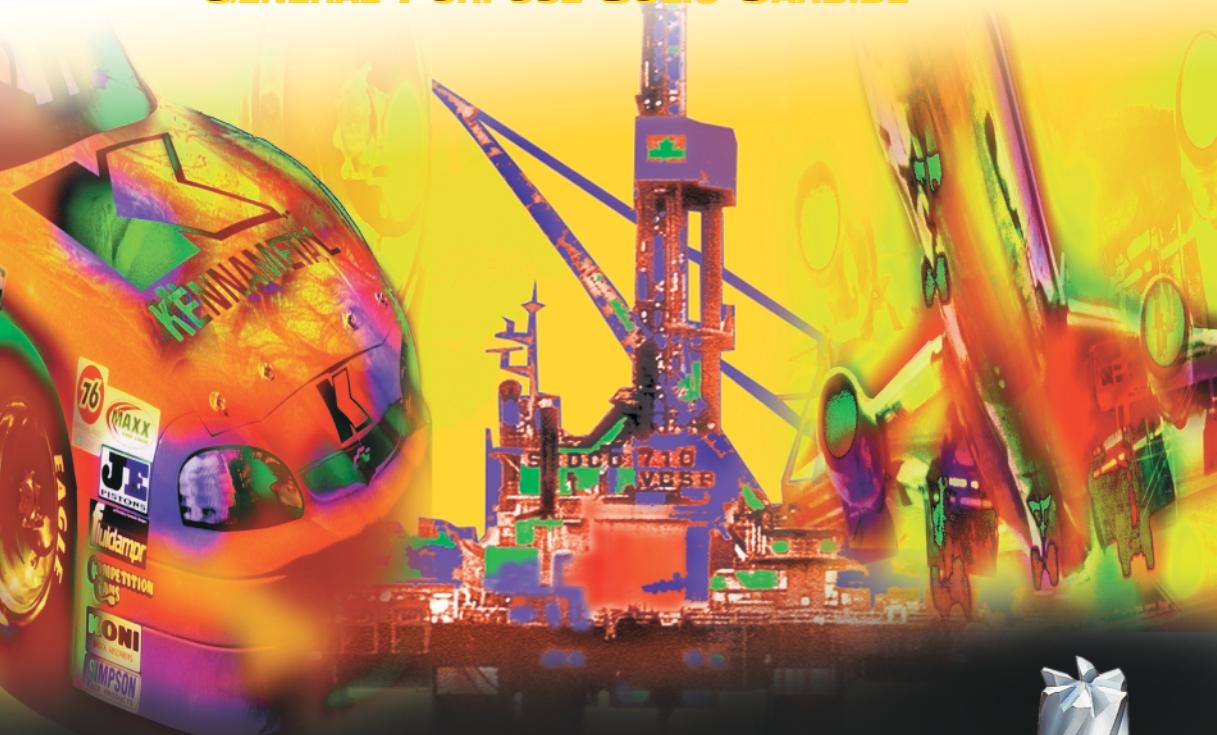


END MILLS

HIGH-PERFORMANCE SOLID CARBIDE

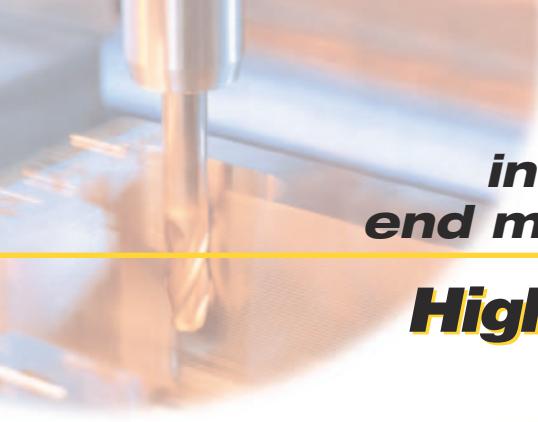
HIGH-PERFORMANCE POWDERED METAL AND HSS

GENERAL-PURPOSE SOLID CARBIDE



Milling

Catalog 1053



Kennametal

introduces a comprehensive solid end mill program utilizing "M" Grades!

High-Performance Solid Carbide



End Mills for Die and Mold

- machine steels and alloyed steels to 60 HRC
- special core design for rigidity and optimized chip flow
- negative geometry for stronger edge
- reinforced corner for strength and longer tool life
- tapered or reduced shank for deep pocketing
- high helix for better surface finish
- First Choice (see page 6)



End Mills for Titanium

- reinforced core diameter for rigidity and strength
- unique end geometry for optimized chip evacuation
 - full eccentric relief for improved edge strength
 - multi-flute for maximum feed rates



Diamond Coated End Mills

- up to 50 times longer tool life
- higher cutting speeds
- lower tool change costs
- machine graphite, composites, green ceramics, and aluminums



Reduced Shank End Mills for Aluminum

- deep pocket and thin wall applications
- feed rates of 300+ IPM are achievable
- rounded edge for perfect blend — no step marks
 - optimized helix configuration



End Mills for Aluminum

- small face contact zone for fast chip formation
- dubbed corner for strength
- cylindrical margin for better surface finish
- high helix for optimized chip evacuation



End Mills for Steels and Stainless Steels

- optimized helix for freer cutting
- reinforced core diameter for added strength
- specialized end geometry for maximum chip evacuation
- up to 40% heavier feed rates

High-Performance Powdered Metal and HSS

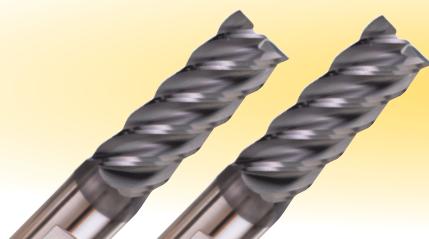
Aluminum

- powdered metal material for longer tool life
 - deep, high-polished rake face
 - open face geometry for optimized chip flow
- special end geometry for enhanced ramping and plunging



Titanium

- M42 cobalt for enhanced wear resistance
- special heat treatment process for optimized toughness
- lower area of contact to minimize friction and heat



Steels and Stainless Steels

- powdered metal material for longer tool life
 - high Vanadium for greater toughness
- optimized cutting geometry for accelerated chip removal
 - freer cutting to minimize heat build up



General-Purpose Solid Carbide



- excellent productivity across a wide range of materials
- premier micro-grain carbide
- comprehensive product offering

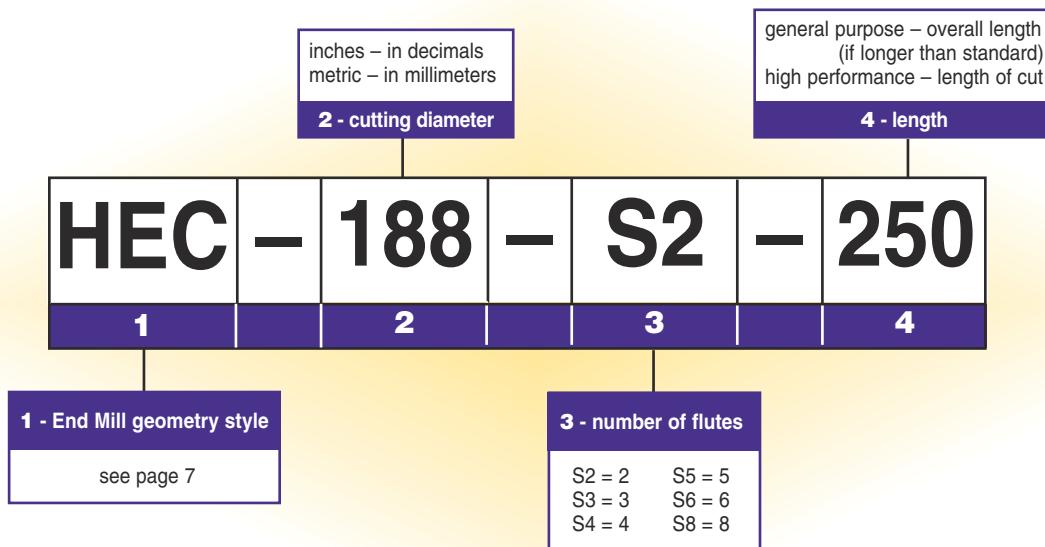


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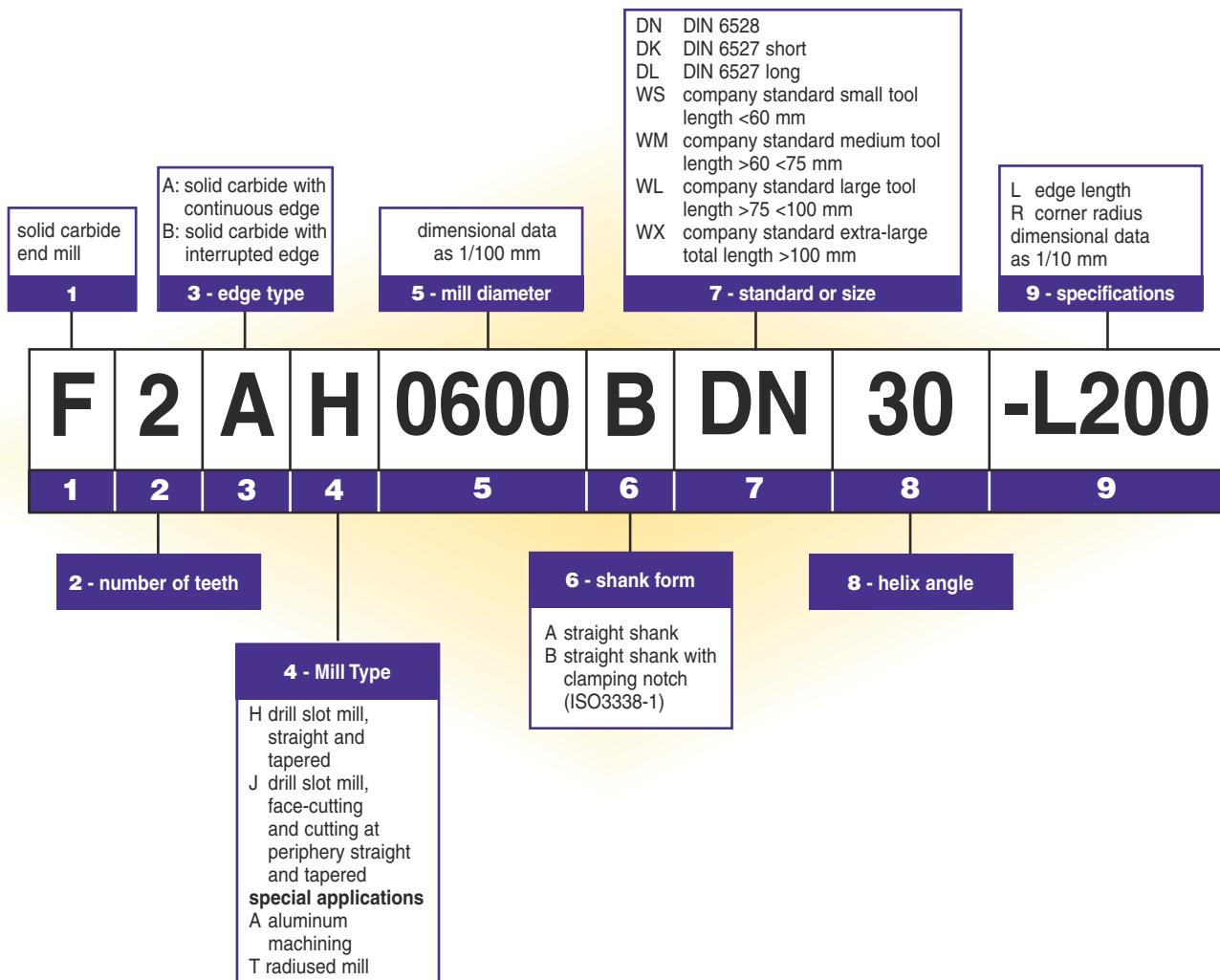
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End Mill Identification System

Inch



Metric



First Choice Grade Descriptions

cutting material	coating	composition and application
K600	uncoated carbide	Carbide grade made from high-quality, micro-grain materials for cutting all types of material. Extreme toughness guarantees a controlled wear rate. The micro-grain structure permits extremely sharp cutting edges.
KC610M (KC610)	TiN TiCN TiN	Coated carbide grade with PVD multi-layer coating (TiN/TiCN/TiN). An excellent grade for milling steel, stainless steel, and nodular graphite iron. Because of the resistance to thermal shocks of its substrate, this grade is an excellent choice for wet as well as dry machining.
KC625M	TiC(N) TiCN TiN	Coated carbide grade with a PVD multi-layer coat [TiN/TiCN/TiC(N)]. KC625M is a high-performance grade for milling all types of material. Good hardness and wear resistance characterizes this grade. It provides outstanding protection for solid carbide tools against cratering and abrasion. This grade is ideally used with cooling or minimal lubrication.
KC635M (KC7215)	TiAlN	PVD TiAlN coated carbide on a deformation resistant substrate. Exceptional heat and wear resistance qualities make this grade an excellent choice for milling aluminum, cast iron, heat resistant alloys, steels, and stainless steels.
KC631M	TiAlN	PVD TiAlN coated carbide on a deformation resistant substrate. It is a very thin and smooth coating that is suitable for milling aluminum. The coating keeps the necessarily sharp edge and protects against abrasion and edge build-up.
KC633M	TiAlN TiN TiAlN	Coated carbide grade with a PVD multi-layer coat (TiAlN, TiN, TiAlN). KC633M is a high-performance grade for dry milling of all material types. This grade is extremely hard and wear resistant. It provides outstanding protection for solid carbide tools against cratering and abrasion.
KT605M	Cermet	The high edge strength permits sharp cutting edges and exhibits virtually no edge build up during machining. This results in excellent surface finishes. Recommended for fine finishing of <32 HRC, characterized by high feed/high speed
KP525M	TiCN	Powdered metal grade with a TiCN coating. The KP525M grade is a universal grade for end milling aluminum, steels, heat-resistant alloys, and stainless steel.
KH110M	high speed st	Uncoated M42 (8%) cobalt grade for use in hard-to-machine materials. This grade includes a special heat treating process to assure optimized hardness.
KDF300	diamond coated	The KDF300 grade is a pure, diamond coated carbide grade for milling aluminum, graphite, and other non-metals. It is an extremely tough and wear resistant grade.

End Mill Application Guide



			General-Purpose Solid Carbide			High-Performance Powdered Metal and HSS			High-Performance Solid Carbide		
	Slotting	Profiling	Slotting	Profiling	Contouring	Slotting	Profiling	Contouring	Slotting	Profiling	Contouring
Steels (<286 BHN) <30 HRC	Slotting	○	HEC - PG 48-49, 51, 57	BNEC - PG 53-54, 56	MDRHEC - PG 50	HDRHEC - PG 50	SFRHEC - PG 50	HHEC - PG 51	HSFT - PG 43	PMRA - PG 45	PMRST - PG 43
	Profiling	●		○					○	●	○
	Contouring		●						○	○	●
Steels (>286 BHN) >30 HRC	Slotting	○	●				●	○	○	●	○
	Profiling	●		○			○	○	●	○	●
	Contouring		●						○	●	●
Stainless Steel	Slotting	○	●				●	●	○	○	●
	Profiling	●		○			○	○	●	○	●
	Contouring		●						●		●
Cast Iron	Slotting	○	●								●
	Profiling	●									○
	Contouring		●								●
Non-Ferrous and Non-Metals	Slotting	○		●		○	●	○			●
	Profiling	○			○	●	○	●			○
	Contouring		●						●		●
High-Temp Alloys	Slotting	○		●			○	○	○	○	●
	Profiling	○		○		●	○	○	○	○	●
	Contouring		●						●		●
Hardened Steels	Slotting	○	●						●	○	
	Profiling	○		○					○	●	
	Contouring	○							●		

● ... First Choice

○ ... alternate choice

blank = not recommended



Rough Milling 303 Stainless

end mill:	HPRSS750S3163
diameter:	3/4"
number of flutes:	3
grade:	KC633M
cutting data:	
cutting speed:	400 sfm
feed rate:	25 ipm
feed per tooth:	.004 cpt
axial doc:	3/4"
radial doc:	1/4"
coolant:	water soluble
cycle time reduction:	30%



Rough Milling H13 Tool Steel (57 HRC)

end mill:	HPRDM625S6063
diameter:	5/8"
number of flutes:	6
grade:	KC633M
cutting data:	
cutting speed:	200 sfm
feed rate:	8.8 ipm
feed per tooth:	.0012 cpt
axial doc:	.625"
radial doc:	.094"
total loc:	400"
workpiece material:	modified ductile iron H13 (57 HRC)
coolant:	without
results:	25% less wear



Radial Thru Slotting 410 Stainless Steel (22 HRC)

end mill:	HEC37554
diameter:	3/8"
number of flutes:	4
grade:	KC610M
cutting speed:	140 sfm
feed rate:	6.8 ipm
feed per tooth:	.001 cpt
axial doc:	.218"
radial doc:	.375"
total loc:	161"
workpiece material:	410 Stainless (22 HRC)
results:	double tool life (81 to 161 minutes)

End Mill Style Definitions



High-Performance Carbide End Mills

		Units	Page
HPFDM	4 to 6 flute finishing end mill for use in steels, hardened steels and other materials >35 HRC	Inch	28
HPRDM	3 to 6 flute roughing end mill for use in steels, hardened steels	Inch	29
HPBNDM	4 flute ball nose finishing end mill for use in steels and hardened steels	Inch	29
HPFA	2 & 3 flute finishing end mill for use in aluminum	Inch	30
HPRSA	Hgh performance end mill w/ reduced shank for deep pocket machining in aluminum	Inch	30
HPRSS	3 flute roughing end mill with chip breaker design for use in stainless, steel, cast iron and aluminum	Inch	31
Diamond Coated	2 & 4 flute diamond coated end mill for use in aluminum and non-metals.	Inch	32-33
HPFSS	3 & 5 flute finishing end mill for use in stainless, cast iron and hi temp	Inch	34-35
HPFT	6 flute finishing end mill for use in high temps & stainless steel	Inch	36
F3AJ - ADL45 OR ADL60	3-8 flute cermet end mill for use in steel 45° and 60° helix	Metric	37
F3AJ - ADL60	3 flute 60° helix end mill	Metric	37
F3BH, F3BJ & F4BJ	3-5 flute roughing end mill with and without coolant for steels	Metric	38
F3BT	3-6 flute roughing enmill for steel and hardened steel. Similar to HPRDM	Metric	39
F4AJ, F5AJ & F6AJ	4-6 flute finishing end mill for steel and hardened steel. Similar to HPFDM	Metric	39
FFBNE	2 flute flush fine ball nose end mill for steels and hardened steel	Metric	39
F2AA & F3AA	2 & 3 flute finishing end mill for use in aluminum. Similar to HPFA	Metric	40
F3BA	3 flute roughing end mill with and without coolant for aluminum. Similar to HPRSS	Metric	40
F3BS	3 flute roughing end mill for steels, hi temps and cast iron.	Metric	41
F3AS	3 flute finishing end mill for steels, hi temps and cast iron. Similar to HPFSS	Metric	41

High-Performance Powdered Metal & HSS End Mills

		Units	Page
HSFT	6 flute M42 cobalt finishing end mill for use in titanium (pure, alpha, beta, and alpha/beta groups)	Inch	43
PMRST	4-6 flute powdered metal roughing end mill for use in steels and hardened steels 32HRC to 45HRC	Inch	43
PMRSS	3-8 flute powdered metal roughing end mill for use in stainless steel and steels < 32HRC	Inch	44
PMFSS	4-6 flute powdered metal finishing end mill for use in stainless steel and steels.	Inch	44
PMRA	3 flute powdered metal roughing end mill for use in aluminum	Inch	45
PMFA	3 flute powdered metal finishing end mill for use in aluminum	Inch	45

General-Purpose Solid Carbide End Mills

		Units	Page
HHSEC	2 & 4 flute high shear, high shear free-cutting positive rake geometry for stainless steel and non-ferrous	Inch	47
SLEC	2 & 4 flute stub length, square end helical end mill for improved rigidity	Inch	47
HEC	2-4 flute square end helical end mill designed for plunging, slotting and peripheral milling	Inch	48-49
MDRHEC	3-5 flute sinusoidal ground roughing end mill for use in steel, stainless steel and cast iron	Inch	50
HDRHEC	Same as MDRHEC except for use in titanium and nickel based alloys	Inch	50
SFRHEC	3 flute, same as HDRHEC except for machining aluminum, brass and copper	Inch	50
DHEC	2 & 4 flute double end, SLEC style end mill	Inch	51
HHEC	3 flute 60° hi helix for use in titanium, Inconel and stainless steel	Inch	51
HEC	6 flute square end helical end mill designed for plunging, slotting and peripheral milling	Inch	51
CRHEC	4 flute HEC style end mill w/ corner radius	Inch	52
BNEC	2 & 4 flute ball nose HEC style end mill	Inch	53-54
DBNEC	4 flute double end, stub length BNEC style end mill	Inch	55
BNEC	2 & 4 flute square end helical end mill designed for plunging, slotting and peripheral milling	Metric	56
HEC	2 & 4 flute ball nose HEC style end mill	Metric	57

KENNA PERFECT™ Selection System

The KENNA PERFECT Selection System is a step by step process for choosing appropriate starting parameters.

To effectively use this guide, you should become familiar with the various Kennametal end mill style definitions (page 9), material groups, and the various steps of the KENNA PERFECT Selection System. These steps are based on:

- Workpiece Material
- End Mill Material (High-Performance Solid Carbide, High-Performance Powdered Metal or HSS, General-Purpose Carbide)
- End Mill Application (Profiling, Slotting, Contouring)
- End Mill Style (see page 9 for definitions)
- Starting Feed (chip load per tooth)
- Grade
- Starting Speed (SFM)

1st Step: Select Workpiece Material Being Machined

page

Low Carbon Steels (<220 BHN) <19 HRC	11
AISI: 1008, 1010, 1018, 1108, 1117, 1141, 12L13, 12L14	
Plain Carbon, Alloy & Tool Steels (225-286 BHN) 20-30 HRC	12
1045, Alloy steels AISI: 1335, 4012, 4023, 4140, 4150, 4320, 4340, 5120, 8620, P20	
Plain Carbon, Alloy & Tool Steels (294-371 BHN) 31-40 HRC	13
Tool steels: H10, H11, Alloy steels AISI: 1335, 4140, 4150, 4320, 4340, 4422, 5120, 8620	
Ferritic-Martensitic (400 & 500 Series) & PH Stainless (135-330 BHN) <35 HRC	14
AISI: 416, 416F, 416Se, 420F, PH Steels 15-5 PH, 17-4 H, 17-7 PH	
Ferritic-Martensitic (400 & 500 Series) & PH Stainless (330-450 BHN) 36-48 HRC	15
AISI: 416, 416F, 416Se, 420F, PH Steels 15-5 PH, 17-4 H, 17-7 PH	
Austenitic Stainless Steels (200 & 300 Series) Including Duplex (135-275 BHN) <28 HRC	16
AISI: 201, 209, 219, 302, 303, 304, 316, 321, 347, 329, ASTM: XM-1, XM-7, XM-21, CF-8M	
Gray Cast Iron (120-220 BHN) <18 HRC	17
ASTM A48: Class 20, 25, 30, 35, 40, 45, 50, 55, 60, SAE J431: grade G1800, G3000, G3500	
Gray Cast Iron (220-320 BHN) 19-34 HRC	18
ASTM A48: Class 20, 25, 30, 35, 40, 45, 50, 55, 60, SAE J431: grade G1800, G3000, G3500	
Aluminum and Other Free-Machining, Non-Ferrous Materials, Low Silicon	19
Aluminum, 6061-T6, 7075-T6	
Aluminum and Other Free-Machining, Non-Ferrous Materials, High Silicon	20
Aluminum, 6061-T6, 7075-T6	
Aluminum and Other Free-Machining, Non-Ferrous Materials Using KDF300 Diamond Coating	21
Aluminum, Graphite, Green ceramics, Fiber-filled plastics, Metal matrix composites (MMC)	
Titanium-alloyed	22
Commercially pure: Ti98.8, Alpha: TiSa12.5SN, Alpha/Beta: Ti-6Al-4V	
Titanium-alloyed, Nickel Base	23
Inconel: 601, 617, 625, 718, X-750, 901, Waspaloy, Hastelloy	
Hardened Steels (381-481 BHN) 41-50 HRC	24
Tool steels: H10, H11, H13, Other tool steels: D2, D3, D5, Alloy steels AISI: 1335, 4140, 4150, 4320, 4340, 5140, 8625, Die steels: P20, P21	
Hardened Steels (496-654 BHN) 51-60 HRC	25
Tool steels: H10, H11, H13, Alloy steels AISI: 1335, 4140, 4150, 4320, 4340, 5140, 8625, Die steels: P20, P21	
Hardened Steels (>654 BHN) >60 HRC	26
Tool steels: H10, H11, H13, Alloy steels AISI: 1335, 4140, 4150, 4320, 4340, 5140, 8625, Die steels: P20, P21	

2nd Step: Select End Mill Composition

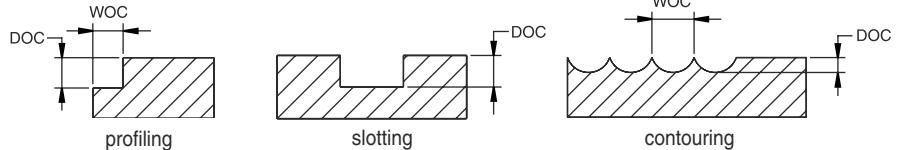
High-Performance Powdered Metal & HSS	General-Purpose Solid Carbide	High-Performance Solid Carbide
Powdered Metal and Heat-Treated HSS for Longer Tool Life	Fine Micro Grain Carbide w/ "M" Grade Coatings	Fine Micro Grain Carbide w/ "M" Grade Coatings
Advanced designs for material specific applications	Optimized tool geometries for use over a wide range of materials	Advanced designs for material specific applications
Excellent productivity in specific applications	Excellent productivity over a wide range of materials	Maximum productivity for specific applications
Increased speeds & feeds over conventional HSS	Higher speed capabilities than powdered metal	Higher speeds than powdered metal
Superior toughness & abrasion resistance over conventional HSS	Excellent toughness	Excellent toughness
Excellent value (productivity/tool costs)	Excellent value (productivity/tool costs)	Superior value (productivity/Tool costs)

KENNA PERFECT Selection System



Low Carbon Steels (<220 BHN) <19 HRC

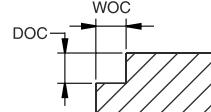
3rd Step: Select End Mill Application



Profiling

Recommended starting feeds (Step 5) are based on the following WOC and DOC:

	MDRHEC PMRSS	HEC CRHEC	SLEC DHEC	PMFSS	HPFDM stub length	HPFDM regular & long	HPRDM	F.. ADL45 F.. ADL60
WOC	0.5 x Dia	0.1 x Dia	0.2 x Dia	0.25 x Dia	0.4 x Dia	0.2 x Dia	0.5 x Dia	1 x Dia
DOC	1 x Dia	1 x Dia	1 x Dia	1 x Dia	1 x Dia	1 x Dia	0.8 x Dia	1 x Dia

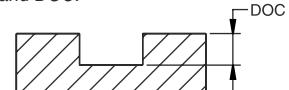


End Mill Composition	4th Step End Mill Style	5th Step Recommended Starting Feed — Chip Load per Flute										6th Step Grade	7th Step Starting Speed
		1/8	3/16	1/4	5/16	3/8	1/2	5/8	3/4	1			
General-Purpose Carbide	HEC, CRHEC	0.001	0.0015	0.002	0.002	0.0025	0.003	0.0035	0.004	0.0045		KC610M	350-500
	SLEC, DHEC	0.0012	0.0018	0.0024	0.0025	0.003	0.0035	0.004	0.0045	0.005		KC635M	400-600
	MDRHEC	—	—	0.001	0.0015	0.002	0.0025	0.003	0.0035	0.004		KC625M	350-400
Powdered Metal	PMRSS	—	—	0.0014	—	0.0016	0.0025	0.0035	0.0042	0.0063		KP525M	120-175
	PMFSS	—	—	0.001	—	0.0012	0.0018	0.003	0.0038	0.0045			
High-Performance Carbide	HPFDM – Stub	—	—	0.0022	0.0028	0.0035	0.0043	0.0059	0.0071	0.008		KT605M	500-700
	HPFDM – Reg/Long	—	—	0.0015	0.002	0.0025	0.003	0.004	0.005	0.0056		KC633M	675
	F.. ADL(45/60)	—	—	0.0015	0.002	0.0028	0.0035	0.005	0.006	—			
	HPRDM	—	0.001	0.0012	0.0016	0.0024	0.0024	0.0031	0.004	0.0047		KC633M	600

Slotting

Recommended starting feeds (Step 5) are based on the following WOC and DOC:

	MDRHEC	PMRSS	HEC, SLEC CRHEC, DHEC	PMFSS	HPRDM	HPFDM stub length	HPFDM regular & long
DOC	0.5 x Dia	1 x Dia	0.5 x Dia	0.5 x Dia	0.8 x Dia	1 x Dia	0.5 x Dia



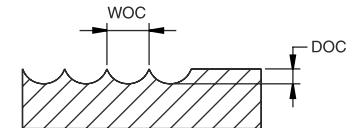
End Mill Composition	4th Step End Mill Style	5th Step Recommended Starting Feed — Chip Load per Flute										6th Step Grade	7th Step Starting Speed
		1/8	3/16	1/4	5/16	3/8	1/2	5/8	3/4	1			
General-Purpose Carbide	HEC, CRHEC	0.0003	0.0004	0.0006	0.0008	0.0013	0.0018	0.002	0.0025	0.0028		KC610M	350-400
	SLEC, DHEC	0.0004	0.0005	0.0008	0.0012	0.0018	0.0025	0.003	0.0035	0.0038		KC635M	350-450
	MDRHEC	—	—	0.0006	0.0012	0.0018	0.0022	0.0025	0.003	0.0035		KC625M	350-400
Powdered Metal	PMRSS	—	—	0.0008	—	0.0012	0.0018	0.0028	0.0035	0.0042		KP525M	150
	PMFSS	—	—	0.0006	—	0.0008	0.0012	0.002	0.0025	0.003			
High-Performance Carbide	HPFDM – Stub	—	—	0.0011	0.0014	0.002	0.0022	0.003	0.0035	0.004		KC633M	675
	HPFDM – Reg/Long	—	—	0.0008	0.001	0.0015	0.0018	0.0023	0.0028	0.003			
	HPRDM	—	0.0006	0.001	0.0013	0.0015	0.0016	0.002	0.0024	0.003		KC633M	600

Contouring

Recommended starting feeds (Step 5) are based on the following WOC and DOC:

	BNEC	HPBNDM
WOC	0.5 x Dia	0.01 x Dia
DOC	0.2 x Dia	0.01 x Dia

NOTE: For every 1% additional DOC on the HPBNDM, reduce feed rates by 3%.



