



MASTER CATALOG **2018**

VOLUME TWO | **ROTATING TOOLS**



HOLEMAKING | TAPPING | SOLID END MILLING | INDEXABLE MILLING

MaxiMet™

Primary Application

The MaxiMet system provides extraordinary metal removal rates and combines roughing and finishing operations with any aluminum plunging, slotting, and profiling application. Its proprietary flute geometry is designed for high stiffness and improved chip evacuation, and generates exceptional wall to floor perpendicularity in thin-wall applications. To ensure a superior floor surface finish, the MaxiMet front geometry is equipped with a wiper facet grind.

- Use only one tool for roughing and finishing operations.
- Slotting depths up to 1 x D as well as side milling up to 0.5 x D radial and 1.5 x D axial engagement.
- Unequal flute spacing for chatter-free performance with the 3-flute series.
- Multiple corner radii and extended neck configurations available as standard.

Features and Benefits

Advanced Technology

- Increase output with fewer tool changes and increased metal removal rates.
- No specific tools for roughing and finishing necessary.
- Fewer passes due to 1 x D slotting capability.
- Perfect for MQL (minimum quantity lubrication) methods.

Tailored Grades

- K600 uncoated grade for longest tool life in aluminum and other non-ferrous materials.

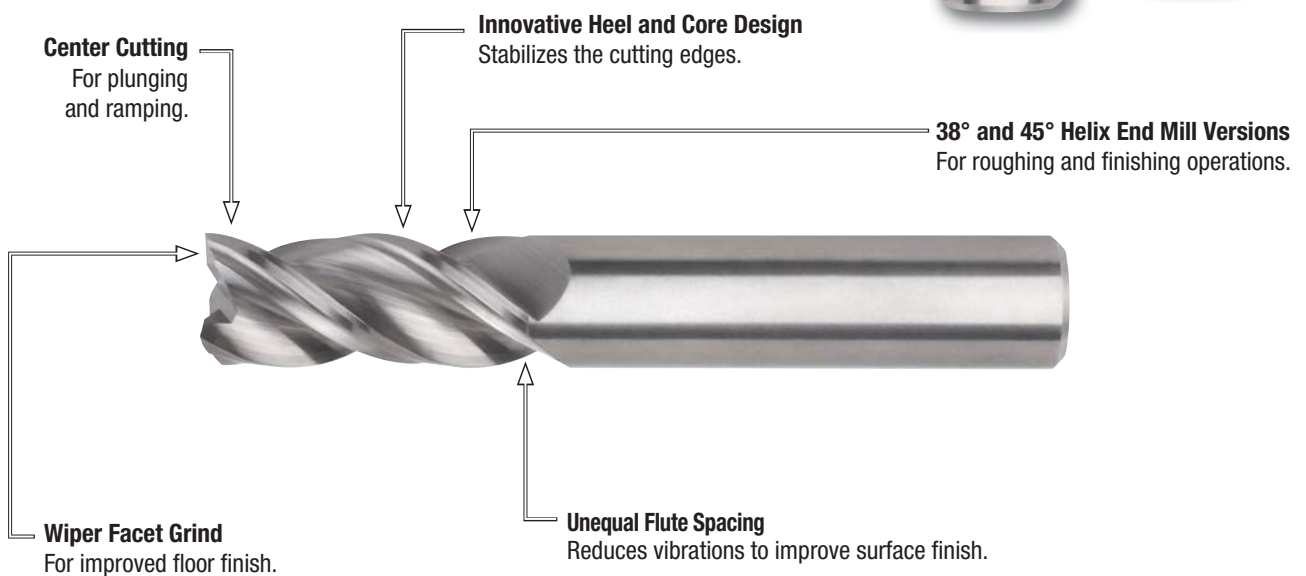
Customization

- Intermediate diameters available.
- Custom solutions available for machining titanium and other high-temperature alloys.
- Internal coolant axial and radial available.
- Various shank options and non-standard coatings available.

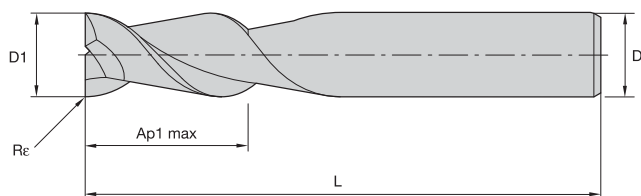
Extensive Standard Offering

- Diameter ranges 3/16–1".
- Extended neck for long-reach applications and radii and sharp corner configurations.

