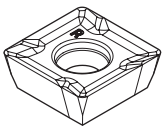
	10%	20%	30%	40%	50%	100%
hm = 0.05	0.16	0.11	0.09	0.08	0.07	0.05
hm = 0.10	0.32	0.22	0.18	0.16	0.14	0.10
hm = 0.15	0.47	0.34	0.27	0.24	0.21	0.15
hm = 0.20	0.63	0.45	0.36	0.32	0.28	0.20

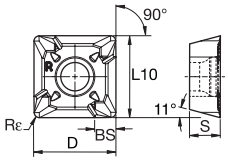
KSSM 90° — IC 10mm

Indexable Inserts for KSSM SP.T10T3...


SPCT-LD2


SPET-GB2


SPCT-LE



● first choice
○ alternate choice

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

SPCT-LD2

catalog number	cutting edges	D	S	L10	BS	Rε	hm	KC410M	KC520M	KC725M	KC915M	KC935M	KT530M
SPCT10T304PPELLD2	4	10,00	3,97	10,00	2,70	0,4	0,08			●			
SPCT10T304PPERLD2	4	10,00	3,97	10,00	2,70	0,4	0,08			●			
SPCT10T3PPELLD2	4	10,00	3,97	10,00	2,70	0,8	0,08			●			
SPCT10T3PPERLD2	4	10,00	3,97	10,00	2,70	0,8	0,08		●	●			
SPCT10T312PPELLD2	4	10,00	3,97	10,00	2,70	1,2	0,08			●			
SPCT10T312PPERLD2	4	10,00	3,97	10,00	2,70	1,2	0,08			●			
SPCT10T316ENLD2	4	10,00	3,97	10,00	–	1,6	0,08			●			
SPCT10T320ENLD2	4	10,00	3,97	10,00	–	2,0	0,08			●			

SPCT-LE

catalog number	cutting edges	D	S	L10	BS	Rε	hm	KC410M	KC520M	KC725M	KC915M	KC935M	KT530M
SPCT10T304PPFLLE	4	10,00	3,97	10,00	2,70	0,4	0,05	●					
SPCT10T304PPFRLE	4	10,00	3,97	10,00	2,70	0,4	0,05	●					
SPCT10T3PPFRLE	4	10,00	3,97	10,00	2,70	0,8	0,05	●					
SPCT10T3PPFLLE	4	10,00	3,97	10,00	2,70	0,8	0,05	●					
SPCT10T312PPFRLE	4	10,00	3,97	10,00	2,70	1,2	0,05	●					
SPCT10T312PPFLLE	4	10,00	3,97	10,00	2,70	1,2	0,05	●					
SPCT10T316FNLE	4	10,00	3,97	10,00	–	1,6	0,05	●					
SPCT10T320FNLE	4	10,00	3,97	10,00	–	2,0	0,05	●					

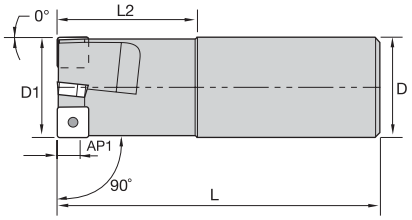
SPET-GB2

catalog number	cutting edges	D	S	L10	BS	Rε	hm	KC410M	KC520M	KC725M	KC915M	KC935M	KT530M
SPET10T3PPELGB2	4	10,00	3,97	10,00	2,70	0,8	0,10		●	●	●	●	
SPET10T3PPERGB2	4	10,00	3,97	10,00	2,70	0,8	0,10		●	●	●	●	
SPET10T3PPSLGB2	4	10,00	3,97	10,00	2,70	0,8	0,15		●	●	●	●	
SPET10T3PPSRGB2	4	10,00	3,97	10,00	2,70	0,8	0,15		●	●	●	●	

SPPT-GB2

catalog number	cutting edges	D	S	L10	BS	Rε	hm	KC410M	KC520M	KC725M	KC915M	KC935M	KT530M
SPPT10T3PPERGB2	4	10,00	3,97	10,00	2,70	0,8	0,10				●	●	
SPPT10T3PPSRGB2	4	10,00	3,97	10,00	2,70	0,8	0,15				●	●	●

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



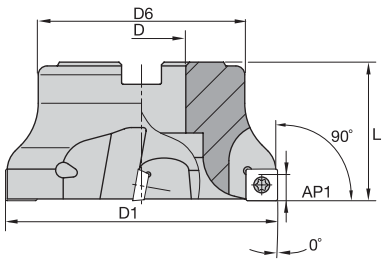


End Mills — Weldon Shank

D1	order number	catalog number	Z	D	L2	L	Ap1 max	kg	Max RPM
25	1981679	25A02R039B25SSP10G	2	25	39	96	6,6	0,3	37100
32	1981788	32A03R039B32SSP10G	3	32	39	100	6,6	0,5	33200
40	1981790	40A04R049B32SSP10G	4	32	49	110	6,6	0,7	30300

Spare Parts

D1	insert screw	Torx plus driver	torque (Nm)
25	MS2148	DT9IP	1,5
32	MS2148	DT9IP	1,5
40	MS2148	DT9IP	1,5





Shell Mills — Fine Pitch

D1	order number	catalog number	Z	D	D6	L	Ap1 max	kg	Max RPM
50	1981677	50A05RS90SP10DG	5	22	47	40	6,6	0,4	26300
63	1981678	63A06RS90SP10DG	6	22	50	40	6,6	0,5	23500
80	1981853	80A08RS90SP10DG	8	27	60	50	6,6	1,1	21450
100	1981854	100B10RS90SP10DG	10	32	80	50	6,6	1,7	18600

Spare Parts

D1	insert screw	Torx plus driver	torque (Nm)	mounting screw
50	MS2148	DT9IP	1,5	MS1234
63	MS2148	DT9IP	1,5	MS1234
80	MS2148	DT9IP	1,5	MS1556
100	MS2148	DT9IP	1,5	—

Ordering Example:
1 x 50A05RS90SP10DG
10 x SPET10T3PPSRGB2 KC725M

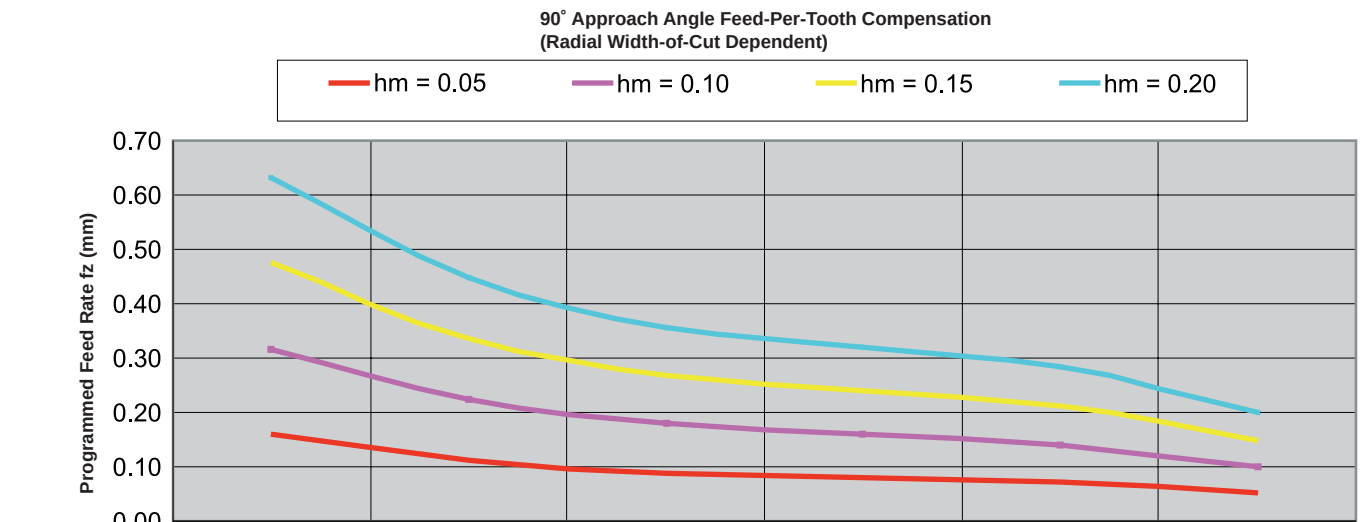
Recommended Starting Speeds [m/min]

90° approach angle

Material Group	KC410M			KC520M			KC725M			KC915M			KC935M			KT530M		
P1							260	**230**	210				390	**340**	320	290	**250**	230
P2							160	**150**	130				240	**220**	200	180	**160**	140
P3							150	**130**	120				220	**200**	180	160	**140**	130
P4							110	**100**	90				160	**150**	140	120	**110**	100
P5							125	**110**	100				225	**200**	180	165	**149**	130
P6							90	**80**					140	**120**		100	**90**	
M1							170	**150**	140				250	**220**	210	190	**160**	150
M2							150	**140**	130				230	**210**	190	170	**150**	140
M3							120	**100**					170	**150**		130	**110**	
K1				270	**240**	220	160	**150**	130	360	**330**	290	250	**230**	210			
K2				210	**190**	180	130	**120**	110	290	**260**	240	200	**180**	170			
K3				180	**160**	140	110	**100**	90	240	**220**	200	170	**150**	140			
N1	1210	**1080**	990															
N2																		
S1							40	**30**										
S2							30	**30**										
S3							40	**40**										
S4							50	**50**										
H1																		

FIRST choice starting speeds are in bold type.
As the average chip thickness goes higher the speed should be decreased.

Recommended Starting Feeds



	10%	20%	30%	40%	50%	100%
hm = 0.05	0.16	0.11	0.09	0.08	0.07	0.05
hm = 0.10	0.32	0.22	0.18	0.16	0.14	0.10
hm = 0.15	0.47	0.34	0.27	0.24	0.21	0.15
hm = 0.20	0.63	0.45	0.36	0.32	0.28	0.20

Percentage of the Cutter Diameter in Cut

CUSTOM MILLING SOLUTIONS



Custom Milling Solutions

Whether you require a single specially tailored tool to mill a specific part feature – or the development of a comprehensive manufacturing process for use on existing or new production equipment, we can manage the total design and implementation of your complete solution!

Our custom Milling programs address today's increased output demands, reduce lead-times, and significantly improve part quality by enabling you to incorporate advanced cutting-edge materials/geometries, combine operations, and eliminate expensive regrinding steps!

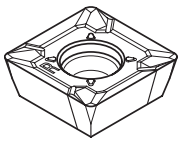


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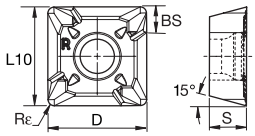
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SDCT-PDE-LD2

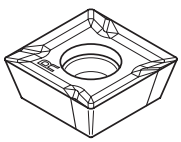


LD2 (Ground) 15° Rake Face

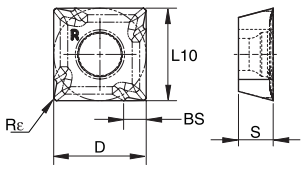
● first choice
○ alternate choice

H	
S	● ●
N	
K	● ○
M	● ●
P	○ ●

catalog number	cutting edges	D	S	L10	BS	Rε	hm	KC520M	KC522M	KC725M
SDCT120404PDERLD2	4	12,70	4,76	12,70	2,93	0,4	0,08			●
SDCT1204PDERLD2	4	12,70	4,76	12,70	3,32	0,8	0,08	●		●
SDCT120412PDERLD2	4	12,70	4,76	12,70	3,05	1,2	0,08			●
SDCT120416ENLD2	4	12,70	4,76	12,70	–	1,6	0,08			●
SDCT120420ENLD2	4	12,70	4,76	12,70	–	2,0	0,08			●
SDCT120424ENLD2	4	12,70	4,76	12,70	–	2,4	0,08			●
SDCT120432ENLD2	4	12,70	4,76	12,70	–	3,2	0,08		●	●



SDCT-PDF-LE

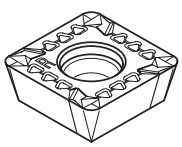


LE (Ground) 20° Rake Face

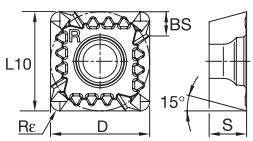
● first choice
○ alternate choice

H	
S	
N	●
K	
M	
P	

catalog number	cutting edges	D	S	L10	BS	Rε	hm	KC410M
SDCT120404PDFRLE	4	12,70	4,76	12,70	2,93	0,4	0,05	●
SDCT1204PDFRLE	4	12,70	4,76	12,70	3,32	0,8	0,05	●
SDCT120412PDFRLE	4	12,70	4,76	12,70	3,05	1,2	0,05	●
SDCT120416FNLE	4	12,70	4,76	12,70	–	1,6	0,05	●
SDCT120420FNLE	4	12,70	4,76	12,70	–	2,0	0,05	●
SDCT120424FNLE	4	12,70	4,76	12,70	–	2,4	0,05	●
SDCT120432FNLE	4	12,70	4,76	12,70	–	3,2	0,05	●



SDET-PD-GB2



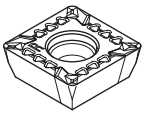
GB2 (Ground) 5° Rake Face

● first choice
○ alternate choice

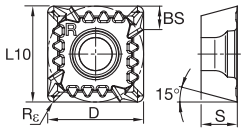
H	
S	●
N	
K	● ● ○
M	● ○
P	● ●

catalog number	cutting edges	D	S	L10	BS	Rε	hm	KC520M	KC725M	KC915M	KC935M
SDET1204PDERGB2	4	12,70	4,76	12,70	3,32	0,8	0,10	●	●	●	●
SDET1204PDSRGB2	4	12,70	4,76	12,70	3,32	0,8	0,15	●	●	●	●
SDET120412PDERGB2	4	12,70	4,76	12,70	3,05	1,2	0,10	●	●	●	●
SDET120416SNGB2	4	12,70	4,76	12,70	–	1,6	0,15	●	●	●	●
SDET120420SNGB2	4	12,70	4,76	12,70	–	2,0	0,15	●	●	●	●
SDET120424SNGB2	4	12,70	4,76	12,70	–	2,4	0,15	●	●	●	●
SDET120432SNGB2	4	12,70	4,76	12,70	–	3,2	0,15	●	●	●	●

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



SDPT-PD-GB2

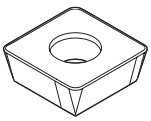


● first choice
○ alternate choice

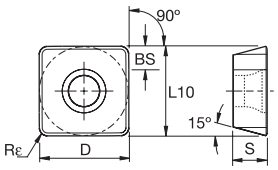
H										
S	●									
N										
K			●	○						
M	●			○						
P	●			●						

GB2 (Precision Sintered) 5° Rake Face

catalog number	cutting edges	D	S	L10	BS	Rε	hm	KC725M	KC915M	KC935M
SDPT1204PDERGB2	4	12,70	4,76	12,70	3,32	0,8	0,10	●	●	●
SDPT1204PDSRGB2	4	12,70	4,76	12,70	3,32	0,8	0,15	●	●	●



SDCW-GN



● first choice
○ alternate choice

H										
S										
N										
K	●									
M										
P										

GN (Ground) Flat Top

catalog number	cutting edges	D	S	L10	BS	Rε	hm	KY3500
SDCW1204PDSRGN	4	12,70	4,76	12,70	3,32	0,8	0,08	●
SDCW120412PDSRGN	4	12,70	4,76	12,70	3,05	1,2	0,08	●

Proven Solution

KSSM 90° - IC 12 mm

Kennametal cutter: ***80A06RS90SD12DG***
Kennametal insert: ***SDCW120412PDSRGN***
Grade: ***KY3500***

Operation: ***face milling cast iron with nodular graphite***

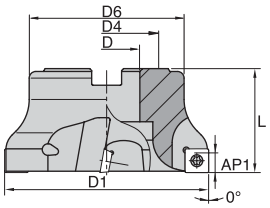
	Kennametal	*Competitor*
cutting speed (m/min):	***548***	***203***
feed per tooth:	***0,20 mm***	***0,17 mm***
axial cutting depth:	***3,96 mm***	***3,96 mm***
time per piece:	***1,19 min***	***3,743 min***
annual costs:	***$21.705,-***	***$33.718,-***

Annual Savings: $12.013,-

KSSM 90° — IC 12 mm

Indexable Shell Mills

- Thicker inserts for heavy-duty applications.
- Excellent for square shoulder milling in wide range of applications.
- Various insert nose radii available for workpiece requirements.





Shell Mills — Coarse Pitch

D1	order number	catalog number	Z	D	D4	D6	L	Ap1 max	kgs	Max RPM
50	1926939	50A03RS90SD12DG	3	22	—	45	40	9,2	0,3	20600
63	1926936	63A04RS90SD12DG	4	22	—	50	40	9,2	0,5	18300
80	1926901	80A05RS90SD12DG	5	27	—	60	50	9,2	1,0	16300
100	1926841	100B06RS90SD12DG	6	32	—	80	50	9,2	1,6	14600
125	1926839	125B07RS90SD12DG	7	40	—	90	63	9,2	2,8	13000
160	1926836	160C08RS90SD12DG	8	40	67	100	63	9,2	4,3	11500

Shell Mills — Fine Pitch

D1	order number	catalog number	Z	D	D4	D6	L	Ap1 max	kgs	Max RPM
50	1926938	50A04RS90SD12DG	4	22	—	46	40	9,2	0,3	20600
63	1926933	63A05RS90SD12DG	5	22	—	50	40	9,2	0,5	18300
80	1926898	80A06RS90SD12DG	6	27	—	60	50	9,2	1,0	16300
100	1926840	100B08RS90SD12DG	8	32	—	80	50	9,2	1,7	14600
125	1926837	125B10RS90SD12DG	10	40	—	90	63	9,2	2,9	13000
160	1926983	160C12RS90SD12DG	12	40	67	100	63	9,2	4,4	11500
200	1926941	200C14RS90SD12DG	14	60	102	130	63	9,2	6,8	10300

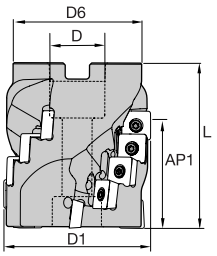
Spare Parts

D1	insert screw	Torx plus driver	torque (Nm)	shim	shim screw	hex driver	mounting screw
50	MS2078	DT15IP	4	—	—	—	MS1234
63	MS2078	DT15IP	4	—	—	—	129.025
80	MS2078	DT15IP	4	SM449	SRS3	DH35M	MS2038
100	MS2078	DT15IP	4	SM449	SRS3	DH35M	—
125	MS2078	DT15IP	4	SM449	SRS3	DH35M	—
160	MS2078	DT15IP	4	SM449	SRS3	DH35M	—
200	MS2078	DT15IP	4	SM449	SRS3	DH35M	—

Ordering Example:
1 x 50A03RS90SD12DG
10 x SDET1204PDERGB2 KC725M

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

NEW!



Shell Mills — Standard Pitch

D1	order number	catalog number	Z	Z U	D	D6	L	Ap1 max	kg	Max RPM
50	2400693	50A3RS90SD12L32	9	3	22	44	55	32,4	0,4	16400
63	2400694	63A3RS90SD12L50	15	3	27	55	70	51,2	0,9	14600
80	2400695	80A4RS90SD12L61	24	4	32	70	80	61,6	1,8	12950

Spare Parts

D1	insert screw	Torx wrench	torque (Nm)	coolant screw
50	MS1273	TT15	4	MS1235CG
63	MS1273	TT15	4	MS1238CG
80	MS1273	TT15	4	MS1241CG

Ordering Example:
1 x 50A3RS90SD12L32
10 x SDCT1204PDEL8LD2 KC725M

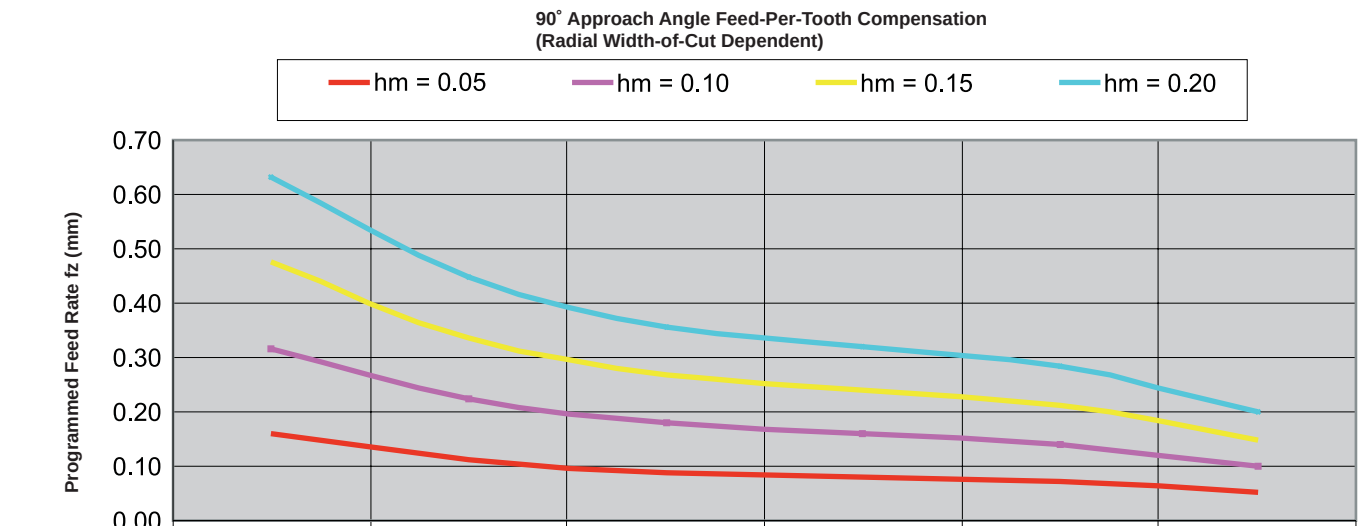
Recommended Starting Speeds [m/min]

90º approach angle

Material Group	KC410M			KC520M			KC522M			KC725M			KC915M			KC935M			KY3500		
P1										260	**230**	210				390	**340**	320			
P2										160	**150**	130				240	**220**	200			
P3										150	**130**	120				220	**200**	180			
P4							100	**90**	80	110	**100**	90				160	**150**	140			
P5							130	**125**	105	125	**110**	100				225	**200**	180			
P6							80	**70**		90	**80**					140	**120**				
M1							150	**130**	120	170	**150**	140				250	**220**	210			
M2							140	**120**	120	150	**140**	130				230	**210**	190			
M3							100	**90**		120	**100**					170	**150**				
K1				270	**240**	220				160	**150**	130	360	**330**	290	250	**230**	210	800	**730**	650
K2				210	**190**	180	200	**180**	170	130	**120**	110	290	**260**	240	200	**180**	170	630	**570**	530
K3				180	**160**	140	170	**150**	140	110	**100**	90	240	**220**	200	170	**150**	140	530	**470**	430
N1	1210	**1080**	990																		
N2																					
S1							30	**30**		40	**30**										
S2							30	**30**		30	**30**										
S3							40	**40**		40	**40**										
S4							50	**40**		50	**50**										
H1																					

FIRST choice starting speeds are in bold type.
As the average chip thickness goes higher the speed should be decreased.

Recommended Starting Feeds



	10%	20%	30%	40%	50%	100%
hm = 0.05	0.16	0.11	0.09	0.08	0.07	0.05
hm = 0.10	0.32	0.22	0.18	0.16	0.14	0.10
hm = 0.15	0.47	0.34	0.27	0.24	0.21	0.15
hm = 0.20	0.63	0.45	0.36	0.32	0.28	0.20

Percentage of the Cutter Diameter in Cut

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- *New Insert Grade: KU40D*



MILLING
- *KSSM Face Mills, End Mills*
- *New Insert Grades: KUC20M, KUC30M*



LATHE
- *New Insert Grades: KU10T, KU25T, KU30T*
- *A4 Turn & Groove System*

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- *CV40 Shank Tool*
- *KM25*



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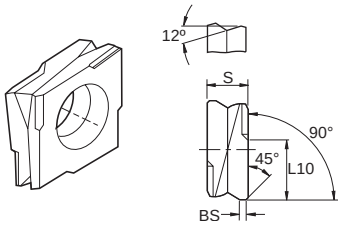
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Call 800/446-7738 or visit www.kennametal.com.

THINK **MILLING,** THINK **KENNAMETAL.**

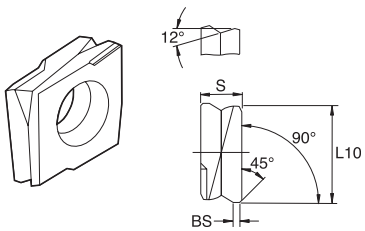
Indexable Inserts for FIX-PERFECT-SPHX1205...



SPHX — GPB 8 Cutting Edges

● first choice
○ alternate choice

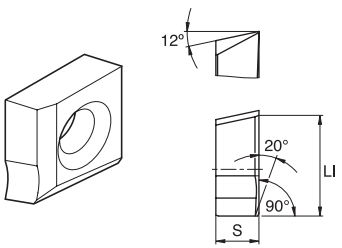
catalog number	cutting edges	L10	S	BS	hm	KC520M	KC725M	KC915M	KC935M	KT530M	KY3500
SPHX1205PCERGPB	8	6,57	5,50	0,70	0,10	●		●	●		
SPHX1205PCSRGPB	8	6,57	5,50	0,70	0,15		●	●	●		
SPHX1205PCTRGPB	8	6,57	5,50	0,70	0,10					●	
SPHX1205PCTRGPBK	8	6,57	5,50	0,70	0,10						●



SPHX — GP4S 4 Cutting Edges

● first choice
○ alternate choice

catalog number	cutting edges	L10	S	BS	hm	KC520M	KC725M	KC915M	KC935M	KY3500
SPHX1205PCERGP4SB	4	11,07	5,50	0,70	0,10	●		●	●	
SPHX1205PCSRGP4SB	4	11,07	5,50	0,70	0,15		●			
SPHX1205PCTRGP4SBK	4	11,08	5,50	0,70	0,10					●

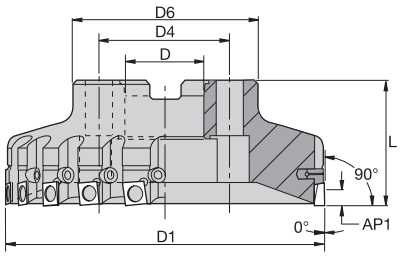


SPHX — W Finishing

● first choice
○ alternate choice

catalog number	cutting edges	LI	S	hm	KB1340	KC520M	KC725M	KC915M	KC935M	KT530M	KY3500
SPHX1205PCER-GP1WB	1	11,00	5,50	–		●		●			
SPHX1205PCERGN1WB	1	11,00	5,20	–					●		
SPHX1205PCERGNT1WB	1	11,00	5,50	–	●						
SPHX1205PCFLGN1WB	1	11,00	5,50	–				●			
SPHX1205PCFLGN1WBK	1	11,00	5,50	–							●
SPHX1205PCFRGN1WB	1	11,00	5,20	–		●	●	●		●	
SPHX1205PCFRGN1WBK	1	11,00	5,20	–							●
SPHX1205PCSR-GP1WB	1	11,00	5,50	–			●				
SPHX1205PCTR-GP1WBK	1	11,00	5,50	–							●

- Rough and finish in one operation.
- Eight true cutting edges.
- Tangential mounted inserts enable higher feed rates.
- Coarse, medium, and fine pitch available.





Face Mills 90° — Coarse Pitch

D1	order number	catalog number	Z	Z ADJ	D	D4	D6	L	Ap1 max	kgs	Max RPM
50	1503007	50A04RP90SP12CFP	4	0	22	—	41	43	6	0,4	6300
63	1503012	63A06RP90SP12CFP	6	0	22	—	51	40	6	0,6	5000
80	1503013	80A06RP90SP12C1WFP	6	1	27	—	64	50	6	1,1	4000
100	1503015	100B08RP90SP12C2WFP	8	2	32	—	84	50	6	1,7	3200
125	1503018	125B10RP90SP12C2WFP	10	2	40	—	94	63	6	2,9	2500
160	1503021	160C12RP90SP12C3WFP	12	3	40	66,7	94	63	6	3,9	2000
200	1503022	200C16RP90SP12C4WFP	16	4	60	101,6	134	63	6	6,1	1600

Face Mills 90° — Medium Pitch

D1	order number	catalog number	Z	Z ADJ	D	D4	D6	L	Ap1 max	kgs	Max RPM
50	1501652	50A05RP90SP12CFP	5	0	22	—	41	43	6	0,4	6300
63	1887178	63A07RP90SP12CFP	7	0	22	—	51	40	6	0,6	5000
80	1887179	80A08RP90SP12C2WFP	8	2	27	—	64	50	6	1,2	4000
100	1887180	100B12RP90SP12C3WFP	12	3	32	—	84	50	6	1,8	3200
125	1887181	125B15RP90SP12C3WFP	15	3	40	—	94	63	6	3,0	2500
160	1887193	160C18RP90SP12C3WFP	18	3	40	66,7	94	63	6	4,0	2000
200	1887194	200C24RP90SP12C4WFP	24	4	60	101,6	134	63	6	6,3	1600

Face Mills 90° — Fine Pitch

D1	order number	catalog number	Z	Z ADJ	D	D4	D6	L	Ap1 max	kgs	Max RPM
63	1501653	63A08RP90SP12CFP	8	0	22	—	51	40	6	0,6	5000
80	1501655	80A10RP90SP12CFP	10	0	27	—	64	50	6	1,2	4000
100	1501660	100B14RP90SP12CFP	14	0	32	—	84	50	6	1,9	3200
125	1501662	125B18RP90SP12CFP	18	0	40	—	94	63	6	3,0	2500
160	1501663	160C22RP90SP12CFP	22	0	40	66,7	94	63	6	4,0	2000
200	1501664	200C28RP90SP12CFP	28	0	60	101,6	134	63	6	6,3	1600

For 125 mm and 160 mm diameter milling cutters, always use the coolant screw and coolant cap together.

Spare Parts

D1	adj element	adj element screw	Torx wrench	clamp stud	set screw	hex wrench	torque (Nm)	mounting screw	coolant screw	coolant cap
50	—	—	—	410.081	121.612	170.003	6	129.025	—	—
63	—	—	—	410.081	121.612	170.003	6	125.025	420.100	—
80	479.100	193.300	KT9	410.081	121.612	170.003	6	125.230	420.120	—
100	479.100	193.300	KT9	410.081	121.612	170.003	6	—	420.160	—
125	479.100	193.300	KT9	410.081	121.612	170.003	6	—	420.200	470.232
160	479.100	193.300	KT9	410.081	121.612	170.003	6	—	420.200	470.233
200	479.100	193.300	KT9	410.081	121.612	170.003	6	—	—	470.234

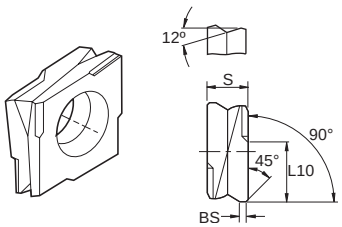
Please order spare parts separately.



Torque wrench (KTW45) and 3 mm hex bit (69709922164) may be purchased separately to ensure proper torque setting

Ordering Example:
1 x 50A04RP90SP12CFP
10 x SPHX1205PCSRGPB KC725M

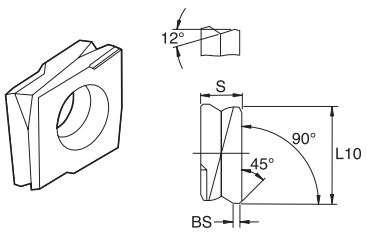
Indexable Inserts for FIX-PERFECT SPHX15T6...



SPHX — GP 8 Cutting Edges

● first choice
○ alternate choice

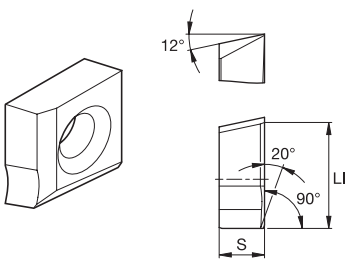
catalog number	cutting edges	S	L10	BS	hm	KC725M	KC915M	KC935M
SPHX15T6PCERGP	8	6,60	8,15	1,20	0,10		●	●
SPHX15T6PCSRGP	8	6,60	8,16	1,20	0,15	●		●



SPHX — GP4S 4 Cutting Edges

● first choice
○ alternate choice

catalog number	cutting edges	S	L10	BS	hm	KC725M	KC915M	KC935M
SPHX15T6PCERGP4S	4	6,60	13,88	1,20	0,10		●	

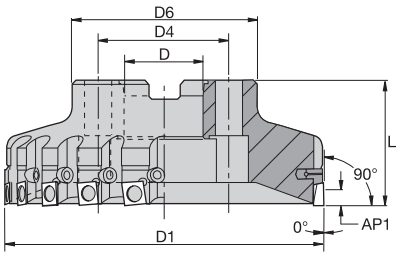


SPHX — W Finishing

● first choice
○ alternate choice

catalog number	cutting edges	S	LI	hm	KC520M	KC915M	KY3500	KB1340
SPHX15T6PCFRGN1W	1	6,20	13,90	—		●		
SPHX15T6PCERGNT1W	1	6,20	13,90	—				●

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





Face Mills 90° — Coarse Pitch

D1	order number	catalog number	Z	Z ADJ	D	D4	D6	L	Ap1 max	kg	Max RPM
80	1795217	80A05RP90SP15C1WFP	5	1	27	—	64	50	8	1,1	4000
100	1777660	100B06RP90SP15C1WFP	6	1	32	—	84	50	8	1,8	3200
125	1795218	125B08RP90SP15C2WFP	8	2	40	—	94	63	8	3,0	2500
160	1795286	160C10RP90SP15C2WFP	10	2	40	66,7	94	63	8	4,1	2000
200	1795288	200C12RP90SP15C2WFP	12	2	60	101,6	134	63	8	6,4	1600

Face Mills 90° — Fine Pitch

D1	order number	catalog number	Z	Z ADJ	D	D4	L	Ap1 max	kg	Max RPM
80	1798604	80A06RP90SP15C1WFP	6	1	27	—	50	8	1,2	4000
100	1777658	100B08RP90SP15C2WFP	8	2	32	—	50	8	1,8	3200
125	1798605	125B10RP90SP15C2WFP	10	2	40	—	63	8	3,0	2500

For 125 mm and 160 mm diameter milling cutters, the coolant screw and coolant cap should always used together.

Spare Parts

D1	adj. element	adj element screw	Torx wrench	clamp stud	set screw	hex wrench	torque (Nm)	mounting screw	coolant screw	coolant cap
80	479.100	193.300	KT9	410.084	121.616	170.003	6	125.230	420.120	—
100	479.100	193.300	KT9	410.084	121.616	170.003	6	—	420.160	—
125	479.100	193.300	KT9	410.084	121.616	170.003	6	—	420.200	470.232
160	479.100	193.300	KT9	410.084	121.616	170.003	6	—	420.200	470.233
200	479.100	193.300	KT9	410.084	121.616	170.003	6	—	—	470.234

Please order spare parts separately.



Torque wrench (KTW45) and 3 mm hex bit (69709922164) may be purchased separately to ensure proper torque setting.

Ordering Example:
1 x 80A05RP90SP15C1WFP
10 x SPHX15T6PCSRGP KC725M

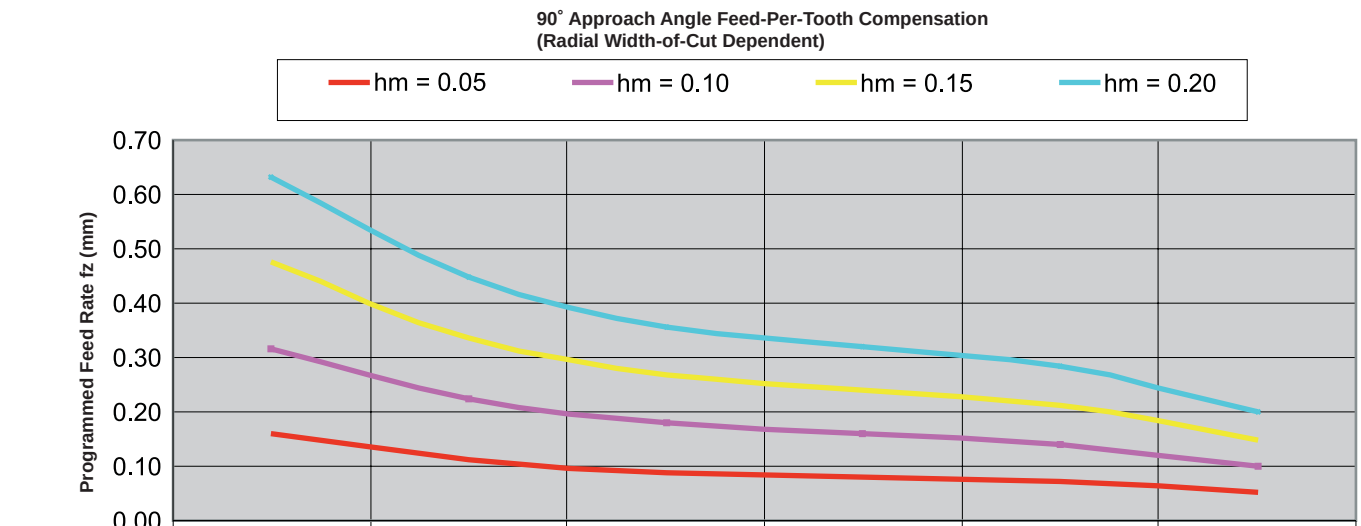
Recommended Starting Speeds [m/min]

90° Approach Angle

Material Group	KC520M			KC725M			KC915M			KC935M			KT530M			KY3500			KB1340		
P1																					
P2																					
P3																					
P4																					
P5																					
P6																					
M1																					
M2																					
M3																					
K1	300	**240**	180				500	**460**	420	280	**250**	230				1375	**1175**	1100	1050	**760**	610
K2	335	**275**	210	215	**200**	175	365	**210**	150	250	**200**	140	450	**400**	350	900	**750**	600			
K3	130	**120**	110	100	**90**	80	160	**120**	100	100	**90**	80	250	**225**	200	450	**400**	350			
N1																					
N2																					
S1																					
S2																					
S3																					
S4																					
H1																					

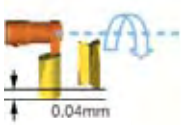
KY3500 is only recommended for machining of low tensile ductile iron (eg. 65-45-12).
FIRST choice starting speeds are in bold type.
As the average chip thickness goes higher the speed should be decreased.

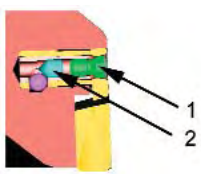
Recommended Starting Feeds



	10%	20%	30%	40%	50%	100%
hm = 0.05	0.16	0.11	0.09	0.08	0.07	0.05
hm = 0.10	0.32	0.22	0.18	0.16	0.14	0.10
hm = 0.15	0.47	0.34	0.27	0.24	0.21	0.15
hm = 0.20	0.63	0.45	0.36	0.32	0.28	0.20

Percentage of the Cutter Diameter in Cut

Roughing		Procedures	Roughing/Finishing	
				
Insert seat			Insert seat	
Standard	Adjustable		Standard	Adjustable
–		**1** Reset adjusting element T x T9	–	
		**2** Insert roughing insert Tighten SW 3 M_{An} = 5 Nm		–
–		**3** Tighten adjusting element gently	–	–
		4 Insert finishing insert and pre-tighten SW 3 M_{VG} = 1 Nm	–	
		5 The finishing insert is positioned 0,04 mm in front of the highest roughing insert	–	
		6 Tighten the finishing insert M_{An} = 5 Nm	–	



Note: This process must be repeated whenever an indexable insert is changed.

Attention: Reset adjusting element!

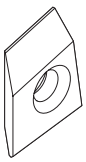
Changing the adjusting element

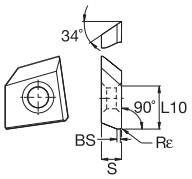
1. Remove the taper screw ①
2. Loosen the SW 1,5 screw ②
3. Remove the adjusting element

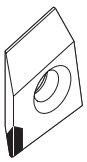
Note: The ball is loose.

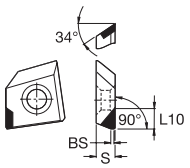
Attention:
The maximum permissible cutting speed of the milling cutter heads is $V_{c\ max}$ = 1000 m/min. Only use original parts when clamping the indexable inserts.

Indexable Inserts for FIX-PERFECT-BGHX15L5...

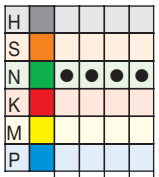

BGHX




BGHX-Tipped

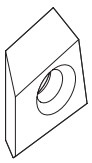


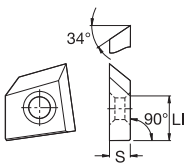
● first choice
○ alternate choice

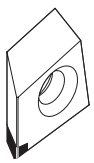


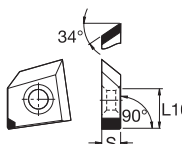
Indexable Inserts — Roughing

catalog number	cutting edges	L10	S	BS	hm	K110M	KC510M	KD1410	KD1415
BGHX15L5PCFRGG	2	10,50	5,00	1,22	0,08	●	●		
BGHX15L5PCTRGG	2	10,50	5,00	1,22	0,08	●	●		
BGHX15L5PCERGGTM	1	2,50	5,00	1,20	0,08			●	
BGHX15L5PCSRLET	1	8,00	5,00	0,90	0,08			●	●
BGHX15L5PCTRHET	1	5,00	5,00	0,90	0,08			●	

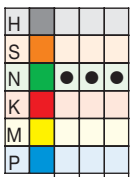

BGHX Wiper




BGHX-Tipped Wper

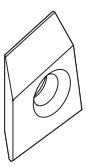


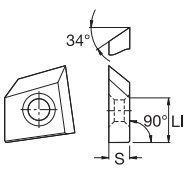
● first choice
○ alternate choice

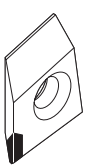


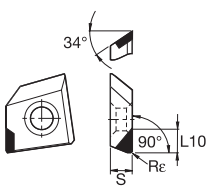
Indexable Inserts — Finishing

catalog number	cutting edges	LI	S	hm	K110M	KC510M	KD1415
BGHX15L5PCFRGG1W	1	10,50	5,00	0,08	●	●	
BGHX15L5PCTRGG1W	1	10,50	5,00	0,08		●	
BGHX15L5PCERGGT1W	1	10,00	5,00	0,08			●

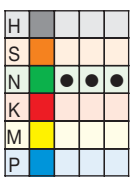

BGHX




BGHX-Tipped

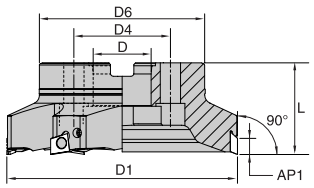


● first choice
○ alternate choice



Indexable Inserts — Roughing with Radius

catalog number	cutting edges	L10	S	BS	Rε	hm	K110M	KC510M	KD1415
BGHX15L504ERGET	1	5,20	5,00	–	0,4	0,08			●
BGHX15L504PCFRGG	2	10,50	5,00	1,20	0,4	0,08	●		
BGHX15L508PCFRGG	2	10,50	5,00	1,20	0,8	0,08	●	●	
BGHX15L512PCFRGG	2	10,50	5,00	1,20	1,2	0,08	●		
BGHX15L515PCFRGG	2	10,50	5,00	1,20	1,5	0,08	●		





- Excellent for milling aluminium and non-ferrous materials.
- Good choice for thin wall or poorly fixtured workpieces.
- 24° positive rake provides free cutting action.
- Produces excellent finish and flatness.
- Maximum speed is 2000 m/min.
- Clamping torque is 5 Nm

M Shell Mills — Coarse Pitch

D1	order number	catalog number	Z	D	D4	D6	L	Ap1 max	kgs	Max RPM
40	2210826	40A02RP90BG15CM	2	16	—	35	40	9,5	0,2	15920
50	2210827	50A03RP90BG15CM	3	22	—	42	40	9,5	0,3	12730
63	2033774	63A03RP90BG15CM	3	22	—	51	40	9,5	0,5	10110
80	2210828	80A03RP90BG15CM	3	27	—	64	50	9,5	1,0	7960
100	2210829	100B04RP90BG15CM	4	32	—	84	50	9,5	1,6	6370
125	2210830	125B05RP90BG15CM	5	40	—	94	63	9,5	2,5	5090
160	2210831	160C06RP90BG15CM	6	40	66,7	114	63	9,5	4,1	3980
200	2210832	200C08RP90BG15CM	8	60	101,6	134	63	9,5	5,6	3180
250	2210873	250C10RP90BG15CM	10	60	101,6	134	63	9,5	8,9	2550
315	2210874	315C12RP90BG15CM	12	60	101,6	22	80	9,5	19,8	2020

For 125 mm and 160 mm diameter milling cutters, always use the coolant screw and coolant cap together.

Spare Parts

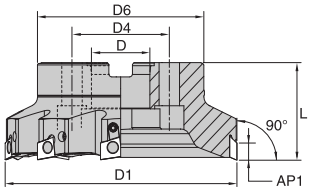
D1	clamp stud	set screw	hex wrench	torque (Nm)	mounting screw	coolant screw	coolant cap
40	410.083	420.060	170.003	5	129.830	420.080	—
50	410.083	420.060	170.003	5	125.025	420.100	—
63	410.083	420.060	170.003	5	125.025	420.100	—
80	410.083	420.060	170.003	5	125.230	420.120	—
100	410.083	420.060	170.003	5	—	420.160	—
125	410.083	420.060	170.003	5	—	420.200	470.232
160	410.083	420.060	170.003	5	—	420.200	470.233
200	410.083	420.060	170.003	5	—	—	470.234
250	410.083	420.060	170.003	5	—	—	470.235
315	410.083	420.060	170.003	5	—	—	470.236

Spare parts must be ordered separately.



Torque wrench (KTW45) and 3 mm hex bit (69709922164) may be purchased separately to ensure proper torque setting.

Ordering Example:
1 x 40A02RP90BG15CM
10 x BGHX15L5PCFRGG K110M





PM Shell Mills — Coarse Pitch

D1	order number	catalog number	Z	Z ADJ	D	D4	D6	L	Ap1 max	kg	Max RPM
40	1797183	40A02RP90BG15CPM	2	0	16	—	35	40	9,5	0,2	31830
50	1758493	50A03RP90BG15CPM	3	0	22	—	42	40	9,5	0,4	28660
63	1757331	63A04RP90BG15C1WPM	4	1	22	—	51	40	9,5	0,5	20210
80	1758495	80A05RP90BG15C1WPM	5	1	27	—	64	50	9,5	1,1	15916
100	1758496	100B06RP90BG15C2WPM	6	2	32	—	84	50	9,5	1,7	12732
125	1758497	125B08RP90BG15C2WPM	8	2	40	—	94	63	9,5	2,8	10186
160	1758498	160C10RP90BG15C2WPM	10	2	40	66,7	114	63	9,5	4,6	7958
200	1758499	200C12RP90BG15C3WPM	12	3	60	101,6	134	63	9,5	6,0	6366
250	1758500	250C16RP90BG15C4WPM	16	4	60	101,6	134	63	9,5	9,4	5093

PM Shell Mills — Fine Pitch

D1	order number	catalog number	Z	Z ADJ	D	D4	D6	L	Ap1 max	kg	Max RPM
80	1758572	80A06RP90BG15C2WPM	6	2	27	—	64	50	9,5	1,1	17910
100	1758573	100B08RP90BG15C2WPM	8	2	32	—	84	50	9,5	1,8	12732
125	1758574	125B10RP90BG15C2WPM	10	2	40	—	94	63	9,5	3,1	11460
160	1758575	160C12RP90BG15C3WPM	12	3	40	66,7	114	63	9,5	4,6	7958

For 125 mm and 160 mm diameter milling cutters, be sure to always use the coolant screw and coolant cap together.

Spare Parts

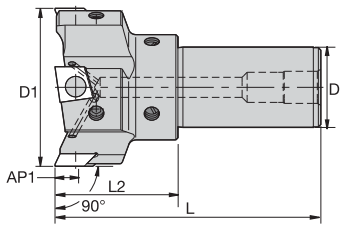
D1	adj. element	adj. element screw	Torx wrench	clamp stud	set screw	hex wrench	torque (Nm)	mounting screw	coolant screw	coolant cap
40	479.116	193.326	KT15	410.083	420.060	170.003	5	129.830	420.080	—
50	479.116	193.326	KT15	410.083	420.060	170.003	5	125.025	420.100	—
63	479.116	193.326	KT15	410.083	420.060	170.003	5	125.025	420.100	—
80	479.116	193.326	KT15	410.083	420.060	170.003	5	125.230	420.120	—
100	479.116	193.326	KT15	410.083	420.060	170.003	5	—	420.160	—
125	479.116	193.326	KT15	410.083	420.060	170.003	5	—	420.200	470.232
160	479.116	193.326	KT15	410.083	420.060	170.003	5	—	420.200	470.233
200	479.116	193.326	KT15	410.083	420.060	170.003	5	—	—	470.234
250	479.116	193.326	KT15	410.083	420.060	170.003	5	—	—	470.235

Please order spare parts separately.



Torque wrench (KTW45) and 3 mm hex bit (69709922164) may be purchased separately to ensure proper torque setting.

Ordering Example:
1 x 40A02RP90BG15CPM
10 x BGHX15L5PCFRGG K110M





HPM End Mills

D1	order number	catalog number	Z	Z ADJ	D	L2	L	Ap1 max	kg	Max RPM
40	1929829	40A02R036A32PBG15S1WHPM	2	1	32	36	97	9,5	0,6	31830
50	1758580	50A03R049A32PBG15S3WHPM	3	3	32	49	110	9,5	0,8	25465
63	1758591	63A04R049A32PBG15S4WHPM	4	4	32	49	110	9,5	1,0	20210

Spare Parts

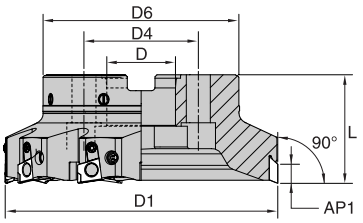
D1	adjusting element	adjusting element screw	Torx driver	Torx wrench	clamp stud	set screw	hex wrench	torque (Nm)
40	479.116	193.326	DT15	—	410.083	420.060	170.003	5
50	479.116	193.326	—	KT15	410.083	420.060	170.003	5
63	479.116	193.326	—	KT15	410.083	420.060	170.003	5

Please order spare parts separately.



Torque wrench (KTW45) and 3 mm hex bit (69709922164) may be purchased separately to ensure proper torque setting.

Ordering Example:
1 x 40A02R036A32PBG15S1WHPM
10 x BGHX15L5PCFRGG K510M





HPM Shell Mills

D1	order number	catalog number	Z	Z ADJ	D	D4	D6	L	Ap1 max	kgs	Max RPM
63	1758592	63A04RP90BG15C4WHPM	4	4	22	—	51	40	9,5	0,5	20210
80	1758593	80A05RP90BG15C5WHPM	5	5	27	—	64	50	9,5	1,1	15916
100	1762369	100B06RP90BG15C6WHPM	6	6	32	—	84	50	9,5	0,7	12732
125	1762370	125B08RP90BG15C8WHPM	8	8	40	—	94	63	9,5	1,2	10186
160	1762451	160C10RP90BG15C10WHPM	10	10	40	66,7	114	63	9,5	1,8	7959
200	1982560	200C12RP90BG15C12WHPM	12	12	60	101,6	134	63	9,5	2,4	6400
250	1963887	250C16RP90BG15C16WHPM	16	16	60	101,6	134	63	9,5	3,6	5100
315	1998364	315C20RP90BG15C20WHPM	20	20	60	101,6	225	80	9,5	7,6	4042

For 125 mm and 160 mm diameter milling cutters, always use the coolant screw and coolant cap together.

Spare Parts

D1	adj. element	adj. element screw	Torx wrench	clamp stud	set screw	hex wrench	torque (Nm)	mounting screw	coolant screw	coolant cap	wear pad	wear pad screw
63	479.116	193.326	KT15	410.083	420.060	170.003	5	125.025	420.100	—	—	—
80	479.116	193.326	KT15	410.083	420.060	170.003	5	125.230	420.120	—	—	—
100	479.116	193.326	KT15	410.083	420.060	170.003	5	—	420.160	—	471.030	191.916
125	479.116	193.326	KT15	410.083	420.060	170.003	5	—	420.200	470.232	471.030	191.916
160	479.116	193.326	KT15	410.083	420.060	170.003	5	—	420.200	470.233	471.030	191.916
200	479.116	193.326	KT15	410.083	420.060	170.003	5	—	—	470.234	471.030	191.916
250	479.116	193.326	KT15	410.083	420.060	170.003	5	—	—	470.235	471.030	191.916
315	479.116	193.326	KT15	410.083	420.060	170.003	5	—	—	470.236	471.030	191.916

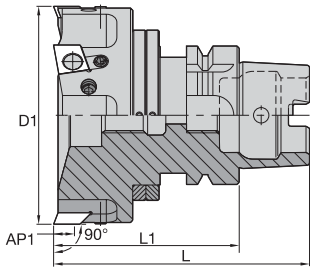
Spare parts must be ordered separately.



Torque wrench (KTW45) and 3 mm hex bit (69709922164) may be purchased separately to ensure proper torque setting.

Ordering Example:
1 x 63A04RP90BG15C4WHPM
10 x BGHX15L5PCFRGG K510M

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





HSM Shell Mills

D1	order number	catalog number	Z	Z ADJ	D	L1	L	Ap1 max	kgs	Max RPM
50	1782709	50A03R060S63PBG15S3WHSM	3	3	63	60	92	9,5	1,0	28660
63	1782710	63A04R070S63PBG15S4WHSM	4	4	63	70	102	9,5	1,3	22750
80	1782711	80A05R090S63PBG15S5WHSM	5	5	63	90	122	9,5	2,1	17910
100	1782712	100A06R090S63PBG15S6WHSM	6	6	63	90	122	9,5	3,0	14330

Spare Parts

D1	adj. element	adj. element screw	Torx wrench	clamp stud	set screw	hex wrench	torque (Nm)	coolant screw	balancing rings
50	479.116	193.326	KT15	410.083	420.060	170.003	5	—	SHVBR0635M
63	479.116	193.326	KT15	410.083	420.060	170.003	5	420.100	SHVBR0635M
80	479.116	193.326	KT15	410.083	420.060	170.003	5	420.120	SHVBR0635M
100	479.116	193.326	KT15	410.083	420.060	170.003	5	420.160	SHVBR0635M

Please order spare parts separately.



Torque wrench (KTW45) and 3mm hex bit (69709922164) may be purchased separately to ensure proper torque setting

Ordering Example:
1 x 50A03R060S63PBG15S3WHSM
10 x BGHX15L5PCFRGG K510M

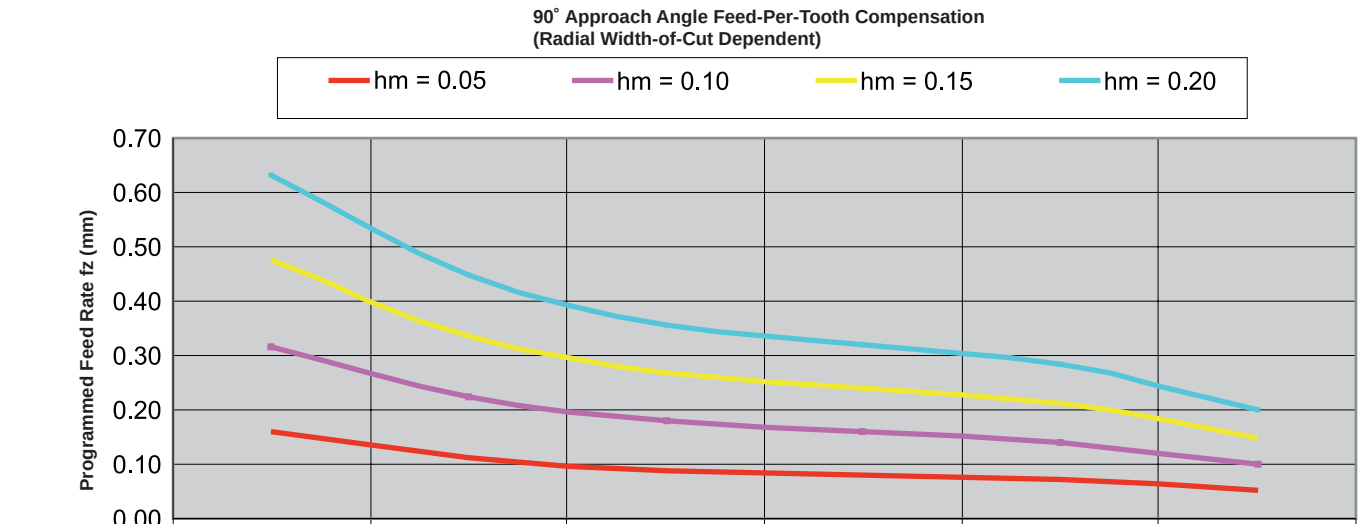
Recommended Starting Speeds [m/min]

90° Approach Angle

Material Group	K110M			KC510M			KD1410			KD1415		
P1												
P2												
P3												
P4												
P5												
P6												
M1												
M2												
M3												
K1												
K2												
K3												
N1	1200	**1000**	840	1750	**1500**	1300	4000	**3500**	3000	4000	**3500**	3000
N2	310	**280**	240	400	**380**	350	1100	**1050**	1000	1100	**1050**	1000
S1												
S2												
S3												
S4												
H1												

FIRST choice starting speeds are in bold type.
As the average chip thickness goes higher the speed should be decreased.

Recommended Starting Feeds

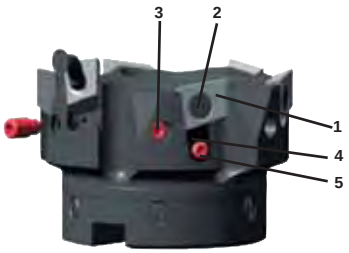


	10%	20%	30%	40%	50%	100%
hm = 0.05	0.16	0.11	0.09	0.08	0.07	0.05
hm = 0.10	0.32	0.22	0.18	0.16	0.14	0.10
hm = 0.15	0.47	0.34	0.27	0.24	0.21	0.15
hm = 0.20	0.63	0.45	0.36	0.32	0.28	0.20

Percentage of the Cutter Diameter in Cut

Indexable Insert Assembly for FIX-PERFECT Aluminum Milling Cutters

Introduction to Fitting Cutting Bodies



Roughing indexable inserts
BGHX15L5PC..GG.



Finishing indexable inserts
BGHX15L5PC..GG.1W



Clean dust, grease, etc., from the insert seat, insert (1), and clamp stud (2).

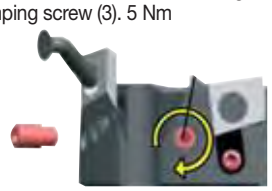
PM

① Loosen the adjusting element (4).



Loosen the adjusting screw (5).

② Insert the indexable inserts and tighten with the clamping screw (3). 5 Nm



Attention: Ensure that the insert is correctly positioned in the insert seat.

③ Tension the adjusting element (4) by tightening the adjusting screw (5) to the specified torque of 0,5 Nm



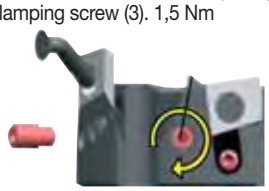
HPM/HSM

① Loosen the adjusting element (4).



Loosen the adjusting screw (5).

② Insert the indexable inserts and pre-tighten with the clamping screw (3). 1,5 Nm



Attention: Ensure that the insert is correctly positioned in the insert seat.
Determine which cutting body is the highest on the axis.

③ Extract by 0,02 mm the insert that is axially the highest by turning the adjusting screw (5).



Adjust the remaining inserts to the desired run-out with maximum travel of the inserts 0,2 mm.

④ Clamp the insert by tightening the clamping screw (3) to the specified torque of 5 Nm



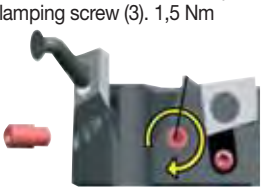
PM/HPM/HSM

① Loosen the adjusting element (4).



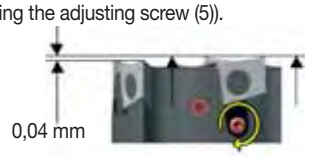
Loosen the adjusting screw (5).

② Insert the indexable inserts and pre-tighten with the clamping screw (3). 1,5 Nm



Attention: Ensure that the insert is correctly positioned in the insert seat.
Determine which cutting body is the highest on the axis.

③ Adjust the finishing indexable insert(s) to the desired projection (preferably 0,04 mm by turning the adjusting screw (5)).



Attention: Ensure that the insert is correctly positioned in the insert seat.

④ Clamp the insert by tightening the clamping screw (3) to the specified torque of 5 Nm



Check the run-out

Attention:

- This process must be repeated whenever an indexable insert is changed.
- To dismantle, loosen the clamping screw (3) and adjusting screw (5). Then remove the insert (1) with the clamp stud (2).



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Engineering Your Competitive Edge



Slotting Cutters

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LN-Style Cutters *413*

KSSM Arbor Mount – Adjustable, 10 mm IC ..... NEW! *417*

KSSM Shell Mount – Adjustable, 10 mm IC ..... NEW! *420*

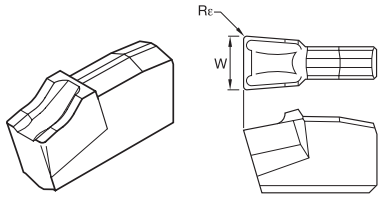
KSSM – Arbor Mount, Adjustable 12 mm IC ..... NEW! *426*

KSSM – Shell Mount, Adjustable 12 mm IC ..... NEW! *427*



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GMILLING

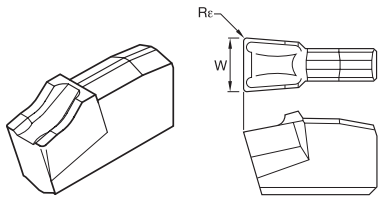
Indexable Inserts for A2



● first choice
○ alternate choice

H	S	N	K	M	P
	●			●	○
			○	○	●
	●	●			

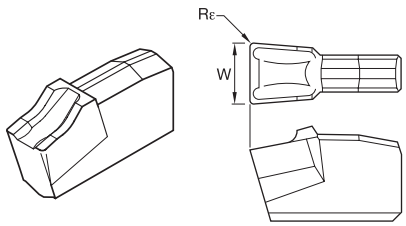
catalog number	W	Rε	hm	KC735M	KC935M	KMF
3.90016ECGD	1,60	0,15	0,06			●
3.90016SNGB	1,60	0,15	0,06	●	●	
3.90016SNGD	1,60	0,15	0,06	●	●	



● first choice
○ alternate choice

H	S	N	K	M	P
	●			●	○
			○	○	●
	●	●			

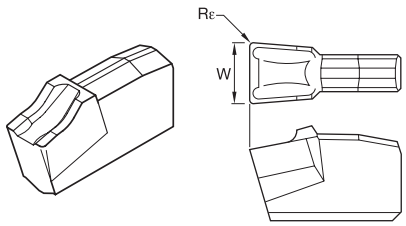
catalog number	W	Rε	hm	KC735M	KC935M	KMF
3.90022ECGD	2,20	0,20	0,06			●
3.90022SNGB	2,20	0,20	0,06	●	●	
3.90022SNGD	2,20	0,20	0,06	●	●	



● first choice
○ alternate choice

H	S	N	K	M	P
	●			●	○
			○	○	●
	●	●			

catalog number	W	Rε	hm	KC735M	KC935M	KMF
3.90030ECGD	3,05	0,20	0,06			●
3.90030SNGB	3,05	0,20	0,06	●	●	
3.90030SNGD	3,05	0,20	0,06	●	●	

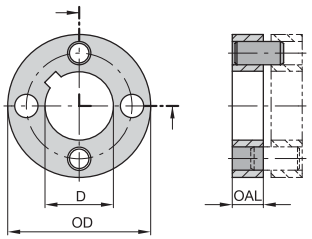


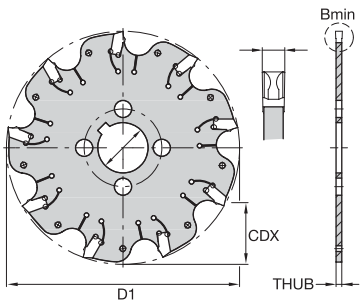
● first choice
○ alternate choice

H	S	N	K	M	P
	●			●	○
			○	○	●
	●	●			

catalog number	W	Rε	hm	KC735M	KC935M	KMF
3.90040ECGD	4,05	0,20	0,06			●
3.90040SNGB	4,05	0,20	0,06	●	●	
3.90040SNGD	4,05	0,20	0,06	●	●	

- Positive chipforming inserts are standard.
- Self-clamping insert seat with fixed stop.
- Excellent for all flat-bottom slotting and cut-off operations.
- Two drive hubs required for each cutter body, except when using two drive supports (must be ordered separately, in pairs).