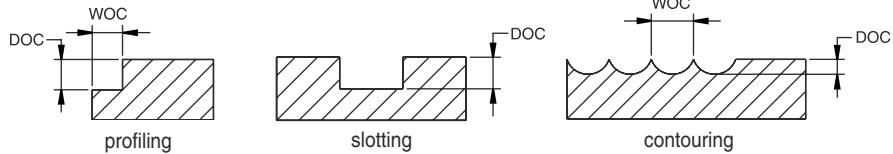
End Mill Composition	4th Step End Mill Style	5th Step Recommended Starting Feed — Chip Load per Flute										6th Step Grade	7th Step Starting Speed
		1/8	3/16	1/4	5/16	3/8	1/2	5/8	3/4	1			
General-Purpose Carbide	BNEC	0.0006	0.001	0.0014	0.0017	0.002	0.0024	0.003	0.0035	0.0045		KC610M	250-400
	HPBNDM	0.0031	0.006	0.008	—	0.0087	0.0094	0.01	0.012	—		KC633M	300-500
High-Performance Carbide	HPBNDM	0.0031	0.006	0.008	—	0.0087	0.0094	0.01	0.012	—		KC633M	1000

NOTE: The above guidelines may require possible variations to achieve optimum results.
Dry machining or mist coolant is preferred with grade KC633M.

KENNA PERFECT Selection System

Plain Carbon, Alloy and Tool Steels (225-286 BHN) 20-30 HRC

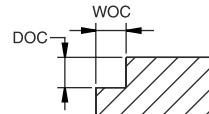
3rd Step: Select End Mill Application



Profiling

Recommended starting feeds (Step 5) are based on the following WOC and DOC:

	MDRHEC PMRSS	HEC CRHEC	SLEC DHEC	PMFSS	HPFDM stub length	HPFDM regular & long	HPRDM
WOC	0.5 x Dia	0.1 x Dia	0.2 x Dia	0.25 x Dia	0.4 x Dia	0.2 x Dia	0.5 x Dia
DOC	1 x Dia	1 x Dia	1 x Dia	1 x Dia	1 x Dia	1 x Dia	0.8 x Dia

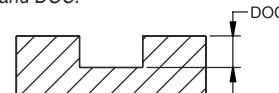


End Mill Composition	4th Step End Mill Style	5th Step Recommended Starting Feed — Chip Load per Flute										6th Step Grade	7th Step Starting Speed
		1/8	3/16	1/4	5/16	3/8	1/2	5/8	3/4	1			
General-Purpose Carbide	HEC, CRHEC	0.001	0.0015	0.002	0.002	0.0025	0.003	0.0035	0.004	0.0045	KC610M	350-500 400-600 350-550	
	SLEC, DHEC	0.0012	0.0018	0.0025	0.0025	0.003	0.0035	0.004	0.0045	0.005	KC635M		
	MDRHEC	—	—	0.0008	0.0015	0.002	0.0028	0.003	0.0035	0.004	KC625M		
Powdered Metal	PMRSS	—	—	0.0012	—	0.0014	0.0022	0.0032	0.0038	0.0058	KP525M	125-175	
	PMFSS	—	—	0.0008	—	0.001	0.0014	0.0026	0.0032	0.004			
High-Performance Carbide	HPFDM - Stub	—	—	0.0022	0.0028	0.0035	0.0043	0.0059	0.0071	0.008	KC633M	650	
	HPFDM - Reg/long	—	—	0.0015	0.002	0.0025	0.003	0.004	0.005	0.0055			
	F.. ADL(45/60)	—	—	0.0015	0.002	0.0028	0.0035	0.005	0.006	—			
	HPRDM	—	0.001	0.0012	0.0016	0.0024	0.0024	0.0031	0.004	0.0047	KC633M	600	

Slotting

Recommended starting feeds (Step 5) are based on the following WOC and DOC:

	MDRHEC	HEC, SLEC CRHEC, DHEC	PMFSS	PMRSS	HPRDM	HPFDM stub length	HPFDM regular & long
DOC	0.5 x Dia	0.5 x Dia	0.5 x Dia	1 X Dia	0.8 x Dia	1 x Dia	0.5 x Dia



End Mill Composition	4th Step End Mill Style	5th Step Recommended Starting Feed — Chip Load per Flute										6th Step Grade	7th Step Starting Speed
		1/8	3/16	1/4	5/16	3/8	1/2	5/8	3/4	1			
General-Purpose Carbide	HEC, CRHEC	0.0003	0.0004	0.0005	0.001	0.0013	0.0018	0.002	0.0025	0.0028	KC610M	350-400 350-450 350-550	
	SLEC, DHEC	0.0004	0.0005	0.0006	0.0012	0.0018	0.0021	0.0025	0.0032	0.0035	KC635M		
	MDRHEC	—	—	0.0006	0.0012	0.0018	0.0022	0.0025	0.003	0.0035	KC625M		
Powdered Metal	PMRSS	—	—	0.0005	—	0.001	0.0015	0.0024	0.003	0.0038	KP525M	150	
	PMFSS	—	—	0.0004	—	0.0006	0.001	0.0015	0.002	0.0025			
High-Performance Carbide	HPFDM - Stub	—	—	0.0011	0.0014	0.0018	0.0022	0.003	0.0035	0.004	KC633M	650	
	HPFDM - Reg/long	—	—	0.0008	0.001	0.0015	0.0018	0.002	0.0025	0.0028			
	HPRDM	—	0.0006	0.0007	0.001	0.0014	0.0014	0.002	0.0024	0.003	KC633M	600	

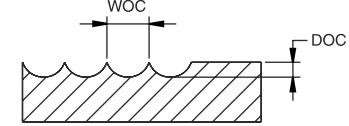


Contouring

Recommended starting feeds (Step 5) are based on the following WOC and DOC:

	BNEC	HPBNDM
WOC	0.5 x Dia	0.01 x Dia
DOC	0.2 x Dia	0.01 x Dia

NOTE: For every 1% additional DOC on the HPBNDM, reduce feed rates by 3%.



End Mill Composition	4th Step End Mill Style	5th Step Recommended Starting Feed — Chip Load per Flute										6th Step Grade	7th Step Starting Speed
		1/8	3/16	1/4	5/16	3/8	1/2	5/8	3/4	1			
General-Purpose Carbide	BNEC	0.0006	0.001	0.0014	0.0017	0.002	0.0024	0.003	0.0035	0.0045	KC610M KC635M	250-400 300-500	
	HPBNDM	0.0031	0.006	0.008	—	0.0087	0.0094	0.01	0.012	—	KC633M		

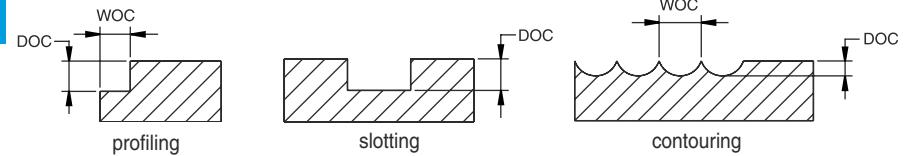
NOTE: The above guidelines may require possible variations to achieve optimum results.
Dry machining or mist coolant is preferred with grade KC633M.

KENNA PERFECT Selection System



Plain Carbon, Alloy and Tool Steels (294-371 BHN) 31-40 HRC

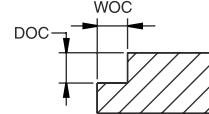
3rd Step: Select End Mill Application



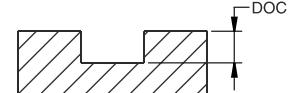
Profiling

Recommended starting feeds (Step 5) are based on the following WOC and DOC:

	MDRHEC PMRSS (T)	HEC CRHEC	SLEC DHEC	PMFSS	HPFDM stub length	HPFDM regular & long	HPRDM
WOC	0.3 x Dia	0.1 x Dia	0.2 x Dia	0.2 x Dia	0.4 x Dia	0.2 x Dia	0.4 x Dia
DOC	1 x Dia	1 x Dia	1 x Dia	1 x Dia	1 x Dia	1 x Dia	0.8 x Dia



End Mill Composition	4th Step End Mill Style	5th Step Recommended Starting Feed — Chip Load per Flute									6th Step Grade	7th Step Starting Speed
		1/8	3/16	1/4	5/16	3/8	1/2	5/8	3/4	1		
General-Purpose Carbide	HEC, CRHEC	0.001	0.0015	0.0018	0.002	0.0023	0.003	0.0035	0.004	0.0045	KC610M KC635M KC625M	250-350 350-450 300-400
	SLEC, DHEC	0.0012	0.0018	0.0024	0.0026	0.003	0.0036	0.0042	0.0048	0.0054		
	MDRHEC	—	—	0.0008	0.0012	0.0015	0.0017	0.002	0.0025	0.0035		
Powdered Metal	PMRST	—	—	—	—	0.0012	0.0015	0.0025	0.003	0.0045	KP525M	100-150
	PMFSS	—	—	0.0005	—	0.0008	0.001	0.002	0.0026	0.003		
High-Performance Carbide	HPFDM - Stub	—	—	0.002	0.0024	0.0033	0.004	0.0055	0.0067	0.0075	KC633M	600
	HPFDM - Reg/long	—	—	0.0018	0.002	0.0025	0.003	0.0038	0.0047	0.0052		
	HPRDM	—	0.0008	0.001	0.0012	0.0016	0.0018	0.0024	0.0031	0.004	KC633M	400



Slotting

Recommended starting feeds (Step 5) are based on the following WOC and DOC:

	MDRHEC	HEC, SLEC CRHEC, DHEC	PMRST	PMFSS	HPRDM	HPFDM stub length	HPFDM regular & long
DOC	0.5 x Dia	0.5 x Dia	1 x Dia	0.5 X Dia	0.8 x Dia	0.75 x Dia	0.5 x Dia

End Mill Composition	4th Step End Mill Style	5th Step Recommended Starting Feed — Chip Load per Flute									6th Step Grade	7th Step Starting Speed
		1/8	3/16	1/4	5/16	3/8	1/2	5/8	3/4	1		
General-Purpose Carbide	HEC, CRHEC	0.0003	0.0004	0.0005	0.0007	0.001	0.0013	0.002	0.0025	0.0028	KC610M KC635M KC625M	250-300 300-350 275-325
	SLEC, DHEC	0.0004	0.0005	0.0006	0.0008	0.0012	0.0018	0.0027	0.0033	0.0035		
	MDRHEC	—	—	0.0006	0.0008	0.001	0.0012	0.0014	0.0018	0.0025		
Powdered Metal	PMRST	—	—	—	—	0.0006	0.001	0.002	0.0025	0.003	KP525M	
	PMFSS	—	—	0.0003	—	0.0005	0.0008	0.0012	0.0015	0.002		
High-Performance Carbide	HPFDM - Stub	—	—	0.0010	0.0012	0.0016	0.0020	0.0028	0.0034	0.0037	KC633M	600
	HPFDM - Reg/long	—	—	0.0006	0.0008	0.001	0.0014	0.0020	0.0023	0.0026		
	HPRDM	—	0.0005	0.0006	0.0007	0.001	0.0011	0.0015	0.002	0.0025	KC633M	400

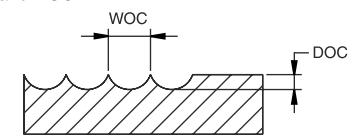


Contouring

Recommended starting feeds (Step 5) are based on the following WOC and DOC:

	BNEC	HPBNDM
WOC	0.5 x Dia	0.01 x Dia
DOC	0.2 x Dia	0.01 x Dia

NOTE: For every 1% additional DOC on the HPBNDM, reduce feed rates by 3%.



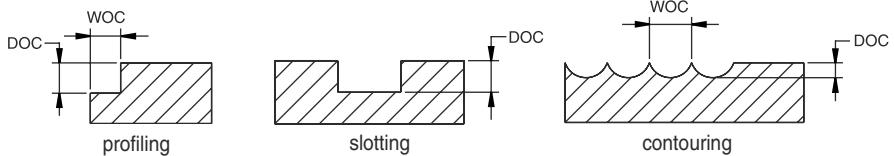
End Mill Composition	4th Step End Mill Style	5th Step Recommended Starting Feed — Chip Load per Flute									6th Step Grade	7th Step Starting Speed
		1/8	3/16	1/4	5/16	3/8	1/2	5/8	3/4	1		
General-Purpose Carbide	BNEC	0.0004	0.0007	0.001	0.0013	0.0015	0.002	0.0025	0.003	0.004	KC610M KC635M	150-250 250-350
	HPBNDM	0.0024	0.0055	0.007	—	0.008	0.0087	0.0094	0.011	—		
High-Performance Carbide											KC633M	850

NOTE: The above guidelines may require possible variations to achieve optimum results.
Dry machining or mist coolant is preferred with grade KC633M.

KENNA PERFECT Selection System

Ferritic-Martensitic (400 & 500 Series) and PH Stainless (135-330 BHN) <35 HRC

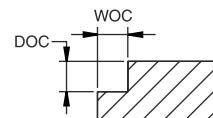
3rd Step: Select End Mill Application



Profiling

Recommended starting feeds (Step 5) are based on the following WOC and DOC:

	MDRHEC PMRSS (T)	HEC CRHEC	SLEC DHEC	PMFSS	HPFDM stub length	HPFDM regular & long	HPRDM
WOC	0.5 x Dia	0.1 x Dia	0.2 x Dia	0.25 x Dia	0.4 x Dia	0.2 x Dia	0.5 x Dia
DOC	1 x Dia	1 x Dia	1 x Dia	1 x Dia	1 x Dia	1 x Dia	0.8 x Dia

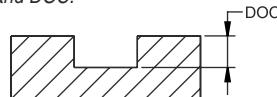


End Mill Composition	4th Step End Mill Style	5th Step Recommended Starting Feed — Chip Load per Flute										6th Step Grade	7th Step Starting Speed
		1/8	3/16	1/4	5/16	3/8	1/2	5/8	3/4	1			
General-Purpose Carbide	HEC, CRHEC	0.001	0.0015	0.002	0.0025	0.003	0.0035	0.004	0.0045			KC610M KC635M KC625M	350-500 400-600 350-550
	SLEC, DHEC	0.0012	0.0018	0.0025	0.0025	0.003	0.0035	0.004	0.0045	0.005			
	MDRHEC	—	—	0.0008	0.0015	0.002	0.0028	0.003	0.0035	0.0045			
Powdered Metal	PMRSS	—	—	0.0012	—	0.0014	.00022	0.0032	0.0038	0.0058		KP525M	120-175
	PMFSS	—	—	0.0008	—	0.001	0.0014	0.0026	0.0032	0.004			
High-Performance Carbide	HPFDM - Stub	—	—	0.0022	0.0028	0.0035	0.0043	0.0055	0.0065	0.0075		KC633M	600
	HPFDM - Reg/long	—	—	0.0015	0.002	0.0025	0.003	0.004	0.005	0.006			
	HPRDM	—	0.001	0.0012	0.0016	0.0024	0.0024	0.0031	0.004	0.0047			

Slotting

Recommended starting feeds (Step 5) are based on the following WOC and DOC:

	MDRHEC	HEC, SLEC CRHEC, DHEC	PMRSS	PMFSS	HPRDM	HPFDM stub length	HPFDM regular & long
DOC	0.5 x Dia	0.5 x Dia	1 x Dia	0.5 X Dia	0.8 x Dia	0.75 x Dia	0.5 x Dia



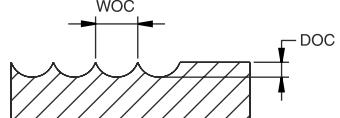
End Mill Composition	4th Step End Mill Style	5th Step Recommended Starting Feed — Chip Load per Flute										6th Step Grade	7th Step Starting Speed
		1/8	3/16	1/4	5/16	3/8	1/2	5/8	3/4	1			
General-Purpose Carbide	HEC, CRHEC	0.0003	0.0004	0.0005	0.001	0.0013	0.0018	0.002	0.0025	0.0028		KC610M KC635M KC625M	350-400 350-450 350-400
	SLEC, DHEC	0.0004	0.0005	0.0006	0.0012	0.0018	0.0021	0.0025	0.0032	0.0035			
	MDRHEC	—	—	0.0006	0.0012	0.0018	0.0022	0.0025	0.003	0.0035			
Powdered Metal	PMRSS	—	—	0.0005	—	0.001	0.0015	0.0024	0.003	0.0038		KP525M	150
	PMFSS	—	—	0.0004	—	0.0006	0.001	0.0015	0.002	0.0025			
High-Performance Carbide	HPFDM - Stub	—	—	0.0011	0.0014	0.0018	0.002	0.0027	0.0032	0.0037		KC633M	600
	HPFDM - Reg/long	—	—	0.0008	0.001	0.0015	0.0018	0.0022	0.0025	0.003			
	HPRDM	—	0.0006	0.0007	0.001	0.0014	0.0014	0.002	0.0024	0.003			

Contouring

Recommended starting feeds (Step 5) are based on the following WOC and DOC:

	BNEC	HPBNDM
WOC	0.5 x Dia	0.01 x Dia
DOC	0.2 x Dia	0.01 x Dia

NOTE: For every 1% additional DOC on the HPBNDM, reduce feed rates by 3%.



End Mill Composition	4th Step End Mill Style	5th Step Recommended Starting Feed — Chip Load per Flute										6th Step Grade	7th Step Starting Speed
		1/8	3/16	1/4	5/16	3/8	1/2	5/8	3/4	1			
General-Purpose Carbide	BNEC	0.0006	0.001	0.0014	0.0017	0.002	0.0024	0.003	0.0035	0.0045	KC610M KC635M	250-400 300-500	
	HPBNDM	0.0031	0.006	0.008	—	0.0087	0.0094	0.01	0.012	—	KC633M		

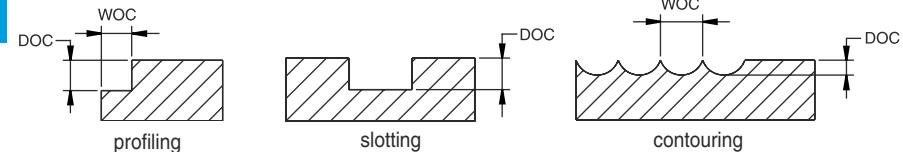
NOTE: The above guidelines may require possible variations to achieve optimum results.
Dry machining or mist coolant is preferred with grade KC633M.

KENNA PERFECT Selection System



Ferritic-Martensitic (400 & 500 Series) and PH Stainless (330-450 BHN) 36-48 HRC

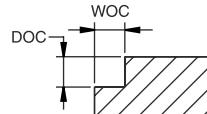
3rd Step: Select End Mill Application



Profiling

Recommended starting feeds (Step 5) are based on the following WOC and DOC:

	MDRHEC PMRST	HEC CRHEC	SLEC DHEC	PMFSS	HPRDM	HPFDM stub length	HPFDM regular & long
WOC	0.3 x Dia	0.1 x Dia	0.1 x Dia	0.2 x Dia	0.4 x Dia	0.4 x Dia	0.2 x Dia
DOC	1 x Dia	1 x Dia	1 x Dia	1 x Dia	0.8 x Dia	1 x Dia	1 x Dia



4th Step End Mill Composition

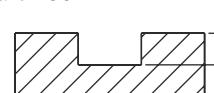
4th Step End Mill Style

5th Step Recommended Starting Feed — Chip Load per Flute

6th Step Grade

7th Step Starting Speed

	1/8	3/16	1/4	5/16	3/8	1/2	5/8	3/4	1		
General-Purpose Carbide	HEC, CRHEC	0.0008	0.001	0.0015	0.0018	0.002	0.0025	0.0028	0.003	0.0037	KC610M KC635M KC625M
	SLEC, DHEC	0.001	0.0012	0.0018	0.002	0.0024	0.003	0.0033	0.0036	0.004	
	MDRHEC	—	—	0.0008	0.001	0.0012	0.0015	0.0018	0.002	0.0025	
Powdered Metal	PMRST	—	—	—	—	0.0012	0.0015	0.0025	0.003	0.0045	KP525M
	PMFSS	—	—	0.0005	—	0.0008	0.001	0.002	0.0025	0.003	
High-Performance Carbide	HPFDM - Stub	—	—	0.0016	0.0022	0.0028	0.0032	0.0043	0.0053	0.0065	KC633M
	HPFDM - Reg/long	—	—	0.0011	0.0015	0.0020	0.0025	0.0030	0.0037	0.0046	
	HPRDM	—	0.0007	0.0009	0.0011	0.0014	0.0017	0.0022	0.0027	0.0035	KC633M



Slotting

Recommended starting feeds (Step 5) are based on the following WOC and DOC:

	MDRHEC PMRST	HEC, SLEC CRHEC, DHEC	PMFSS	HPRDM	HPFDM stub length	HPFDM regular & long
DOC	0.5 x Dia	0.5 x Dia	0.25 x Dia	0.5 x Dia	0.75 x Dia	0.5 x Dia

4th Step End Mill Composition

4th Step End Mill Style

5th Step Recommended Starting Feed — Chip Load per Flute

6th Step Grade

7th Step Starting Speed

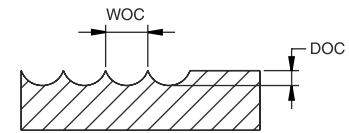
	1/8	3/16	1/4	5/16	3/8	1/2	5/8	3/4	1		
General-Purpose Carbide	HEC, CRHEC	0.0003	0.0004	0.0005	0.0007	0.001	0.0013	0.002	0.0025	0.0028	KC610M KC635M KC625M
	SLEC, DHEC	0.0004	0.0005	0.0006	0.0008	0.0012	0.0018	0.0027	0.0033	0.0035	
	MDRHEC	—	—	0.0006	0.0012	0.0018	0.0022	0.0025	0.003	0.0035	
Powdered Metal	PMRST	—	—	—	—	0.0006	0.001	0.002	0.0025	0.003	KP525M
	PMFSS	—	—	0.0003	—	0.0005	0.0008	0.0012	0.0015	0.002	
High-Performance Carbide	HPFDM - Stub	—	—	0.0010	0.0012	0.0016	0.0020	0.0026	0.0032	0.0039	KC633M
	HPFDM - Reg/long	—	—	0.0006	0.0008	0.0012	0.0014	0.0020	0.0023	0.0026	
	HPRDM	—	0.0005	0.0006	0.0007	0.0008	0.0011	0.0014	0.0016	0.0023	KC633M

Contouring

Recommended starting feeds (Step 5) are based on the following WOC and DOC:

	BNEC	HPBNDM
WOC	0.5 x Dia	0.01 x Dia
DOC	0.2 x Dia	0.01 x Dia

NOTE: For every 1% additional DOC on the HPBNDM, reduce feed rates by 3%.



4th Step End Mill Composition

4th Step End Mill Style

5th Step Recommended Starting Feed — Chip Load per Flute

6th Step Grade

7th Step Starting Speed

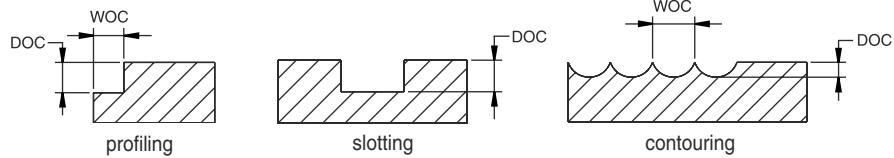
	1/8	3/16	1/4	5/16	3/8	1/2	5/8	3/4	1		
General-Purpose Carbide	BNEC	0.0004	0.0007	0.001	0.0013	0.0015	0.002	0.0025	0.003	0.004	KC610M KC635M
	HPBNDM	0.0024	0.004	0.006	—	0.0065	0.0075	0.008	0.009	—	
High-Performance Carbide											KC633M

NOTE: The above guidelines may require possible variations to achieve optimum results.
Dry machining or mist coolant is preferred with grade KC633M.