**Solid carbide end mills for
high metal removal rates
and superior surface finishes
in aluminum.**



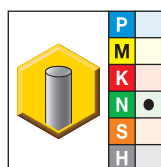
- Kennametal standards dimensions.
- Center cutting.
- Effective in thin wall applications.
- Wiper facet, special end gash, and flute geometry provide better surface finishes.
- Unique geometry delivers maximum metal removal rates.



End Mill Tolerances

D1	tolerance h6	D	tolerance h6
<1/8"	+0/-0.002"	<1/8"	+0/-0.00024"
1/8-7/32"	+0/-0.002"	1/8-7/32"	+0/-0.00031"
1/4-3/8"	+0/-0.00035"	1/4-3/8"	+0/-0.00035"
13/32-11/16"	+0/-0.00043"	13/32-11/16"	+0/-0.00043"
23/32-1 3/16"	+0/-0.00051"	23/32-1 3/16"	+0/-0.00051"

ABDF • Wiper Facet



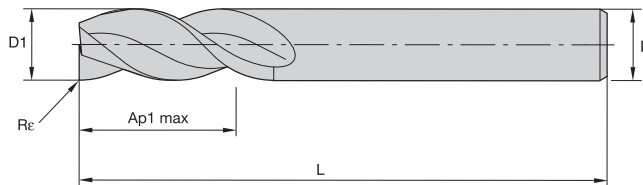
- first choice
- alternate choice

K600	D1	D	Ap1 max	L	Re
ABDF0188J2ARA	3/16	3/16	3/8	2	.015
ABDF0188J2AS	3/16	3/16	3/8	2	—
ABDF0250J2ARA	1/4	1/4	1/2	2 1/2	.015
ABDF0250J2ARB	1/4	1/4	1/2	2 1/2	.030
ABDF0250J2AS	1/4	1/4	1/2	2 1/2	—
ABDF0312J2ARA	5/16	5/16	5/8	2 1/2	.015
ABDF0312J2ARB	5/16	5/16	5/8	2 1/2	.030
ABDF0312J2AS	5/16	5/16	5/8	2 1/2	—
ABDF0375J2ARB	3/8	3/8	3/4	2 1/2	.030
ABDF0375J2AS	3/8	3/8	3/4	2 1/2	—
ABDF0500J2ARB	1/2	1/2	1 1/4	3	.030
ABDF0500J2ARC	1/2	1/2	1 1/4	3	.060
ABDF0500J2ARE	1/2	1/2	1 1/4	3	.120
ABDF0500J2AS	1/2	1/2	1 1/4	3	—
ABDF0625J2AS	5/8	5/8	1 1/4	3 1/2	—
ABDF0625J2BRB	5/8	5/8	1 5/8	3 1/2	.030
ABDF0625J2BRC	5/8	5/8	1 5/8	3 1/2	.060
ABDF0625J2BRE *	5/8	5/8	1 5/8	3 1/2	.120
ABDF0625J2BS	5/8	5/8	1 5/8	3 1/2	—
ABDF0750J2ARB *	3/4	3/4	1 1/2	4	.030
ABDF0750J2ARC	3/4	3/4	1 1/2	4	.060
ABDF0750J2ARE	3/4	3/4	1 1/2	4	.120
ABDF0750J2AS	3/4	3/4	1 1/2	4	—
ABDF0750J2BRB	3/4	3/4	1 5/8	4	.030
ABDF0750J2BRC	3/4	3/4	1 5/8	4	.060
ABDF0750J2BS	3/4	3/4	1 5/8	4	—
ABDF1000J2ARB *	1	1	1 1/2	4	.030
ABDF1000J2ARC	1	1	1 1/2	4	.060
ABDF1000J2ARE *	1	1	1 1/2	4	.120
ABDF1000J2AS *	1	1	1 1/2	4	—
ABDF1000J2BRB *	1	1	2	5	.030
ABDF1000J2BRC	1	1	2	5	.060
ABDF1000J2BS	1	1	2	5	—

NOTE: For application data, see page P122.