A2 — Cutting Width 1,6 mm

D1	order number	catalog number	Z	D	CDX	THUB	B min	kgs	Max RPM
63	1246114	4.97060116	5	16	15	1,3	1,6	0,03	5100
80	1246122	4.97080116	7	16	21	1,3	1,6	0,04	4000
100	1246131	4.97101116	9	22	27	1,3	1,6	0,07	3200
125	1246138	4.97123116	11	32	35	1,3	1,6	0,10	2600

Drive Rings

D1	cutter number	drive ring number	D	O/Dia	OAL	Kgs
63	1246114	460.889	16	32	8	0.04
80	1246122	460.899	16	38	8	0.05
100	1246131	460.890	22	46	10	0.09
125	1246138	460.897	32	55	10	0.12

Insert wrench 170.183 (order code 1124601) must be ordered separately.

A2 — Cutting Width 2,2 mm

D1	order number	catalog number	Z	D	CDX	THUB	B min	kg	Max RPM
63	1191307	4.97060122	5	16	15	1,8	2,2	0,03	5100
80	1246124	4.97080122	7	16	21	1,8	2,2	0,05	4000
100	1246132	4.97101122	9	22	27	1,8	2,2	0,08	3200
125	1246140	4.97123122	11	32	35	1,8	2,2	0,12	2600
160	1246147	4.97164122	14	40	40	1,8	2,2	0,30	2000

Drive Rings

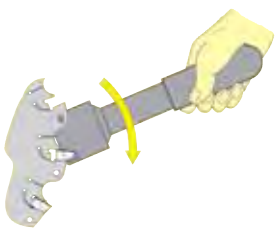
D1	cutter number	drive ring number	D	O/Dia	OAL	Kgs
63	1191307	460.889	16	32	8	0.04
80	1246124	460.899	16	38	8	0.05
100	1246132	460.890	22	46	10	0.09
125	1246140	460.897	32	55	10	0.12
160	1246147	460.888	32	80	12	0.34

Insert wrench 170.183 (order code 1124601) must be ordered separately.

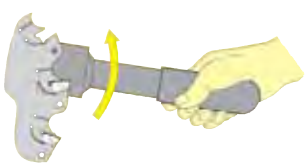
Self-clamping insert seat for maximum machining safety



Fittting the insert



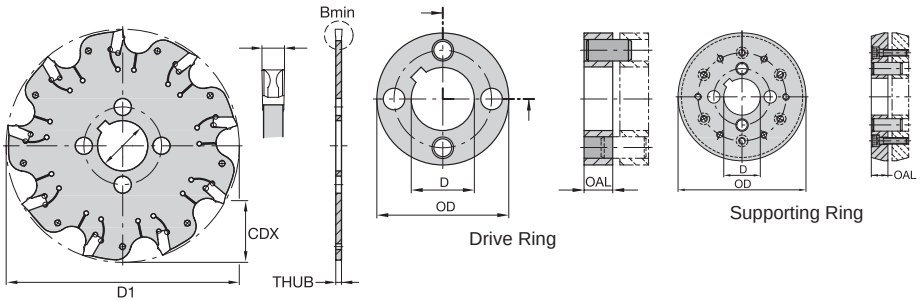
Removing the insert



Ordering Example:
1 x 4.97060116
10 x 3.90016SNGD KC935M

Very Narrow Slotting Cutters

- Positive chipforming inserts are standard.
- Self-clamping insert seat with fixed stop.
- Excellent for all flat-bottom slotting and cut-off operations.
- Two drive hubs required for each cutter body, except when using two drive supports (must be ordered separately, in pairs).



A2 — Cutting Width 3 mm

D1	order number	catalog number	Z	D	THUB	B min	kgs	Max RPM
63	1246118	4.97060130	4	16	2,4	3,0	0,05	5100
80	1246126	4.97080130	6	16	2,4	3,0	0,08	4000
100	1246134	4.97101130	9	22	2,4	3,0	0,13	3200
125	1246142	4.97123130	11	32	2,4	3,0	0,20	2600
160	1246149	4.97164130	14	40	2,4	3,0	0,35	2000
200	1246153	4.97204130	19	40	2,4	3,0	0,50	1600
250	1246157	4.97254130	24	40	2,4	3,0	0,80	1300

Note: For CDX value, refer to drive ring and support ring tables

Insert wrench 170.183 (order code 1124601) must be ordered separately.

A2 — Cutting Width 4 mm

D1	order number	catalog number	Z	D	THUB	B min	kgs	Max RPM
63	1246120	4.97060140	4	16	3,4	4,0	0,06	5100
80	1246129	4.97080140	6	16	3,4	4,0	0,10	4000
100	1246136	4.97101140	9	22	3,4	4,0	0,15	3200
125	1246145	4.97123140	11	32	3,4	4,0	0,25	2600
160	1246150	4.97164140	14	40	3,4	4,0	0,40	2000
200	1246154	4.97204140	19	40	3,4	4,0	0,65	1600
250	1246159	4.97254140	24	40	3,4	4,0	0,95	1300

Note: For CDX value, refer to drive ring and support ring tables

Insert wrench 170.183 (order code 1124601) must be ordered separately.

Drive Rings

D1	drive ring number	CDX	D	O/Dia	OAL	Kg
63	460.898	15.5	16	32	8	0.03
80	460.899	21	16	38	8	0.05
100	460.890	27	22	46	10	0.09
125	460.897	35	32	55	10	0.12
160	460.888	40	40	80	12	0.34
200	460.888	60	40	80	12	0.34
250	460.888	85	40	80	12	0.34

A2 Supporting Rings

D1	catalog number	CDX	D	O/Dia	OAL	Kg	Clamp Screw	Allen Key	Allen Key Size
200	460.887	30	40	140	12	1.15	125.616	170.005	5 mm
250	460.887	55	40	140	12	1.15	125.616	170.005	5 mm
250	460.886	30	40	190	12	2.35	125.616	170.005	5 mm

Ordering Example:
1 x 4.97060130
10 x 3.90030SNGD KC935M

Recommended Starting Speeds [m/min]

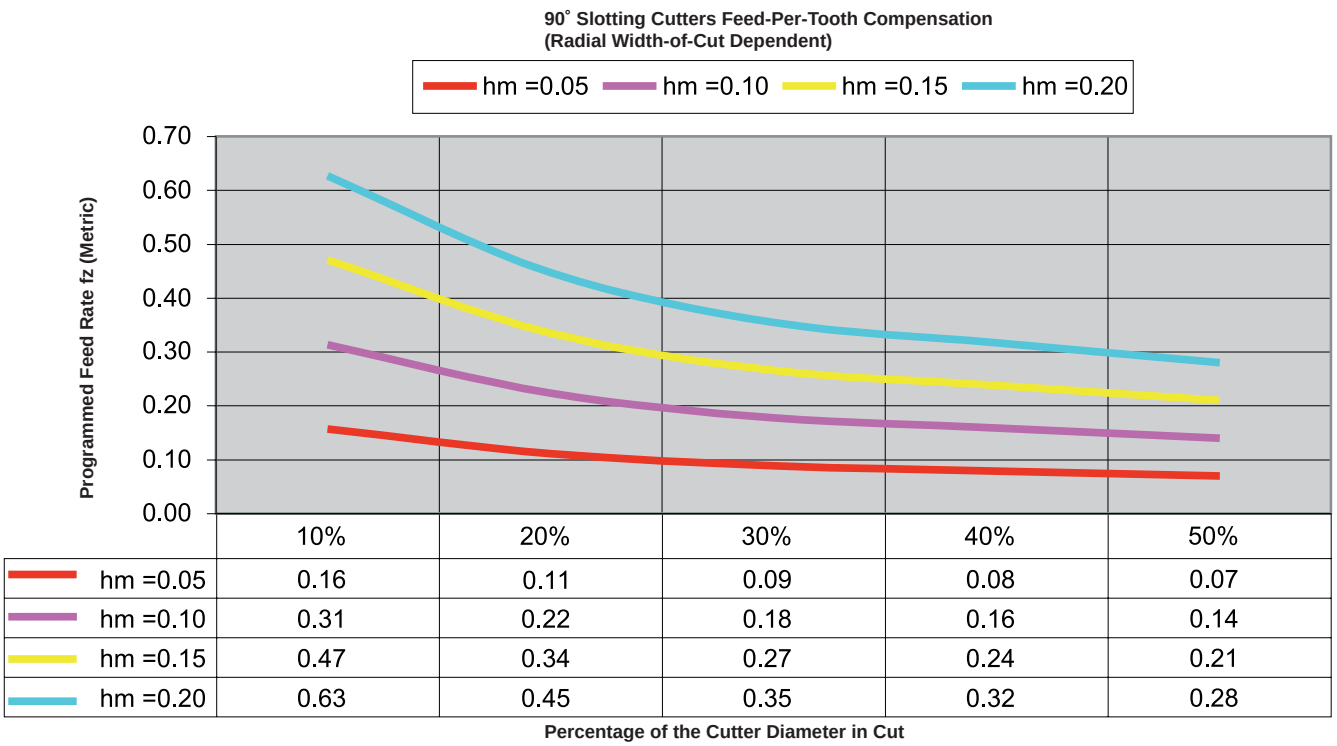
A2 Slotting Cutting Data

Material Group	KC110M			KC735M			KC935M		
P1							310	**270**	250
P2							190	**180**	160
P3							180	**160**	140
P4							130	**120**	110
P5							180	**160**	150
P6							110	**90**	
M1				80	**70**	70	200	**180**	160
M2				80	**70**	60	190	**170**	150
M3				50	**50**		140	**120**	
K1							200	**180**	160
K2							160	**150**	130
K3							140	**120**	110
N1	330	**295**	270						
N2	220	**195**	170						
S1	30	**25**	20						
S2	30	**25**	20						
S3	30	**25**	20						
S4	25	**25**	20						
H1									

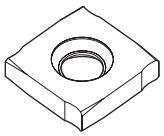
FIRST choice starting speeds are in bold type.

As the average chip thickness goes higher the speed should be decreased.

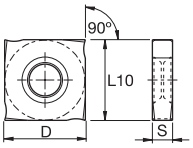
Recommended Starting Feeds



	10%	20%	30%	40%	50%
hm =0.05	0.16	0.11	0.09	0.08	0.07
hm =0.10	0.31	0.22	0.18	0.16	0.14
hm =0.15	0.47	0.34	0.27	0.24	0.21
hm =0.20	0.63	0.45	0.35	0.32	0.28



SNHX



● first choice
○ alternate choice

SNHX-T

catalog number	cutting edges	D	S	L10	hm	K110M	K125M	KC510M	KC725M	KC915M	KC935M
SNHX1102T	4	11,00	2,38	11,00	0,05				●		●
SNHX1103T	4	11,00	2,70	11,00	0,05				●		●
SNHX1203T	4	12,70	3,20	12,70	0,06				●		●
SNHX12045T	4	12,70	4,50	12,70	0,08				●		
SNHX1204T	4	12,70	4,00	12,70	0,08				●		
SNHX1205T	4	12,70	5,40	12,70	0,08				●		

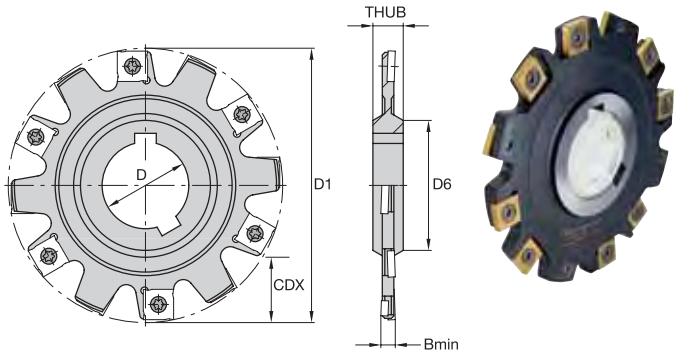
SNHX-NGE

catalog number	cutting edges	D	S	L10	hm	K110M	K125M	KC510M	KC725M	KC915M	KC935M
SNHX11T3PZFNGE	4	11,00	2,70	11,00	0,05			●			
SNHX1203PZFNGE	4	12,70	3,20	12,70	0,06			●			
SNHX12L5PZFNGE	4	12,70	5,40	12,70	0,08	●		●			

SNHX-NGP

catalog number	cutting edges	D	S	L10	hm	K110M	K125M	KC510M	KC725M	KC915M	KC935M
SNHX1102PZTNGP	4	11,00	2,30	11,00	0,05	●			●		●
SNHX11T3PZTNGP	4	11,00	2,70	11,00	0,05				●		●
SNHX1203PZTNGP	4	12,70	3,20	12,70	0,08		●		●	●	●
SNHX1204PZTNGP	4	12,70	4,00	12,70	0,08						●
SNHX12L4PZTNGP	4	12,70	4,50	12,70	0,08						●
SNHX12L5PZTNGP	4	12,70	5,40	12,70	0,08				●		●

- 4 mm to 14 mm slot widths.
- Four indexes per insert.
- Three chipformers available.
- Two keyways for staggered mounting.
- Requires only one spare part.
- Economical to use.



SN — Arbor Mount — Full Side Cutting

D1	order number	catalog number	Z	Z S	D	D6	CDX	THUB	B min	kg	insert 1
80	1244389	4.96082-204	10	5	27	45	15	12	4,0	0,3	SNHX1102___
100	1191306	4.96102-204	12	6	27	45	25	12	4,0	0,4	SNHX1102___
100	1244398	4.96102-205	12	6	27	45	25	12	5,0	0,4	SNHX11T3___
100	1244368	4.96102-206	10	5	27	45	25	12	6,0	0,4	SNHX1203___
100	1244369	4.96102-210	10	5	27	45	25	12	10,0	0,7	SNHX12L5___
125	1244370	4.96124-204	14	7	40	58	30	12	4,0	0,5	SNHX1102___
125	1244371	4.96124-205	14	7	40	58	30	12	5,0	0,6	SNHX11T3___
125	1244372	4.96124-206	12	6	40	58	30	12	6,0	0,6	SNHX1203___
125	1244373	4.96124-208	12	4	40	58	30	12	8,0	0,7	SNHX1203___
125	1244374	4.96124-210	12	6	40	58	30	12	10,0	0,8	SNHX12L5___
125	1244375	4.96124-212	12	4	40	58	30	12	12,0	0,9	SNHX12L5___
160	1244394	4.96164-204	18	9	40	68	44	12	4,0	0,9	SNHX1102___
160	1244376	4.96164-205	18	9	40	68	44	12	5,0	0,9	SNHX11T3___
160	1244377	4.96164-206	16	8	40	68	44	12	6,0	1,1	SNHX1203___
160	1244379	4.96164-210	16	8	40	68	44	12	10,0	1,4	SNHX12L5___
200	1244395	4.96205-208	18	6	50	72	62	12	8,0	1,8	SNHX1203___
250	1244385	4.96255-206	24	12	50	72	86	12	6,0	4,2	SNHX1203___
250	1244386	4.96255-208	24	8	50	72	86	12	8,0	4,5	SNHX1203___
250	1244388	4.96255-214	24	8	50	72	86	14	14,0	5,2	SNHX12L5___

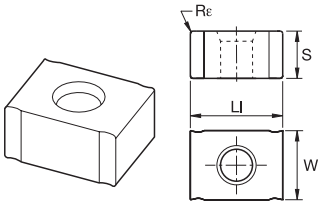
Spare Parts

D1	Bmin	insert screw	wrench	torque (Nm)
80	4	192.529	170.023	1
100	4	192.529	170.023	1
100	5	192.530	170.023	1
100	6	192.531	170.025	3
100	10	192.532	170.025	3
125	4	192.529	170.023	1
125	5	192.530	170.023	1
125	6	192.531	170.025	3
125	8	192.531	170.025	3
125	10	192.532	170.025	3
125	12	192.532	170.025	3
160	4	192.529	170.023	1
160	5	192.530	170.023	1
160	6	192.531	170.025	3
160	10	192.532	170.025	3
200	8	192.531	170.025	3
250	6	192.531	170.025	3
250	8	192.531	170.025	3
250	14	192.532	170.025	3

Ordering Example:
1 x 4.96082204
10 x SNHX1102PZTNGP KC935M

90° LN Slotting Cutters

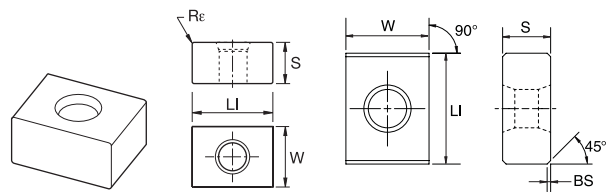
Indexable Inserts for 90LN LNEU/LNEQ



● first choice
○ alternate choice

	KC520M	KC715M	KC725M	KC935M
H				
S			●	
N				
K	●			○
M			●	○
P		●	●	●

catalog number	cutting edges	LI	W	S	Rε	hm	KC520M	KC715M	KC725M	KC935M
LNEU1235R03	2	12,70	9,60	3,50	0,3	0,05	●		●	
LNEU1240R03	2	12,70	9,60	4,00	0,3	0,05	●		●	
LNEU1240R16	2	12,70	9,60	4,00	1,6	0,05		●	●	
LNEU1245R16	2	12,70	9,60	4,50	1,6	0,05	●		●	
LNEU1245R32	2	12,70	9,60	4,50	3,2	0,05	●		●	
LNEU1255R16	2	12,70	9,60	5,50	1,6	0,05			●	
LNEU1255R32	2	12,70	9,60	5,50	3,2	0,05			●	
LNEU1240R08	4	12,70	9,60	4,00	0,8	0,05	●	●	●	
LNEU1245R04	4	12,70	9,60	4,50	0,4	0,05	●		●	●
LNEU1245R08	4	12,70	9,60	4,50	0,8	0,05	●		●	
LNEU1250R04	4	12,70	9,60	5,00	0,4	0,05	●		●	
LNEU1250R08	4	12,70	9,60	5,00	0,8	0,05			●	
LNEU1255R04	4	12,70	9,60	5,50	0,4	0,05			●	
LNEU1255R08	4	12,70	9,60	5,50	0,8	0,05	●		●	
LNEU1260R04	4	12,70	9,60	6,00	0,4	0,05			●	
LNEU1235R03SGP	2	12,70	9,60	3,50	0,3	0,05			●	
LNEU1240R03SGP	2	12,70	9,60	4,00	0,3	0,05			●	
LNEU1245R04SGP	4	12,70	9,60	4,50	0,4	0,05			●	●
LNEU1245R08SGP	4	12,70	9,60	4,50	0,8	0,05			●	
LNEU1245R16SGP	4	12,70	9,60	4,50	1,6	0,05			●	●
LNEU1250R04SGP	4	12,70	9,60	5,00	0,4	0,05			●	
LNEU1250R08SGP	4	12,70	9,60	5,00	0,8	0,05			●	
LNEU1255R04SGP	4	12,70	9,60	5,50	0,4	0,05			●	



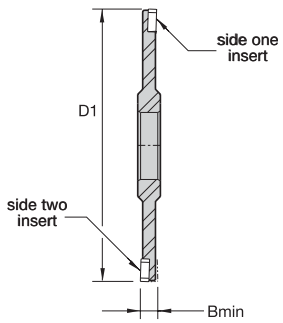
● first choice
○ alternate choice

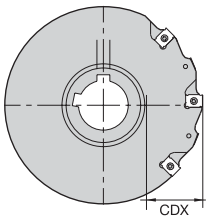
	KC520M	KC725M	KC735M	KC915M	KC935M
H					
S		●	●		
N					
K	●			●	○
M		●	●		○
P		●	○		●

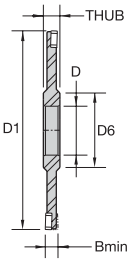
catalog number	cutting edges	LI	W	S	BS	Rε	hm	KC520M	KC725M	KC735M	KC915M	KC935M
LNEQ1240	2	12,70	9,53	4,00	0,30	–	0,06			●		
LNEQ1255	4	12,70	9,53	5,50	0,40	–	0,06			●		
LNEQ1235R03	2	12,70	9,53	3,50	–	0,3	0,06		●	●	●	
LNEQ1240R03	2	12,70	9,53	4,00	–	0,3	0,06		●		●	●
LNEQ1245R04	4	12,70	9,53	4,50	–	0,4	0,06	●	●		●	●
LNEQ1250R04	4	12,70	9,53	5,00	–	0,4	0,06			●	●	●
LNEQ1255R04	4	12,70	9,53	5,50	–	0,4	0,06	●	●		●	
LNEQ1260R04	4	12,70	9,53	6,00	–	0,4	0,06		●		●	

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

- 6 mm to 13 mm slot width range.
- Easy width adjustment through insert thickness.
- Right-hand and full-side cutting versions.
- Neutral and positive chipforming inserts are standard.
- Four insert cutting edges.
- Two keyways for staggered mounting.
- Requires only one spare part.









LN — Arbor Mount — Full Side Cutting

D1	order number	catalog number	Z	Z S	D	D6	CDX	THUB	B min	B max	kgs
80	1131447	80F08NS90LN12N08	8	4	27	44	16	12	8,0	9,0	0,4
80	1131438	80F08NS90LN12N06	8	4	27	44	16	12	6,0	7,0	0,3
100	1150508	100G10NS90LN12N06	10	5	32	52	22	12	6,0	7,0	0,4
100	1130249	100G10NS90LN12N08	10	5	32	52	22	12	8,0	9,0	0,5
125	1130489	125H12NS90LN12N10	12	4	40	63	30	12	10,0	11,0	0,9
125	1130477	125H12NS90LN12N06	12	6	40	63	30	12	6,0	7,0	0,7
160	1130595	160H15NS90LN12N10	15	5	40	63	46	12	10,0	11,0	1,6
160	1130608	160H15NS90LN12N12	15	5	40	63	46	12	12,0	13,0	1,6
160	1130615	160H16NS90LN12N06	16	8	40	63	46	12	6,0	7,0	1,1
160	1130626	160H16NS90LN12N08	16	8	40	63	46	12	8,0	9,0	1,3
200	1130804	200J18NS90LN12N10	18	6	50	75	60	12	10,0	11,0	2,4
200	1296082	200J18NS90LN12N12	18	6	50	75	60	12	12,0	13,0	2,9
200	1150527	200J18NS90LN12N08	18	9	50	75	60	12	8,0	9,0	2,0
200	1130793	200J18NS90LN12N06	18	9	50	75	60	12	6,0	7,0	1,6

Spare Parts

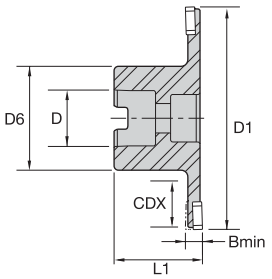
D1	B min	insert screw	Torx driver	torque (Nm)
80	8	MS1282	DT15	3
80	6	MS1280	DT15	3
100	6	MS1280	DT15	3
100	8	MS1282	DT15	3
125	10	MS1282	DT15	3
125	6	MS1280	DT15	3
160	12	MS1285	DT15	3
160	10	MS1282	DT15	3
160	6	MS1280	DT15	3
160	8	MS1282	DT15	3
200	12	MS1285	DT15	3
200	10	MS1282	DT15	3
200	6	MS1280	DT15	3
200	8	MS1282	DT15	3

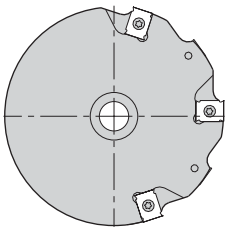
Ordering Example:
1 x 80F08NS90LN12N06
10 x LNEU1235R03SGP KC725M
10 x LNEU1240R03SGP KC725M

90° LN Slotting Cutters

Narrow Slotting Cutters — Type B, Shell Mount

- 6 mm to 11 mm slot width range.
- Easy width adjustment through insert thickness.
- Right-hand and full-side cutting versions.
- Neutral and positive chipforming inserts are standard.
- Four insert cutting edges.
- Requires only one spare part.







LN — Shell Mount — Full Side Cutting

D1	order number	catalog number	Z	Z S	D	D6	L1	B min	B max	CDX	kgs
80	1131472	80Y08RS90LN12N08	8	4	22	42	50	8	9	16,0	0,75
80	1131463	80Y08RS90LN12N06	8	4	22	42	50	6	7	16,0	0,65
100	1130277	100Y10RS90LN12N06	10	5	27	50	50	6	7	22,0	1,00
100	1130283	100Y10RS90LN12N08	10	5	27	50	50	8	9	22,0	1,20
125	1130506	125Y12RS90LN12N10	12	4	40	70	50	10	11	26,0	2,00
160	1150524	160Y15RS90LN12N10	15	5	40	70	50	10	11	43,0	2,45
160	1150511	160Y16RS90LN12N06	16	8	40	70	50	6	7	43,0	1,85
160	1150513	160Y16RS90LN12N08	16	8	40	70	50	8	9	43,0	2,15

Spare Parts

D1	B min	insert screw	Torx driver	torque (Nm)
80	6	MS1280	DT15	3
80	8	MS1282	DT15	3
100	8	MS1282	DT15	3
100	6	MS1280	DT15	3
125	10	MS1285	DT15	3
160	10	MS1282	DT15	3
160	6	MS1280	DT15	3
160	8	MS1282	DT15	3

Ordering Example:
1 x 80Y08RS90LN12N06
10 x LNEU1235R03SGP KC725M
10 x LNEU1240R03SGP KC725M

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

Recommended Starting Speeds [m/min]

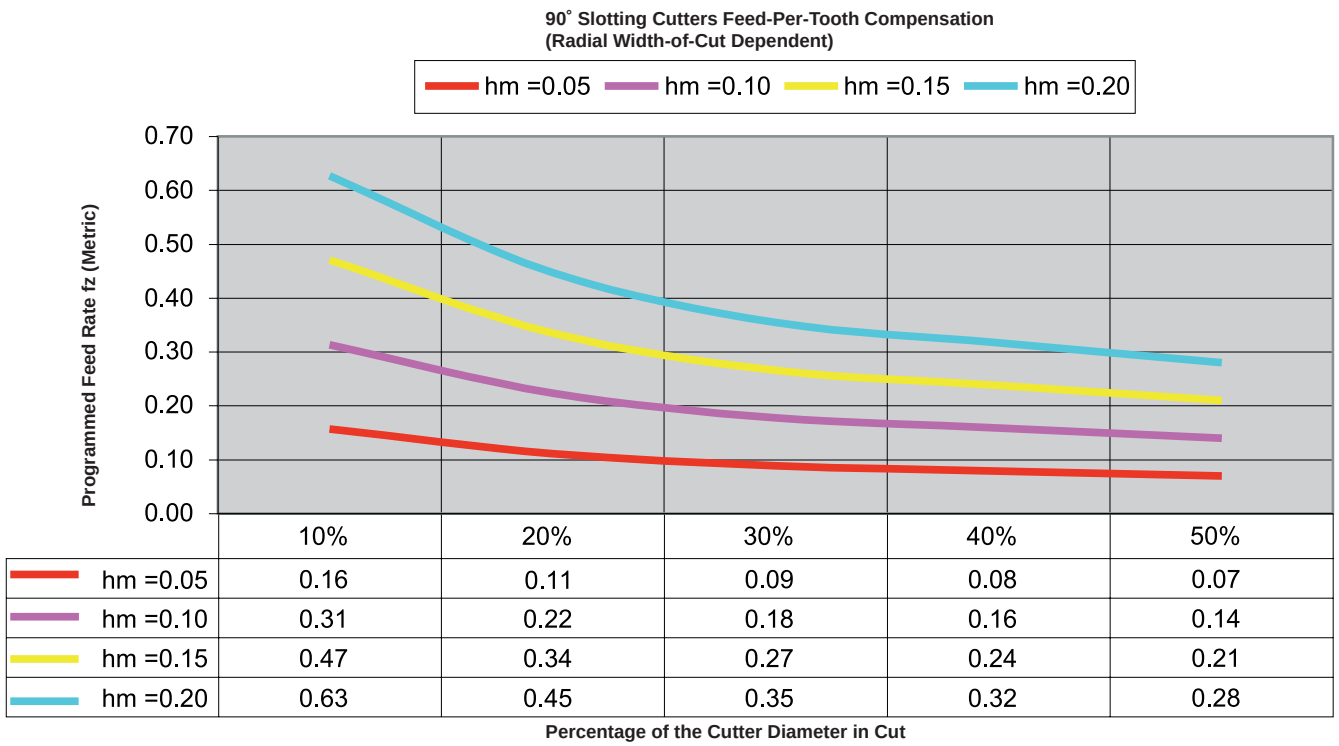
SN / LN Slotting Cutting Data

Material Group	K110M			K125M			KC510M			KC520M			KC715M			KC725M			KC735M			KC915M			KC935M		
P1				180	**160**	140							270	**240**	220	210	**180**	170							310	**270**	250
P2				150	**140**	130							170	**150**	140	130	**120**	100							190	**180**	160
P3				130	**120**	110							150	**140**	120	120	**100**	90							180	**160**	140
P4				110	**100**	90							120	**100**	90	90	**80**	70							130	**120**	110
P5				80	**60**	50							160	**140**	125	115	**110**	100							180	**160**	150
P6													90	**80**		70	**60**								110	**90**	
M1													180	**150**	140	140	**120**	110	80	**70**	70				200	**180**	160
M2																120	**110**	100	80	**70**	60				190	**170**	150
M3																90	**80**		50	**50**					140	**120**	
K1	130	**120**	110				230	**210**	190	210	**190**	170				130	**120**	110				290	**260**	240	200	**180**	160
K2	110	**100**	90				180	**160**	150	170	**150**	140				100	**90**	90				230	**210**	190	160	**150**	130
K3	100	**90**	80				150	**140**	130	140	**130**	120				90	**80**	70				190	**170**	160	140	**120**	110
N1	505	**475**	450				510	**450**	420																		
N2	410	**370**	330																								
S1																30	**20**										
S2																20	**20**										
S3																30	**30**										
S4																40	**40**										
H1																											

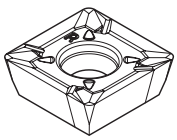
FIRST choice starting speeds are in bold type.

As the average chip thickness goes higher the speed should be decreased.

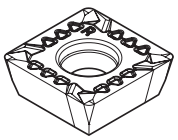
Recommended Starting Feeds



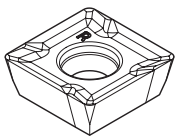
	10%	20%	30%	40%	50%
hm =0.05	0.16	0.11	0.09	0.08	0.07
hm =0.10	0.31	0.22	0.18	0.16	0.14
hm =0.15	0.47	0.34	0.27	0.24	0.21
hm =0.20	0.63	0.45	0.35	0.32	0.28



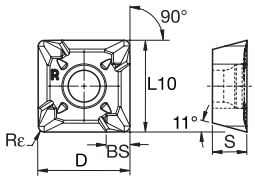
SPCT-LD2



SPET-GB2



SPCT-LE



● first choice
○ alternate choice

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

SPCT-LD2

catalog number	cutting edges	D	S	L10	BS	Rε	hm	KC410M	KC520M	KC725M	KC915M	KC935M	KT530M
SPCT10T304PPELLD2	4	10,00	3,97	10,00	2,70	0,4	0,08			●			
SPCT10T304PPERLD2	4	10,00	3,97	10,00	2,70	0,4	0,08			●			
SPCT10T3PPELLD2	4	10,00	3,97	10,00	2,70	0,8	0,08			●			
SPCT10T3PPERLD2	4	10,00	3,97	10,00	2,70	0,8	0,08		●	●			
SPCT10T312PPELLD2	4	10,00	3,97	10,00	2,70	1,2	0,08			●			
SPCT10T312PPERLD2	4	10,00	3,97	10,00	2,70	1,2	0,08			●			
SPCT10T316ENLD2	4	10,00	3,97	10,00	–	1,6	0,08			●			
SPCT10T320ENLD2	4	10,00	3,97	10,00	–	2,0	0,08			●			

SPCT-LE

catalog number	cutting edges	D	S	L10	BS	Rε	hm	KC410M	KC520M	KC725M	KC915M	KC935M	KT530M
SPCT10T304PPFLLE	4	10,00	3,97	10,00	2,70	0,40	0,05	●					
SPCT10T304PPFRLE	4	10,00	3,97	10,00	2,70	0,40	0,05	●					
SPCT10T3PPFRLE	4	10,00	3,97	10,00	2,70	0,79	0,05	●					
SPCT10T3PPFLLE	4	10,00	3,97	10,00	2,70	0,79	0,05	●					
SPCT10T312PPFRLE	4	10,00	3,97	10,00	2,70	1,19	0,05	●					
SPCT10T312PPFLLE	4	10,00	3,97	10,00	2,70	1,19	0,05	●					
SPCT10T316FNLE	4	10,00	3,97	10,00	–	1,59	0,05	●					
SPCT10T320FNLE	4	10,00	3,97	10,00	–	1,98	0,05	●					

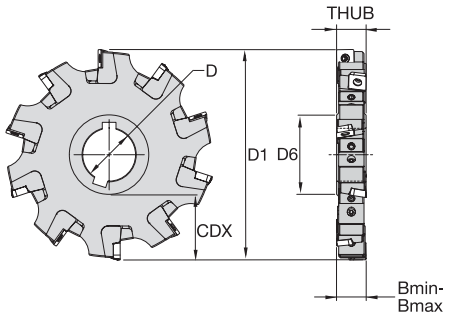
SPET-GB2

catalog number	cutting edges	D	S	L10	BS	Rε	hm	KC410M	KC520M	KC725M	KC915M	KC935M	KT530M
SPET10T3PPELGB2	4	10,00	3,97	10,00	2,70	0,8	0,10		●	●	●	●	
SPET10T3PPERGB2	4	10,00	3,97	10,00	2,70	0,8	0,10		●	●	●	●	
SPET10T3PPSLGB2	4	10,00	3,97	10,00	2,70	0,8	0,15		●	●	●	●	
SPET10T3PPSRGB2	4	10,00	3,97	10,00	2,70	0,8	0,15		●	●	●	●	

SPPT-GB2

catalog number	cutting edges	D	S	L10	BS	Rε	hm	KC410M	KC520M	KC725M	KC915M	KC935M	KT530M
SPPT10T3PPERGB2	4	10,00	3,97	10,00	2,70	0,8	0,10				●	●	
SPPT10T3PPSRGB2	4	10,00	3,97	10,00	2,70	0,8	0,15				●	●	●

- 14 mm to 18 mm slot width ranges.
- Rapid adjustment and setting via patent-pending cam adjustment mechanism.
- Large selection of insert geometries and grades to cut most workpiece materials.
- Four insert cutting edges.
- Wide choice of insert radii.
- Two keyways for staggered mounting.
- Wiper insert facets for superior surface finishes.





Arbor Mount Slotting Cutter — 14 mm - 16 mm Adjustment Range

D1	order number	catalog number	Z	Z S	D	D6	CDX	THUB	B min	B max	kgs	Max RPM
100	2442595	100G06NK90SP10N14K	6	3	32	46,8	25,9	13,9	14	16	0,5	17250
125	2442601	125H08NK90SP10N14K	8	4	40	54,8	34,4	13,9	14	16	0,8	15450
160	2443455	160H10NK90SP10N14K	10	5	40	54,8	51,9	13,9	14	16	1,5	13650
200	2443479	200J14NK90SP10N14K	14	7	50	68,8	64,9	13,9	14	16	2,4	12200

Spare Parts

D1	cartridge -left hand	cartridge -right hand	wedge	wedge screw	hex wrench	cam pin	cam pin wrench	insert screw	Torx plus wrench	torque (Nm)
100	LK90SP1014	RK90SP1014	W14	STCM11	THW3M	CP1416	MW25	MS2148	TTP9	1,5
125	LK90SP1014	RK90SP1014	W14	STCM11	THW3M	CP1416	MW25	MS2148	TTP9	1,5
160	LK90SP1014	RK90SP1014	W14	STCM11	THW3M	CP1416	MW25	MS2148	TTP9	1,5
200	LK90SP1014	RK90SP1014	W14	STCM11	THW3M	CP1416	MW25	MS2148	TTP9	1,5

Arbor Mount Slotting Cutter — 16 mm - 18 mm Adjustment Range

D1	order number	catalog number	Z	Z S	D	D6	CDX	THUB	B min	B max	kgs	Max RPM
125	2443434	125H08NK90SP10N16K	8	4	40	54,8	34,4	15,9	16	18	1,0	15450
160	2443458	160H10NK90SP10N16K	10	5	40	54,8	51,9	15,9	16	18	1,8	13650
200	2443482	200J14NK90SP10N16K	14	7	50	68,8	64,9	15,9	16	18	2,8	12200
250	2443503	250J18NK90SP10N16K	18	9	50	68,8	89,9	15,9	16	18	4,7	10900
315	2443521	315K20NK90SP10N16K	20	10	60	83,8	114,9	15,9	16	18	7,7	9700

Spare Parts

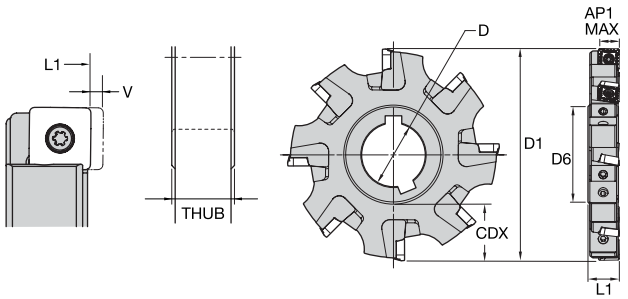
D1	cartridge -left hand	cartridge -right hand	wedge	wedge screw	hex wrench	cam pin	cam pin wrench	insert screw	Torx plus wrench	torque (Nm)
125	LK90SP1016	RK90SP1016	W16	STCM11	THW3M	CP1416	MW25	MS2148	TTP9	1,5
160	LK90SP1016	RK90SP1016	W16	STCM11	THW3M	CP1416	MW25	MS2148	TTP9	1,5
200	LK90SP1016	RK90SP1016	W16	STCM11	THW3M	CP1416	MW25	MS2148	TTP9	1,5
250	LK90SP1016	RK90SP1016	W16	STCM11	THW3M	CP1416	MW25	MS2148	TTP9	1,5
315	LK90SP1016	RK90SP1016	W16	STCM11	THW3M	CP1416	MW25	MS2148	TTP9	1,5

Ordering Example:
1 x 125H08NK90SP10N14K
10 x SPCT10T304PPERLD2 KC725M
10 x SPCT10T304PPELLD2 KC725M

KSSM Slotting Cutters — IC 10 — Adjustable

KSSM — Type A, Arbor Mount — 10 mm IC Inserts

- Rapid adjustment and setting via patent-pending cam adjustment mechanism.
- Large selection of insert geometries and grades to cut most workpiece materials.
- Four insert cutting edges.
- Wide choice of insert radii.
- Two keyways for staggered mounting.
- Wiper insert facets for superior surface finishes.





Arbor Mount — Half-Side Cutting — Right Hand — 14 mm

D1	order number	catalog number	Z	Z S	D	D6	CDX	THUB	L1	Ap1 max	V	kgs	Max RPM
100	2442596	100G06RK90SP10N14K	6	6	32,0	46,8	25,9	13,9	13,9	9,1	1,0	0,5	17250
125	2442602	125H08RK90SP10N14K	8	8	40,0	54,8	34,4	13,9	13,9	9,1	1,0	0,8	15450
160	2443456	160H10RK90SP10N14K	10	10	40,0	54,8	51,9	13,9	13,9	9,1	1,0	1,5	13650
200	2443480	200J14RK90SP10N14K	14	14	50,0	68,8	64,9	13,9	13,9	9,1	1,0	2,4	12200

Spare Parts

D1	cartridge -right hand	wedge	wedge screw	hex wrench	cam pin	cam pin wrench	insert screw	Torx plus wrench	torque (Nm)
100	RK90SP1014	W14	STCM32	THW3M	CP1416	MW25	MS2148	TTP9	1,5
125	RK90SP1014	W14	STCM11	THW3M	CP1416	MW25	MS2148	TTP9	1,5
160	RK90SP1014	W14	STCM11	THW3M	CP1416	MW25	MS2148	TTP9	1,5
200	RK90SP1014	W14	STCM11	THW3M	CP1416	MW25	MS2148	TTP9	1,5

Arbor Mount — Half-Side Cutting — Right Hand — 16 mm

D1	order number	catalog number	Z	Z S	D	D6	CDX	THUB	L1	Ap1 max	V	kgs	Max RPM
125	2443435	125H08RK90SP10N16K	8	8	40,0	54,8	34,4	15,9	15,2	9,1	1,0	1,0	15450
160	2443459	160H10RK90SP10N16K	10	10	40,0	54,8	51,9	15,9	15,2	9,1	1,0	1,8	13650
200	2443483	200J14RK90SP10N16K	14	14	50,0	68,8	64,9	15,9	15,2	9,1	1,0	2,8	12200
250	2443504	250J18RK90SP10N16K	18	18	50,0	68,8	89,9	15,9	15,2	9,1	1,0	4,7	10900
315	2443522	315K20RK90SP10N16K	20	20	60,0	83,8	114,9	15,9	15,2	9,1	1,0	7,7	9700

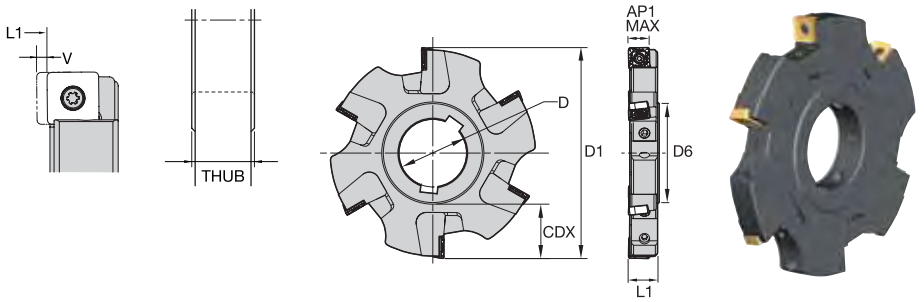
Spare Parts

D1	cartridge -right hand	wedge	wedge screw	hex wrench	cam pin	cam pin wrench	insert screw	Torx plus wrench	torque (Nm)
125	RK90SP1016	W16	STCM11	THW3M	CP1416	MW25	MS2148	TTP9	1,5
160	RK90SP1016	W16	STCM11	THW3M	CP1416	MW25	MS2148	TTP9	1,5
200	RK90SP1016	W16	STCM11	THW3M	CP1416	MW25	MS2148	TTP9	1,5
250	RK90SP1016	W16	STCM11	THW3M	CP1416	MW25	MS2148	TTP9	1,5
315	RK90SP1016	W16	STCM11	THW3M	CP1416	MW25	MS2148	TTP9	1,5

Ordering Example:
1 x 200J14RK90SP10N14K
10 x SPCT10T304PPERLD2 KC725M

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

- Rapid adjustment and setting via patent-pending cam adjustment mechanism.
- Large selection of insert geometries and grades to cut most workpiece materials.
- Four insert cutting edges.
- Wide choice of insert radii.
- Two keyways for staggered mounting.
- Wiper insert facets for superior surface finishes.



Arbor Mount — Half-Side Cutting — Left-Hand — 14 mm

D1	order number	catalog number	Z	Z S	D	D6	CDX	THUB	L1	Ap1 max	V	kgs	Max RPM
100	2442597	100G06LK90SP10N14K	6	6	32,0	46,8	25,9	13,9	13,9	9,1	1,0	0,5	17250
125	2443433	125H08LK90SP10N14K	8	8	40,0	54,8	34,4	13,9	13,9	9,1	1,0	0,8	15450
160	2443457	160H10LK90SP10N14K	10	10	40,0	54,8	51,9	13,9	13,9	9,1	1,0	1,5	13650
200	2443481	200J14LK90SP10N14K	14	14	50,0	68,8	64,9	13,9	13,9	9,1	1,0	2,4	12200

Spare Parts

D1	cartridge -left hand	wedge	wedge screw	hex wrench	cam pin	cam pin wrench	insert screw	Torx plus wrench	torque (Nm)
100	LK90SP1014	W14	STCM11	THW3M	CP1416	MW25	MS2148	TTP9	1,5
125	LK90SP1014	W14	STCM11	THW3M	CP1416	MW25	MS2148	TTP9	1,5
160	LK90SP1014	W14	STCM11	THW3M	CP1416	MW25	MS2148	TTP9	1,5
200	LK90SP1014	W14	STCM11	THW3M	CP1416	MW25	MS2148	TTP9	1,5

Arbor Mount — Half-Side Cutting — Left-Hand — 16 mm

D1	order number	catalog number	Z	Z S	D	D6	CDX	THUB	L1	Ap1 max	V	kgs	Max RPM
125	2443436	125H08LK90SP10N16K	8	8	40,0	54,8	34,4	15,9	15,2	9,1	1,0	1,0	15450
160	2443460	160H10LK90SP10N16K	10	10	40,0	54,8	51,9	15,9	15,2	9,1	1,0	1,8	13650
200	2443484	200J14LK90SP10N16K	14	14	50,0	68,8	64,9	15,9	15,2	9,1	1,0	2,8	12200
250	2443505	250J18LK90SP10N16K	18	18	50,0	68,8	89,9	15,9	15,2	9,1	1,0	4,7	10900
315	2443523	315K20LK90SP10N16K	20	20	60,0	83,8	114,9	15,9	15,2	9,1	1,0	7,7	9700

Spare Parts

D1	cartridge -left hand	wedge	wedge screw	hex wrench	cam pin	cam pin wrench	insert screw	Torx plus wrench	torque (Nm)
125	LK90SP1016	W16	STCM11	THW3M	CP1416	MW25	MS2148	TTP9	1,5
160	LK90SP1016	W16	STCM11	THW3M	CP1416	MW25	MS2148	TTP9	1,5
200	LK90SP1016	W16	STCM11	THW3M	CP1416	MW25	MS2148	TTP9	1,5
250	LK90SP1016	W16	STCM11	THW3M	CP1416	MW25	MS2148	TTP9	1,5
315	LK90SP1016	W16	STCM11	THW3M	CP1416	MW25	MS2148	TTP9	1,5

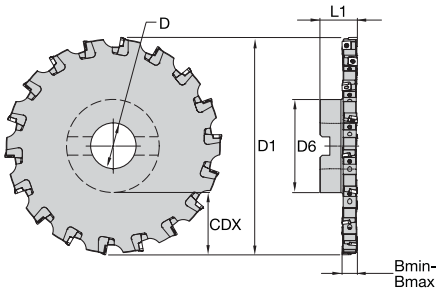
Ordering Example:
1 x 160H10LK90SP10N14K
10 x SPCT10T304PPELLD2 KC725M

KSSM Slotting Cutters — IC 10 — Adjustable

KENNAMETAL

KSSM — Type B, Shell Mount — 10 mm IC Inserts

- 14 mm to 18 mm slot width ranges.
- Rapid adjustment and setting via patent pending cam adjustment mechanism.
- Large selection of insert geometries and grades to cut most workpiece materials.
- Four insert cutting edges.
- Wide choice of insert radii.
- Two keyways for staggered mounting.
- Wiper insert facets for superior surface finishes.





Shell Mount Slotting Cutters — 14 mm - 16 mm Adjustment Range

D1	order number	catalog number	Z	Z S	D	D6	CDX	L1	B min	B max	kgs	Max RPM
100	2442598	100Y06NK90SP10N14K	6	3	27	48,0	24,4	50,8	14	16	0,9	17250
125	2443443	125Y08NK90SP10N14K	8	4	32	58,0	31,9	50,8	14	16	1,4	15450
160	2443467	160Y10NK90SP10N14K	10	5	40	70,0	43,4	50,8	14	16	2,0	13650
200	2443491	200Y14NK90SP10N14K	14	7	40	90,0	53,4	50,8	14	16	3,7	12200

Spare Parts

D1	cartridge -left hand	cartridge -right hand	wedge	wedge screw	hex wrench	cam pin	cam pin wrench	insert screw	Torx plus wrench	mounting screw
100	LK90SP1014	RK90SP1014	W14	STCM11	THW3M	CP1416	MW25	MS2148	TTP9	MS1556
125	LK90SP1014	RK90SP1014	W14	STCM11	THW3M	CP1416	MW25	MS2148	TTP9	MS1559
160	LK90SP1014	RK90SP1014	W14	STCM11	THW3M	CP1416	MW25	MS2148	TTP9	—
200	LK90SP1014	RK90SP1014	W14	STCM11	THW3M	CP1416	MW25	MS2148	TTP9	—

Shell Mount Slotting Cutters — 16 mm - 18 mm Adjustment Range

D1	order number	catalog number	Z	Z S	D	D6	CDX	L1	B min	B max	kgs	Max RPM
125	2443446	125Y08NK90SP10N16K	8	4	32	58,0	31,9	50,8	16	18	1,6	15450
160	2443470	160Y10NK90SP10N16K	10	5	40	70,0	43,4	50,8	16	18	2,2	13650
200	2443494	200Y14NK90SP10N16K	14	7	40	90,0	53,4	50,8	16	18	4,1	12200
250	2443512	250Y18NK90SP10N16K	18	9	60	130,0	58,4	50,8	16	18	6,4	10900
315	2443530	315Y20NK90SP10N16K	20	10	60	130,0	90,9	50,8	16	18	9,5	9700

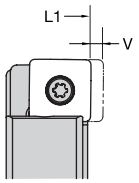
Spare Parts

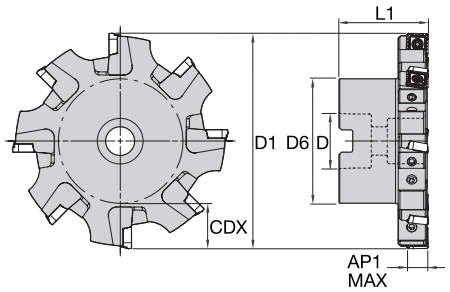
D1	cartridge -left hand	cartridge -right hand	wedge	wedge screw	hex wrench	cam pin	cam pin wrench	insert screw	Torx plus wrench	torque (Nm)	mounting screw
125	LK90SP1016	RK90SP1016	W16	STCM11	THW3M	CP1416	MW25	MS2148	TTP9	1,5	MS1559
160	LK90SP1016	RK90SP1016	W16	STCM11	THW3M	CP1416	MW25	MS2148	TTP9	1,5	—
200	LK90SP1016	RK90SP1016	W16	STCM11	THW3M	CP1416	MW25	MS2148	TTP9	1,5	—
250	LK90SP1016	RK90SP1016	W16	STCM11	THW3M	CP1416	MW25	MS2148	TTP9	1,5	—
315	LK90SP1016	RK90SP1016	W16	STCM11	THW3M	CP1416	MW25	MS2148	TTP9	1,5	—

Ordering Example:
1 x 160Y10NK90SP10N14K
10 x SPCT10T304PPERLD2 KC725M
10 x SPCT10T304PPELLD2 KC725M

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

- Rapid adjustment and setting via patent-pending cam adjustment mechanism.
- Large selection of insert geometries and grades to cut most workpiece materials.
- Four insert cutting edges.
- Wide choice of insert radii.
- Two keyways for staggered mounting.
- Wiper insert facets for superior surface finishes.







Shell Mount — Half-Side Cutting — Right Hand — 14 mm

D1	order number	catalog number	Z	Z S	D	D6	CDX	L1	Ap1 max	V	kgs	Max RPM
100	2442599	100Y06RK90SP10N14K	6	6	27	48,0	24,4	50,8	9,1	1,0	0,9	17250
125	2443444	125Y08RK90SP10N14K	8	8	32	58,0	31,9	50,8	9,1	1,0	1,4	15450
160	2443468	160Y10RK90SP10N14K	10	10	40	70,0	43,4	50,8	9,1	1,0	2,0	13650
200	2443492	200Y14RK90SP10N14K	14	14	40	90,0	53,4	50,8	9,1	1,0	3,7	12200

Spare Parts

D1	cartridge -right hand	wedge	wedge screw	hex wrench	cam pin	cam pin wrench	insert screw	Torx plus wrench	torque (Nm)	mounting screw
100	RK90SP1014	W14	STCM11	THW3M	CP1416	MW25	MS2148	TTP9	1,5	MS1556
125	RK90SP1014	W14	STCM11	THW3M	CP1416	MW25	MS2148	TTP9	1,5	MS1559
160	RK90SP1014	W14	STCM11	THW3M	CP1416	MW25	MS2148	TTP9	1,5	—
200	RK90SP1014	W14	STCM11	THW3M	CP1416	MW25	MS2148	TTP9	1,5	—

Shell Mount — Half-Side Cutting — Right Hand — 16 mm

D1	order number	catalog number	Z	Z S	D	D6	CDX	L1	Ap1 max	V	kgs	Max RPM
125	2443447	125Y08RK90SP10N16K	8	8	32	58,0	31,9	50,8	9,1	1,0	1,6	15450
160	2443471	160Y10RK90SP10N16K	10	10	40	70,0	43,4	50,8	9,1	1,0	2,2	13650
200	2443495	200Y14RK90SP10N16K	14	14	40	90,0	53,4	50,8	9,1	1,0	4,1	12200
250	2443513	250Y18RK90SP10N16K	18	18	60	130,0	58,4	50,8	9,1	1,0	6,4	10900
315	2443531	315Y20RK90SP10N16K	20	20	60	130,0	90,9	50,8	9,1	1,0	9,5	9700

Spare Parts

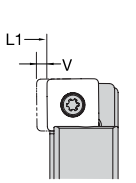
D1	cartridge -right hand	wedge	wedge screw	hex wrench	cam pin	cam pin wrench	insert screw	Torx plus wrench	torque (Nm)	mounting screw
125	RK90SP1016	W16	STCM11	THW3M	CP1416	MW25	MS2148	TTP9	1,5	MS1559
160	RK90SP1016	W16	STCM11	THW3M	CP1416	MW25	MS2148	TTP9	1,5	—
200	RK90SP1016	W16	STCM11	THW3M	CP1416	MW25	MS2148	TTP9	1,5	—
250	RK90SP1016	W16	STCM11	THW3M	CP1416	MW25	MS2148	TTP9	1,5	—
315	RK90SP1016	W16	STCM11	THW3M	CP1416	MW25	MS2148	TTP9	1,5	—

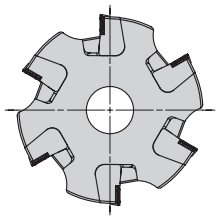
Ordering Example:
1 x 100Y06RK90SP10N14K
10 x SPCT10T304PPERLD2 KC725M

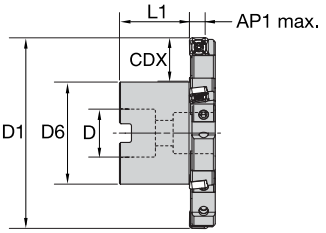
KSSM Slotting Cutters — IC 10 — Adjustable

KSSM - Type B, Shell Mount — 10 mm IC Inserts

- Rapid adjustment and setting via patent-pending cam adjustment mechanism.
- Large selection of insert geometries and grades to cut most workpiece materials.
- Four insert cutting edges.
- Wide choice of insert radii.
- Two keyways for staggered mounting.
- Wiper insert facets for superior surface finishes.









Shell Mount — Half-Side Cutting — Left-Hand — 14 mm

D1	order number	catalog number	Z	Z S	D	D6	CDX	L1	Ap1 max	V	kgs	Max RPM
100	2442600	100Y06LK90SP10N14K	6	6	27	48,0	24,4	36,8	9,1	1,0	0,9	17250
125	2443445	125Y08LK90SP10N14K	8	8	32	58,0	31,9	36,8	9,1	1,0	1,4	15450
160	2443469	160Y10LK90SP10N14K	10	10	40	70,0	43,4	36,8	9,1	1,0	2,0	13650
200	2443493	200Y14LK90SP10N14K	14	14	40	90,0	53,4	36,8	9,1	1,0	3,7	12200

Spare Parts

D1	cartridge -left hand	wedge	wedge screw	hex wrench	cam pin	cam pin wrench	insert screw	Torx plus wrench	mounting screw
100	LK90SP1014	W14	STCM11	THW3M	CP1416	MW25	MS2148	TTP9	MS1556
125	LK90SP1014	W14	STCM11	THW3M	CP1416	MW25	MS2148	TTP9	MS1559
160	LK90SP1014	W14	STCM11	THW3M	CP1416	MW25	MS2148	TTP9	—
200	LK90SP1014	W14	STCM11	THW3M	CP1416	MW25	MS2148	TTP9	—

Shell Mount — Half-Side Cutting — Left-Hand — 16 mm

D1	order number	catalog number	Z	Z S	D	D6	CDX	L1	Ap1 max	V	kgs	Max RPM
125	2443448	125Y08LK90SP10N16K	8	8	32	58,0	31,9	34,8	9,1	1,0	1,6	15450
160	2443472	160Y10LK90SP10N16K	10	10	40	70,0	43,4	34,8	9,1	1,0	2,2	13650
200	2443496	200Y14LK90SP10N16K	14	14	40	90,0	53,4	34,8	9,1	1,0	4,1	12200
250	2443514	250Y18LK90SP10N16K	18	18	60	130,0	58,4	34,8	9,1	1,0	6,4	10900
315	2443532	315Y20LK90SP10N16K	20	20	60	130,0	90,9	34,8	9,1	1,0	9,5	9700

Spare Parts

D1	cartridge -left hand	wedge	wedge screw	hex wrench	cam pin	cam pin wrench	insert screw	Torx plus wrench	torque (Nm)	mounting screw
125	LK90SP1016	W16	STCM11	THW3M	CP1416	MW25	MS2148	TTP9	1,5	MS1559
160	LK90SP1016	W16	STCM11	THW3M	CP1416	MW25	MS2148	TTP9	1,5	—
200	LK90SP1016	W16	STCM11	THW3M	CP1416	MW25	MS2148	TTP9	1,5	—
250	LK90SP1016	W16	STCM11	THW3M	CP1416	MW25	MS2148	TTP9	1,5	—
315	LK90SP1016	W16	STCM11	THW3M	CP1416	MW25	MS2148	TTP9	1,5	—

Ordering Example:
1 x 100Y06LK90SP10N14K
10 x SPCT10T304PPELLD2 KC725M

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

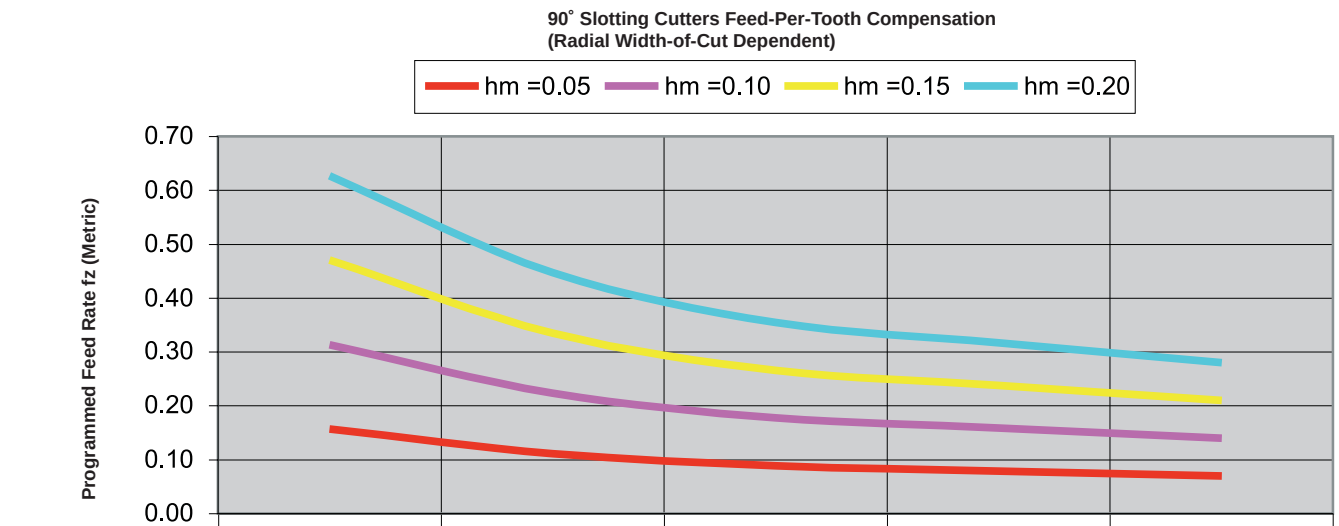
Recommended Starting Speeds [m/min]

KSSM Slotting Cutting Data

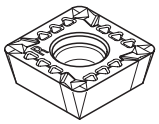
Material Group	KC410M			KC520M			KC725M			KC915M			KC935M			KT530M		
P1							210	180	170				310	**270**	250	230	**200**	190
P2							130	**120**	100				190	**180**	160	140	**130**	120
P3							120	**100**	90				180	**160**	140	130	**120**	100
P4							90	**80**	70				130	**120**	110	100	**90**	80
P5							115	**110**	100				180	**160**	150	130	**115**	105
P6							70	**60**					110	**90**		80	**70**	
M1							140	**120**	110				200	**180**	160	150	**130**	120
M2							120	**110**	100				190	**170**	150	140	**120**	110
M3							90	**80**					140	**120**		100	**90**	
K1				210	**190**	170	130	**120**	110	290	**260**	240	200	**180**	160			
K2				170	**150**	140	100	**90**	90	230	**210**	190	160	**150**	130			
K3				140	**130**	120	90	**80**	70	190	**170**	160	140	**120**	110			
N1	970	**860**	790															
N2																		
S1							30	**20**										
S2							20	**20**										
S3							30	**30**										
S4							40	**40**										
H1																		

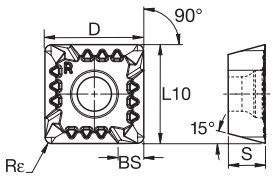
FIRST choice starting speeds are in bold type.
As the average chip thickness goes higher the speed should be decreased.