KENNA PERFECT Selection System

Austenitic Stainless Steels (200 & 300 Series), including Duplex (135-275 BHN) <28 HRC

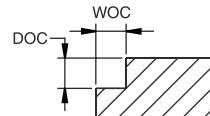
3rd Step: Select End Mill Application



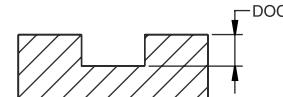
Profiling

Recommended starting feeds (Step 5) are based on the following WOC and DOC:

	MDRHEC	HEC & HHSEC CRHEC	SLEC DHEC	PMRS (S/T)	PMFSS	HPFT HPFSS - 3 & 5 Flutes	HPRSS
WOC	0.4 x Dia	0.1 x Dia	0.1 x Dia	0.5 x Dia	0.25 x Dia	0.1 x Dia	0.4 x Dia
DOC	1 x Dia	1 x Dia	1 x Dia	1 x Dia	1 x Dia	1 x Dia	1 x Dia



End Mill Composition	4th Step End Mill Style	5th Step Recommended Starting Feed — Chip Load per Flute										6th Step Grade	7th Step Starting Speed
		1/8	3/16	1/4	5/16	3/8	1/2	5/8	3/4	1			
General-Purpose Carbide	HEC, HHSEC	0.0005	0.0007	0.001	0.0013	0.0017	0.0025	0.003	0.004	0.0045	KC610M KC635M KC625M	200-350 250-450 250-350	
	SLEC, DHEC	0.0006	0.0009	0.0012	0.0015	0.002	0.0024	0.0036	0.0048	0.0055			
	MDRHEC	—	—	0.0008	0.001	0.0015	0.002	0.0025	0.003	0.0035			
Powdered Metal	PMRS (S/T)	—	—	0.0008	—	0.001	0.0015	0.002	0.0025	0.0035	KP525M	75-125	
	PMFSS	—	—	0.0006	—	0.0008	0.001	0.0015	0.002	0.003			
High-Performance Carbide	HPRSS	—	—	0.0012	—	0.0018	0.0024	0.003	0.0035	0.004	KC633M KC635M	200-450	
	HPFSS	0.001	0.0013	0.0015	0.002	0.0022	0.003	0.0036	0.0047	0.005			

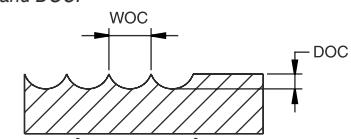


Slotting

Recommended starting feeds (Step 5) are based on the following WOC and DOC:

	MDRHEC	HHSEC	PMRS (S/T)	PMFSS	HPRSS	HPFSS – 3 Flute
DOC	0.5 x Dia	1 x Dia	1 x Dia	0.5 x Dia	1 x Dia	0.5 x Dia

End Mill Composition	4th Step End Mill Style	5th Step Recommended Starting Feed — Chip Load per Flute										6th Step Grade	7th Step Starting Speed
		1/8	3/16	1/4	5/16	3/8	1/2	5/8	3/4	1			
General-Purpose Carbide	HEC,CRHEC	0.0003	0.0004	0.0005	0.0007	0.001	0.0015	0.0017	0.002	0.0025	KC610M KC635M KC625M	200-300 250-350 200-325	
	SLEC,DHEC	0.0004	0.0005	0.0006	0.0008	0.0012	0.0018	0.002	0.0024	0.003			
	MDRHEC	—	—	0.0005	0.0008	0.001	0.0015	0.002	0.0025	0.003			
Powdered Metal	PMRS (S/T)	—	—	0.0004	—	0.0006	0.001	0.0015	0.002	0.003	KP525M	75-125	
	PMFSS	—	—	0.0003	—	0.0005	0.0008	0.0012	0.0015	0.0023			
High-Performance Carbide	HPRSS	—	—	0.001	—	0.0014	0.002	0.0021	0.0023	0.0026	KC633M KC635M	250-350	
	HPFSS - Stub	0.0012	0.0013	0.0014	0.002	0.0024	0.0026	0.003	0.0031	0.0034			
	HPFSS - Reg	0.001	0.0011	0.0012	0.0016	0.002	0.0022	0.0024	0.0026	0.0028			



Contouring

Recommended starting feeds (Step 5) are based on the following WOC and DOC:

	BNEC
WOC	0.5 x Dia
DOC	0.2 x Dia

End Mill Composition	4th Step End Mill Style	5th Step Recommended Starting Feed — Chip Load per Flute										6th Step Grade	7th Step Starting Speed
		1/8	3/16	1/4	5/16	3/8	1/2	5/8	3/4	1			
General-Purpose Carbide	BNEC	0.0005	0.001	0.0015	0.0017	0.002	0.0025	0.003	0.0038	0.004	KC610M	200-300	

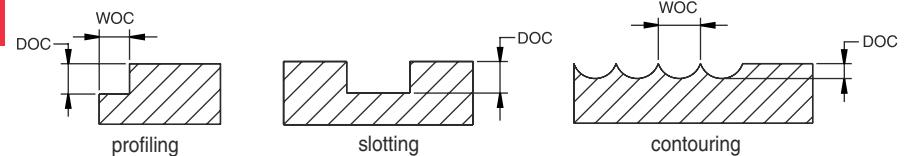
NOTE: The above guidelines may require possible variations to achieve optimum results.

KENNA PERFECT Selection System



Gray Cast Iron (120-220 BHN) <18 HRC

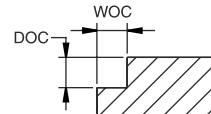
3rd Step: Select End Mill Application



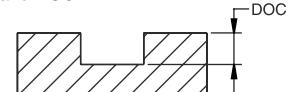
Profiling

Recommended starting feeds (Step 5) are based on the following WOC and DOC:

	MDRHEC	HEC CRHEC	SLEC DHEC	HPFSS	HPRSS
WOC	0.5 x Dia	0.1 x Dia	0.2 x Dia	0.1 x Dia	0.5 x Dia
DOC	1 x Dia				



End Mill Composition	4th Step End Mill Style	5th Step Recommended Starting Feed — Chip Load per Flute									6th Step Grade	7th Step Starting Speed
		1/8	3/16	1/4	5/16	3/8	1/2	5/8	3/4	1		
General-Purpose Carbide	HEC, CRHEC	0.0005	0.0007	0.0015	0.002	0.0023	0.0028	0.004	0.005	0.006	K600	400
	SLEC, DHEC	0.0012	0.0022	0.003	0.004	0.0045	0.005	0.006	0.0065	0.007	KC635M	600
	MDRHEC	—	—	0.0008	0.0015	0.002	0.0028	0.003	0.0035	0.0045	KC625M	475
High-Performance Carbide	HPFSS	0.0005	0.0008	0.0015	0.002	0.0025	0.0035	0.0045	0.006	0.007	KC635M	400
	HPRSS	—	—	0.0015	—	0.002	0.0025	0.003	0.0045	0.005	KC633M	600

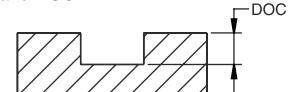


Slotting

Recommended starting feeds (Step 5) are based on the following WOC and DOC:

	MDRHEC	HEC, SLEC CRHEC, DHEC	HPRSS	HPFSS 3-Flute
DOC	0.5 x Dia	0.5 x Dia	0.8 x Dia	0.25 x Dia

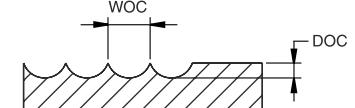
End Mill Composition	4th Step End Mill Style	5th Step Recommended Starting Feed — Chip Load per Flute									6th Step Grade	7th Step Starting Speed
		1/8	3/16	1/4	5/16	3/8	1/2	5/8	3/4	1		
General-Purpose Carbide	HEC, CRHEC	0.0003	0.0005	0.0007	0.001	0.0015	0.002	0.0025	0.003	0.0037	K600	400
	SLEC, DHEC	0.0004	0.000625	0.0006	0.0012	0.0018	0.0025	0.003	0.0035	0.0038	KC635M	600
	MDRHEC	—	—	0.0006	0.0012	0.0018	0.0022	0.0025	0.003	0.0035	KC625M	475
High-Performance Carbide	HPFSS - 3 flute	0.0005	0.0008	0.001	0.0015	0.002	0.0025	0.003	0.004	0.0048	KC635M	400
	HPRSS	—	—	0.0008	—	0.0015	0.0022	0.0025	0.003	0.0035	KC633M	600



Contouring

Recommended starting feeds (Step 5) are based on the following WOC and DOC:

	BNEC
WOC	0.5 x Dia
DOC	0.2 x Dia



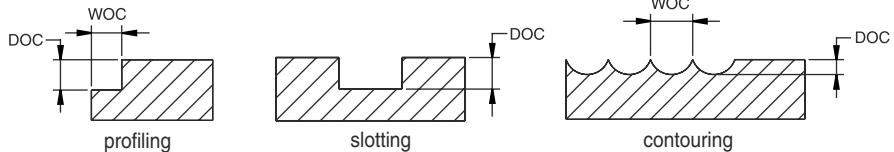
End Mill Composition	4th Step End Mill Style	5th Step Recommended Starting Feed — Chip Load per Flute									6th Step Grade	7th Step Starting Speed
		1/8	3/16	1/4	5/16	3/8	1/2	5/8	3/4	1		
General-Purpose Carbide	BNEC	0.0005	0.001	0.002	0.003	0.0036	0.004	0.005	0.0055	0.006	K600	400
General-Purpose Carbide	BNEC	—	—	—	—	—	—	—	—	—	KC635M	600

NOTE: The above guidelines may require possible variations to achieve optimum results.

KENNA PERFECT Selection System

Gray Cast Iron (220-320 BHN) 19-34 HRC

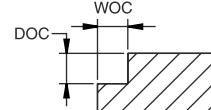
3rd Step: Select End Mill Application



Profiling

Recommended starting feeds (Step 5) are based on the following WOC and DOC:

	MDRHEC	HEC CRHEC	SLEC DHEC	HPFSS	HPRSS
WOC	0.5 x Dia	0.1 x Dia	0.2 x Dia	0.1 x Dia	0.5 x Dia
DOC	1 x Dia				

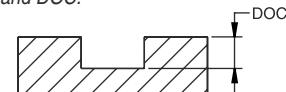


End Mill Composition	4th Step End Mill Style	5th Step Recommended Starting Feed — Chip Load per Flute										6th Step Grade	7th Step Starting Speed
		1/8	3/16	1/4	5/16	3/8	1/2	5/8	3/4	1			
General-Purpose Carbide	HEC, CRHEC	0.0005	0.0007	0.0015	0.002	0.0023	0.0028	0.004	0.005	0.006	K600	300	
	SLEC, DHEC	0.0012	0.0022	0.003	0.004	0.0045	0.005	0.006	0.0065	0.007	KC635M	500	
	MDRHEC	—	—	0.0008	0.0015	0.002	0.0025	0.003	0.0035	0.0045	KC625M	350	
High-Performance Carbide	HPFSS	0.0005	0.0008	0.0015	0.002	0.0025	0.0035	0.0045	0.006	0.007	KC635M	300	
	HPRSS	—	—	0.0015	—	0.002	0.0028	0.003	0.0045	0.005	KC633M	500	

Slotting

Recommended starting feeds (Step 5) are based on the following WOC and DOC:

	MDRHEC	HEC, SLEC CRHEC, DHEC	HPRSS	HPFSS 3-Flute
DOC	0.5 x Dia	0.3 x Dia	0.8 x Dia	0.25 x Dia

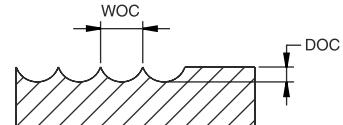


End Mill Composition	4th Step End Mill Style	5th Step Recommended Starting Feed — Chip Load per Flute										6th Step Grade	7th Step Starting Speed
		1/8	3/16	1/4	5/16	3/8	1/2	5/8	3/4	1			
General-Purpose Carbide	HEC, CRHEC	0.0003	0.0005	0.0007	0.001	0.0015	0.002	0.0025	0.003	0.0037	K600	300	
	SLEC, DHEC	0.0004	0.0006	0.0006	0.0012	0.0018	0.0025	0.003	0.0035	0.0038	KC635M	500	
	MDRHEC	—	—	0.0006	0.0012	0.0015	0.002	0.0025	0.003	0.0035	KC625M	350	
High-Performance Carbide	HPFSS - 3 flute	0.0005	0.0008	0.001	0.0015	0.0018	0.002	0.003	0.004	0.0045	KC635M	300	
	HPRSS	—	—	0.0008	—	0.0015	0.002	0.0025	0.003	0.0035	KC633M	500	

Contouring

Recommended starting feeds (Step 5) are based on the following WOC and DOC:

	BNEC
WOC	0.5 x Dia
DOC	0.2 x Dia



End Mill Composition	4th Step End Mill Style	5th Step Recommended Starting Feed — Chip Load per Flute										6th Step Grade	7th Step Starting Speed
		1/8	3/16	1/4	5/16	3/8	1/2	5/8	3/4	1			
General-Purpose Carbide	BNEC	0.0005	0.001	0.002	0.003	0.0036	0.004	0.005	0.0055	0.006	K600 KC635M	300 500	

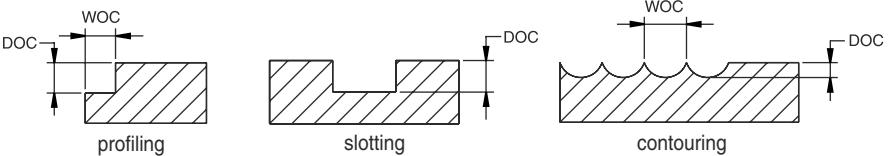
NOTE: The above guidelines may require possible variations to achieve optimum results.

KENNA PERFECT Selection System



Aluminum and Other Free-Machining, Non-Ferrous Materials — Low Silicon

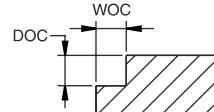
3rd Step: Select End Mill Application



Profiling

Recommended starting feeds (Step 5) are based on the following WOC and DOC:

	SFRHEC	HHSEC	PMRA PMFA	HPFA	HPRSS
WOC	0.8 x Dia	0.8 x Dia	0.25 x Dia	<1 x Dia	0.6 x Dia
DOC	0.6 x Dia	0.6 x Dia	1 x Dia	<1 x Dia	0.6 x Dia



End Mill Composition

4th Step End Mill Style

5th Step Recommended Starting Feed — Chip Load per Flute

6th Step Grade

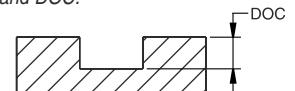
7th Step Starting Speed

		1/16	1/8	3/16	1/4	5/16	3/8	1/2	5/8	3/4	1	1 1/4	2		
General-Purpose Carbide	HHSEC	0.0005	0.001	0.0015	0.002	0.0025	0.003	0.004	0.005	0.006	0.007	—	—	K600 KC635M KC625M	
	SFRHEC	—	—	—	0.0015	—	0.0025	0.0035	0.0045	0.006	0.007	—	—	600-4000 600-6000 600-5000	
Powdered Metal	PMRA & PMFA	—	—	—	—	—	0.004	0.005	0.006	0.007	0.01	0.012	0.015	KP525M	500-3250
High-Performance Carbide	HPFA	—	0.0017	0.0019	0.0024	0.003	0.0036	0.0048	0.006	0.0072	0.0096	—	—	K600 KC625M	600-4000 600-6000
	HPRSS	—	—	—	0.0026	—	0.0036	0.0048	0.0056	0.0072	0.0084	—	—	KC633M	1600-5000

Slotting

Recommended starting feeds (Step 5) are based on the following WOC and DOC:

	SFRHEC	HHSEC	PMRA PMFA	HPFA	HPRSS
DOC	1 x Dia	1 x Dia	1 x Dia	1 x Dia	1 x Dia



End Mill Composition

4th Step End Mill Style

5th Step Recommended Starting Feed — Chip Load per Flute

6th Step Grade

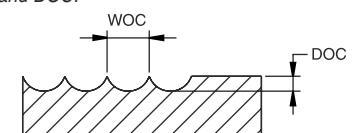
7th Step Starting Speed

		1/16	1/8	3/16	1/4	5/16	3/8	1/2	5/8	3/4	1	1 1/4	2		
General-Purpose Carbide	HHSEC	0.0003	0.0005	0.0006	0.001	0.0012	0.0015	0.0018	0.0025	0.003	0.004	—	—	K600 KC635M KC625M	
	SFRHEC	—	—	—	0.001	—	0.0017	0.002	0.0025	0.003	0.004	—	—	600-4000 600-6000 600-5000	
Powdered Metal	PMRA & PMFA	—	—	—	—	—	0.003	0.004	0.005	0.006	0.008	0.01	0.012	KP525M	750-2000
High-Performance Carbide	HPFA	—	0.0014	0.0016	0.002	0.0025	0.003	0.004	0.005	0.006	0.008	—	—	K600 KC625M	600-4000 600-6000
	HPRSS	—	—	—	0.0022	—	0.003	0.004	0.0047	0.006	0.007	—	—	KC633M	1600-5000

Contouring

Recommended starting feeds (Step 5) are based on the following WOC and DOC:

	BNEC
WOC	0.5 x Dia
DOC	0.2 x Dia



End Mill Composition

4th Step End Mill Style

5th Step Recommended Starting Feed — Chip Load per Flute

6th Step Grade

7th Step Starting Speed

		1/16	1/8	3/16	1/4	5/16	3/8	1/2	5/8	3/4	1	
General-Purpose Carbide	BNEC	0.0004	0.0006	0.001	0.0013	0.0015	0.002	0.0024	0.0035	0.005	0.006	K600 KC635M

Finishing

Starting recommended parameters to obtain a fine finish using a 0.1 x Dia WOC and 1 x LOC of the end mill:

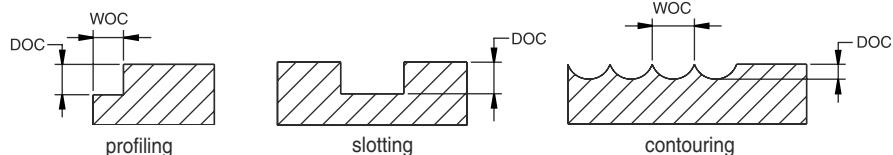
		1/8	3/16	1/4	5/16	3/8	1/2	5/8	3/4	1	
High-Performance Carbide	HPFA	0.0012	0.0014	0.0016	0.0018	0.002	0.0024	0.0026	0.0028	0.003	K600 KC625M

NOTE: The above guidelines may require possible variations to achieve optimum results.
Reduce chip load per tooth by .7 for the HPRSA series end mills.

KENNA PERFECT Selection System

Aluminum and Other Free-Machining, Non-Ferrous Materials — High-Silicon

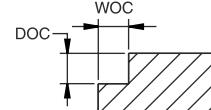
3rd Step: Select End Mill Application



Profiling

Recommended starting feeds (Step 5) are based on the following WOC and DOC:

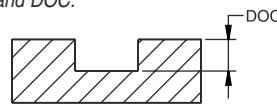
	SFRHEC	HHSEC	PMRA PMFA	HPFA	HPRSS
WOC	0.8 x Dia	0.8 x Dia		<1x Dia	0.6 x Dia
DOC	0.6 x Dia	0.6 x Dia		<1x Dia	0.6 x Dia



Slotting

Recommended Starting Feed — Chip Load per Flute

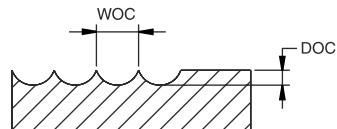
End Mill Composition	4th Step End Mill Style	1/16	1/8	3/16	1/4	5/16	3/8	1/2	5/8	3/4	1	6th Step Grade	7th Step Starting Speed
General-Purpose Carbide	HHSEC	0.0005	0.001	0.0015	0.002	0.0025	0.003	0.004	0.005	0.006	0.007	K600 KC635M KC625M	300-2000 300-3000 300-2500
	SFRHEC	—	—	—	0.0015	—	0.0025	0.0035	0.0045	0.006	0.007		
	HPFA	—	0.0017	0.0019	0.0024	0.003	0.0036	0.0048	0.006	0.0072	0.0096	K600	300-2000
High-Performance Carbide	HPRSS	—	—	—	0.0026	—	0.0036	0.0048	0.0056	0.0072	0.0084	KC625M	300-3000
												KC633M	800-2500



Contouring

Recommended starting feeds (Step 5) are based on the following WOC and DOC:

	BNEC
WOC	0.5 x Dia
DOC	0.2 x Dia



Finishing

Starting recommended parameters to obtain a fine finish using a 0.1 x Dia WOC and 1 x LOC of the end mill:

End Mill Composition	4th Step End Mill Style	1/16	1/8	3/16	1/4	5/16	3/8	1/2	5/8	3/4	1	6th Step Grade	7th Step Starting Speed
General-Purpose Carbide	BNEC	0.0004	0.0006	0.001	0.0013	0.0015	0.002	0.0024	0.0035	0.005	0.006	K600 KC635M	300-2000 300-3000

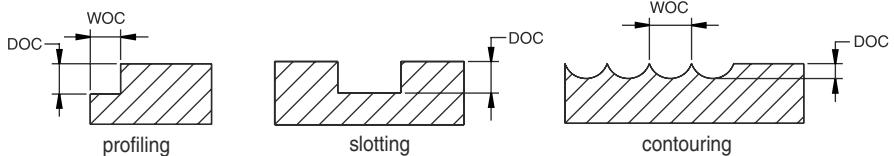
NOTE: The above guidelines may require possible variations to achieve optimum results.
Reduce chip load per tooth by .7 for the HPRSA series end mills.

KENNA PERFECT Selection System



Aluminum and Other Free-Machining, Non-Ferrous Materials using KDF300 Diamond Coating

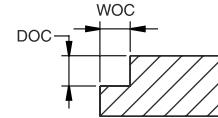
3rd Step: Select End Mill Application



Profiling

	HEC
WOC	0.1 x Dia
DOC	1 x Dia

Recommended starting feeds (Step 5) are based on the following WOC and DOC:



End Mill Composition

4th Step End Mill Style

5th Step Recommended Starting Feed — Chip Load per Flute

6th Step Grade

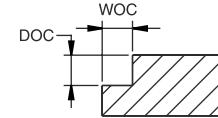
7th Step Starting Speed

		1/64	1/32	1/16	3/32	1/8	3/16	1/4	5/16	3/8	1/2	
Graphite, Hard Carbon	HEC	0.0003	0.0005	0.001	0.0011	0.0012	0.0015	0.0017	0.0019	0.0022	0.0024	KDF300 80-3000
Green Ceramics, Powder-Filled Plastics, Thermoset Plastics	HEC	0.0003	0.0005	0.001	0.0011	0.0012	0.0015	0.0017	0.0019	0.0022	0.0024	KDF300 50-1300
Fiber-Filled Plastics	HEC	—	—	0.0011	0.0012	0.0013	0.0016	0.0018	0.0021	0.0023	0.0032	KDF300 150-750
Free-Machining Aluminum	HEC	—	—	—	—	0.001	0.0012	0.0014	0.0016	0.0018	0.0025	KDF300 300-900
Metal Matrix Composites (MMC)	HEC	—	—	—	—	0.001	0.0012	0.0014	0.0016	0.0018	0.0025	KDF300 300-750

Rough Profiling

	HEC
WOC	0.5 x Dia
DOC	1 x Dia

Recommended starting feeds (Step 5) are based on the following WOC and DOC:



End Mill Composition

4th Step End Mill Style

5th Step Recommended Starting Feed — Chip Load per Flute

6th Step Grade

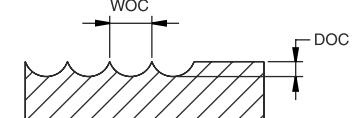
7th Step Starting Speed

		1/64	1/32	1/16	3/32	1/8	3/16	1/4	5/16	3/8	1/2	
Graphite, Hard Carbon	HEC	0.0002	0.0004	0.0007	0.0009	0.001	0.0012	0.0013	0.0015	0.0017	0.0019	KDF300 80-1000
Green Ceramics, Powder-Filled Plastics, Thermoset Plastics	HEC	0.0002	0.0004	0.0007	0.0009	0.001	0.0012	0.0013	0.0015	0.0017	0.0019	KDF300 40-600
Fiber-Filled Plastics	HEC	—	—	0.0008	0.0009	0.0011	0.0013	0.0015	0.0016	0.0019	0.0025	KDF300 60-400
Free-Machining Aluminum	HEC	—	—	—	—	0.0008	0.0009	0.0011	0.0013	0.0014	0.002	KDF300 100-500
Metal Matrix Composites (MMC)	HEC	—	—	—	—	0.0008	0.0009	0.0011	0.0013	0.0014	0.002	KDF300 100-400

Contouring

	BNEC
WOC	0.3 x Dia
DOC	0.7 x Dia

Recommended starting feeds (Step 5) are based on the following WOC and DOC:



End Mill Composition

4th Step End Mill Style

5th Step Recommended Starting Feed — Chip Load per Flute

6th Step Grade

7th Step Starting Speed

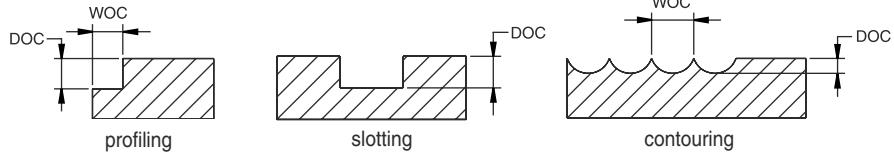
		1/64	1/32	1/16	3/32	1/8	3/16	1/4	5/16	3/8	1/2	
Graphite, Hard Carbon	HEC	0.0002	0.0004	0.0007	0.0008	0.0009	0.0011	0.0013	0.0015	0.0017	0.0019	KDF300 80-1200
Green Ceramics, Powder-Filled Plastics, Thermoset Plastics	HEC	0.0002	0.0004	0.0007	0.0008	0.0009	0.0011	0.0013	0.0015	0.0017	0.0019	KDF300 50-600
Fiber-Filled Plastics	HEC	—	—	0.0007	0.0008	0.0009	0.0011	0.0012	0.0014	0.0015	0.0021	KDF300 75-450
Free-Machining Aluminum	HEC	—	—	—	—	0.0007	0.0008	0.001	0.0011	0.0012	0.0016	KDF300 100-550
Metal Matrix Composites (MMC)	HEC	—	—	—	—	0.0007	0.0008	0.001	0.0011	0.0012	0.0016	KDF300 100-450

*NOTE: Lowest values in the SFM range is for the smallest diameter in the chart. Middle of the range should be used on the 1/4" diameter. Higher end of the range for the 1/2".