*Made-to-order standard item. Standard pricing, manufacturing lead time, and minimum order quantity applies.

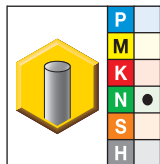
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23/32-1 3/16"	+0/-0.00051"	23/32-1 3/16"	+0/-0.00051"

■ ABDE • Wiper Facet

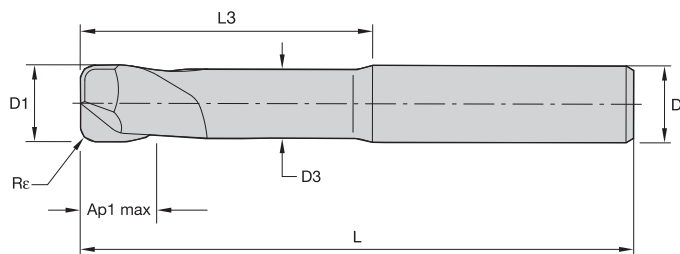


- first choice
- alternate choice

K600	D1	D	Ap1 max	L	Rε
ABDE0188J3ARA	3/16	3/16	7/32	2	.015
ABDE0188J3AS	3/16	3/16	7/32	2	—
ABDE0250J3ARB	1/4	1/4	1/2	2 1/2	.030
ABDE0250J3AS	1/4	1/4	1/2	2 1/2	—
ABDE0312J3ARB	5/16	5/16	5/8	2 1/2	.030
ABDE0312J3AS	5/16	5/16	5/8	2 1/2	—
ABDE0375J3ARB	3/8	3/8	3/4	2 1/2	.030
ABDE0375J3AS	3/8	3/8	3/4	2 1/2	—
ABDE0500J3ARB	1/2	1/2	1 1/4	3	.030
ABDE0500J3ARC	1/2	1/2	1 1/4	3	.060
ABDE0500J3ARE	1/2	1/2	1 1/4	3	.120
ABDE0500J3AS	1/2	1/2	1 1/4	3	—
ABDE0625J3AS	5/8	5/8	1 1/4	3 1/2	—
ABDE0625J3BRB	5/8	5/8	1 5/8	3 1/2	.030
ABDE0625J3BS	5/8	5/8	1 5/8	3 1/2	—
ABDE0750J3ARB	3/4	3/4	1 1/2	4	.030
ABDE0750J3ARC	3/4	3/4	1 1/2	4	.060
ABDE0750J3ARE	3/4	3/4	1 1/2	4	.120
ABDE0750J3AS	3/4	3/4	1 1/2	4	—
ABDE0750J3BRB	3/4	3/4	1 5/8	4	.030
ABDE0750J3BRC	3/4	3/4	1 5/8	4	.060
ABDE0750J3BRE	3/4	3/4	1 5/8	4	.120
ABDE0750J3BS	3/4	3/4	1 5/8	4	—
ABDE1000J3ARB	1	1	1 1/2	4	.030
ABDE1000J3ARC	1	1	1 1/2	4	.060
ABDE1000J3ARE	1	1	1 1/2	4	.120
ABDE1000J3AS	1	1	1 1/2	4	—
ABDE1000J3BRB	1	1	2	5	.030
ABDE1000J3BRC	1	1	2	5	.060
ABDE1000J3BRE	1	1	2	5	.120
ABDE1000J3BS	1	1	2	5	—

NOTE: For application data, see page P122.

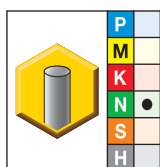
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ABDF • Wiper Facet • Extended Neck