Recommended Starting Feeds



	10%	20%	30%	40%	50%
hm =0.05	0.16	0.11	0.09	0.08	0.07
hm =0.10	0.31	0.22	0.18	0.16	0.14
hm =0.15	0.47	0.34	0.27	0.24	0.21
hm =0.20	0.63	0.45	0.35	0.32	0.28



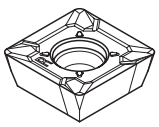


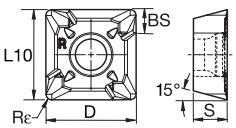
● first choice
○ alternate choice

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

GB2 (Ground) 5° Rake Face

catalog number	cutting edges	D	S	L10	BS	Rε	hm	KC520M	KC725M	KC915M	KC935M
SDET1204PDELGB2	4	12,70	4,76	12,70	3,32	0,8	0,10	●	●	●	●
SDET1204PDERGB2	4	12,70	4,76	12,70	3,32	0,8	0,10	●	●	●	●
SDET1204PDSLGB2	4	12,70	4,76	12,70	3,32	0,8	0,15	●	●	●	●
SDET1204PDSRGB2	4	12,70	4,76	12,70	3,32	0,8	0,15	●	●	●	●
SDET120412PDELGB2	4	12,70	4,76	12,70	3,05	1,2	0,10	●	●	●	●
SDET120412PDERGB2	4	12,70	4,76	12,70	3,05	1,2	0,10	●	●	●	●
SDET120416SNGB2	4	12,70	4,76	12,70	–	1,6	0,15	●	●	●	●
SDET120420SNGB2	4	12,70	4,76	12,70	–	2,0	0,15	●	●	●	●
SDET120424SNGB2	4	12,70	4,76	12,70	–	2,4	0,15	●	●	●	●
SDET120432SNGB2	4	12,70	4,76	12,70	–	3,2	0,15	●	●	●	●



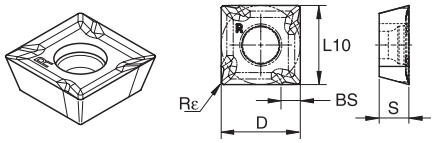


● first choice
○ alternate choice

H			
S		●	●
N			
K	●	○	
M		●	●
P		○	●

LD2 (Ground) 15° Rake Face

catalog number	cutting edges	D	S	L10	BS	Rε	hm	KC520M	KC522M	KC725M
SDCT120404PDELLD2	4	12,70	4,76	12,70	2,70	0,4	0,08			●
SDCT120404PDERLD2	4	12,70	4,76	12,70	2,93	0,4	0,08			●
SDCT1204PDELLD2	4	12,70	4,76	12,70	3,32	0,8	0,08			●
SDCT1204PDERLD2	4	12,70	4,76	12,70	3,32	0,8	0,08	●		●
SDCT120412PDELLD2	4	12,70	4,76	12,70	3,05	1,2	0,08			●
SDCT120412PDERLD2	4	12,70	4,76	12,70	3,05	1,2	0,08			●
SDCT120416ENLD2	4	12,70	4,76	12,70	–	1,6	0,08			●
SDCT120420ENLD2	4	12,70	4,76	12,70	–	2,0	0,08			●
SDCT120424ENLD2	4	12,70	4,76	12,70	–	2,4	0,08			●
SDCT120432ENLD2	4	12,70	4,76	12,70	–	3,2	0,08		●	●

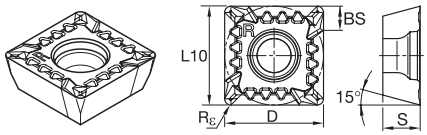


● first choice
○ alternate choice

H	S	N	K	M	P
		●			

LE (Ground) 20° Rake Face

catalog number	cutting edges	D	S	L10	BS	Rε	hm	KC410M
SDCT120404PDFLLE	4	12,70	4,76	12,70	2,93	0,4	0,05	●
SDCT120404PDFRLE	4	12,70	4,76	12,70	2,93	0,4	0,05	●
SDCT1204PDFLLE	4	12,70	4,76	12,70	3,32	0,8	0,05	●
SDCT1204PDFRLE	4	12,70	4,76	12,70	3,32	0,8	0,05	●
SDCT120412PDFLLE	4	12,70	4,76	12,70	3,05	1,2	0,05	●
SDCT120412PDFRLE	4	12,70	4,76	12,70	3,05	1,2	0,05	●
SDCT120416FNLE	4	12,70	4,76	12,70	–	1,6	0,05	●
SDCT120420FNLE	4	12,70	4,76	12,70	–	2,0	0,05	●
SDCT120424FNLE	4	12,70	4,76	12,70	–	2,4	0,05	●
SDCT120432FNLE	4	12,70	4,76	12,70	–	3,2	0,05	●

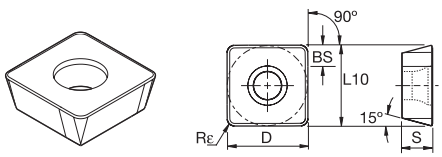


● first choice
○ alternate choice

H	S	N	K	M	P
	●		● ○	● ○	●

GB2 (Precision Sintered) 5° Rake Face

catalog number	cutting edges	D	S	L10	BS	Rε	hm	KC725M	KC915M	KC935M
SDPT1204PDERGB2	4	12,70	4,76	12,70	3,32	0,8	0,10	●	●	●
SDPT1204PDSRGB2	4	12,70	4,76	12,70	3,32	0,8	0,15	●	●	●



● first choice
○ alternate choice

H	S	N	K	M	P
			●		

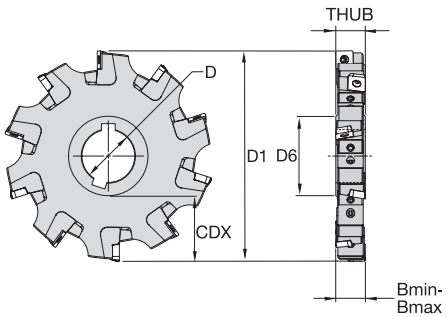
GN (Ground) Flat Top

catalog number	cutting edges	D	S	L10	BS	Rε	hm	KY3500
SDCW1204PDSRGN	4	12,70	4,76	12,70	3,32	0,8	0,08	●
SDCW120412PDSRGN	4	12,70	4,76	12,70	3,05	1,2	0,08	●

KSSM Slotting Cutters — IC 12 — Adjustable

KSSM - Type A, Arbor Mount — 12 mm IC Inserts

- 18 mm to 23,3 mm slot width ranges.
- Rapid adjustment and setting via patent pending cam adjustment mechanism.
- Large selection of insert geometries and grades to cut most workpiece materials.
- Four insert cutting edges.
- Wide choice of insert radii.
- Two keyways for staggered mounting.
- Wiper insert facets for superior surface finishes.





Arbor Mount Slotting Cutter — 18 mm - 20,7 mm Adjustment Range

D1	order number	catalog number	Z	Z S	D	D6	CDX	THUB	B min	B max	kgs	Max RPM
125	2443437	125H08NK90SD12N18K	8	4	40	54,8	34,0	18,2	18	20,7	1,0	10350
160	2443461	160H10NK90SD12N18K	10	5	40	54,8	51,5	18,2	18	20,7	1,8	9150
200	2443485	200J14NK90SD12N18K	14	7	50	68,8	64,5	18,2	18	20,7	3,0	8200
250	2443506	250J16NK90SD12N18K	16	8	50	68,8	89,5	18,2	18	20,7	5,0	7350
315	2443524	315K18NK90SD12N18K	18	9	60	83,8	114,5	18,2	18	20,7	8,4	6500

Spare Parts

D1	cartridge -left hand	cartridge -right hand	wedge	wedge screw	hex wrench	cam pin	cam pin wrench	insert screw	Torx plus wrench	torque (Nm)
125	LK90SD1218	RK90SD1218	W18	STCM11	THW3M	CP1820	MW3	MS2077	TTP15	4
160	LK90SD1218	RK90SD1218	W18	STCM11	THW3M	CP1820	MW3	MS2077	TTP15	4
200	LK90SD1218	RK90SD1218	W18	STCM11	THW3M	CP1820	MW3	MS2077	TTP15	4
250	LK90SD1218	RK90SD1218	W18	STCM11	THW3M	CP1820	MW3	MS2077	TTP15	4
315	LK90SD1218	RK90SD1218	W18	STCM11	THW3M	CP1820	MW3	MS2077	TTP15	4

Arbor Mount Slotting Cutter — 20,6 mm - 23,3 mm Adjustment Range

D1	order number	catalog number	Z	Z S	D	D6	CDX	THUB	B min	B max	kgs	Max RPM
125	2443440	125H08NK90SD12N20K	8	4	40	54,8	34,0	20,8	21	23,3	1,2	10350
160	2443464	160H10NK90SD12N20K	10	5	40	54,8	51,5	20,8	21	23,3	2,1	9150
200	2443488	200J14NK90SD12N20K	14	7	50	68,8	64,5	20,8	21	23,3	3,5	8200
250	2443509	250J16NK90SD12N20K	16	8	50	68,8	89,5	20,8	21	23,3	5,9	7350
315	2443527	315K18NK90SD12N20K	18	9	60	83,8	114,5	20,8	21	23,3	9,7	6500

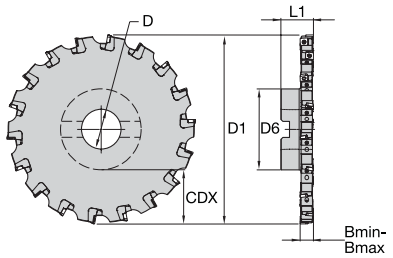
Spare Parts

D1	cartridge -left hand	cartridge -right hand	wedge	wedge screw	hex wrench	cam pin	cam pin wrench	insert screw	Torx plus wrench	torque (Nm)
125	LK90SD1220	RK90SD1220	W20	STCM11	THW3M	CP1820	MW3	MS2077	TTP15	4
160	LK90SD1220	RK90SD1220	W20	STCM11	THW3M	CP1820	MW3	MS2077	TTP15	4
200	LK90SD1220	RK90SD1220	W20	STCM11	THW3M	CP1820	MW3	MS2077	TTP15	4
250	LK90SD1220	RK90SD1220	W20	STCM11	THW3M	CP1820	MW3	MS2077	TTP15	4
315	LK90SD1220	RK90SD1220	W20	STCM11	THW3M	CP1820	MW3	MS2077	TTP15	4

Ordering Example:
1 x 200J14NK90SD12N18K
10 x SDCT120404PDERLD2 KC725M
10 x SDCT120404PDELLD2 KC725M

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

- 18 mm to 23,3 mm slot width ranges.
- Rapid adjustment and setting via patent pending cam adjustment mechanism.
- Large selection of insert geometries and grades to cut most workpiece materials.
- Four insert cutting edges.
- Wide choice of insert radii.
- Two keyways for staggered mounting.
- Wiper insert facets for superior surface finishes.





Shell Mount — Slotting Width — 18 mm - 20,7 mm Adjustment Range

D1	order number	catalog number	Z	Z S	D	D6	CDX	L1	B min	B max	kgs	Max RPM
125	2443449	125Y08NK90SD12N18K	8	4	32	58,0	31,9	51,0	18	20,7	1,6	10350
160	2443473	160Y10NK90SD12N18K	10	5	40	70,0	43,4	51,0	18	20,7	2,3	9150
200	2443497	200Y14NK90SD12N18K	14	7	40	90,0	53,4	51,0	18	20,7	4,2	8200
250	2443515	250Y16NK90SD12N18K	16	8	60	130,0	58,4	51,0	18	20,7	6,7	7350
315	2443536	315Y18NK90SD12N18K	18	9	60	130,0	90,9	51,0	18	20,7	10,1	6500

Spare Parts

D1	cartridge -left hand	cartridge -right hand	wedge	wedge screw	hex wrench	cam pin	cam pin wrench	insert screw	Torx plus wrench	torque (Nm)	mounting screw
125	LK90SD1218	RK90SD1218	W18	STCM11	THW3M	CP1820	MW3	MS2077	TTP15	4	MS1559
160	LK90SD1218	RK90SD1218	W18	STCM11	THW3M	CP1820	MW3	MS2077	TTP15	4	–
200	LK90SD1218	RK90SD1218	W18	STCM11	THW3M	CP1820	MW3	MS2077	TTP15	4	–
250	LK90SD1218	RK90SD1218	W18	STCM11	THW3M	CP1820	MW3	MS2077	TTP15	4	–
315	LK90SD1218	RK90SD1218	W18	STCM11	THW3M	CP1820	MW3	MS2077	TTP15	4	–

Shell Mount — Slotting Width — 20,6 mm - 23,3 mm Adjustment Range

D1	order number	catalog number	Z	Z S	D	D6	CDX	L1	B min	B max	kgs	Max RPM
125	2443452	125Y08NK90SD12N20K	8	4	32	58,0	31,9	51,0	20,7	23,3	1,7	10350
160	2443476	160Y10NK90SD12N20K	10	5	40	70,0	43,4	51,0	20,7	23,3	2,5	9150
200	2443500	200Y14NK90SD12N20K	14	7	40	90,0	53,4	51,0	20,7	23,3	4,6	8200
250	2443518	250Y16NK90SD12N20K	16	8	60	130,0	58,4	51,0	20,7	23,3	7,3	7350
315	2443533	315Y18NK90SD12N20K	18	9	60	130,0	90,9	51,0	20,7	23,3	11,3	6500

Spare Parts

D1	cartridge -left hand	cartridge -right hand	wedge	wedge screw	hex wrench	cam pin	cam pin wrench	insert screw	Torx plus wrench	torque (Nm)	mounting screw
125	LK90SD1220	RK90SD1220	W20	STCM11	THW3M	CP1820	MW3	MS2077	TTP15	4	MS1559
160	LK90SD1220	RK90SD1220	W20	STCM11	THW3M	CP1820	MW3	MS2077	TTP15	4	–
200	LK90SD1220	RK90SD1220	W20	STCM11	THW3M	CP1820	MW3	MS2077	TTP15	4	–
250	LK90SD1220	RK90SD1220	W20	STCM11	THW3M	CP1820	MW3	MS2077	TTP15	4	–
315	LK90SD1220	RK90SD1220	W20	STCM11	THW3M	CP1820	MW3	MS2077	TTP15	4	–

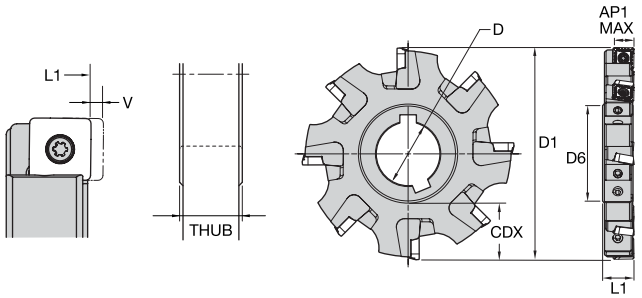
Ordering Example:

1 x 200Y14NK90SD12N18K
10 x SDCT120404PDERLD2 KC725M
10 x SDCT120404PDELLD2 KC725M

KSSM Slotting Cutters — IC 12 — Adjustable

KSSM - Type A, Arbor Mount — 12 mm IC Inserts

- Rapid adjustment and setting via patent-pending cam adjustment mechanism.
- Large selection of insert geometries and grades to cut most workpiece materials.
- Four insert cutting edges.
- Wide choice of insert radii.
- Two keyways for staggered mounting.
- Wiper insert facets for superior surface finishes.





Arbor Mount — Half-Side Cutting — Right-Hand — 18 mm

D1	order number	catalog number	Z	Z S	D	D6	CDX	THUB	L1	Ap1 max	V	kgs	Max RPM
125	2443438	125H08RK90SD12N18K	8	8	40	54,8	34,0	18,2	18,1	11,7	1,3	1,0	10350
160	2443462	160H10RK90SD12N18K	10	10	40	54,8	51,5	18,2	18,1	11,7	1,3	1,8	9150
200	2443486	200J14RK90SD12N18K	14	14	50	68,8	64,5	18,2	18,1	11,7	1,3	3,0	8200
250	2443507	250J16RK90SD12N18K	16	16	50	68,8	89,5	18,2	18,1	11,7	1,3	5,0	7350
315	2443525	315K18RK90SD12N18K	18	18	60	83,8	114,5	18,2	18,1	11,7	1,3	8,4	6500

Spare Parts

D1	cartridge -right hand	wedge	wedge screw	hex wrench	cam pin	cam pin wrench	insert screw	Torx plus wrench	torque (Nm)
125	RK90SD1218	W18	STCM11	THW3M	CP1820	MW3	MS2077	TTP15	4
160	RK90SD1218	W18	STCM11	THW3M	CP1820	MW3	MS2077	TTP15	4
200	RK90SD1218	W18	STCM11	THW3M	CP1820	MW3	MS2077	TTP15	4
250	RK90SD1218	W18	STCM11	THW3M	CP1820	MW3	MS2077	TTP15	4
315	RK90SD1218	W18	STCM11	THW3M	CP1820	MW3	MS2077	TTP15	4

Arbor Mount — Half-Side Cutting — Right-Hand — 21 mm

D1	order number	catalog number	Z	Z S	D	D6	CDX	THUB	L1	Ap1 max	V	kgs	Max RPM
125	2443441	125H08RK90SD12N20K	8	8	40	54,8	34,0	20,8	20,7	11,7	1,3	1,2	10350
160	2443465	160H10RK90SD12N20K	10	10	40	54,8	51,5	20,8	20,7	11,7	1,3	2,1	9150
200	2443489	200J14RK90SD12N20K	14	14	50	68,8	64,5	20,8	20,7	11,7	1,3	3,5	8200
250	2443510	250J16RK90SD12N20K	16	16	50	68,8	89,5	20,8	20,7	11,7	1,3	5,9	7350
315	2443528	315K18RK90SD12N20K	18	18	60	83,8	114,5	20,8	20,7	11,7	1,3	9,7	6500

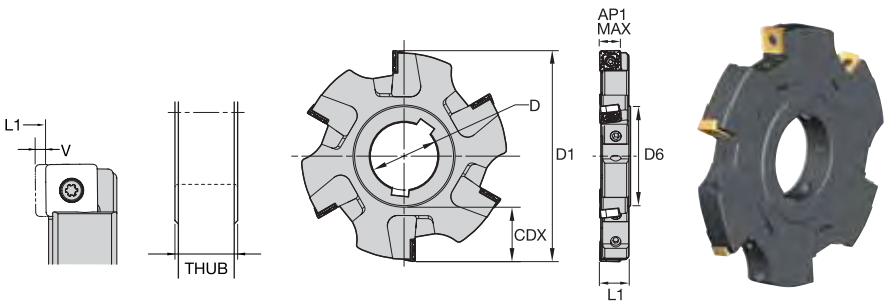
Spare Parts

D1	cartridge -right hand	wedge	wedge screw	hex wrench	cam pin	cam pin wrench	insert screw	Torx plus wrench	torque (Nm)
125	RK90SD1220	W20	STCM11	THW3M	CP1820	MW3	MS2077	TTP15	4
160	RK90SD1220	W20	STCM11	THW3M	CP1820	MW3	MS2077	TTP15	4
200	RK90SD1220	W20	STCM11	THW3M	CP1820	MW3	MS2077	TTP15	4
250	RK90SD1220	W20	STCM11	THW3M	CP1820	MW3	MS2077	TTP15	4
315	RK90SD1220	W20	STCM11	THW3M	CP1820	MW3	MS2077	TTP15	4

Ordering Example:
1 x 125H08RK90SD12N18K
10 x SDCT120404PDERLD2 KC725M

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

- Rapid adjustment and setting via patent-pending cam adjustment mechanism.
- Large selection of insert geometries and grades to cut most workpiece materials.
- Four insert cutting edges.
- Wide choice of insert radii.
- Two keyways for staggered mounting.
- Wiper insert facets for superior surface finishes.



Arbor Mount — Half-Side Cutting — Left-Hand — 18 mm

D1	order number	catalog number	Z	Z S	D	D6	CDX	THUB	L1	Ap1 max	V	kgs	Max RPM
125	2443439	125H08LK90SD12N18K	8	8	40	54,8	34,0	18,2	18,1	11,7	1,3	1,0	10350
160	2443463	160H10LK90SD12N18K	10	10	40	54,8	51,5	18,2	18,1	11,7	1,3	1,8	9150
200	2443487	200J14LK90SD12N18K	14	14	50	68,8	64,5	18,2	18,1	11,7	1,3	3,0	8200
250	2443508	250J16LK90SD12N18K	16	16	50	68,8	89,5	18,2	18,1	11,7	1,3	5,0	7350
315	2443526	315K18LK90SD12N18K	18	18	60	83,8	114,5	18,2	18,1	11,7	1,3	8,4	6500

Spare Parts

D1	cartridge -left hand	wedge	wedge screw	hex wrench	cam pin	cam pin wrench	insert screw	Torx plus wrench	torque (Nm)
125	LK90SD1218	W18	STCM11	THW3M	CP1820	MW3	MS2077	TTP15	4
160	LK90SD1218	W18	STCM11	THW3M	CP1820	MW3	MS2077	TTP15	4
200	LK90SD1218	W18	STCM11	THW3M	CP1820	MW3	MS2077	TTP15	4
250	LK90SD1218	W18	STCM11	THW3M	CP1820	MW3	MS2077	TTP15	4
315	LK90SD1218	W18	STCM11	THW3M	CP1820	MW3	MS2077	TTP15	4

Arbor Mount — Half-Side Cutting — Left-Hand — 21 mm

D1	order number	catalog number	Z	Z S	D	D6	CDX	THUB	L1	Ap1 max	V	kgs	Max RPM
125	2443442	125H08LK90SD12N20K	8	8	40	54,8	34,0	20,8	20,7	11,7	1,3	1,2	10350
160	2443466	160H10LK90SD12N20K	10	10	40	54,8	51,5	20,8	20,7	11,7	1,3	2,1	9150
200	2443490	200J14LK90SD12N20K	14	14	50	68,8	64,5	20,8	20,7	11,7	1,3	3,5	8200
250	2443511	250J16LK90SD12N20K	16	16	50	68,8	89,5	20,8	20,7	11,7	1,3	5,9	7350
315	2443529	315K18LK90SD12N20K	18	18	60	83,8	114,5	20,8	20,7	11,7	1,3	9,7	6500

Spare Parts

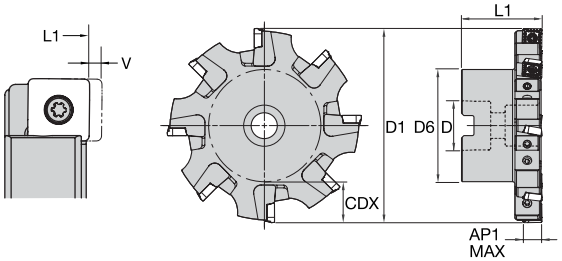
D1	cartridge -left hand	wedge	wedge screw	hex wrench	cam pin	cam pin wrench	insert screw	Torx plus wrench	torque (Nm)
125	LK90SD1220	W20	STCM11	THW3M	CP1820	MW3	MS2077	TTP15	4
160	LK90SD1220	W20	STCM11	THW3M	CP1820	MW3	MS2077	TTP15	4
200	LK90SD1220	W20	STCM11	THW3M	CP1820	MW3	MS2077	TTP15	4
250	LK90SD1220	W20	STCM11	THW3M	CP1820	MW3	MS2077	TTP15	4
315	LK90SD1220	W20	STCM11	THW3M	CP1820	MW3	MS2077	TTP15	4

Ordering Example:
1 x 125H08LK90SD12N18K
10 x SDCT120404PDELLD2 KC725M

KSSM Slotting Cutters — IC 12 — Adjustable

KSSM — Type B, Shell Mount — 12 mm IC Inserts

- Rapid adjustment and setting via patent-pending cam adjustment mechanism.
- Large selection of insert geometries and grades to cut most workpiece materials.
- Four insert cutting edges.
- Wide choice of insert radii.
- Two keyways for staggered mounting.
- Wiper insert facets for superior surface finishes.





Shell Mount — Half-Side Cutting — Right-Hand — 18 mm

D1	order number	catalog number	Z	Z S	D	D6	CDX	L1	Ap1 max	V	kgs	Max RPM
125	2443450	125Y08RK90SD12N18K	8	8	32	58,0	31,9	51,0	11,7	1,3	1,6	10350
160	2443474	160Y10RK90SD12N18K	10	10	40	70,0	43,4	51,0	11,7	1,3	2,3	9150
200	2443498	200Y14RK90SD12N18K	14	14	40	90,0	53,4	51,0	11,7	1,3	4,2	8200
250	2443516	250Y16RK90SD12N18K	16	16	60	130,0	58,4	51,0	11,7	1,3	6,7	7350
315	2443537	315Y18RK90SD12N18K	18	18	60	130,0	90,9	51,0	11,7	1,3	10,1	6500

Spare Parts

D1	cartridge -right hand	wedge	wedge screw	hex wrench	cam pin	cam pin wrench	insert screw	Torx plus wrench	torque (Nm)	mounting screw
125	RK90SD1218	W18	STCM11	THW3M	CP1820	MW3	MS2077	TTP15	4	MS1559
160	RK90SD1218	W18	STCM11	THW3M	CP1820	MW3	MS2077	TTP15	4	—
200	RK90SD1218	W18	STCM11	THW3M	CP1820	MW3	MS2077	TTP15	4	—
250	RK90SD1218	W18	STCM11	THW3M	CP1820	MW3	MS2077	TTP15	4	—
315	RK90SD1218	W18	STCM11	THW3M	CP1820	MW3	MS2077	TTP15	4	—

Shell Mount — Half-Side Cutting — Right-Hand — 21 mm

D1	order number	catalog number	Z	Z S	D	D6	CDX	L1	Ap1 max	V	kgs	Max RPM
125	2443453	125Y08RK90SD12N20K	8	8	32	58,0	31,9	51,0	11,7	1,3	1,7	10350
160	2443477	160Y10RK90SD12N20K	10	10	40	70,0	43,4	51,0	11,7	1,3	2,5	9150
200	2443501	200Y14RK90SD12N20K	14	14	40	90,0	53,4	51,0	11,7	1,3	4,6	8200
250	2443519	250Y16RK90SD12N20K	16	16	60	130,0	58,4	51,0	11,7	1,3	7,3	7350
315	2443534	315Y18RK90SD12N20K	18	18	60	130,0	90,9	51,0	11,7	1,3	11,3	6500

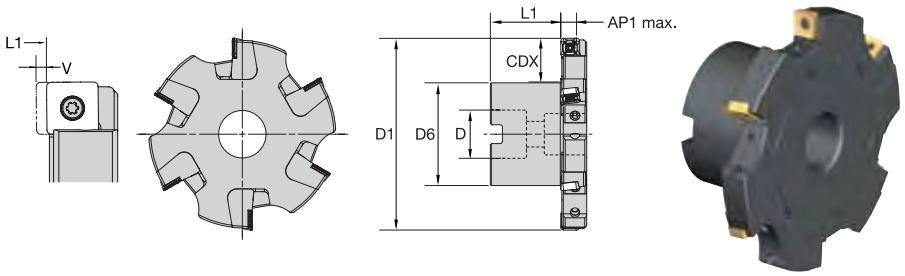
Spare Parts

D1	cartridge -right hand	wedge	wedge screw	hex wrench	cam pin	cam pin wrench	insert screw	Torx plus wrench	torque (Nm)	mounting screw
125	RK90SD1220	W20	STCM11	THW3M	CP1820	MW3	MS2077	TTP15	4	MS1559
160	RK90SD1220	W20	STCM11	THW3M	CP1820	MW3	MS2077	TTP15	4	—
200	RK90SD1220	W20	STCM11	THW3M	CP1820	MW3	MS2077	TTP15	4	—
250	RK90SD1220	W20	STCM11	THW3M	CP1820	MW3	MS2077	TTP15	4	—
315	RK90SD1220	W20	STCM11	THW3M	CP1820	MW3	MS2077	TTP15	4	—

Ordering Example:
1 x 125Y08RK90SD12N18K
10 x SDCT120404PDERLD2 KC725M

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

- Rapid adjustment and setting via patent-pending cam adjustment mechanism.
- Large selection of insert geometries and grades to cut most workpiece materials.
- Four insert cutting edges.
- Wide choice of insert radii.
- Two keyways for staggered mounting.
- Wiper insert facets for superior surface finishes.



Shell Mount — Half-Side Cutting — Left-Hand — 18 mm

D1	order number	catalog number	Z	Z S	D	D6	CDX	L1	Ap1 max	V	kg	Max RPM
125	2443451	125Y08LK90SD12N18K	8	8	32	58,0	31,9	33,0	11,7	1,3	1,6	10350
160	2443475	160Y10LK90SD12N18K	10	10	40	70,0	43,4	33,0	11,7	1,3	2,3	9150
200	2443499	200Y14LK90SD12N18K	14	14	40	90,0	53,4	33,0	11,7	1,3	4,2	8200
250	2443517	250Y16LK90SD12N18K	16	16	60	130,0	58,4	33,0	11,7	1,3	6,7	7350
315	2443538	315Y18LK90SD12N18K	18	18	60	130,0	90,9	33,0	11,7	1,3	10,1	6500

Spare Parts

D1	cartridge -left hand	wedge	wedge screw	hex wrench	cam pin	cam pin wrench	insert screw	Torx plus wrench	torque (Nm)	mounting screw
125	LK90SD1218	W18	STCM11	THW3M	CP1820	MW3	MS2077	TTP15	4	MS1559
160	LK90SD1218	W18	STCM11	THW3M	CP1820	MW3	MS2077	TTP15	4	—
200	LK90SD1218	W18	STCM11	THW3M	CP1820	MW3	MS2077	TTP15	4	—
250	LK90SD1218	W18	STCM11	THW3M	CP1820	MW3	MS2077	TTP15	4	—
315	LK90SD1218	W18	STCM11	THW3M	CP1820	MW3	MS2077	TTP15	4	—

Shell Mount — Half-Side Cutting — Left Hand — 21mm

D1	order number	catalog number	Z	Z S	D	D6	CDX	L1	Ap1 max	V	kg	Max RPM
125	2443454	125Y08LK90SD12N20K	8	8	32	58,0	31,9	30,4	11,7	1,3	1,7	10350
160	2443478	160Y10LK90SD12N20K	10	10	40	70,0	43,4	30,4	11,7	1,3	2,5	9150
200	2443502	200Y14LK90SD12N20K	14	14	40	90,0	53,4	30,4	11,7	1,3	4,6	8200
250	2443520	250Y16LK90SD12N20K	16	16	60	130,0	58,4	30,4	11,7	1,3	7,3	7350
315	2443535	315Y18LK90SD12N20K	18	18	60	130,0	90,9	30,4	11,7	1,3	11,3	6500

Spare Parts

D1	cartridge -left hand	wedge	wedge screw	hex wrench	cam pin	cam pin wrench	insert screw	Torx plus wrench	torque (Nm)	mounting screw
125	LK90SD1220	W20	STCM11	THW3M	CP1820	MW3	MS2077	TTP15	4	MS1559
160	LK90SD1220	W20	STCM11	THW3M	CP1820	MW3	MS2077	TTP15	4	—
200	LK90SD1220	W20	STCM11	THW3M	CP1820	MW3	MS2077	TTP15	4	—
250	LK90SD1220	W20	STCM11	THW3M	CP1820	MW3	MS2077	TTP15	4	—
315	LK90SD1220	W20	STCM11	THW3M	CP1820	MW3	MS2077	TTP15	4	—

Ordering Example:
1 x 250Y16LK90SD12N18K
10 x SDCT120404PDELLD2 KC725M

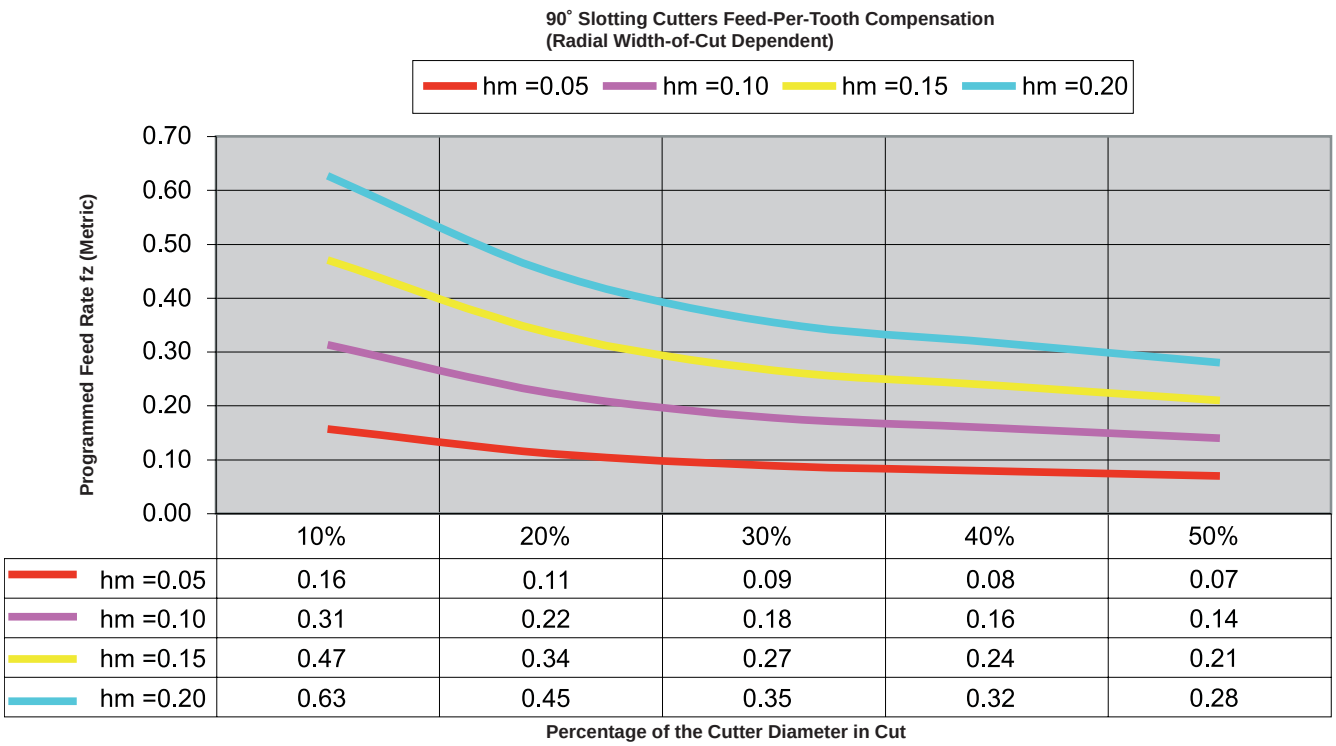
Recommended Starting Speeds [m/min]

KSSM Slotting Cutting Data

Material Group	KC410M			KC520M			KC522M			KC725M			KC915M			KC935M			KY3500		
P1										210	**180**	170				310	**270**	250			
P2										130	**120**	100				190	**180**	160			
P3										120	**100**	90				180	**160**	140			
P4							80	**70**	70	90	**80**	70				130	**120**	110			
P5							108	**100**	85	115	**110**	100				180	**160**	150			
P6							70	**50**		70	**60**					110	**90**				
M1							120	**110**	100	140	**120**	110				200	**180**	160			
M2							110	**100**	90	120	**110**	100				190	**170**	150			
M3							80	**80**		90	**80**					140	**120**				
K1				210	**190**	170				130	**120**	110	290	**260**	240	200	**180**	160	800	**730**	650
K2				170	**150**	140	160	**150**	130	100	**90**	90	230	**210**	190	160	**150**	130	630	**570**	530
K3				140	**130**	120	140	**120**	110	90	**80**	70	190	**170**	160	140	**120**	110	530	**470**	430
N1	970	**860**	790																		
N2																					
S1							30	**20**		30	**20**										
S2							20	**20**		20	**20**										
S3							30	**30**		30	**30**										
S4							40	**30**		40	**40**										
H1																					

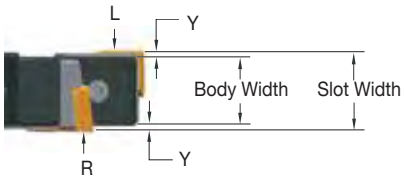
FIRST choice starting speeds are in bold type.
As the average chip thickness goes higher the speed should be decreased.

Recommended Starting Feeds



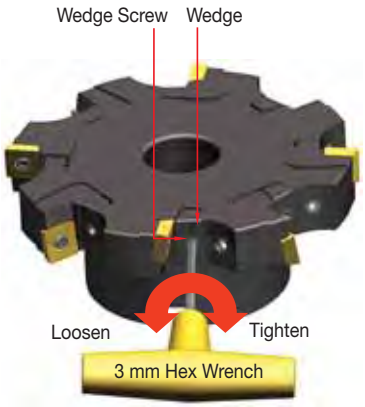
	10%	20%	30%	40%	50%
hm =0.05	0.16	0.11	0.09	0.08	0.07
hm =0.10	0.31	0.22	0.18	0.16	0.14
hm =0.15	0.47	0.34	0.27	0.24	0.21
hm =0.20	0.63	0.45	0.35	0.32	0.28

KSSM Slot Width Adjustment Instructions



1. Measure Body Width at pocket 1 (per stamp on tool body) behind cartridge.
2. Zero tool presetter at pocket 1 behind cartridge.
3. Move presetter over the insert and set distance Y.
   Y = (Desired Slot Width –Body Width)/2.
4. Zero over insert at starting pocket (Pocket 1).
5. Adjust remaining cartridges on the same side.
6. Return to starting pocket and start with step 2 for opposite side of cutter.

KSSM Cartridge Adjustment Instructions



1. Insert 3 mm hex wrench into STCM Screw.
2. Rotate 3 mm hex wrench counter-clockwise to loosen wedge.
3. Rotate 3 mm hex wrench clockwise to lightly tighten STCM screw to approximately 1 Nm so the Wedge is touching the cartridge and cutter body. This creates some slight resistance against the cartridge during the adjustment.



4. Insert hex wrench into Cam Pin behind cartridge.
5. Rotate wrench to adjust cartridge to desired position.
6. For best accuracy, back Cam Pin off so you can feel it is not touching the sides of the slot in the back of the cartridge.
7. Remove wrench from cam pin.



8. Insert 3 mm hex wrench into STCM Screw
9. Tighten STCM screw to 5,1 –6,2 Nm prior to using the cutter. Kennametal torque wrench KTW 45 or alternate torque wrench should be used.
10. Double check cartridge position to assure no movement.

DIE-AND-MOLD

DIE-AND-MOLD



Die-and-Mold

Kennametal enables die-and-mold manufacturers to machine hard materials with high-speed technology (HSM) — and to be fully integrated with advanced CAD/CAM solutions — to exceed tough productivity targets.



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Plastic Mold

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Die & Mold

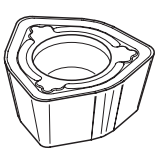
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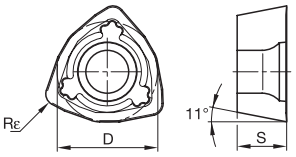


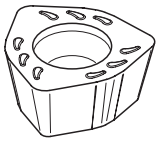
GMILLING
LLINGMILL
MILLINGM

Indexable Inserts for KSWM KenFEED WPM...

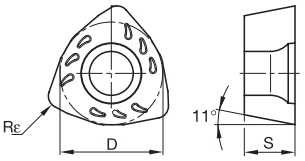


WPM-GP





WPM-HN

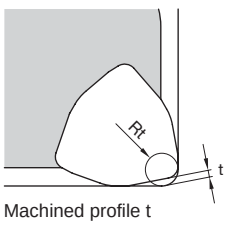


● first choice
○ alternate choice

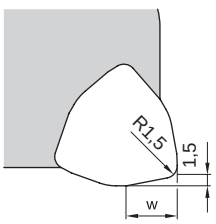
H	○	
S	●	○
N		
K	○	
M	●	○
P	○	●

catalog number	cutting edges	D	S	Rε	fz max	KC522M	KC525M
WPMT05X315ZZERGP	3	7,94	3,50	1,50	2,0	●	●
WPMW05X315ZZSRHN	3	7,94	3,50	1,50	2,0	●	●
WPMW06X415ZZERGP	3	9,53	4,20	1,50	2,0	●	●
WPMW06X415ZZSRHN	3	9,53	4,20	1,50	2,0	●	●
WPMT080615ZZERGP	3	12,87	6,35	1,50	3,0	●	●
WPMT080615ZZSRHN	3	13,21	6,35	1,50	3,0	●	●

Tool geometry for programming.



Machined profile t

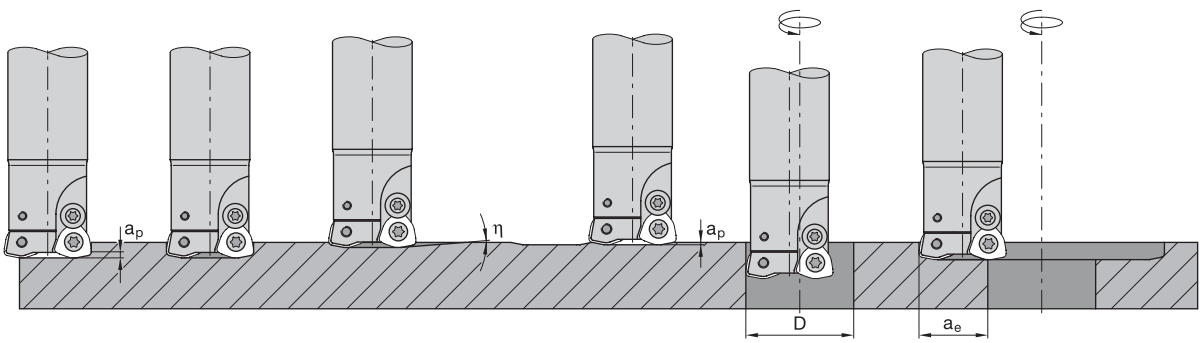


Maximum cutting depth 1,5 mm

Insert	Rt	t	w
WPM.05	2,0	0,5	3,8
WPM.06	2,5	0,7	4,3
WPM.08	2,0	0,7	5,7

For CAD/CAM programming, please use a theoretical corner radius Rt.

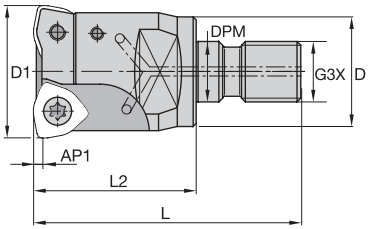
Possible applications:



Square shoulder milling | Slot milling | Ramping | Face milling | Circular plunging | Helical interpolation, countersinking

NEW!

- High feed rate up to 3 mm for high metal removal rate.
- Suitable for a wide range of applications including circular plunging and ramping, face milling and contour milling for roughing applications.
- Enables high productivity.
- Stable clamping system.





Screw-On End Mills

D1	order number	catalog number	Z	G3X	D	DPM	L	L2	Ap1 max	Max Ramp Angle	kg	insert 1
20	2543286	20Y02R030M10SWP05	2	M10	18	10,5	50	30	1,0	3.0°	0,3	WP..05X3..
25	2576104	25Y03R035M12SWP05	3	M12	21	12,5	57	35	1,0	5.0°	0,3	WP..05X3..
32	2622224	32Y03R045M16SWP06	3	M16	29	17,0	70	45	1,5	3.0°	0,2	WP..06X4..
35	2246763	35Y02R045M16SWP08	2	M16	29	17,0	74	45	1,5	5.0°	0,6	WP..0806
35	2622225	35Y03R045M16SWP06	3	M16	29	17,0	70	45	1,5	3.0°	0,3	WP..06X4..
35	2622226	35Y04R045M16SWP06	4	M16	29	17,0	70	45	1,5	2.5°	0,4	WP..06X4..
42	2246764	42Y03R045M16SWP08	3	M16	29	17,0	74	45	1,5	4.5°	0,8	WP..0806
42	2622227	42Y04R045M16SWP06	4	M16	29	17,0	70	45	1,5	2.5°	0,5	WP..06X4..
42	2622228	42Y05R045M16SWP05	5	M16	29	17,0	70	45	1,0	2.0°	0,5	WP..05X3..

Spare Parts

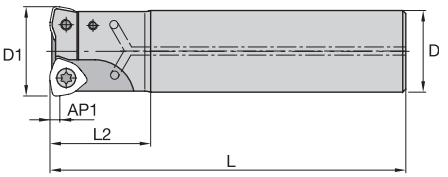
D1	insert	insert screw	Torx wrench	torque (Nm)
20	WP05	193.443	FT15	3,5
25	WP05	193.443	FT15	3,5
32	WP06	MS1184	FT15	3,5
35	WP08	191.726	FT20	6,0
35	WP06	MS1184	FT15	3,5
35	WP06	MS1184	FT15	3,5
42	WP08	191.726	FT20	6,0
42	WP06	MS1184	FT15	3,5
42	WP05	193.443	FT15	3,5

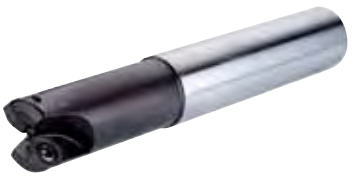
Ordering Example:
1 x 20Y02R030M10SWP05
10 x WPMT05X315ZZERGP KC525M

Indexable End Mills

NEW!

- High feed rate (up to 3 mm) for high metal removal rate.
- Suitable for a wide range of applications, including circular plunging and ramping, face milling, and contour milling for roughing applications.
- Enables high productivity.
- Stable clamping system.





End Mills

D1	order number	catalog number	Z	D	L2	L	Ap1 max	Max Ramp Angle	kg	insert 1
20	2622213	20Y02R080A20SWP05	2	20	50	130	1,0	3.0°	0,3	WP..05X3..
20	2622214	20Y02R130A20SWP05	2	20	50	180	1,0	2.5°	0,6	WP..05X3..
25	2622215	25Y03R090A25SWP05	3	25	50	140	1,0	5.0°	0,5	WP..05X3..
32	2622217	32Y03R100A32SWP06	3	32	50	150	1,5	3.5°	0,7	WP..06X4..
32	2622218	32Y03R150A32SWP06	3	32	50	200	1,5	3.0°	0,9	WP..06X4..
35	2426594	35Y02R070A32SWP08	2	32	40	150	1,5	5.0°	0,9	WP..0806
35	2622219	35Y03R100A32SWP06	3	32	50	150	1,5	3.0°	0,7	WP..06X4..
35	2426593	35Y02R120A32SWP08	2	32	40	200	1,5	5.0°	1,2	WP..0806

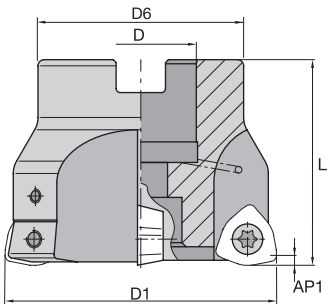
Spare Parts

D1	insert	insert screw	Torx wrench	torque (Nm)
20	WP05	193.443	FT15	3,5
20	WP05	193.443	FT15	3,5
25	WP05	193.443	FT15	3,5
32	WP06	MS1184	FT15	3,5
32	WP06	MS1184	FT15	3,5
35	WP08	191.726	FT20	6,0
35	WP06	MS1184	FT15	3,5
35	WP08	191.726	FT20	6,0

Ordering Example:
1 x 20Y02R080A20SWP05
10 x WPMW05X315ZZSRHN KC522M

NEW!

- High feed rate up to 3 mm for high metal removal rate.
- Wide range of applications: circular plunging and ramping, face milling, and contour milling for roughing applications.
- Enables high productivity.
- Stable clamping system.





Shell Mills

D1	order number	catalog number	Z	D	D6	L	Ap1 max	Max Ramp Angle	kg	insert 1
42	2622220	42A05RS91WP05	5	16	32	40	1,0	2.0°	0,2	WP..05X3..
52	2622229	52A04RS91WP08	4	22	42	50	1,5	4.0°	0,5	WP..0806
52	2622221	52A05RS91WP06	5	22	42	50	1,5	2.0°	0,5	WP..06X4..
66	2403211	66A04RS91WP08	4	27	50	50	1,5	2.5°	0,6	WP..0806
66	2622222	66A06RS91WP06	6	27	50	50	1,5	1.5°	0,6	WP..06X4..
80	2418256	80A05RS91WP08	5	27	50	50	1,5	1.5°	1,2	WP..0806
80	2622223	80A07RS91WP06	7	27	50	50	1,5	1.0°	1,0	WP..06X4..

Spare Parts

D1	insert	insert screw	Torx wrench	torque (Nm)
42	WP05	193.443	FT15	3,5
52	WP08	193.383	FT20	6,0
52	WP06	MS1184	FT15	3,5
66	WP08	191.726	FT20	6,0
66	WP06	MS1184	FT15	3,5
80	WP08	191.726	FT20	6,0
80	WP06	MS1184	FT15	3,5

Ordering Example:
1 x 42A05RS91WP05
10 x WPMW05X315ZZSRHN KC522M

Recommended Starting Speeds [m/min]

KenFeed Inserts

Material Group	KC522M			KC525M		
P1	250	**230**	210	220	**200**	180
P2	210	**200**	190	180	**160**	150
P3	190	**180**	170	160	**150**	140
P4	170	**160**	150	140	**130**	120
P5	180	**170**	160	150	**140**	130
P6	160	**150**	140	130	**120**	110
M1	220	**210**	200	150	**140**	130
M2	190	**170**	150	130	**120**	110
M3	130	**120**	110	90	**80**	70
K1						
K2						
K3						
N1						
N2						
S1	60	**60**	50	60	**50**	50
S2	60	**60**	50	60	**50**	50
S3	50	**40**	40	50	**50**	40
S4		**60**			**60**	
H1	160	**120**	80			

FIRST choice starting speeds are in bold type.
As the average chip thickness goes higher the speed should be decreased.

Recommended Starting Feeds

End Mills

cutter Dia	order number	insert size	feed p/tooth fz	Max Ap	Max ramp angle
20	2622213	WP - - 05X3	0,30 - 0,80	1,0	3°
20	2622214	WP - - 05X3	0,30 - 0,80	1,0	3°
25	2622215	WP - - 05X3	0,30 - 0,80	1,0	5°
32	2622217	WP - - 06X4	0,50 - 1,50	1,5	3.5°
32	2622218	WP - - 06X4	0,50 - 1,50	1,5	3.5°
35	2426594	WP - - 0806	0,50 - 1,50	1,5	5°
35	2426593	WP - - 0806	0,50 - 1,50	1,5	5°
35	2622219	WP - - 06X4	0,50 - 1,50	1,5	3°

Shell Mills

cutter Dia	order number	insert size	feed p/tooth fz	Max Ap	Max ramp angle
42	2622220	WP - - 05X3	0,30 - 0,80	1,0	2°
52	2622229	WP - - 0806	0,50 - 1,50	1,5	4°
52	2622221	WP - - 06X4	0,50 - 1,50	1,5	2°
66	2403211	WP - - 0806	0,50 - 1,50	1,5	2.5°
66	2622222	WP - - 06X4	0,50 - 1,50	1,5	1.5°
80	2418256	WP - - 0806	0,50 - 1,50	1,5	1.5°
80	2622223	WP - - 06X4	0,50 - 1,50	1,5	1°

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

Screw-On End Mills

Dia	number	size	fz	Ap	ramp angle
20	2543286	WP - - 05X3	0,30 - 0,80	1,0	3°
25	2576104	WP - - 05X3	0,30 - 0,80	1,0	5°
32	2622224	WP - - 06X4	0,50 - 1,50	1,5	3°
35	2246763	WP - - 0806	0,50 - 1,50	1,5	5°
35	2622225	WP - - 06X4	0,50 - 1,50	1,5	3°
35	2622226	WP - - 06X4	0,50 - 1,50	1,5	2.5°
42	2246764	WP - - 0806	0,50 - 1,50	1,5	4.5°
42	2622227	WP - - 06X4	0,50 - 1,50	1,5	2.5°
42	2622228	WP - - 05X3	0,30 - 0,80	1,0	2°

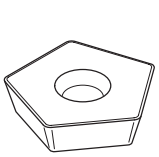
Helical Ramping from Solid

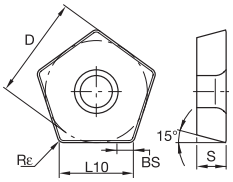
cutter Dia	insert size	minimum hole Dia	Max hole Dia	Max axial depth	Max ramp angle
20	WP - - 05X3	30,00	37,00	1,00	3°
25	WP - - 05X3	33,00	47,00	1,00	5°
32	WP - - 06X4	47,00	61,00	1,50	3.5°
35	WP - - 0806	51,00	67,00	1,50	5°
35	WP - - 06X4	53,00	67,00	1,50	3°
42	WP - - 0806	63,00	81,00	1,50	4.5°
42	WP - - 06X4	66,00	81,00	1,50	2.5°
42	WP - - 05X5	70,00	81,00	1,50	2°
52	WP - - 0806	78,00	101,00	1,50	4°
52	WP - - 06X4	80,00	101,00	1,50	2°
66	WP - - 0806	104,00	129,00	1,50	2.5°
66	WP - - 06X4	108,00	129,00	1,50	1.5°
80	WP - - 0806	132,00	157,00	1,50	1.5°
80	WP - - 06X4	140,00	157,00	1,50	1°

Starting Axial Depth of Cut

cutter Dia	insert size	feed p/tooth fz	starting Ap
20	WP - - 05X3	0,30	0,50
25	WP - - 05X3	0,30	0,50
32	WP - - 06X4	0,50	1,00
35	WP - - 0806	0,50	1,00
35	WP - - 06X4	0,50	1,00
42	WP - - 0806	0,50	1,00
42	WP - - 06X4	0,50	1,00
42	WP - - 05X5	0,30	0,70
52	WP - - 0806	0,50	1,00
52	WP - - 06X4	0,50	1,00
66	WP - - 0806	0,50	1,00
66	WP - - 06X4	0,50	1,00
80	WP - - 0806	0,50	1,00
80	WP - - 06X4	0,50	1,00

Indexable Inserts for KMS Face Mill PDHX1204...



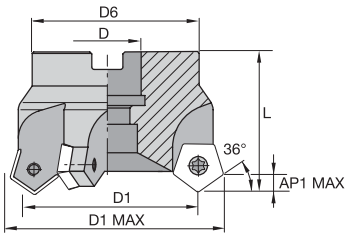


● first choice
○ alternate choice

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

catalog number	cutting edges	D	S	L10	BS	Rε	hm	KC510M	KC525M	KC715M	KC725M
PDHX120410SNGN	5	16,54	4,76	12,00	1,99	1,0	0,20	●	●	●	●
PDHX120420SNGN	5	16,54	4,76	12,00	2,00	2,0	0,20	●	●	●	●

- Use for heavy roughing operations.
- Low cutting forces.
- Higher feed rates.
- Use up to 200 mm overhang.





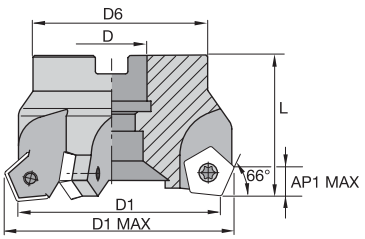
Shell Mills — 36° Lead

D1 max	order number	catalog number	Z	D	D1	D6	L	Ap1 max	Max Ramp Angle	kgs
66	1888207	66A05RS36PD12	5	27	47,2	48	55	5,5	8.0°	0,5
80	1888202	80A06RS36PD12	6	27	61,2	60	55	5,5	8.0°	1,0
125	1888193	125B08RS36PD12	8	40	106,2	90	55	5,5	3.0°	2,3
160	1951722	160B10RS36PD12	10	40	141,2	90	55	5,5	2.0°	2,9

Spare Parts

D1 max	insert screw	Torx wrench	torque (Nm)
66	193.343	FT20	6
80	193.343	FT20	6
125	193.343	FT20	6
160	193.343	FT20	6

- Use for heavy roughing operations.
- Lower cutting forces.
- Higher feed rates.
- Use up to 200 mm overhang.





Shell Mills — 66° Lead

D1 max	order number	catalog number	Z	D	D1	D6	L	Ap1 max	Max Ramp Angle	kgs
66	1888208	66A05RS66PD12	5	27	56,5	48	55	8,0	1.0°	0,6

Spare Parts

D1 max	insert screw	Torx wrench	torque (Nm)
66	193.343	FT20	6

Ordering Example:
1 x 66A05RS36PD12
10 x PDHX120410SNGN KC725M

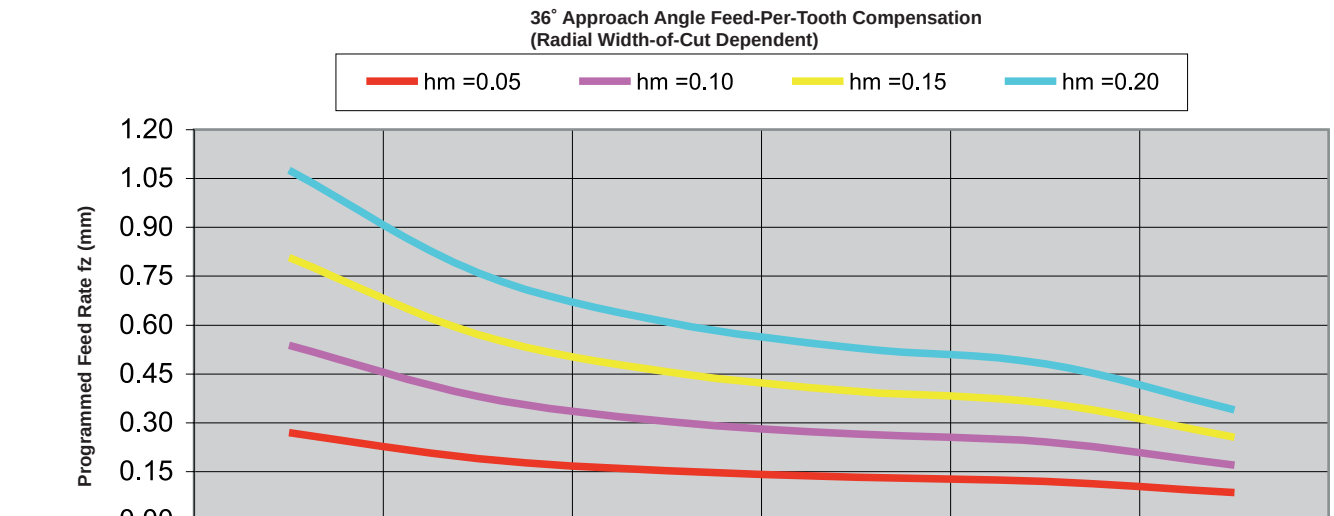
Recommended Starting Speeds [m/min]

KMS Face Mills with 36° or 66° Approach Angle.

Material Group	KC510M			KC525M			KC715M			KC725M		
P1				320	**290**	260	410	**360**	330	310	**270**	250
P2				230	**200**	170	250	**220**	200	190	**180**	160
P3				200	**180**	160	220	**200**	180	180	**160**	140
P4				170	**160**	140	170	**160**	140	130	**120**	110
P5				220	**200**	180	230	**205**	180	180	**160**	150
P6				120	**110**	100	140	**120**	110	110	**100**	90
M1				210	**190**	170	270	**230**	220	190	**170**	160
M2				190	**170**	150	220	**205**	180	180	**170**	150
M3				150	**130**	110	155	**145**	135	140	**120**	100
K1	240	**220**	200									
K2	200	**180**	160							160	**140**	130
K3	160	**140**	120							130	**120**	110
N1												
N2												
S1												
S2												
S3												
S4												
H1												

FIRST choice starting speeds are in bold type.
As the average chip thickness goes higher the speed should be decreased.

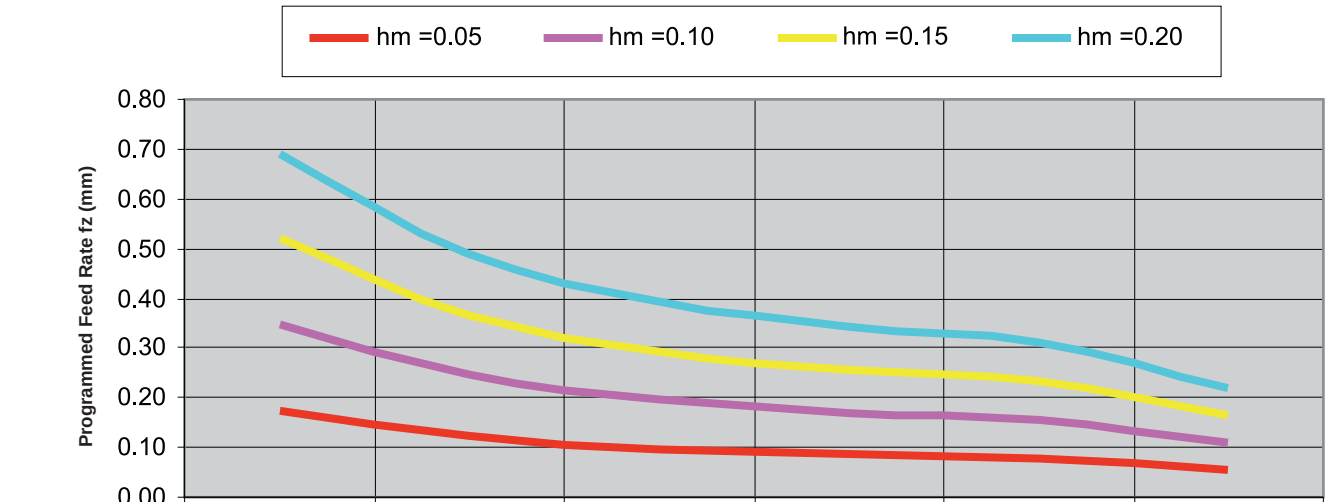
Recommended Starting Feeds



	10%	20%	30%	40%	50%	100%
hm =0.05	0.27	0.19	0.15	0.13	0.12	0.09
hm =0.10	0.54	0.38	0.30	0.26	0.24	0.17
hm =0.15	0.81	0.57	0.46	0.40	0.36	0.26
hm =0.20	1.08	0.76	0.61	0.53	0.48	0.34

Recommended Starting Feeds

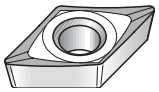
66° Approach Angle Feed-Per-Tooth Compensation
(Radial Width-of-Cut Dependent)

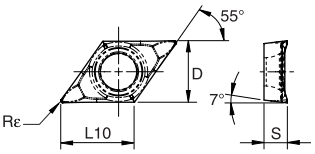


	10%	20%	30%	40%	50%	100%
hm =0.05	0.17	0.12	0.10	0.09	0.08	0.05
hm =0.10	0.35	0.24	0.20	0.17	0.15	0.11
hm =0.15	0.52	0.37	0.29	0.26	0.23	0.16
hm =0.20	0.69	0.49	0.39	0.34	0.31	0.22

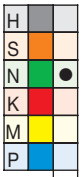
Percentage of the Cutter Diameter in Cut

Indexable Inserts for KMM - DCGT07...