KENNA PERFECT Selection System

Titanium-alloyed, Commercially Pure, Alpha, Beta, Alpha/Beta

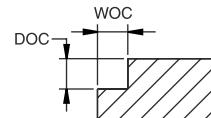
3rd Step: Select End Mill Application



Profiling

Recommended starting feeds (Step 5) are based on the following WOC and DOC:

	HDRHEC	HHEC HEC	HSFT	PMRS (S/T)	PMFSS	HPFT HPFSS	HPRSS
WOC	0.5 x Dia	0.1 x Dia	0.1 x Dia	0.5 x Dia	0.1 x Dia	0.1 x Dia	0.5 x Dia
DOC	1 x Dia	1 x Dia	1.5 x Dia	1 x Dia	1 x Dia	1 x Dia	1 x Dia

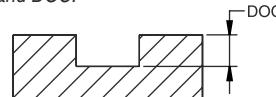


End Mill Composition	4th Step End Mill Style	5th Step Recommended Starting Feed — Chip Load per Flute										6th Step Grade	7th Step Starting Speed
		1/8	3/16	1/4	5/16	3/8	1/2	5/8	3/4	1			
General-Purpose Carbide	HHEC & HEC	0.0005	0.0006	0.001	0.0012	0.0015	0.0018	0.0025	0.003	0.0035	KC635M	125-300 100-150	
	HDRHEC	—	—	0.001	—	0.0013	0.0017	0.002	0.0025	0.003	KC625M		
Powdered Metal	HSFT	—	—	—	—	0.0025	0.0035	0.0037	0.004	0.0055	KH110M	45-140	
	PMRS (S/T)	—	—	0.0012	—	0.0014	0.0022	0.0032	0.0038	0.005	KP525M	75-125	
	PMFSS	—	—	0.0008	—	0.001	0.0014	0.0026	0.0032	0.004			
High-Performance Carbide	HPFT & HPFSS	—	—	0.0013	—	0.002	0.0024	0.0036	0.0047	0.005	KC633M	200-400	
	HPRSS	—	—	0.001	—	0.0018	0.0021	0.0024	0.003	0.0035	KC635M		

Slotting

Recommended starting feeds (Step 5) are based on the following WOC and DOC:

	HDRHEC HPRSS	HEC	HSFT	PMRS (S/T)	PMFSS	HPFSS 3-Flute	HPRSS
DOC	0.5 x Dia	0.25 x Dia	0.25 x Dia	1 x Dia	0.5 x Dia	0.25 x Dia	0.5 x Dia

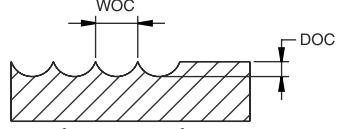


End Mill Composition	4th Step End Mill Style	5th Step Recommended Starting Feed — Chip Load per Flute										6th Step Grade	7th Step Starting Speed
		1/8	3/16	1/4	5/16	3/8	1/2	5/8	3/4	1			
General-Purpose Carbide	HEC	0.0003	0.0004	0.0006	0.0008	0.001	0.0012	0.002	0.0025	0.003	KC635M	100-150 75-125	
	HDRHEC	—	—	0.0008	—	0.001	0.0015	0.002	0.0025	0.003	KC625M		
Powdered Metal	PMFSS	—	—	0.0005	—	0.001	0.0015	0.0024	0.003	0.0038	KP525M	75-125	
	PMRS (S/T)	—	—	0.0004	—	0.0006	0.001	0.0015	0.002	0.0025			
	HPFSS-3 FLUTE	—	—	0.0008	—	0.0012	0.0015	0.002	0.0028	0.003	KC635M		
High-Performance Carbide	HPRSS	—	—	0.0008	—	0.0015	0.0018	0.002	0.0025	0.003	KC633M	100-200	

Contouring

Recommended starting feeds (Step 5) are based on the following WOC and DOC:

	BNEC
WOC	0.5 x Dia
DOC	0.2 x Dia



End Mill Composition	4th Step End Mill Style	5th Step Recommended Starting Feed — Chip Load per Flute										6th Step Grade	7th Step Starting Speed
		1/8	3/16	1/4	5/16	3/8	1/2	5/8	3/4	1			
General-Purpose Carbide	BNEC	0.0004	0.0007	0.001	0.0013	0.0015	0.0018	0.002	0.0025	0.003	KC635M	100-200	

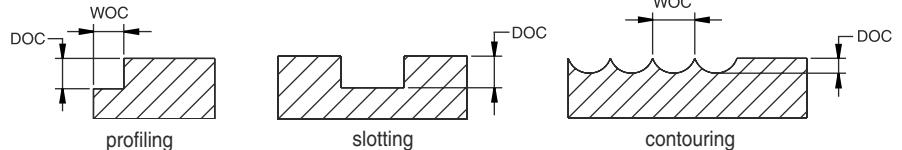
NOTE: The above guidelines may require possible variations to achieve optimum results.

KENNA PERFECT Selection System



Titanium-alloyed, Nickel Base

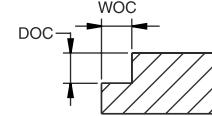
3rd Step: Select End Mill Application



Profiling

Recommended starting feeds (Step 5) are based on the following WOC and DOC:

	HDRHEC	HHEC HEC	HSFT	PMRS (S/T)	PMFSS	HPFT HPFSS	HPRSS
WOC	0.3 x Dia	0.1 x Dia	0.1 x Dia	0.5 x Dia	0.1 x Dia	0.1 x Dia	0.5 x Dia
DOC	0.5 x Dia	1 x Dia	1.5 x Dia	1 x Dia	1 x Dia	1 x Dia	1 x Dia

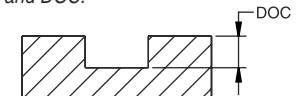


End Mill Composition	4th Step End Mill Style	5th Step Recommended Starting Feed — Chip Load per Flute										6th Step Grade	7th Step Starting Speed
		1/8	3/16	1/4	5/16	3/8	1/2	5/8	3/4	1			
General-Purpose Carbide	HHEC & HEC	0.0005	0.0006	0.001	0.0012	0.0015	0.0018	0.0025	0.003	0.0035		KC635M KC625M	100-200 75-150
	HDRHEC	—	—	0.0006	—	0.0008	0.001	0.0015	0.002	0.0025			
Powdered Metal	PMRS (S/T)	—	—	0.0008	—	0.001	0.0015	0.0022	0.003	0.0035		KP525M	45-60
	PMFSS	—	—	0.0006	—	0.0008	0.001	0.0018	0.0025	0.0032			
High-Performance Carbide	HPFT & HPFSS	—	—	0.0013	0.0015	0.002	0.0026	0.0036	0.0047	0.005		KC633M KC635M	100-250 100-200
	HPRSS	—	—	0.0007	—	0.0011	0.0014	0.0018	0.0024	0.0029			

Slotting

Recommended starting feeds (Step 5) are based on the following WOC and DOC:

	HDRHEC	HHEC	PMRS (S/T)	PMFSS	HPFSS 3-Flute	HPRSS
DOC	0.5 X Dia	0.5 X Dia	1 x Dia	0.5 X Dia	0.25 X Dia	1 x Dia

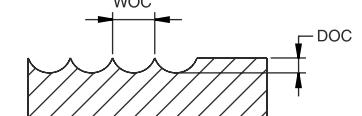


End Mill Composition	4th Step End Mill Style	5th Step Recommended Starting Feed — Chip Load per Flute										6th Step Grade	7th Step Starting Speed
		1/8	3/16	1/4	5/16	3/8	1/2	5/8	3/4	1			
General-Purpose Carbide	HEC	0.0003	0.0004	0.0006	0.0007	0.0008	0.001	0.0015	0.002	0.0025		KC610M KC625M	500 550
	HDRHEC	—	—	0.0008	—	0.001	0.0013	0.0015	0.002	0.0025			
Powdered Metal	PMFSS	—	—	0.0004	—	0.0007	0.0012	0.0016	0.002	0.003		KP525M	45-60
	PMRS (S/T)	—	—	0.0003	—	0.0005	0.0008	0.001	0.0015	0.002			
High-Performance Carbide	HPFSS - 3 FLUTE	0.0004	0.0007	0.001	0.0012	0.0014	0.0016	0.0018	0.002	0.0025		KC635M KC633M	75-100 75-100
	HPRSS	—	—	0.0006	—	0.0009	0.0012	0.0015	0.002	0.0024			

Contouring

Recommended starting feeds (Step 5) are based on the following WOC and DOC:

	BNEC
WOC	0.5 x Dia
DOC	0.2 x Dia



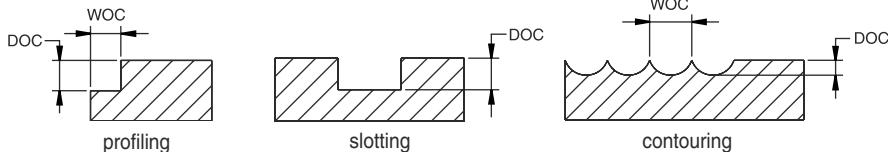
End Mill Composition	4th Step End Mill Style	5th Step Recommended Starting Feed — Chip Load per Flute										6th Step Grade	7th Step Starting Speed
		1/8	3/16	1/4	5/16	3/8	1/2	5/8	3/4	1			
General-Purpose Carbide	BNEC	0.0005	0.0007	0.001	0.0015	0.0018	0.002	0.003	0.0025	0.0037		KC635M	75-150

NOTE: The above guidelines may require possible variations to achieve optimum results.

KENNA PERFECT Selection System

Hardened Steels (381-481 BHN) 41-50 HRC

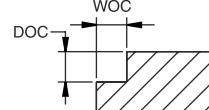
3rd Step: Select End Mill Application



Profiling

Recommended starting feeds (Step 5) are based on the following WOC and DOC:

	MDRHEC	HEC, SLEC CRHEC, DHEC	HPFDM (40-45 HRC) stub length	HPFDM (45-50 HRC) stub length	HPFDM regular & long	HPRDM
WOC	0.25 x Dia	0.1 x Dia	0.4 x Dia	0.25 x Dia	0.2 x Dia	0.4 x Dia
DOC	1 x Dia	1 x Dia	1 x Dia	1 x Dia	1 x Dia	0.8 x Dia



End Mill Composition

4th Step End Mill Style

5th Step

Recommended Starting Feed — Chip Load per Flute

6th Step Grade

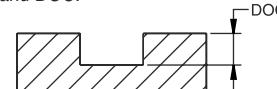
7th Step Starting Speed

	1/8	3/16	1/4	5/16	3/8	1/2	5/8	3/4	1		
General-Purpose Carbide	HEC, CRHEC	0.0005	0.0007	0.001	0.0015	0.0017	0.002	0.0023	0.0025	0.003	KC635M KC625M
	SLEC, DHEC	0.0006	0.0008	0.0012	0.0017	0.0019	0.0022	0.0025	0.0029	0.0033	
	MDRHEC	—	—	0.0006	0.001	0.0012	0.0015	0.0018	0.002	0.0028	
High-Performance Carbide	HPFDM-Stub	—	—	0.0014	0.002	0.0025	0.003	0.0038	0.0046	0.006	KC633M
	HPFDM-Reg/Long	—	—	0.0010	0.0014	0.0018	0.0021	0.0027	0.0032	0.0042	
	HPRDM	—	0.0006	0.0008	0.001	0.0012	0.0016	0.002	0.0024	0.0028	KC633M
											250-300 175-250

Slotting

Recommended starting feeds (Step 5) are based on the following WOC and DOC:

	MDRHEC	HEC, SLEC CRHEC, DHEC	HPFDM (40-45 HRC) stub length	HPFDM (45-50 HRC) stub length	HPFDM regular & long	HPRDM
DOC	0.5 x Dia	0.3 x Dia	0.75 x Dia	0.5 x Dia	0.5 x Dia	0.5 x Dia



End Mill Composition

4th Step End Mill Style

5th Step

Recommended Starting Feed — Chip Load per Flute

6th Step Grade

7th Step Starting Speed

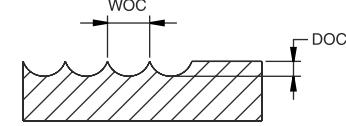
	1/8	3/16	1/4	5/16	3/8	1/2	5/8	3/4	1		
General-Purpose Carbide	HEC, CRHEC	0.0003	0.0004	0.0006	0.0009	0.001	0.0012	0.0014	0.0015	0.0018	KC635M KC625M
	SLEC, DHEC	0.0004	0.0005	0.0007	0.001	0.0011	0.0013	0.0015	0.0017	0.002	
	MDRHEC	—	—	0.0005	0.0008	0.001	0.0013	0.0015	0.0018	0.0025	
High-Performance Carbide	HPRDM	—	0.0004	0.0005	0.0006	0.0007	0.001	0.0012	0.0014	0.0017	KC633M
	HPFDM-Stub	—	—	0.0007	0.001	0.0013	0.0015	0.0019	0.0023	0.003	KC633M
	HPFDM- Reg/long	—	—	0.0005	0.0007	0.0009	0.001	0.0013	0.0016	0.0021	
											175-250 150-200

Contouring

Recommended starting feeds (Step 5) are based on the following WOC and DOC:

	BNEC	HPBNDM
WOC	0.4 x Dia	0.01 x Dia
DOC	0.2 x Dia	0.01 x Dia

NOTE: For every 1% additional DOC on the HPBNDM, reduce feed rates by 3%.



End Mill Composition

4th Step End Mill Style

5th Step

Recommended Starting Feed — Chip Load per Flute

6th Step Grade

7th Step Starting Speed

	1/8	3/16	1/4	5/16	3/8	1/2	5/8	3/4	1		
General-Purpose Carbide	BNEC	0.0004	0.0007	0.001	0.0013	0.0015	0.002	0.0025	0.003	0.004	KC610M KC635M
	HPBNDM	0.0024	0.0031	0.004	—	0.0055	0.0063	0.0071	0.0079	—	
High-Performance Carbide	BNEC	0.0004	0.0007	0.001	0.0013	0.0015	0.002	0.0025	0.003	0.004	KC633M
	HPBNDM	0.0024	0.0031	0.004	—	0.0055	0.0063	0.0071	0.0079	—	KC633M
											150-200 235-275

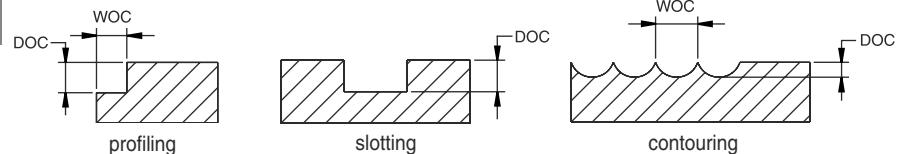
NOTE: The above guidelines may require possible variations to achieve optimum results.
Dry machining or mist coolant is preferred with grade KC633M.

KENNA PERFECT Selection System



Hardened Steels (496-654 BHN) 51-60 HRC

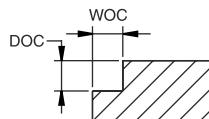
3rd Step: Select End Mill Application



Profiling

Recommended starting feeds (Step 5) are based on the following WOC and DOC:

	HEC CRHEC	SLEC DHEC	HPFDM (51-55 HRC) stub length	HPFDM (56-60 HRC) stub length	HPFDM regular & long	HPRDM
WOC	0.1 x Dia	0.1 x Dia	0.25 x Dia	0.2 x Dia	0.2 x Dia	0.25 x Dia
DOC	1 x Dia	1 x Dia	1 x Dia	1 x Dia	1 x Dia	0.8 x Dia

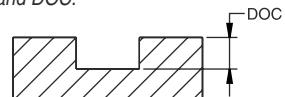


End Mill Composition	End Mill Style	5th Step Recommended Starting Feed — Chip Load per Flute										6th Step Grade	7th Step Starting Speed
		1/8	3/16	1/4	5/16	3/8	1/2	5/8	3/4	1			
General-Purpose Carbide	HEC, CRHEC	0.0003	0.0004	0.0005	0.0006	0.0007	0.0008	0.001	0.0015	0.002		KC635M	75-125
	SLEC, DHEC	0.0004	0.0005	0.0006	0.0007	0.0008	0.001	0.0015	0.002	0.003			
High-Performance Carbide	HPFDM - Stub	—	—	0.0007	0.001	0.0014	0.0016	0.0022	0.0026	0.0031		KC633M	250
	HPFDM - Reg/long	—	—	0.0005	0.0007	0.0010	0.0011	0.0015	0.0018	0.0022			
	HPRDM	—	0.0003	0.0004	0.0006	0.0008	0.001	0.0012	0.0016	0.0018		KC633M	200

Slotting

Recommended starting feeds (Step 5) are based on the following WOC and DOC:

	HPFDM (51-55 HRC) stub length	HPFDM (56-60 HRC) stub length	HPFDM (51-55 HRC) regular & long	HPFDM (56-60 HRC) regular & long	HPRDM
DOC	0.5 x Dia	0.4 x Dia	0.5 x Dia	0.25 x Dia	0.3 x Dia



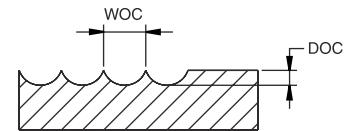
End Mill Composition	End Mill Style	5th Step Recommended Starting Feed — Chip Load per Flute										6th Step Grade	7th Step Starting Speed
		1/8	3/16	1/4	5/16	3/8	1/2	5/8	3/4	1			
High-Performance Carbide	HPRDM	—	0.0002	0.0003	0.0004	0.0005	0.0006	0.0007	0.001	0.0011	KC633M	200	
	HPFDM - Stub	—	—	0.0004	0.0005	0.0007	0.0008	0.0011	0.0013	0.0016	KC633M	250	
	HPFDM - Reg/long	—	—	0.0002	0.0004	0.0005	0.0006	0.0008	0.0009	0.0011			

Contouring

Recommended starting feeds (Step 5) are based on the following WOC and DOC:

	BNEC	HPBNDM
WOC	0.1 x Dia	0.01 x Dia
DOC	0.2 x Dia	0.01 x Dia

NOTE: For every 1% additional DOC on the HPBNDM, reduce feed rates by 3%.



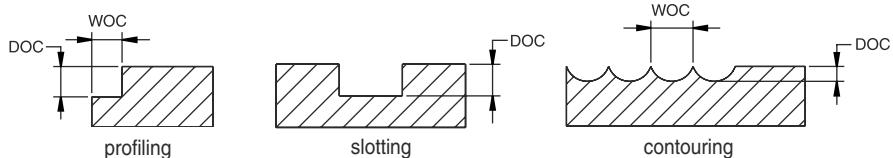
End Mill Composition	End Mill Style	5th Step Recommended Starting Feed — Chip Load per Flute										6th Step Grade	7th Step Starting Speed
		1/8	3/16	1/4	5/16	3/8	1/2	5/8	3/4	1			
General-Purpose Carbide	BNEC	0.0002	0.0004	0.0006	0.0008	0.001	0.0013	0.0016	0.002	0.0025	KC635M	100-250	
	HPBNDM	0.0016	0.002	0.0024	—	0.0028	0.0031	0.0035	0.004	—	KC633M		

NOTE: The above guidelines may require possible variations to achieve optimum results.
Dry machining or mist coolant is preferred with grade KC633M.

KENNA PERFECT Selection System

Hardened Steels (>654 BHN) >60 HRC

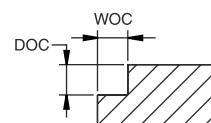
3rd Step: Select End Mill Application



Profiling

Recommended starting feeds (Step 5) are based on the following WOC and DOC:

	HPFDM all	HPRDM
WOC	0.2 x Dia	0.2 x Dia
DOC	1 x Dia	0.8 x Dia

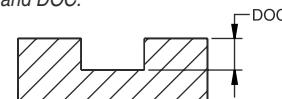


Slotting

Recommended starting feeds (Step 5) are based on the following WOC and DOC:

	HPFDM
DOC	0.3 x Dia

End Mill Composition	4th Step End Mill Style	5th Step Recommended Starting Feed — Chip Load per Flute	6th Step Grade	7th Step Starting Speed
High-Performance Carbide	HPFDM - Stub	—	—	—
	HPFDM - Reg/long	—	—	—
	HPRDM	0.00027	0.0004	0.0004

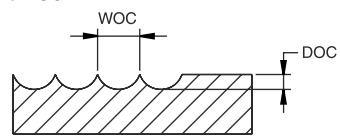


Contouring

Recommended starting feeds (Step 5) are based on the following WOC and DOC:

	HPBNDM
WOC	0.01 x Dia
DOC	0.01 x Dia

NOTE: For every 1% additional DOC on the HPBNDM, reduce feed rates by 3%.



End Mill Composition	4th Step End Mill Style	5th Step Recommended Starting Feed — Chip Load per Flute	6th Step Grade	7th Step Starting Speed
High-Performance Carbide	HPBNDM	0.0012	0.0016	0.002

NOTE: The above guidelines may require possible variations to achieve optimum results.
Dry machining or mist coolant is preferred with grade KC633M.

High-Performance Solid Carbide End Mills



- Non-polished shank for better gripping power!
- Material specific solutions!
- Fine grain carbide!
- "M" Grades!
- Optimized end mill designs for maximum productivity!

High-Performance Carbide End Mills		Units	Page
HPFDM	4 to 6 flute finishing end mill for use in steels, hardened steels and other materials >35 HRC	Inch	28
HPRDM	3 to 6 flute roughing end mill for use in steels, hardened steels	Inch	29
HPBNDM	4 flute ball nose finishing end mill for use in steels and hardened steels	Inch	29
HPFA	2 & 3 flute finishing end mill for use in aluminum	Inch	30
HPRSA	Hgh performance end mill w/ reduced shank for deep pocket machining in aluminum	Inch	30
HPRSS	3 flute roughing end mill with chip breaker design for use in stainless, steel, aluminum, cast iron and aluminum	Inch	31
Diamond Coated	2 & 4 flute diamond coated end mill for use in aluminum and non-metals.	Inch	32-33
HPFSS	3 & 5 flute finishing end mill for use in stainless, cast iron and hi temp	Inch	34-35
HPFT	6 flute finishing end mill for use in high-temp & stainless steel	Inch	36
F3AJ - ADL45 OR ADL60	3-8 flute cermet end mill for use in steel 45° and 60° helix	Metric	37
F3AJ - ADL60	3 flute 60° helix end mill	Metric	37
F3BH, F3BJ & F4BJ	3-5 flute roughing end mill with and without coolant for steels	Metric	38
F3BT	3-6 flute roughing emmill for steel and hardened steel. Similar to HPRDM	Metric	39
F4AJ, F5AJ & F6AJ	4-6 flute finishing end mill for steel and hardened steel. Similar to HPFDM	Metric	39
FFBNE	2 flute flush fine ball nose end mill for steels and hardened steel	Metric	39
F2AA & F3AA	2 & 3 flute finishing end mill for use in aluminum. Similar to HPFA	Metric	40
F3BA	3 flute roughing end mill with and without coolant for aluminum. Similar to HPRSS	Metric	40
F3BS	3 flute roughing end mill for steels, high-temp & cast iron.	Metric	41
F3AS	3 flute finishing end mill for steels, high-temp & cast iron. Similar to HPFSS	Metric	41

cutting diameter	Din h6		Din d11	
	+	-	+	-
< 1/8"	0	.00024"	.0008"	.0031"
1/8" to 7/32"	0	.00031"	.0012"	.0041"
1/4" to 3/8"	0	.00035"	.0016"	.0051"
13/32" to 11/16"	0	.00043"	.002"	.0063"
23/32 to 1 3/16"	0	.00051"	.0026"	.0077
1 1/4" to 2"	0	.00063"	—	—



High-Performance Solid Carbide End Mills

- recommended for steels and hardened steels <60 HRC, stainless and high temps >35 HRC
- dry milling
- variable core thickness to maximize chip evacuation and rigidity

- two tools in one (roughing & finishing)
- superior rigidity enables increased metal removal rates
- optimized rake and core geometry for extended tool life
- reinforced corner for longer tool life
- improved wall straightness and perpendicularity

Applicable Material Groups			
STEEL	STAINLESS STEEL	HIGH-TEMP ALLOY	HARDENED MATERIAL



Stub Length (50° Helix)

catalog number	KC633M
HPFDM250S4038	■
HPFDM312S4050	■
HPFDM375S4056	■
HPFDM500S4075	■
HPFDM625S4094	■
HPFDM750S4113	■
HPFDM1000S5150	■

diameter tolerance = +.000/-0.002

shank tolerance = DIN h6 (pg. 27)

end mill dimensions				
cutting diameter	shank diameter	flute length	overall length	no. of flutes
1/4	1/4	3/8	3	4
5/16	5/16	1/2	4	4
3/8	3/8	9/16	4	4
1/2	1/2	3/4	5	4
5/8	5/8	15/16	5	4
3/4	3/4	1 1/8	6	4
1	1	1 1/2	6	5



Regular Length (50° Helix)

catalog number	KC633M
HPFDM250S4063	■
HPFDM312S4075	■
HPFDM375S5094	■
HPFDM500S6125	■
HPFDM625S6156	■
HPFDM750S6188	■
HPFDM1000S6250	■

end mill dimensions				
cutting diameter	shank diameter	flute length	overall length	no. of flutes
1/4	1/4	5/8	3	4
5/16	5/16	3/4	4	4
3/8	3/8	15/16	4	5
1/2	1/2	1 1/4	5	6
5/8	5/8	1 9/16	5	6
3/4	3/4	1 7/8	6	6
1	1	2 1/2	6	6



Long Length (50° Helix)

catalog number	KC633M
HPFDM250S4088	■
HPFDM312S4113	■
HPFDM375S5131	■
HPFDM500S6175	■
HPFDM625S6219	■
HPFDM750S6263	■
HPFDM1000S6350	■

end mill dimensions				
cutting diameter	shank diameter	flute length	overall length	no. of flutes
1/4	1/4	7/8	3	4
5/16	5/16	1 1/8	4	4
3/8	3/8	1 5/16	4	5
1/2	1/2	1 3/4	5	6
5/8	5/8	2 3/16	5	6
3/4	3/4	2 5/8	6	6
1	1	3 1/2	6	6



- recommended for steels and hardened steels <70 HRC, stainless and high temps >35 HRC
- optimized design for maximum metal removal
- neck and cone geometry for increased rigidity

- reinforced shanks
- specialized profile on the roughing end mills
- small corner radius on the roughing end mills for reinforced corners

Applicable Material Groups			
STEEL	STAINLESS STEEL	HIGH-TEMP ALLOY	HARDENED MATERIAL



Roughing End Mills (45° Helix)

catalog number	KC633M
HPRDM188S3019	■
HPRDM250S4025	■
HPRDM312S4031	■
HPRDM375S4038	■
HPRDM500S4050	■
HPRDM625S6063	■
HPRDM750S6075	■
HPRDM1000S6100	■

cutting diameter tolerance = DIN h11 (pg. 27)
shank diameter tolerance = DIN h6 (pg. 27)

end mill dimensions					
cutting diameter	shank diameter	flute length	overall length	radius	no.of flutes
3/16	1/4	3/16	3	0.03	3
1/4	3/8	1/4	4	0.03	4
5/16	3/8	5/16	4	0.03	4
3/8	1/2	3/8	5	0.03	4
1/2	5/8	1/2	5	0.04	4
5/8	5/8	5/8	5	0.04	6
3/4	3/4	3/4	6	0.05	6
1	1	1	6	0.05	6



Ball Nose End Mills (15° Helix)

catalog number	KC633M
HPBNDM125S4013	■
HPBNDM188S4019	■
HPBNDM250S4025	■
HPBNDM375S4038	■
HPBNDM500S4050	■
HPBNDM625S4063	■
HPBNDM750S4075	■

cutting diameter tolerance = +.000/-0.002
shank diameter tolerance = DIN h6 (pg. 27)

end mill dimensions				
cutting diameter	shank diameter	flute length	overall length	no. of flutes
1/8	1/4	1/8	3	4
3/16	1/4	3/16	3	4
1/4	3/8	1/4	4	4
3/8	1/2	3/8	5	4
1/2	5/8	1/2	5	4
5/8	5/8	5/8	5	4
3/4	3/4	3/4	6	4

NEW High-Performance Solid Carbide End Mills

Standard Length

- specific 2 flute geometry for deep pockets with <90° angles
- optimized helix for maximum chip evacuation
- cylindrical margin for better surface finish
- specific 3 flute geometry for thin wall finishing
- enhanced rake form to eliminate chatter
- reinforced corner
- double rake face geometry for faster chip and improved surface finish and perpendicularity