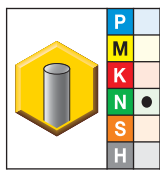


- first choice
- alternate choice

K600	D1	D	D3	Ap1 max	L3	L	Re
ABDF0250J2AQB *	1/4	1/4	.235	3/8	3/4	4	.030
ABDF0250J2BQB	1/4	1/4	.235	3/8	1 1/8	4	.030
ABDF0250J2BQ	1/4	1/4	.235	3/8	1 1/8	4	—
ABDF0250J2CQB	1/4	1/4	.235	3/8	2 1/8	4	.030
ABDF0250J2CQ	1/4	1/4	.235	3/8	2 1/8	4	—
ABDF0312J2AQB	5/16	5/16	.294	7/16	1 1/8	4	.030
ABDF0375J2AQB	3/8	3/8	.352	1/2	1 1/8	4	.030
ABDF0375J2AQ	3/8	3/8	.352	1/2	1 1/8	4	—
ABDF0375J2BQB	3/8	3/8	.352	1/2	2 1/8	4	.030
ABDF0375J2BQ	3/8	3/8	.352	1/2	2 1/8	4	—
ABDF0500J2AQB	1/2	1/2	.469	5/8	1 3/8	4	.030
ABDF0500J2AQE	1/2	1/2	.469	5/8	1 3/8	4	.120
ABDF0500J2AQ	1/2	1/2	.469	5/8	1 3/8	4	—
ABDF0500J2BQB	1/2	1/2	.469	5/8	2 1/4	4	.030
ABDF0500J2BQC	1/2	1/2	.469	5/8	2 1/4	4	.060
ABDF0500J2BQD	1/2	1/2	.469	5/8	2 1/4	4	.090
ABDF0500J2BQE	1/2	1/2	.469	5/8	2 1/4	4	.120
ABDF0500J2BQ	1/2	1/2	.469	5/8	2 1/4	4	—
ABDF0500J2CQB	1/2	1/2	.469	5/8	3 3/8	6	.030
ABDF0500J2CQC	1/2	1/2	.469	5/8	3 3/8	6	.060
ABDF0500J2CQD *	1/2	1/2	.469	5/8	3 3/8	6	.090
ABDF0500J2CQE	1/2	1/2	.469	5/8	3 3/8	6	.120
ABDF0500J2CQ	1/2	1/2	.469	5/8	3 3/8	6	—
ABDF0625J2AQ	5/8	5/8	.587	3/4	1 5/8	4	—
ABDF0625J2BQB	5/8	5/8	.587	3/4	3 3/8	6	.030
ABDF0625J2BQE *	5/8	5/8	.587	3/4	3 3/8	6	.120
ABDF0625J2BQ	5/8	5/8	.587	3/4	3 3/8	6	—
ABDF0750J2AQB *	3/4	3/4	.705	1	1 5/8	4	.030
ABDF0750J2AQE	3/4	3/4	.705	1	1 5/8	4	.120
ABDF0750J2AQ *	3/4	3/4	.705	1	1 5/8	4	—
ABDF0750J2BQB	3/4	3/4	.705	1	2 1/2	6	.030
ABDF0750J2BQC	3/4	3/4	.705	1	2 1/2	6	.060

(continued)

(ABDF • Wiper Facet • Extended Neck — continued)



● first choice

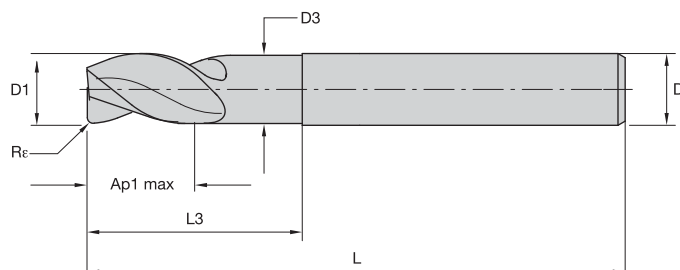
○ alternate choice

K600	D1	D	D3	Ap1 max	L3	L	R _e
ABDF0750J2BQD *	3/4	3/4	.705	1	2 1/2	6	.090
ABDF0750J2BQE	3/4	3/4	.705	1	2 1/2	6	.120
ABDF0750J2BQ	3/4	3/4	.705	1	2 1/2	6	—
ABDF0750J2CQB	3/4	3/4	.705	1	3 3/8	6	.030
ABDF0750J2CQ	3/4	3/4	.705	1	3 3/8	6	—
ABDF1000J2AQB *	1	1	.940	1 1/4	2 3/8	5	.030
ABDF1000J2AQE	1	1	.940	1 1/4	2 3/8	5	.120
ABDF1000J2AQ *	1	1	.940	1 1/4	2 3/8	5	—
ABDF1000J2BQB	1	1	.940	1 1/4	3 3/8	7	.030
ABDF1000J2BQE *	1	1	.940	1 1/4	3 3/8	7	.120
ABDF1000J2BQ *	1	1	.940	1 1/4	3 3/8	7	—
ABDF1000J2CQB *	1	1	.940	1 1/4	4 3/8	7	.030
ABDF1000J2CQ *	1	1	.940	1 1/4	4 3/8	7	—

NOTE: For application data, see page P123.