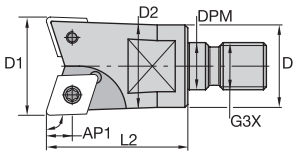


● first choice
○ alternate choice



catalog number	cutting edges	D	S	L10	Rε	hm	KC5410
DCGT070202HP	2	6,35	2,38	7,75	0,2	0,08	●
DCGT070204HP	2	6,35	2,38	7,75	0,4	0,08	●
DCGT070208HP	2	6,35	2,38	7,75	0,8	0,08	●

- Screw-on end mills for aluminum, copper, and graphite machining.
- Grade KC5410 and HP geometry.



95° approach angle



Screw-On End Mills

D1	order number	catalog number	Z	G3X	DPM	D	D2	L2	L	Ap1 max	kg
16	1940584	16Y02R025M08SDC07	2	M8	8,5	13	15	25	43	1	0,03
20	1940585	20Y03R030M10SDC07	3	M10	10,5	18	19	30	48	1	0,03

Spare Parts

D1	insert screw	Torx wrench	torque (Nm)
16	MS1153	FT7	1
20	MS1153	FT7	1

Ordering Example:
1 x 16Y02R025M08SDC07
10 x DCGT070202HP KC5410

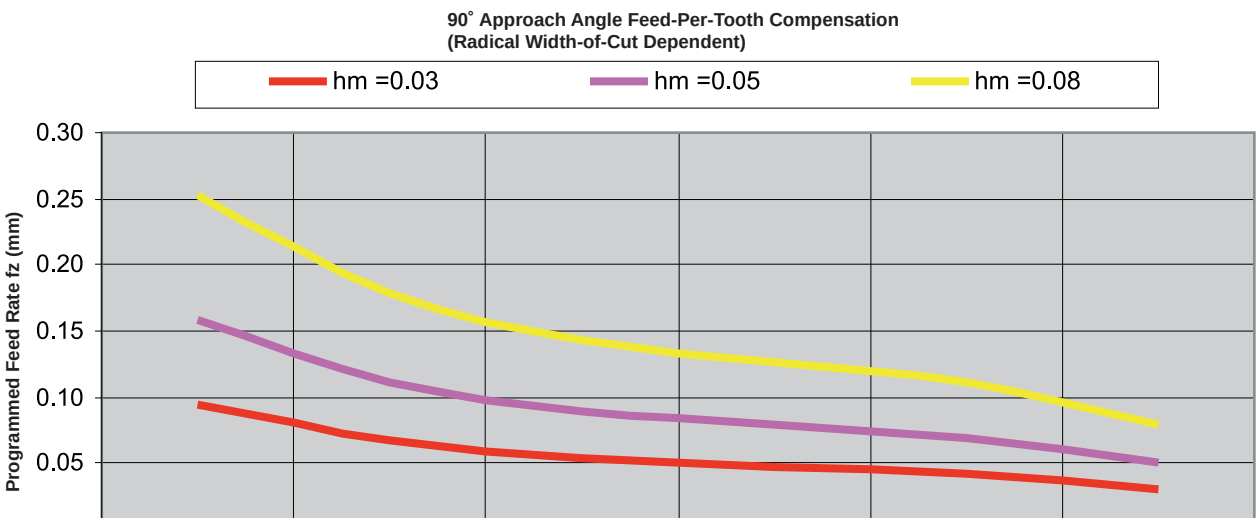
Recommended Starting Speeds [m/min]

KMM - DCGT07..., 95° approach angle

Material Group	KC5410		
P1			
P2			
P3			
P4			
P5			
P6			
M1			
M2			
M3			
K1			
K2			
K3			
N1	1000	**800**	600
N2			
S1			
S2			
S3			
S4			
H1			

FIRST choice starting speeds are in bold type.
As the average chip thickness goes higher the speed should be decreased.

Recommended Starting Feeds

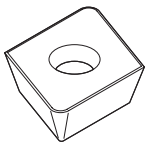


	10%	20%	30%	40%	50%	100%
hm =0.03	0.09	0.07	0.05	0.05	0.04	0.03
hm =0.05	0.16	0.11	0.09	0.08	0.07	0.05
hm =0.08	0.25	0.18	0.14	0.13	0.11	0.08

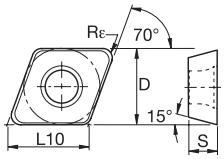
Percentage of the Cutter Diameter in Cut

KENNAMETAL

Indexable Inserts for KMM XDHX04/XDHX06/XDHX10



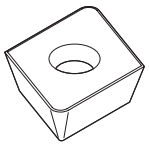
XDHX-LN



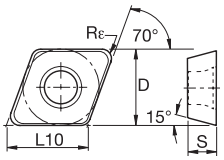
● first choice
○ alternate choice

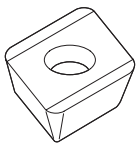
H										
S										
N										
K		●								
M			○							
P			●	●	●					

catalog number	cutting edges	D	S	L10	Rε	hm	KC510M	KC525M	KC715M	KT530M
XDHX040105ELN	2	4,00	1,59	4,26	0,5	0,05			●	●
XDHX040110ELN	2	4,00	1,59	4,26	1,0	0,05	●	●	●	

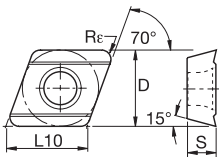


XDHX-LN





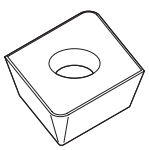
XDHX-GC



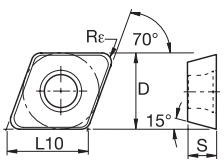
● first choice
○ alternate choice

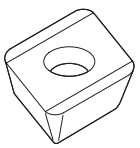
H				●	●					
S										
N		●		●						
K				●	○					
M					●		●			
P					○	●	●			

catalog number	cutting edges	D	S	L10	Rε	hm	K110M	KC510M	KC522M	KC715M	KC725M
XDHX060210EGC	2	6,50	2,38	6,89	1,0	0,05	●	●			
XDHX060210SLN	2	6,50	2,38	6,92	1,0	0,08		●	●	●	●

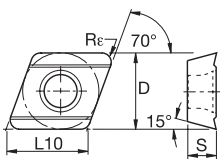


XDHX-GN





XDHX-GC

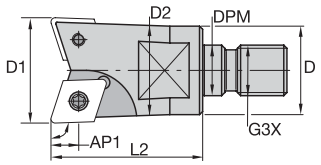


● first choice
○ alternate choice

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

catalog number	cutting edges	D	S	L10	Rε	hm	K110M	KC510M	KC522M	KC525M	KC715M
XDHX10T310EGC	2	10,00	3,97	10,64	1,0	0,05	●	●	●		
XDHX10T310SGN	2	10,00	3,97	10,64	1,0	0,08		●	●	●	●

- Rhombic-style inserts for reduced cutting forces.
- Wide range of applications.
- Better surface quality.



95° approach angle



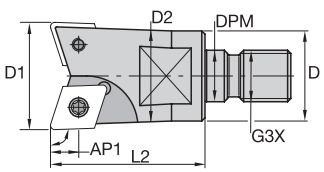
Screw-On End Mills — XDHX04

D1	order number	catalog number	Z	G3X	DPM	D	D2	L2	Ap1 max	kg	insert 1
10	1888436	10Y02R020M06SXD04	2	M6	6,5	9,7	8,6	20	1,2	0,01	XD_X0401
10	1888439	10Y02R035M08SXD04	2	M8	8,5	13,0	8,6	35	1,2	0,03	XD_X0401
12	1888440	12Y02R020M06SXD04	2	M6	6,5	9,7	10,8	20	1,2	0,02	XD_X0401
12	1888443	12Y02R035M08SXD04	2	M8	8,5	13,0	10,8	35	1,2	0,04	XD_X0401
12	1888441	12Y02R025M08SXD04	2	M8	8,5	13,0	10,8	25	1,2	0,03	XD_X0401
15	1888444	15Y03R025M08SXD04	3	M8	8,5	13,0	13,8	25	1,2	0,03	XD_X0401

Spare Parts

D1	insert screw	Torx wrench	torque (Nm)
10	193.340	FT6	1
12	193.340	FT6	1
15	193.340	FT6	1

- Rhombic-style inserts for reduced cutting forces.
- Wide range of applications.
- Improved surface quality.



95° approach angle



Screw-On End Mills — XDHX06

D1	order number	catalog number	Z	G3X	DPM	D	D2	L2	Ap1 max	kg	insert 1
13	1888446	13Y01R020M08SXD06	1	M8	8,5	13	11,4	20,0	1,2	0,03	XD_X06021
16	1888447	16Y02R025M08SXD06	2	M8	8,5	13	13,8	25,0	1,2	0,03	XD_X06021
20	1888448	20Y03R030M10SXD06	3	M10	10,5	18	17,6	30,0	1,2	0,06	XD_X06021
25	1888449	25Y03R035M12SXD06	3	M12	12,5	21	22,7	35,0	1,2	0,10	XD_X06021

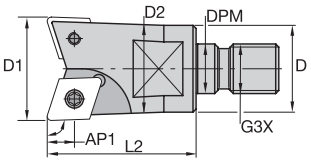
Spare Parts

D1	insert screw	Torx wrench	torque (Nm)
13	193.341	FT7	1
16	193.341	FT7	1
20	193.341	FT7	1
25	193.341	FT7	1

Ordering Example:
1 x 10Y02R020M06SXD04
10 x XDHX040110ELN KC525M

Indexable Screw-On End Mills and Shell Mills — XDHX 10

- Rhombic-style inserts for reduced cutting forces.
- Wide range of applications.
- Improved surface quality.



95° approach angle



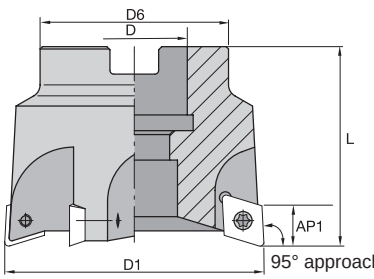
Screw-On End Mills - XDHX10

D1	order number	catalog number	Z	G3X	DPM	D	D2	L2	Ap1 max	kg	insert
25	1880650	25Y02R036M12SXD10	2	M12	12,5	21	22,0	36	1,5	0,9	XD_X10T310
35	1880651	35Y03R043M16SXD10	3	M16	17,0	29	32,0	43	1,5	0,2	XD_X10T310
42	1880652	42Y04R043M16SXD10	4	M16	17,0	29	38,7	43	1,5	0,0	XD_X10T310

Spare Parts

D1	insert screw	Torx wrench	torque (Nm)
25	193.342	FT15	2
35	193.342	FT15	2
42	193.342	FT15	2

- Rhombic-style inserts for reduced cutting forces.
- Wide range of applications.
- Improved surface quality.
- First choice for long overhangs.



95° approach angle



Shell Mills — XDHX10

D1	order number	catalog number	Z	D	D6	L	Ap1 max	kg	insert
52	1888194	52A05RS95XD10	5	22	42	50	1,5	1,4	XD_X10T3

Spare Parts

D1	insert screw	Torx wrench	torque (Nm)
52	193.342	FT15	2

Ordering Example:
1 x 25Y02R036M12SXD10
10 x XDHX10T310SGN KC525M

Recommended Starting Speeds [m/min]

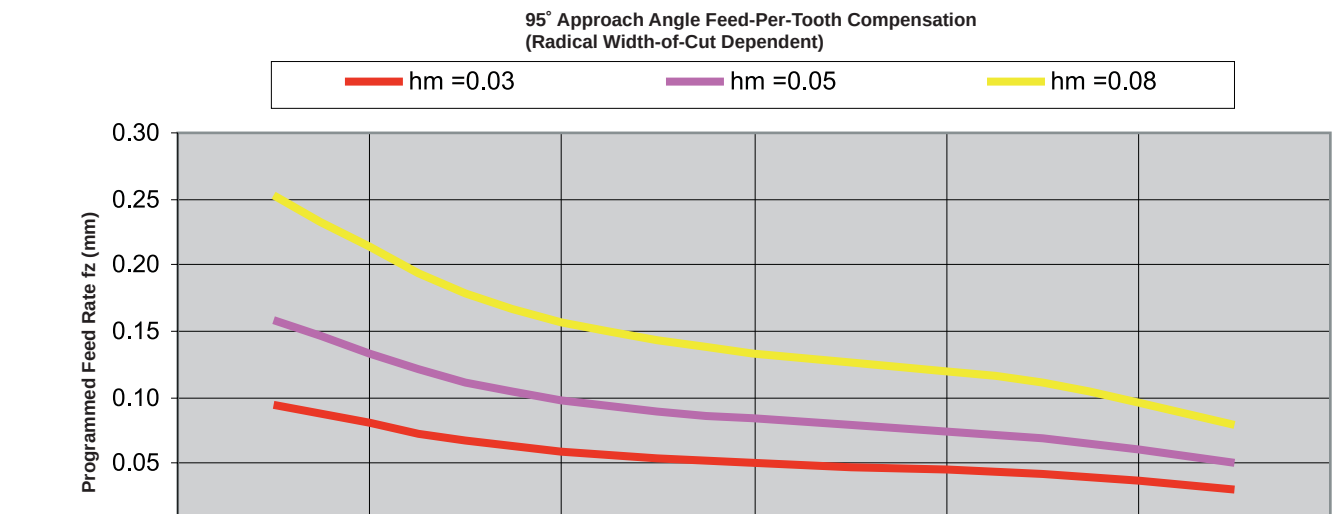
KMM - XDHX - 04/06/10 - 95° Approach angle

Material Group	K110M			KC510M			KC522M			KC525M			KC715M			KC725M			KT530M		
P1							250	**230**	210	220	**200**	180	350	**325**	300	315	**275**	260	345	**305**	280
P2							210	**200**	190	180	**160**	150	325	**300**	275	195	**175**	160	215	**195**	170
P3							190	**180**	170	160	**150**	140	300	**275**	250	180	**160**	145	195	**170**	160
P4							170	**160**	150	140	**130**	120	200	**180**	160	130	**120**	110	145	**130**	120
P5							180	**170**	160	150	**140**	130	205	**195**	175	180	**160**	145	200	**180**	160
P6							160	**150**	140	130	**120**	110	180	**170**	160	110	**95**		120	**110**	
M1							220	**210**	200	150	**140**	130					**180**	165	225	**200**	180
M2							190	**170**	150	130	**120**	110					**170**	150	205	**185**	170
M3							130	**120**	110	90	**80**	70					**125**		150	**135**	
K1				350	**320**	285	280	**240**	200												
K2				275	**250**	230	200	**180**	160												
K3				235	**205**	190	160	**140**	120												
N1	330	**295**	270	800	**680**	620															
N2	220	**195**	170	390	**370**	350															
S1																					
S2																					
S3																					
S4																					
H1				140	**100**	80	160	**120**	80												

FIRST choice starting speeds are in bold type.

As the average chip thickness goes higher the speed should be decreased.

Recommended Starting Feeds

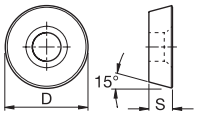


	10%	20%	30%	40%	50%	100%
hm =0.03	0.09	0.07	0.05	0.05	0.04	0.03
hm =0.05	0.16	0.11	0.09	0.08	0.07	0.05
hm =0.08	0.25	0.18	0.14	0.13	0.11	0.08

Percentage of the Cutter Diameter in Cut

Indexable Inserts for KDM RD.X05...

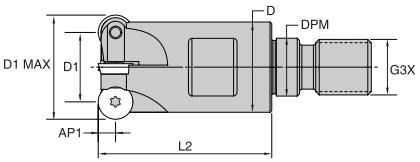




● first choice
○ alternate choice

H	●
S	●
N	○
K	● ○
M	●
P	○ ●

catalog number	D	S	hm	KC510M	KC522M	KT530M
RDHX0501M0ELN	5,00	1,50	0,05	●	●	●





Screw-On End Mills

D1 max	order number	catalog number	Z	D1	D	DPM	L2	G3X	Ap1 max	Max Ramp Angle	kgs
12	1888399	12E03R020M06SRD05	3	7	9,8	6,5	20	M6	2	9.5°	0,02
15	1888402	15E04R025M08SRD05	4	10	13,0	8,5	25	M8	2	5.5°	0,03
20	1888403	20E05R030M10SRD05	5	15	18,0	10,5	30	M10	2	3.5°	0,03
25	1888404	25E06R035M12SRD05	6	20	21,0	12,5	35	M12	2	2.0°	0,03

Spare Parts

D1 max	insert screw	Torx wrench	torque (Nm)
12	193.340	FT6	1
15	193.340	FT6	1
20	193.340	FT6	1
25	193.340	FT6	1

Ordering Example:
1 x 12E03R020M06SRD05
10 x RDHX0501MOELN KC522M

Recommended Starting Speeds [m/min]

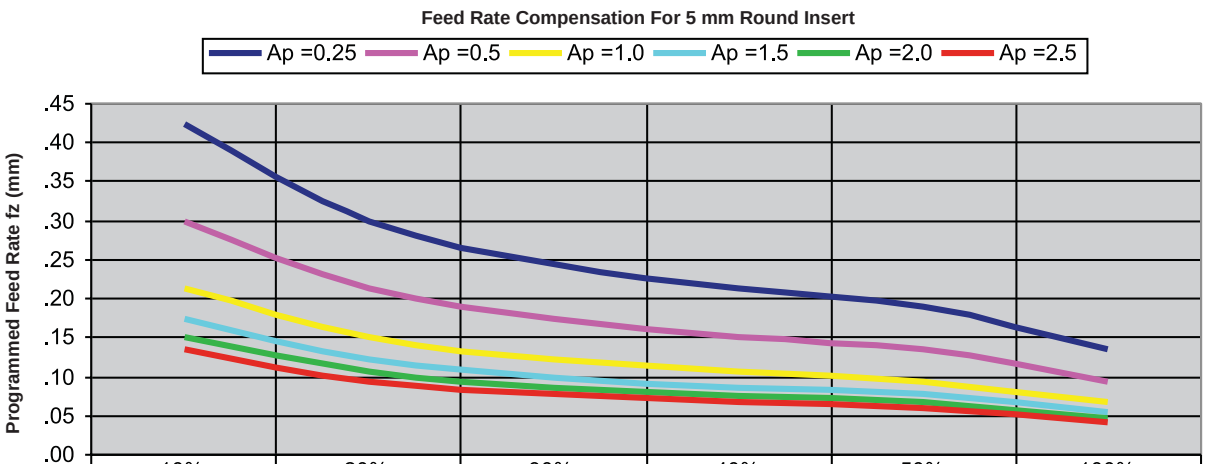
RD.X05 Inserts

Material Group	KC510M			KC522M			KT530M		
P1							350	**300**	280
P2							210	**190**	170
P3							190	**170**	160
P4				120	**110**	100	150	**130**	120
P5				155	**150**	135	200	**175**	160
P6				100	**80**		120	**110**	
M1				180	**160**	150	220	**200**	180
M2				170	**150**	140	200	**180**	170
M3				120	**110**		150	**130**	
K1	350	**320**	280						
K2	280	**250**	230	240	**220**	200			
K3	230	**210**	190	200	**180**	170			
N1	760	**680**	620						
N2									
S1				40	**30**				
S2				30	**30**				
S3				40	**40**				
S4				50	**50**				
H1				150	**110**	80			

FIRST choice starting speeds are in bold type.
As the average chip thickness goes higher the speed should be decreased.

Recommended Starting Feeds

RD.X05 Inserts

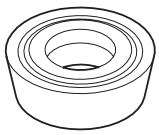


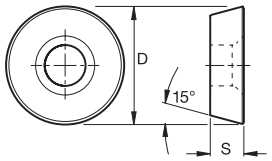
	10%	20%	30%	40%	50%	100%
Ap =0.25	0.42	0.30	0.24	0.21	0.19	0.13
Ap =0.5	0.30	0.21	0.17	0.15	0.13	0.09
Ap =1.0	0.21	0.15	0.12	0.11	0.09	0.07
Ap =1.5	0.17	0.12	0.10	0.09	0.08	0.05
Ap =2.0	0.15	0.11	0.09	0.08	0.07	0.05
Ap =2.5	0.13	0.09	0.08	0.07	0.06	0.04

Percentage of the Cutter Diameter in Cut

Indexable Inserts for KDM RD.X07...


RDHX-LN


RDHX-FLP

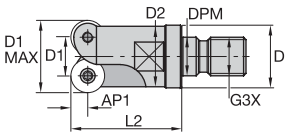


● first choice
○ alternate choice

	KC510M	KC522M	KC525M	KC715M	KC725M	KT530M
H		●				
S		●	○		●	
N	○	○				
K	●	○				
M		●	○		●	
P		○	●	●	●	●

catalog number	D	S	hm	KC510M	KC522M	KC525M	KC715M	KC725M	KT530M
RDHX07T1M0SLN	7,00	1,98	0,08	●		●	●		
RDHX0702M0FLP	7,00	2,38	0,05	●	●			●	
RDHX0702M0SLN	7,00	2,38	0,08	●	●	●	●	●	
RDHX0702M0TLN	7,00	2,38	0,08						●

- Diameter range of 12 mm to 35 mm.
- Stable and positive geometry.





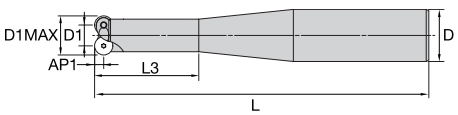
Screw-On End Mills — RDHX07T1 / RDHX0702 Inserts

D1 max	order number	catalog number	Z	D1	D	D2	L2	L3	DPM	G3X	Ap1 max	Max Ramp Angle	kg	insert 1
12	1888407	12E02R018M06SRD07	2	5	9,8	11	18	18	6,5	M6	3	9.5°	0,02	RD07T1
12	1888406	12E02R028M08SRD07	2	5	13,0	11	28	20	8,5	M8	3	9.5°	0,03	RD07T1
15	1888409	15E02R023M08SRD07	2	8	13,0	13	23	23	8,5	M8	3	4.5°	0,03	RD0702
15	1888410	15E03R023M08SRD07	3	8	13,0	13	23	23	8,5	M8	3	4.5°	0,03	RD0702
20	1888411	20E04R030M10SRD07	4	13	18,0	18	30	30	10,5	M10	3	2.5°	0,07	RD0702
25	1888412	25E05R035M12SRD07	5	18	21,0	21	35	35	12,5	M12	3	3.5°	0,11	RD0702
30	1888413	30E05R043M16SRD07	5	23	29,0	26	43	43	17,0	M16	3	5.5°	0,22	RD0702
35	1888414	35E06R043M16SRD07	6	28	29,0	32	43	43	17,0	M16	3	4.5°	0,25	RD0702

Spare Parts

D1 max	insert	insert screw	Torx wrench	torque (Nm)
12	RD07T1	193.364	FT7	1
12	RD07T1	193.364	FT7	1
15	RD0702	193.341	FT7	1
15	RD0702	193.341	FT7	1
20	RD0702	193.341	FT7	1
25	RD0702	193.341	FT7	1
30	RD0702	193.341	FT7	1
35	RD0702	193.341	FT7	1

- Stable and positive geometry.





End Mills with Weldon shank — RDHX0702 Inserts

D1 max	order number	catalog number	Z	D1	D	L3	L	Ap1 max	Max Ramp Angle	kg	insert 1
15	1888453	15E02R040B16SRD07	2	8	16	40	90	3,5	4.5°	0,13	RD0702
15	1888469	15E02R060B16SRD07	2	8	16	25	110	3,5	4.5°	0,15	RD0702
15	1888465	15E02R100B16SRD07	2	8	20	40	152	3,5	4.5°	0,28	RD0702
15	1888463	15E02R120B16SRD07	2	8	25	40	178	3,5	4.5°	0,45	RD0702

Spare Parts

D1 max	insert screw	Torx wrench	torque (Nm)
15	193.341	FT7	1

Ordering Example:
1 x 12E02R023M08SRD07
10 x RDHX07T1MOSLN KC725M

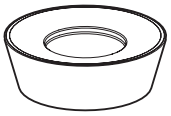
Speed and feed chart see page 462

KENNAMETAL

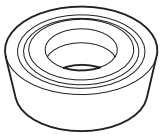
Indexable Inserts for KDM RD.X10...



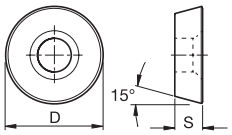
RD.X-HN
RD.X-GN



RDPX-HP



RDHX-FLP

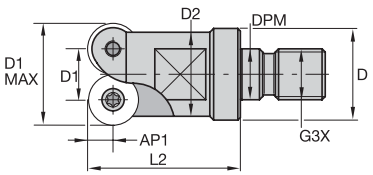


● first choice
○ alternate choice

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

catalog number	D	S	hm	K110M	KC510M	KC522M	KC525M	KC715M	KC725M	KC935M	KT530M
RDHX1003M0FLP	10,00	3,18	0,05	●	●	●			●		
RDHX1003M0SGN	10,00	3,18	0,10		●	●	●		●		
RDHX1003M0TGN	10,00	3,18	0,10								●
RDPX1003M0SHN	10,00	3,18	0,10		●	●	●	●	●		
RDPX1003M0SHP	10,00	3,18	0,10			●			●	●	

- Diameter range 20 mm to 42 mm
- Stable and positive geometry.
- Ground and sintered-to-size inserts.

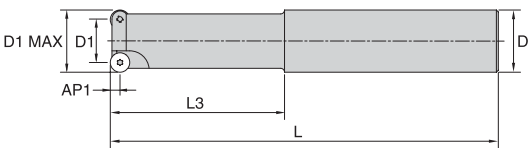




Screw-On End Mills — RD.X10 Inserts

D1 max	order number	catalog number	Z	D1	D	D2	L2	DPM	G3X	Ap1 max	Max Ramp Angle	kg	insert screw	Torx wrench	Nm
20	1888415	20E02R030M10SRD10	2	10	18	17,5	30	10,5	M10	4,5	15.0°	0,07	193.342	FT15	3,5
25	1888417	25E03R035M12SRD10	3	15	21	20,6	35	12,5	M12	4,5	13.5°	0,11	193.342	FT15	3,5
25	1888416	25E02R035M12SRD10	2	15	21	21,0	35	12,5	M12	4,5	13.5°	0,03	193.342	FT15	3,5
30	1888418	30E04R043M16SRD10	4	20	29	25,0	43	17,0	M16	4,5	9.0°	0,20	193.342	FT15	3,5
35	1888419	35E04R045M16SRD10	4	25	29	32,9	45	17,0	M16	4,5	7.0°	0,03	193.342	FT15	3,5
42	1888420	42E05R045M16SRD10	5	32	29	37,7	45	17,0	M16	4,5	5.0°	0,29	193.342	FT15	3,5

- Stable and positive geometry.
- Ground and sintered-to-size inserts.





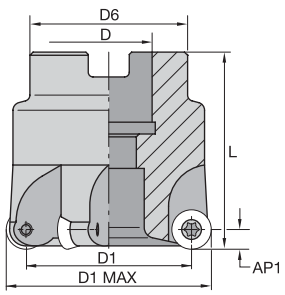
End Mills with Cylindrical Shank — RD.X10 Inserts

D1 max	order number	catalog number	Z	D1	D	L3	L	Ap1 max	Max Ramp Angle	kg	insert screw	Torx wrench	Nm
25	1888457	25E02R070A25SRD10	2	15	25	70	180	5	15.0°	0,62	193.342	FT15	3,5
32	1888454	32E03R090A32SRD10	3	22	32	90	200	5	15.0°	0,20	193.342	FT15	3,5

End Mills with Weldon Shank — RD.X10 Inserts

D1 max	order number	catalog number	Z	D1	D	L3	L	Ap1 max	Max Ramp Angle	kg	insert screw	Torx wrench	Nm
20	1888468	20E02R040B20SRD10	2	10	20	40	112	5	15.0°	0,25	193.342	FT15	3,5
20	1888466	20E02R060B20SRD10	2	10	20	60	138	5	15.0°	0,31	193.342	FT15	3,5
20	1888464	20E02R080B20SRD10	2	10	25	60	158	5	15.0°	0,47	193.342	FT15	3,5
20	1888460	20E02R120B20SRD10	2	10	25	60	180	5	15.0°	0,52	193.342	FT15	3,5
20	1888461	20E02R100B20SRD10	2	10	25	60	180	5	15.0°	0,53	193.342	FT15	3,5

- Stable and positive geometry.
- Ground and sintered-to-size inserts.





Shell Mills — RD.X10 Inserts

D1 max	order number	catalog number	Z	D1	D	D6	L	Ap1 max	Max Ramp Angle	kg	insert screw	Torx wrench	Nm
52	1888180	52A06RSMORD10	6	42	22	42	50	5	15°	0,45	193.342	FT15	3,5

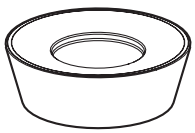
Ordering Example:
1 x 20E02R030M10SRD10
10 x RDHX1003MOSGN KC725M

Speed and feed chart see page 463

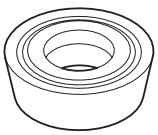
Indexable Inserts for KDM RD.X12...



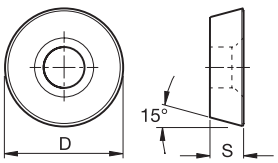
RD.X-HN
RD.X-GN



RDPX-HP



RDHX-FLP

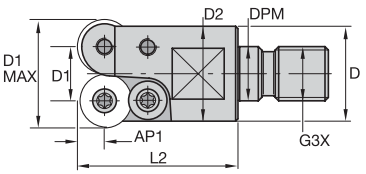


● first choice
○ alternate choice

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

catalog number	D	S	hm	KC510M	KC522M	KC525M	KC715M	KC725M	KC935M	KT530M
RDHX12T3M0FGN	12,00	3,97	0,08	●						
RDHX12T3M0FLP	12,00	3,97	0,08	●	●			●		
RDHX12T3M0SGN	12,00	3,97	0,12	●	●	●	●	●		
RDHX12T3M0TGN	12,00	3,97	0,12							●
RDPX12T3M0SHN	12,00	3,97	0,12	●	●	●	●	●		
RDPX12T3M0SHP	12,00	3,97	0,12		●			●	●	

- Diameter range from 24 mm to 42 mm.
- Stable and positive geometry.
- Ground and sintered-to-size inserts.





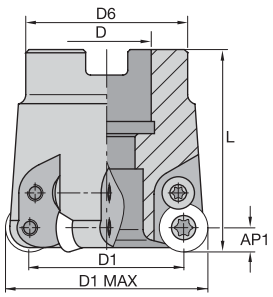
Screw-On End Mills — RD.X12 Inserts

D1 max	order number	catalog number	Z	D1	D	D2	L2	DPM	G3X	Ap1 max	Max Ramp Angle	kgs
24	1888421	24E02R035M12SRD12	2	12	21	21,0	35	12,5	M12	6	15.0°	0,09
35	1888422	35E03R043M16SRD12	3	23	29	32,6	43	17,0	M16	6	9.5°	0,23
42	1888423	42E04R043M16SRD12	4	30	29	38,0	43	17,0	M16	6	5.5°	0,30

Spare Parts

D1 max	insert screw	Torx wrench	torque (Nm)	clamp screw
24	193.342	FT15	3,5	193.338
35	193.342	FT15	3,5	193.338
42	193.342	FT15	3,5	193.338

- Diameter range from 52 mm to 80 mm.
- Stable and positive geometry.
- Ground and sintered-to-size inserts.





Shell Mills — RD.X12 Inserts

D1 max	order number	catalog number	Z	D1	D	D6	L	Ap1 max	Max Ramp Angle	kgs
52	1888182	52A05RSMORD12	5	40	22	42	50	6	4.5°	0,45
66	1888205	66A06RSMORD12	6	54	27	50	50	6	3.5°	0,75
80	1888200	80A07RSMORD12	7	68	27	50	50	6	2.5°	1,00

Spare Parts

D1 max	insert screw	Torx wrench	torque (Nm)	clamp screw
52	193.342	FT15	3,5	193.338
66	193.342	FT15	3,5	193.338
80	193.342	FT15	3,5	193.338

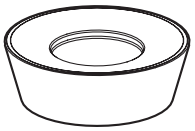
Ordering Example:
1 x 24E02R035M12SRD12
10 x RDHX12T3MOSGN KC725M

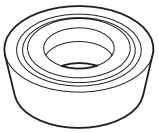
Speed and feed chart see page 464

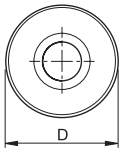
Indexable Inserts for KDM RD.X16...

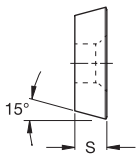

RDHX-SGN


RDPX-SHN


RDPX-SHP


RDHX-FLP





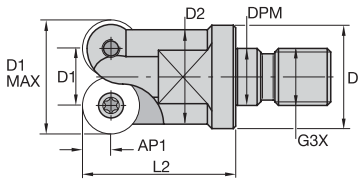
● first choice
○ alternate choice

	KC510M	KC522M	KC525M	KC715M	KC725M	KC735M	KC935M
H		●					
S		●	○		●	●	
N	○						
K	●						○
M		●	○		●	●	○
P		○	●	●	●	○	●

catalog number	D	S	hm	KC510M	KC522M	KC525M	KC715M	KC725M	KC735M	KC935M
RDHX1604M0FLP	16,00	4,76	0,08	●	●			●		
RDHX1604M0SGN	16,00	4,76	0,15	●	●	●		●		
RDPX1604M0SHN	16,00	4,76	0,15	●		●	●	●		
RDPX1604M0SHP	16,00	4,76	0,15		●	●		●		●

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

- Stable and positive geometry.
- Ground and sintered-to-size inserts.





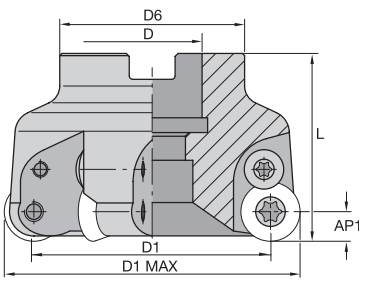
Screw-On End Mills — RD.X16 Inserts

D1 max	order number	catalog number	Z	D1	D	D2	L2	DPM	G3X	Ap1 max	Max Ramp Angle	kgs
32	1888424	32E02R043M16SRD16	2	16	29	26,5	43	17	M16	7,5	15.0°	0,2

Spare Parts

D1 max	insert screw	Torx wrench	torque (Nm)
32	193.343	FT20	6

- Diameter range of 52 mm to 100 mm.
- Stable and positive geometry.
- Ground and pressed-to-size inserts.





Shell Mills — RD.X16 Inserts

D1 max	order number	catalog number	Z	D1	D	D6	L	Ap1 max	Max Ramp Angle	kgs
52	1888196	52A04RSMORD16	4	36	22	40	50	8	5.5°	0,38
66	1888209	66A05RSMORD16	5	50	27	50	50	8	3.5°	0,60
80	1888204	80A06RSMORD16	6	64	27	50	50	8	2.5°	0,80
100	1888197	100B07RSMORD16	7	84	32	60	55	8	2.0°	1,37

Spare Parts

D1 max	insert screw	Torx wrench	torque (Nm)	clamp screw
52	193.343	FT20	6	193.383
66	193.343	FT20	6	193.383
80	193.343	FT20	6	193.383
100	193.343	FT20	6	193.383

Ordering Example:
1 x 32E02R043M16SRD16
10 x RDHX1604MOSGN KC725M

Speed and feed chart see page 465

Recommended Starting Speeds [m/min]

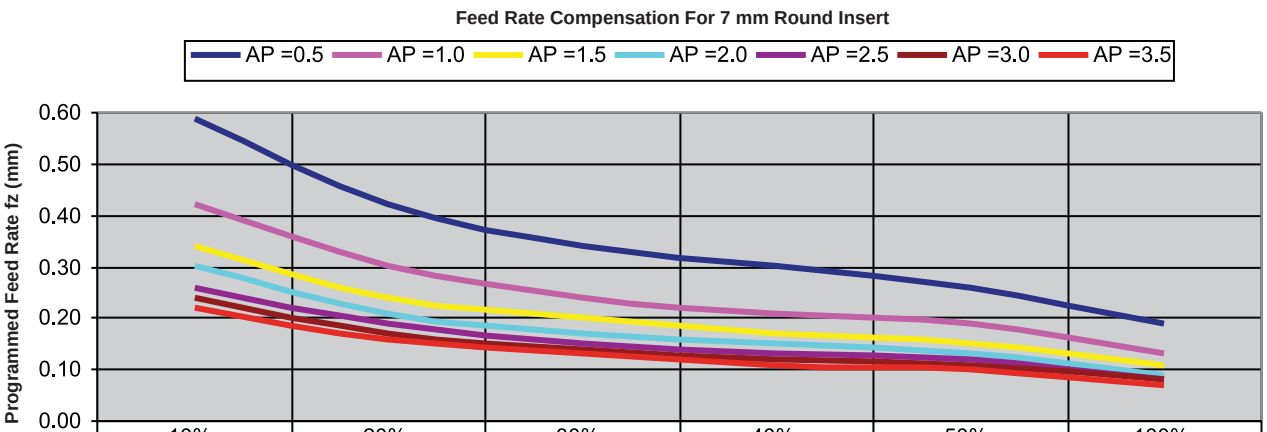
RD.X07.. Inserts

Material Group	KC510M			KC522M			KC525M			KC715M			KC725M			KT530M		
P1							230	**200**	180	410	**370**	330	315	**275**	250	350	**305**	280
P2							180	**160**	150	250	**230**	200	195	**180**	160	215	**190**	170
P3							160	**150**	140	225	**200**	185	180	**160**	140	180	**170**	160
P4				120	**110**	100	140	**130**	120	170	**160**	140	130	**120**	110	145	**130**	120
P5				160	**145**	130	150	**140**	130	225	**205**	190	180	**160**	145	200	**180**	160
P6				100	**90**	80	130	**120**	110	145	**130**	110	130	**120**	110	120	**105**	95
M1							150	**140**	130				205	**195**	170	225	**200**	180
M2							130	**120**					185	**170**	150	205	**185**	170
M3							90	**80**								150	**130**	110
K1	350	**320**	290															
K2	280	**250**	230															
K3	230	**200**	190															
N1	420	**360**	300															
N2																		
S1				45	**35**		45	**35**					45	**35**				
S2				35	**30**		35	**30**					40	**35**				
S3				45	**40**		45	**40**					50	**45**				
S4				55	**50**		55	**50**					60	**50**				
H1				150	**110**	80												

FIRST choice starting speeds are in bold type.
As the average chip thickness goes higher the speed should be decreased.

Recommended Starting Feeds

RD.X07 Insert



	10%	20%	30%	40%	50%	100%
AP =0.5	0.59	0.42	0.34	0.30	0.26	0.19
AP =1.0	0.42	0.30	0.24	0.21	0.19	0.13
AP =1.5	0.34	0.24	0.20	0.17	0.15	0.11
AP =2.0	0.30	0.21	0.17	0.15	0.13	0.09
AP =2.5	0.26	0.19	0.15	0.13	0.12	0.08
AP =3.0	0.24	0.17	0.14	0.12	0.11	0.08
AP =3.5	0.22	0.16	0.13	0.11	0.10	0.07

Percentage of the Cutter Diameter in Cut

Recommended Starting Speeds [m/min]

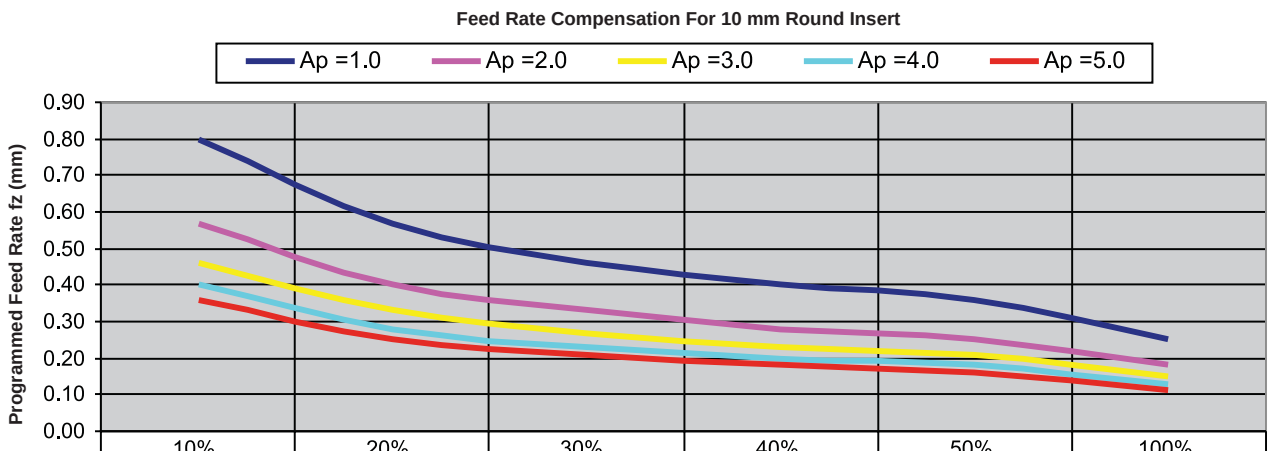
RD.X10 Inserts

Material Group	K110M			KC510M			KC522M			KC525M			KC715M			KC725M			KC935M			KT530M		
P1										220	**200**	180	410	**360**	330	315	**275**	260	475	**420**	385	345	**305**	280
P2										180	**160**	150	260	**225**	205	195	**175**	160	295	**260**	240	215	**195**	170
P3										160	**150**	140	225	**205**	185	180	**160**	145	260	**240**	215	195	**170**	160
P4							120	**110**	100	140	**130**	120	170	**160**	145	130	**120**	110	200	**180**	165	145	**130**	120
P5							160	**145**	130	150	**140**	130	235	**205**	190	180	**160**	145	275	**240**	220	200	**180**	160
P6							95	**85**		130	**120**	110	145	**125**		110	**95**		165	**145**		120	**110**	
M1							185	**160**	150	150	**140**	130				205	**180**	165	310	**270**	230	225	**200**	180
M2							165	**150**	140	130	**120**	110				185	**170**	150	280	**255**	230	205	**185**	170
M3							140	**110**		90	**80**	70				140	**125**		210	**185**		150	**135**	
K1				350	**320**	285													310	**275**	205			
K2				275	**250**	230													245	**220**	200			
K3				235	**205**	190													205	**180**	165			
N1	180	**150**	120	425	**365**	305																		
N2																								
S1							40	**35**		40	**35**					45	**40**							
S2							35	**30**		35	**30**					40	**40**							
S3							45	**40**		45	**40**					50	**45**							
S4							55	**50**		55	**50**					60	**55**							
H1							150	**110**	80															

FIRST choice starting speeds are in bold type.
As the average chip thickness goes higher the speed should be decreased.

Recommended Starting Feeds

RD.X10 Insert



	10%	20%	30%	40%	50%	100%
Ap =1.0	0.80	0.57	0.46	0.40	0.36	0.25
Ap =2.0	0.57	0.40	0.33	0.28	0.25	0.18
Ap =3.0	0.46	0.33	0.27	0.23	0.21	0.15
Ap =4.0	0.40	0.28	0.23	0.20	0.18	0.13
Ap =5.0	0.36	0.25	0.21	0.18	0.16	0.11

Percentage of the Cutter Diameter in Cut

Recommended Starting Speeds [m/min]

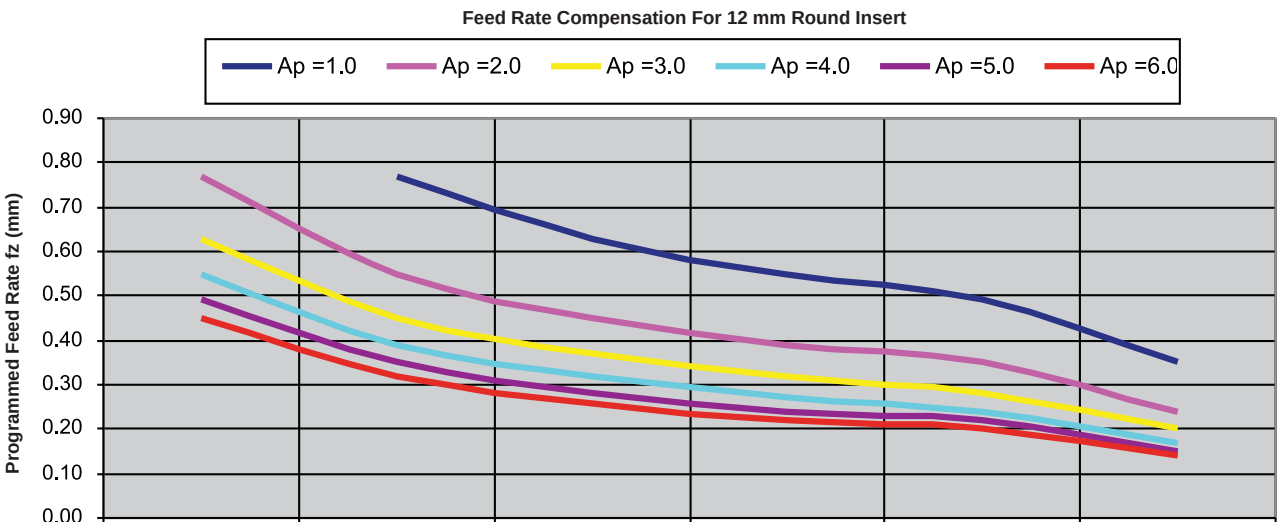
RD.X12 Inserts

Material Group	KC510M			KC522M			KC525M			KC715M			KC725M			KC935M			KT530M		
P1										410	**360**	330	310	**270**	250	470	**410**	380	350	**300**	280
P2										250	**220**	200	190	**180**	160	290	**260**	240	210	**190**	170
P3										220	**200**	180	180	**160**	140	260	**240**	220	190	**170**	160
P4				120	**110**	100				170	**160**	140	130	**120**	110	200	**180**	160	150	**130**	120
P5				155	**150**	135				230	**205**	180	180	**160**	150	265	**240**	215	200	**175**	160
P6				100	**80**					140	**120**		110	**90**		160	**140**		120	**110**	
M1				180	**160**	150	150	**140**	130	270	**230**	220	200	**180**	160	310	**270**	250	220	**200**	180
M2				170	**150**	140	130	**120**	110				180	**170**	150	280	**250**	230	200	**180**	170
M3				120	**110**		90	**80**	70				140	**120**		210	**180**		150	**130**	
K1	350	**320**	280										200	**180**	160	310	**280**	250			
K2	280	**250**	230	240	**220**	200							160	**140**	130	240	**220**	200			
K3	230	**210**	190	200	**180**	170							130	**120**	110	200	**180**	170			
N1	760	**680**	620																		
N2																					
S1				40	**30**		40	**30**					40	**40**							
S2				30	**30**		30	**30**					40	**40**							
S3				40	**40**		40	**40**					50	**50**							
S4				50	**50**		50	**50**					60	**50**							
H1				150	**110**	80															

FIRST choice starting speeds are in bold type.
As the average chip thickness goes higher the speed should be decreased.

Recommended Starting Feeds

RD.X12 Insert



	10%	20%	30%	40%	50%	100%
Ap =1.0		0.77	0.63	0.55	0.49	0.35
Ap =2.0	0.77	0.55	0.45	0.39	0.35	0.24
Ap =3.0	0.63	0.45	0.37	0.32	0.28	0.2
Ap =4.0	0.55	0.39	0.32	0.27	0.24	0.17
Ap =5.0	0.49	0.35	0.28	0.24	0.22	0.15
Ap =6.0	0.45	0.32	0.26	0.22	0.20	0.14

Percentage of the Cutter Diameter in Cut

Recommended Starting Speeds [m/min]

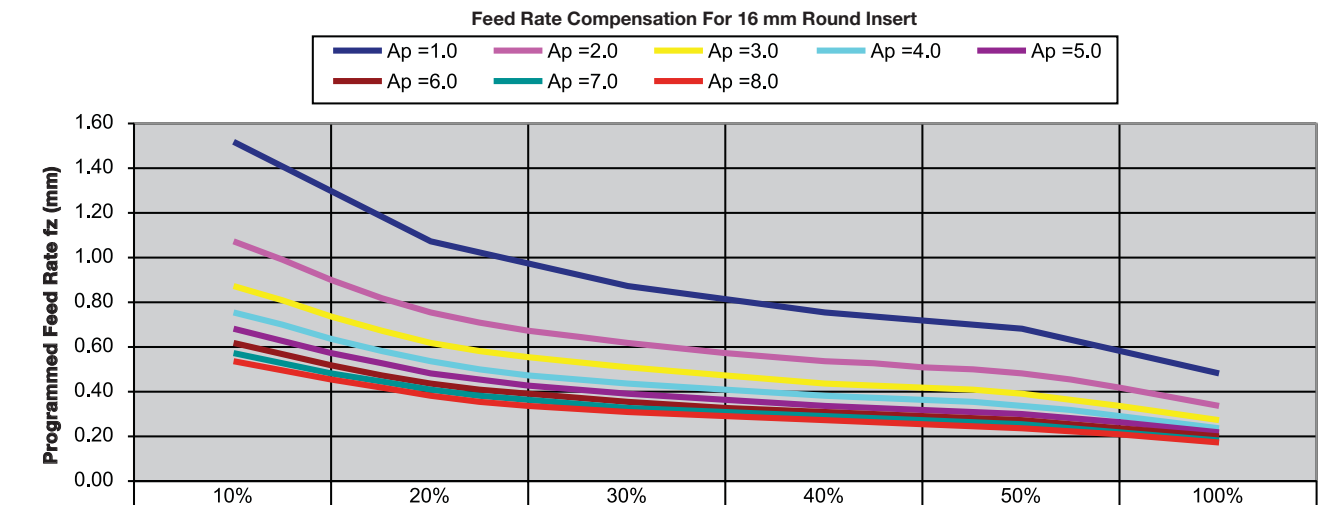
RD.X16.. Inserts

Material Group	KC510M			KC522M			KC525M			KC715M			KC725M			KC735M			KC935M		
P1										410	**360**	330	310	**270**	250				470	**410**	380
P2										250	**220**	200	190	**180**	160				290	**260**	240
P3										220	**200**	180	180	**160**	140				260	**240**	220
P4				120	**110**	100				170	**160**	140	130	**120**	110				200	**180**	160
P5				155	**150**	135				230	**205**	180	180	**160**	150				265	**240**	215
P6				100	**80**					140	**120**		110	**90**					160	**140**	
M1				180	**160**	150	150	**140**	130	270	**230**	220	200	**180**	160	120	**110**	100	310	**270**	250
M2				170	**150**	140	130	**120**	110				180	**170**	150	110	**100**	90	280	**250**	230
M3				120	**110**		90	**80**	70				140	**120**		80	**70**		210	**180**	
K1	350	**320**	280										200	**180**	160				310	**280**	250
K2	280	**250**	230	240	**220**	200							160	**140**	130				240	**220**	200
K3	230	**210**	190	200	**180**	170							130	**120**	110				200	**180**	170
N1	760	**680**	620																		
N2																					
S1				40	**30**		40	**30**					40	**40**							
S2				30	**30**		30	**30**					40	**40**							
S3				40	**40**		40	**40**					50	**50**							
S4				50	**50**		50	**50**					60	**50**							
H1				150	**110**	80															

FIRST choice starting speeds are in bold type.
As the average chip thickness goes higher the speed should be decreased.

Recommended Starting Feeds

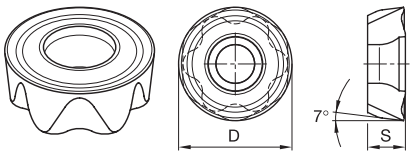
RD.X16 Insert



	10%	20%	30%	40%	50%	100%
Ap =1.0	1.52	1.07	0.88	0.76	0.68	0.48
Ap =2.0	1.07	0.76	0.62	0.54	0.48	0.34
Ap =3.0	0.88	0.62	0.51	0.44	0.39	0.28
Ap =4.0	0.76	0.54	0.44	0.38	0.34	0.24
Ap =5.0	0.68	0.48	0.39	0.34	0.30	0.21
Ap =6.0	0.62	0.44	0.36	0.31	0.28	0.20
Ap =7.0	0.57	0.41	0.33	0.29	0.26	0.18
Ap =8.0	0.54	0.38	0.31	0.27	0.24	0.17

Percentage of the Cutter Diameter in Cut

Indexable Inserts for KSRM RCGT 20 mm



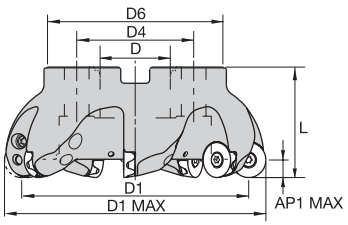
● first choice
○ alternate choice

H	
S	●
N	
K	○
M	● ○
P	● ●

catalog number	D	S	hm	KC725M	KC935M
RCGT2006M0ELF	20,00	6,35	0,10	●	
RCGT2006M0SHF	20,00	6,35	0,20	●	●

NEW!

- Diameter range from 63mm to 200mm.
- Engineered for roughing titanium with large depths of cut through positive geometry inserts.
- Insert size is 20mm.
- Minimum of four cutting edges per insert.
- Excellent for long overhangs.





D1 max	order number	catalog number	Z	D1	D	D4	D6	L	Ap1 max	kg	Max RPM
63	3095646	63A04RS90RC20C	4	43	22	–	50	50	10,0	0,62	26000
80	3095647	80A05RS90RC20C	5	60	27	–	60	50	10,0	0,89	22000
100	3095649	100B06RS90RC20C	6	80	32	–	80	63	10,0	2,12	18000
100	3095648	100B05RS90RC20C	5	80	32	–	80	63	10,0	2,17	18000
125	3095650	125B06RS90RC20C	6	105	40	–	90	63	10,0	3,03	15000
160	3095651	160C07RS90RC20C	7	140	40	66,7	100	63	10,0	3,90	14000
160	3095652	160C08RS90RC20C	8	140	40	66,7	100	63	10,0	3,86	14000
200	3095653	200C09RS90RC20C	9	180	60	101,6	130	63	10,0	5,76	12500

Spare Parts

D1 max	insert screw	Torx wrench	torque (Nm)	anti rotation screw	coolant screw	coolant cap
63	MS1162	TT25	5	S2160	MS1242CG	–
80	MS1162	TT25	5	S2160	MS2190CG	–
100	MS1162	TT25	5	S2160	MS2188C	–
100	MS1162	TT25	5	S2160	MS2188C	–
125	MS1162	TT25	5	S2160	MS2187C	–
160	MS1162	TT25	5	S2160	–	MCC-M160-01
160	MS1162	TT25	5	S2160	–	MCC-M160-01
200	MS1162	TT25	5	S2160	–	MCC-0800-01

Ordering Example:
1 x 63A04RS90RC20C
10 x RCGT2006M0ELF KC725M

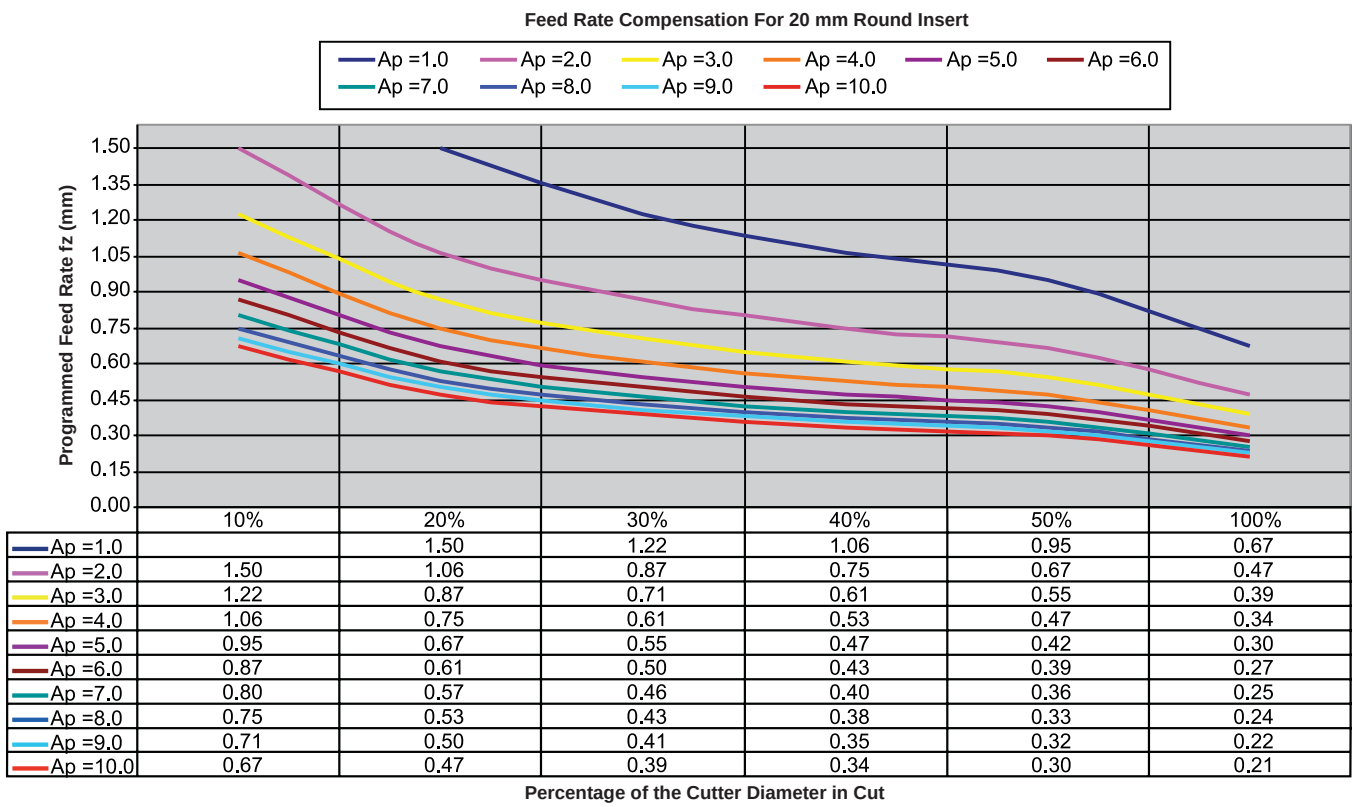
To place an order, contact Kennametal or your authorized Kennametal distributor, or visit www.kennametal.com.

Recommended Starting Speeds [m/min]

Material Group	KC725M			KC935M		
P1	310	**270**	250	470	**410**	380
P2	190	**180**	160	290	**260**	240
P3	180	**160**	140	260	**240**	220
P4	130	**120**	110	200	**180**	160
P5	180	**160**	150	265	**240**	215
P6	110	**90**		160	**140**	
M1	200	**180**	160	310	**270**	250
M2	180	**170**	150	280	**250**	230
M3	140	**120**		210	**180**	
K1	200	**180**	160	310	**280**	250
K2	160	**140**	130	240	**220**	200
K3	130	**120**	110	200	**180**	170
N1						
N2						
S1	40	**40**				
S2	40	**40**				
S3	50	**50**				
S4	60	**50**				
H1						

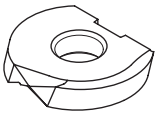
FIRST choice starting speeds are in bold type.
As the average chip thickness goes higher the speed should be decreased.

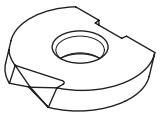
Recommended Starting Feeds

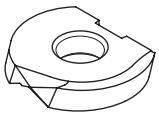


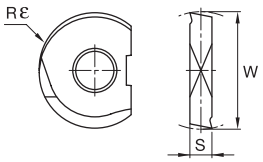
	10%	20%	30%	40%	50%	100%
Ap =1.0		1.50	1.22	1.06	0.95	0.67
Ap =2.0	1.50	1.06	0.87	0.75	0.67	0.47
Ap =3.0	1.22	0.87	0.71	0.61	0.55	0.39
Ap =4.0	1.06	0.75	0.61	0.53	0.47	0.34
Ap =5.0	0.95	0.67	0.55	0.47	0.42	0.30
Ap =6.0	0.87	0.61	0.50	0.43	0.39	0.27
Ap =7.0	0.80	0.57	0.46	0.40	0.36	0.25
Ap =8.0	0.75	0.53	0.43	0.38	0.33	0.24
Ap =9.0	0.71	0.50	0.41	0.35	0.32	0.22
Ap =10.0	0.67	0.47	0.39	0.34	0.30	0.21

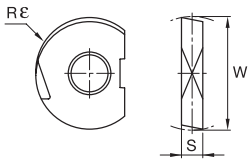
Indexable Inserts for KDMB...

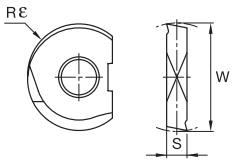

KDMB-GC


KDMB-GN

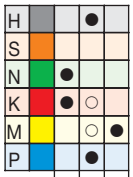

KDMB-LD







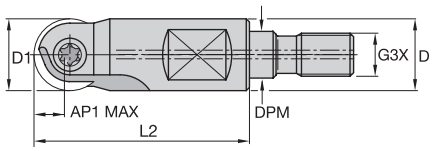
● first choice
○ alternate choice



catalog number	W	S	Rε	hm	K115M	KC515M	KC530M
KDMB08M0ERGC	8,00	2,00	4,0	0,05		●	
KDMB10M0ERGC	10,00	2,50	5,0	0,05		●	●
KDMB12M0ERGC	12,00	2,50	6,0	0,05		●	●
KDMB16M0ERGC	16,00	3,00	8,0	0,05		●	●
KDMB20M0ERGC	20,00	3,00	10,0	0,05		●	●
KDMB25M0ERGC	25,00	4,00	12,5	0,05		●	●
KDMB08M0ERGN	8,00	2,00	4,0	0,08		●	●
KDMB10M0ERGN	10,00	2,50	5,0	0,08		●	●
KDMB12M0ERGN	12,00	2,50	6,0	0,08		●	●
KDMB16M0ERGN	16,00	3,00	8,0	0,08		●	●
KDMB20M0ERGN	20,00	3,00	10,0	0,08		●	●
KDMB25M0ERGN	25,00	4,00	12,5	0,08		●	●
KDMB32M0ERGN	32,00	5,00	16,0	0,08		●	●
KDMB08M0FRLD	8,00	2,00	4,0	0,03	●		
KDMB10M0FRLD	10,00	2,50	5,0	0,03	●		
KDMB12M0FRLD	12,00	2,50	6,0	0,03	●		
KDMB16M0FRLD	16,00	3,00	8,0	0,03	●		
KDMB20M0FRLD	20,00	3,00	10,0	0,03	●		
KDMB25M0FRLD	25,00	4,00	12,5	0,03	●		

NEW!

- Ball nose finisher for three-dimensional milling applications.
- Enables productive, precise, and economical machining.





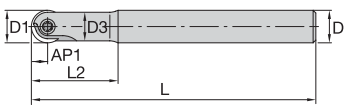
Screw-On End Mills

D1	order number	old catalog number	new catalog number	Z	Z U	G3X	DPM	D	L2	Ap1 max	Max Ramp Angle	kg	Max RPM	insert 1
12	1918651	KBNM123008HP	KDMB12R030M08SN	1	2	M8	8,5	13	30	6,0	3.0°	0,02	40000	KDMB12..
16	1918652	KBNM163508HP	KDMB16R035M08SN	1	2	M8	8,5	13	35	8,0	3.0°	0,03	40000	KDMB16..
20	1918663	KBNM203510HP	KDMB20R035M10SN	1	2	M10	10,5	18	35	10,0	3.0°	0,10	40000	KDMB20..
25	1918664	KBNM254012HP	KDMB25R040M12SN	1	2	M12	12,5	21	40	12,5	3.0°	0,10	40000	KDMB25..