Applicable Material Groups

Non-FERROUS



2 Flute

catalog number	K600	KC625M
HPFA125S2050	■	■
HPFA188S2063	■	■
HPFA250S2075	■	■
HPFA312S2081	■	■
HPFA375S2100	■	■
HPFA500S2125	■	■
HPFA625S2163	■	■
HPFA750S2163	■	■
HPFA1000S2200	■	■

3 Flute (45° Helix)

catalog number	K600	KC625M
—		
—		
HPFA250S3075	■	■
HPFA312S3081	■	■
HPFA375S3100	■	■
HPFA500S3125	■	■
HPFA625S3163	■	■
HPFA750S3163	■	■
HPFA1000S3200	■	■

diameter tolerance = +.000/-0.002

shank tolerance = DIN h6 (pg. 27)

end mill dimensions			
cutting diameter	shank diameter	flute length	overall length
1/8	1/8	1/2	1 1/2
3/16	3/16	5/8	2
1/4	1/4	3/4	2 1/2
5/16	5/16	13/16	2 1/2
3/8	3/8	1	2 1/2
1/2	1/2	1 1/4	3
5/8	5/8	1 5/8	3 1/2
3/4	3/4	1 5/8	4
1	1	2	4

Square End with Reduced Shank

- reduced shank to avoid rubbing on the walls
- optimized design for deep pocketing and thin wall
- excellent surface finish
- increased stability and rigidity for maximum productivity
- perfect blend – no step marks



diameter tolerance = +.000/-0.003

shank tolerance = -.0001/-0.0004"

2 Flute (37° Helix)

catalog number	KC625M
HPRSA250S2225	■
HPRSA375S2225	■
HPRSA500S2225	■
HPRSA500S2325	■
HPRSA625S2325	■
HPRSA750S2225	■
HPRSA750S2325	■
HPRSA1000S2225	■
HPRSA1000S2425	■

end mill dimensions				
cutting diameter	shank diameter	flute length	reach length	overall length
1/4	1/4	3/8	2 1/4	4
3/8	3/8	1/2	2 1/4	4
1/2	1/2	5/8	2 1/4	5
1/2	1/2	5/8	3 1/4	6
5/8	5/8	3/4	3 1/4	6
3/4	3/4	1	2 1/4	5
3/4	3/4	1	3 1/4	6
1	1	1 1/8	2 1/4	5
1	1	1 1/8	4 1/4	7

High-Performance Solid Carbide End Mills

Specialized 3 flute design with chipbreakers

- corner radii for extended tool life
- optimized flute design for heavy stock removals and deep slotting in soft steels, Inconel, stainless steel, and aluminum
- double radial clearance

Applicable Material Groups			
STAINLESS STEEL	CAST IRON	NON-FERROUS	HIGH-TEMP ALLOY



3 Flute (35° Helix)

catalog number	KC633M
HPRSS250S3075	■
HPRSS375S3100	■
HPRSS500S3125	■
HPRSS625S3163	■
HPRSS750S3163	■
HPRSS1000S3200	■

diameter tolerance = DIN h11 (pg. 27)

shank tolerance = DIN h6 (pg. 27)

end mill dimensions			
cutting diameter	shank diameter	flute length	overall length
1/4	1/4	3/4	2 1/2
3/8	3/8	1	2 1/2
1/2	1/2	1 1/4	3
5/8	5/8	1 5/8	3 1/2
3/4	3/4	1 5/8	4
1	1	2	4

**PROVEN.
IN MILLING GRADE
TECHNOLOGY.
“M” Grades**

- **Substrates and coatings engineered specifically for Milling!**
- **Maximize metal removal rates!**
- **Covers a wide variety of materials to satisfy all your cutting needs!**
- **Unparalleled grade advantage!**

**M grades exceed
your expectations!**



NEW High-Performance Diamond Coated End Mills

KDF

- up to 50X tool life and 3X faster than conventional carbide
- reduced cutting force due to the natural lubricity of diamond
- for use in: graphite, green ceramics, fiberglass composites, plastics, carbon fiber composites
- run coolant-free
- 30° helix
- pure diamond coating

Applicable Material Groups
Non-FERROUS

2 Flute

catalog number	KDF300
BNEC016S2005	■
BNEC031S2009	□
BNEC047S2019	□
—	□
BNEC062S2025	□
BNEC078S2025	□
—	□
BNEC094S2038	□
BNEC125S2050	■
—	□
BNEC188S2063	■
—	□
BNEC250S2075	■
—	□
BNEC312S2081	□
—	□
BNEC375S2100	□
—	□
BNEC500S2100	□
—	□
—	□
—	□
—	□

4 Flute

catalog number	KDF300
—	□
BNEC031S4009	□
BNEC047S4019	□
BNEC062S4019	■
BNEC062S4025	■
BNEC078S4025	□
BNEC094S4028	■
BNEC094S4038	■
BNEC125S4050	■
BNEC125S4100	■
BNEC188S4063	■
BNEC188S4100	■
BNEC250S4075	■
BNEC250S4150	■
BNEC312S4081	□
BNEC312S4150	□
BNEC375S4100	■
BNEC375S4150	□
BNEC500S4100	■
BNEC500S4150	■
BNEC500S4300*	■
BNEC750S4150	□
BNEC1000S4150	□

end mill dimensions			
cutting diameter	shank diameter	flute length	overall length
1/64	1/8	3/64	1 1/2
1/32	1/8	3/32	1 1/2
3/64	1/8	3/16	1 1/2
1/16	1/8	3/16	1 1/2
1/16	1/8	1/4	1 1/2
5/64	1/8	1/4	1 1/2
3/32	1/8	9/32	1 1/2
3/32	1/8	3/8	1 1/2
1/8	1/8	1/2	1 1/2
1/8	1/8	1	3
3/16	3/16	5/8	2
3/16	3/16	1	4
1/4	1/4	3/4	2 1/2
1/4	1/4	1 1/2	4
5/16	5/16	13/16	2 1/2
5/16	5/16	1 1/2	4
3/8	3/8	1	2 1/2
3/8	3/8	1 1/2	4
1/2	1/2	1	3
1/2	1/2	1 1/2	4
1/2	1/2	3*	6
3/4	3/4	1 1/2	4
1	1	1 1/2	4

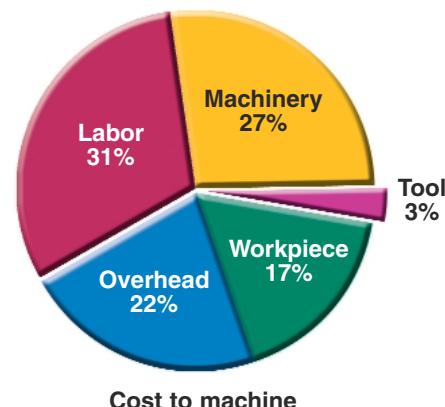
■ Stocked standard □ Non-stocked standard — 2 week delivery

* Maximum coated length = 2 1/2"

KDF300 Tolerances

Cutting Diameter	Shank Diameter	Runout
+.000/-0.002"	+.0000/-0.0004"	0.001"

Machining highly abrasive non-ferrous materials has become much improved as a result of the evolution of the KDF300 diamond coating. This coating is a pure diamond with no metallic binders. It is highly recommended for use in the Die and Mold arena where graphite is a key component. The associated gains in productivity far outweigh the differences in tool costs. The following graph illustrates that any cost savings in labor and overhead affects 53% of the cost to machine a part. A lower tool cost will impact only 3% of the machining cost.





High-Performance Diamond Coated End Mills



KDF

- up to 50X tool life and 3X faster than conventional carbide
- reduced cutting force due to the natural lubricity of diamond
- for use in: graphite, green ceramics, fiberglass composites, plastics, carbon fiber composites

- run coolant-free
- 30° helix
- pure diamond coating

Applicable Material Groups

Non-FERROUS

2 Flute

catalog number	KDF300
HEC016S2005	□
HEC031S2009	□
HEC047S2019	□
—	
HEC062S2025	□
HEC078S2025	□
—	
HEC094S2038	□
HEC125S2050	■
—	
HEC188S2063	■
HEC188S2075	■
—	
HEC250S2075	■
—	
HEC312S2081	□
—	
HEC375S2100	□
—	
HEC500S2100	□
—	
—	
—	
—	

4 Flute

catalog number	KDF300
HEC016S4005	□
HEC031S4009	■
HEC047S4019	■
HEC062S4019	■
HEC062S4025	■
HEC078S4025	□
HEC094S4028	■
HEC094S4038	■
HEC125S4050	■
HEC125S4100	■
HEC188S4063	■
—	
HEC188S4100	□
HEC250S4075	■
HEC250S4150	■
HEC312S4081	□
HEC312S4150	■
HEC375S4100	■
HEC375S4150	■
HEC500S4100	■
HEC500S4150	■
HEC500S4300*	■
HEC750S4150	□
HEC1000S4150	□

end mill dimensions			
cutting diameter	shank diameter	flute length	overall length
1/64	1/8	3/64	1 1/2
1/32	1/8	3/32	1 1/2
3/64	1/8	3/16	1 1/2
1/16	1/8	3/16	1 1/2
1/16	1/8	1/4	1 1/2
5/64	1/8	1/4	1 1/2
3/32	1/8	9/32	1 1/2
3/32	1/8	3/8	1 1/2
1/8	1/8	1/2	1 1/2
1/8	1/8	1	3
3/16	3/16	5/8	2
3/16	3/16	3/4	2
3/16	3/16	1	4
1/4	1/4	3/4	2 1/2
1/4	1/4	1 1/2	4
5/16	5/16	13/16	2 1/2
5/16	5/16	1 1/2	4
3/8	3/8	1	2 1/2
3/8	3/8	1 1/2	4
1/2	1/2	1	3
1/2	1/2	1 1/2	4
1/2	1/2	3*	6
3/4	3/4	1 1/2	4
1	1	1 1/2	4

4 Flute with Corner Radius

catalog number	KDF300
CRHEC062S4025R15	□
CRHEC125S4050R15	□
CRHEC125S4100R15	□
CRHEC125S4100R30	□
CRHEC250S4075R15	□
CRHEC250S4075R30	□
CRHEC250S4150R15	□
CRHEC250S4150R30	□
CRHEC500S4100R15	□
CRHEC500S4300R15	□
CRHEC500S4300R30	□

end mill dimensions				
cutting diameter	shank diameter	flute length	overall length	corner radius
1/16	1/8	1/4	1 1/2	0.015
1/8	1/8	1/2	1 1/2	0.015
1/8	1/8	1	3	0.015
1/8	1/8	1	3	0.030
1/4	1/4	3/4	2 1/2	0.015
1/4	1/4	3/4	2 1/2	0.030
1/4	1/4	1 1/2	4	0.015
1/4	1/4	1 1/2	4	0.030
1/2	1/2	1	3	0.015
1/2	1/2	3	6	0.015
1/2	1/2	3	6	0.030

■ Stocked standard □ Non-stocked standard — 2 week delivery

* Maximum coated length = 2 1/2"

NEW High-Performance Solid Carbide End Mills

- reinforced core, increased rigidity
- medium helix for freer cutting
- optimized end geometry for chip evacuation during plung cutting

- provides 20 to 40% heavier feed rates
- excellent surface finish

Applicable Material Groups			
STEEL	STAINLESS STEEL	CAST IRON	HIGH-TEMP ALLOY

Stub Length (30° Helix)



3 Flute

catalog number	KC635M
HPFSS125S3025*	■
HPFSS188S3031*	■
HPFSS250S3038*	■
HPFSS312S3044*	■
HPFSS375S3050*	■
HPFSS500S3063	■
HPFSS625S3075	■
HPFSS750S3088	■
HPFSS1000S3113	■

cutting diameter tolerance:

<1/4" = +.000/-002

≥1/4" = +.000/-003

shank diameter tolerance = +.0000/-0005

end mill dimensions				
cutting diameter	shank diameter	flute length	overall length	corner radius
1/8	1/8	1/4	1 1/2	.010
3/16	3/16	5/16	2	.020
1/4	1/4	3/8	2	.020
5/16	5/16	7/16	2	.020
3/8	3/8	1/2	2	.020
1/2	1/2	5/8	2 1/2	.035
5/8	5/8	3/4	3	.035
3/4	3/4	7/8	3	.035
1	1	1 1/8	3	.035

*smooth shank

Regular Length (30° Helix)



3 Flute

catalog number	KC635M
HPFSS125S3050*	■
HPFSS188S3056*	■
HPFSS250S3075*	■
HPFSS312S3081*	■
HPFSS375S3088*	■
HPFSS500S3125	■
HPFSS625S3163	■
HPFSS750S3163	■
HPFSS1000S3200	■

end mill dimensions				
cutting diameter	shank diameter	flute length	overall length	corner radius
1/8	1/8	1/2	1 1/2	.010
3/16	3/16	9/16	2	.020
1/4	1/4	3/4	2 1/2	.020
5/16	5/16	13/16	2 1/2	.020
3/8	3/8	7/8	2 1/2	.020
1/2	1/2	1 1/4	3	.035
5/8	5/8	1 5/8	3 1/2	.035
3/4	3/4	1 5/8	4	.035
1	1	2	4	.035

*smooth shank

High-Performance Solid Carbide End Mills

- reinforced core, increased rigidity
- medium high helix for freer cutting
- optimized end geometry for chip evacuation during plunge cutting

Applicable Material Groups			
STEEL	STAINLESS STEEL	CAST IRON	HIGH-TEMP ALLOY

Regular Length (47° Helix)



5 Flute

catalog number	KC635M
HPFSS125S5050*	■
HPFSS188S5056*	■
HPFSS250S5075*	■
HPFSS312S5081*	■
HPFSS375S5088*	■
HPFSS500S5125	■
HPFSS625S5163	■
HPFSS750S5163	■
HPFSS1000S5200	■

*smooth shank

end mill dimensions			
cutting diameter	shank diameter	flute length	overall length
1/8	1/8	1/2	1 1/2
3/16	3/16	9/16	2
1/4	1/4	3/4	2 1/2
5/16	5/16	13/16	2 1/2
3/8	3/8	7/8	2 1/2
1/2	1/2	1 1/4	3
5/8	5/8	1 5/8	3 1/2
3/4	3/4	1 5/8	4
1	1	2	4

Long Length (47° Helix)



5 Flute

catalog number	KC635M
HPFSS250S5125*	■
HPFSS312S5125*	■
HPFSS375S5150*	■
HPFSS500S5200	■
HPFSS625S5250	■
HPFSS750S5325	■
HPFSS1000S5325	■

*smooth shank

end mill dimensions			
cutting diameter	shank diameter	flute length	overall length
1/4	1/4	1 1/4	4
5/16	5/16	1 1/4	4
3/8	3/8	1 1/2	4
1/2	1/2	2	4
5/8	5/8	2 1/2	5
3/4	3/4	3 1/4	5
1	1	3 1/4	6



High-Performance Solid Carbide End Mills

- specialized 6 flute design for finishing applications in high-temperature alloys
- reinforced core diameter for increased rigidity
- optimized end geometry for better chip evacuation



Applicable Material Groups
Stainless Steel

Standard Length (45° Helix) 6 Flute

catalog number	KC635M
HPFT250S6075	■
HPFT312S6081	■
HPFT375S6088	■
HPFT500S6100	■
HPFT625S6125	■
HPFT750S6150	■
HPFT1000S6150	■

cutting diameter tolerance:
 $\leq 3/8"$ = +.000/-002
 $> 3/8"$ = +.000/-003
shank diameter tolerance = +.0001/-0004

end mill dimensions			
cutting diameter	shank diameter	flute length	overall length
1/4	1/4	3/4	2 1/2
5/16	5/16	13/16	2 1/2
3/8	3/8	7/8	2 1/2
1/2	1/2	1	3
5/8	5/8	1 1/4	3 1/2
3/4	3/4	1 1/2	4
1	1	1 1/2	4

Long Length (45° Helix) 6 Flute

catalog number	KC635M
HPFT500S6200	■
HPFT625S6225	■
HPFT750S6225	■
HPFT1000S6225	■

end mill dimensions			
cutting diameter	shank diameter	flute length	overall length
1/2	1/2	2	4 1/2
5/8	5/8	2 1/4	5
3/4	3/4	2 1/4	5
1	1	2 1/4	5



- metric diameters
- ADL45 is a 45° helix
- ADL60 is a 60° helix
- fine finishing in steels <32 HRC
- high speed/high feed

Applicable Material Groups

STEEL

catalog number				KT605M
3 Flute	4 Flute	6 Flute	8 Flute	
F3AJ0600ADL45	F4AJ0600ADL45	—	—	■
F3AJ0600ADL60	—	—	—	■
F3AJ0800ADL45	F4AJ0800ADL45	—	—	■
F3AJ0800ADL60	—	—	—	■
F3AJ1000ADL45	F4AJ1000ADL45	—	—	■
F3AJ1000ADL60	—	—	—	■
F3AJ1200ADL45	—	F6AJ1200ADL45	—	■
F3AJ1200ADL60	—	—	—	■
F3AJ1400ADL45	—	F6AJ1400ADL45	—	■
F3AJ1400ADL60	—	—	—	■
F3AJ1600ADL45	—	—	F8AJ1600ADL45	■
F3AJ1600ADL60	—	—	—	■
F3AJ1800ADL45	—	—	F8AJ1800ADL45	■
F3AJ1800ADL60	—	—	—	■
F3AJ2000ADL45	—	—	F8AJ2000ADL45	■
F3AJ2000ADL60	—	—	—	■

end mill dimensions			
cutting diameter	shank diameter	flute length	overall length
6	6	10	57
6	6	13	57
8	8	16	63
8	8	19	63
10	10	19	72
10	10	22	72
12	12	22	83
12	12	26	83
14	14	22	83
14	14	26	83
16	16	26	92
16	16	32	92
18	18	26	92
18	18	32	92
20	20	32	104
20	20	38	104



- metric diameters
- recommended for fine finishing or side milling

Applicable Material Groups

STAINLESS STEEL
HIGH-TEMP ALLOY



3 Flute

catalog number	K600	KC625M
F3AJ0600ADL60	■	■
F3AJ0800ADL60	■	■
F3AJ1000ADL60	■	■
F3AJ1200ADL60	■	■
F3AJ1400ADL60	■	■
F3AJ1600ADL60	■	■
F3AJ1800ADL60	■	■
F3AJ2000ADL60	■	■

end mill dimensions			
cutting diameter	shank diameter	flute length	overall length
6	6	13	57
8	8	19	63
10	10	22	72
12	12	26	83
14	14	26	83
16	16	32	92
18	18	32	92
20	20	38	104



High-Performance Solid Carbide End Mills

- metric diameters
- sinusoidal design
- coolant thru



Applicable Material Groups	
STEEL	
	STAINLESS STEEL

Roughing End Mills (20° Helix)

catalog number			KC625M	KC633M
3 Flute	4 Flute	5 Flute		
F3BH0400BWS20L110	—	—	■	■
F3BH0500BWS20L130	—	—	■	■
F3BH0600BWS20L080	—	—	■	■
F3BH0600BWS20L130	—	—	■	■
F3BH0800BWS20L110	—	—	■	■
F3BH0800BWM20L160	—	—	■	■
—	F4BJ1000BWM20L130	—	■	■
—	F4BJ1000BWM20L220	—	■	■
—	F4BJ1200BWM20L160	—	■	■
—	F4BJ1200BWL20L260	—	■	■
—	F4BJ1400BWL20L260	—	■	■
—	F4BJ1600BWL20L190	—	■	■
—	F4BJ1600BWL20L320	—	■	■
—	F4BJ2000BWL20L220	—	■	■
—	F4BJ2000BXW20L380	—	■	■
—	—	F5BJ2500BXW20L450	■	■

end mill dimensions			
cutting diameter	shank diameter	overall length	flute length
4	6	55	11
5	6	57	13
6	6	54	8
6	6	57	13
8	8	58	11
8	8	63	16
10	10	66	13
10	10	72	22
12	12	73	16
12	12	83	26
14	14	83	26
16	16	82	19
16	16	92	32
20	20	92	22
20	20	104	38
25	25	121	45



Roughing End Mills with Coolant (20° Helix)

catalog number		KC625M	KC633M
3 Flute with coolant	4 Flute with coolant		
F3BH0800BWS20C110	—	■	■
F3BH0800BWM20C160	—	■	■
—	F4BJ1000BWM20C130	■	■
—	F4BJ1000BWM20C220	■	■
—	F4BJ1200BWM20C160	■	■
—	F4BJ1200BWL20C260	■	■
—	F4BJ1600BWL20C190	■	■
—	F4BJ1600BWL20C320	■	■
—	F4BJ2000BWL20C220	■	■
—	F4BJ2000BXW20C380	■	■

end mill dimensions			
cutting diameter	shank diameter	overall length	flute length
8	8	58	11
8	8	63	16
10	10	66	13
10	10	72	22
12	12	73	16
12	12	83	26
16	16	82	19
16	16	92	32
20	20	92	22
20	20	104	38



- metric diameters
- optimized design for maximum metal removal in die steels >60 HRC

- heavy core diameters
- reinforced shanks

Applicable Material Groups			
STEEL	STAINLESS STEEL	HIGH-TEMP ALLOY	HARDENED MATERIAL



Roughing End Mills (45° Helix)

catalog number	KC633M
F3BT0400AWM45R075	■
F3BT0500AWM45R075	■
F4BT0600AWL45R075	■
F4BT0800AWL45R075	■
F4BT1000AWX45R075	■
F4BT1200AWX45R100	■
F6BT2000AWX45R125	■
F6BT2500AWX45R125	■

end mill dimensions					
cutting diameter	shank diameter	flute length	corner radius	overall length	no. of flutes
4	6	4	,75	75	3
5	6	5	,75	75	3
6	6	10	,75	100	4
8	8	10	,75	100	4
10	10	10	,75	125	4
12	12	12	1,00	125	4
20	20	20	1,25	150	6
25	25	25	1,25	150	6



Finishing End Mills (50° Helix)

catalog number	KC635M
F4AJ0600AWL50L090	■
F4AJ0600AWL50L150	■
F4AJ0600AWL50L210	■
F4AJ0800AWL50L120	■
F4AJ0800AWL50L200	■
F4AJ1000AWL50L150	■
F5AJ1000AWL50L250	■
F5AJ1000AWL50L350	■
F4AJ1200AWX50L180	■
F6AJ1200AWX50L300	■
F6AJ1200AWX50L420	■
F4AJ1600AWX50L240	■
F6AJ1600AWX50L400	■
F6AJ1600AWX50L560	■
F4AJ2000AWX50L300	■
F6AJ2000AWX50L500	■
F6AJ2000AWX50L700	■

end mill dimensions				
cutting diameter	shank diameter	flute length	overall length	no. of flutes
6	6	9	76	4
6	6	15	76	4
6	6	21	76	4
8	8	12	100	4
8	8	20	100	4
10	10	15	100	4
10	10	25	100	5
10	10	35	100	5
12	12	18	125	4
12	12	30	125	6
12	12	42	125	6
16	16	24	125	4
16	16	40	125	6
16	16	56	125	6
20	20	30	150	4
20	20	50	150	6
20	20	70	150	6



Flush Fine – 2 Flute

catalog number	KC635M
FFBNCEC6MS2	■
FFBNCEC8MS2	■
FFBNEC10M32	■

end mill dimensions			
cutting diameter	shank diameter	flute length	overall length
6	6	10	80
8	8	13	90
10	10	16	100

NEW High-Performance Solid Carbide End Mills

- metric diameters
- specific 2 & 3 flute geometry for aluminum
- optimized helix for maximum chip evacuation

- enhanced rake form to eliminate chatter
- reinforced corner
- coolant through design

Applicable Material Groups

Non-FERROUS



2 Flute – Finishing End Mills (45° Helix)

catalog number	K600	KC631M
F2AA0400ADL45	■	■
F2AA0500ADL45	■	■
F2AA0600ADL45	■	■
F2AA0800ADL45	■	■
F2AA1000ADL45	■	■
F2AA1200ADL45	■	■
F2AA1400ADL45	■	■
F2AA1600ADL45	■	■
F2AA1800ADL45	■	■
F2AA2000ADL45	■	■

end mill dimensions			
cutting diameter	shank diameter	flute length	overall length
4	6	8	57
5	6	10	57
6	6	10	57
8	8	16	63
10	10	19	72
12	12	22	83
14	14	22	83
16	16	26	92
18	18	26	92
20	20	32	104



3 Flute – Finishing End Mills (45° Helix)

catalog number	K600
F3AA0300AWS45	■
F3AA0400AWS45	■
F3AA0500AWS45	■
F3AA0600AWS45	■
F3AA0800AWM45	■
F3AA1000AWL45	■
F3AA1200AWL45	■
F3AA1400AWL45	■
F3AA1600AWL45	■
F3AA1800AWL495	■
F3AA2000AWX45	■

end mill dimensions			
cutting diameter	shank diameter	flute length	overall length
3	3	12	38
4	4	12	50
5	6	14	50
6	6	16	50
8	8	20	63
10	10	22	76
12	12	25	76
14	14	32	89
16	16	32	89
18	18	38	100
20	20	38	104

Roughing End Mills (30° Helix)

3 Flute

3 Flute with Coolant

catalog number	K600
F3BA0600BWS30	■
F3BA0800BWM30	■
F3BA1000BWM30	■
F3BA1200BWL30	■
F3BA1600BWL30	■
F3BA2000BWX30	■
F3BA2500BWX30	■

catalog number	K600
F3BA0800BWM30C160	■
F3BA1000B2M30C220	■
F3BA1200BWL30C260	■
F3BA1600BWL30C320	■
F3BA2000BWX30C380	■
F3BA2500BWX30C450	■

end mill dimensions			
cutting diameter	shank diameter	flute length	overall length
6	6	13	57
8	8	16	63
10	10	22	72
12	12	26	83
16	16	32	92
20	20	38	104
25	25	45	121



- metric diameters
- reinforced core increased rigidity
- medium helix for freer cutting
- optimized end geometry for chip evacuation during plunge cutting



Applicable Material Groups			
STEEL	STAINLESS STEEL	CAST IRON	HIGH-TEMP ALLOY

Roughing End Mills – 3 Flute (35° Helix)

catalog number	KC633M
F3BS0600BDK35	■
F3BS0800BDK35	■
F3BS1000BDK35	■
F3BS1200BDK35	■
F3BS1400BDK35	■
F3BS1600BDK35	■
F3BS2000BDK35	■

end mill dimensions			
cutting diameter	shank diameter	flute length	overall length
6	6	7	54
8	8	9	58
10	10	11	66
12	12	12	73
14	14	14	75
16	16	16	80
20	20	20	92



Finishing End Mills – 3 Flute (35° Helix)

catalog number	KC633M
F3AS0300BDK35	■
F3AS0400BDK35	■
F3AS0500BDK35	■
F3AS0600BDK35	■
F3AS0800BDK35	■
F3AS1000BDK35	■
F3AS1200BDK35	■
F3AS1400BDK35	■
F3AS1600BDK35	■
F3AS1800BDK35	■
F3AS2000BDK35	■

end mill dimensions				
cutting diameter	shank diameter	flute length	overall length	corner radius
3	6	4	50	,25
4	6	5	54	,25
5	6	6	54	,25
6	6	7	54	,45
8	8	9	58	,45
10	10	11	66	,45
12	12	12	73	,76
14	14	14	75	,45
16	16	16	82	,45
18	18	18	84	,45
20	20	20	92	,45