Spare Parts

D1	insert screw	Torx wrench	torque (Nm)
12	193.393	KT20	4,0
16	193.392	KT20	5,0
20	193.391	KT20	6,0
25	193.390	KT30	6,5

NEW!





Necked End Mills — Cylindrical Shank — Steel

D1	order number	old catalog number	new catalog number	Z	Z U	D	D3	L2	L	Ap1 max	Max Ramp Angle	kg	Max RPM	insert 1
12	1918676	KBNE1213012HPSS	KDMB12R130A12SN	1	2	12	10,5	32	130	6,0	3°	0,10	40000	KDMB12..
12	1918677	KBNE1215012HPSS	KDMB12R150A12SN	1	2	12	10,5	46	150	6,0	3°	0,10	40000	KDMB12..
16	1918678	KBNE1614016HPSS	KDMB16R140A16SN	1	2	16	14,0	35	140	8,0	3°	0,20	40000	KDMB16..
16	1918679	KBNE1616016HPSS	KDMB16R160A16SN	1	2	16	14,0	53	160	8,0	3°	0,20	40000	KDMB16..
20	1918680	KBNE2016020HPSS	KDMB20R160A20SN	1	2	20	18,0	45	160	10,0	3°	0,40	40000	KDMB20..
20	1918681	KBNE2017520HPSS	KDMB20R175A20SN	1	2	20	18,0	61	175	10,0	3°	0,40	40000	KDMB20..
25	1918682	KBNE2516025HPSS	KDMB25R160A25SN	1	2	25	22,4	45	160	12,5	3°	0,60	40000	KDMB25..
25	1918683	KBNE2519025HPSS	KDMB25R190A25SN	1	2	25	22,4	70	190	12,5	3°	0,70	40000	KDMB25..
32	1918684	KBNE3217532HPSS	KDMB32R175A32SN	1	2	32	28,6	56	175	16,0	3°	1,00	40000	KDMB32..
32	1918685	KBNE3221032HPSS	KDMB32R210A32SN	1	2	32	28,6	80	210	16,0	3°	1,17	40000	KDMB32..

Spare Parts

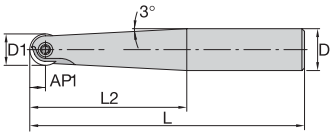
D1	insert screw	Torx wrench	torque (Nm)
12	193.393	KT20	4,0
16	193.392	KT20	5,0
20	193.391	KT20	6,0
25	193.390	KT30	6,5
32	193.389	KT30	6,5

Ordering Example:
1 x KDMB12R030M08SN
10 x KDMB12MOERGN KC515M

Ball Nose Finisher — End Mills

NEW!

- Ball nose finisher for three-dimensional milling applications.
- Enables productive, precise, and economical machining.





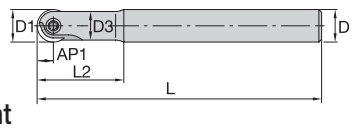
Tapered End Mills — Cylindrical Shank

D1	order number	old catalog number	new catalog number	Z	Z U	D	L2	L	Ap1 max	Max Ramp Angle	kg	Max RPM	insert 1
8	1918669	KBNE0814012HPTN	KDMB08R140A08ST	1	2	12	50	140	4,0	3.0°	0,10	40000	KDMB08..
10	1918670	KBNE1015012HPTN	KDMB10R150A10ST	1	2	12	35	150	5,0	3.0°	0,10	40000	KDMB10..
12	1918671	KBNE1216016HPTN	KDMB12R160A12ST	1	2	16	60	160	6,0	3.0°	0,20	40000	KDMB12..
16	1918672	KBNE1617520HPTN	KDMB16R175A16ST	1	2	20	67	175	8,0	3.0°	0,40	40000	KDMB16..
20	1918673	KBNE2019025HPTN	KDMB20R190A20ST	1	2	25	80	190	10,0	3.0°	0,60	40000	KDMB20..
25	1918674	KBNE2521032HPTN	KDMB25R210A25ST	1	2	32	100	210	12,5	3.0°	1,10	40000	KDMB25..

Spare Parts

D1	insert screw	Torx wrench	torque (Nm)
8	193.395	KT8	2,0
10	193.394	KT15	3,0
12	193.393	KT20	4,0
16	193.392	KT20	5,0
20	193.391	KT20	6,0
25	193.390	KT30	6,5

NEW!





Necked End Mills — Carbide Shank with Through Coolant

D1	order number	catalog number	Z	Z U	D	D3	L2	L	Ap1 max	Max Ramp Angle	kg	Max RPM	insert 1
10	2877242	KDMB10R120A10HNC	1	2	10	8,8	35	120	5,0	3.0°	0,12	40000	KDMB10..
10	2877373	KDMB10R150A10HNC	1	2	10	8,8	50	150	5,0	3.0°	0,14	40000	KDMB10..
12	2877374	KDMB12R120A12HNC	1	2	12	10,5	35	120	6,0	3.0°	0,16	40000	KDMB12..
12	2877375	KDMB12R160A12HNC	1	2	12	10,5	50	160	6,0	3.0°	0,21	40000	KDMB12..
16	2877376	KDMB16R140A16HNC	1	2	16	14,0	40	140	8,0	3.0°	0,34	40000	KDMB16..
16	2877377	KDMB16R175A16HNC	1	2	16	14,0	55	175	8,0	3.0°	0,42	40000	KDMB16..
20	2877378	KDMB20R140A20HNC	1	2	20	18,0	50	140	10,0	3.0°	0,52	40000	KDMB20..
20	2877379	KDMB20R190A20HNC	1	2	20	18,0	75	190	10,0	3.0°	0,70	40000	KDMB20..
25	2877380	KDMB25R160A25HNC	1	2	25	22,4	60	160	12,5	3.0°	0,90	30000	KDMB25..
25	2877381	KDMB25R210A25HNC	1	2	25	22,4	90	210	12,5	3.0°	1,16	30000	KDMB25..
32	2877382	KDMB32R190A32HNC	1	2	32	28,6	65	190	16,0	3.0°	1,17	30000	KDMB32..
32	2877383	KDMB32R240A32HNC	1	2	32	28,6	105	240	16,0	3.0°	2,16	30000	KDMB32..

Spare Parts

D1	insert screw	Torx wrench	torque (Nm)
10	193.394	KT15	3,0
12	193.393	KT20	4,0
16	193.392	KT20	5,0
20	193.391	KT20	6,0
25	193.390	KT30	6,5
32	193.389	KT30	6,5

Ordering Example:
1 x KDMB08R140A08ST
10 x KDMB08MOERGN KC515M

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

Recommended Starting Speeds [m/min]

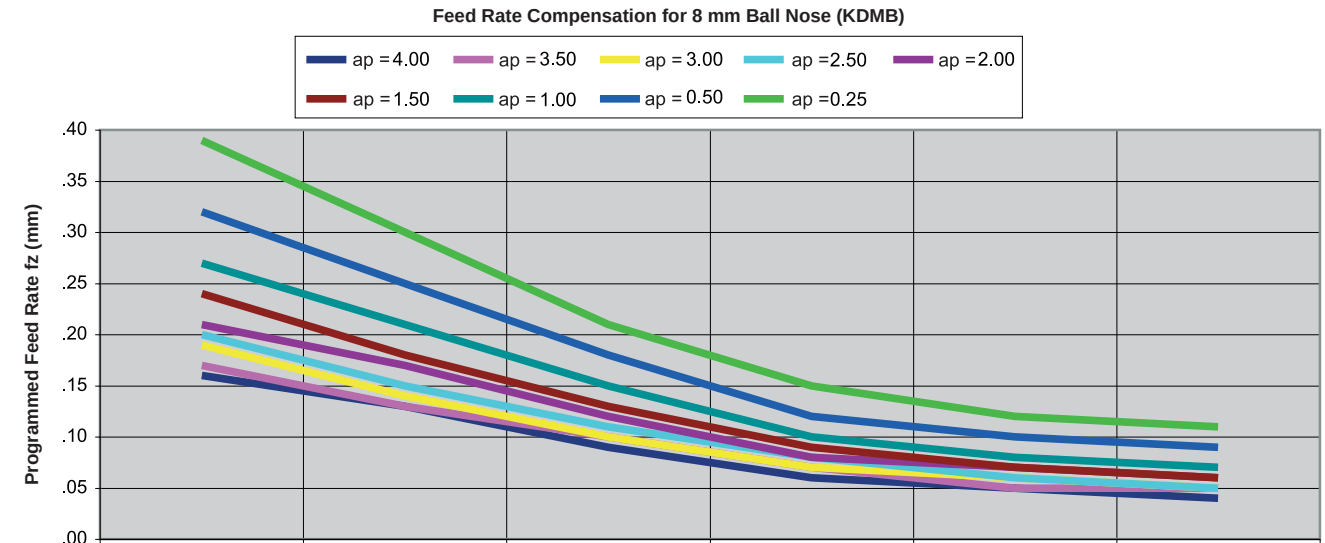
Semi-Finish and Finishing Tools - Ball Nose Only (KDMB)

Material Group	K115M			KC515M			KC530M		
P1				275	**245**	215	230	**200**	170
P2				260	**230**	200	200	**170**	140
P3				230	**200**	170	170	**150**	140
P4				200	**170**	140	150	**140**	120
P5				170	**140**	110	140	**120**	110
P6				140	**110**	90	110	**90**	75
M1				275	**230**	200	230	**180**	150
M2				230	**185**	140	150	**120**	110
M3				185	**150**	120	120	**110**	90
K1	180	**150**	120	365	**275**	180			
K2	150	**120**	90	275	**215**	150			
K3	90	**75**	60	120	**90**	60			
N1	365	**275**	180						
N2	245	**180**	150						
S1									
S2									
S3									
S4									
H1				90	**60**	45			

FIRST choice starting speeds are in bold type.
As the average chip thickness goes higher the speed should be decreased.

Recommended Starting Feeds

KDMB Ball Nose - 8,0 mm Semi-Finish - Finishing only



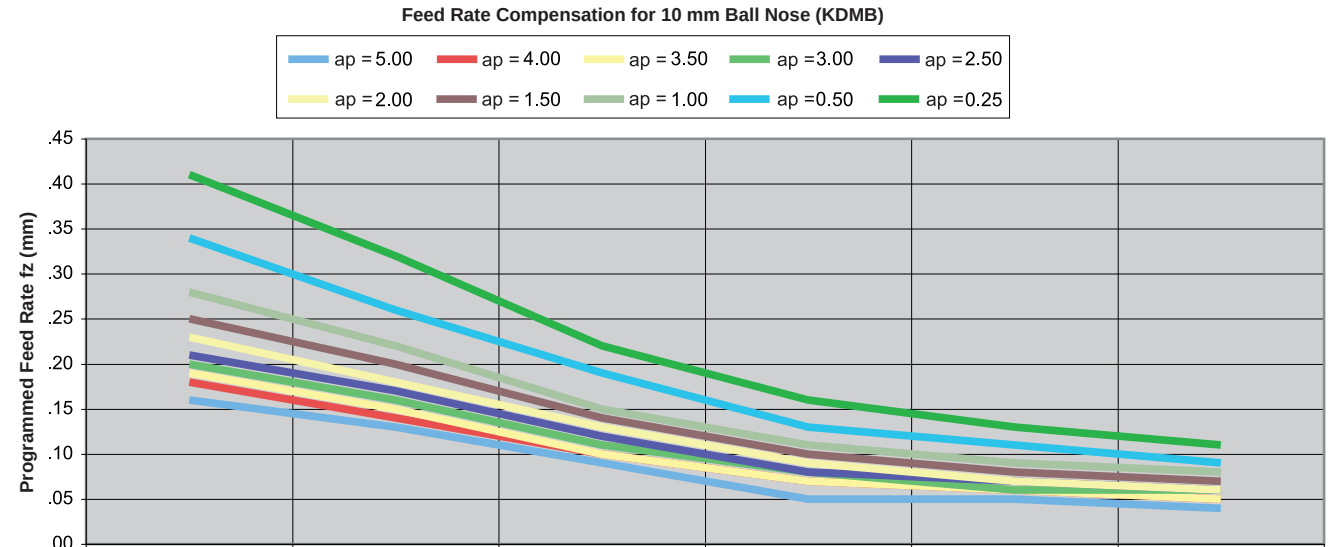
	3%	5%	10%	20%	30%	40%
4.00	.16	.13	.09	.06	.05	.04
3.50	.17	.13	.10	.07	.05	.05
3.00	.19	.14	.10	.07	.06	.05
2.50	.20	.15	.11	.08	.06	.05
2.00	.21	.17	.12	.08	.07	.06
1.50	.24	.18	.13	.09	.07	.06
1.00	.27	.21	.15	.10	.08	.07
0.50	.32	.25	.18	.12	.10	.09
0.25	.39	.30	.21	.15	.12	.11

Percentage of the Cutter Diameter in Cut

	Axial depth of cut for 8,0mm Ø								
	4,00	3,50	3,00	2,50	2,00	1,50	1,00	0,50	0,25
	Working Diameter (mm)								
Working Diameter	8,00	7,94	7,75	7,42	6,93	6,24	5,29	3,87	2,78

Recommended Starting Feeds

KDMB Ball Nose - 10,0 mm
Semi-Finish - Finishing Only



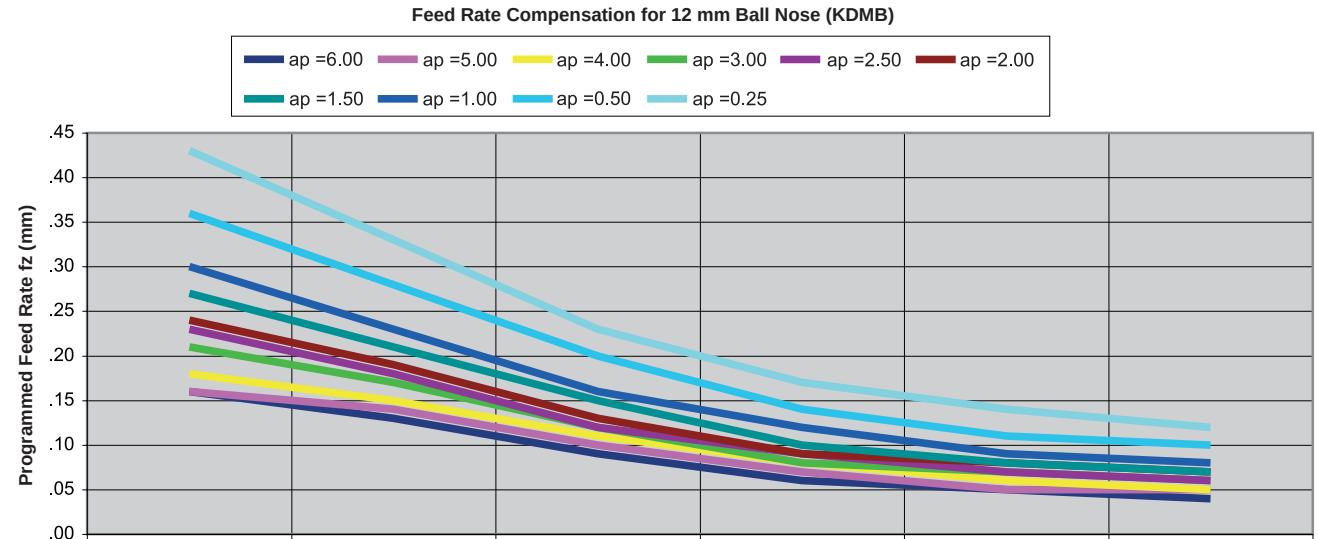
	3%	5%	10%	20%	30%	40%
5.00	.16	.13	.09	.05	.05	.04
4.00	.18	.14	.10	.07	.06	.05
3.50	.19	.15	.10	.07	.06	.05
3.00	.20	.16	.11	.08	.06	.06
2.50	.21	.17	.12	.08	.07	.06
2.00	.23	.18	.13	.09	.07	.06
1.50	.25	.20	.14	.10	.08	.07
1.00	.28	.22	.15	.11	.09	.08
0.50	.34	.26	.19	.13	.11	.09
0.25	.41	.32	.22	.16	.13	.11

Percentage of the Cutter Diameter in Cut

	Axial depth of cut for 10mm Ø									
	5,00	4,00	3,50	3,00	2,50	2,00	1,50	1,00	0,50	0,25
	Working Diameter (mm)									
Working Diameter	10,00	9,80	9,54	9,17	8,66	8,00	7,14	6,00	4,36	3,12

Recommended Starting Feeds

KDMB Ball Nose - 12,0 mm
Semi-Finish - Finishing Only



	3%	5%	10%	20%	30%	40%
6.00	.16	.13	.09	.06	.05	.04
5.00	.16	.14	.10	.07	.05	.05
4.00	.18	.15	.11	.08	.06	.05
3.00	.21	.17	.12	.08	.07	.06
2.50	.23	.18	.12	.09	.07	.06
2.00	.24	.19	.13	.09	.08	.07
1.50	.27	.21	.15	.10	.08	.07
1.00	.30	.23	.16	.12	.09	.08
0.50	.36	.28	.20	.14	.11	.10
0.25	.43	.33	.23	.17	.14	.12

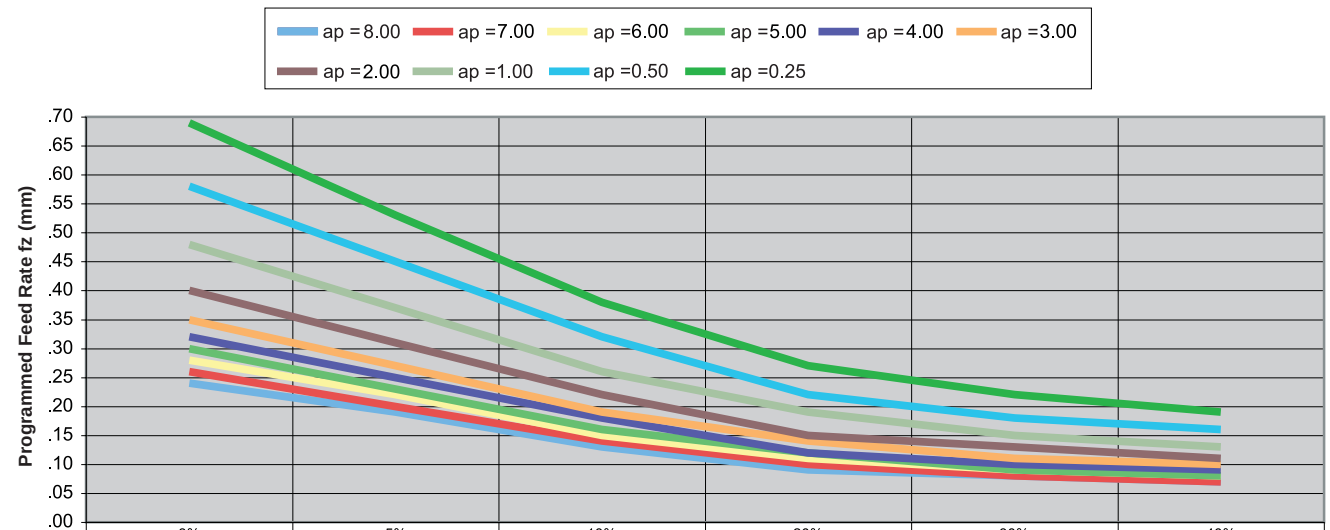
Percentage of the Cutter Diameter in Cut

	Axial depth of cut for 12mm Ø									
	6,00	5,00	4,00	3,00	2,50	2,00	1,50	1,00	0,50	0,25
	Working Diameter (mm)									
Working Diameter	12,00	11,83	11,31	10,39	9,75	8,94	7,94	6,63	4,80	3,43

Recommended Starting Feeds

KDMB Ball Nose - 16,0 mm
Semi-Finish - Finishing Only

Feed Rate Compensation for 16 mm Ball Nose (KDMB)



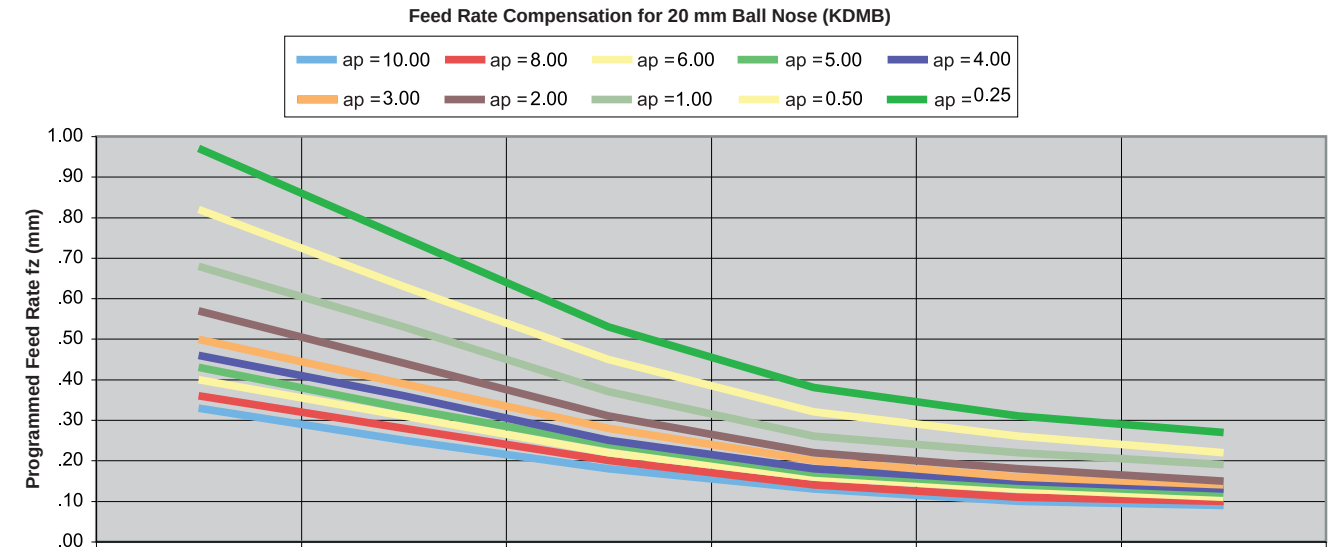
	3%	5%	10%	20%	30%	40%
8.00	.24	.19	.13	.09	.08	.07
7.00	.26	.20	.14	.10	.08	.07
6.00	.28	.22	.15	.11	.09	.08
5.00	.30	.23	.16	.12	.09	.08
4.00	.32	.25	.18	.12	.10	.09
3.00	.35	.27	.19	.14	.11	.10
2.00	.40	.31	.22	.15	.13	.11
1.00	.48	.37	.26	.19	.15	.13
0.50	.58	.45	.32	.22	.18	.16
0.25	.69	.53	.38	.27	.22	.19

Percentage of the Cutter Diameter in Cut

	Axial depth of cut for 16mm Ø									
	8,00	7,00	6,00	5,00	4,00	3,00	2,00	1,00	0,50	0,25
	Working Diameter (mm)									
Working Diameter	16,00	15,87	15,49	14,83	13,86	12,49	10,58	7,75	5,57	3,97

Recommended Starting Feeds

KDMB Ball Nose - 20,0 mm
Semi-Finish - Finishing Only



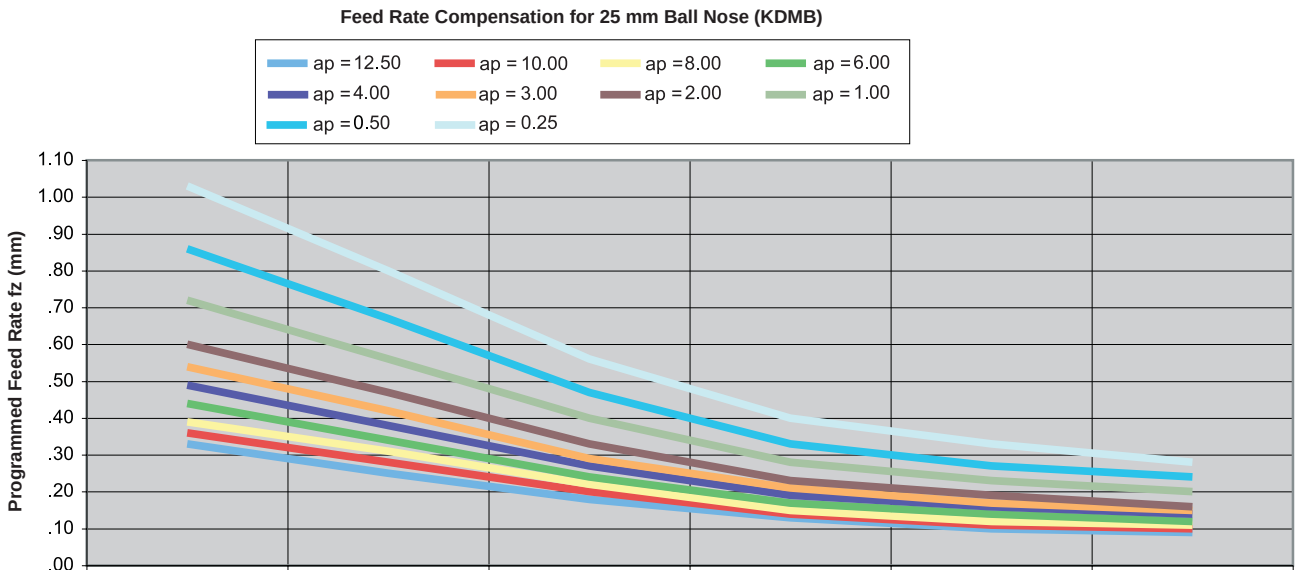
	3%	5%	10%	20%	30%	40%
10.00	.33	.25	.18	.13	.10	.09
8.00	.36	.28	.20	.14	.11	.10
6.00	.40	.31	.22	.16	.13	.11
5.00	.43	.33	.24	.17	.14	.12
4.00	.46	.36	.25	.18	.15	.13
3.00	.50	.39	.28	.20	.16	.14
2.00	.57	.44	.31	.22	.18	.15
1.00	.68	.53	.37	.26	.22	.19
0.50	.82	.63	.45	.32	.26	.22
0.25	.97	.75	.53	.38	.31	.27

Percentage of the Cutter Diameter in Cut

	Axial depth of cut for 20mm Ø									
	10,00	8,00	6,00	5,00	4,00	3,00	2,00	1,00	0,50	0,25
	Working Diameter (mm)									
Working Diameter	20,00	19,60	18,33	17,32	16,00	14,28	12,00	8,72	6,24	4,44

Recommended Starting Feeds

KDMB Ball Nose - 25,0 mm
Semi-Finish - Finishing Only



	3%	5%	10%	20%	30%	40%
Ap =12.5	.33	.25	.18	.13	.10	.09
Ap =10	.36	.28	.20	.14	.11	.10
Ap =8	.39	.31	.22	.15	.12	.11
Ap =6	.44	.34	.24	.17	.14	.12
Ap =4	.49	.38	.27	.19	.16	.14
Ap =3	.54	.42	.29	.21	.17	.15
Ap =2	.60	.47	.33	.23	.19	.16
Ap =1	.72	.56	.40	.28	.23	.20
Ap =0.5	.86	.67	.47	.33	.27	.24
Ap =0.25	1.03	.80	.56	.40	.33	.28

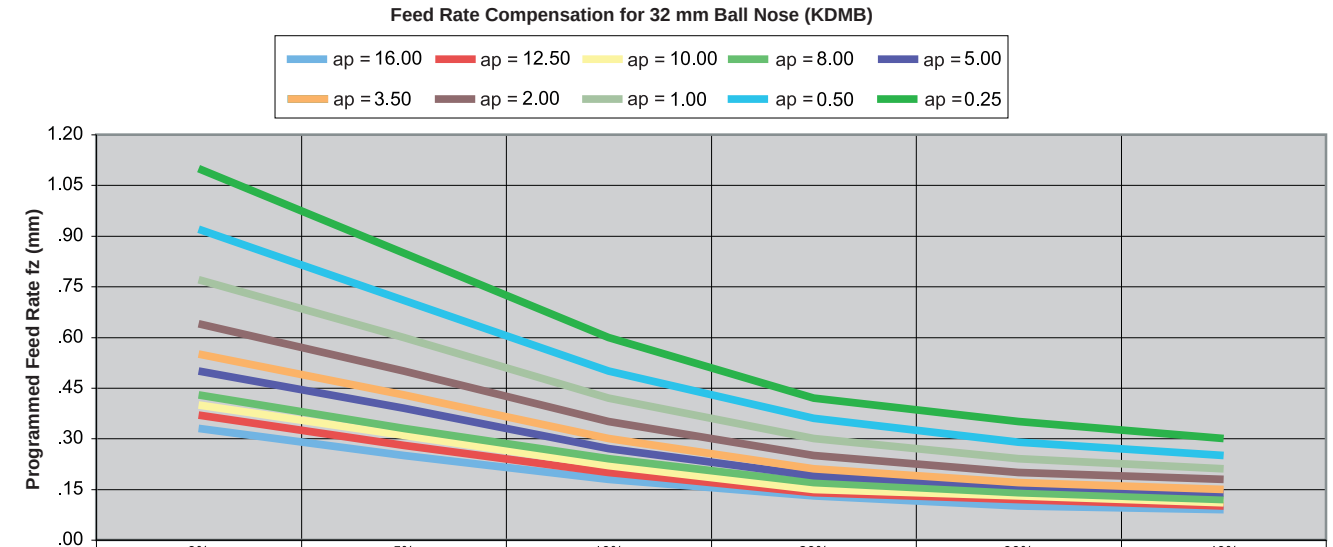
Percentage of the Cutter Diameter in Cut

	Axial depth of cut for 25mm Ø									
	12,50	10,00	8,00	6,00	4,00	3,00	2,00	1,00	0,50	0,25
	Working Diameter (mm)									
Working Diameter	25,00	24,49	23,32	21,35	18,33	16,25	13,56	9,80	7,00	4,97

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

Recommended Starting Feeds

KDMB Ball Nose - 32,0 mm
Semi-Finish - Finishing Only

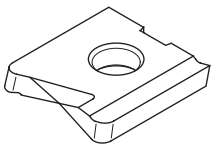


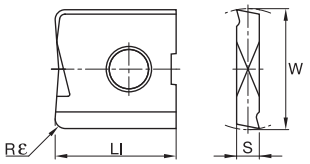
	3%	5%	10%	20%	30%	40%
16.00	.33	.25	.18	.13	.10	.09
12.50	.37	.28	.20	.14	.12	.10
10.00	.40	.31	.22	.15	.13	.11
8.00	.43	.33	.24	.17	.14	.12
5.00	.50	.39	.27	.19	.16	.14
3.50	.55	.43	.30	.21	.17	.15
2.00	.64	.50	.35	.25	.20	.18
1.00	.77	.60	.42	.30	.24	.21
0.50	.92	.71	.50	.36	.29	.25
0.25	1.10	.85	.60	.42	.35	.30

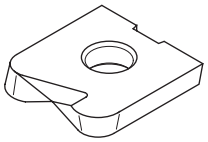
Percentage of the Cutter Diameter in Cut

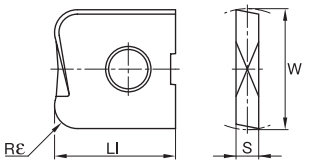
	Axial depth of cut for 32mm Ø									
	16,00	12,50	10,00	8,00	5,00	3,50	2,00	1,00	0,50	0,25
	Working Diameter (mm)									
Working Diameter	32,00	31,22	29,66	27,71	23,24	19,97	15,49	11,14	7,94	5,63

Indexable Inserts for KDMS...


KDMS-GC




KDMS-GN

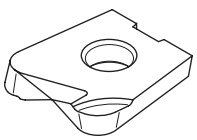


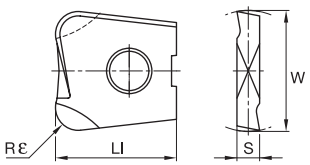
● first choice
○ alternate choice

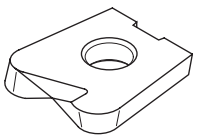
H		●					
S							
N							
K		○					
M		○	●				
P		●					

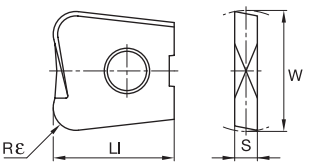
catalog number	LI	W	S	Rε	hm	KC515M	KC530M
KDMS0806ERGC	9,50	8,00	2,00	0,6	0,03	●	●
KDMS0806ERGN	9,50	8,00	2,00	0,6	0,03	●	
KDMS1008ERGC	11,50	10,00	2,50	0,8	0,03	●	●
KDMS1008ERGN	11,50	10,00	2,50	0,8	0,08	●	●
KDMS1210ERGC	14,00	12,00	2,50	1,0	0,03		●
KDMS1210ERGN	14,00	12,00	2,50	1,0	0,08	●	●
KDMS1613ERGC	16,00	16,00	3,00	1,3	0,03	●	●
KDMS1613ERGN	16,00	16,00	3,00	1,3	0,08	●	●
KDMS2016ERGC	18,00	20,00	3,00	1,6	0,03	●	
KDMS2016ERGN	18,00	20,00	3,00	1,6	0,08	●	●
KDMS2520ERGC	23,50	25,00	4,00	2,0	0,03	●	●
KDMS2520ERGN	23,50	25,00	4,00	2,0	0,08	●	●
KDMS3220ERGN	28,00	32,00	5,00	2,0	0,08	●	

Indexable Inserts for KDMT...


KDMT-GC




KDMT-GN



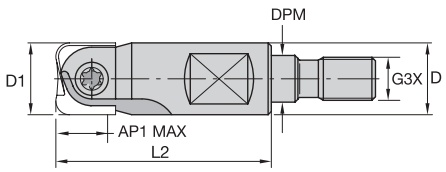
● first choice
○ alternate choice

H		●					
S							
N							
K		○					
M		○					
P		●					

catalog number	LI	W	S	Rε	hm	KC515M
KDMT1210ERGN	14,00	12,00	2,50	1,0	0,05	●
KDMT1220ERGN	14,00	12,00	2,50	2,0	0,05	●
KDMT1610ERGC	16,00	16,00	3,00	1,0	0,03	●
KDMT1610ERGN	16,00	16,00	3,00	1,0	0,05	●
KDMT1630ERGN	16,00	16,00	3,00	3,0	0,05	●
KDMT2010ERGC	18,00	20,00	3,00	1,0	0,03	●
KDMT2010ERGN	18,00	20,00	3,00	1,0	0,05	●
KDMT2040ERGN	18,00	20,00	3,00	4,0	0,05	●
KDMT2510ERGC	23,50	25,00	4,00	1,0	0,03	●
KDMT2510ERGN	23,50	25,00	4,00	1,0	0,05	●

NEW!

- Flat bottom finisher for three-dimensional milling applications.
- Enables productive, precise, and economical machining.





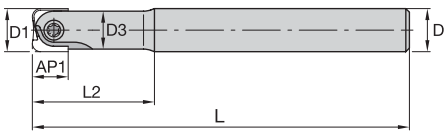
Screw-On End Mills

D1	order number	old catalog number	new catalog number	Z	Z U	G3X	DPM	D	L2	Ap1 max	Max Ramp Angle	kg	Max RPM	insert 1
12	1918665	KTCM123208HP	KDMT12R032M08SN	1	2	M08	8,5	13	30	3	3.0°	0,02	40000	KDM.12..
16	1918666	KTCM163708HP	KDMT16R037M08SN	1	2	M08	8,5	13	37	4	3.0°	0,05	40000	KDM.16..
20	1918667	KTCM203710HP	KDMT20R037M10SN	1	2	M10	10,5	18	35	5	3.0°	0,10	40000	KDM.20..
25	1918668	KTCM254212HP	KDMT25R042M12SN	1	2	M12	12,5	21	40	6	3.0°	0,10	40000	KDM.25..

Spare Parts

D1	insert screw	Torx wrench	torque (Nm)
12	193.393	KT20	4,0
16	193.392	KT20	5,0
20	193.391	KT20	6,0
25	193.390	KT30	6,5

NEW!





Necked End Mills — Cylindrical Shank — Steel

D1	order number	catalog number	Z	Z U	D	D3	L2	L	Ap1 max	Max Ramp Angle	kg	Max RPM	insert 1
12	1918690	KDMT12R130A12SN	1	2	12	10,5	34	132	3	3.0°	0,1	40000	KDM.12..
12	1918691	KDMT12R150A12SN	1	2	12	10,5	48	152	3	3.0°	0,1	40000	KDM.12..
16	1918692	KDMT16R140A16SN	1	2	16	14,0	38	142	4	3.0°	0,2	40000	KDM.16..
16	1918693	KDMT16R160A16SN	1	2	16	14,0	55	162	4	3.0°	0,2	40000	KDM.16..
20	1918694	KDMT20R160A20SN	1	2	20	18,0	47	162	5	3.0°	0,4	40000	KDM.20..
20	1918695	KDMT20R175A20SN	1	2	20	18,0	63	177	5	3.0°	0,4	40000	KDM.20..
25	1918696	KDMT25R160A25SN	1	2	25	22,4	47	162	6	3.0°	0,6	40000	KDM.25..
25	1918697	KDMT25R190A25SN	1	2	25	22,4	72	190	6	3.0°	0,7	40000	KDM.25..
32	1918698	KDMT32R175A32SN	1	2	32	28,6	58	177	8	3.0°	1,0	40000	KDM.32..
32	1918699	KDMT32R210A32SN	1	2	32	28,6	82	212	8	3.0°	1,2	40000	KDM.32..

Spare Parts

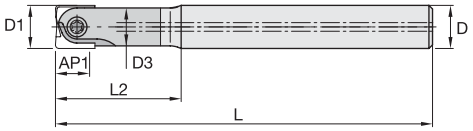
D1	insert screw	Torx wrench	torque (Nm)
12	193.393	KT20	4,0
16	193.392	KT20	5,0
20	193.391	KT20	6,0
25	193.390	KT30	6,5
32	193.389	KT30	6,5

Ordering Example:
1 x KDMT12R032M08SN
10 x KDMS1210ERGN KC515M

Flat Bottom and Back Draft Finishing End Mills

NEW!

- Flat bottom finisher for three-dimensional milling applications.
- Enables productive, precise, and economical machining.





Necked End Mills — Carbide Shank with Through Coolant

D1	order number	catalog number	Z	Z U	D	D3	L2	L	Ap1 max	Max Ramp Angle	kg	Max RPM	insert 1
12	2877384	KDMT12R120A12HNC	1	2	12	10,5	37	122	3	3.0°	0,2	40000	KDM.12..
12	2877385	KDMT12R160A12HNC	1	2	12	10,5	52	162	3	3.0°	0,2	40000	KDM.12..
16	2877386	KDMT16R140A16HNC	1	2	16	14,0	42	142	4	3.0°	0,3	40000	KDM.16..
16	2877387	KDMT16R175A16HNC	1	2	16	14,0	57	177	4	3.0°	0,4	40000	KDM.16..
20	2877388	KDMT20R140A20HNC	1	2	20	18,0	52	142	5	3.0°	0,5	40000	KDM.20..
20	2877389	KDMT20R190A20HNC	1	2	20	18,0	77	192	5	3.0°	0,7	40000	KDM.20..
25	2877390	KDMT25R160A25HNC	1	2	25	22,4	62	162	6	3.0°	0,9	30000	KDM.25..
25	2877391	KDMT25R210A25HNC	1	2	25	22,4	92	212	6	3.0°	1,2	30000	KDM.25..
32	2877392	KDMT32R190A32HNC	1	2	32	28,6	67	192	8	3.0°	1,7	30000	KDM.32..
32	2877453	KDMT32R240A32HNC	1	2	32	28,6	107	242	8	3.0°	2,0	30000	KDM.32..

Spare Parts

D1	insert screw	Torx wrench	torque (Nm)
12	193.393	KT20	4,0
16	193.392	KT20	5,0
20	193.391	KT20	6,0
25	193.390	KT30	6,5
32	193.389	KT30	6,5

Ordering Example:
1 x KDMT12R120A12HNC
10 x KDMS1210ERGN KC515M

Recommended Starting Speeds [m/min]

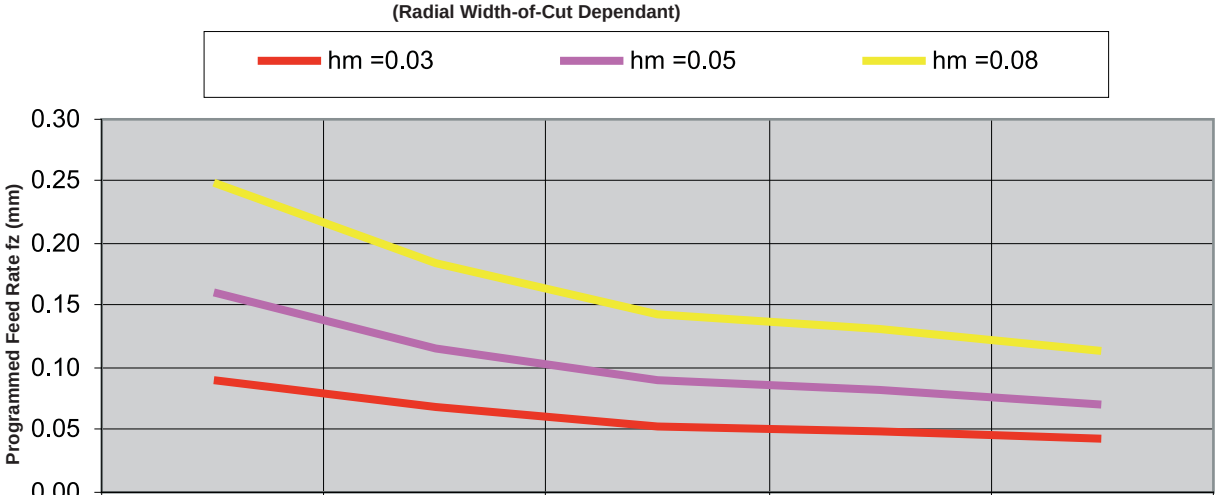
Semi-Finish and Finishing Tools - KDMS & KDMT

Material Group	KC515M			KC530M		
P1	275	**245**	215	230	**200**	170
P2	260	**230**	200	200	**170**	140
P3	230	**200**	170	170	**150**	140
P4	200	**170**	140	150	**140**	120
P5	170	**140**	110	140	**120**	110
P6	140	**110**	90	110	**90**	75
M1	275	**230**	200	230	**180**	150
M2	230	**185**	140	150	**120**	110
M3	185	**150**	120	120	**110**	90
K1	365	**275**	180			
K2	275	**215**	150			
K3	120	**90**	60			
N1						
N2						
S1						
S2						
S3						
S4						
H1	90	**60**	45			

FIRST choice starting speeds are in bold type.
As the average chip thickness goes higher the speed should be decreased.

Recommended Starting Feeds

90° (KDMT) Approach Angle Feed-Per-Tooth Compensation (Radial Width-of-Cut Dependant)



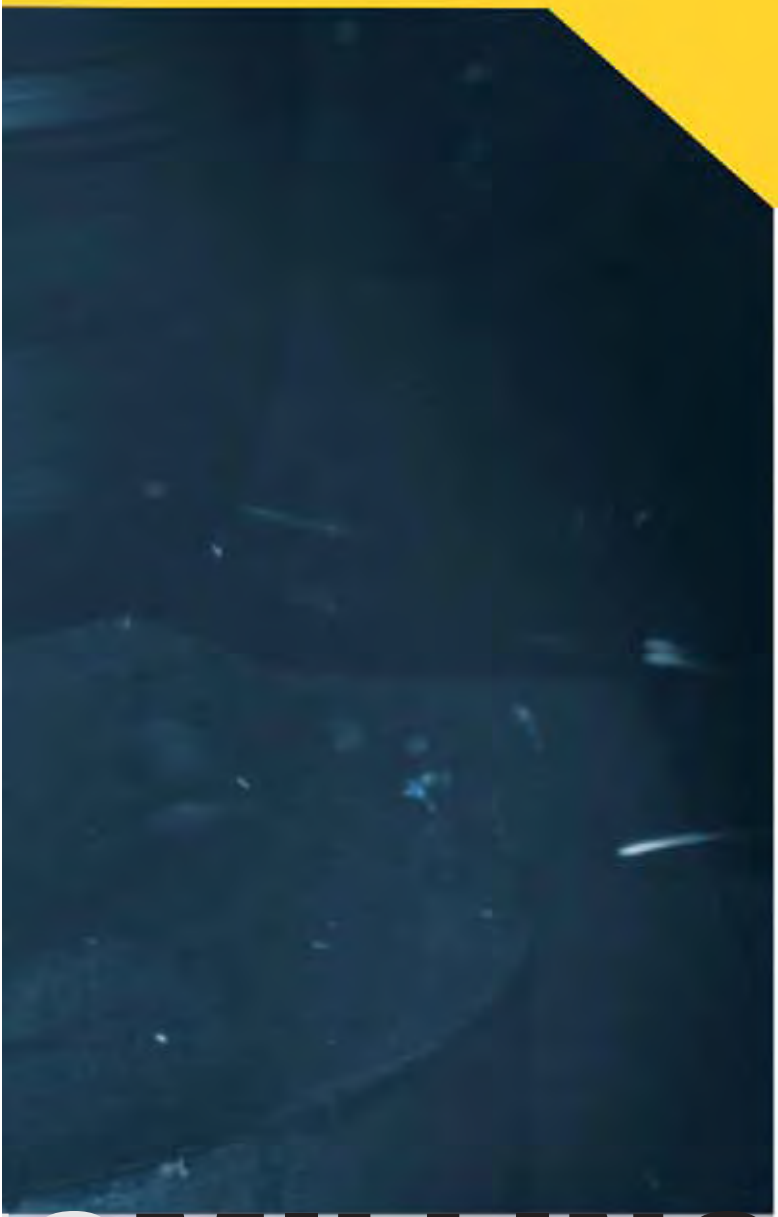
	10%	20%	30%	40%	50%
hm =0.03	0.09	0.07	0.05	0.05	0.04
hm =0.05	0.16	0.12	0.09	0.08	0.07
hm =0.08	0.25	0.18	0.14	0.13	0.11

Percentage of the Cutter Diameter in Cut


THINK **MILLING,**
THINK **KENNAMETAL.**
MILLING
MILLING
MILLIN

KENNAMETAL®

Engineering Your Competitive Edge



Ceramic Mills

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KSSR-RP High-Temp Shell Mills 486

Cutting Speed Data 487

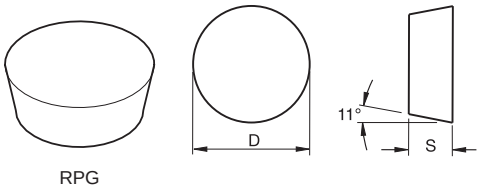


MILLING

MILLING

MILLING

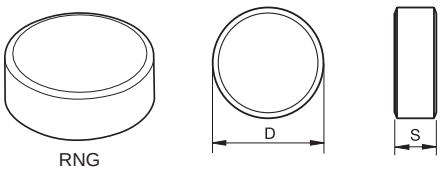
Indexable Ceramic Inserts for End Mills and Shell Mills - RPGN 1204



● first choice
○ alternate choice

				KY1540	KY2100
H					
S				●	●
N					
K					
M					●
P				●	●
catalog number	D	S	hm		
RPGN120400E	12,70	4,76	0,05	●	●

Indexable Ceramic Inserts for Shell Mills - RNGN 1207



● first choice
○ alternate choice

				KY1540	KY2100	KY4300
H						●
S				●	●	●
N						
K						
M					●	
P				●	●	
catalog number	D	S	hm			
RNGN120700E	12,70	7,94	0,10			●
RNGN120700T01020	12,70	7,94	0,10	●	●	●

Proven Solution

Ceramic Cutters

Kennametal cutter: ***KSSR050RP12CF04***
Kennametal insert: ***RPGN120400E***
Grade: ***KY2100***

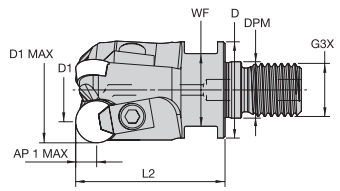
Operation: ***pocket milling in high-temp alloys***

	Kennametal	*Competitor*
cutting speed (m/min):	***610***	***23***
feed per tooth:	***0,08 mm***	***0,05 mm***
axial cutting depth:	***3,18 mm***	***3,18 mm***
time per piece:	***35 s***	***22 min***
annual costs:	***$2.397,-***	***$20.914,-***

Annual Savings: $18.516,-

NEW!

- Use on high-temp alloys, PH stainless, and stainless steels
- For dry machining with internal air cooling.





Screw-On End Mills — RPGN1204

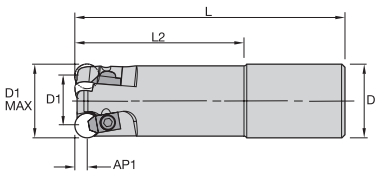
D1 max	order number	catalog number	Z	D1	D	L2	DPM	G3X	WF	Ap1 max	Max RPM
32	3101753	KIPR032RP12MF03	3	19,6	29	45	17	M16	22	6,3	20420

Spare Parts

D1 max	clamp	clamp screw	Nm
32	KCI3	129.512	6,0

NEW!

- Use on high-temp alloys, PH stainless, and stainless steels
- For dry machining with internal air cooling.





End Mills, cylindrical shank — RPGN1204

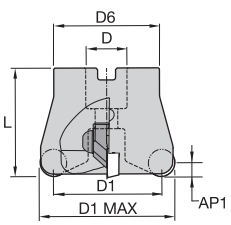
D1 max	order number	catalog number	Z	D1	D	L2	L	Ap1 max	Max RPM
32	3101754	KIPR032RP12CF03	3	19,6	32	50	110	6,3	20420
40	3101755	KIPR040RP12CF04	4	27,5	32	49	110	6,3	18260

Spare Parts

D1 max	clamp	clamp screw	Nm
32	KCI3	129.512	6,0
40	KCI3	129.512	6,0

NEW!

- First choice for face milling high-temp alloys.
- For dry machining with internal air cooling.





Shell Mills — RPGN1204

D1 max	order number	catalog number	Z	D1	D	D6	L	Ap1 max	Max RPM
50	3101756	KSSR050RP12CF04	4	37,5	16	44	50	6	16730
63	3101757	KSSR063RP12CF04	4	50,5	22	50	50	6	14900
80	3101758	KSSR080RP12CF05	5	67,5	27	60	50	6	13220
100	3101759	KSSR100RP12CF06	6	87,5	32	80	50	6	11830

Spare Parts

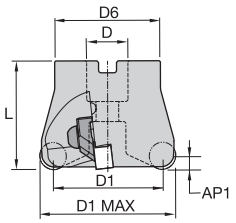
D1 max	clamp	clamp screw	Nm
50	KCI3	129.512	6,0
63	KCI3	129.512	6,0
80	KCI3	129.512	6,0
100	KCI3	129.512	6,0

Ordering Example:
1 x KIPR032RP12MF03
10 x RPGN120400E KY1540

Indexable High-Performance Shell Mills

NEW!

- First choice for face milling high-temp alloys and hard or hardened materials up to 60 HRc.





Shell Mills — RNGN 1207

D1 max	order number	catalog number	Z	D	D1	D6	L	Ap1 max	kg
50	3101760	KSSR050RN12CF03	3	16	37,3	42	50	6,0	0,38
63	3101761	KSSR063RN12CF04	4	22	50,3	54	50	6,0	0,60
80	3101762	KSSR080RN12CF05	5	27	67,3	64	50	6,0	0,96
100	3101763	KSSR100RN12CF06	6	32	87,3	84	50	6,0	1,53
125	3101764	KSSR125RN12CF07	7	40	112,3	94	63	6,0	2,70
160	3101765	KSSR160RN12CF09	9	40	147,3	114	63	6,0	4,85

Spare Parts

D1max	clamp	washer	clamp screw	Nm
50	555.205	191.279	MS1221	9,00
63	555.205	191.279	MS1221	9,00
80	555.205	191.279	MS1221	9,00
100	555.205	191.279	MS1221	9,00
125	555.205	191.279	MS1221	9,00
160	555.205	191.279	MS1221	9,00

Ordering Example:
1 x KSSR063RN12CF04
10 x RNGN120700E K74300

Recommended Starting Speeds

Ceramic round inserts RP12.. / RN12..

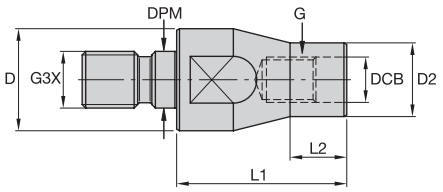
Material Group	KY2100 (up to HRc 35)		KY1540 (up to HRc 48)		KY4300 (up to 60 HRc)	
	RPGN1204	RNGN1207	RPGN1204	RNGN1207	RNGN1207	
P1						
P2						
P3						
P4						
P5	975	825	725	600		D
P6	975	825	725	600		D
M1	975	825				D
M2	915	750				D
M3	725	610				D
K1						
K2						
K3						
N1						
N2						
S1	2125	1400	900	650		D
S2	1700	900	1225	800	800	D
S3	1700	900	1225	800	800	D
S4						
H1					300	D

D = dry or air coolant

Ceramic round inserts - Metric

Calculated "Vs" Actual Chip Correction Chart

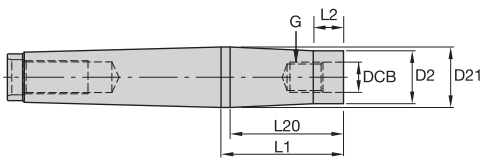
Axial Depth of cut	RPGN1204 hm = 0,05 Corrected fz	RNGN1207 hm = 0,10 Corrected fz
0,25	0,15	0,15
0,38	0,15	0,15
0,51	0,13	0,15
0,79	0,11	0,15
1,60	0,08	0,15
2,39	0,07	0,13
3,18	0,06	0,12
3,96	0,06	0,11
4,78	0,05	0,11
5,56	0,05	0,10
6,35	0,05	0,10



Screw-On Reductions for Screw-On End Mills

G3X	order number	catalog number	D	D2	DPM	DCB	L2	L1	WF	G
M10X1.5	1889148	M10M08030M	18	13,0	10,5	8,5	10	30	14,9	M8X1.25-6H
M12X1.75	1889151	M12M06060M	21	9,8	12,5	6,5	10	60	16,9	M6X1.0-6H
M12X1.75	1889154	M12M08080M	21	13,0	12,5	8,5	10	80	16,9	M8X1.25-6H
M12X1.75	1889150	M12M06040M	21	9,8	12,5	6,5	10	40	16,9	M6X1.0-6H
M12X1.75	1889153	M12M08060M	21	13,0	12,5	8,5	10	60	16,9	M8X1.25-6H
M12X1.75	1889155	M12M10035M	21	18,0	12,5	10,5	10	35	16,9	M10X1.5-6H
M12X1.75	1889156	M12M08040M	21	13,0	12,5	8,5	10	40	16,9	M8X1.25-6H
M12X1.75	1889152	M12M06080M	21	9,8	12,5	6,5	10	80	16,9	M6X1.0-6H
M16X2.0	1889161	M16M12040M	29	21,0	17,0	12,5	10	40	21,9	M12X1.75-6H
M16X2.0	1889162	M16M08060M	29	13,0	17,0	8,5	10	60	21,9	M8X1.25-6H
M16X2.0	1889158	M16M08080M	29	13,0	17,0	8,5	10	80	21,9	M8X1.25-6H
M16X2.0	1889160	M16M10080M	29	18,0	17,0	10,5	10	80	21,9	M10X1.5-6H
M16X2.0	1889159	M16M10060M	29	18,0	17,0	10,5	10	60	21,9	M10X1.5-6H
M8X1.25	1889146	M08M06025M	13	9,8	8,5	6,5	10	25	9,9	M6X1.0-6H

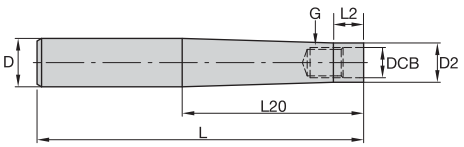
WF = width of flange.



Screw-On Extensions; Morse Taper Shank

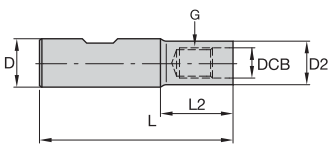
Morse Taper – Screw-On Shanks

order number	catalog number	MT	G	DCB	D2	D21	L2	L20	L1
1889094	MT3M10R100M	3	M10X1.5-6H	10,5	18	24,0	10	96,5	100
1889095	MT3M12R030M	3	M12X1.75-6H	12,5	21	24,0	10	26,5	30
1889096	MT3M12R045M	3	M12X1.75-6H	12,5	21	24,0	10	41,5	45
1889097	MT3M12R060M	3	M12X1.75-6H	12,5	21	24,0	10	56,5	60
1889098	MT3M12R075M	3	M12X1.75-6H	12,5	21	24,0	10	71,5	75
1889100	MT3M12R095M	3	M12X1.75-6H	12,5	21	24,0	10	91,5	95
1889101	MT4M12R120M	4	M12X1.75-6H	12,5	21	31,5	10	115,5	120
1895478	MT4M16R035M	4	M16X2.0-6H	17,0	29	31,5	10	30,5	35
1895481	MT4M16R080M	4	M16X2.0-6H	17,0	29	31,5	10	75,5	80
1895486	MT5M16R180M	5	M16X2.0-6H	17,0	29	45,0	10	168,6	180



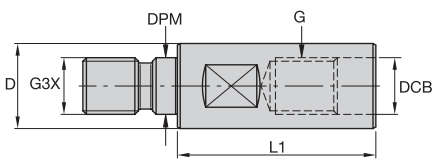
Vibration-Dampening Shank According to DIN 6535 HA

order number	catalog number	D	D2	L2	L20	L	G	DCB
1889122	SS120M06085HM	12	9,8	40,0	40,0	85,0	M6X1.0-6H	6,5
1889121	SS120M06105HM	12	9,8	60,0	60,0	105,0	M6X1.0-6H	6,5
1889120	SS120M06125HM	12	9,8	80,0	80,0	125,0	M6X1.0-6H	6,5
1889119	SS160M08088HM	16	13,0	40,0	40,0	88,0	M8X1.25-6H	8,5
1889118	SS160M08108HM	16	13,0	60,0	60,0	108,0	M8X1.25-6H	8,5
1889117	SS160M08128HM	16	13,0	80,0	80,0	128,0	M8X1.25-6H	8,5
1889115	SS160M08148HM	16	13,0	100,0	100,0	148,0	M8X1.25-6H	8,5
1889114	SS160M08168HM	16	13,0	120,0	120,0	168,0	M8X1.25-6H	8,5
1889126	SS200M10090HM	20	18,0	40,0	40,0	90,0	M10X1.5-6H	10,5
1889127	SS200M10110HM	20	18,0	60,0	60,0	110,0	M10X1.5-6H	10,5
1889125	SS200M10130HM	20	18,0	80,0	80,0	130,0	M10X1.5-6H	10,5
1889124	SS200M10150HM	20	18,0	100,0	100,0	150,0	M10X1.5-6H	10,5
1889123	SS200M10170HM	20	18,0	120,0	120,0	170,0	M10X1.5-6H	10,5



Weldon Shank According to DIN 1835 Form B

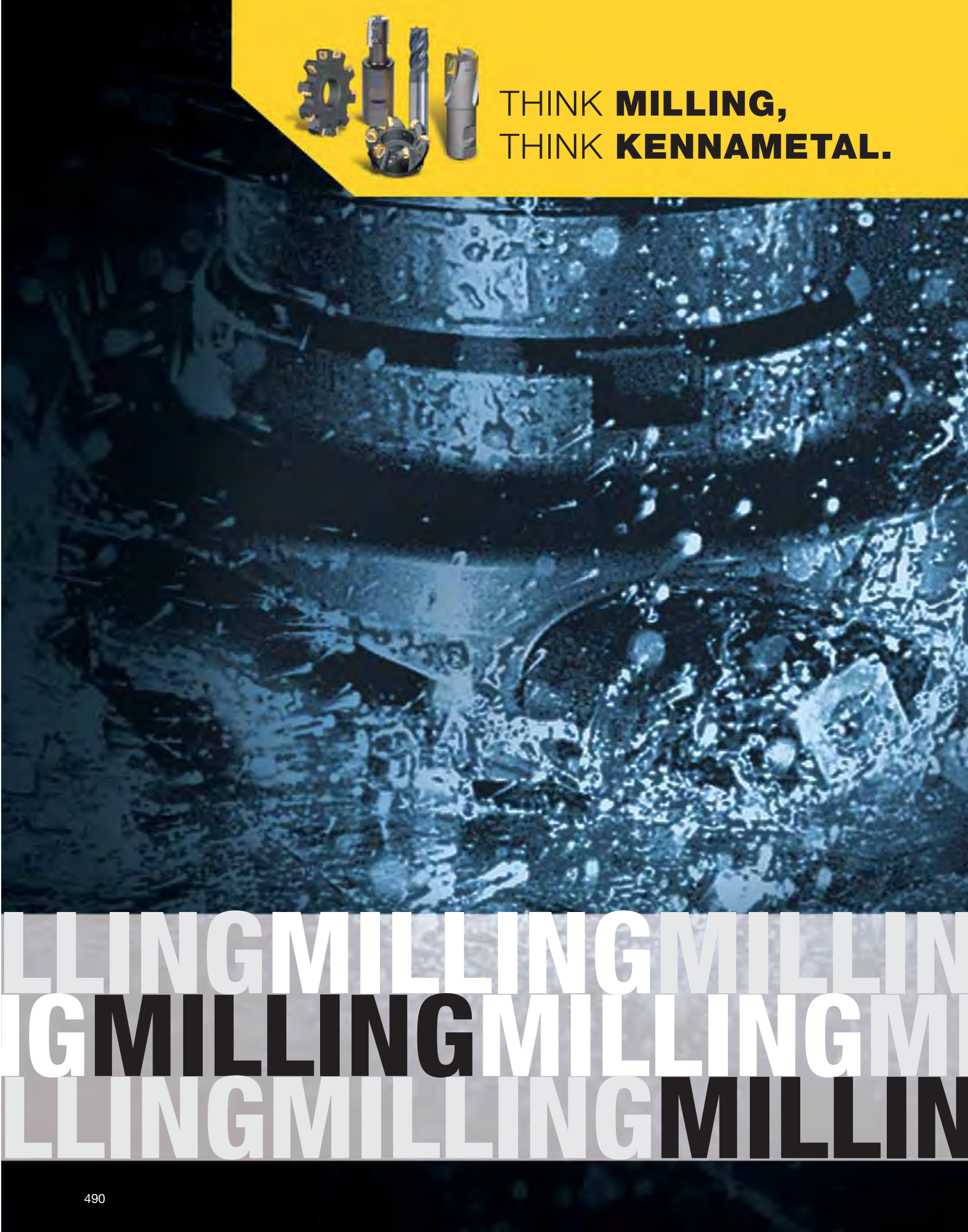
order number	catalog number	D	D2	L2	L	G	DCB
1889144	M06W10060M	10	9,8	20	60	M6	6,5
1889145	M08W16073M	16	13,0	25	73	M8	8,5
1889147	M10W20080M	20	18,0	30	80	M10	10,5
1889149	M12W25086M	25	21,0	30	86	M12	12,5
1889157	M16W32095M	32	29,0	35	95	M16	17,0



Extensions for Screw-On End Mills

G3X	order number	catalog number	D	DPM	DCB	WF	L1	G
M6X1.0	1889129	M06M06025M	9,8	6,5	6,5	6,9	25	M6X1.0-6H
M8X1.25	1889130	M08M08030M	13,0	8,5	8,5	9,9	30	M8X1.25-6H
M10X1.5	1889131	M10M10035M	18,0	10,5	10,5	14,9	35	M10X1.5-6H
M12X1.75	1889132	M12M12040M	21,0	12,5	12,5	16,9	40	M12X1.75-6H
M16X2.0	1889143	M16M16040M	29,0	17,0	17,0	21,9	40	M16X2.0-6H

WF = width of flange.


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Classic Mills

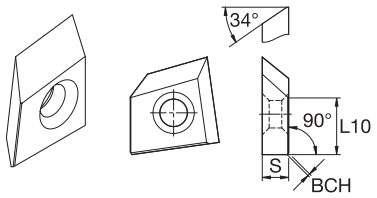
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RPF 90° 498
Centre Cutting End Mills 499



MILLING
MILLING
MILLING

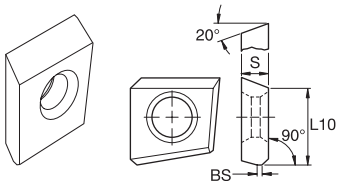
Indexable Inserts for FIX-PERFECT 4.21103..



● first choice
○ alternate choice

H	S	N	K	M	P
			●	○	●
				○	●
					●

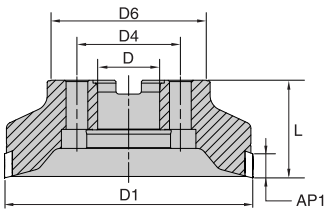
catalog number	cutting edges	L10	S	BS	BCH	hm	KC915M	KC935M	KT530M
4.21103R611	2	10,50	4,00	0,60	0,50	0,06	●	●	●
4.21103R614	2	10,50	4,00	0,60	0,50	0,06		●	
4.21103R619	2	10,50	4,00	0,60	0,50	0,1	●		



● first choice
○ alternate choice

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

catalog number	cutting edges	L10	S	BS	hm	K110M	KC915M	KC935M	KT530M
4.21503R611	2	14,50	5,00	0,70	0,06	●	●	●	●
4.21503R612	2	14,50	5,00	0,70	0,06			●	
4.21503R614	2	14,50	5,00	0,70	0,06			●	
4.21503R615	2	14,50	5,00	0,70	0,05	●			
4.21503R619	2	14,50	5,00	0,70	0,06	●	●		





Shell Mills — R311/ R313 — Coarse Pitch

D1	order number	catalog number	Z	D	D4	D6	L	Ap1 max	kg	Max RPM	insert 1
40	1247248	4.00403R311	3	16	—	33	40	10	0,2	7900	4.21103R6__
50	1247125	4.00504R311	4	16	—	33	40	10	0,3	6300	4.21103R6__
63	1191198	4.00604R311	4	22	—	42	40	10	0,5	5000	4.21103R6__
80	1191206	4.00805R313	5	27	—	50	50	14	0,8	4000	4.21503R6__
80	1191209	4.00806R313	6	27	—	50	50	14	0,8	4000	4.21503R6__
100	1247272	4.01005R313	5	32	—	60	50	14	1,3	3200	4.21503R6__
125	1191222	4.01206R313	6	40	—	75	63	14	2,5	2500	4.21503R6__
160	1247296	4.01608R313	8	40	66,7	100	63	14	4,3	2000	4.21503R6__
200	1247303	4.02010R313	10	60	101,6	130	63	14	6,7	1600	4.21503R6__

Spare Parts

D1	clamp stud	set screw	hex wrench	torque (Nm)
40	112.244	121.610	170.003	5
50	112.244	121.610	170.003	5
63	112.244	121.610	170.003	5
80	118.204	121.612	170.003	5
100	118.204	121.612	170.003	5
125	118.204	121.612	170.003	5
160	118.204	121.612	170.003	5
200	118.204	121.612	170.003	5

Shell Mills — R311/ R313 — Fine Pitch

D1	order number	catalog number	Z	D	D4	D6	L	Ap1 max	kg	Max RPM	insert 1
50	1191195	4.00505R311	5	16	—	33	40	10	0,3	6300	4.21103R6__
63	1191202	4.00606R311	6	22	—	42	40	10	0,4	5000	4.21103R6__
80	1191211	4.00808R311	8	27	—	50	50	10	0,9	4000	4.21103R6__
100	1191216	4.01007R313	7	32	—	60	50	14	1,3	3200	4.21503R6__
125	1191224	4.01208R313	8	40	—	75	63	14	2,5	2500	4.21503R6__
160	1191233	4.01610R313	10	40	66,7	100	63	14	4,3	2000	4.21503R6__

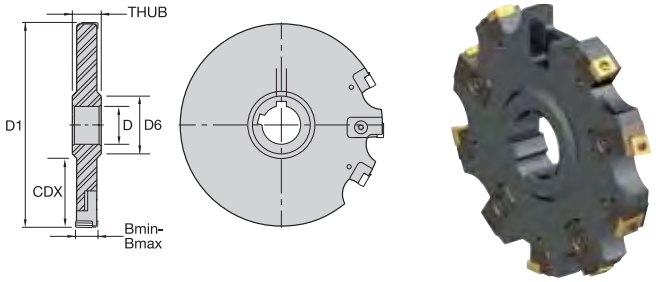
Spare Parts

D1	clamp stud	set screw	hex wrench	torque (Nm)
50	112.244	121.610	170.003	5
63	112.244	121.610	170.003	5
80	112.244	121.610	170.003	5
100	118.204	121.612	170.003	5
125	118.204	121.612	170.003	5
160	118.204	121.612	170.003	5

90° CN Slotting Cutters

Type A

- 14 mm to 18 mm maximum width of cut.
- Nominal lead angle of 0°/90°.
- Tolerances are +/- 0,05 mm.



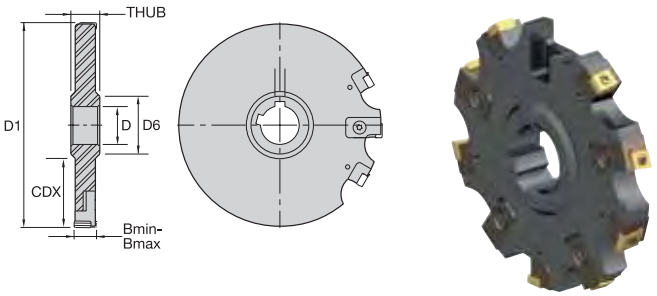
D1	order number	catalog number	Z	Z S	D	D6	CDX	THUB	B min	B max	kg	insert 1
125	1130461	125H08NS90CN10N14	8	4	40	56	32	18	14	18	1,3	CN1005
160	1130556	160H10NS90CN10N14	10	5	40	63	49	18	14	18	2,1	CN1005

Spare Parts

D1	cartridge-left hand	cartridge-right hand	cartridge screw	Torx wrench	torque (Nm)	insert screw	Torx driver	torque (Nm)	spacer
125	KCN1014L	KCN1014R	MS1308	TT25	6	MS1273	DT15	3	KS1273
160	KCN1014L	KCN1014R	MS1308	TT25	6	MS1273	DT15	3	KS1273

Spare parts must be ordered separately.

- 18 mm to 22 mm maximum width of cut.
- Nominal lead angle of 0°/90°.
- Tolerances are +/- 0,05 mm.



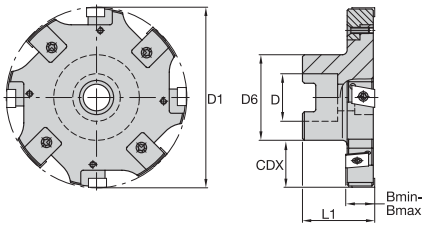
D1	order number	catalog number	Z	Z S	D	D6	CDX	THUB	B min	B max	kg	insert
125	1130468	125H08NS90CN12N18	8	4	40	56	32	22	18	22	1,7	CN1205
160	1130576	160H10NS90CN12N18	10	5	40	63	49	22	18	22	2,7	CN1205
200	1296081	200J12NS90CN12N18	12	6	50	75	62	22	18	22	4,1	CN1205
250	1129832	250J16NS90CN12N18	16	8	50	75	80	22	18	22	6,3	CN1205

Spare Parts

D1	cartridge-left hand	cartridge-right hand	cartridge screw	Torx wrench	torque (Nm)	insert screw	Torx driver	torque (Nm)	spacer
125	KCN1218L	KCN1218R	MS1309	TT25	6	MS1273	DT15	3	KS1273
160	KCN1218L	KCN1218R	MS1309	TT25	6	MS1273	DT15	3	KS1273
200	KCN1218L	KCN1218R	MS1309	TT25	6	MS1273	DT15	3	KS1273
250	KCN1218L	KCN1218R	MS1309	TT25	6	MS1273	DT15	3	KS1273

Spare parts must be ordered separately.

- 14 mm to 18 mm maximum width of cut.
- Nominal lead angle of 0°/90°.
- Tolerances are +/- 0,05 mm.



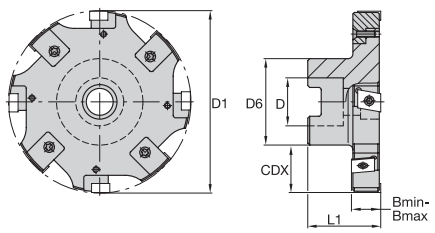
D1	order number	catalog number	Z	Z S	D	D6	CDX	L1	B min	B max	kg	insert 1
125	1130496	125Y08RS90CN10N14	8	4	32	60	32	50	14	18	1,9	CN1005
160	1130634	160Y10RS90CN10N14	10	5	40	70	42	50	14	18	2,9	CN1005
200	1176484	200Y12RS90CN10N14	12	6	40	90	52	50	14	18	4,8	CN1005

Spare Parts

D1	cartridge-left hand	cartridge-right hand	cartridge screw	Torx wrench	torque (Nm)	insert screw	Torx driver	torque (Nm)	spacer
125	KCN1014L	KCN1014R	MS1308	TT25	6	MS1273	DT15	3	KS1273
160	KCN1014L	KCN1014R	MS1308	TT25	6	MS1273	DT15	3	KS1273
200	KCN1014L	KCN1014R	MS1308	TT25	6	MS1273	DT15	3	KS1273

Spare parts must be ordered separately.

- 18 mm to 22 mm maximum width of cut.
- Nominal lead angle is 0°/90°.
- Tolerances are +/- 0,05 mm.

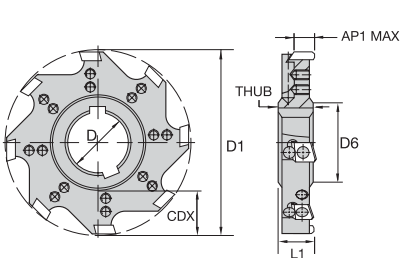


D1	order number	catalog number	Z	Z S	D	D6	CDX	L1	B min	B max	kg	insert 1
125	1124141	125Y08RS90CN12N18	8	4	32	60	32	50	18	22	2,2	CN1205
160	1130643	160Y10RS90CN12N18	10	5	40	70	42	50	18	22	3,4	CN1205
200	1296087	200Y12RS90CN12N18	12	6	40	90	52	50	18	22	5,6	CN1205

Spare Parts

D1	cartridge-left hand	cartridge-right hand	cartridge screw	Torx wrench	torque (Nm)	insert screw	Torx driver	torque (Nm)	spacer
125	KCN1218L	KCN1218R	MS1309	TT25	6	MS1273	DT15	3	KS1273
160	KCN1218L	KCN1218R	MS1309	TT25	6	MS1273	DT15	3	KS1273
200	KCN1218L	KCN1218R	MS1309	TT25	6	MS1273	DT15	3	KS1273

Spare parts must be ordered separately.





R133 — Right Hand

D1	order number	catalog number	Z	Z S	D	D6	CDX	THUB	L1	Ap1 max	kg	insert 1
100	1247560	4.91003R133	8	8	32	48	24	18	18,5	9,91	0,8	4.21103R___
125	1247588	4.91204R133	10	10	40	58	32	18	18,5	9,91	1,3	4.21103R___
160	1247574	4.91604R133	12	12	40	58	49	18	18,5	9,91	2,1	4.21103R___

Spare Parts

D1	adj. element	clamp stud	set screw	hex wrench	torque (Nm)	back-up screw
100	470.154	112.244	121.610	170.003	3	128.508
125	470.154	112.244	121.610	170.003	3	128.508
160	470.154	112.244	121.610	170.003	3	128.508

Spare parts must be ordered separately.

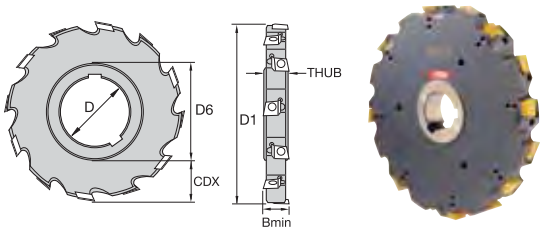
L133 — Left Hand

D1	order number	catalog number	Z	Z S	D	D6	CDX	THUB	L1	Ap1 max	kg	insert 1
100	1247583	4.91003L133	8	8	32	48	24	18	18,5	9,91	0,8	4.21103L___
125	1247568	4.91204L133	10	10	40	58	32	18	18,5	9,91	1,3	4.21103L___
160	1247571	4.91604L133	12	12	40	58	49	18	18,5	9,91	2,1	4.21103L___

Spare Parts

D1	adj. element	clamp stud	set screw	hex wrench	torque (Nm)	back-up screw
100	470.154	112.244	121.610	170.003	3	128.508
125	470.154	112.244	121.610	170.003	3	128.508
160	470.154	112.244	121.610	170.003	3	128.508

Spare parts must be ordered separately.



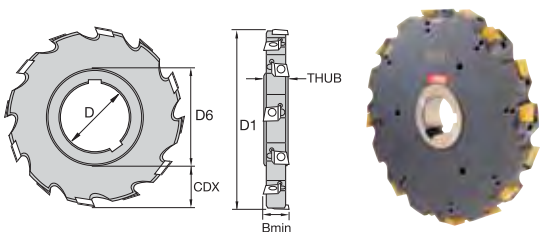
R133 — Arbor Mount — Full Side Slotting

D1	order number	catalog number	Z	Z S	D	D6	CDX	THUB	B min	kg	insert 1	insert 2
100	1247600	4.94209-400	8	4	32	48	24	14,9	16	0,6	4.21103R___	4.21103L___

Spare Parts

D1	clamp stud	set screw	hex wrench	torque (Nm)
100	112.244	121.610	170.003	3

Spare parts must be ordered separately.



R133 — Arbor Mount — Full Side Slotting

D1	order number	catalog number	Z	Z S	D	D6	CDX	THUB	B min	kg	insert 1	insert 2
125	1247561	4.91204-133	10	5	40	58	32	18,9	20	1,4	4.21103R___	4.21103L___

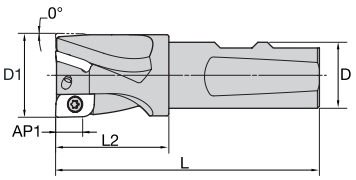
Spare Parts

D1	adj. element	clamp stud	set screw	hex wrench	torque (Nm)	back-up screw
125	470.154	112.244	121.610	170.003	3	128.508

Spare parts must be ordered separately.

RPF 90° LF..1503 End Mills and Shell Mills

- Capable of ramping, plunging, face milling, and helical interpolation of bores in solid materials.
- Nose radius of 0,4 mm; 0,8 mm; 1,2 mm; 1,6 mm; 2,0 mm; 2,4 mm; 3,2 mm; 4,0 mm; and 4,8 mm.
- Through-the-tool coolant capability.
- Combination shank identified by "X" in the catalog number.
- Cylindrical shank identified by "A" in the catalog number.





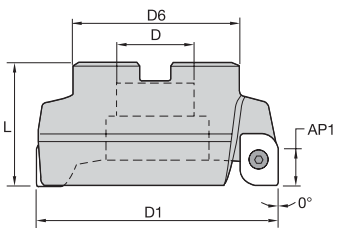
D1	order number	catalog number	Z	D	L2	L	Ap1 max	Max Ramp Angle	kg	Max RPM
32	1833438	32A3R043A25SLF10	3	25	43	100	10	17.0°	0,3	15400
32	1024606	32A3R043X25SLF10	3	25	43	100	10	17.0°	0,3	15400
32	1833439	32A3R063A25SLF10	3	25	63	120	10	17.0°	0,5	15400
32	1833441	32A3R079A32SLF10	3	32	79	140	10	17.0°	0,7	15400
32	1024610	32A3R079X32SLF10	3	32	79	140	10	17.0°	0,7	15400

Spare Parts

D1	insert screw	Torx wrench	torque (Nm)
32	MS1589	TT15	3

Spare parts must be ordered separately.

- Capable of ramping, plunging, face milling, and helical interpolation of bores in solid materials.
- Nose radius of 0,4 mm; 0,8 mm; 1,2 mm; 1,6 mm; 2,0 mm; 2,4 mm; 3,2 mm; 4,0 mm; and 4,8 mm.
- Through-the-tool coolant capability.





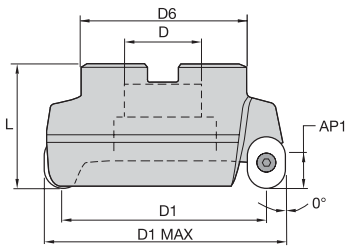
D1	order number	catalog number	Z	D	D6	L	Ap1 max	Max Ramp Angle	kg	Max RPM	insert 1
40	1024443	40A03RS90LF10	3	16	38,7	50	10	11.0°	0,2	13800	LFEW150308R
50	1024477	50A04RS90LF10	4	22	42,0	50	10	8.0°	0,3	12350	LFEW150308R

Spare parts must be ordered separately.

Spare Parts

D1	insert screw	Torx wrench	torque (Nm)
40	MS1589	TT15	1,5
50	MS1589	TT15	1,5

- Capable of ramping, plunging, face milling, and helical interpolation of bores in solid materials.
- Nose radius is 8,0 mm.
- Through-the-tool coolant capability.



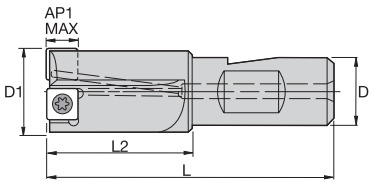


D1 max	order number	catalog number	Z	D	D1	D6	L	Ap1 max	Max Ramp Angle	kg	Max RPM	insert 1
63	1024613	47A04RS90LF22	4	22	47,4	42,0	50	11,0	11°	0,7	10770	LFHW220480
80	1024655	64B05RS90LF22	5	27	64,4	66,6	50	11,0	8°	0,9	9560	LFHW220480

Spare Parts

D1 max	insert screw	Torx driver	torque (Nm)
63	MS1129	DT15	3
80	MS1129	DT15	3

Spare parts must be ordered separately.





End Mills

D1	order number	catalog number	Z	Z U	D	L2	L	Ap1 max	insert 1	insert 2
12	1191270	4.31012R160	1	1	16	18,5	80	5,5	COGX06T104R	—
15	1244329	4.31415R200	2	1	20	19,2	95	5,5	SPGX0602AP	XCGX060204R
16	1191273	4.31416R200	2	1	20	19,4	95	5,5	XCGX060204R	SPGX0602AP
18	1231816	4.31418R200	2	1	20	24,6	100	5,5	SPGX0602AP	CCGX060204N
18	1244333	4.31218R200	2	1	20	29,6	110	5,0	SPGX0602AP	—
20	1191272	4.31220R200	2	1	20	36,7	120	5,0	SPGX0602AP	—
20	1191274	4.31420R200	2	1	20	36,9	120	5,5	CCGX060204N	SPGX0602AP
25	1191275	4.31425R250	2	1	25	41,8	130	8,5	CCGX09T308R	SPGX0903AP
26	1231842	4.31226R250	2	1	25	37,9	130	8,0	SPGX0903AP	—
32	1191276	4.31432R320	2	1	32	41,8	130	11,5	CCGX120412R	SPGX12T3AP
32	1197550	4.31132R320	2	1	32	42,0	130	11,5	SPGX12T3AP	APFX1604PDR
40	1191271	4.31140R320	4	2	32	45,1	135	15,0	APFX1604PDR	SPGX0903AP

Spare Parts

D1	insert screw	wrench	torque (Nm)
12	192.667	170.023	1
15	192.416	170.023	1
16	192.416	170.023	1
18	192.416	170.023	1
18	192.416	170.023	1
20	192.416	170.023	1
20	192.416	170.023	1
25	191.924	170.024	2
26	191.924	170.024	2
32	191.848	170.025	3
32	191.848	170.025	3
40	191.916	170.025	4



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Thread Mills

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Application Information *516*



For ISO Internal Threads

Thread	Tap hole fl (mm)	Indexable insert	Largest milling cutter[1]
M11 x 0,75	10,19	STN10075ISO-I	9X1R .. STN10M
M12	10,11	STN10175ISO-I-C	9X1R015B20-STN10C
M12 x 1,00	10,92	STN10100ISO-I	9X1R .. STN10M
M14	11,84	STN11200ISO-I-C	11X1R .. STN11N
M16	13,84	STN11200ISO-I-C	11X1R .. STN11N
M20	17,29	STN16250ISO-I-C	15X1R020B16-STN16C
M20 x 1,50	18,38	STN11150ISO-I	11X1R .. STN11N
M20 x 1,00	18,92	STN11100ISO-I	11X1R .. STN11N
M22	19,29	STN22250ISO-I-C	18X1R030B25-STN22C
M24	20,75	STN22300ISO-I-C	18X1R030B25-STN22C
M24 x 2,00	21,84	STN16200ISO-I	17X1R022B16-STN16N
M24 x 1,50	22,38	STN11150ISO-I	11X1R .. STN11N
M24 x 1,50	22,38	STN16150ISO-I	17X1R022B16-STN16N
M27	23,75	STN22300ISO-I-C	18X1R030B25-STN22C
M30	26,21	STN27350ISO-I-C	25X1R040B25-STN27C
M30 x 2,00	27,84	STN16200ISO-I	22X1R025B25-STN16L
M33	29,21	STN27350ISO-I-C	25X1R040B25-STN27C
M33 x 2,00	30,84	STN16200ISO-I	22X1R025B25-STN16L
M33 x 1,50	31,38	STN16150ISO-I	22X1R025B25-STN16L
M35 x 1,50	33,38	STN16150ISO-I	22X1R025B25-STN16L
M36	31,67	STN27400ISO-I-C	30X1R052B25-STN27N
M36 x 3,00	32,75	STN27300ISO-I-C	30X1R052B25-STN27N
M36 x 2,00	33,84	STN16200ISO-I	22X1R025B25-STN16L
M39	34,67	STN27400ISO-I-C	30X1R052B25-STN27N
M39 x 3,00	35,75	STN27300ISO-I-C	30X1R052B25-STN27N
M39 x 2,00	36,84	STN27200ISO-I	30X1R052B25-STN27N
M42	37,13	STN27450ISO-I-C	30X1R052B25-STN27N
M42 x 2,00	39,84	STN27200ISO-I	30X1R052B25-STN27N
M45	40,13	STN27450ISO-I-C	30X1R052B25-STN27N
M45 x 2,00	42,84	STN27200ISO-I	37X1R .. STN27N or L
M48	42,59	STNB38 500ISO-I	35X1R055B32-STNB38N
M48 x 3,00	44,75	STN27300ISO-I	30X1R052B25-STN27N
M48 x 2,00	45,84	STN27200ISO-I	37X1R058B32-STN27N or L
M52	46,59	STNB38 500ISO-I	35X1R055B32-STNB38N
M55 x 2,00	52,84	STN27200ISO-I	37X1R .. STN27N or L
M55 x 1,50	53,38	STN27150ISO-I	37X1R .. STN27N or L
M56	50,05	STNB38550ISO-I	35X1R055B32-STNB38N
M56 x 4,00	51,67	STNB38400ISO-I	35X1R055B32-STNB38N
M56 x 2,00	53,84	STN27200ISO-I	37X1R .. STN27N or L
M60	54,05	STNB38550ISO-I	35X1R055B32-STNB38N
M64	57,51	STNB38600ISO-I	35X1R055B32-STNB38N
M64 x 4,00	59,67	STNB38400ISO-I	46X1R100B40-STNB38L
M64 x 4,00	59,67	STN27400ISO-I	37X1R .. STN27N or L
M68	61,51	STNB38600ISO-I	46X1R100B40-STNB38L
M68 x 4,00	63,67	STN27400ISO-I	37X1R .. STN27N or L
M68 x 3,00	64,75	STN27300ISO-I	37X1R .. STN27N or L
M72 x 6,00	65,51	STNB38600ISO-I	46X1R100B40-STNB38L
M72 x 4,00	67,67	STN27400ISO-I	37X1R .. STN27N or L
M72 x 3,00	68,75	STN27300ISO-I	37X1R .. STN27N or L
M72 x 2,00	69,84	STN27200ISO-I	37X1R .. STN27N or L

1) Only possible milling cutter for ISO-I-C thread

Thread	Tap hole fl (mm)	Indexable insert	Largest milling cutter[1]
1/2 - 13UNC	10,58	STN1113UN-I	10X1R015B20-STN11C
9/16 - 24UNEF	13,14	STN1024UN-I	9X1R .. STN10M
9/16 - 18UNF	12,76	STN1018UN-I	9X1R .. STN10M
5/8 - 24UNEF	14,73	STN1124UN-I	11X1R .. STN11N
5/8 - 18UNF	14,35	STN1118UN-I	11X1R .. STN11N
3/4 - 20UNEF	17,68	STN1120UN-I	11X1R .. STN11N
3/4 - 16UNF	17,33	STN1116UN-I	11X1R .. STN11N
7/8 - 20UNEF	20,85	STN1620UN-I	17X1R .. STN16N
7/8 - 14UNF	20,26	STN1114UN-I	11X1R .. STN11N
1 - 20UNEF	24,03	STN1620UN-I	20X1R .. STN16N
1 - 16UN	23,68	STN1616UN-I	18X1R030B25-STN22C
1 - 12UNF	23,11	STN1612UN-I	17X1R .. STN16N
1 1/8 - 18UNEF	27,05	STN1618UN-I	22X1R .. STN16L
1 1/8 - 12UNF	26,28	STN1612UN-I	22X1R .. STN16L
1 1/4 - 18UNEF	30,22	STN1618UN-I	22X1R .. STN16L
1 1/4 - 12UNF	29,46	STN1612UN-I	22X1R .. STN16L
1 3/8 - 18UNEF	33,40	STN1618UN-I	22X1R .. STN16L
1 3/8 - 12UNF	32,63	STN1612UN-I	22X1R .. STN16L
1 1/2 - 18UNEF	36,57	STN2718UN-I	30X1R .. STN27N or L
1 1/2 - 12UNF	35,81	STN2712UN-I	30X1R .. STN27N or L
1 5/8 - 18UNEF	39,75	STN2718UN-I	30X1R .. STN27N or L
1 3/4 - 16UN	42,73	STN2716UN-I	30X1R052B25-STN27N
1 7/8 - 12UN	45,33	STN2712UN-I	37X1R .. STN27N or L
2 - 8UN	47,36	STN278UN-I	37X1R .. STN27N or L
2 - 4 1/2UNC	44,69	STNB3845UN-I	35X1R055B32-STNB38N
2 1/4 - 16UN	55,43	STN2716UN-I	37X1R .. STN27N or L
2 1/4 - 8UN	53,71	STN278UN-I	37X1R .. STN27N or L
2 1/4 - 4 1/2UNC	51,04	STNB3845UN-I	35X1R055B32-STNB38N
2 1/2 - 8UN	60,06	STN278UN-I	37X1R .. STN27N or L
2 1/2 - 4UNC	56,63	STNB384UN-I	35X1R055B32-STNB38N
2 3/4 - 12UN	67,56	STN2712UN-I	37X1R .. STN27N or L
2 3/4 - 4UNC	62,98	STNB384UN-I	46X1R100B40-STNB38L
3 - 16UN	74,48	STN2716UN-I	37X1R .. STN27N or L
3 - 4UNC	69,33	STNB386UN-I	46X1R100B40-STNB38L

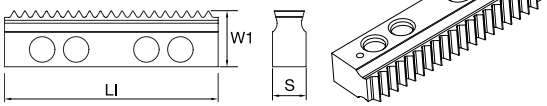
Whitworth pipe thread (internal) to DIN 259

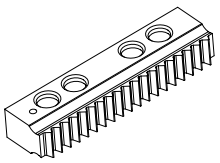
Thread	Tap hole fl (mm)	Indexable insert	Largest milling cutter[1]
R 5/8	20,59	STN1614BSW	17X1R022B16-STN16N
R 3/4	24,12	STN1614BSW	20X1R043B20-STN16N
R 7/8	27,88	STN1614BSW	22X1R025B25-STN16L
R 1	30,29	STN1611BSW	22X1R025B25-STN16L
R 1 1/8	34,94	STN2711BSW	30X1R052B25-STN27N
R 1 1/4	38,95	STN2711BSW	30X1R052B25-STN27N
and larger		STN2711BSW	30X1R052B25-STN27N

1) Only possible milling cutter for ISO-I-C thread

TMS — Thread Milling

NEW!





● first choice
○ alternate choice

H	○	●
S		●
N	●	
K	●	
M	○	●
P	●	○

catalog number	thread pitch mm	LI	W1	S	KC610M	KC635M
TM25N100ISO	1,0	25,00	7,62	3,56	●	●
TM25N150ISO	1,5	25,00	7,62	3,56	●	●
TM25N200ISO	2,0	25,00	7,62	3,56	●	●
TM25N250ISO	2,5	25,00	7,62	3,56	●	●
TM25N300ISO	3,0	25,00	7,62	3,56	●	●

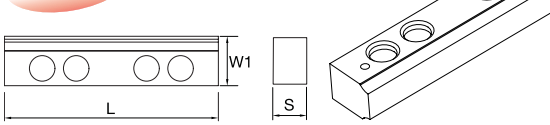
catalog number	tpi	LI	W1	S	KC610M	KC635M
TM25N8UN	8	25,00	7,62	3,56	●	●
TM25N9UN	9	25,00	7,62	3,56	●	●
TM25N10UN	10	25,00	7,62	3,56	●	●
TM25N12UN	12	25,00	7,62	3,56	●	●
TM25N14UN	14	25,00	7,62	3,56	●	●
TM25N16UN	16	25,00	7,62	3,56	●	●
TM25N18UN	18	25,00	7,62	3,56	●	●
TM25N20UN	20	25,00	7,62	3,56	●	●

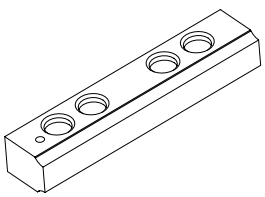
catalog number	tpi	LI	W1	S	KC610M	KC635M
TM25EN11W	11	25,00	7,62	3,56	●	●
TM25EN12W	12	25,00	7,62	3,56	●	●
TM25EN14W	14	25,00	7,62	3,56	●	●
TM25EN16W	16	25,00	7,62	3,56	●	●

catalog number	tpi	LI	W1	S	KC610M	KC635M
TM25EN115NPT	11.5	25,00	7,62	3,56	●	●
TM25EN14NPT	14	25,00	7,62	3,56	●	●

catalog number	LI	W1	S	KC610M	KC635M
TM25EN11BSPT	25,00	7,62	3,56	●	●
TM25EN14BSPT	25,00	7,62	3,56	●	●

NEW!

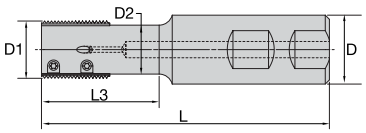




catalog number	L	W1	S
TM25BLANK	25,00	5,59	3,56

This insert is a **plug** and cannot be ground to make another thread profile.

NEW!





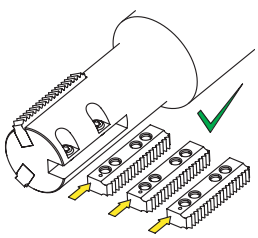
- Cutting diameter ranges from 17 mm to 30 mm.
- For internal and external threading on most types of workpiece materials.
- One tool is used for both right-hand and left-hand threads.
- All cutters have through-coolant capability.
- Utilizes inserts with various profiles and pitches.

Thread Mill — Normal Shank

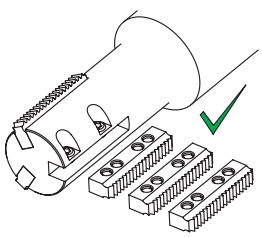
D1	order number	catalog number	Z	D	D2	L3	L	insert screw	Torx plus driver	torque Nm
17,0	3030846	TM25D17L36Z2	2	25	14,0	36	95	TM25INSERTSCREW	DT8IP	4
17,0	3030845	TM25D17L26Z2	2	25	14,0	26	85	TM25INSERTSCREW	DT8IP	4
20,5	3030848	TM25D20L37Z3	3	25	16,7	37	96	TM25INSERTSCREW	DT8IP	4
20,5	3030849	TM25D20L44Z3	3	25	16,7	44	103	TM25INSERTSCREW	DT8IP	4
22,0	3030852	TM25D22L55Z3	3	25	18,0	55	114	TM25INSERTSCREW	DT8IP	4
22,0	3030850	TM25D22L43Z3	3	25	18,0	43	102	TM25INSERTSCREW	DT8IP	4
30,0	3031703	TM25D30L55Z5	5	25	26,0	55	115	TM25INSERTSCREW	DT8IP	4
30,0	3031705	TMC25D30L80Z4	4	25	26,0	80	140	TM25INSERTSCREW	DT8IP	4

Toolholder	Thread Application per Toolholder Min. Thread Ø					
	D1 (mm)	ISO (coarse)	ISO (fine)	UNC	UN/UNF/UNEF/UNS	BSF
TM25D17L26Z2 TM25D17L36Z2	17.	M20 x 2.5	M19 x 1; M19 x 1.5; M20 x 2.	3/4-10	7/8-10UNS; 13/16-12UN; 7/8-14UNF; 3/4-16UNF; 3/4-18UNS; 3/4-20UNEF;	7/8-11; 7/8-12; 7/8-14; 7/8-16
TM25D20L37Z3 TM25D20L44Z3	20.5	M24 x 3.0	M22 x 1.; M23 x 1.5; M23 x 2.; M23.5 x 2.5	1-8	15/16-9UN; 1.0-10UNS; 15/16-12UN 1.0-14UNS; 15/16-16UN; 7/8-18UNS; 7/8-20UNEF;	1.-11; 1.-12; 1.-14; 1.-16
TM25D22L43Z3 TM25D22L55Z3	22	M27 x 3.0	M24 x 1.; M24 x 1.5; M25 x 2.; M25 x 2.5		11/16-8UN; 1.0-9UN; 1.0-10UNS; 1.0-12UNF 1.0-14UNS; 1.0-16UN; 1.0-18UN; 15/16-20UNEF	1-11; 1-12; 1-14; 1-16
TM25D30L55Z5 TMC25D30L80Z4	30		M32 x 1.; M32 x 1.5; M33 x 2.; M33 x 2.5; M34 x 3		1 3/8-8UN; 1 3/8-9UN; 1 3/8-10UN; 1 5/16-12UN; 1 3/8-14UNS; 1 5/16-16UN; 1 5/16-18UNEF; 1 5/16-20UN	1 3/8-11; 1 3/8-12; 1 3/8-14; 1 3/8-16

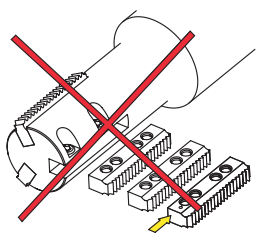
Kennametal threadmill software: TM - CNC Generator
www.kennametal.com/EN/support/software.jthml



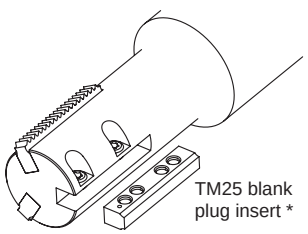
Side with identification marks



Side without identification marks



Always mount all inserts on the same side

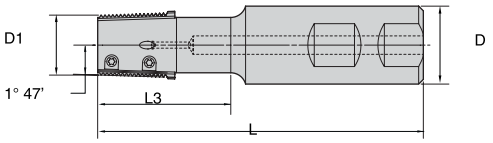


* When not using an insert in each pocket, protect the pocket by using a TM25 blank.

Ordering Example:
1 x TM25D17L26Z2
10 x TM25N200ISO KC610

Indexable End Mills — Conical Thread

NEW!





- Cutting diameter ranges from 17 mm to 28 mm.
- For internal and external threading on most types of workpiece materials.
- One tool is used for both right-hand and left-hand threads.
- All cutters have through-coolant capability.
- Utilizes inserts with various profiles and pitches.

Thread Mill — Conical Thread

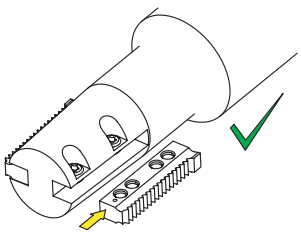
D1	order number	catalog number	Z	D	L3	L	insert screw	Torx plus driver	Torque Nm
14	3030847	TMT25D17L26Z2	2	25	26	85	TM25INSERTSCREW	DT8IP	4
18	3030851	TMT25D22L43Z3	3	25	43	102	TM25INSERTSCREW	DT8IP	4
26	3031704	TMT25D28L43Z4	4	25	43	103	TM25INSERTSCREW	DT8IP	4

Toolholder		Thread Application per Toolholder Min. Thread Ø		
	D1 (mm)	NPT	NPTF	BSPT
TMT25D17L26Z2	17.1	1/2-14; 3/4-14; 1-11.5; 2-11.5	1/2-14; 3/4-14; 1-11.5; 2-11.5	1/2-14; 3/4-14; 1-11; 1 1/4-11; 1 1/2-11; 2-11
TMT25D22L43Z3	22	3/4-14; 1-11.5; 2-11.5	3/4-14; 1-11.5; 2-11.5	3/4-14; 1-11; 1 1/4-11;1 1/2-11; 2-11; 2 1/2-11; 3-11; 4-11; 5-11; 6-11
TMT25D28L43Z4	28	1-11.5; 2-11.5	1-11.5; 2-11.5	1-11; 1 1/4-11; 1 1/2-11; 2-11; 2 1/2-11; 3-11; 4-11; 5-11; 6-11

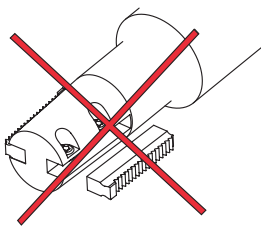
On conical inserts the identification mark must be face up

Kennametal threadmill software: TM - CNC Generator

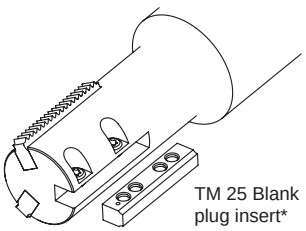
www.kennametal.com/EN/support/software.jthml



On conical inserts the identification mark must be face up



Insert loaded incorrectly



TM 25 Blank plug insert*

* When not using an insert in each pocket, protect the pocket by using a TM25 blank.

Ordering Example:
1 x TMT25D17L26Z2
10 x TM25N8UN KC610M

Kennametal (NEW) Threadmill (TM Inserts)

Materials	Brinell	Surface Speeds		Indexable Inserts
Steel	HB	KC610M	KC635M	Feed f (mm/tooth)
P1	125	100 - 210	90 - 180	0,05 - 0,20
P2	180	100 - 170	90 - 160	0,05 - 0,20
P3	225	60 - 130	70 - 115	0,05 - 0,20
P4	250	80 - 150	80 - 160	0,05 - 0,20
P5	275	75 - 130	80 - 160	0,05 - 0,15
P6	325	70 - 110	60 - 100	0,05 - 0,10
Stainless Steel				
M1	180	100 - 170	120 - 180	0,05 - 0,10
M2	250	70 - 140	100 - 140	0,05 - 0,10
M3	330	70 - 120	100 - 120	0,05 - 0,10
Cast Iron				
K1	180	60 - 130	100 - 120	0,02 - 0,08
K2	220	60 - 125	80 - 100	0,05 - 0,15
K3	260	50 - 90	60 - 90	0,05 - 0,10
Non Ferrous				
N1	60 - 100	100 - 250	-	0,05 - 0,25
High Temp alloys				
S1	200	20 - 45	20 - 40	0,05 - 0,10
S2	250	20 - 30	20 - 30	0,02 - 0,05
S3	280	15 - 20	15 - 20	0,02 - 0,05
S4	350	10 - 15	10 - 15	0,02 - 0,05
Hardened Steel				
H1	55HRc	20 - 45	20 - 45	0,01 - 0,03

Kennametal threadmill software: TM - CNC Generator
www.Kennametal.com/EN/support/software.JTHML

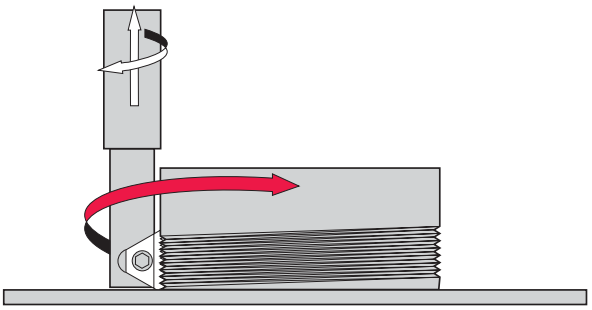


Thread Milling System (TMS)

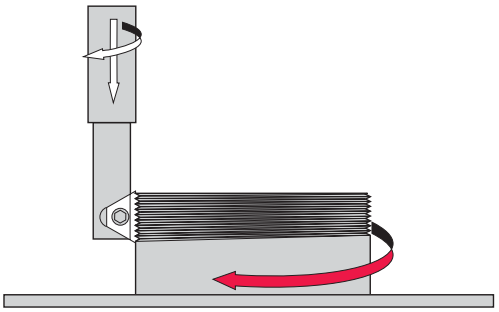
The following are a few thread milling methods (work directions).

NOTE: Climb milling results in lower cutting forces, better chip development, higher thread surface quality, and longer insert life. Therefore, it should be used whenever possible. But, in the case of some hardened materials or when milling certain difficult-to-machine exotic materials, conventional milling may be preferred.

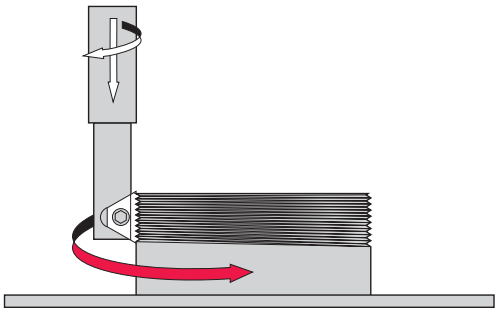
Methods of External Thread Milling



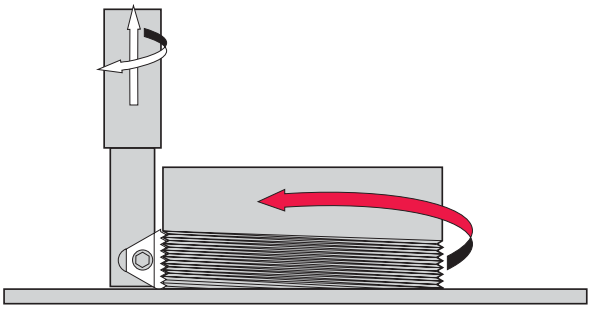
right-hand thread... conventional milling



right-hand thread... climb milling

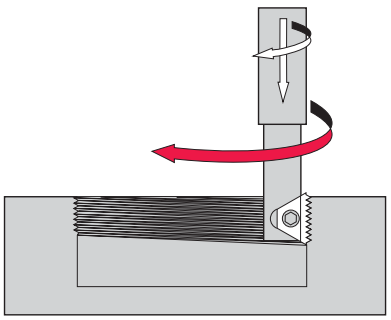


left-hand thread... conventional milling

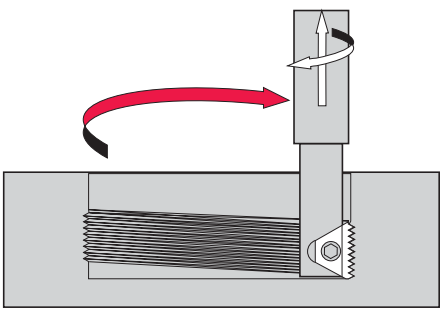


left-hand thread... climb milling

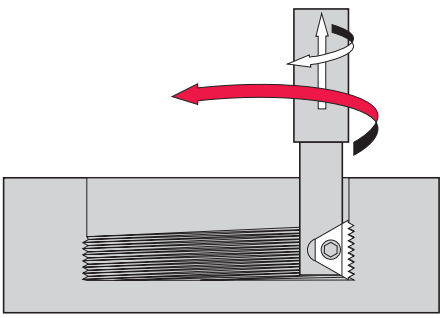
Methods of Internal Thread Milling



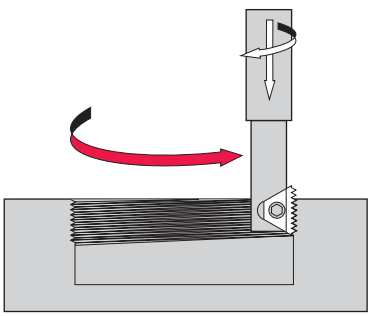
right-hand thread... conventional milling



right-hand thread... climb milling



left-hand thread... conventional milling



left-hand thread... climb milling

1.
Insert Type/IC Size

Type		IC
STN10	=	.236"
STN11	=	1/4"
STN16	=	3/8"
STN27	=	5/8"
STNB38	=	3/4"
LT11	=	1/4"

3.
Thread Profile

UN — American UN (Unified National)

ISO — ISO metric

BSW — British BSW (Whitworth 55°)

NPT — American National Pipe Taper

NPTF — American National Pipe Taper "Dryseal"

BSPT — British Standard Pipe Taper

NPS — American National Pipe Straight

5.
Grade

KC610M
steels and stainless

KC620M
non-ferrous

KC635M
high-temp, steel, and stainless

STN 16 **150** **ISO** **I** **KC610M**

2.
Thread Pitch

0.5 — 6mm
32 — 4 tpi

4.
Thread Type

I — Internal
E — External

Cutter Identification System

1.
Cutter dia. (mm)

4.
Tool Load

5.
Shank Type

W — Weldon

7.
Insert Type IC Size

Type		IC
STN10	=	.236"
STN11	=	1/4"
STN16	=	3/8"
STN27	=	5/8"
STNB38	=	3/4"
LT11	=	1/4"

20 **X1** **R** **043** **B** **20** **STN 16** **N**

2.
Number of Effective Teeth

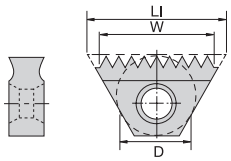
3.
Cutting Direction

R — right hand
L — left hand

6.
Shank dia. (mm)

8.
Cutter Style

N — normal shank
L — long shank
M — mini-thread cutter
T — taper thread
D — double insert cutter
S — single-point cutter

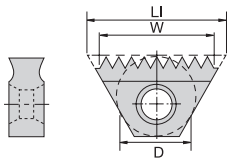


● first choice
○ alternate choice

					KC610M	KC620M	KC635M
H						●	●
S						●	●
N					●		
K					●		
M					○	●	●
P					●	○	○

INTERNAL

catalog number	thread pitch mm	D	LI	W	KC610M	KC620M	KC635M
STN10050ISOI	0,50	6,00	10,41	9,91			●
STN10075ISOI	0,75	6,00	10,41	9,65			●
STN10100ISOI	1,0	6,00	10,41	8,89		●	●
STN10125ISOI	1,25	6,00	10,41	8,64			●
STN10150ISOI	1,5	6,00	10,41	8,89			●
STN11050ISOI	0,50	6,35	10,92	10,41			●
STN11100ISOI	1,0	6,35	10,92	9,91			●
STN11125ISOI	1,25	6,35	10,92	8,64		●	●
STN11150ISOI	1,5	6,35	10,92	10,41	●		●
STN16050ISOI	0,50	9,53	16,00	14,99			●
STN16075ISOI	0,75	9,53	16,00	14,99		●	●
STN16100ISOI	1,0	9,53	16,00	14,99			●
STN16125ISOI	1,25	9,53	16,00	14,99			●
STN16150ISOI	1,5	9,53	16,00	14,99	●	●	●
STN16175ISOI	1,75	9,53	16,00	13,97			●
STN16200ISOI	2,0	9,53	16,00	13,97			●
STN27100ISOI	1,0	15,88	26,92	25,91			●
STN27125ISOI	1,25	15,88	26,92	24,89			●
STN27150ISOI	1,5	15,88	26,92	25,40			●
STN27200ISOI	2,0	15,88	26,92	23,88			●
STN27300ISOI	3,0	15,88	26,92	23,88			●
STN27350ISOI	3,5	15,88	26,92	24,38			●
STN27400ISOI	4,0	15,88	26,92	23,88		●	●
STN27450ISOI	4,5	15,88	26,92	22,61			●
STNB38400ISOI	4,0	19,05	38,61	32,00			●
STNB38450ISOI	4,5	19,05	38,61	31,50			●
STNB38500ISOI	5,0	19,05	38,61	29,97			●
STNB38550ISOI	5,5	19,05	38,61	33,02			●
STNB38600ISOI	6,0	19,05	38,61	29,97	●		●



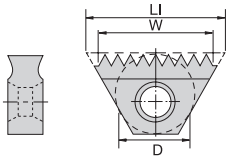
● first choice
○ alternate choice

					KC610M	KC620M
H						●
S						●
N					●	
K					●	
M					○	●
P					●	○

catalog number	thread pitch mm	D	LI	W	KC610M	KC620M
STN16250ISOIC	2,5	9,53	16,00	12,50		●
STN22300ISOIC	3,0	12,70	22,10	18,00	●	
STN27350ISOIC	3,5	15,88	26,92	24,50	●	

EXTERNAL

catalog number	thread pitch mm	D	LI	W	KC610M	KC620M
STN16150ISOE	1,5	9,53	16,00	14,99		●
STN16200ISOE	2,0	9,53	16,00	13,97	●	
STN27200ISOE	2,0	15,88	26,92	23,88	●	

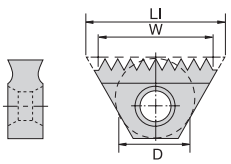


● first choice
○ alternate choice

H ● S ● N K M ● P ○

INTERNAL

catalog number	tpi	D	D	LI	W	KC635M
STN1032UNI	32	6,00	.2362	10,41	9,65	●
STN1024UNI	24	6,00	.2362	10,41	9,65	●
STN1018UNI	18	6,00	.2362	10,41	8,38	●
STN1016UNI	16	6,00	.2362	10,41	9,65	●
STN1132UNI	32	6,35	1/4	10,92	10,41	●
STN1114UNI	14	6,35	1/4	10,92	9,14	●
STN1627UNI	27	9,53	3/8	16,00	14,22	●
STN1624UNI	24	9,53	3/8	16,00	14,73	●
STN1613UNI	13	9,53	3/8	16,00	13,72	●
STN1612UNI	12	9,53	3/8	16,00	14,73	●
STN2724UNI	24	15,88	5/8	26,92	25,40	●
STN2718UNI	18	15,88	5/8	26,92	25,40	●
STN2714UNI	14	15,88	5/8	26,92	25,40	●
STN2711UNI	11	15,88	5/8	26,92	25,40	●
STN279UNI	9	15,88	5/8	26,92	22,61	●
STN278UNI	8	15,88	5/8	26,92	22,35	●
STN277UNI	7	15,88	5/8	26,92	25,40	●



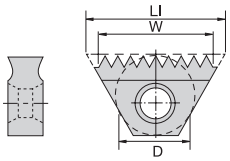
● first choice
○ alternate choice

H ● S ● N K M ● P ○

EXTERNAL

catalog number	tpi	D	D	LI	W	KC635M
STN1128UNE	28	6,35	1/4	10,92	9,91	●
STN1124UNE	24	6,35	1/4	10,92	9,65	●
STN1120UNE	20	6,35	1/4	10,92	10,16	●
STN1118UNE	18	6,35	1/4	10,92	9,91	●
STN1116UNE	16	6,35	1/4	10,92	9,65	●
STN1114UNE	14	6,35	1/4	10,92	9,14	●
STN1624UNE	24	9,53	3/8	16,00	14,73	●
STN1618UNE	18	9,53	3/8	16,00	14,22	●
STN1614UNE	14	9,53	3/8	16,00	14,48	●
STN2724UNE	24	15,88	5/8	26,92	25,40	●
STN2720UNE	20	15,88	5/8	26,92	25,40	●
STN2718UNE	18	15,88	5/8	26,92	25,40	●
STN2714UNE	14	15,88	5/8	26,92	25,40	●
STN279UNE	9	15,88	5/8	26,92	22,61	●
STN277UNE	7	15,88	5/8	26,92	21,84	●

Indexable Inserts for BSW, BSPT, NPS, NPT Thread Profiles

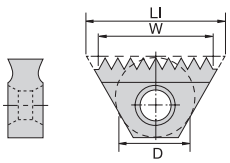


● first choice
○ alternate choice

H	●
S	●
N	
K	
M	●
P	○

catalog number	tpi	D	LI	W	KC635M
STN1128BSW	28	6,35	10,92	9,91	●
STN1124BSW	24	6,35	10,92	9,65	●
STN1120BSW	20	6,35	10,92	10,16	●
STN1119BSW	19	6,35	10,92	9,40	●
STN1624BSW	24	9,53	16,00	14,73	●
STN1619BSW	19	9,53	16,00	14,73	●
STN1618BSW	18	9,53	16,00	14,22	●
STN1616BSW	16	9,53	16,00	14,22	●
STN1614BSW	14	9,53	16,00	14,48	●
STN1612BSW	12	9,53	16,00	14,73	●
STN1611BSW	11	9,53	16,00	13,97	●
STN1620BSW	20	9,53	16,00	13,97	●
STN2716BSW	16	15,88	26,92	25,40	●
STN2714BSW	14	15,88	26,92	25,40	●
STN2712BSW	12	15,88	26,92	23,37	●
STN2711BSW	11	15,88	26,92	23,11	●
STN2710BSW	10	15,88	26,92	25,40	●
STN279BSW	9	15,88	26,92	22,61	●
STN278BSW	8	15,88	26,92	22,35	●
STN277BSW	7	15,88	26,92	21,84	●
STN276BSW	6	15,88	26,92	21,08	●

catalog number	tpi	D	LI	W	KC620M
STN2711BSPT	11	15,88	26,92	23,11	●



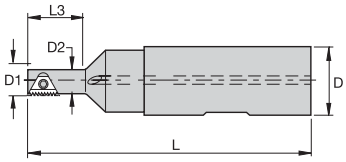
● first choice
○ alternate choice

H	●
S	●
N	
K	
M	●
P	○

catalog number	tpi	D	LI	W	KC635M
STN1614NPS	14	9,53	16,00	14,48	●
STN16115NPS	11.5	9,53	16,00	13,21	●
STN27115NPS	11.5	15,88	26,92	24,38	●
STN278NPS	8	15,88	26,92	22,35	●

catalog number	tpi	D	LI	W	KC635M
STN1118NPT	18	6,35	10,92	9,91	●
STN1614NPT	14	9,53	16,00	14,48	●
STN16115NPT	11.5	9,53	16,00	13,21	●
STN27115NPT	11.5	15,88	26,92	24,38	●
STN278NPT	8	15,88	26,92	22,35	●
STNB38115NPT	11.5	19,05	26,92	35,31	●
STNB388NPT	8	19,05	38,61	31,75	●

- 9,0 mm cutting diameter.
- For internal and external threading on most types of workpiece materials.
- One tool is used for both right-hand and left-hand threads.
- All cutters have through-coolant capability.
- Utilizes inserts with various profiles and pitches.



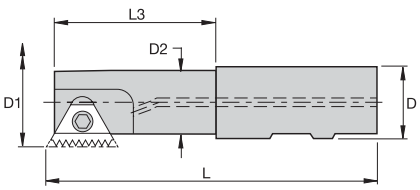
Thread Mill — Mini

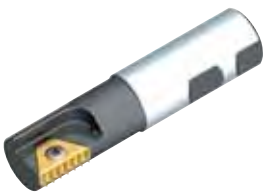
D1	order number	catalog number	insert 1	Z	D	D2	L2	L	Max RPM
9	1132616	9X1R012B12STN10M	STN10	1	12	6,8	12	69	39935
9	1191395	9X1R017B20STN10M	STN10	1	20	6,8	17	84	39935

Spare Parts

D1	insert screw	Torx driver
9	SN7TPKG	DT7
9	SN7TPKG	DT7

- Cutting diameter ranges from 11,5 mm to 37 mm.
- For internal and external threading on most types of workpiece materials.
- One tool is used for both right-hand and left-hand threads.
- All cutters have through-coolant capability.
- Utilizes inserts with various profiles and pitches.





Thread Mill — Normal Shank

D1	order number	catalog number	insert 1	Z	D	D2	L3	L	Max RPM
11,5	1130302	11X1R020B20STN11N	STN11	1	20	8,9	20	85	36825
11,5	1294964	11X1R012B12STN11N	STN11	1	12	8,9	12	70	36825
17,0	1130686	17X1R022B16STN16N	STN16	1	16	13,6	22	90	25750
20,0	1130740	20X1R043B20STN16N	STN16	1	20	16,6	43	95	23330
30,0	1130969	30X1R052B25STN27N	STN27	1	25	24,0	52	110	12900
37,0	1131069	37X1R058B32STN27N	STN27	1	32	27,0	58	120	11600
35,0	1178986	35X1R055B32STNB38N	STNB38	1	32	31,0	55	115	11000

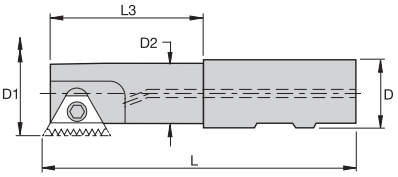
Spare Parts

D1	insert screw	Torx driver	Torx wrench
11,5	SN2TPKG	DT8	—
11,5	SN2TPKG	DT8	—
17,0	SN3TPKG	DT10	—
20,0	SN3TPKG	DT10	—
30,0	SN5TMPKG	—	TT25
37,0	SN5TMPKG	—	TT25
35,0	SM7TPKG	—	TT30

Ordering Example:
1 x 11X1R012B12STN11N
10 x STN11125ISOI KC610M

Indexable End Mills — One Cutting Edge

- Cutting diameter ranges from 22 mm to 46 mm.
- For internal and external threading on most types of workpiece materials.
- One tool is used for both right-hand and left-hand threads.
- All cutters have through-coolant capability.
- Utilizes inserts with various profiles and pitches.



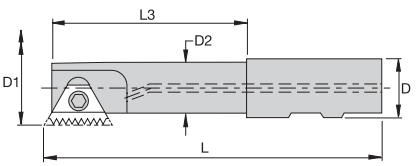


Thread Mill — Long Shank

D1	order number	catalog number	insert 1	Z	D	D2	L3	L	Max RPM
22	1130837	22X1R025B25STN16L	STN16	1	25	18,6	25	125	22230
30	1130977	30X1R092B25STN27L	STN27	1	25	24,0	92	150	12900
37	1131086	37X1R098B32STN27L	STN27	1	32	31,0	98	160	11600
46	1566071	46X1R100B40STNB38L	STNB38	1	40	38,0	100	170	10000

Spare Parts

D1	insert screw	Torx driver	Torx wrench
22	SN3TPKG	DT10	—
30	SN5TMPKG	—	TT25
37	SN5TMPKG	—	TT25
46	SM7TPKG	—	TT30



Thread Mill — Internal Coarse Pitch Thread

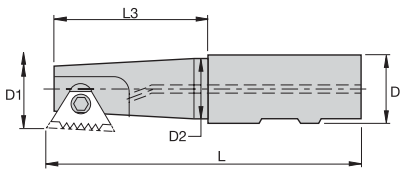
D1	order number	catalog number	insert 1	Z	D	D2	L3	L	Max RPM
15,5	1176964	15X1R020B16STN16C	STN16___C	1	16	12,2	20,5	91	26550
18,0	1176965	18X1R030B25STN22C	STN22___C	1	25	13,4	30,0	88	23350
25,0	1176967	25X1R040B25STN27C	STN27___C	1	25	19,0	40,0	98	22000

Spare Parts

D1	insert screw	Torx driver	Torx wrench
15,5	SN3TPKG	DT10	—
18,0	SN4TMPKG	DT15	—
25,0	SN5TMPKG		TT25

Ordering Example:
1 x 22X1R025B25STN16L
10 x STN16100UNI KC610M

- Cutting diameter ranges from 9,9 mm to 30 mm.
- For internal and external threading on most types of workpiece materials.
- One tool is used for both right-hand and left-hand threads.
- All cutters have through-coolant capability.
- Utilizes inserts with various profiles and pitches.



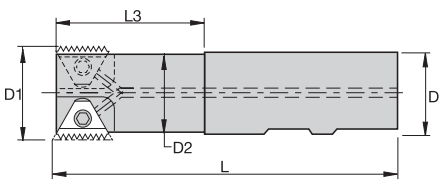
Thread Mill —Tapered Shank — Right Hand

D1	order number	catalog number	insert 1	Z	D	D2	L3	L	Max RPM
9,9	1176970	10X1R015B20STN11T	STN11	1	20	7,4	16	77	36500
15,5	1132781	15X1R022B16STN16T	STN16	1	16	12,5	22	80	26550
19,0	1135826	19X1R023B20STN16T	STN16	1	20	15,0	23	85	24350
30,0	1124003	30X1R052B25STN27T	STN27	1	25	24,0	52	110	12900

Spare Parts

D1	insert screw	Torx driver	Torx wrench
9,9	SN2TPKG	DT8	—
15,5	SN3TPKG	DT10	—
19,0	SN3TPKG	DT10	—
30,0	SN5TMPKG	—	TT25

- Cutting diameter ranges from 26 mm to 42 mm.
- For internal and external threading on most types of workpiece materials.
- One tool is used for both right-hand and left-hand threads.
- All cutters have through-coolant capability.
- Utilizes inserts with various profiles and pitches.