High-Performance Powdered Metal & HSS



- **Powdered metal technology for increased feed and speed over conventional HSS!**
- **Material specific solutions!**
- **“M” Grades!**
- **Optimized end mill designs to maximize productivity!**

High-Performance Powdered Metal & HSS End Mills		Units	Page
HSFT	6 flute M42 cobalt finishing end mill for use in titanium (pure, alpha, beta, and alpha/beta groups)	Inch	43
PMRST	4-6 flute powdered metal roughing end mill for use in steels and hardened steels 32 HRC to 45 HRC	Inch	43
PMRSS	3-8 flute powdered metal roughing end mill for use in stainless steel and steels < 32 HRC	Inch	44
PMFSS	4-6 flute powdered metal finishing end mill for use in stainless steel and steels.	Inch	44
PMRA	3 flute powdered metal roughing end mill for use in aluminum	Inch	45
PMFA	3 flute powdered metal finishing end mill for use in aluminum	Inch	45



- M42 Cobalt
- specialized post heat treatment process for maximum hardness and stability

- optimized geometry to minimize work hardening
- specialized spiral design allows for faster chip removal



Standard Lengths (35° Helix) 4 and 6 Flute

catalog number	KH110M
HSFT375S4075	■
HSFT500S4125	■
HSFT625S4163	■
HSFT750S6163	■
HSFT100S6200	■
HSFT1250S6200	■
HSFT1500S6200	■

cutting diameter tolerance = +.002"/-.000"

shank diameter tolerance = DIN h6 (pg. 27)

end mill dimensions				
cutting diameter	shank diameter	flute length	overall length	no. of flutes
3/8	3/8	3/4	2 1/2	4
1/2	1/2	1 1/4	3 1/4	4
5/8	5/8	1 5/8	3 3/4	4
3/4	3/4	1 5/8	3 7/8	6
1	1	2	4 1/2	6
1 1/4	1 1/4	2	4 1/2	6
1 1/2	1 1/4	2	4 1/2	6



- fine, sinusoidal profile for use in profiling and shallow slotting operations
- profiling operations in titanium 30+ HRC and steels 32 to 45 HRC
- increased tool life over a coarse profile



Roughing End Mills – Fine Profile (25° Helix)

catalog number	KP525M
PMRST375S4075	■
PMRST500S4125	■
PMRST500S4200	■
PMRST625S4163	■
PMRST750S4163	■
PMRST750S4300	■
PMRST1000S5200	■
PMRST1000S5400	■
PMRST1250S6200	■
PMRST1250S6400	■
PMRST1500S6200	■
PMRST1500S6400	■
PMRST2000S6400	■
PMRST2000S6600	■

cutting diameter tolerance = ±.003

shank diameter tolerance = -.0001/-0.0004

Applicable Material Groups			
STEEL	STAINLESS STEEL	HIGH-TEMP ALLOY	HARDENED MATERIAL

end mill dimensions				
cutting diameter	shank diameter	flute length	overall length	no. of flutes
3/8	3/8	3/4	2 1/2	4
1/2	1/2	1 1/4	3 1/4	4
1/2	1/2	2	4	4
5/8	5/8	1 5/8	3 3/4	4
3/4	3/4	1 5/8	3 7/8	4
3/4	3/4	3	5 1/4	4
1	1	2	4 1/2	5
1	1	4	6 1/2	5
1 1/4	1 1/4	2	5 1/2	6
1 1/4	1 1/4	4	6 1/2	6
1 1/2	1 1/2	2	4 1/2	6
1 1/2	1 1/2	4	6 1/2	6
2	2	4	7 3/4	6
2	2	6	9 3/4	6



High-Performance Powdered Metallurgy End Mills

- powdered metal 8% cobalt
- optimized geometry for maximum productivity

- increased vanadium for greater toughness
- chamfered corners on roughing end mills

Applicable Material Groups		
STEEL	STAINLESS STEEL	HIGH-TEMP ALLOY



cutting diameter tolerance = $\pm .003$

shank diameter tolerance = $-.0001/- .0004$

Roughing End Mills – Coarse Profile (25° Helix)

catalog number	KP525M
PMRSS250S3063	■
PMRSS375S4075	■
PMRSS500S4125	■
PMRSS500S4200	■
PMRSS625S4163	■
PMRSS750S4163	■
PMRSS750S4300	■
PMRSS100S5200	■
PMRSS100S5400	■
PMRSS1250S5200	■
PMRSS1250S5400	■
PMRSS1500S6200	■
PMRSS1500S6400	■
PMRSS2000S8400	■
PMRSS2000S8600	■

end mill dimensions				
cutting diameter	shank diameter	flute length	overall length	no. of flutes
1/4	3/8	5/8	2 7/16	3
3/8	3/8	3/4	2 1/2	4
1/2	1/2	1 1/4	3 1/4	4
1/2	1/2	2	4	4
5/8	5/8	1 5/8	3 3/4	4
3/4	3/4	1 5/8	3 7/8	4
3/4	3/4	3	5 1/4	4
1	1	2	4 1/2	5
1	1	4	6 1/2	5
1 1/4	1 1/4	2	5 1/2	5
1 1/4	1 1/4	4	6 1/2	5
1 1/2	1 1/4	2	4 1/2	6
1 1/2	1 1/4	4	6 1/2	6
2	2	4	7 3/4	8
2	2	6	9 3/4	8



cutting diameter tolerance = $.0015/- .000$

shank diameter tolerance = $-.0001/- .0004$

Finishing End Mills (35° Helix)

catalog number	KP525M
PMFSS250S4125	■
PMFSS375S4150	■
PMFSS500S4200	■
PMFSS625S4250	■
PMFSS750S4300	■
PMFSS1000S4300	■
PMFSS1000S6400	■
PMFSS1250S6400	■
PMFSS1250S6600	■
PMFSS1500S6400	■
PMFSS2000S6400	■

end mill dimensions				
cutting diameter	shank diameter	flute length	overall length	no. of flutes
1/4	3/8	1 1/4	3 1/16	4
3/8	1/2	1 1/2	3 1/4	4
1/2	1/2	2	4	4
5/8	5/8	2 1/2	4 5/8	4
3/4	3/4	3	5 1/4	4
1	1	3	5 1/2	4
1	1	4	6 1/2	6
1 1/4	1 1/4	4	6 1/2	6
1 1/4	1 1/4	6	8 1/2	6
1 1/2	1 1/4	4	6 1/2	6
2	2	4	7 3/4	6



High-Performance Powdered Metallurgy End Mills



- deep high-polished rake face
- specific truncated design to eliminate recutting chips
- eccentric relief for improved edge strength
- optimized helix for maximum chip evacuation

- enhanced rake form to eliminate chatter
- reinforced corner (45° chamfer) or rougher



Roughing End Mills – 3 Flute (42° Helix)

catalog number	KP525M
PMRA500S3125	■
PMRA500S3200	■
PMRA625S3163	■
PMRA750S3163	■
PMRA750S3225	■
PMRA750S3300	■
PMRA1000S3200	■
PMRA1000S3300	■
PMRA1000S3400	■
PMRA1250S3200	■
PMRA1250S3400	■
PMRA1250S3600	■
PMRA1500S3300	■
PMRA1500S3400	■
PMRA1500S3600	■
PMRA2000S3300	■
PMRA2000S3400	■
PMRA2000S3600	■

cutting diameter tolerance = ±.003

shank diameter tolerance = -.0001/-..0004

Applicable Material Groups
Non-FERROUS



Finishing End Mills – 3 Flute (42° Helix)

catalog number	KP525M
PMFA375S3150	■
PMFA500S3200	■
PMFA500S3300	■
PMFA625S3250	■
PMFA750S3225	■
PMFA750S3300	■
PMFA1000S3300	■
PMFA1000S3400	■
PMFA1250S3300	■
PMFA1250S3400	■
PMFA1250S3600	■
PMFA1500S3300	■
PMFA1500S3400	■
PMFA1500S3600	■
PMFA2000S3300	■
PMFA2000S3400	■
PMFA2000S3600	■

cutting diameter tolerance = +.0015/-..000

shank diameter tolerance = -.0001/-..0004

end mill dimensions			
cutting diameter	shank diameter	flute length	overall length
3/8	3/8	1 1/2	3 1/4
1/2	1/2	2	4
1/2	1/2	3	5
5/8	5/8	2 1/2	4 5/8
3/4	3/4	2 1/4	4 1/2
3/4	3/4	3	5 1/4
1	1	2	4 1/2
1	1	3	5 1/2
1	1	4	6 1/2
1 1/4	1 1/4	2	4 1/2
1 1/4	1 1/4	4	6 1/2
1 1/4	1 1/4	6	8 1/2
1 1/2	1 1/4	3	5 1/2
1 1/2	1 1/4	4	6 1/2
1 1/2	1 1/4	6	8 1/2
2	2	3	6 3/4
2	2	4	7 3/4
2	2	6	9 3/4



General-Purpose Solid Carbide End Mills



- **Excellent productivity across a wide range of materials!**
- **Premier micro-grain carbide!**
- **Comprehensive product offering!**

General-Purpose Solid Carbide End Mills		Units	Page
HHSEC	2 & 4 flute high shear, high shear free-cutting positive rake geometry for stainless steel and non-ferrous	Inch	47
SLEC	2 & 4 flute stub length, square end helical end mill for improved rigidity	Inch	47
HEC	2-4 flute square end helical end mill designed for plunging, slotting and peripheral milling	Inch	48-49
MDRHEC	3-5 flute sinusoidal ground roughing end mill for use in steel, stainless steel and cast iron	Inch	50
HDRHEC	Same as MDRHEC except for use in titanium and nickel based alloys	Inch	50
SFRHEC	3 flute, same as HDRHEC except for machining aluminum, brass and copper	Inch	50
DHEC	2 & 4 flute double end, SLEC style end mill	Inch	51
HHEC	3 flute 60° hi helix for use in titanium, Inconel and stainless steel	Inch	51
HEC	6 flute square end helical end mill designed for plunging, slotting and peripheral milling	Inch	51
CRHEC	4 flute HEC style end mill w/ corner radius	Inch	52
BNEC	2 & 4 flute ball nose HEC style end mill	Inch	53-54
DBNEC	4 flute double end, stub length BNEC style end mill	Inch	55
BNEC	2 & 4 flute square end helical end mill designed for plunging, slotting and peripheral milling	Metric	56
HEC	2 & 4 flute ball nose HEC style end mill	Metric	57

General-Purpose End Mill Tolerances

End Mill Diameter	Cutting Diameter Tolerance	Shank Diameter Tolerance
1/4" and under	.+000 to -.002	.+000 to -.0005
over 1/4"	.+000 to -.003	.+000 to -.0005
Corner radius tolerance on all diameters = .+000 to -.002.		

General-Purpose Solid Carbide End Mills



High Shear – 2, 4 Flute (Non-Ferrous Milling) 35° Helix

right-hand spiral/right-hand cutting/center cutting



2 Flute

catalog number	K600	KC610M	KC635M
HHSEC062S2	■	■	■
HHSEC094S2	■	■	■
HHSEC125S2	■	■	■
HHSEC156S2	■	■	■
HHSEC188S2	■	■	■
HHSEC219S2	■	■	■
HHSEC250S2	■	■	■
HHSEC281S2			■
HHSEC312S2	■	■	■
HHSEC375S2	■	■	■
HHSEC438S2	■	■	■
HHSEC500S2	■	■	■
HHSEC562S2	■	■	■
HHSEC625S2	■	■	■
HHSEC688S2			■
HHSEC750S2	■	■	■
HHSEC100S2	■	■	■

4 Flute

catalog number	K600	KC610M	KC635M
HHSEC062S4	■	■	■
HHSEC094S4	■	■	■
HHSEC125S4	■	■	■
HHSEC156S4	■	■	■
HHSEC188S4	■	■	■
HHSEC219S4	■	■	■
HHSEC250S4	■	■	■
HHSEC281S4			■
HHSEC312S4	■	■	■
HHSEC375S4	■	■	■
HHSEC438S4	■	■	■
HHSEC500S4	■	■	■
HHSEC562S4	■	■	■
HHSEC625S4	■	■	■
HHSEC688S4			■
HHSEC750S4	■	■	■
HHSEC100S4	■	■	■

end mill dimensions			
cutting diameter	flute length	shank diameter	overall length
1/16	3/16	1/8	1 1/2
3/32	3/8	1/8	1 1/2
1/8	3/8	1/8	1 1/2
5/32	9/16	3/16	2
3/16	9/16	3/16	2
7/32	5/8	1/4	2 1/2
1/4	3/4	1/4	2 1/2
9/32	3/4	5/16	2 1/2
5/16	13/16	5/16	2 1/2
3/8	7/8	3/8	2 1/2
7/16	1	7/16	2 1/2
1/2	1	1/2	3
9/16	1 1/4	9/16	3 1/2
5/8	1 1/4	5/8	3 1/2
11/16	1 1/2	3/4	4
3/4	1 1/2	3/4	4
1	1 1/2	1	4

Single End – Stub Length – 2, 4 Flute (30° Helix)

30° right-hand spiral/right-hand cutting/center cutting



2 Flute

catalog number	K600	KC610M
SLEC062S2		■
SLEC094S2		■
SLEC125S2	■	■
SLEC156S2		■
SLEC188S2	■	■
SLEC250S2	■	■
SLEC312S2	■	■
SLEC375S2	■	■
SLEC438S2	■	■
SLEC500S2	■	■
SLEC625S2	■	■
SLEC750S2	■	■

4 Flute

catalog number	K600	KC610M
SLEC062S4		■
SLEC094S4		■
SLEC125S4	■	■
SLEC156S4		■
SLEC188S4	■	■
SLEC250S4	■	■
SLEC312S4	■	■
SLEC375S4	■	■
SLEC438S4	■	■
SLEC500SA	■	■
SLEC625S4	■	■
SLEC750S4	■	■

end mill dimensions			
cutting diameter	flute length	shank diameter	overall length
1/16	1/8	1/8	1 1/2
3/32	3/16	1/8	1 1/2
1/8	1/4	1/8	1 1/2
5/32	5/16	3/16	2
3/16	3/8	3/16	2
1/4	1/2	1/4	2
9/32	1/2	5/16	2
5/16	5/8	3/8	2
3/8	5/8	7/16	2 1/2
7/16	5/8	1/2	2 1/2
1/2	5/8	1/2	3
5/8	3/4	5/8	3
3/4	1	3/4	3

General-Purpose Solid Carbide End Mills

Single End – Standard Length – 2, 3, 4 Flute (30° Helix)

square end/30° right-hand spiral/right-hand cutting/center cutting



2 Flute

catalog number	K600	KC610M	KC635M
HEC016S2	■	■	
HEC031S2	■	■	■
HEC047S2	■	■	
HEC062S2	■	■	■
HEC078S2	■	■	
HEC094S2	■	■	■
HEC109S2	■	■	
HEC125S2	■	■	■
HEC141S2	■	■	
HEC156S2	■	■	■
HEC172S2	■	■	
HEC188S2	■	■	■
HEC203S2	■	■	
HEC219S2	■	■	■
HEC234S2	■	■	
HEC250S2	■	■	■
HEC266S2	■	■	
HEC281S2	■	■	■
HEC297S2	■	■	
HEC312S2	■	■	■
HEC328S2		■	
HEC344S2	■	■	
HEC360S2	■		
HEC375S2	■	■	■
HEC391S2		■	
HEC406S2	■	■	
HEC422S2		■	
HEC438S2	■	■	■
HEC469S2	■	■	
HEC484S2		■	
HEC500S2	■	■	■
HEC562S2	■	■	■
HEC625S2	■	■	■
HEC688S2	■	■	
HEC750S2	■	■	■
HEC875S2	■	■	
HEC100S2	■	■	■

3 Flute

catalog number	K600	KC610M
HEC016S3	■	■
HEC031S3	■	■
HEC047S3	■	■
HEC062S3	■	■
HEC078S3	■	■
HEC094S3	■	■
HEC109S3	■	■
HEC125S3	■	■
HEC141S3	■	■
HEC156S3	■	■
HEC172S3	■	■
HEC188S3	■	■
HEC203S3	■	■
HEC219S3	■	■
HEC234S3	■	■
HEC250S3	■	■
—		
HEC281S3	■	■
—		
HEC312S3	■	■
HEC328S3		■
HEC344S3	■	■
HEC360S3		■
HEC375S3	■	■
HEC391S3		■
HEC406S3	■	■
HEC422S3		■
HEC438S3	■	■
HEC469S3	■	■
HEC484S3		■
HEC500S3	■	■
HEC562S3	■	■
HEC625S3	■	■
HEC688S3		■
HEC750S3	■	■
—		
HEC100S3	■	■

4 Flute

catalog number	K600	KC610M	KC635M
HEC016S4	■	■	
HEC031S4	■	■	■
HEC047S4	■	■	
HEC062S4	■	■	■
HEC078S4	■	■	
HEC094S4	■	■	■
HEC109S4	■	■	
HEC125S4	■	■	■
HEC141S4	■	■	
HEC156S4	■	■	■
HEC172S4	■	■	
HEC188S4	■	■	■
HEC203S4	■	■	
HEC219S4	■	■	■
HEC234S4	■	■	
HEC250S4	■	■	■
HEC266S4	■	■	
HEC281S4	■	■	■
HEC297S4	■	■	
HEC312S4	■	■	■
HEC328S4		■	
HEC344S4	■	■	
HEC360S4	■	■	
HEC375S4	■	■	■
HEC391S4	■	■	
HEC406S4	■	■	
HEC422S4		■	
HEC438S4	■	■	■
HEC469S4	■	■	
HEC484S4		■	
HEC500S4	■	■	■
HEC562S4	■	■	■
HEC625S4	■	■	■
HEC688S4		■	
HEC750S4	■	■	■
HEC875S4	■	■	
HEC100S4	■	■	■

end mill dimensions

cutting diameter	flute length	shank diameter	overall length
1/64	1/32	1/8	1 1/2
1/32	5/64	1/8	1 1/2
3/64	7/64	1/8	1 1/2
1/16	3/16	1/8	1 1/2
5/64	3/16	1/8	1 1/2
3/32	3/8	1/8	1 1/2
7/64	3/8	1/8	1 1/2
1/8	1/2	1/8	1 1/2
9/64	9/16	3/16	2
5/32	9/16	3/16	2
11/64	5/8	3/16	2
3/16	5/8	3/16	2
13/64	5/8	1/4	2 1/2
7/32	5/8	1/4	2 1/2
15/64	3/4	1/4	2 1/2
1/4	3/4	1/4	2 1/2
17/64	3/4	5/16	2 1/2
9/32	3/4	5/16	2 1/2
19/64	13/16	5/16	2 1/2
5/16	13/16	5/16	2 1/2
21/64	1	3/8	2 1/2
11/32	1	3/8	2 1/2
23/64	1	3/8	2 1/2
3/8	1	3/8	2 1/2
25/64	1	7/16	2 1/2
13/32	1	7/16	2 1/2
27/64	1	7/16	2 1/2
7/16	1	7/16	2 1/2
15/32	1	1/2	3
31/64	1	1/2	3
1/2	1	1/2	3
9/16	1 1/8	9/16	3 1/2
5/8	1 1/4	5/8	3 1/2
11/16	1 3/8	3/4	4
3/4	1 1/2	3/4	4
7/8	1 1/2	7/8	4
1	1 1/2	1	4

General-Purpose Solid Carbide End Mills



Square End – Long Length – 2, 4 Flute (30° Helix)

30° right-hand spiral/right-hand cutting/center cutting



2 Flute Long

catalog number	K600	KC610M
HEC125S2225	■	■
HEC188S2250	■	■
HEC250S2300	■	■
HEC312S2300	■	■
HEC375S2300	■	■
HEC438S2450	■	■
HEC500S2450	■	■
HEC625S2500	■	■
HEC750S2500	■	■
HEC100S2500	■	■

4 Flute Long

catalog number	K600	KC610M
HEC125S4225	■	■
HEC188S4250	■	■
HEC250S4300	■	■
HEC312S4300	■	■
HEC375S4300	■	■
HEC438S4450	■	■
HEC500S4450	■	■
HEC625S4500	■	■
HEC750S4500	■	■
HEC100S4500	■	■

end mill dimensions			
cutting diameter	flute length	shank diameter	overall length
1/8	3/4	1/8	2 1/4
3/16	3/4	3/16	2 1/2
1/4	1 1/8	1/4	3
5/16	1 1/8	5/16	3
3/8	1 1/8	3/8	3
7/16	2	7/16	4 1/2
1/2	2	1/2	4 1/2
5/8	2 1/4	5/8	5
3/4	2 1/4	3/4	5
1	2 1/4	1	5

Square End – Extra Long Length – 2, 4 Flute (30° Helix)

30° right-hand spiral/right-hand cutting/center cutting



2 Flute Extra Long

catalog number	K600	KC610M
HEC125S2300	■	■
HEC188S2300	■	■
HEC250S2400	■	■
HEC312S2400	■	■
HEC375S2400	■	■
HEC438S2600	■	■
HEC500S2600	■	■
HEC625S2600	■	■
HEC750S2600	■	■
HEC100S2600	■	■

4 Flute Extra Long

catalog number	K600	KC610M
HEC125S4300	■	■
HEC188S4300	■	■
HEC250S4400	■	■
HEC312S4400	■	■
HEC375S4400	■	■
HEC438S4600	■	■
HEC500S4600	■	■
HEC625S4600	■	■
HEC750S4600	■	■
HEC100S4600	■	■

end mill dimensions			
cutting diameter	flute length	shank diameter	overall length
1/8	1	1/8	3
3/16	1 1/8	3/16	3
1/4	1 1/2	1/4	4
5/16	1 5/8	5/16	4
3/8	1 3/4	3/8	4
7/16	3	7/16	6
1/2	3	1/2	6
5/8	3	5/8	6
3/4	3	3/4	6
1	3	1	6

General-Purpose Solid Carbide End Mills

General Purpose

roughing/right-hand spiral/right-hand cutting/sinusoidal grind/Weldon flat



- For use on mild steel, steel alloys, stainless steel and hardened steels.
- Grade KC610M is the recommended grade for mild steel, steel alloys and hardened steels. KC625M is optional.
- Grade KC625M is the recommended grade for stainless steel. KC610M is optional.

catalog number	cutting diameter	flute length	shank diameter	overall length	number of flutes	KC610M	KC625M
MDRHEC250S3	1/4	3/4	1/4	2 1/2	3	■	■
MDRHEC312S3	5/16	3/4	5/16	2 1/2	3	■	■
MDRHEC375S3	3/8	7/8	3/8	2 1/2	3	■	■
MDRHEC500S4	1/2	1	1/2	3	4	■	■
MDRHEC625S4	5/8	1 1/4	5/8	3 1/2	4	■	■
MDRHEC750S4	3/4	1 5/8	3/4	4	4	■	■
MDRHEC100S5	1	1 3/4	1	4	5	■	■



- For use on space age exotics: titanium and nickel-base/high-temperature alloys (Inconel, Rene, Waspaloy, etc.).
- Grade KC625M is the recommended grade. KC610M is optional.



catalog number	cutting diameter	flute length	shank diameter	overall length	number of flutes	KC610M	KC625M
HDRHEC250S3	1/4	3/4	1/4	2 1/2	3	■	■
HDRHEC375S3	3/8	7/8	3/8	2 1/2	3	■	■
HDRHEC500S4	1/2	1	1/2	3	4	■	■
HDRHEC625S4	5/8	1 1/4	5/8	3 1/2	4	■	■
HDRHEC750S4	3/4	1 5/8	3/4	4	4	■	■
HDRHEC100S6	1	1 3/4	1	4	6	■	■



- For use on aluminum, brass or copper.
- Grade KC625M is the recommended grade.



catalog number	cutting diameter	flute length	shank diameter	overall length	number of flutes	KC625M
SFRHEC250S3	1/4	3/4	1/4	2 1/2	3	■
SFRHEC375S3	3/8	7/8	3/8	2 1/2	3	■
SFRHEC500S3	1/2	1	1/2	3	3	■
SFRHEC625S3	5/8	1 1/4	5/8	3 1/2	3	■
SFRHEC750S3	3/4	1 5/8	3/4	4	3	■
SFRHEC100S3	1	1 3/4	1	4	3	■

General-Purpose Solid Carbide End Mills



Double End – Stub Length – 2, 4 Flute (30° Helix)

right-hand spiral/right-hand cutting/center cutting



2 Flute

catalog number	K600	KC610M	KC635M
DHEC031S2	■	■	
DHEC047S2		■	
DHEC062S2	■	■	
DHEC078S2		■	
DHEC094S2	■	■	
DHEC109S2		■	
DHEC125S2	■	■	■
DHEC141S2		■	
DHEC156S2	■	■	■
DHEC172S2		■	
DHEC188S2	■	■	■
—			
DHEC219S2	■	■	
—			
DHEC250S2	■	■	■
DHEC281S2		■	
DHEC312S2	■	■	■
DHEC375S2	■	■	■
DHEC438S2	■	■	■
DHEC500S2	■	■	■

4 Flute

catalog number	K600	KC610M	KC635M
DHEC031S4	■	■	■
DHEC047S4	■	■	
DHEC062S4	■	■	■
DHEC078S4		■	
DHEC094S4	■	■	■
DHEC109S4	■	■	
DHEC125S4	■	■	■
DHEC141S4		■	
DHEC156S4	■	■	■
DHEC172S4		■	
DHEC188S4	■	■	■
DHEC203S4		■	
DHEC219S4		■	
DHEC234S4		■	
DHEC250S4	■	■	■
DHEC281S4		■	
DHEC312S4	■	■	■
DHEC375S4	■	■	■
DHEC438S4	■	■	■
DHEC500S4	■	■	■

end mill dimensions			
cutting diameter	flute length	shank diameter	overall length
1/32	1/16	1/8	1 1/2
3/64	3/32	1/8	1 1/2
1/16	1/8	1/8	1 1/2
5/64	1/8	1/8	1 1/2
3/32	3/16	1/8	1 1/2
7/64	3/16	1/8	1 1/2
1/8	1/4	3/16	2
9/64	5/16	3/16	2
5/32	5/16	3/16	2
11/64	5/16	3/16	2
3/16	3/8	3/16	2
13/64	1/2	1/4	2 1/2
7/32	1/2	1/4	2 1/2
15/64	1/2	1/4	2 1/2
1/4	1/2	1/4	2 1/2
9/32	1/2	5/16	2 1/2
5/16	1/2	5/16	2 1/2
3/8	9/16	3/8	3
7/16	9/16	1/2	3
1/2	5/8	1/2	3

60° High Helix – Titanium, Inconel, and Stainless Steel

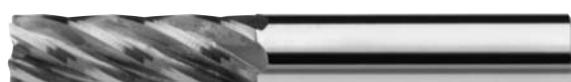
right-hand spiral/right-hand cutting/center cutting



standard length – 3 flute

catalog number	K605	KC615	KC635M	end mill dimensions			
				cutting diameter	flute length	shank diameter	overall length
HHEC125S3	■	■	■	1/8	1/2	1/4	2 1/2
HHEC188S3	■	■	■	3/16	5/8	1/4	2 1/2
HHEC250S3	■	■	■	1/4	3/4	1/4	2 1/2
HHEC312S3	■	■	■	5/16	13/16	5/16	2 1/2
HHEC375S3	■	■	■	3/8	7/8	3/8	2 1/2
HHEC438S3	■	■	■	7/16	1	7/16	3
HHEC500S3	■	■	■	1/2	1	1/2	3
HHEC562S3	■	■	■	9/16	1 1/4	9/16	3 1/2
HHEC625S3	■	■	■	5/8	1 1/4	5/8	3 1/2
HHEC750S3	■	■	■	3/4	1 1/2	3/4	4
HHEC750S4	■	■		3/4	1 1/2	3/4	4
HHEC100S3	■	■	■	1	1 1/2	1	4
HHEC100S4	■	■		1	1 1/2	1	4

General-Purpose 30° right-hand spiral/right-hand cutting



6 Flute

catalog number	K600	KC610M	end mill dimensions			
			cutting diameter	flute length	shank diameter	overall length
HEC125S6	■	■	1/8	1/2	1/8	1 1/2
HEC156S6	■	■	5/32	1/2	3/16	2
HEC188S6	■	■	3/16	5/8	3/16	2
HEC250S6	■	■	1/4	3/4	1/4	2 1/2
HEC312S6	■	■	5/16	13/16	5/16	2 1/2
HEC375S6	■	■	3/8	1	3/8	2 1/2
HEC438S6	■	■	7/16	1	7/16	2 3/4
HEC500S6	■	■	1/2	1	1/2	3

General-Purpose Solid Carbide End Mills

Corner Radius – 4 Flute (30° Helix)
right-hand spiral/right-hand cutting/center cutting



4 Flute

catalog number	KC610M
CRHEC125S4R15	■
CRHEC125S4R20	■
CRHEC188S4R15	■
CRHEC188S4R20	■
CRHEC188S4R30	■
CRHEC250S4R15	■
CRHEC250S4R20	■
CRHEC250S4R30	■
CRHEC250S4R45	■
CRHEC312S4R15	■
CRHEC312S4R20	■
CRHEC312S4R30	■
CRHEC312S4R45	■
CRHEC375S4R15	■
CRHEC375S4R20	■
CRHEC375S4R30	■
CRHEC375S4R45	■
CRHEC500S4R15	■
CRHEC500S4R20	■
CRHEC500S4R30	■
CRHEC500S4R45	■
CRHEC500S4R60	■
CRHEC625S4R15	■
CRHEC625S4R30	■
CRHEC625S4R60	■
CRHEC625S4R90	■
CRHEC750S4R15	■
CRHEC750S4R20	■
CRHEC750S4R30	■
CRHEC750S4R45	■
CRHEC750S4R60	■
CRHEC750S4R90	■
CRHEC750S4R125	■
CRHEC100SRR15	■
CRHEC100S4R20	■
CRHEC100S4R30	■
CRHEC100S4R45	■
CRHEC100S4R60	■
CRHEC100S4R90	■
CRHEC100S4R125	■

end mill dimensions				
cutting diameter	corner radius	flute length	shank diameter	overall length
1/8	.015	1/2	1/8	1 1/2
1/8	.020	1/2	1/8	1 1/2
3/16	.015	5/8	3/16	2
3/16	.020	5/8	3/16	2
3/16	.030	5/8	3/16	2
1/4	.015	3/4	1/4	2 1/2
1/4	.020	3/4	1/4	2 1/2
1/4	.030	3/4	1/4	2 1/2
1/4	.045	3/4	1/4	2 1/2
5/16	.015	13/16	5/16	2 1/2
5/16	.020	13/16	5/16	2 1/2
5/16	.030	13/16	5/16	2 1/2
5/16	.045	13/16	5/16	2 1/2
3/8	.015	1	*3/8	2 1/2
3/8	.020	1	*3/8	2 1/2
3/8	.030	1	*3/8	2 1/2
3/8	.045	1	*3/8	2 1/2
1/2	.015	1	*1/2	3
1/2	.020	1	*1/2	3
1/2	.030	1	*1/2	3
1/2	.045	1	*1/2	3
1/2	.060	1	*1/2	3
5/8	.015	1 1/4	*5/8	3 1/2
5/8	.030	1 1/4	*5/8	3 1/2
5/8	.060	1 1/4	*5/8	3 1/2
5/8	.090	1 1/4	*5/8	3 1/2
3/4	.015	1 1/2	*3/4	4
3/4	.020	1 1/2	*3/4	4
3/4	.030	1 1/2	*3/4	4
3/4	.045	1 1/2	*3/4	4
3/4	.060	1 1/2	*3/4	4
3/4	.090	1 1/2	*3/4	4
3/4	.125	1 1/2	*3/4	4
1	.015	1 1/2	*1	4
1	.020	1 1/2	*1	4
1	.030	1 1/2	*1	4
1	.045	1 1/2	*1	4
1	.060	1 1/2	*1	4
1	.090	1 1/2	*1	4
1	.125	1 1/2	*1	4

*Weldon flat on shank.

General-Purpose Solid Carbide End Mills



Ball Nose – Regular Length – 2, 3 or 4 Flute (30° Helix)

30° right-hand spiral/right-hand cutting/center cutting



2 Flute

catalog number	K600	KC610M	KC635M
BNEC016S2		■	
BNEC031S2		■	
BNEC047S2	■	■	
BNEC062S2	■	■	
BNEC078S2	■	■	
BNEC094S2	■	■	
BNEC109S2	■	■	
BNEC125S2	■	■	■
BNEC141S2	■	■	
BNEC156S2	■	■	
BNEC172S2		■	
BNEC188S2	■	■	■
BNEC203S2		■	
BNEC219S2	■	■	
BNEC234S2		■	
BNEC250S2	■	■	■
BNEC266S2		■	
BNEC281S2	■	■	
BNEC297S2		■	
BNEC312S2	■	■	■
BNEC344S2	■	■	
BNEC375S2	■	■	■
BNEC406S2		■	
BNEC438S2	■	■	■
BNEC469S2		■	
BNEC500S2	■	■	■
BNEC562S2	■	■	■
BNEC625S2	■	■	■
BNEC688S2	■	■	■
BNEC750S2	■	■	■
BNEC875S2		■	■
BNEC100S2	■	■	■

3 Flute

catalog number	KC610M
—	
BNEC031S3	■
—	
BNEC062S3	■
—	
BNEC094S3	■
—	
BNEC125S3	■
—	
—	
—	
BNEC188S3	■
—	
—	
—	
BNEC250S3	■
—	
—	
—	
BNEC375S3	■
—	
—	
—	
BNEC500S3	■
—	
—	
—	

4 Flute

catalog number	K600	KC610M	KC635M
BNEC016S4		■	
BNEC031S4		■	
BNEC047S4	■	■	
BNEC062S4	■	■	
BNEC078S4	■	■	
BNEC094S4	■	■	
BNEC109S4	■	■	
BNEC125S4	■	■	■
BNEC141S4	■	■	
BNEC156S4	■	■	
BNEC172S4	■	■	
BNEC188S4	■	■	■
BNEC203S4	■	■	
BNEC219S4	■	■	
BNEC234S4	■	■	
BNEC250S4	■	■	■
BNEC266S4	■	■	
BNEC281S4	■	■	
BNEC297S4		■	
BNEC312S4	■	■	■
BNEC344S4	■	■	
BNEC375S4	■	■	■
BNEC406S4	■	■	
BNEC438S4	■	■	■
BNEC469S4		■	
BNEC500S4	■	■	■
BNEC562S4	■	■	■
BNEC625S4	■	■	■
BNEC688S4	■	■	■
BNEC750S4	■	■	■
BNEC875S4	■	■	■
BNEC100S4	■	■	■

end mill dimensions

cutting diameter	flute length	shank diameter	overall length
1/64	1/32	1/8	1 1/2
1/32	5/64	1/8	1 1/2
3/64	7/64	1/8	1 1/2
1/16	3/16	1/8	1 1/2
5/64	3/16	1/8	1 1/2
3/32	3/8	1/8	1 1/2
7/64	3/8	1/8	1 1/2
1/8	1/2	1/8	1 1/2
9/64	9/16	3/16	2
5/32	9/16	3/16	2
11/64	5/8	3/16	2
3/16	5/8	3/16	2
13/64	5/8	1/4	2 1/2
7/32	5/8	1/4	2 1/2
15/64	3/4	1/4	2 1/2
1/4	3/4	1/4	2 1/2
17/64	3/4	5/16	2 1/2
9/32	3/4	5/16	2 1/2
19/64	13/16	5/16	2 1/2
5/16	13/16	5/16	2 1/2
11/32	1	3/8	2 1/2
3/8	1	3/8	2 1/2
13/32	1	7/16	2 1/2
7/16	1	7/16	2 1/2
15/32	1	1/2	3
1/2	1	1/2	3
9/16	1 1/8	9/16	3 1/2
5/8	1 1/4	5/8	3 1/2
11/16	1 3/8	3/4	4
3/4	1 1/2	3/4	4
7/8	1 1/2	7/8	4
1	1 1/2	1	4

General-Purpose Solid Carbide End Mills

Ball Nose – Long Length – 2, 4 Flute (30° Helix)

30° right-hand spiral/right-hand cutting/center cutting



2 Flute

catalog number	K600	KC610M
BNEC125S2225	■	
BNEC188S2250	■	
BNEC250S2300	■	
BNEC312S2300	■	
BNEC375S2300	■	
BNEC500S2450	■	

4 Flute

catalog number	K600	KC610M
BNEC125S4225	■	■
BNEC188S4250	■	■
BNEC250S4300	■	■
BNEC312S4300	■	■
BNEC375S4300	■	■
BNEC500S4450	■	■

end mill dimensions

cutting diameter	flute length	shank diameter	overall length
1/8	3/4	1/8	2 1/4
3/16	3/4	3/16	2 1/2
1/4	1 1/8	1/4	3
5/16	1 1/8	5/16	3
3/8	1 1/8	3/8	3
1/2	2	1/2	4 1/2

Ball Nose – Extra Long Length – 2, 4 Flute (30° Helix)

30° right-hand spiral/right-hand cutting/center cutting



2 Flute

catalog number	K600	KC610M
BNEC125S2300	■	■
BNEC188S2300	■	■
BNEC250S2400	■	■
BNEC312S2400	■	■
BNEC375S2400	■	■
BNEC500S2600	■	■
BNEC625S2600		■
BNEC750S2600	■	■
BNEC100S2600	■	■

4 Flute

catalog number	K600	KC610M
BNEC125S4300	■	■
BNEC188S4300	■	■
BNEC250S4400	■	■
BNEC312S4400	■	■
BNEC375S4400	■	■
BNEC500S4600	■	■
BNEC625S4600		■
BNEC750S4600	■	■
BNEC100S4600	■	■

end mill dimensions

cutting diameter	flute length	shank diameter	overall length
1/8	1	1/8	3
3/16	1 1/8	3/16	3
1/4	1 1/2	1/4	4
5/16	1 5/8	5/16	4
3/8	1 3/4	3/8	4
1/2	3	1/2	6
5/8	3	5/8	6
3/4	3	3/4	6
1	3	1	6

General-Purpose Solid Carbide End Mills



Double End Ball Nose – Stub Length – 4 Flute (30° Helix)

30° right-hand spiral/right-hand cutting/center cutting



4 Flute

catalog number	KC610M
DBNEC031S4	■
DBNEC062S4	■
DBNEC094S4	■
DBNEC109S4	■
DBNEC125S4	■
DBNEC156S4	■
DBNEC188S4	■
DBNEC250S4	■
DBNEC312S4	■
DBNEC375S4	■
DBNEC500S4	■

end mill dimensions			
cutting diameter	flute length	shank diameter	overall length
1/32	1/16	1/8	1 1/2
1/16	1/8	1/8	1 1/2
3/32	3/16	1/8	1 1/2
7/64	3/16	1/8	1 1/2
1/8	1/4	3/16	2
5/32	5/16	3/16	2
3/16	3/8	3/16	2
1/4	1/2	1/4	2 1/2
5/16	1/2	5/16	2 1/2
3/8	9/16	3/8	3
1/2	5/8	1/2	3

PROVEN. IN FACE MILLING.

Maximize your productivity by combining Kennametal's "M" Grade Technology and First Choice Milling Products. Contact us toll-free 800/446-7738 for Kennametal Milling Literature.

KENNA PERFECT™ Material Classification System				
STEEL	STAINLESS STEEL	CAST IRON	NON-FERROUS	HIGH-TEMP ALLOY
				HARDENED MATERIAL

KENNA UNIVERSAL
KENNA UNIVERSAL solutions are engineered to machine a wide range of workpiece materials.



KENNA UNIVERSAL
KSSM

Refer to Catalog 1051 for additional information.

KENNA PERFECT
KENNA PERFECT solutions are engineered to machine a specific workpiece material.



KENNA PERFECT
Cast Iron

Refer to Catalog 0052 for additional information.

KENNA PERFECT
Aluminum

Refer to Catalog 0051 for additional information.

General-Purpose Solid Carbide End Mills – Metric Diameters

Ball-Nose – Standard Length – 2, 4, Flute (30° Helix)

right-hand spiral/right-hand cutting/center cutting



2 Flute

catalog number	K600	KC610M	KC635M
BNEC2MS2	■	■	■
BNEC25MS2	■	■	■
BNEC3MS2	■	■	■
BNEC35MS2	■	■	■
BNEC4MS2	■	■	■
BNEC45MS2		■	■
BNEC5MS2	■	■	■
BNEC6MS2	■	■	■
BNEC7MS2	■	■	■
BNEC8MS2	■	■	■
BNEC9MS2	■	■	■
BNEC10MS2	■	■	■
BNEC11MS2		■	■
BNEC12MS2	■	■	■
BNEC14MS2		■	■
BNEC16MS2	■	■	■
BNEC18MS2		■	■
BNEC20MS2	■	■	■
BNEC25MMS2	■	■	■

4 Flute

catalog number	K600	KC610M
BNEC2MS4	■	■
BNEC25MS4	■	■
BNEC3MS4	■	■
BNEC35MS4	■	■
BNEC4MS4	■	■
BNEC45MS4	■	■
BNEC5MS4	■	■
BNEC6MS4	■	■
BNEC7MS4	■	■
BNEC8MS4	■	■
BNEC9MS4	■	■
BNEC10MS4	■	■
BNEC11MS4		■
BNEC12MS4	■	■
BNEC14MS4		■
BNEC16MS4	■	■
BNEC18MS4		■
BNEC20MS4	■	■
BNEC25MMS4	■	■

end mill dimensions			
cutting diameter	shank diameter	flute length	overall length
2	6,3	3	38
2,5	9,5	3	38
3	12	3	38
3,5	12	4	50
4	14	4	50
4,5	16	6	50
5	16	6	50
6	19	6	50
7	19	8	63
8	20	8	63
9	22	10	75
10	22	10	75
11	25	12	75
12	25	12	75
14	32	14	89
16	32	16	89
18	38	18	100
20	38	20	100
25	38	25	100

Ball-Nose – Extra Long Length – 2, 4, Flute (30° Helix)

right-hand spiral/right-hand cutting/center cutting



2 Flute

catalog number	K600	KC610M	KC635M
BNEC6MS275M	■	■	■
BNEC8MS275M	■	■	■
BNEC10MS2100M	■	■	■
BNEC12MS2100M	■	■	■
BNEC12MS2150M		■	■
BNEC16MS2150M		■	■
BNEC20MS2150M		■	■

4 Flute

catalog number	K600	KC610M
BNEC6MS475M	■	■
BNEC8MS475M	■	■
BNEC10MS4100M	■	■
BNEC12MS4100M	■	■
BNEC12MS4150M		■
BNEC16MS4150M	■	■
BNEC20MS4150M	■	■

end mill dimensions			
cutting diameter	shank diameter	flute length	overall length
6	25	6	75
8	25	8	75
10	38	10	100
12	50	12	100
12	75	12	150
16	75	16	150
20	75	20	150

General-Purpose Solid Carbide End Mills



Square End – Standard Length – 2, 4, Flute (30° Helix)

right-hand spiral/right-hand cutting/center cutting



2 Flute

catalog number	K600	KC610M
HEC2MS2	■	■
HEC25MS2	■	■
HEC3MS2	■	■
HEC35MS2	■	■
HEC4MS2	■	■
HEC45MS2	■	■
HEC5MS2	■	■
HEC6MS2	■	■
HEC7MS2	■	■
HEC8MS2	■	■
HEC9MS2	■	■
HEC10MS2	■	■
HEC11MS2	■	■
HEC12MS2	■	■
HEC14MS2	■	■
HEC16MS2	■	■
HEC18MS2	■	■
HEC20MS2	■	■
HEC25MMS2	■	■

4 Flute

catalog number	K600	KC610M
HEC2MS4	■	■
HEC25MS4	■	■
HEC3MS4	■	■
HEC35MS4	■	■
HEC4MS4	■	■
HEC45MS4	■	■
HEC5MS4	■	■
HEC6MS4	■	■
HEC7MS4	■	■
HEC8MS4	■	■
HEC9MS4	■	■
HEC10MS4	■	■
HEC11MS4	■	■
HEC12MS4	■	■
HEC14MS4	■	■
HEC16MS4	■	■
HEC18MS4	■	■
HEC20MS4	■	■
HEC25MMS4	■	■



end mill dimensions

cutting diameter	shank diameter	flute length	overall length
2	6,3	3	38
2,5	9,5	3	38
3	12	3	38
3,5	12	4	50
4	14	4	50
4,5	16	6	50
5	16	6	50
6	19	6	50
7	19	8	63
8	20	8	63
9	22	10	75
10	22	10	75
11	25	12	75
12	25	12	75
14	32	14	89
16	32	16	89
18	38	18	100
20	38	20	100
25	38	25	100

Square End – Extra Long Length – 2, 4, Flute (30° Helix)



2 Flute

catalog number	K600	KC610M
HEC6MS275M	■	■
HEC8MS275M	■	■
HEC10MS2100M	■	■
HEC12MS2100M	■	■
HEC12MS2150M	■	■
HEC14MS2150M	■	■
HEC16MS2150M	■	■
HEC20MS2150M	■	■
HEC25MS2150M	■	■

4 Flute

catalog number	K600	KC610M
HEC6MS475M	■	■
HEC8MS475M	■	■
HEC10MS4100M	■	■
HEC12MS4100M	■	■
HEC12MS4150M	■	■
HEC14MS4150M	■	■
HEC16MS4150M	■	■
HEC20MS4150M	■	■
HEC25MS4150M	■	■



end mill dimensions

cutting diameter	shank diameter	flute length	overall length
6	25	6	75
8	25	8	75
10	38	10	100
12	50	12	100
12	75	12	150
14	75	14	150
16	75	16	150
20	75	20	150
25	75	25	150

SHRINKING SYSTEMS

Thermo Induction

INDUCTIVE HEATER/COOLING UNIT 5 STATION INDUCTION GENERATOR

- Processor controlled heating and cooling!
- Quick and accurate shrinking process!
- Toolchange cycles within 60 seconds!
- 5 integral cooling stations!
- Full cylindrical solid carbide shanks recommended!
- HSS and notched shanks can be used!

TOOLHOLDERS

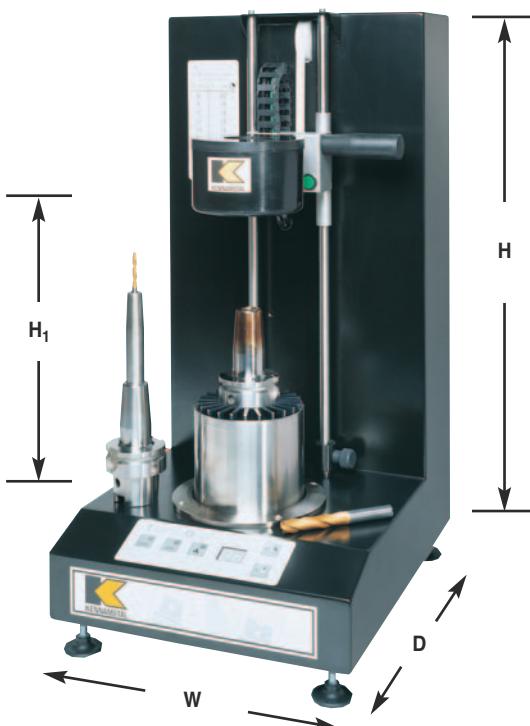
- Slim design!
- High accuracy <.0001" run-out!
- Great grip for roughing and finishing operations!
- Designed for high speeds, toolholders pre-balanced!
- Available in popular sizes with HSK, CV, BT, DV and straight shanks!
- Manufactured from high class heat-resistant tool steel!
- Pre-adjustment axial stopscrew!



Catalog number TTISG30005

Inductive Heater / Cooling Unit Single Station Induction Generator

- recommended for carbide shank cutting tools only
- manual operation
- 30-40 second tool change process
- 208v (8.5A) 3-phase connection
- permanent fixed induction coil for Ø 1/4" - 7/8" (6 mm - 20 mm) toolholder bores
- uses same "toolholder location / cooling pots" and "cooling adapters" as TTISG30005
- one station for heating and cooling process



catalog number	W inch	W mm	H inch	H mm	H ₁ inch	H ₁ mm	D inch	D mm	lbs.	kg
									weight	weight
TTISG2000NA	12.0	304,8	25.0	635,0	15.0	381,0	14.0	355,6	55.0	24,8

PROVEN. IN END MILLING.



NGE I, II, and B New Generation End Mills

For exceptional metal-removal rates
in a wide variety of workpiece materials!
Ideal for machining of 90° shoulders, slab
milling, channeling, and contour milling!





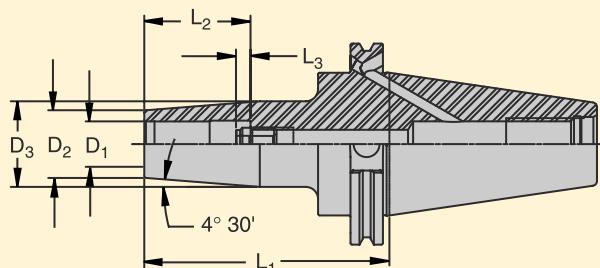
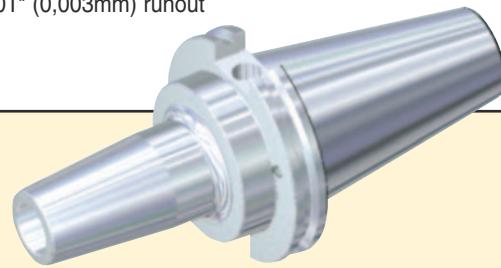
Shrink Fit Toolholders

CV Form B / AD Coolant – Shank

Standard Length Toolholders — Balanced G6.3 @ 15,000 rpm

- recommended for drilling, end milling, reaming and boring
- form B coolant to DIN 69871 form B standard, can be adapted to through the drawbar coolant (form AD)
- carbide and HSS cutting tools with h6 shank tolerance

- 3/8" (10mm) axial adjustment
- less than .0001" (0,003mm) runout



Inch Bores

	catalog number	D_1 inch	D_2 inch	D_2 mm	D_3 inch	D_3 mm	L_1 inch	L_1 mm	L_2 inch	L_2 mm	L_3 inch	L_3 mm	lbs. weight	kg weight
CV40B standard length	CV40 B TT 025 350	1/4	.79	20.0	1.06	27.0	3.500	88.90	1.42	36.0	0.39	10.0	2.56	1.16
	CV40 B TT 031 350	5/16	.79	20.0	1.06	27.0	3.500	88.90	1.42	36.0	0.39	10.0	2.56	1.16
	CV40 B TT 038 375	3/8	.94	24.0	1.26	32.0	3.750	95.25	1.65	42.0	0.39	10.0	2.78	1.26
	CV40 B TT 044 375	7/16	.94	24.0	1.26	32.0	3.750	95.25	1.85	47.0	0.39	10.0	2.76	1.25
	CV40 B TT 050 375	1/2	.94	24.0	1.26	32.0	3.750	95.25	1.85	47.0	0.39	10.0	2.73	1.24
	CV40 B TT 056 375	9/16	1.06	27.0	1.34	34.0	3.750	95.25	1.85	47.0	0.39	10.0	2.84	1.29
	CV40 B TT 062 375	5/8	1.06	27.0	1.34	34.0	3.750	95.25	1.97	50.0	0.39	10.0	2.76	1.25
	CV40 B TT 068 400	11/16	1.34	34.0	1.75	44.4	4.000	101.60	1.97	50.0	0.39	10.0	3.31	1.50
	CV40 B TT 075 400	3/4	1.34	34.0	1.75	44.4	4.000	101.60	2.05	52.0	0.39	10.0	3.24	1.47
	CV40 B TT 088 400	7/8	1.34	34.0	1.75	44.4	4.000	101.60	2.05	52.0	0.39	10.0	3.15	1.43
	CV40 B TT 100 400	1	1.73	44.0	2.09	53.0	4.000	101.60	2.28	58.0	0.39	10.0	3.77	1.71
	CV40 B TT 125 400	1 1/4	1.73	44.0	2.09	53.0	4.000	101.60	2.28	58.0	0.39	10.0	3.48	1.58
CV50B standard length	CV50 B TT 025 350	1/4	.79	20.0	1.06	27.0	3.500	88.90	1.42	36.0	0.39	10.0	6.97	3.16
	CV50 B TT 031 350	5/16	.79	20.0	1.06	27.0	3.500	88.90	1.42	36.0	0.39	10.0	6.95	3.15
	CV50 B TT 038 375	3/8	.94	24.0	1.26	32.0	3.750	95.25	1.65	42.0	0.39	10.0	7.19	3.26
	CV50 B TT 044 375	7/16	.94	24.0	1.26	32.0	3.750	95.25	1.85	47.0	0.39	10.0	7.17	3.25
	CV50 B TT 050 375	1/2	.94	24.0	1.26	32.0	3.750	95.25	1.85	47.0	0.39	10.0	7.14	3.24
	CV50 B TT 056 375	9/16	1.06	27.0	1.34	34.0	3.750	95.25	1.85	47.0	0.39	10.0	7.25	3.29
	CV50 B TT 062 375	5/8	1.06	27.0	1.34	34.0	3.750	95.25	1.97	50.0	0.39	10.0	7.12	3.23
	CV50 B TT 068 400	11/16	1.30	33.0	1.65	42.0	4.000	101.60	1.97	50.0	0.39	10.0	7.59	3.44
	CV50 B TT 075 400	3/4	1.30	33.0	1.65	42.0	4.000	101.60	2.05	52.0	0.39	10.0	7.52	3.41
	CV50 B TT 088 400	7/8	1.30	33.0	1.65	42.0	4.000	101.60	2.05	52.0	0.39	10.0	7.43	3.37
	CV50 B TT 100 400	1	1.73	44.0	2.09	53.0	4.000	101.60	2.28	58.0	0.39	10.0	8.14	3.69
	CV50 B TT 125 400	1 1/4	1.73	44.0	2.09	53.0	4.000	101.60	2.28	58.0	0.39	10.0	7.85	3.56