Thread Mill — Double Insert

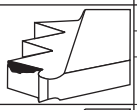
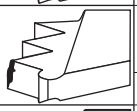
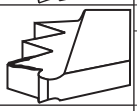
D1	order number	catalog number	insert 1	Z	D	D2	L3	L	Max RPM
26	1124019	26X2R043B25STN16D	STN16	2	25	23	43	100	20530
42	1131118	42X2R045B32STN27D	STN27	2	32	36	45	120	10900

Spare Parts

D1	insert screw	Torx driver	Torx wrench
26	SN3TPKG	DT10	—
42	SN5TMPKG	—	TT25

Ordering Example:
1 x 10X1R015B20STN11T
10 x STN1118NPT KC635M

Thread Milling Troubleshooting

problem	possible cause	solution
excessive insert flank wear 	• cutting speed too high	• Reduce cutting speed.
	• chip is too thin	• Increase feed rate.
	• insufficient coolant	• Increase coolant quantity/pressure.
chipping of cutting edge 	• chip is too thick	• Reduce feed rate. • Use the tangential arc method of entrance. • Increase rpm.
	• vibration	• Check rigidity.
material build-up on the cutting edge 	• cutting speed too slow	• Increase cutting speed.
	• chip thickness too small	• Increase feed rate.
chatter / vibration	• feed rate is too high	• Reduce the feed.
	• profile is too deep (coarse pitch threads)	• Execute two passes, each with increased cutting depth. • Execute two passes, each cutting only half the thread length.
	• thread length is too long	• Execute two passes, each cutting only half of the thread length.
insufficient thread accuracy	• tool deflection	• Reduce feed rate. • Execute a “zero” cut.

Insert Tolerance Classes

thread designation	standard designation	tolerance class
UN	ANSI B 1.174	2A/2B
*UNJ	MIL-S-8879A	3A/3B
ISO	R262 (DIN 13)	6g/6H
NPT	USAS B2.1 : 1968	standard NPT
NPTF	ANSI B 1.20.3-1976	standard
BSW	B.S. 84 : 1956, DIN 259, ISO 228/1 : 1982	medium class A
BSPT	B.S. 21 : 1985	standard BSPT
*ACME	ANSI B1/5 : 1988	3G
*PG	DIN 40430	standard
*TR	DIN 103	7e/7H

*NOTE: Denotes thread forms quoted on request as non-stock standards (4-6 weeks delivery).

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Technical Data

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Choosing Cutter Diameter

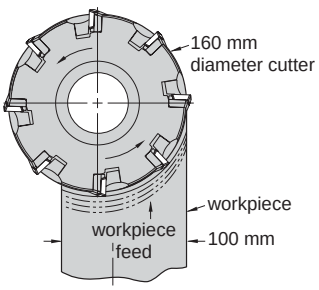
Workpiece dimensions determine the best face mill diameter to select.

Cutter-to-part width-of-cut ratio should be approximately 3:2 or 1 1/2 times the part width. For example, if the width of cut is 100 mm, choose a 160 mm diameter cutter. If the width is extremely wide, select a cutter diameter that matches the spindle capacity and take multiple passes. For example, if the width of cut is 610 mm and the machine has a standard #50 taper spindle, you should use an 200 mm diameter cutter and take five passes, at slightly less than 125 mm per pass, or four passes at 160 mm per pass, depending on horsepower and rigidity.

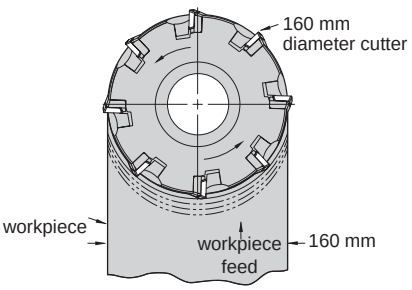
An undesirable situation is when the cutter diameter is about equal to the width of cut. The chip being formed at the entrance and exit of the cut will be very thin. The thin chips formed cannot carry away heat as well as thicker chips, therefore the heat is transferred back into the insert causing premature edge failure. Work-hardening is also more likely to occur in the entry and exit area.

When the proper cutter diameter is not available, proper cutter positioning will provide positive results.

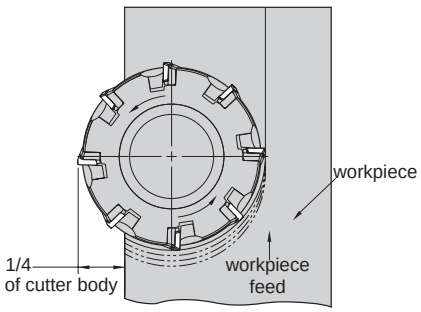
- Position cutter with approximately 1/4 of the cutter body outside the workpiece and make two passes.
- Produces negative angle of entry (desirable).
- Can result in longer tool life.



desirable



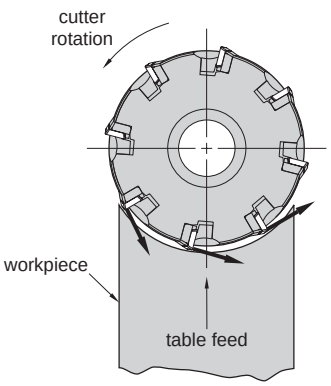
undesirable

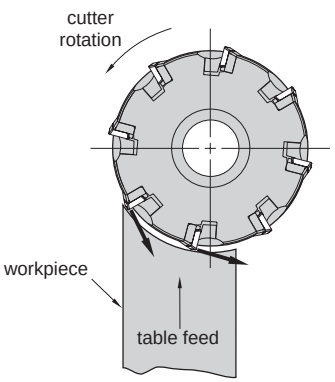


cutter position

Cutter Positioning/Cutting Forces

The cutting forces are constantly changing as the inserts move through the cut. We should understand that in changing the position of the cutter in relation to the workpiece, we can re-direct the cutting forces. This is important to ensure a safe operation based on fixture design, workpiece design, and workpiece considerations.





Pitch, or density, refers to the number of inserts in a cutter. Cutters can be classified as having either coarse, medium, or fine pitch. When designing a cutter, the engineer must take the depth of cut and feed per tooth into consideration. He then must provide the necessary chip clearance in the body so that the chip can pass without restricting its formation. For this reason, cutters designed for heavy metal removal have maximum chip clearance. This, therefore, restricts the number of inserts in the cutter, making it a coarse pitch cutter.

In medium pitch cutters, the chip clearance area in the body is usually slightly smaller than a coarse pitch cutter. And, in fine pitch cutters, the chip clearance is considerably less.

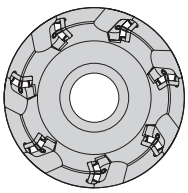
Coarse pitch is recommended for general purpose milling where adequate horsepower is available, and where maximum depth of cut is required.

Medium pitch is recommended when moderate feed per insert is required, and where it is more advantageous to have more than one insert in the cut. Medium pitch also reduces entry shock and cutting pressure while maintaining feed rates.

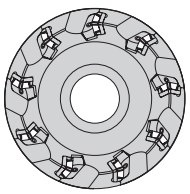
Fine pitch is ideal when milling a severely interrupted surface such as a manifold block. Fine pitch cutters are capable of higher inch/mm per minute feed rates than medium or coarse pitch cutters. They also experience higher cutting forces and greater horsepower consumption than medium or coarse pitch cutters do.

Differential Pitch

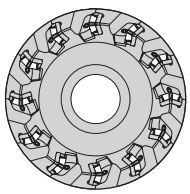
A cutter with unequally spaced inserts is a differential-pitch milling cutter. This configuration breaks up the harmonics that result from equally spaced inserts, greatly reducing the chance of vibration. Most cutters use this design regardless of the cutter pitch.



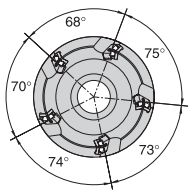
coarse pitch



medium pitch



fine pitch



differential pitch

Lead Angles/Cutting Forces on Workpiece and Fixturing

Cutting forces produced during the milling process are constantly changing as the insert moves through the cut. Understanding the relationship of these forces will help ensure safe operation by preventing workpiece movement during the cut. For example, fixture design and clamp positioning are determined by the cutting forces produced in milling. Equally important is an understanding of the effect lead angle has on cutting force direction, actual chip thickness, and tool life.

90° lead angle

advantages:
When 90° shoulder is required
- Can be a problem solver on thin wall workpieces

disadvantages:
Highest radial cutting forces
- High entry shock load
- Increased chance of burr on insert exit side of part

75° and 70° lead angle

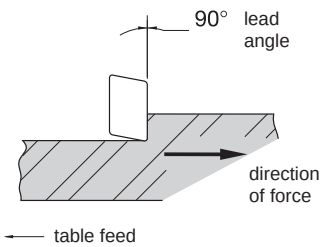
advantages:
- For general milling applications and relatively rigid conditions
- Good relation of insert size and maximum depth of cut
- Reduced entry shock load

disadvantages:
- Higher radial forces can cause problems in weak machine/workpiece/fixture conditions

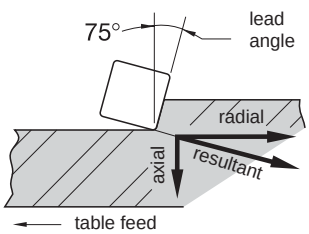
45° lead angle

advantages:
- Well balanced axial and radial cutting forces
- Less breakout on workpiece corner
- Entry shock minimized
- Less radial forces directed into spindle bearings
- Higher feed rates possible

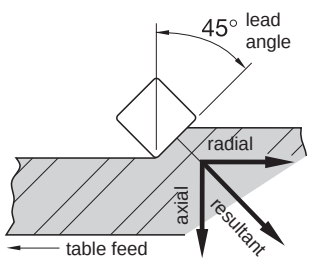
disadvantages:
- Reduced maximum depth of cut due to lead angle
- Larger body diameter can cause fixture clearance problems



90° lead



75° and 70° lead



45° lead

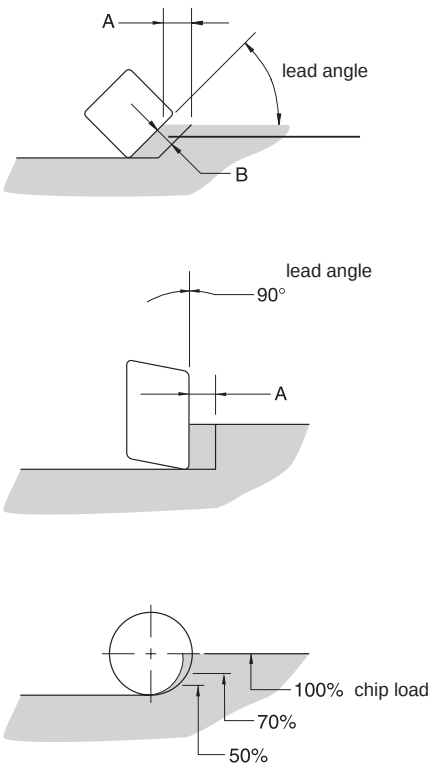
Lead Angle/Chip Thickness

Chip thickness is affected by lead angle. The greater the lead angle, the thinner the chip will be since it's distributed over a greater length of the cutting edge. To achieve greater productivity and problem-free milling, use a lead angle cutter whenever possible.

lead angle	feed per tooth	actual chip thickness "B"
90°	A	A
75°	A	.96 x A
70°	A	.94 x A
60°	A	.86 x A
45°	A	.707 x A

example:

90°	0,25 mm	0,25 mm
75°	0,25 mm	0,24 mm
70°	0,25 mm	0,24 mm
60°	0,25 mm	0,22 mm
45°	0,25 mm	0,18 mm



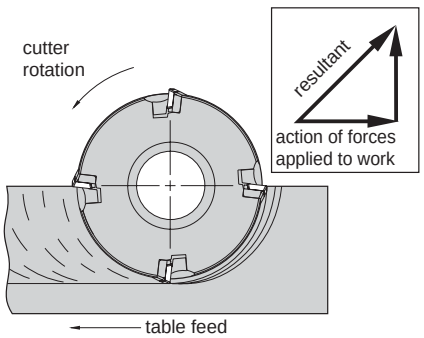
On round inserts, the chip load and lead angle vary with the depth of cut.

lead angle/chip thickness

Conventional Milling

For many years it was common practice to mill against the direction of the feed, due to the use of high-speed steel cutters and an absence of backlash-eliminating devices. The milling procedure became known as conventional, or up-milling.

In conventional milling, friction and rubbing occur as the insert enters into the cut, resulting in chip welding and heat dissipation into the insert and workpiece. Resultant forces in conventional milling are against the direction of the feed. Work-hardening is also likely to occur.

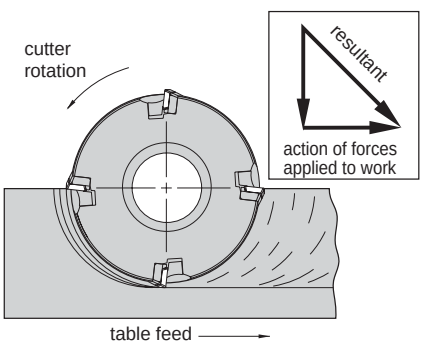


conventional milling

Climb Milling (preferred)

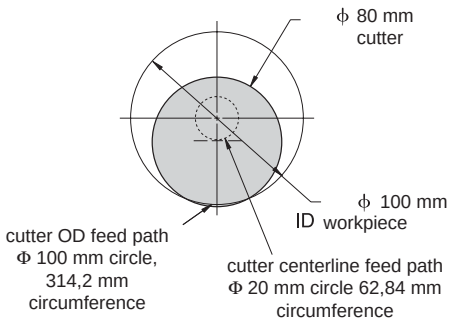
Climb milling is normally recommended. The insert enters the workpiece material with some chip load and produces a chip that thins as it exits the cut. This reduces the heat by dissipating it into the chip. Work-hardening is minimized.

Climb milling forces tend to push the workpiece toward the fixture and in the direction of the feed. Climb milling is preferred over conventional milling in most situations.



climb milling

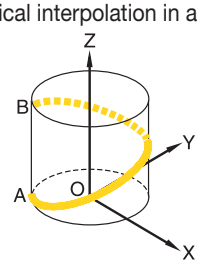
circular interpolation: Consists of a cutter rotating about its own axis while traveling in an orbiting motion about an ID or OD workpiece circumference without any vertical shift during the operation. This orbiting movement utilizes the "X" and "Y" axis.



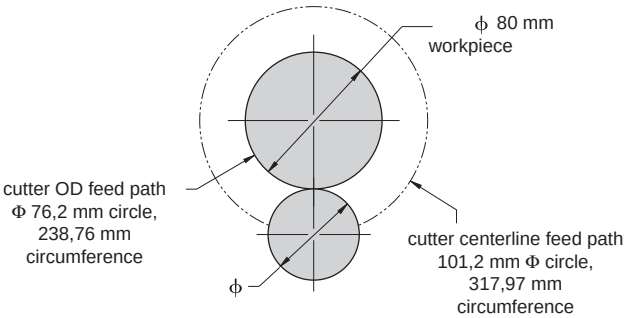
ID circular interpolation

helical interpolation: This application requires a milling machine with three-axis control capability. The operation consists of a cutter rotating about its own axis together in an orbiting motion about an ID or OD workpiece circumference in the "X" and "Y" plane. The circular movement about the "X" and "Y" plane, with a simultaneous linear movement in the Z-axis plane (which is perpendicular to the "X" and "Y" plane), creates the helical movement. For example, the path from point A to point B on the envelope of the cylinder combines a circular movement in the "X" and "Y" plane with a linear movement in the "Z" direction. On most CNC systems, this function can be executed in two different ways:

- GO2: helical interpolation in a clockwise direction.
- GO3: helical interpolation in a counterclockwise direction.



helical interpolation



OD circular interpolation

calculation of feed rate for circular and helical interpolation:

On most CNC machines, the feed rate required for programming contour (circular or helical) milling is calculated based on the centerline of the tool. When dealing with linear tool movement, the feed rate at the cutting edge and centerline are identical, but with circular tool movement, this is not the case.

calculate feed rate at the cutting edge: First calculate the tool feed rate at the cutting edge with the following formula.

$F_1 = fz \times z \times n$

F_1 = tool feed rate at the cutting edge (mm/min)

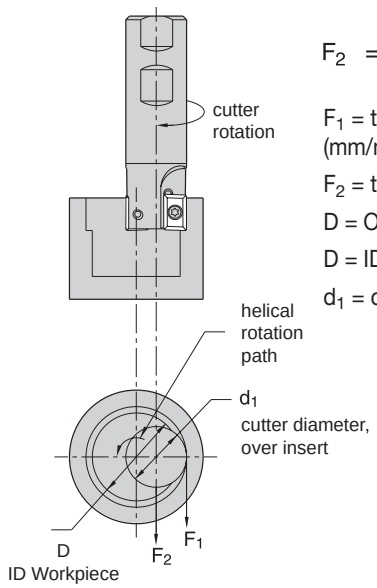
fz = mm per tooth (chip load)

Z = number of effective inserts in the cutter

n = revolutions per minute

Calculation of the Feed Rate at the Tool Centerline: Use the following equations to define the relationship between feed rates at the cutting edge and at the tool centerline.

inside diameter (ID) helical interpolation



$$F_2 = \frac{F_1 \times (D - d_1)}{D}$$

F_1 = tool feed rate at the cutting edge (mm/min)

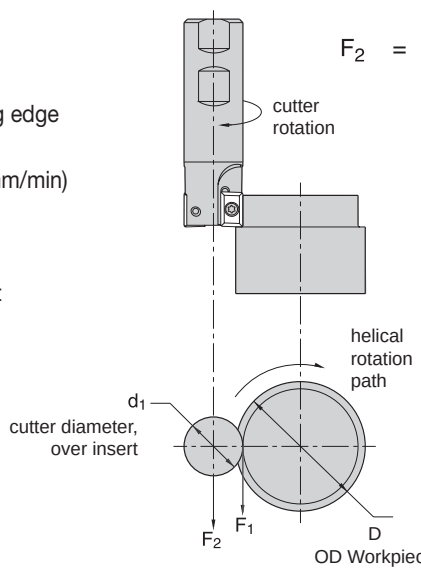
F_2 = tool centerline feed rate (mm/min)

D = OD workpiece diameter

D = ID workpiece diameter

d_1 = cutter diameter, over insert

outside diameter (OD) helical interpolation



$$F_2 = \frac{F_1 \times (d_1 + D)}{D}$$

ID and OD Circular and Helical Interpolation

In ID contour applications, you will find the tool centerline feed is always less than the cutting edge feed rate.

example for ID

D	=	4" ID workpiece	(100 mm)
d_1	=	3" cutter diameter	(80 mm)
fz	=	.008 ipt	(0,2 mm/tooth)
n	=	637 rpm	637 rpm
z	=	7 effective inserts	7

1. Calculate feed rate at the cutting edge.

$F_1 = fz \times z \times n$

$F_1 = .008 \times 7 \times 637 = 35.7$ in./min. $\quad 0.2 \times 7 \times 637 = 892$ mm/min.

2. Calculate feed rate at the tool centerline.

$$F_2 = \frac{F_1 \times (D - d_1)}{D}$$

$$F_2 = \frac{35.7 \times (4.0 - 3.0)}{4.0} = 8.9 \text{ in./min.}$$

$$F_2 = \frac{892 \times (100 - 80)}{100} = 178 \text{ mm/min}$$

To have F_1 (892 mm/min.) at the cutting edge feed rate, we must program the machine tool for F_2 (178 mm/min.) at the tool centerline feed rate. This is a difference of approximately 75% less feed than the cutting edge feed rate F_1.

In OD contour applications, you will find the tool centerline feed rate is always larger than the cutting edge feed rate.

example for OD

D	=	5" OD workpiece	125 mm
d_1	=	2" cutter diameter	50 mm
fz	=	.008 ipt	0,2 mm/tooth
n	=	955 rpm	955 rpm
z	=	5 effective teeth	5

1. Calculate feed rate at the cutting edge.

$F_1 = fz \times z \times n$

$F_1 = .008 \times 5 \times 955 = 38.2$ in./min. $\quad 0.2 \times 5 \times 955 = 955$ mm/min.

2. Calculate feed rate at the tool centerline.

$$F_2 = \frac{F_1 \times (d_1 + D)}{D}$$

$$F_2 = \frac{38.2 \times (2 + 5)}{5} = 53.5 \text{ in./min.}$$

$$F_2 = \frac{955 \times (50 + 125)}{125} = 1.337 \text{ mm/min}$$

To have F_1 (955 mm/min.) at the cutting edge feed rate, we must program the machine tool for F_2 (1.337 mm/min.) at the tool centerline feed rate. This translates to an increase of about 40% more feed rate than the cutting edge feed rate F_1.

Large Surfaces

Interpolating with a smaller cutter may be faster than using a large-diameter cutter. Also, keep the cutter in contact with the workpiece rather than exiting and re-entering.

Maximize Metal Removal Rate

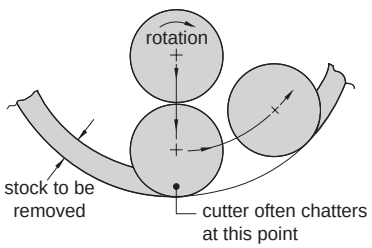
Concentrate on mrr (metal removal rate), not just on higher Vc (cutting speed). Increasing spindle speed without increasing chip load will not improve mrr. However, by doubling fz, mrr does increase and horsepower consumption only increases by approximately 50%.

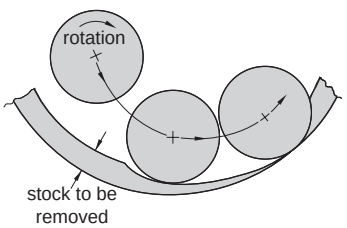
Preset

Use cutter preset areas for proper setting of cutters rather than indexing cutters at the machine, if possible.

Ramp In and Out

As shown below, ramping gradually into the cut will provide greater tool life. Also, by keeping the cutter constantly moving when entering and exiting the cut, dwell marks will be eliminated on the workpiece.

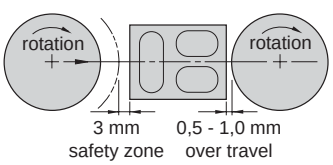




Safety and Over Travel

Program the milling cutter to rapid advance up to the part, within a range of 3 mm before engaging the workpiece. This allows the machine to reach its proper operating parameters before actual chip making begins.

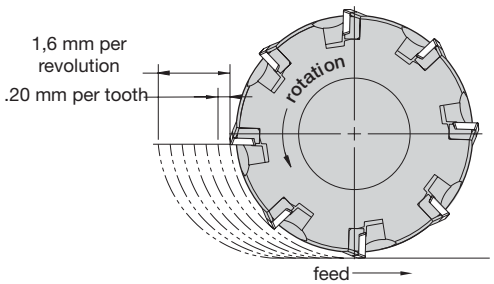
Rapid advance to the next cutting location, when the cutter is 0,5 mm to 1 mm past the edge of the part. If the spindle has built-in tilt or programmed runout, the cutter can be advanced to the next cutting location while the back half of the cutter is still over the finished milled surface.

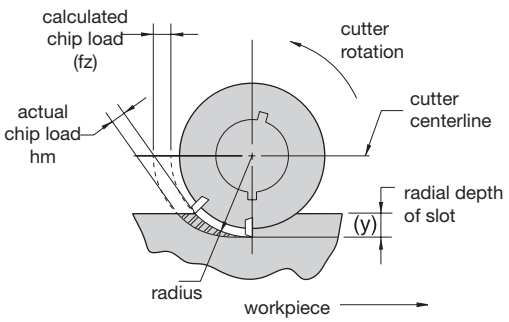


to find	given	formula
Vc	D n	$Vc = \frac{\pi \times D \times n}{1000}$
n	D Vc	$n = \frac{1000 \times Vc}{\pi \times D}$
Vf	fz n z	$Vf = fz \times z \times n$
fz	z Vf n	$fz = \frac{Vf}{z \times n}$

legend		
Vc	=	surface feed per minute
n	=	revolutions per minute
D	=	cutter diameter
Vf	=	feed (mm per minute)
fz	=	mm per tooth (chip load)
z	=	number of effective teeth or inserts in cutter
π	=	3.1416

given	calculated	
D = 125 mm cutter diameter Z = 8 teeth in cutter Vc = 200 mm/min fz = 0,2 mm	$n = \frac{1000 \times 200}{3.1416 \times 125}$	= 510 rpm
	Vf =	0,20 x 8 x 510 = 816 mm/min



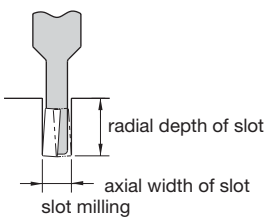


Slotting or Periphery Milling

True or actual chip load on the cutting edge of the insert is equal to the programmed chip load only when 50% or more of the cutter's diameter is engaged in the cut (lead angle not considered). Anything less than half the diameter of the cutter means that the actual chip load is reduced by some percentage. The smaller the radial depth of cut, the greater the decrease in actual chip load.

It's very important to maintain a chip load which is great enough to ensure heat dissipation and prevent work hardening. A sufficient chip load will also create stability between the cutter and the workpiece.

The formulas shown below are used to determine the programmed chip load, or feed rate necessary to obtain the desired load on the insert cutting edge as it enters the workpiece. These formulas should be applied whenever an arbor mounted slotting cutter is being used, or when less than half the diameter of a face mill or end mill is engaged in the cut. The lighter the radial depth of cut, the more important it becomes to apply these productivity formulas.



Productivity Formulas

$$\text{chip load } fz = \frac{\left(\frac{\sqrt{(\text{dia.} - y) \times (y)}}{\text{radius}}\right) \times \left(\frac{vf}{n}\right)}{z}$$

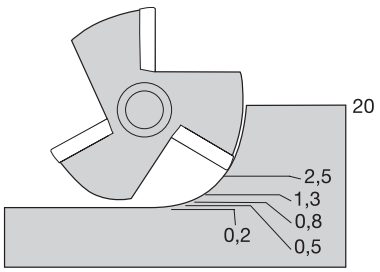
or

$$Vf = \frac{n \times z \times fz}{\left(\frac{\sqrt{(\text{dia.} - y) \times (y)}}{\text{radius}}\right)}$$

Feed Rate Compensation

Operations such as **periphery milling with a light radial depth of cut or slotting with an arbor mounted cutter** require a calculation for feed rate compensation to maintain the proper chip load on the insert edge at entry into the cut. The calculated chip load and actual chip load can be dramatically different, depending on the radial depth and the cutter diameter. For instance, the actual chip load on entry for a 20 mm diameter cutter taking a 0.3 mm radial depth cut is only 23% of the calculated chip load. It is not uncommon to encounter built-up edge, work-hardening, or chatter problems if the following formula is not applied. Minimal cutter runout is critical to obtaining an equal chip load on each flute of the cutter too. A side benefit to applying this formula is increased productivity as feed rates can increase dramatically.

radial depth of cut	actual chip load (fz)	feed required (Vf) to maintain fz = 0,1	increase
20	0,1	140	0%
2,5	0,05	292	109%
1,3	0,04	389	178%
0,8	0,03	498	256%
0,5	0,02	607	335%
0,3	0,015	859	515%



40 mm end mill – 6 flutes
30 m/min (vc) 230 rpm
0,1 mm (fz) 140 mm/min (Vf)

Formulas—Horsepower

metal removal rate

The metal removal rate (MRR) calculation is a good basis for determining metalcutting efficiency.

MRR = doc x woc x Vf = mm^3/min.

horsepower consumption

Milling cutters can consume significant amounts of horsepower. Very often it is the lack of horsepower that is the limiting factor when deciding on a particular operation. On applications where large diameter cutters or heavy stock removal is necessary, it's advantageous to first calculate the necessary horsepower requirements.

NOTE: Spindle efficiency "E" varies from 75 to 90%.
(E = .75 to .90)

A suitable formula for calculating horsepower (HPc) at the cutter is:

$$HP_c = \frac{MRR}{K}$$

example:
width of cut (woc) 42mm
depth of cut (doc) 5mm
feed (vf) . . . . . 1092 mm/min
4140 220 HB . . . . "K" factor 1.56

MRR = 5 x 42 x 1092 = 229320 mm^3/min

For horsepower at the motor (HP_m), use formula:

$$HP_m = \frac{HP_c}{E}$$

In determining horsepower consumption, "K" factors must be used. The "K" factor is a power constant that represents the number of cubic inches of metal per minute that can be removed by one horsepower.

NOTE: "K" factors vary depending on the hardness of the material.

"K" Factors

workpiece material	hardness HB	"K" factor
steels, and wrought and cast irons (plain carbon alloy steels, and tool steels)	85-200	1.64
	201-253	1.56
	254-286	1.28
40 mm end mill – 6 flutes 30 m/min (vc) 230 rpm 0,1 mm (fz) 140 mm/min (Vf)	287-327	1.10
	328-371	.88
	372-481	.69
	482-560	.59
	561-615	.54
precipitation hardening stainless steels	150-450	1.27-.42
cast irons (gray, ductile, and malleable)	150-175	2.27
	110-190	2.0
	176-200	1.89
	201-250	1.52
	251-300	1.27
	301-320	1.19
stainless steels, and wrought and cast irons (ferritic, austenitic, and martensitic)	135-275	1.54-.76
	286-421	.74-.50
titanium	250-375	1.33-.87
high-temperature alloys, nickel, cobalt base	200-360	.83-.48
iron base	180-320	.91-.53
nickel alloys	80-360	.91-.53
aluminum alloys	30-150 (500 kg)	6.25-3.33
magnesium alloys	40-90 (500 kg)	10.0-6.67
copper	150	3.33
copper alloys	100-150	3.33
	151-243	2.0

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Over the past 50 years, metal removal rates (MRR) and power constants have served as the conventional values used to calculate horsepower. Although this is a relatively common method of calculating horsepower, a more accurate method has been developed when milling with high shear cutters. This new approach utilizes the following information:

1. calculating tangential force (F_t)
2. ultimate material strength
3. cross-sectional area of the chip
4. number of inserts in the cut
5. machinability factor
6. tool wear factor
7. calculating torque
8. calculating horsepower at cutter
9. calculating horsepower at motor

Tangential Force, Torque, and Horsepower Calculations in Face Milling with High Shear Milling Cutters

1. calculation of tangential force (N)

Calculation of tangential force is important since it produces torque at the spindle and accounts for the greatest portion of machining power at the cutting tool. Using this tangential force formula is a quick way to determine the approximate forces that fixtures, part wall sections, or spindle bearings will endure. Tangential force is calculated with the following formula:

$$F_t = S \times A \times Z_c \times C_m \times C_w \quad (N)$$

where:
- S = ultimate strength of the work material (N/mm^2)
- A = cross-sectional area of the chip removed by the milling insert (mm^2)
- Z_c = number of inserts in cut
- C_m = machinability factor
- C_w = tool wear factor

2. ultimate material strength (N/mm^2)

The approximate relationship between the ultimate material strength and hardness of the most commonly used work materials such as steels, irons (for example: gray cast iron), titanium alloys (Ti – 6Al – 4V), and aluminum alloys (2024, 5052) can be expressed by the empirical formula:

$$S = 5 \times HB \ (N/mm^2)$$

where HB = Brinell hardness numbers obtained, primarily, at the 3000-kgf load. When testing soft metals such as aluminum alloys, the 500-kgf load is used. Hardness obtained at the 500-kgf load should be converted into the hardness equivalent of the 3000-kgf load by using the load factor of 1.15. For example, 130 HB at the 500-kgf load is equivalent to 150 HB at the 3000-kgf load (130 x 1.15 = 150). If hardness is given in Rockwell “B” or Rockwell “C” numbers, see Appendix 1 (page 510).

3. cross-sectional area of the chip (A)

Cross-sectional area of the chip (Fig. 1) is defined by:

$$A = d\ f \ (mm^2)$$

where:
- d = axial depth of cut (mm)
- fz = feed per tooth (mm)

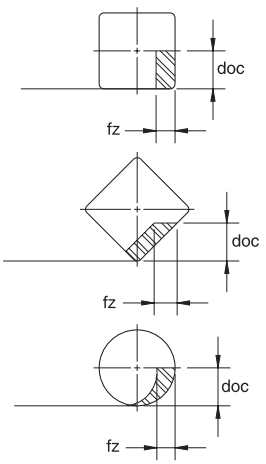


Figure 1: Cross-sectional area of the chip and insert’s shape

4. number of inserts in cut (Zc)

The number of inserts in the cut (simultaneously engaged with work material) depends on the number of inserts in the cutter “Z” and the engagement angle (α). This relationship is shown by the formula:

$$Z_c = \frac{Z \times \alpha^\circ}{360^\circ}$$

The engagement angle depends on the width of cut “W” and cutter diameter “D”. This angle is found from the geometry of figure 2 (formulas to calculate engagement angle and the number of inserts in the cut at any width of cut are given in Appendix 2, page 540).

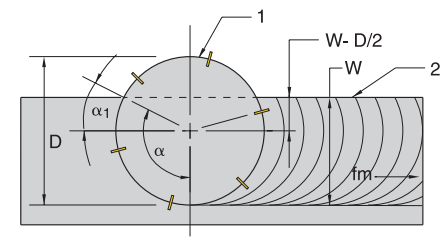


Figure 2: Schematic for calculating the number of inserts in cut

1	=	milling cutter
2	=	workpiece
α	=	engagement angle
α_1	=	the angle between cutter centerline and cutter radius to the peripheral point of exit or entry
W	=	width of cut (woc)
D	=	cutter diameter
fm	=	workpiece feed motion

Tangential Force, Torque, and Horsepower Calculations in Face Milling with High Shear Milling Cutters

If the width of cut equals cutter diameter (W/D = 1.0), the engagement angle $\alpha = 180°$ and $Z_c = \frac{Z \times 180°}{360°} = 0.5Z$.

If the width of cut is equal to half of the cutter diameter (W/D = 0.5), the engagement angle $\alpha = 90°$ and $Z_c = \frac{Z \times 90°}{360°} = .25Z$.

The values of Z_c depending on the given W/D ratios, are shown in table 1.

Table 1

W/D	.88	.80	.75	.67	.56	.38	.33	.19	.125
Z_c	.38Z	.35Z	.33Z	.30Z	.27Z	.21Z	.20Z	.14Z	.12Z

5. machinability factor (C_m)

Machinability factor is used to indicate degree of difficulty in machining various workpiece materials. Table 2 shows machinability factor values for some of the most common workpiece materials.

Table 2

workpiece material	C_m		
	W/D≤.67	.67<W/D<1.0	W/D=1.0
carbon and alloy steels	1.0	1.15	1.3
stainless steel	2.0	2.15	2.3
gray cast iron	1.0	1.15	1.3
titanium alloys	1.0	1.20	1.4
aluminum alloys	1.0	1.05	1.1

The values of C_m are based on milling tests with a torque dynamometer at different cutting conditions. It has been found that machinability factor depends on type of work material and the ratio of radial width of cut to cutter diameter (W/D).

This ratio determines the uniformity of the chip thickness. When W/D = 1.0, the chip at the point of entry starts off at zero thickness. It increases to a maximum thickness at the centerline of the cutter, and thins off to zero again at the point of exit. This type of cut generates maximum friction at the cutting edge, and machinability factor reaches its maximum value. The optimal cutting conditions are obtained when W/D = 2/3 = .67. The thickness of the chip is practically uniform, the friction is minimal, and machinability factor decreases to its minimum value.

More extensive testing will determine machinability factors for a larger variety of work materials and improve the accuracy for calculating tangential force and power consumption.

6. tool wear factor (C_w)

For milling with sharp cutting tools (short time operation), tool wear factor $C_w = 1.0$. For a longer operation (before the inserts are indexed), the following tool wear factors are considered:

- light face milling $C_w = 1.1$
- general face milling $C_w = 1.2$
- heavy-duty face milling $C_w = 1.3$

7. calculation of torque (Nm)

The torque "T" generated by tangential force is calculated using the following formula:

$$T = F_t \times D/2 \quad \text{(Nm)}$$

where D = cutter diameter (m)

8. calculating horsepower (HP_c or HP_m)

The machining power at the cutter (sharp edges) is calculated by either of these two formulas:

$$HP_c = \frac{F_t \times Vc}{10{,}000}$$

or

$$HP_c = \frac{T \times n}{1{,}600}$$

where V_c = peripheral cutting speed (m/min)
n = spindle speed (rpm)
10000 and 1600 = conversion factors

9. The required power at the motor is calculated using the following formula (HP_m):

$$HP_m = \frac{HP_c}{E}$$

where E = machine tool efficiency factor (E = .75 to .90)

NOTE: Spindle efficiency varies from 75 to 90%.

Tangential Force, Torque, and Horsepower Calculations in Face Milling with High-Shear Milling Cutters (cont'd.)

Example for Calculating Horsepower

given values

milling cutter KSOM125R06OF07:

effective diameter D = 125 mm

number of inserts Z = 6

workpiece material:

alloy steel AISI 4140

hardness 220 HB

machining conditions:

spindle speed	n	= 458 rpm
cutting speed	Vc	= 180 m/min
machine feed rate	Vf	= 824 mm/min
mm per tooth (chip load)	fz	= 0,3 mm
axial depth of cut	doc	= 4 mm
radial width of cut	woc	= 90 mm
W/D ratio	W/D	= 0,72

Step-By-Step Calculations

1. calculating tangential force

1.1 ultimate strength of the workpiece material

$S = 5 \times HB = 5 \times 220 = 1100\ N/mm^2$

1.2 cross-sectional area of the chip

$A = doc \times fz = 4 \times 0,3 = 1,2\ mm^2$

1.3 number of inserts in cut:

width of cut-to-diameter ratio (w/d)

W/D = 90 / 125 = 0,72 (See Table 1, page 526)

Now use Z_c value shown in Table 1 under 0,72.

$Z_c = 0,33 \times Z = 0,33 \times 6 = 2$ inserts in cut.

NOTE: Z = number of inserts in cutter.

1.4 tangential force

$F_t = S \times A \times Z_c \times C_m \times C_w$

$F_t = 1100 \times 1,2 \times 2 \times 1.1 \times 1.1 = 3194\ N$

NOTE: $C_m = 1.1$ and $C_w = 1.1$

2. calculating torque at the cutter

$$T = (F_t \times D)/2 = \frac{3,194 \times 0,125}{2} = 199,6\ Nm$$

3. calculating horsepower

- At the cutter...reference formulas in paragraph 8 on page 526

$$HP_c = \frac{F_t \times Vc}{10,000} = \frac{3,194 \times 180}{10,000} = 57,5\ hp$$

or

$$HP_c = \frac{T \times rpm}{1,600} = \frac{1,996 \times 458}{1,600} = 57,5\ hp$$

- At the motor...reference formula in paragraph 9 on page 526
- Where E = machine tool efficiency factor (E = .75 to .90)

$$HP_m = \frac{HP_c}{E} = \frac{57,5}{.8} = 71,9\ hp$$

Surface Finish

Surface finish may be an important specification on a machined part. Finishes produced by indexable insert cutters usually range from 0.80-3.8 Ra. This broad range can be affected by several variables such as work material, machine rigidity, spindle alignment, fixturing, insert nose geometry, insert wear, cutting feed and speed, heat-generated chip welding, and chatter.

Good finishes will result when you use the right combination of cutter geometry, insert style, and cutting speeds and feeds for the material being milled. It is also important to have the part adequately fixtured, and the machine properly maintained.

Figure 1 illustrates that finer finishes can be obtained by using a larger corner radius, flat, or wiper on the insert. This tends to wipe out or reduce feed marks. In addition to the corner geometry of the insert, it is important to correctly set each insert relative to the other inserts. For example, if all of the inserts have the same corner geometry, and are set in the cutter body to a face height of approximately 0,025 mm relative to each other, the finish produced will be better than if the inserts were set to within 0,07 mm.

Improved finishes can also be obtained by increasing speeds and reducing feeds. Be aware, however, that increased speed also increases cutting temperatures, and may reduce insert edge life.

Finish will not necessarily be the same on all areas of the milled surface. Figure 2 shows that the Ra finish will be lower on the area where the feed marks are close to each other, and higher where feed marks are farther apart.

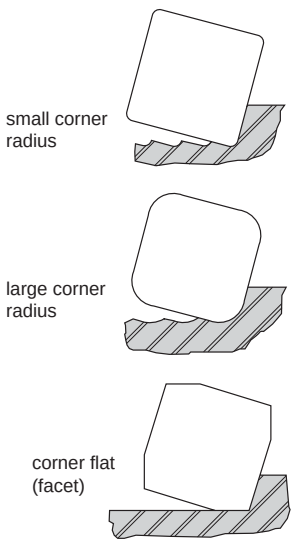


Figure 1: Larger insert corner radii or flats produce finer milling finishes.

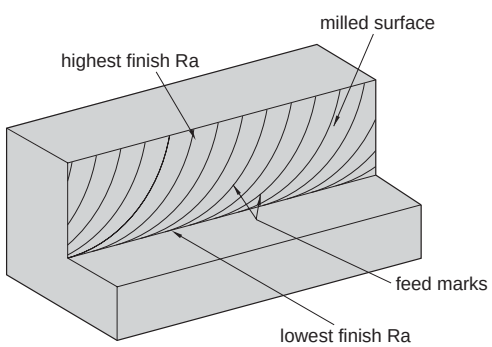


Figure 2: Quality of Ra finish corresponds to the distance between feed marks.

In figure 3, the Ra value will be lower near the outside diameter of the cut where the feed marks are at their closest, and higher at the center where the feed marks are farthest apart. Peaks produced are highest at the center of the cutter as it is positioned in the cut, and lowest at the outside diameter of the cutter, as illustrated below in figures 3 and 4.

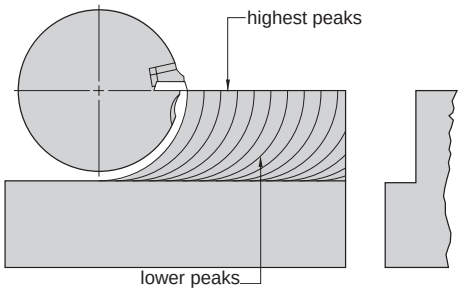


Figure 3: Ra finish is higher at the widest feed marks.

Both finish and flatness are affected by feed marks. A taper will be produced from the high peaks down to the low peaks.

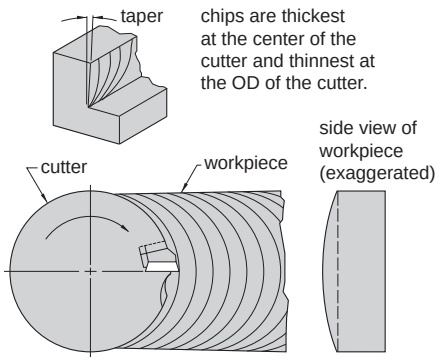


Figure 4: A taper is produced from the high peaks to the low ones.

Both finish and flatness are affected by feed marks. A taper will be produced from the high peaks down to the low peaks.

Flatness also affects part tolerance. This effect is more predominant in side milling both sides of a part as shown in figure 5.

An obvious solution to obtaining a more consistent and improved surface finish with a minimum of taper is to reduce or flatten the peaks between feed marks. This can be done by introducing an insert with a corner configuration capable of wiping out or reducing these peaks. Shown in figure 5 is an exaggerated change in part width due to flatness and taper.

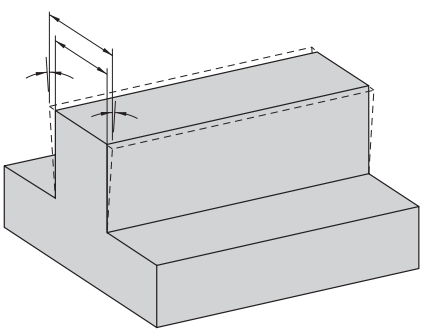


Figure 5: Flatness affects part tolerance more when milling both sides of a part.

Figures 6 and 7 compare the feed marks produced with a nose radius insert to those produced with a wiper insert. A wiper insert with a large radius for wiping out or reducing peaks (figure 7) has been effective in producing finishes below 2.5 Ra. Figures 6 and 7 show the wiper insert is designed to "top off" the peaks of the feed marks. An improved surface finish, surface flatness, and reduced taper will result.

Wiper inserts are normally set at 0,025-0,04 mm above the highest positioned insert in the cutter to ensure a good wiping action. Kennametal wiper inserts are typically designed to fit into any pocket in the cutter body. This means one or more wiper inserts can be used. Interchangeable wipers can be used to share the load on the periphery of the cut in feed per tooth.

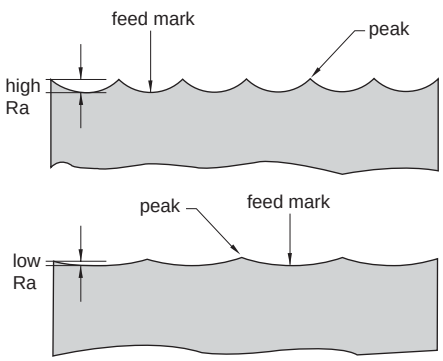


Figure 6: Peaks produced with a standard radii insert (top) compared to those produced with a large radius wiper insert (bottom).

Poor Surface Finish

cause	solution
cutter runout	Check for high insert, dirt in the pockets, or dirty spindle and cutter mounting face. Also, look for burrs on the cutter and damaged cutter pocket.
worn or chipped insert	Index insert.
feed per revolution exceeding flat on wiper	Reduce feed rate or install wiper with greater effective insert facet width.
wiper insert is set too high	Set the wiper insert 0,025 to 0,04 mm above highest insert.
chatter	Check rigidity of machine and table fixturing. Check arbor and spindle, adjust feed rates, adjust rpm, or reduce cut width. Consider cutter with fewer pockets.

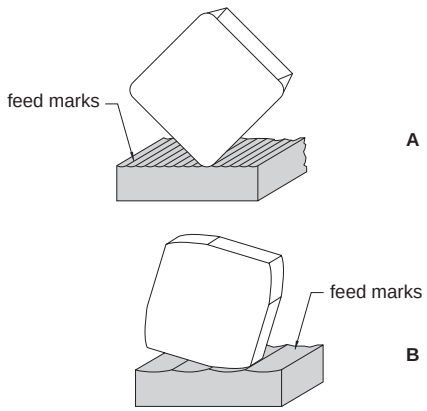


Figure 7: Feed marks produced with a nose radius insert (A) compared to marks produced with a wiper insert (B).

Measuring Finish Produced in a Milling Operation

Do not rely on your eye or fingernail to determine surface finish. Fingernails are about 25 times as thick as the stylus tip of a surface measuring instrument. They will skid across surface peaks, missing the valleys. Use a surface measuring instrument since the appearance of the surface finish may be deceiving. For example, reflected light on a uniformly milled surface pattern will look smoother than a random pattern. Also, a shiny surface will appear smoother than a dull surface.

Placement of the measuring device in a specific area on the milled surface will affect the reading. Also, a surface finish measured perpendicular to the feed direction is better than measuring parallel to the feed direction. This is usually the case regardless of workpiece condition and material (see figure 8).

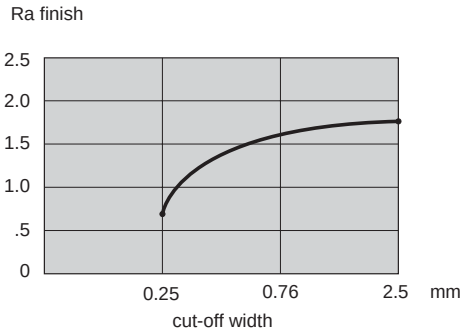
Changing the cut-off width of the surface measuring instrument will affect the Ra value of the measurement.

Surface Profile Record

Figure 9 shows the variation in roughness created by increasing the cut-off width on the instrument. The greater the cut-off, (see figure 9), the higher the Ra finish. For example, figure 10 illustrates that a 0,25 mm cut-off width will produce a 0.6 Ra finish; whereas, a 0,76 mm cut-off width will produce a 2.0 Ra finish.

Also, figure 10 demonstrates that most measuring devices are provided with 0,25 mm, 0,76 mm, and 2,54 mm cut-offs. In most cases, the 0,76 mm width cut-off is preferred.

Figure 11 shows the standard surface symbols specifying maximum and minimum roughness, waviness, and lay, which is the direction in which the measurement is taken.



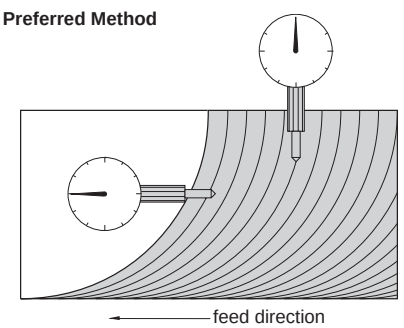


Figure 8: Measuring surface finish

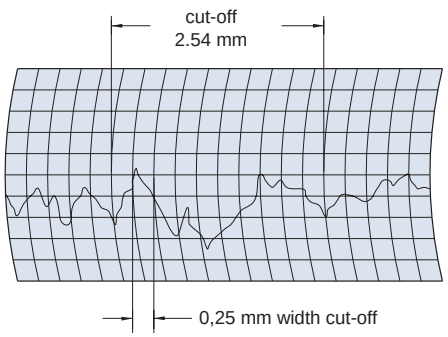


Figure 9: Increasing the cut-off width creates a variation in roughness.

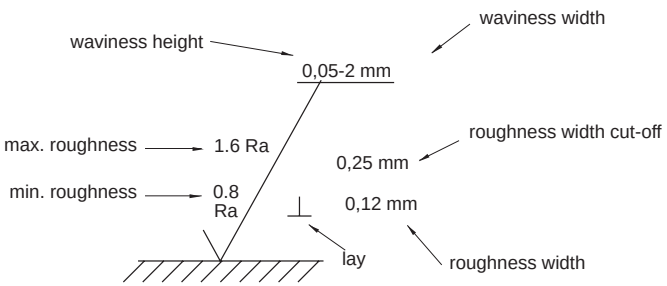


Figure 11: Standard surface symbols

Introduction

Troubleshooting should be performed in a sequential method to identify and solve your milling problems. These problems can be recognized as premature insert edge failure, part appearance, machine noise or vibration, and the cutter's appearance. Successful troubleshooting requires that we correctly identify the problem, then take the necessary corrective action one step at a time. The five key areas of concern are:

1. cutting tool material (grade)
2. cutter/adapter
3. machine
4. workpiece
5. set-up/fixturing

This section will discuss possible causes and will recommend corrective actions for each of the five areas listed. Remember, if more than one step is taken concurrently, the real cause of the problem may never be discovered. Always perform one corrective measure at a time.

Edge Condition Problems and Solutions

1. chipping: Appears like normal flank wear to the untrained eye. Actually, normal flank wear lands have a fine, smooth wear pattern, while a land formed by chipping has a saw-toothed, uneven surface. If chipping is not detected soon enough, it may be perceived as depth-of-cut notching.

Chipping can also be caused by recutting of chips. A good example of this would be a slotting operation where chip clearance or chip gullet space does not allow the chips to evacuate cleanly. In this instance, packing of the chips also occurs.

In most cases, by changing to a stronger grade and/or to a different edge preparation such as a larger hone or T-land, or from a 90° cutter geometry to a lead angle cutter geometry, will resolve the problem.

problem	cause	solution
chipping 	• chatter	• Check system rigidity for proper part clamping. • Correct worn gibs/bearings. • Check for improper cutter mounting.
	• edge prep	• Use largest hone or T-land possible.
	• grade	• Use a tougher grade.
	• built-up edge	• Increase speed.
	• feed	• Reduce feed per tooth.
	• recutting chips	• Choose cutter geometry with correct pitch for chip clearance. • Use air blast or coolant to remove chips.

2. depth-of-cut notching: Appears when chipping or localized wear at the depth-of-cut line on the rake face and flank of the insert occurs. Notching is primarily caused by the condition of the workpiece material. Material conditions prone to depth-of-cut notch include: an abrasive workpiece skin of scale, abrasive properties of high-temperature alloys like Inconel, a work-hardened outer layer resulting from a previous machining operation, or heat-treated material above 55 HRC.

problem	cause	solution
depth-of-cut notching 	• cutter geometry	• Change to a lead angle cutter.
	• grade	• Use a more wear-resistant grade of carbide.
	• feed	• Reduce feed per tooth.
	• speed	• Reduce speed.
	• edge-prep	• Use honed or T-land inserts.
	• programming	• Vary depth of cut on very abrasive materials.

Edge Condition Problems and Solutions (cont'd.)

3. thermal cracks: These cracks run perpendicular to the insert's cutting edge and are caused by the extreme temperature variations involved in milling. In one revolution of a milling cutter, the insert starts to cut and the temperature quickly rises as the insert enters the cut. The varying chip thickness also changes the temperature throughout the cut. When the insert comes out of the cut, air or coolant flow rapidly cools the insert before it reenters the cut.

These temperature variations create heat stresses in the insert which can result in thermal cracks. To the untrained eye, advanced thermal cracking could appear as chipping.

problem	cause	solution
thermal cracks 	• speed and feed	• Reduce cutting edge temperature by reducing the cutting speed and possibly the feed per tooth.
	• coolant	• Shut off coolant.
	• grade	• Use coated grade designed for wet milling.

4. built-up edge: This condition involves the adhesion of layers of workpiece material to the top surface of the insert. Hardened pieces of the adhered material periodically break free, leaving an irregularly shaped depression along the cutting edge. This causes damage to the part and insert. Cutting forces also will be increased due to built-up edge.

problem	cause	solution
built-up edge 	• speed	• Increase sfm.
	• feed	• Increase feed per tooth.
	• coolant	• Use mist or flood coolant to avoid chips sticking to the insert when machining stainless steel and aluminum alloys.
	• grade	• Use sharp edge PVD inserts.
		• Higher speeds require diamond-tipped inserts or diamond-coated inserts on certain non-ferrous alloys.
	• edge-prep	• Use sharp edge, positive rake PVD inserts, or polished inserts.

5. crater wear: A relatively smooth, regular depression is produced on the insert's rake face. Crater wear occurs in two ways:

1. Material adhering to the insert's top surface is dislodged, carrying away minute fragments of the top surface of the insert.
2. Frictional heat builds up from the flow of chips over the top surface of the insert. Eventually, this heat buildup softens the insert behind the cutting edge and removes minute particles of the insert until a crater forms.

Crater wear is rarely encountered in milling, but can appear when machining certain steel and cast iron alloys. If crater wear becomes severe, there is a risk that the cutting edge will break, destroying the insert.

problem	cause	solution
crater wear 	• grade	• Use a more wear-resistant grade.
	• speed	• Reduce cutting speed.
	• edge-prep	• Use smaller T-land or increase feed to proper range for T-land.

6. flank wear: Uniform flank wear is the preferred method of insert failure because it can be predicted. Excessive flank wear increases cutting forces and contributes to poor surface finish. When wear occurs at an unacceptable rate or becomes unpredictable, the key elements that must be investigated are speed, feed, grade, and insert/cutter geometry.

NOTE: Inserts should be indexed when roughing (0,38 to 0,50 mm flank wear is reached) and finishing (0,25 to 0,38 mm flank wear or sooner).

problem	cause	solution
flank wear 	• speed	• Check this area first. Recalculate (Vc) to assure correctness. • Speed should be reduced without changing feed per tooth.
	• feed	• Increase feed per tooth (feed should be high enough to avoid the pure rubbing which occurs with small chip thickness).
	• grade	• Use more wear-resistant grade. • Change to a coated grade if you are now using an uncoated grade.
	• insert geometry	• Inspect insert to determine if proper style is being used in the cutter.

7. multiple factors: When wear, chipping, thermal cracking, and breakage occur at once, the machine operator must look beyond the normal feed, speed, and depth-of-cut adjustments to find the root cause of the problem. Speed, feed, and depth-of-cut parameters should be re-examined for accuracy, but the system's rigidity should also be closely inspected for loose or worn parts as well.

problem	cause	solution
multiple factors 	• system rigidity	• Check system for loose cutter mounting. • Improve fixture and cutter rigidity. • Check for worn hardware or improper insert installation. • Reduce the guage length of the cutter and arbor assembly.
	• feed	• Reduce feed rate to relieve cutting forces.
	• cutter geometry	• If possible, use a lead angle cutter to redirect cutting forces away from the insert nose.
	• insert/grade	• If possible, use a larger nose radius. • Use T-land insert. • Use a tougher grade of carbide.

Troubleshooting Matrix for Advanced Cutting Tool Materials

This matrix explains the specific areas where advanced cutting tool materials perform differently from uncoated and coated carbide grades during the troubleshooting identification process.

cutting tool material	problem	solution	comments
cermets KT530M	• chipping	• Reduce feed per insert. • Turn off coolant. • Apply hone or T-land insert.	• Excellent resistance to built-up edge. • Dry milling grades, do not use coolant. • KT530M is noted for maximum toughness and edge chipping resistance at moderate speeds and medium chip loads.
	• breakage (fracture)	• Reduce depth of cut and chip load. • Increase speed. • Apply hone or T-land insert.	
sialon Kyon 1540 Kyon 2100	• depth-of-cut notch	• Reduce hone or size of T-land edge preparation. • Pre-chamfer part to eliminate stress points on cutting edge of insert. • Vary depth of cut.	• Excellent for machining nickel-base materials over 35 HRC. • Available in positive rake inserts. • Run dry – no coolant. • Works well on PH stainless steels. • Use KY1540 at less than 600 m/min.
	• minor chipping	• Minor chipping is normal, especially on Inconel.	
	• flank wear	• Use 0.2 mm as indexing criterion.	
	• fracture	• Do not over-torque clamping.	
silicon nitride Kyon 3500	• flank wear	• Reduce speed. • Increase feed.	• Use without coolant. • Will provide optimum combination of increased toughness and wear resistance in high-speed machining of cast irons. • Wide range of Vc. • Kyon 3500 is your first choice for maximum toughness and edge chipping resistance at high-speed and heavy-to moderate feeds.
	• chipping	• Change edge preparation. • Reduce chip load.	
	• breakage	• Reduce doc. • Use thicker inserts.	

Troubleshooting Matrix for Advanced Cutting Tool Materials (cont'd.)

cutting tool material	problem	solution	comments
polycrystalline diamond (tipped) KD1410 KD1415 KD1420	• chipping and breaking	• Check system rigidity. • Reduce chip load. • Increase Vc. • Edge prep	• Excellent wear resistance for improved size control and surface finish. • Unsurpassed tool life when machining aluminum alloys, non-ferrous and non-metallics at high Vc. • Can be used with coolant. • Regrindable/resettable.
diamond film coating KDF300	• burrs and finish	• Use a KD1410 tipped insert in one or two pockets as a wiper insert.	• Roughing to semi-finishing grade. • Excellent tool life when machining aluminum alloys that have 12% or less silicon content. • Multiple cutting edges versus single-edge on tipped PCD. • Less expensive than ground, PCD-tipped KD1410.
KB1340 cubic boron nitrides	• chipping and breaking	• Check system rigidity. • Additional edge preparation may be required (hone or T-land).	• Use on hardened tool steels, cast irons, and some high-temperature alloys (Ni-base). • Applications on: Ni-hards, high-chrome irons, chilled cast irons, hard alloys, and hardened tool steels (50-65 HRC). • KD1340 tipped CBN for finishing only; one cutting edge. • Regrindable/resettable.

hardness

Brinell	Rockwell		Brinell	Rockwell	
HB	HRB	HRC	HB	HRB	HRC
654	—	60	253	101.5	25
634	—	59	247	101.0	24
615	—	58	243	100.0	23
595	—	57	237	99.0	22
577	—	56	231	98.5	21
560	—	55	228	98.0	20
543	—	54	222	97.0	18.6
525	—	53	216	96.0	17.2
512	—	52	210	95.0	15.7
496	—	51	205	94.0	14.3
481	—	50	200	93.0	13
469	—	49	195	92.0	11.7
455	—	48	190	91.0	10.4
443	—	47	185	90.0	9.2
432	—	46	180	89.0	8
421	—	45	176	88.0	6.9
409	—	44	172	87.0	5.8
400	—	43	169	86.0	4.7
390	—	42	165	85.0	3.6
381	—	41	162	84.0	2.5
371	—	40	159	83.0	1.4
362	—	39	156	82.0	0.3
353	—	38	153	81.0	—
344	—	37	150	80.0	—
336	109.	36	147	79.0	—
327	108.	35	144	78.0	—
319	108.	34	141	77.0	—
311	107.	33	139	76.0	—
301	107.	32	137	75.0	—
294	106.	31	135	74.0	—
286	105.	30	132	73.0	—
279	104.	29	130	72.0	—
271	104.	28	127	71.0	—
264	103.	27	125	70.0	—
258	102.	26	123	69.0	—

NOTE: Values in shaded areas are beyond normal range and are given for information only.

inch to metric

diameter Ø	
inches	m m
.314	8,0
.375	9,5
.393	10,0
.472	12,0
.500	12,7
.625	15,9
.630	16,0
.750	19,1
.787	20,0
.875	22,2
.984	25,0
1.000	25,4
1.259	32,0
1.500	38,1
1.968	50,0
2.000	50,8
2.480	63,0
2.500	63,5

diameter Ø	
inches	m m
3.000	76,2
3.149	80,0
3.500	88,9
3.937	100,0
4.000	101,6
4.921	125,0
5.000	127,0
6.000	152,4
6.299	160,0
7.000	177,8
7.874	200,0
8.000	203,2
9.842	250,0
10.000	254,0
12.000	304,8
12.401	315,0
14.000	355,6
15.748	400,0

doc	
inches	m m
.010	0,254
.015	0,381
.030	0,762
.050	1,270
.100	2,540
.125	3,175
.150	3,810
.250	6,350
.375	9,525
.500	12,700

speed	
sfm	m/min.
300	91
400	122
500	152
600	183
800	244
1000	305
1200	366
2000	610
4000	1219
10000	3048

feed C.P.T.	
inch/T	m m / T
.003	0,076
.004	0,12
.005	0,127
.006	0,152
.007	0,178
.008	0,203
.009	0,229
.010	0,254
.011	0,279
.012	0,305

surface finish	
µ inch	µ m
500	12,5
250	6,3
125	3,2
63	1,6
32	0,8
16	0,4

English Measures — unless otherwise designated, are those used in the United States, and the units of weight and mass are avoirdupois units.

Gallon — designates the U.S. gallon. To convert into the Imperial gallon, multiply the U.S. gallon by 0.83267. Likewise, the word ton designates a short ton, 2,000 pounds.

Exponents — the figures 10^{-1}, 10^{-2}, 10^{-3}, etc. denote 0.1, 0.01, 0.001, etc. respectively. The figures 10^{1}, 10^{2}, 10^{3}, etc. denote 10, 100, 1000, etc. respectively.

Properties of water — it freezes at 32°F., and is at its maximum density at 39.2°F. In the multipliers using the properties of water, calculations are based on water at 39.2°F. in a vacuum, weighing 62.427 pounds per cubic foot, or 8.345 pounds per U.S. gallon.

multiply	by	to obtain
B.T.U./Min.	12.96	foot–lbs./sec.
B.T.U./Min.	0.02356	horsepower
B.T.U./Min.	0.01757	kilowatts
B.T.U./Min.	17.57	watts
centigrams	0.01	grams
centiliters	0.01	liters
centimeters	0.3937	inches
centimeters	0.01	meters
centimeters	10	millimeters
centimeters/second	1.969	feet/minute
centimeters/second	0.03281	feet/second
centimeters/second	0.036	kilometers/hour
centimeters/second	0.6	meters/minute
centimeters/second	0.02237	miles/hour
centimeters/second	3.728×10^{-4}	miles/minute
cms./sec./sec.	0.03281	feet/sec./sec.
cubic centimeters	3.531×10^{-5}	cubic feet
cubic centimeters	6.102×10^{-2}	cubic inches
cubic centimeters	10^{-6}	cubic meters
cubic centimeters	1.308×10^{-6}	cubic yards
cubic centimeters	2.642×10^{-4}	gallons
cubic centimeters	10^{-3}	liters
cubic centimeters	2.113×10^{-3}	pints (liquid)
cubic centimeters	1.057×10^{-3}	quarts (liquid)
cubic inches	16.39	cubic centimeters
cubic inches	5.787×10^{-4}	cubic feet
cubic inches	1.639×10^{-5}	cubic meters
cubic inches	2.143×10^{-5}	cubic yards
cubic inches	4.329×10^{-3}	gallons
cubic inches	1.639×10^{-2}	liters
cubic inches	0.03463	pints (liquid)
cubic inches	0.01732	quarts (liquid)
cubic meters	10^{6}	cubic centimeters
cubic meters	35.31	cubic feet
cubic meters	61.023	cubic inches
cubic meters	1.308	cubic yards
cubic meters	264.2	gallons
cubic meters	10^{3}	liters
cubic meters	2113	pints (liquid)
cubic meters	1057	quarts (liquid)
cubic yards	7.646×10^{5}	cubic centimeters
cubic yards	27	cubic feet
cubic yards	46,656	cubic inches
cubic yards	0.7646	cubic meters
cubic yards	202.0	gallons
cubic yards	764.6	liters
cubic yards	1616	pints (liquid)
cubic yards	807.9	quarts (liquid)
decigrams	0.1	grams
deciliters	0.1	liters
decimeters	0.1	meters
degrees (angle)	60	minutes
degrees (angle)	0.01745	radians
degrees (angle)	3600	seconds
degrees/second	0.01745	radians/second
degrees/second	0.1667	revolutions/minute
degrees/second	0.002778	revolutions/second
dekagrams	10	grams
dekaliters	10	liters
dekameters	10	meters
drams	27.34375	grains
drams	0.0625	ounces
drams	1.771845	grams
feet	30.48	centimeters
feet	12	inches
feet	0.3048	meters
feet	1/3	yards
feet/minute	0.5080	centimeters/second
feet/minute	0.01667	feet/second
feet/minute	0.01829	kilometers/hour
feet/minute	0.3048	meters/minute
feet/minute	0.01136	miles/hour
feet/second	30.48	centimeters/second
feet/second	1.097	kilometers/hour
feet/second	0.5921	knots
feet/second	18.29	miles/minute
feet/second	0.6818	miles/hour
feet/second	0.01136	miles/minute
foot/sec./sec.	30.48	cms./sec./sec.
foot/sec./sec.	0.3048	meters/sec./sec.
foot–pounds	1.286×10^{-3}	British Thermal Units
foot–pounds	5.050×10^{-7}	horsepower–hrs.
foot–pounds	3.241×10^{-4}	kilogram–calories
foot–pounds	0.1383	kilogram–meters
foot–pounds	3.766×10^{-7}	kilowatt–hours
foot–pounds/minute	1.286×10^{-3}	B.T.U./minute
foot–pounds/minute	0.01667	foot–pounds/second
foot–pounds/minute	3.030×10^{-5}	horsepower
foot–pounds/minute	3.241×10^{-4}	kg.–calories/minute
foot–pounds/minute	2.260×10^{-5}	kilowatts
foot–pounds/second	7.717×10^{-2}	B.T.U./minute
foot–pounds/second	1.818×10^{-3}	horsepower
foot–pounds/second	1.945×10^{-2}	kg.–calories/minute
foot–pounds/second	1.356×10^{-3}	kilowatts
gallons/minute	0.06308	liters/second
gallons/minute	8.0208	cubic feet/hour
gallons/minute	8.0208	overflow rate
	area (square foot)	feet/hour
grams	980.7	dynes
grams	15.43	grains
grams	10^{-3}	kilograms
grams	10^{3}	milligrams
grams	0.03527	ounces
grams	0.03215	ounces (troy)
grams	2.205×10^{-3}	pounds
grams/cm.	5.600×10^{-3}	pounds/inch
grams/cubic cm.	62.43	pounds/cubic foot
grams/cubic cm.	0.03613	pounds/cubic inch
hectograms	100	grams
hectoliters	100	liters
hectometers	100	meters
hectowatts	100	watts

multiply	by	to obtain
horsepower	42.44	B.T.U./minute
horsepower	33,000	foot–lbs./minute
horsepower	550	foot–lbs./second
horsepower	1.014	horsepower (metric)
horsepower	10.70	kg.–calories/minute
horsepower	0.7457	kilowatts
horsepower	745.7	watts
inches	2.540	centimeters
kilograms	980,665	dynes
kilograms	2.205	lbs.
kilograms	1.102×10^{-3}	tons (short)
kilograms	10^{3}	grams
kiloliters	10^{3}	liters
kilometers	10^{5}	centimeters
kilometers	3281	feet
kilometers	10^{3}	meters
kilometers	0.6214	miles
kilometers	1094	yards
kilometers/hour	27.78	centimeters/second
kilometers/hour	54.68	feet/minute
kilometers/hour	0.9113	feet/second
kilometers/hour	0.5396	knots
kilometers/hour	16.67	meters/minute
kilometers/hour	0.6214	miles/hour
kilowatts	56.92	B.T.U./min.
kilowatts	4.425×10^{4}	foot–lbs./min.
kilowatts	737.6	foot–lbs./sec.
kilowatts	1.341	horsepower
kilowatts	14.34	kg.–calories/min.
kilowatts	10^{3}	watts
kilowatt–hours	3415	B.T.U.
kilowatt–hours	2.655×10^{6}	foot–lbs.
kilowatt–hours	1.341	horsepower–hrs.
kilowatt–hours	860.5	kilogram–calories
kilowatt–hours	3.671×10^{5}	kilogram–meters
liters	10^{3}	cubic centimeters
liters	0.03531	cubic feet
liters	61.02	cubic inches
liters	10^{-3}	cubic meters
liters	1.308×10^{-3}	cubic yards
liters	0.2642	gallons
liters	2.113	pints (liquid)
liters	1.057	quarts (liquid)
liters/min.	5.886×10^{-4}	cubic feet/second
liters/min.	4.403×10^{-3}	gallons/second
meters	100	centimeters
meters	3.281	feet
meters	39.37	inches
meters	10^{-3}	kilometers
meters	10^{3}	millimeters
meters	1.094	yards
meters/minute	1.667	centimeters/second
meters/minute	3.281	feet/minute
meters/minute	0.05468	feet/second
meters/minute	0.06	kilometers/hour
meters/minute	0.03728	miles/hour
meters/second	196.8	feet/minute
meters/second	3.281	feet/second
meters/second	3.6	kilometers/hour
meters/second	0.06	kilometers/minute
meters/second	2.237	miles/hour
meters/second	0.03728	miles/minute
miles	5280	feet
miles	1.609	kilometers
miles	1760	yards

multiply	by	to obtain
miles/hour	44.7	centimeters/second
miles/hour	88	feet/minute
miles/hour	1.467	feet/second
miles/hour	1.609	kilometers/hour
miles/hour	0.8684	knots
miles/hour	26.82	meters/minute
miles/minute	2682	centimeters/second
miles/minute	88	feet/second
miles/minute	1.609	kilometers/minute
miles/minute	60	miles/hour
milligrams	10^{-3}	grams
milliliters	10^{-3}	liters
millimeters	0.1	centimeters
millimeters	0.03937	inches
minutes (angle)	2.909×10^{-4}	radians
ounces	16	drams
ounces	437.5	grains
ounces	0.0625	pounds
ounces	28.349527	grams
ounces	0.9115	ounces (troy)
ounces	2.790×10^{-5}	tons (long)
ounces	2.835×10^{-5}	tons (metric)
pounds	16	ounces
pounds	256	drams
pounds	7000	grains
pounds	0.0005	tons (short)
pounds	453.5924	grams
pounds	1.21528	pounds (troy)
pounds	14.5833	ounces (troy)
pounds/foot	1.488	kgs./meter
pounds/inch	178.6	grams/cm.
quadrants (angle)	90	degrees
quadrants (angle)	5400	minutes
quadrants (angle)	1.571	radians
radians	57.30	degrees
radians	3438	minutes
radians	0.637	quadrants
radians/second	57.30	degrees/second
radians/second	0.1592	revolutions/second
radians/second	9.549	revolutions/minute
radians/second/second	573.0	revolutions/minute/minute
radians/second/second	0.1592	revolutions/second/second
revolutions	360	degrees
revolutions	4	quadrants
revolutions	6.283	radians
revolutions/min.	6	degrees/second
revolutions/min.	0.1047	radians/second
revolutions/min.	0.01667	revolutions/second
revolutions/min./min.	1.745×10^{-3}	radians/second/second
revolutions/min./min.	2.778×10^{-4}	revolutions/second/second
revolutions/second	360	degrees/second
revolutions/second	6.283	radians/second
revolutions/second	60	revolutions/minute
revolutions/second/second	6.283	radians/second/second
revolutions/second/second	3600	revolutions/minute/minute
seconds (angle)	4.848×10^{-6}	radians
square centimeters	1.076×10^{-3}	square feet
square centimeters	0.1550	square inches
square centimeters	10^{-4}	square meters
square centimeters	100	square millimeters
square feet	2.296×10^{-5}	acres
square feet	929.0	square centimeters
square feet	144	square inches
square feet	0.09290	square meters
square feet	3.587×10^{-8}	square miles

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multiply	by	to obtain
square feet	1/9	square yards
square inches	6.452	square centimeters
square inches	6.944×10^{-3}	square feet
square inches	645.2	square millimeters
square kilometers	247.1	acres
square kilometers	10.76×10^{6}	square feet
square kilometers	10^{6}	square meters
square kilometers	0.3861	square miles
square kilometers	1.196×10^{6}	square yards
square meters	2.471×10^{-4}	acres
square meters	10.76	square feet
square meters	3.861×10^{-7}	square miles
square meters	1.196	square yards
square miles	640	acres
square miles	27.88×10^{6}	square feet
square miles	2.590	square kilometers
square miles	3.098×10^{6}	square yards
square millimeters	0.01	square centimeters
square millimeters	1.550×10^{-3}	square inches
square yards	2.066×10^{-4}	acres
square yards	9	square feet
square yards	0.8361	square meters
square yards	3.228×10^{-7}	square miles
Temperature (°C.) + 273	1	Abs. temperature (°C.)
Temperature (°C.) + 17.78	1.8	temperature (°F.)

multiply	by	to obtain
Temperature (°F.) + 460	1	Abs. temperature (°F.)
Temperature (°F.) -32	5/9	temperature (°C.)
tons (short)	2000	pounds
tons (short)	32,000	ounces
tons (short)	907.18486	kilograms
tons (short)	2430.56	pounds (troy)
tons (short)	0.89287	tons (long)
tons (short)	29166.66	ounces (troy)
tons (short)	0.90718	tons (metric)
watts	0.05692	B.T.U./minute
watts	44.26	foot–pounds/minute
watts	0.7376	foot–pounds/second
watts	1.341×10^{-3}	horsepower
watts	0.01434	kilogram–calories/minute
watts	10-3	kilowatts
watts–hours	3.415	B.T.U.
watts–hours	2655	foot–pounds
watts–hours	1.341×10^{-3}	horsepower–hours
watts–hours	0.8605	kilogram–calories
watts–hours	367.1	kilogram–meters
watts–hours	10-3	kilowatt–hours
yards	91.44	centimeters
yards	3	feet
yards	36	inches
yards	0.9144	meters

Appendix 1—Rockwell/Brinell Hardness Conversion

If the work materials hardness is available in Rockwell B (HRB) or Rockwell C (HRC) numbers, they should be converted into Brinell hardness numbers by the following equations shown in Table A and Table B.

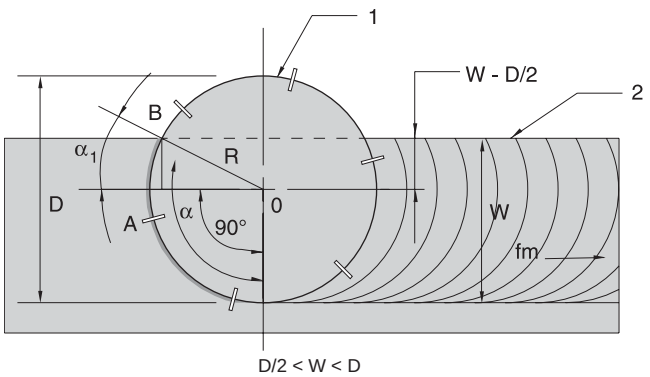
Table A. Brinell-Rockwell C Hardness Relationship

Rockwell C Hardness Numbers (HRC)		Equations to Convert Rockwell C Hardness (HRC) into Brinell Hardness (HB)
from	to	
21	30	HB = 5.970 x HRC + 104.7
31	40	HB = 8.570 x HRC + 27.6
41	50	HB = 11.158 x HRC + 79.6
51	60	HB = 17.515 x HRC - 401

Table B. Brinell-Rockwell B Hardness Relationship

Rockwell B Hardness Numbers (HRB)		Equations to Convert Rockwell B Hardness (HRB) into Brinell Hardness (HB)
from	to	
55	69	HB = 1.646 x HRB + 8.7
70	79	HB = 2.394 x HRB - 42.7
80	89	HB = 3.297 x HRB - 114
90	100	HB = 5.582 x HRB - 319

Appendix 2 — Engagement Angle and Number of Inserts in Cut



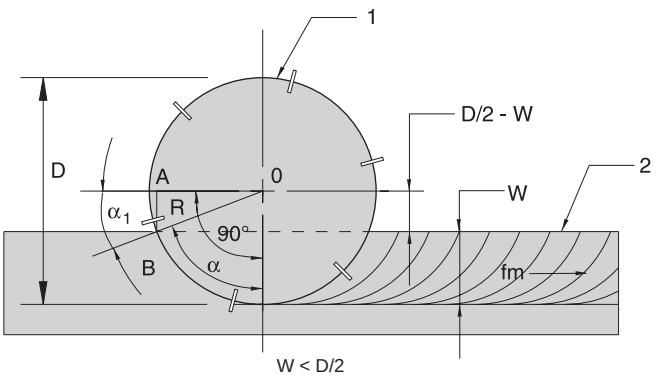
$$Z_c = \frac{Z \times \alpha^\circ}{360^\circ} \qquad \alpha = 90^\circ + \alpha_1$$

$$\sin \alpha_1 = \frac{AB}{OB} = \frac{W - D/2}{D/2} = \frac{2(W - D/2)}{D} = \frac{2W - D}{D};$$

$$\alpha_1 = \arcsin \frac{2W - D}{D};$$

$$Z_c = \frac{Z\left(90^\circ + \arcsin \frac{2W - D}{D}\right)}{360^\circ}$$

D = cutter diameter
W = width pf cut (woc)
α = engagement angle
α_1 = angle between cutter centerline and cutter radius to the peripheral point of exit or entry
Z = number of inserts in cutter
Z_c = number of inserts in cut



$$Z_c = \frac{Z \times \alpha^\circ}{360^\circ} \qquad \alpha = 90^\circ - \alpha_1$$

$$\sin \alpha_1 = \frac{AB}{OB} = \frac{D/2 - W}{D/2} = \frac{2(D/2 - W)}{D} = \frac{D - 2W}{D};$$

$$\alpha_1 = \arcsin \frac{D - 2W}{D}$$

$$Z_c = \frac{Z\left(90^\circ - \arcsin \frac{D - 2W}{D}\right)}{360^\circ}$$

AA (Arithmetic Average) - See “Ra”.

Abrasion Wear - Wear that occurs when hard particles on the underside of the chip pass over the tool face and remove tool material by mechanical action. These particles could be abrasive inclusions in the workpiece, fragments of a built-up edge, or particles of tool material which have been removed by adhesion.

Adhesion - Metal build-up on cutting edge, usually caused by operation at too low speeds.

Adhesion Wear - Wear caused by the fracture of welds which are formed as part of the friction mechanism between the chip and the tool. When these minute junctions are fractured, small bits of tool material are torn out and carried away on the underside of the chip or by the workpiece.

Advanced Cutting Tool Materials - Cutting tool materials able to withstand the extremely harsh environment of elevated cutting tool speeds and the resulting temperatures. These materials include ceramic, PCD and PCBN substrates.

Amorphous - Noncrystalline; having no molecular lattice structure, which is characteristic of the solid state.

ANSI - American National Standards Institute.

Arbor - A device designed to carry and drive an arbor-type cutting tool. It can be mounted in or on the spindle of a machine tool.

Backlash - A reaction during the metalcutting process where the potential energy of the object in motion is suddenly released when the object stops, typically causing the device to quickly snap backwards relative to the last direction of motion.

Base - The surface of the shank which bears against the support and takes the tangential pressure of the cut.

Black Oxide - A black finish on a metal produced by immersing it in hot oxidizing salts or salt solutions.

Boring - A machining process in which internal diameters are made in true relation to the centerline of the spindle. It is most commonly used for enlarging or finishing holes or other circular contours.

Breakout - Term used to describe an uneven break of workpiece material as the insert exits the part.

Brinell Hardness (BHN) - A test to determine the hardness of metallic materials. It consists in applying a known load to the material surface to be tested through a hardened steel ball of known diameter. The diameter of the resulting permanent impression in the metal is measured and then calculated in the Brinell hardness number.

Built-Up Edge (BUE) - An insert edge condition problem that is characterized by the adhesion, or build-up, of layers of workpiece material to the top rake surface of the insert.

Burring - A condition whereby small slivers of workpiece material roll out over the shoulders and points of the workpiece as the tool exits the cut.

CAD (Computer-Aided Design) - Product design functions performed with the help of computers and special software.

CAE (Computer-Aided Engineering) - Engineering functions performed with the help of computers and special software.

CAM (Computer-Aided Manufacturing) - The use of computers to control machining and manufacturing.

Cemented Carbide - A sintered combination of cobalt or other binder metal and refractory metal carbides suitable for use as a cutting tool material.

Ceramics - A cutting tool material (substrate) comprised of aluminum oxide and metal alloys (i.e.: TiC), or silicon nitride. Ceramics are capable of higher speed machining than carbides on steel, irons and super-alloys, but have less toughness and thermal shock resistance.

Cermets - A cutting tool material (substrate) comprised of titanium carbonitride and metallic binder, usually nickel and/or cobalt. Cermets combine some of the high-speed characteristics of ceramics with improved toughness for semi-finish and finish machining of steel and stainless steels. Cermets have greater chemical wear resistance than most tungsten carbide grades, but have less toughness and thermal shock resistance.

Chamfer -

(1) A beveled surface to eliminate an otherwise sharp corner.

(2) A relieved angular cutting edge at a tooth corner.

(3) The surface formed by cutting away sharp corners and edges formed by two faces a piece of metal.

(4) A bevel on the cutting edge of a carbide cutting tool for the purpose of increasing its strength. The angle is measured from the cutting face downward and may vary from 1 to 45 degrees.

Chamfering - Metal turning operation used to remove sharp edges from workpiece diameter.

Chatter - Chatter is a condition of vibration involving the machine, workpiece and cutting tool. Once this condition arises it is often self-sustaining until the problem is corrected. Chatter can be identified when lines or grooves appear at regular intervals in the workpiece.

Chemical Vapor Deposition - See CVD.

Chipping - An insert edge condition problem that is characterized by breakage of the insert’s cutting tip during the cutting action.

Chuck - An attachment for holding a workpiece or a tool in a machine.

Chucker - Machine normally used to cut a part whose diameter is larger than length.

CIM (Computer-Integrated Manufacturing) - The use of interconnected computers and special software to assist in all phases of production.

Clearance - The angle below or behind the cutting edge to be forced into the work. Without clearance, the tool will not cut. It is also the term used for secondary relief in some cases.

Coated Carbide - Coated carbides have a thin layer of very hard material deposited on their surface. This material can be deposited by either physical or chemical vapor deposition. Coated carbides permit a significant increase in cutting speed and add crater and abrasion resistance in high productivity machining operations. Also see CVD and PVD.

Collet - Flexible-sided device that secures a tool or workpiece in a similar fashion as a chuck, but can accommodate only a narrow size range. Collets typically provide greater gripping force and precision than do chucks.

Composites - Materials composed of different elements held together by a compatible binder.

Counterbore - As applied to a milling cutter. An enlargement of the cutter bore at one or both ends to provide space for a nut, screw or bolts, or to provide clearance for a shoulder on arbor or spindle. A recess to facilitate manufacturing.

Crater Wear - An insert edge condition problem that resembles a relatively smooth, regular depression produced on the top of the insert (rake face).

Crest (screw thread) - The outer most surface of the thread form which joins the flanks.

Cubic Boron Nitride - See PCBN.

CVD (Chemical Vapor Deposition) - A process that deposits, or coats a film of hard refractory material on the cutting tool in a sealed reactor to about 1000° C with gaseous hydrogen at atmospheric or lower pressure. Volatile compounds are then added to the hydrogen to supply the constituents of the coating. The higher temperature CVD process provides improved abrasion and crater wear than the PVD process, although it causes poorer toughness through residual tensile stresses in the coatings.

Cycle Time - The time required to complete all machining operations on the workpiece.

Deformation - The permanent change in the shape of a cutting tool due to cutting forces and temperature. Deformation generally occurs in high speed or heavy machining. Deformation can be "plastic" (permanent) or "elastic" (non-permanent).

Depth Of Cut (doc) - The perpendicular distance between the original and final surfaces of the workpiece.

Depth Of Cut Notch (docn) - An insert edge problem that appears as chipping or wear at the doc line on the rake face and flank of the insert.

DIN - German Institute for Normalization (DIN) standards that are developed by a non-profit organization of approximately 130 standards committees with representatives from all technical areas.

Drilling - Hole making with a rotary, end-cutting tool having one or more cutting lips and one or more helical or straight flutes or tubes for the ejection of chips and the passage of cutting fluid.

Ductility - The ability of a material to deform plastically without fracturing, being measured by elongation or reduction of area in a tensile test, by height of cupping in an Erichsen test, or by other means.

Economics - Economics dictate that the cutting tool material or grade you select should ideally be one that will yield the highest productivity (metal removal rate) at the lowest cost while providing correct and consistent tool life.

Edge Preparation (insert) - A conditioning of the cutting edge. Edge preparations include chamfering, honing, and T-land or a combination of hones and lands.

Edge Wear - Edge wear appears as wear along the flank of the insert, below and immediately adjacent to the cutting edge. Uniform edge wear is the preferred method of insert failure because it can be predicted. Also referred to as flank wear.

End Cutting Angle - The angle between the cutting edge on the end of the tool and a line perpendicular to the side edge of the straight portion of the tool shank.

Engine Lathe - A floor mounted machine on which work is rotated about a horizontal axis and shaped by a cutting tool. This definition can also apply to CNC lathes. The term "engine lathe" is a carry-over from when lathes were powered by steam engines.

Face -

(1) The surface of the cutting tool on which the chip impinges as it is separated from the workpiece.

(2) To machine the flat, or end surface of the workpiece, such as facing a surface of a bar before or after turning.

Facing - Machining along the centerline towards the center of the end of the workpiece. Cleaning of one end of material for the purpose of ultrasonic evaluation. This process is also used to make two ends parallel to each other.

Feed Rate - The rate of change of position of the insert relative to the work while cutting. Usually expressed in inches per minute (ipm) when milling and inches per revolution (ipr) when turning.

Finish (surface) - See Surface Finish.

Flank - That surface which is adjacent to the cutting edge and below it when the tool is in a horizontal position for turning. The flank of a thread is either surface connecting the crest with the root. The flank surface intersection with an axial plane is theoretically a straight line.

Flatness - An even, smooth horizontal surface without depressions or elevations when gauged along the same plane. Also see Surface Finish.

FMS (Flexible Manufacturing System) - An automated or near-automated manufacturing system that is designed to manufacture a variety of similar parts. Also associated with machine tools grouped in "cells" for efficient production.

Forging - Squeezing red-hot steel between dies to strengthen it.

Fracture (insert) - When a large enough part of the insert breaks off to cause immediate failure of the cutting edge.

Fracture Toughness - A measure of the energy a material will absorb prior to fracture.

Galling - Developing a condition on the rubbing surface of one or both mating parts where excessive friction between high spots results in localized welding with subsequent spalling and a further roughening of the surface.

Geometry (insert) - The physical characteristics of an insert.

Grade - A designation given to a composition for a particular coated or uncoated cemented carbide cutting tool material.

High-Speed Spindles - Generally speaking, high-speed spindles are regarded as highperformance spindles that run over 15,000 rpm and are balanced and/or balanceable.

Honed (Edge Preparation) - The process of blunting and strengthening of the cutting edge by means of abrasives. It may be done by hand or machine. Also see Edge Preparation.

Hot Hardness - See Red Hardness.

Hypereutectic - An aluminum alloy containing more than 12.2% silicon (Si). Silicon is added to aluminum to improve casting qualities in addition to providing corrosion resistance, low thermal expansion, and high thermal conductivity. Also see Hypoeutectic.

Hypoeutectic - An aluminum alloy containing less than 12.2% silicon (Si). Also see Hypereutectic.

Inscribed Circle - The circle which can be constructed internal to any closed figure or shape such that all sides of the figure are tangent to the circle. The inscribed circle is most often used to describe the dimensions of a triangle, pentagon, hexagon, or octagon.

Insert Lock Screw - Usually identifies a screw with a Torx or hex socket that is used to retain inserts in the toolholder.

ISO - From the Greek word Isosceles meaning "the same as". The International Organization for Standardization located in Geneva, Switzerland, issues these standards for the purpose of setting standards which all countries can agree upon.

"K" Factor - The "K" factor is a power constant that represents the number of cubic inches of metal per minute that can be removed by one horsepower input.

K-Land - See T-land.

Knoop hardness - Microhardness determined from the resistance of metal to indentation by a pyramidal diamond indenter, having edge angles of 172° 30' and 130°, making a rhomodedral impression with one long and one short diagonal.

Land - Area immediately behind cutting edges.

Lead (screw thread) - The distance a screw thread advances axially in one revolution. On a single start, the pitch and lead are identical. The lead is equal to the pitch, times the number of starts.

Lead Angle (chip thickness) - Increasing the lead angle reduces chip thickness for any given feed rate. This chip thinning process occurs by spreading the same amount of material over a greater length of the insert cutting edge.

Lead Angle (cutting forces) - Increasing lead angle allows the cutting edge to gradually enter and exit the workpiece surface. This helps reduce radial pressure. However, increasing the lead angle increases axial pressure and can cause deflection of the machined surface of thin cross-section parts.

Lead Angle (defined) - The angle between the cutting edge of the insert.

Lead Angle (screw thread) - On a straight thread, the lead angle is the angle created by the helix of the thread at the pitch diameter with a plane perpendicular to the axis. The helix angle is the complement to the lead angle.

Lubricity - Slipperiness; the property that diminishes friction. Tantalum carbide and titanium carbide are used to produce lubricity in steel cutting grades of tungsten carbide to reduce crater and wear.

Machinability - The relative difficulty of a machining operation with regard to tool life, surface roughness, and power consumption.

Machinability Factor (Cm) - Indicator of the machinability, or degree of difficulty, in machining various workpiece materials.

Machinability Rating - A rating expressed as a percentage rating to the difficulty of machining a given material. It is usually based on the 100 percent rating of A.I.S.I. B-1112, Cold Rolled Steel when turned at 180 sfm under normal cutting conditions. A high rating number means the material is easier to machine.

Major Diameter (screw thread) - The largest diameter of a straight screw thread. This applies to both internal and external threads.

Mandrel - Workholder for turning that fits in the inner diameter of workpieces. Three common types of mandrels are expanding, pin, and threaded.

Microstructure - The structure of polished and etched metals as revealed by a microscope at a magnification greater than ten.

Minor Diameter (screw thread) - The smallest diameter of a straight screw thread. This applies to both internal and external threads.

Negative Rake - A rake angle that is less than 90° between insert rake face and surface of work.

Nest - A removable part of a toolholder or milling cutter designed to support the cutting insert. Also called anvil or seat.

Nose - The corner angle formed by joining the side-cutting and end-cutting edges of a tool.

Nose Radius - The radius on the tool between the end and side cutting edges.

Notching, Depth of Cut - See Depth of Cut Notch (docn).

Overshoot - A condition resulting in the deviation from the normal path or designated value caused by momentum carried over from the previous step, as when a tool is rapidly traversed over a considerable distance to begin a cut.

PCBN (Polycrystalline Cubic Boron Nitride) - An ultra-hard cutting tool material (substrate) consisting of polycrystalline cubic boron nitride with a metallic or ceramic binder. PCBN is available either as a tip brazed to a carbide insert carrier or as a solid insert. Primarily used to machine hardened ferrous material.

PCD (Polycrystalline Diamond) - An ultra-hard cutting tool material (substrate) consisting of a synthetic polycrystalline diamond tip brazed to a carbide insert carrier. Primarily used to machine non-ferrous materials at high speeds.

Pitch (screw thread) - The distance from a point on a screw thread to a corresponding point on the next thread measured parallel to the thread axis.

Pitch Diameter - (Simple Effective Diameter) On a straight thread, the pitch diameter is the diameter of the imaginary co-axial cylinder, the surface of which would pass through the thread profiles at such points as to make the width of the groove equal to one-half of the basic pitch. On a perfect thread, this occurs at the point where the widths of the thread and groove are equal. On a taper thread, the pitch diameter at a given position on the thread axis is the diameter of the pitch cone at that position.

Positive Rake - A rake angle that is more than 90° between insert rake face and work surface.

Profiling - Machine operation where the tool does not move parallel to the workpiece, but follows contours.

PVD (Physical Vapor Deposition) - PVD is a process that deposits, or coats, a film of hard refractory materials on the cutting tool by heating the tools in a sealed reactor to about 500° C in a vacuum chamber. A vaporized or ionized compound is then deposited on the tools by ion plating, magnetron sputtering, or arc evaporation. The PVD process is designed to improve coating toughness and prevent chipping of the cutting edge.

Quick-Change Tooling - This tool changing procedure involves changing an entire pre-gauged cutting unit as opposed to changing an individual insert. Quick-change tooling helps to minimize time lost for changing tools and making setups.

Ra - A measure of roughness. An arithmetical average (also referred to as "AA") that is very close to root mean square (rms) except the Ra(AA) measures 11 percent lower. The squaring process used in obtaining the rms average gives added weight to the larger ordinates of the surface roughness.

Radial Runout - The total variation in a radial direction of all cutting edges in a plane of rotation. Also known as total indicator reading.

Rake Angle - The angle between the face of the cutting tool and the work. If the face of the tool lies perpendicular to the work, it has a zero-degree, or neutral rake. If the angle of the tool face makes the cutting edge more acute, then it has a positive rake, if more blunt, then it has a negative rake.

Red Hardness (Hot Hardness) - Ability of a cutting tool material to withstand extremely high temperatures without softening or degrading.

Refractory Metal - A metal having an extremely high melting point. The term is typically used in reference to metals that have a melting point above the range of iron.

Relief - The clearance angle behind or below the cutting edge which allows the cutting edge to be forced into the work. It is sometimes divided into primary relief (adjacent to the cutting edge) and secondary relief (beyond the primary relief). See Clearance.

Rigidity - The inflexibility, or stiffness of a machine set-up and the associated fixtures. Rigidity is extremely important for successful metalcutting.

RMS (root mean square) - A measure of roughness or average deviation from the mean surface of the machined workpiece. The mean surface is the perfect surface that would be formed if all of the roughness peaks were cut off and filled into the valleys below the surface.

Rockwell Hardness (HRC) - A measure of hardness calculated from the difference in depth of penetration of an indenture between a major and a minor load. The more commonly used Rockwell scales are Rockwell "C" (HRC), using a diamond spheroconical penetrator, and a Rockwell "B" (HRB), using a 1/16 inch diameter steel ball penetrator.

Root (screw thread) - The inner most surface of the thread form which joins the flanks.

Roughness - Fine irregularities in the part surface texture produced by the cutting action. See Surface Finish.

rpm (revolution per minute) - defined as

$$n = \frac{1000 \times Vc}{\pi \times D}$$

Semisynthetic Cutting Fluid - Water-based chemical solution that contains some amount of oil.

Vc (surface feet per minute) - defined as

$$Vc = \frac{\pi \times D \times n}{1000}$$

Shank - The main body of a single point tool or toolholder.

Side Cutting Edge Angle - The angle between the side cutting edge and the projected side of the shank or holder (also see Lead Angle).

Soluble-Oil Cutting Fluid - Fluid in which oil is suspended in water. Also known as emulsified oil, the fluid is a mix of oil and water in ratios of 1:5 to 1:100, depending on the oil and the machining application.

Square Shoulder - Lead angles of 0° create 90°, or square, shoulders.

Starting Feeds and Speeds - The process of correctly setting the initial cutting specifications. Correct starting feeds and speeds will dramatically increase productivity and reduce costs.

Surface Finish -

(1) Condition of a surface as a result of a final treatment.

(2) Measured surface profile characteristics, the preferred term being roughness.

(3) Physical characteristics of the machined workpiece surface.

Surface Symbols - ANSI approved symbols that are used to designate control of workpiece surface irregularities.

Synthetic Cutting Fluid - Water-based solution that contains no oil.

T-Land - A negative land that is ground on the face of the insert from the cutting edge inward. T-land and T-land with honed edge preparations offer maximum insert edge protection and strength, although significantly increasing the cutting pressure of the operation. See Edge Preparation.

Tangential Force - Action in a direction tangential to the revolving workpiece and represents the resistance to the rotation of the workpiece.

Thermal Cracks - Separations in the cutting tool generally visible in the crater or top face of the cutting tool due to high-temperature gradients encountered in some metalcutting operations. To decrease thermal cracking effects, a more heat-resistant grade is selected.

Thread Angle (included) - The included angle between the individual flanks of the thread form.

Threading - Producing external threads on a cylindrical surface. Three common types of threading are die threading, single-point threading, and thread milling.

Threads per inch (tpi) - The number of threads per inch measured axially. The terms pitch and tpi are often used interchangeably.

TIR (total indicator reading) - See Radial Runout.

Tool Wear Factor (Cw) - Indicator of approximate tool wear.

Torque - The torque generated by tangential forces is calculated using the following formula:

$$T = Ft \times D/2 \text{ (Nm)}$$

Trepanning - Cutting a groove in a solid part in the form of a circle and removing the center core in one piece. Shallow trepanning, also called face grooving, is usually performed with a curved blade.

True Rake Angle (TRA) - Describes the angle between the reference plane and the face of the insert, as measured in a plane normal to the cutting edge. It affects horsepower consumption, cutting forces and tool life, and is derived from the combined angles of the axial rake, radial rake and lead angle. The true rake equals the radial rake when the lead angle equals zero.

Turning - A machining process in which a workpiece is held and rotated against a single-point tool to form flat or contoured surfaces concentric with the longitudinal axis of the workpiece.

Turning Center - A lathe-type NC machine tool capable of automatically boring, turning outer and inner diameters, threading, and facing parts. It is often equipped with a system for automatically changing or indexing cutting tools.

Turret Lathe - Differs from the engine lathe in that the normal compound rest is replaced by pivoting, multi-tool turrets mounted on the cross slide and tailstock.

Ultimate Material Strength - The maximum strength or stress that a material is capable of withstanding without breaking under a gradually and uniformly applied load.

Uncoated Carbide - Uncoated cemented carbide was first produced by combining tungsten carbide with a cobalt binder, and today this material can be modified with other materials. Uncoated tungsten carbide grade usage, in standard insert configurations, is slowly fading from the metalcutting scene due to productivity gains promised by coated carbides.

Undercut - A cut shorter than the programmed cut resulting in a command change in direction. Also a condition in generated gear teeth when any part of the fillet curve lies inside of a line drawn tangent to the working profile at its point of juncture with the fillet.

Undershoot - The tendency of a machine to round off the corners of a programmed path because of servo log, backlash, and overall quality and rigidity of the machine.

Waviness - The widest-spaced irregularities measured along the workpart surface. Also see Surface Finish.

Workhardening - When the cutting condition is such that a high temperature is produced at the cutting point engagement of the workpiece, the high temperature will cause the material to harden at a higher Rockwell rating than it was originally.

Company Name			Date
Attention		Email	
Address			Phone Number
City	State	Zip	Sales Rep.

Please complete only the information that is required for your application.

Application Requirements:

- ❒ Face Milling
- ❒ Shoulder Milling (End milling)
- ❒ Slot Milling
- ❒ Plunge Milling (Z-axis)
- ❒ Ramping
- ❒ Contour Milling
- ❒ Helical / Circular Interpolation
- ❒ Drilling (Center Cutting)
- ❒ Thread Milling

Work Place Material:

- ❒ Bar Stock
- ❒ Casting
- ❒ Forging
- ❒ Material =
- ❒ Hardness =

Surface Finish Requirements:

- ❒ Roughing
- ❒ Finishing ~ Req'd Finish =
- ❒ Ra
- ❒ Rz
- ❒ Microinch (MU)
- ❒ Micrometer (MU)

Mounting Requirements:

Arbor Mount
- ❒ Shell Mill Mount
- ❒ Type A (Cap Screw)
- ❒ Type B (Retaining Screw)
- ❒ Type C (Bolt Circle)
- ❒ Hub Mount (Shaft Mounting)

Shank Mount
- ❒ Plain Straight Shank (Smooth)
- ❒ Flatted Straight Shank (Weldon)
- ❒ Whistle Notch Straight Shank
- ❒ Threaded Shank
- ❒ R8 ~ Bridgeport Shank
- ❒ Morse

Integral Mount
- ❒ CV
- ❒ BT
- ❒ DV
- ❒ HSK
- ❒ Morse

Size =

Form =

Special requirements =

Insert Requirements:

- ❒ Insert Style =
- ❒ Insert Size =
- ❒ Insert Corner Radius =

Cutter Requirements:

- ❒ Design Units = ❒ Inch ❒ Metric
- ❒ Cutting Diameter — Dc (or D1) =
- ❒ Cutter Height (Overall Length) — L =
- ❒ Lead Angle — Kr (or Kri) =
- ❒ Number of Effective Inserts — z (or Zs) =
- ❒ Programmed Chip Load — fz =
- ❒ Axial Depth of Cut — ap =
- ❒ Radial Depth of Cut — ae =

ap = Engagement measured parallel to (along) tool axis
ae = Engagement measured perpendicular to tool axis

- ❒ Cutting Direction = ❒ Right Hand ❒ Left Hand
- ❒ Through Tool Coolant
- ❒ Insert Spacing = ❒ Differential ❒ HARVI

Additional Information:

Material Grade Comparison Table

KENNAMETAL

Steel

Mat. Group	Mat. No.	Germany DIN	France AFNOR	Great Britain BS	Italy UNI	Sweden SS	Spain UNE	U.S.A. AISI/SAE UNS	Japan JIS
	Plain Steel, Cast Steel, Free-Machining Steel								
P1	1.0332	St14		14491CR		1447		1008	
P1	1.1121	Ck10	CC10	040A10		1264		1010	S10C
P1	1.0721	10S20		210M15				1108	
P1	1.0401	C15	CC12	080M15	C15C16	1350	F.111	1015	S15C
P1	1.0402	C22	CC20	050A20	C20C21	1450	F.112	1020	S20C,S22C
P1	1.1141	Ck15	XC12	080M15	C16	1370	C15K	1015	S15C
P1	1.0036	USt37-3			FE37BFU				
P1	1.0715	9SMn28	S250	230M07	CF9SMn28	1912	11SMn28	1213	SUM22
P1	1.0718	9SMnPb28	S250Pb		CF9SMnPb28	1914	11SMnPb28	12L3	SUM22L
P2	1.0501	C35	CC35	060A35	C35	1550	F.113	1035	S35C
P2	1.0503	C45	CC45	080M46	C45	1650	F.114	1045	S45C
P2	1.1158	Ck25	XC25	070M25	C25			1025	S25C
P2	1.1183	Cf35	XC38TS	060A35	C36	1572		1035	S35C
P2	1.1191	Ck45	XC42	080M46	C45	1672	C45K	1045	S45C
P2	1.1213	Cf53	XC48TS	060A52	C53	1674		1050	S50C
P3	1.5415	15Mo3	15D3	1501-240	16Mo3KW	2912	16Mo3	ASTMA204GrA	
P3	1.5423	16Mo5		1503-245-420	16Mo5		16Mo5	4520	SB450M
P1	1.0050	St50-2			FE50				SM50YA
P3	1.7242	16CrMo 4	18CrMo4			18CrMo4			
P3	1.7337	16CrMo 4 4			A18CrMo45KW			A387Gr.12Cl.	
P3	1.7362	12CrMo 19 5	Z10CD5.05	3606-625	16CrMo205				
P1	1.0060	St60-2			FE60-2				SM570
P2	1.0535	C55		070M55	C55	1655		1055	S55C
P2	1.0601	C60	CC55	080A62	C60			1060	S60C
P2	1.1203	Ck55	XC55	070M55	C50		C55K	1055	S55C
P2	1.1221	Ck60	XC60	080A62	C60	1678		1060	S58C
P3/4	1.1545	C1051			C100KU				SK3
P3/4	1.1545	C105W1			C100KU				SK3
P1	1.0070	St70-2			FE70-2				
P3/4	1.7238	49CrMo4							
P3/4	1.7561	42CrV6							
P3/4	1.7701	51CrMoV4	51CDV4		51CrMoV4				
	Low-Alloy Steel, Cast Steel, Free-Machining Steel								
P3/4	1.2067	100Cr6	Y100C6	BL3			100Cr6	L3	SUJ2
P3/4	1.2210	115CrV3	100C3		107CrV3KU			L2	
P3/4	1.2241	51CrV4							
P3/4	1.2419	105WCr6	105WC13		10WCr6	2140	105WCr5		SKS31
P3/4	1.2419	105WCr6	105WC13		107WCr5KU				SKS31
P3/4	1.2542	45WCrV7		BS1	45WCrV8KU	2710	45WCrSi8	S1	
P3/4	1.2550	60WCrV7	55WC20		58WCr9KU	-2710		S1	
P3/4	1.2713	55NiCrMoV6	55NCDV7				F.520.S	L6	SKH1;SKT4
P3/4	1.2721	50NiCr13				-2550			
P3/4	1.2762	75CrMoNiW67							
P3/4	1.2762	75CrMoNiW67							
P3/4	1.2842	90MnCrV8	90MV8	BO2	88MnV8KU			O2	
P3/4	1.3505	100Cr6	100C6	534A99	100Cr6	2258		52100	SUJ2
P3	1.5622	14Ni6	16N6		14Ni6		15Ni6	ASTMA350LF5	
P3	1.5732	14NiCr10	14NC11		16NiCr11		15NiCr11	3415	SNC415(H)
P3	1.5752	14NiCr14	12NC15	655M13				3415;3310	SNC815(H)
P3/4	1.6511	36CrNiMo4	40NCD3	816M40	38NiCrM04(KB)		33NiCrMo4	9840	SNCM447
P3/4	1.6523	21NiCrMo2	20NCD2	805M20	20NiCrMo2	2506	20NiCrMo2	8620	SNCM220(H)
P3/4	1.6546	40NiCrMo22		311-TYPE7	40NiCrM02(KB)		40NiCrMo2	8740	SNCM240
P3/4	1.6582	35CrNiMo6	35NCD6	817M40	35NiCrMo6(KB)	2541		4340	SNCM447
P3	1.6587	17CrNiMo6	18NCD6	820A16			14NiCrMo13		
P3	1.6657	14NiCrMo34		832M13	15NiCrMo13		14NiCrMo131		
P3/4	1.7033	34Cr4	32C4	530A32		34Cr4(KB)	35Cr4	5132	SCR430(H)
P3/4	1.7035	41Cr4	42C4	530M40			42Cr4	5140	SCR440(H)
P3/4	1.7045	42Cr4	42C4TS	530A40	41Cr4	2245	42Cr4	5140	SCr440
P3	1.7131	16MnCr5	16MC5	(527M20)	16MnCr5	2511	16MnCr5	5115	SCR415
P3/4	1.7176	55Cr3	55C3	527A60				5155	SUP9(A)
P3/4	1.7218	25CrMo4	25CD4	1717CDS110	25CrMo4(KB)	2225	55Cr3	4130	SM420;SCM430
P3/4	1.7220	34CrMo4	35CD4	708A37	35CrMo4	2234	34CrMo4	4137;4135	SCM432;SCCRM3

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Mat. Group	Mat. No.	Germany DIN	France AFNOR	Great Britain BS	Italy UNI	Sweden SS	Spain UNE	U.S.A. AISI/SAE UNS	Japan JIS
	Plain Steel, Cast Steel, Free-Machining Steel								
P3/4	1.7223	41CrMo4	42CD4TS	708M40	41CrMo4	2244	42CrMo4	4140;4142	SCM440
P3/4	1.7225	42CrMo4	42CD4	708M40	42CrMo4	2244	42CrMo4	4140	SCM440(H)
P3	1.7262	15CrMo5	12CD4			2216	12CrMo4		SCM415(H)
P3	1.7335	13CrMo44	15CD3.5/4.5	1501-620-Gr27	14CrMo45		14CrMo45	ASTMA182	SPVAF12
P3/4	1.7361	32CrMo12	30CD12	722M24	32CrMo12	2240	F.124.A		
P3	1.7380	10CrMo9 10		1501-622Gr31;45				ASTMA182F.22	SPVA,SCMV4
P3	1.7715	14MoV6 3		1503-660-440			13MoCrV6		
P3/4	1.8159	50CrV4	50CrV4	735A50	50CrV4	2230	51CrV4	6150	SUP10
P3/4	1.8159	50CrV4		735A50	51CrV4	2230		6150	SUP10
P3/4	1.3501	100Cr2	100C2					E50100	
P3/4	1.5710	36NiCr6	35NC6	640A35				3135	SNC236
P3/4	1.5736	36NiCr10	30NC11					3435	SNC631(H)
P3/4	1.5755	31NiCr14	18NC13	653M31					SNC836
P3/4	1.7733	24CrMoV55	20CDV6		21CrMoV511				
P3/4	1.7755	GS-45CrMoV104							
P3	1.8070	21CrMoV511			35NiCr9				
P3/4	1.8509	41CrALMo7	40CAD6,12	905M39	41CrAlMo7	2940	41CrAlMo7		SACM645
P3/4	1.8523	39CrMoV139		897M39	36CrMoV12				
P3/4	1.2311	40CrMnMo7			35CrMo8KU				
P5/6	1.4882	X50CrMnNiNbN219	Z50CMNNb21.09						
P3/4	1.5864	35NiCr18							
	High-Alloy Steel, Cast Steel								
P3/4	1.2343	X38CrMoV51	Z38CDV5	BH11	X37CrMoV51KU		X37CrMoV5	H11	SKD6
P3/4	1.2344	X40CrMoV51	Z40CDV5	BH13	X40CrMoV511KU	2242	X40CrMoV5	H13	SKD61
P3/4	1.2379	X155CrVMo121	Z160CDV12	BD2	X155CrVMo121KU			D2	SKD11
P3/4	1.2436	X210CrW12			X215CrW121KU	2312	X210CrW12		SKD2
P3/4	1.2581	X30WCrV93	Z30WCV9	BH21	X30WCrV93KU		X30WCrV9	H21	SKD5
P3/4	1.2601	X165CrMoV12			X165CrMoW12KU	2310	X160CrMoV12		
P3/4	1.2606	X37CrMoW 51	Z35CWDV5	BH12	X35CrMoW05KU		F.537	H12	SKD62
P5/6	1.5662	X8Ni9		1501.509;50	X10Ni9		XBNi09	ASTMA353	SL9N53
P3	1.5680	12Ni19	Z18N5					2515	
P3/4	1.3202	S12-1-4-5		BT15	HS12-1-5-5		12-1-5-5		
P3/4	1.3207	S10-4-3-10	Z130WKCDV	BT42	HS10-4-3-10				SKH57
P3/4	1.3243	S6-5-2-5	KCV06-05-05-04-02		HS6-5-2-5	2723	6-5-2-5	T15	SKH55
P3/4	1.3246	S7-4-2-5	Z110WKCDV07-05-04			HS7-4-2-5	7-4-2-5	M35	
P3/4	1.3247	S2-10-1-8	Z110DKCWV09-08-04		BM42	HS2-9-1-8	2-10-1-8	M41	SKH51
P3/4	1.3249	S2-9-2-8		BM34			2-9-2-8	M42	
P3/4	1.3343	S6-5-2	Z85WDCV	BM2	HS6-5-2-5	2722		M35	SKH9;SKH51
	Stainless Steel, Cast Steel								
P5/6	1.4000	X6Cr13	Z6C13	403S17	X6Cr3	2301	F.3110	403	SUS403
P5/6	1.4001	X6Cr14					F.8401		410S,429
P5/6	1.4002	X6CrAl13	Z8CA12	405S17	X6CrAl13			405	SUS405
P5/6	1.4006	(G-)X10Cr13	Z10C13	410S21	X12Cr13	2302	F.3401	SUS410	SUS410
P5/6	1.4016	X8Cr17	Z8C17	430S15	X8Cr17	2320	F.3113	430	SUS430
P5/6	1.4021	X20Cr13	Z20C13	420S37	X20Cr13	2303		420	SUS420J1
P5/6	1.4027	G-X20Cr14	Z20C13M	420C29					SCS2
P5/6	1.4086	G-X120Cr29		452C11					
P5/6	1.4104	X12CrMoS17	Z10CF17	441S29	X10CrS17	2383	F.3117	430F	SUS430F
P5/6	1.4113	X6CrMo17	Z8CD1701	434S17	X8CrMo17	2325		434	SUS434
P5/6	1.4340	G-X40CrNi274							
P5/6	1.4417	X2CrNiMoSi195				2376		S31500	
P5/6	1.4720	X20CrMo13							
P5/6	1.4724	X10CrA113	Z10C13	403S17	X10CrA112		F.311	405	SUS405
P5/6	1.4742	X10CrA118	Z10CAS18	430S15	X8Cr17		F.3113	430	SUS430
P5/6	1.4762	X10CrA124	Z10CAS24		X16Cr26	2322		446	SUH446
P5/6	1.4034	X46Cr13	Z40CM	420S45	X40Cr14	2304	F.3405		
P5/6	1.4057	X20CrNi17	Z6CNi6.02	431S29	X16CrNi16	2321		431	SUS431
P5/6	1.4125	X105CrMo17	Z100CD17		X 105CrMo17				SUS440C
P5/6	1.4534							13.8PH	
P5/6	1.4540	X4CrNiCuNb164	Z6CNU15.05					15.5PH	
P5/6	1.4542	X5CrNiCuNb174	Z7CNU17.04					17.4PH	SCS 24

Material Grade Comparison Table

KENNAMETAL

Stainless Steel and Cast Iron

Mat. Group	Mat. No.	Germany DIN	France AFNOR	Great Britain BS	Italy UNI	Sweden SS	Spain UNE	U.S.A. AISI/SAE UNS	Japan JIS
	Austenitic Stainless Steel								
M1	1.4301	X5CrNi189	Z6CN18.09	304S15	X5CrNi1810	2332	F.3551	304	SUS304
M1	1.4310	X12CrNi177	Z12CN17.07	301S21	X2CrNi1807	2331	F.3517	301	SUS301
M1	1.4311	X2CrNiN1810	Z2CN18.10	304S62	X2CrNiN1810	2371		304LN	SUS304LN
M1	1.4312	G-X10CrNi188	Z10CN18.9M	302C25					
M1	1.4350	X5CrNi189	Z6CN18.09	304S31	X5CrNi1810	2332/2333	F.3551	304	
M1	1.4362	X2CrNiN234	Z2CN23-04AZ			2327		S32304	
M2	1.4401	X5CrNiMo17122	Z6CND17.11	316S16	X5CrNiMo1712	2347	F.3543	316	SUS316
M2	1.4404	X2CrNiMo1810	Z2CND17.12	316S12	X2CrNiMo1712	2343/2348/2553			316L SUS316
M2	1.4410	G-X10CrNiMo189	Z5CND20.12M						
M2	1.4429	X2CrNiMoN17133	Z2CND17.13	316S63	X2CrNiMoN1713	2375		316LN	SUS316LN
M2	1.4435	X2CrNiMo18143	Z2CND17.12	316S13	X2CrNiMo1712	2353		316L	SCS16
M2	1.4436	X5CrNiMo17133	Z6CND18-12-03	316S33	X8CrNiMo1713	2343/2347		316	SUS316
M2	1.4438	X2CrNiMo18164	Z2CND19.15	317S12	X2CrNiMo1816	2367		317L	SUS317L
M2	1.4500	G-X7NiCrMoCuNb2520	23NCDU25.20M						
M2	1.4541	X10CrNiMoTi1810	Z6CNT18.10	321S12	X6CrNiTi1811	2337	F.3553F.3523	321	SUS321
M2	1.4550	X10CrNiNb	Z6CNNb18.10	347S17	X6CrNiNb1811	2338	F.3552F.3524	347	SUS347
M2	1.4552	G-X7CrNiNb189	Z4CNNb19.10M	347C17					
M2	1.4571	X10CrNiMoTi1810	Z6NDT17.12	320S17	X6CrNiMoTi1712	2350	F.3535	316Ti	SUS316TI
M2	1.4583	X10CrNiMoNb1812	Z6CNDN1713B		X6CrNiMoNb			318	
M2	1.4585	G-X7CrNiMoCuNb1818			X6CrNiMoTi1712				
M1	1.4828	X15CrNiSi2012	Z15CNS20.12	309S24				309	SUH309
M2	1.4845	X12CrNi2521	Z12CN2520	310S24	X6CrNi2520	2361	F.331	310S	SUH310;
	Austenitic/Ferritic Stainless Steel (Duplex)								
M3	1.4460	X8CrNiMo275				2324		S32900	SUS329J1
M3	1.4462	X2CrNiMoN2253	Z2CND22-05-03			2977			
M3	1.4821	X20CrNiSi254	Z20CNS25.04						
M3	1.4823	G-X40CrNiSi274							
	Gray Cast Iron								
K1	0.6010	GG10	Ft10D		G10	110		CLASS20	FC100
K1	0.6015	GG15	Ft15D	GRADE150	G15	115	FG15	CLASS25	FC150
K1	0.6020	GG20	Ft20D	GRADE220	G20	120	FG20	CLASS30	FC200
K1	0.6025	GG25	Ft25D	GRADE260	G25	125	FG25	CLASS35	FC250
K1	0.6030	GG30	Ft30D	GRADE300	G30	130	FG30	CLASS45	FC300
K1	0.6035	GG35	Ft35D	GRADE350	G35	135	FG35	CLASS50	FC350
K1	0.6040	GG40	Ft40D	GRADE400		140		CLASS55	FC400
	Gray Cast Iron with Nodular Graphite								
K2	0.7033	GGG35.3				0717-15			FCD350
K2	0.7040	GGG40	FCS400-12	SNG420/12	GGG40	0717-02	GGG40	60-40-18	FCD400
K2	0.7043	GGG40.3	FGS370-17	SNG370/17		0717-12			FCD400
K3	0.7050	GGG50	FGS500-7	SNG500/7	GGG50	0727-02	GGG50	80-55-06	FCD500
K3	0.7060	GGG60	FGS600-3	SNG600/3	GGG60	0732-03	GGG60		FCD600
K3	0.7070	GGG70	FGS700-2	SNG700/2	GGG70	0737-01	GGG70	100-70-03	FCD700
	White Malleable Cast Iron								
K1	0.8040	GTW-40	MB40-10	W410/4	GMB40		GTW40		
K1	0.8045	GTW-45			GMB45		GTW45		
K1	0.8055	GTW-55					GTW55		
K1	0.8065	GTW-65					GTW65		
K2	0.8135	GTS-35	MN35-10	B340/12		810	GTS35	32510	
K2	0.8145	GTS-45		P440/7		852	GTS45	40010	
K1	0.8035	GTW-35	MB35-7	W340/3			GTW35		
K3	0.8155	GTS-55	MP50-5	P510/4		854	GTS55	50005	
K3	0.8165	GTS-65	MP60-3	P570/3		856	GTS65	70003	
K3	0.8170	GTS-70	M870-2	P690/2		0862; 864	GTS70	90001	

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Mat. Group	Mat. No.	Germany DIN	France AFNOR	Great Britain BS	Italy UNI	Sweden SS	Spain UNE	U.S.A. AISI/SAE UNS	Japan JIS
	Aluminum Alloys								
N1	3.0255	Al99.5	A59050C	L31/34/36				1000	
N1	3.3315	AlMg1							
N1	3.1655	AlCuSiPb							
N1	3.1754	G-AlCu5Ni1,5	3.4345	AlZnMgCu0,5	AZ4GU/9051	L86	811-04		7050
N2	3.2373	G-AlSi9Mg							
N2	3.2381	G-AlSi10Mg							
N2	3.2382	GD-AlSi10Mg							
N2	3.2383	G-AlSi10Mg (Cu)		LM9		4253		A360.2	
N2	3.2383	GK-AlSi10Mg (Cu)		LM9		4253		A360.2	
N2	3.2581	G-AlSi12		LM6		4261		A413.2	
N2	3.2582	GD-AlSi12				4247		A413.0	A6061
N2	3.2583	G-AlSi12 (Cu)		LM20		4260		A413.1	ADC12
N1	3.3561	G-AlMg5	A-SU 12	LN5		4252		GD-AlSi12	AC4A
N1	3.5101	G-MgZn4SE1Zr1	G-Z4TR	MAG5				ZE41	
N1	3.5103	MgSE3Zn2Zr1	G-TR3Z2	MAG6				EZ33	
N1	3.5106	G-MgAg3SE2Zr1	G-Ag22,5	MAG12				QE22	
N1	3.5812	G-MgAl8Zn1	G-A9	MAG1				AZ81	
N1	3.5912	G-MgAl9Zn1	G-A9Z1	MAG7				AZ91	
N1	2.1871	G-AlCu4TiMg							
N1	3.2371	G-AlSi7Mg						4218B	
	Copper Alloy								
N3	2.1090	G-CuSn7ZnPb	U-E7Z5Pb4					C93200	
N3	2.1096	G-CuSn5ZnPb	U-E5Pb5Z5	LG2				C83600	
N3	2.1098	G-CuSn2ZnPb							
N3	2.1176	G-CuPb10Sn	U-E10Pb10	LB2				C93700	
N3	2.1182	G-CuPb15Sn	U-Pb15E8	LB1				C93800	
N3	2.0240	CuZn15	CuZn15	CZ102				C23000	
N3	2.0265	CuZn30	CuZn30	CZ106				C26000	
N3	2.0321	CuZn37	CuZn36, CuZn37	CZ108	C2700,C2720			C27200, C27700	
N3	2.0592	G-CuZn35Al1	U-Z36N3	HTB1				C86500	
N3	2.0596	G-CuZn34Al2	U-Z36N3	HTB1				C86200	
N3	2.1188	G-CuPb20Sn	U-Pb20	LB5				C94100	
N3	2.1292	G-CuCrF35		CC1-FF				C81500	
N3	2.1293	CuCrZr	U-Cr0,8Zr	CC102				C18200	
N3	2.0966	CuAl10Ni5Fe4	U-A10N	Ca104				C63000	
N3	2.0975	G-CuAl10Ni						B-148-52	
N3	2.1050	G-CuSn10		CT1				C90700	
N3	2.1052	G-CuSn12	UE12P	Pb2				C90800	
N4		Nylon, Plastics, Rubbers, Phenolics and Resins							
N5		Carbon and Graphite Composites, brush alloys, Kevlar, Graphite (280 - 400 HB, 30 - 40 HRC)							
N6		MMC's (Aluminum-based Metal Matrix Composites)							

Material Grade Comparison Table

KENNAMETAL

High-Temp Alloys

Mat. Group	Mat. No.	Germany DIN	France AFNOR	Great Britain BS	Italy UNI	Sweden SS	Spain UNE	U.S.A. AISI/SAE UNS	Japan JIS
	Super-Alloys Fe-based				**US Trade Designation**				
S1	1.4558	X2NiCrAlTi3220		NA15	Incoloy 800			N08800	
S1	1.4562	X1NiCrMoCu32287						N08031	
S1	1.4563	X1NiCrMoCuN31274	Z1NCDU31.27					N08028	
S1	1.4864	X12NiCrSi	Z12NCS35.16					330	SUH330
S1	1.4864	X12NiCrSi3616	Z12NCS35.16	NA17				N08330	SUH330
S1	1.4958	X5NiCrAlTi3120							
S1	1.4977	X40CoCrNi2020	Z42CNKDWNb						
S1					A-286			S66286	
S1					Greek Ascoloy			S41800	
S1					Haynes 556 (HS556)			R30556	
S1					N155			R30155	
	Super-Alloys Fe-based				**US Trade Designation**				
S2					Haynes 188			R30188	
S2					L605 (Haynes 25)			R30605	
S2					MARM-302, 322, 509				
S2					Stellite 6, 21, 31				
	Super-Alloys Ni-based				**US Trade Designation**				
S3	2.4360	NiCu30Fe	NU30	NA13	Monel 400				
S3	2.4610	NiMo16Cr16Ti			Hastelloy C-4				
S3	2.4630	NiCr20Ti	NC20T	HR5, 203-4	Nimonic 75			N06075	
S3	2.4642	NiCr29Fe	NC30Fe		Inconel 690				
S3	2.4810	G-NiMo30			Hastelloy C			N10276	
S3	2.4856	NiCr22Mo9Nb	NC22FeDNb	NA21	Inconel 625			N06625	
S3	2.4858	NiCr21Mo	NC21FeDU	NA16	Incoloy 825			N08825	
S3	2.4375	NiCu30 Al	NU30AT	NA18	Monel 718				
S3	2.4668	NiCr19FeNbMo	NC19FeNb		Inconel 718			N07718	
S3	2.4669	NiCr15Fe7TiAl	NC15TNbA		Inconel X-750			N07750	
S3	2.4685	G-NiMo28			Hastelloy B			N10001	
S3	2.4694	NiCr16Fe7TiAl			Inconel 751			N00751	
	Titanium and Titanium Alloys				**US Trade Designation**				
S4	3.7025	Ti 1		2TA1				R50250	
S4	3.7124	TiCu2		2TA21-24					
S4	3.7195	TiAl3V2.5							
S4	3.7225	Ti1Pd		TP1				R52250	
S4	3.7115	TiAl5Sn2							
S4	3.7145	TiAl6Sn2Zr4Mo2Si						R54620	
S4	3.7165	TiAl6V4	T-A6V	TA10-13; TA28	TiAl6V4			R56400	
S4	3.7175	TiAl6V6Sn2			Ti6V6Al2Sn			R56620	
S4	3.7185	TiAl4Mo4Sn2		TA45-51; TA57					

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Mat. Group	Mat. No.	Germany DIN	France AFNOR	Great Britain BS	Italy UNI	Sweden SS	Spain UNE	U.S.A. AISI/SAE UNS	Japan JIS
	White Cast Iron								
H1	0.9620	G-X260NiCr42		Grade 2A		0512-00		Ni- Hard 2	
H1	0.9625	G-X330NiCr42		Grade 2B		0513-00		Ni- Hard 1	
H1	0.9630	G-X300CrNiSi952						Ni- Hard 4	
H1	0.9635	G-X300CrMo153							
	Hardened Cast Iron								
H1	0.9640	G-X300CrMoNi1521							
H1	0.9645	G-X260CrMoNi2021							
H1	0.9650	G-X260Cr27		Grade 3D		0466-00		A532IIIA25%Cr	
H1	0.9655	G-X300CrMo271							
H1	0.9655	G-X300CrMo271		Grade 3E				A532IIIA25%Cr	
	Hardened Steels								
H1	Hardened Steels < 48 HRC								
H2	Hardened Steels 48 - 55 HRC								
H3	Hardened Steels 50 - 60 HRC								
H4	Hardened Steels > 60 HRC								

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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, published in 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.

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