Metric Bores

	catalog number	D_1 inch	D_2 inch	D_2 mm	D_3 inch	D_3 mm	L_1 inch	L_1 mm	L_2 inch	L_2 mm	L_3 inch	L_3 mm	lbs. weight	kg weight
CV40B standard length	CV40BTT06M350	6	.79	20.0	1.06	27.0	3.500	88.90	1.42	36.0	0.39	10.0	2.56	1.16
	CV40BTT08M350	8	.79	20.0	1.06	27.0	3.500	88.90	1.42	36.0	0.39	10.0	2.54	1.15
	CV40BTT10M375	10	.94	24.0	1.26	32.0	3.750	95.25	1.65	42.0	0.39	10.0	2.76	1.25
	CV40BTT12M375	12	.94	24.0	1.26	32.0	3.750	95.25	1.85	47.0	0.39	10.0	2.73	1.24
	CV40BTT14M375	14	1.06	27.0	1.34	34.0	3.750	95.25	1.85	47.0	0.39	10.0	2.84	1.29
	CV40BTT16M375	16	1.06	27.0	1.34	34.0	3.750	95.25	1.97	50.0	0.39	10.0	2.76	1.25
	CV40BTT18M400	18	1.34	34.0	1.75	44.4	4.000	101.60	1.97	50.0	0.39	10.0	3.29	1.49
	CV40BTT20M400	20	1.34	34.0	1.75	44.4	4.000	101.60	2.05	52.0	0.39	10.0	3.20	1.45
	CV40BTT25M400	25	1.73	44.0	2.09	53.0	4.000	101.60	2.28	58.0	0.39	10.0	3.77	1.71
	CV40BTT32M400	32	1.73	44.0	2.09	53.0	4.000	101.60	2.28	58.0	0.39	10.0	3.46	1.57
CV50B standard length	CV50BTT06M350	6	.79	20.0	1.06	27.0	3.500	88.90	1.42	36.0	0.39	10.0	6.97	3.16
	CV50BTT08M350	8	.79	20.0	1.06	27.0	3.500	88.90	1.42	36.0	0.39	10.0	6.97	3.16
	CV50BTT10M375	10	.94	24.0	1.26	32.0	3.750	95.25	1.65	42.0	0.39	10.0	7.19	3.26
	CV50BTT12M375	12	.94	24.0	1.26	32.0	3.750	95.25	1.85	47.0	0.39	10.0	7.14	3.24
	CV50BTT14M375	14	1.06	27.0	1.34	34.0	3.750	95.25	1.85	47.0	0.39	10.0	7.25	3.29
	CV50BTT16M375	16	1.06	27.0	1.34	34.0	3.750	95.25	1.85	47.0	0.39	10.0	7.12	3.23
	CV50BTT18M400	18	1.34	33.0	1.65	42.0	3.750	95.25	1.97	50.0	0.39	10.0	7.59	3.44
	CV50BTT20M400	20	1.34	33.0	1.65	42.0	4.000	101.60	1.97	50.0	0.39	10.0	7.50	3.40
	CV50BTT25M400	25	1.73	44.0	2.09	53.0	4.000	101.60	1.96	50.0	0.39	10.0	8.16	3.70
	CV50BTT32M400	32	1.73	44.0	2.09	53.0	4.000	101.60	2.05	52.0	0.39	10.0	7.85	3.56

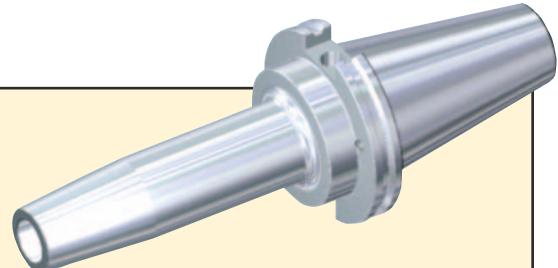
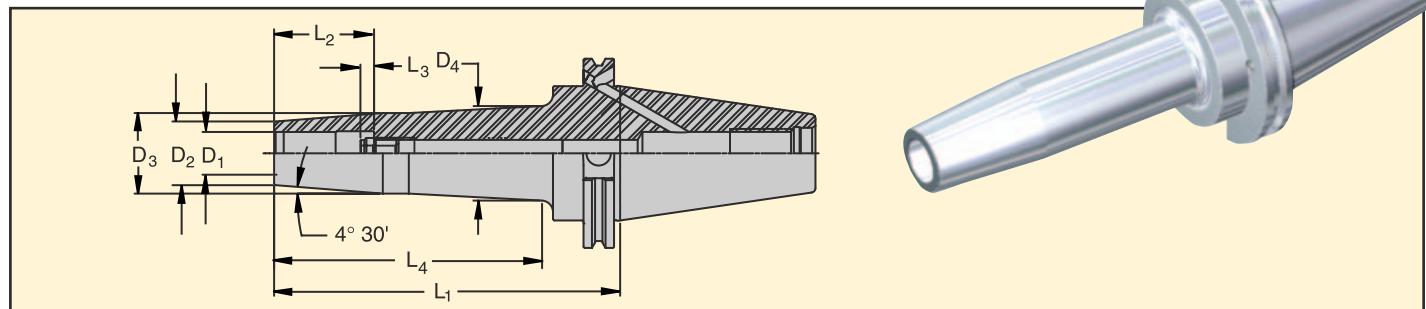
Toolholder comes complete with coolant through stop screw. Different toolholder styles and lengths available upon request

CV Form B / AD Coolant – Shank

Extended Length Toolholders — Balanced G6.3 @ 15,000 rpm

- recommended for drilling, end milling, reaming and boring
- form B coolant to DIN 69871 form B standard,
can be adapted to through the drawbar coolant (form AD)
- carbide and HSS cutting tools with h6 shank tolerance

- 3/8" (10mm) axial adjustment
- less than .0001" (0.003mm) runout



Inch Bores

	catalog number	D ₁ inch	D ₂ inch	D ₂ mm	D ₃ inch	D ₃ mm	D ₄ inch	D ₄ mm	L ₁ inch	L ₁ mm	L ₂ inch	L ₂ mm	L ₃ inch	L ₃ mm	L ₄ inch	L ₄ mm	lbs. weight	kg weight
CV40B extended length	CV40 B TT 025 600	1/4	.79	20.0	1.06	27.0	1.22	31.0	6.000	152.40	1.42	36.0	0.39	10.0	4.51	114.50	3.18	1.44
	CV40 B TT 031 600	5/16	.79	20.0	1.06	27.0	1.22	31.0	6.000	152.40	1.42	36.0	0.39	10.0	4.51	114.50	3.18	1.44
	CV40 B TT 038 600	3/8	.94	24.0	1.26	32.0	1.40	35.5	6.000	152.40	1.65	42.0	0.39	10.0	4.51	114.50	3.55	1.61
	CV40 B TT 044 600	7/16	.94	24.0	1.26	32.0	1.40	35.5	6.000	152.40	1.85	47.0	0.39	10.0	4.51	114.50	3.53	1.60
	CV40 B TT 050 600	1/2	.94	24.0	1.26	32.0	1.40	35.5	6.000	152.40	1.85	47.0	0.39	10.0	4.51	114.50	3.51	1.59
	CV40 B TT 056 600	9/16	1.06	27.0	1.34	34.0	1.48	37.5	6.000	152.40	1.85	47.0	0.39	10.0	4.59	116.50	3.73	1.69
	CV40 B TT 062 600	5/8	1.06	27.0	1.34	34.0	1.48	37.5	6.000	152.40	1.97	50.0	0.39	10.0	4.59	116.50	3.66	1.66
	CV40 B TT 068 600	11/16	1.30	33.0	1.65	42.0	1.65	42.0	6.000	152.40	1.97	50.0	0.39	10.0	4.59	116.50	4.52	2.05
	CV40 B TT 075 600	3/4	1.30	33.0	1.65	42.0	1.65	42.0	6.000	152.40	2.05	52.0	0.39	10.0	4.59	116.50	4.45	2.02
	CV40 B TT 088 600	7/8	1.30	33.0	1.65	42.0	1.65	42.0	6.000	152.40	2.05	52.0	0.39	10.0	4.59	116.50	4.37	1.98
	CV40 B TT 100 600	1	1.73	44.0	2.09	53.0	2.09	53.0	6.000	152.40	2.28	58.0	0.39	10.0	5.24	133.00	5.62	2.55
	CV40 B TT 125 600	1 1/4	1.73	44.0	2.09	53.0	2.09	53.0	6.000	152.40	2.28	58.0	0.39	10.0	5.24	133.00	5.34	2.42
CV50B extended length	CV50 B TT 025 800	1/4	.79	20.0	1.06	27.0	1.36	34.5	8.000	203.20	1.42	36.0	0.39	10.0	6.40	162.50	8.22	3.73
	CV50 B TT 031 800	5/16	.79	20.0	1.06	27.0	1.36	34.5	8.000	203.20	1.42	36.0	0.39	10.0	6.40	162.50	8.22	3.73
	CV50 B TT 038 800	3/8	.94	24.0	1.26	32.0	1.54	39.0	8.000	203.20	1.65	42.0	0.39	10.0	6.40	162.50	8.75	3.97
	CV50 B TT 044 800	7/16	.94	24.0	1.26	32.0	1.54	39.0	8.000	203.20	1.85	47.0	0.39	10.0	6.40	162.50	8.73	3.96
	CV50 B TT 050 800	1/2	.94	24.0	1.26	32.0	1.54	39.0	8.000	203.20	1.85	47.0	0.39	10.0	6.40	162.50	8.71	3.95
	CV50 B TT 056 800	9/16	1.06	27.0	1.34	34.0	1.61	41.0	8.000	203.20	1.85	47.0	0.39	10.0	6.40	162.50	9.04	4.10
	CV50 B TT 062 800	5/8	1.06	27.0	1.34	34.0	1.61	41.0	8.000	203.20	1.97	50.0	0.39	10.0	6.40	162.50	8.91	4.04
	CV50 B TT 068 800	11/16	1.34	34.0	1.65	42.0	1.91	48.5	8.000	203.20	1.97	50.0	0.39	10.0	6.40	162.50	10.14	4.60
	CV50 B TT 075 800	3/4	1.34	34.0	1.65	42.0	1.91	48.5	8.000	203.20	2.05	52.0	0.39	10.0	6.40	162.50	9.88	4.48
	CV50 B TT 088 800	7/8	1.34	34.0	1.65	42.0	1.91	48.5	8.000	203.20	2.05	52.0	0.39	10.0	6.40	162.50	9.79	4.44
	CV50 B TT 100 800	1	1.73	44.0	2.09	53.0	2.34	59.5	8.000	203.20	2.28	58.0	0.39	10.0	6.50	165.00	12.04	5.46
	CV50 B TT 125 800	1 1/4	1.73	44.0	2.09	53.0	2.34	59.5	8.000	203.20	2.28	58.0	0.39	10.0	6.50	165.00	11.75	5.33

Metric Bores

	catalog number	D ₁ inch	D ₂ inch	D ₂ mm	D ₃ inch	D ₃ mm	D ₄ inch	D ₄ mm	L ₁ inch	L ₁ mm	L ₂ inch	L ₂ mm	L ₃ inch	L ₃ mm	L ₄ inch	L ₄ mm	lbs. weight	kg weight
CV40B extended length	CV40BTT06M600	6	.79	20.0	1.06	27.0	1.22	31.0	6.000	152.40	1.42	36.0	0.39	10.0	4.51	114.50	3.18	1.44
	CV40BTT08M600	8	.79	20.0	1.06	27.0	1.22	31.0	6.000	152.40	1.42	36.0	0.39	10.0	4.51	114.50	3.15	1.43
	CV40BTT10M600	10	.94	24.0	1.26	32.0	1.40	35.5	6.000	152.40	1.65	42.0	0.39	10.0	4.51	114.50	3.55	1.61
	CV40BTT12M600	12	.94	24.0	1.26	32.0	1.40	35.5	6.000	152.40	1.85	47.0	0.39	10.0	4.51	114.50	3.51	1.59
	CV40BTT14M600	14	1.06	27.0	1.34	34.0	1.48	37.5	6.000	152.40	1.85	47.0	0.39	10.0	4.59	116.50	3.73	1.69
	CV40BTT16M600	16	1.06	27.0	1.34	34.0	1.48	37.5	6.000	152.40	1.97	50.0	0.39	10.0	4.59	116.50	3.66	1.66
	CV40BTT18M600	18	1.30	33.0	1.65	42.0	1.65	42.0	6.000	152.40	1.97	50.0	0.39	10.0	4.59	116.50	4.50	2.04
	CV40BTT20M600	20	1.30	33.0	1.65	42.0	1.65	42.0	6.000	152.40	2.05	52.0	0.39	10.0	4.59	116.50	4.43	2.01
	CV40BTT25M600	25	1.73	44.0	2.09	53.0	2.09	53.0	6.000	152.40	2.28	58.0	0.39	10.0	5.24	133.00	5.64	2.56
	CV40BTT32M600	32	1.73	44.0	2.09	53.0	2.09	53.0	6.000	152.40	2.28	58.0	0.39	10.0	5.24	133.00	5.31	2.41
CV50B extended length	CV50BTT06M800	6	.79	20.0	1.06	27.0	1.36	34.5	8.000	203.20	1.42	36.0	0.39	10.0	6.40	162.50	8.22	3.73
	CV50BTT08M800	8	.79	20.0	1.06	27.0	1.36	34.5	8.000	203.20	1.42	36.0	0.39	10.0	6.40	162.50	8.20	3.72
	CV50BTT10M800	10	.94	24.0	1.26	32.0	1.54	39.0	8.000	203.20	1.65	42.0	0.39	10.0	6.40	162.50	8.75	3.97
	CV50BTT12M800	12	.94	24.0	1.26	32.0	1.54	39.0	8.000	203.20	1.85	47.0	0.39	10.0	6.40	162.50	8.73	3.96
	CV50BTT14M800	14	1.06	27.0	1.34	34.0	1.61	41.0	8.000	203.20	1.85	47.0	0.39	10.0	6.40	162.50	9.04	4.10
	CV50BTT16M800	16	1.06	27.0	1.34	34.0	1.61	41.0	8.000	203.20	1.85	47.0	0.39	10.0	6.40	162.50	8.91	4.04
	CV50BTT18M800	18	1.30	33.0	1.65	42.0	1.91	48.5	8.000	203.20	1.97	50.0	0.39	10.0	6.40	162.50	10.12	4.59
	CV50BTT20M800	20	1.30	33.0	1.65	42.0	1.91	48.5	8.000	203.20	1.97	50.0	0.39	10.0	6.40	162.50	9.86	4.47
	CV50BTT25M800	25	1.73	44.0	2.09	53.0	2.34	59.5	8.000	203.20	1.96	50.0	0.39	10.0	6.50	165.00	12.06	5.47
	CV50BTT32M800	32	1.73	44.0	2.09	53.0	2.34	59.5	8.000	203.20	2.05	52.0	0.39	10.0	6.50	165.00	11.75	5.33

Toolholder comes complete with coolant through stop screw. Different toolholder styles and lengths available upon request

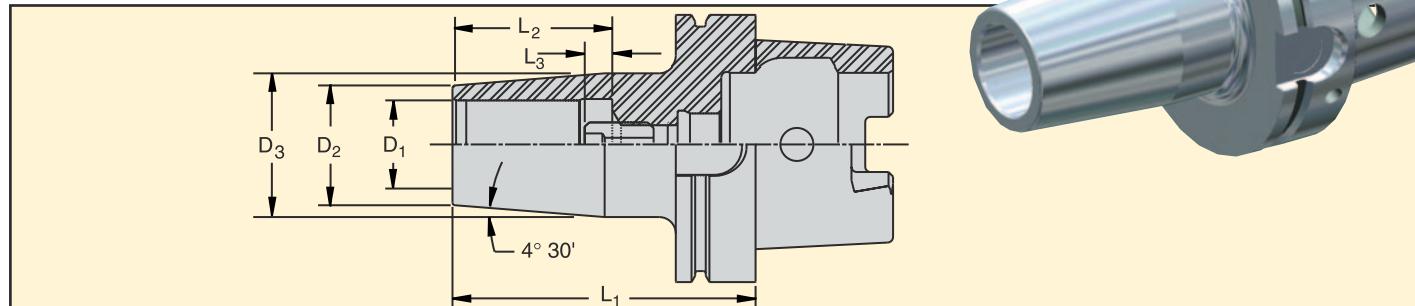
Rotating Toolholder Systems – Shrink Fit

HSK form A – Shank Toolholders – Balanced



- recommended for drilling, end milling, reaming and boring
- through-coolant capability
- carbide and HSS cutting tools with h6 shank tolerance

- axial adjustment
- less than .0001" (0,003mm) runout



Inch Bores

	catalog number	D ₁ inch	D ₂ inch	D ₂ mm	D ₃ inch	D ₃ mm	L ₁ inch	L ₁ mm	L ₂ inch	L ₂ mm	L ₃ inch	L ₃ mm	lbs. weight	kg weight
HSK63A standard length	HSK63A TT 025 315	1/4	.79	20,0	1.06	27,0	3.150	80,0	1.42	36,0	.39	10,0	1.50	0,67
	HSK63A TT 031 315	5/16	.79	20,0	1.06	27,0	3.150	80,0	1.42	36,0	.39	10,0	1.50	0,68
	HSK63A TT 038 335	3/8	.94	24,0	1.26	32,0	3.346	85,0	1.65	42,0	.39	10,0	1.73	0,76
	HSK63A TT 044 354	7/16	.94	24,0	1.26	32,0	3.543	90,0	1.85	47,0	.39	10,0	1.79	0,78
	HSK63A TT 050 354	1/2	.94	24,0	1.26	32,0	3.543	90,0	1.85	47,0	.39	10,0	1.80	0,77
	HSK63A TT 056 354	9/16	1.06	27,0	1.34	34,0	3.543	90,0	1.85	47,0	.39	10,0	1.88	0,82
	HSK63A TT 062 374	5/8	1.06	27,0	1.34	34,0	3.740	95,0	1.96	50,0	.39	10,0	1.93	0,82
	HSK63A TT 068 374	11/16	1.30	33,0	1.65	42,0	3.740	95,0	1.96	50,0	.39	10,0	2.38	1,08
	HSK63A TT 075 394	3/4	1.30	33,0	1.65	42,0	3.937	100,0	1.96	50,0	.39	10,0	2.31	1,05
	HSK63A TT 088 394	7/8	1.73	44,0	2.09	53,0	3.937	100,0	2.05	52,0	.39	10,0	2.24	1,01
	HSK63A TT 100 453	1	1.73	44,0	2.09	53,0	4.528	115,0	2.28	58,0	.39	10,0	3.31	1,50
	HSK63A TT 125 472	1 1/4	1.73	44,0	2.09	53,0	4.725	120,0	2.28	58,0	.39	10,0	3.02	1,37
HSK80A standard length	HSK80A TT 025 335	1/4	.79	20,0	1.06	27,0	3.346	85,0	1.42	36,0	.39	10,0	2.83	1,28
	HSK80A TT 031 335	5/16	.79	20,0	1.06	27,0	3.346	85,0	1.42	36,0	.39	10,0	2.83	1,28
	HSK80A TT 038 354	3/8	.94	24,0	1.26	32,0	3.543	90,0	1.65	42,0	.39	10,0	3.05	1,38
	HSK80A TT 044 374	7/16	.94	24,0	1.26	32,0	3.740	95,0	1.85	47,0	.39	10,0	3.09	1,40
	HSK80A TT 050 374	1/2	.94	24,0	1.26	32,0	3.740	95,0	1.85	47,0	.39	10,0	3.05	1,38
	HSK80A TT 056 374	9/16	1.06	27,0	1.34	34,0	3.740	95,0	1.85	47,0	.39	10,0	3.18	1,44
	HSK80A TT 062 394	5/8	1.06	27,0	1.34	34,0	3.937	100,0	1.96	50,0	.39	10,0	3.23	1,46
	HSK80A TT 068 394	11/16	1.30	33,0	1.65	42,0	3.937	100,0	1.96	50,0	.39	10,0	3.67	1,66
	HSK80A TT 075 413	3/4	1.30	33,0	1.65	42,0	4.134	105,0	1.96	50,0	.39	10,0	3.71	1,68
	HSK80A TT 088 413	7/8	1.73	44,0	2.09	53,0	4.134	105,0	2.05	52,0	.39	10,0	3.62	1,64
	HSK80A TT 100 453	1	1.73	44,0	2.09	53,0	4.528	115,0	2.28	58,0	.39	10,0	4.86	2,20
	HSK80A TT 125 472	1 1/4	1.73	44,0	2.09	53,0	4.725	120,0	2.28	58,0	.39	10,0	4.75	2,15

Metric Bores

	catalog number	D ₁ inch	D ₂ inch	D ₂ mm	D ₃ inch	D ₃ mm	L ₁ inch	L ₁ mm	L ₂ inch	L ₂ mm	L ₃ inch	L ₃ mm	lbs. weight	kg weight
HSK63A standard length	HSK63A TT 06 080M	6	.79	20,0	1.06	27,0	3.150	80,0	1.42	36,0	.39	10,0	1.49	0,67
	HSK63A TT 08 080M	8	.79	20,0	1.06	27,0	3.150	80,0	1.42	36,0	.39	10,0	1.49	0,67
	HSK63A TT 10 085M	10	.94	24,0	1.26	32,0	3.346	85,0	1.65	42,0	.39	10,0	1.67	0,76
	HSK63A TT 12 090M	12	.94	24,0	1.26	32,0	3.543	90,0	1.85	47,0	.39	10,0	1.71	0,77
	HSK63A TT 14 090M	14	1.06	27,0	1.34	34,0	3.543	90,0	1.85	47,0	.39	10,0	1.82	0,82
	HSK63A TT 16 095M	16	1.06	27,0	1.34	34,0	3.740	95,0	1.97	50,0	.39	10,0	1.84	0,83
	HSK63A TT 18 095M	18	1.30	33,0	1.65	42,0	3.740	95,0	1.97	50,0	.39	10,0	2.22	1,01
	HSK63A TT 20 100M	20	1.30	33,0	1.65	42,0	3.937	100,0	2.05	52,0	.39	10,0	2.26	1,03
	HSK63A TT 25 115M	25	1.73	44,0	2.09	53,0	4.528	115,0	2.28	58,0	.39	10,0	3.58	1,62
	HSK63A TT 32 120M	32	1.73	44,0	2.09	53,0	4.725	120,0	2.28	58,0	.39	10,0	3.54	1,56
HSK80A standard length	HSK80A TT 06 085M	6	.79	20,0	1.06	27,0	3.346	85,0	1.42	36,0	.39	10,0	2.60	1,18
	HSK80A TT 08 085M	8	.79	20,0	1.06	27,0	3.346	85,0	1.42	36,0	.39	10,0	2.60	1,18
	HSK80A TT 10 090M	10	.94	24,0	1.26	32,0	3.543	90,0	1.65	42,0	.39	10,0	2.80	1,26
	HSK80A TT 12 095M	12	.94	24,0	1.26	32,0	3.740	95,0	1.85	47,0	.39	10,0	2.80	1,26
	HSK80A TT 14 095M	14	1.06	27,0	1.34	34,0	3.740	95,0	1.85	47,0	.39	10,0	2.92	1,32
	HSK80A TT 16 100M	16	1.06	27,0	1.34	34,0	3.937	100,0	1.97	50,0	.39	10,0	2.94	1,33
	HSK80A TT 18 100M	18	1.30	33,0	1.65	42,0	3.937	100,0	1.97	50,0	.39	10,0	3.35	1,52
	HSK80A TT 20 105M	20	1.30	33,0	1.65	42,0	4.134	105,0	2.05	52,0	.39	10,0	3.39	1,54
	HSK80A TT 25 115M	25	1.73	44,0	2.09	53,0	4.528	115,0	2.28	58,0	.39	10,0	4.58	2,08
	HSK80A TT 32 120M	32	1.73	44,0	2.09	53,0	4.724	120,0	2.28	58,0	.39	10,0	4.40	2,00

Toolholder comes complete with coolant through stopscrew. Coolant supply unit assembly and wrench must be ordered separately.
Different toolholder styles and lengths available on request.

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 fragmenting 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.

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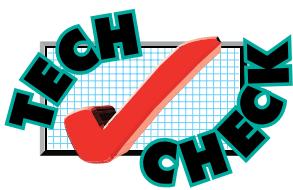
Kennametal urges that its customers adhere to the recommended standards of use of their metalcutting machines and tools, and that they follow procedures that ensure safe metalcutting operations. The technical information included throughout this catalog, as well as recommendations on machining practices 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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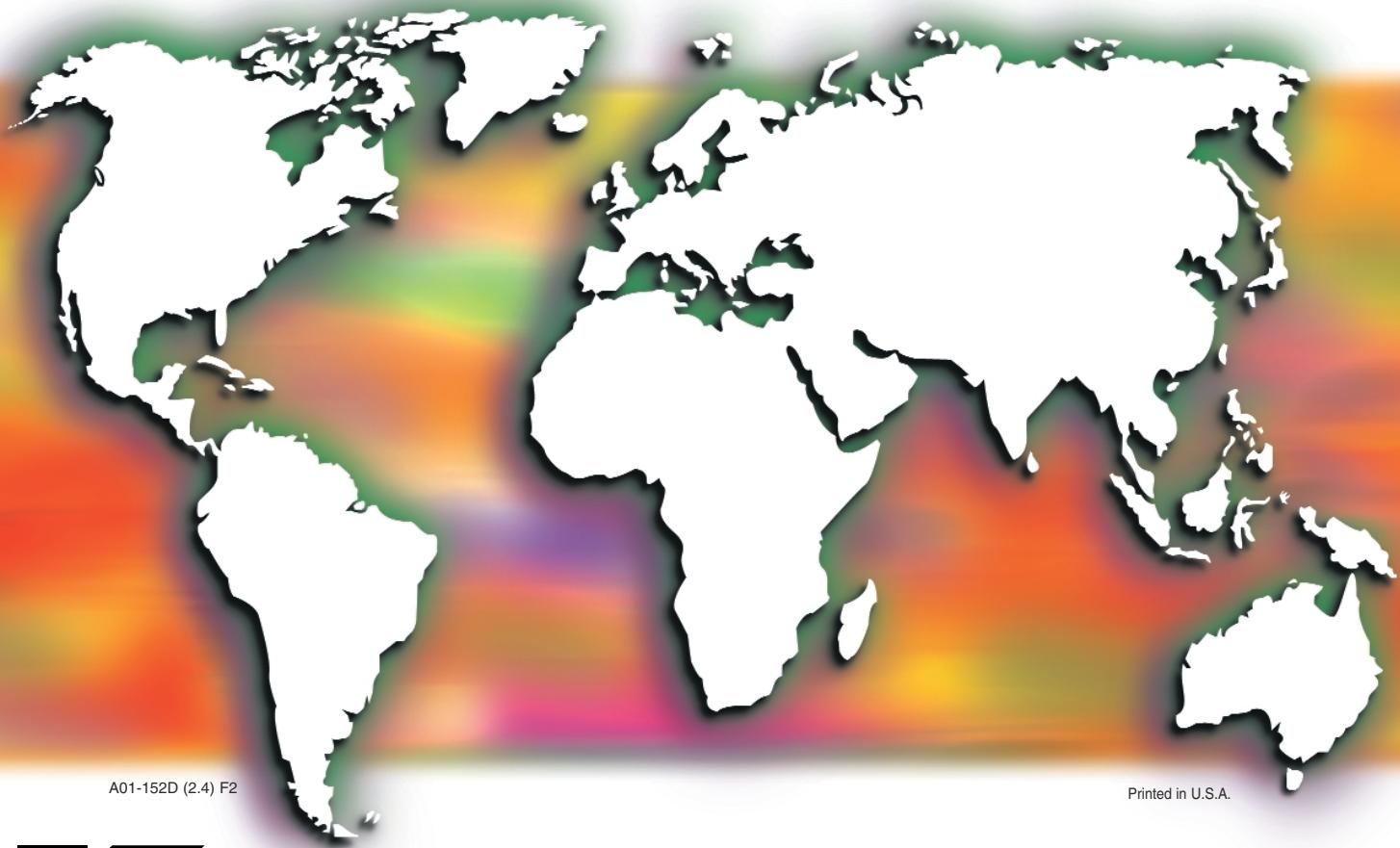
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