*Made-to-order standard item. Standard pricing, manufacturing lead time, and minimum order quantity applies.

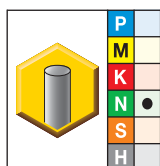
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■ ABDE • Wiper Facet • Extended Neck

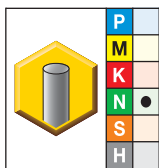


- first choice
- alternate choice

K600	D1	D	D3	Ap1 max	L3	L	Rε
ABDE0250J3AQB	1/4	1/4	.234	3/8	3/4	4	.030
ABDE0250J3AQ	1/4	1/4	.234	3/8	3/4	4	—
ABDE0250J3BQB	1/4	1/4	.234	3/8	1 1/8	4	.030
ABDE0250J3BQ	1/4	1/4	.234	3/8	1 1/8	4	—
ABDE0250J3CQB	1/4	1/4	.234	3/8	2 1/8	4	.030
ABDE0250J3CQ	1/4	1/4	.234	3/8	2 1/8	4	—
ABDE0312J3AQB	5/16	5/16	.293	7/16	1 1/8	4	.030
ABDE0375J3AQB	3/8	3/8	.351	1/2	1 1/8	4	.030
ABDE0375J3AQ	3/8	3/8	.351	1/2	1 1/8	4	—
ABDE0375J3BQB	3/8	3/8	.351	1/2	2 1/8	4	.030
ABDE0375J3BQ	3/8	3/8	.351	1/2	2 1/8	4	—
ABDE0500J3AQB	1/2	1/2	.469	5/8	1 3/8	4	.030
ABDE0500J3AQE	1/2	1/2	.469	5/8	1 3/8	4	.120
ABDE0500J3AQ	1/2	1/2	.469	5/8	1 3/8	4	—
ABDE0500J3BQB	1/2	1/2	.469	5/8	2 1/4	4	.030
ABDE0500J3BQC	1/2	1/2	.469	5/8	2 1/4	4	.060
ABDE0500J3BQD	1/2	1/2	.469	5/8	2 1/4	4	.090
ABDE0500J3BQE	1/2	1/2	.469	5/8	2 1/4	4	.120
ABDE0500J3BQ	1/2	1/2	.469	5/8	2 1/4	4	—
ABDE0500J3CQB	1/2	1/2	.469	5/8	3 3/8	6	.030
ABDE0500J3CQC	1/2	1/2	.469	5/8	3 3/8	6	.060
ABDE0500J3CQD *	1/2	1/2	.469	5/8	3 3/8	6	.090
ABDE0500J3CQE	1/2	1/2	.469	5/8	3 3/8	6	.120
ABDE0500J3CQ	1/2	1/2	.469	5/8	3 3/8	6	—
ABDE0625J3AQB	5/8	5/8	.585	3/4	1 5/8	4	.030
ABDE0625J3AQ	5/8	5/8	.585	3/4	1 5/8	4	—
ABDE0625J3BQB	5/8	5/8	.585	3/4	3 3/8	6	.030
ABDE0625J3BQE	5/8	5/8	.585	3/4	3 3/8	6	.120
ABDE0625J3BQ	5/8	5/8	.585	3/4	3 3/8	6	—
ABDE0750J3AQB	3/4	3/4	.705	1	1 5/8	4	.030
ABDE0750J3AQE *	3/4	3/4	.705	1	1 5/8	4	.120
ABDE0750J3AQ	3/4	3/4	.705	1	1 5/8	4	—

(continued)

(ABDE • Wiper Facet • Extended Neck — continued)



● first choice

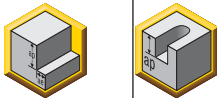
○ alternate choice

K600	D1	D	D3	Ap1 max	L3	L	R _ε
ABDE0750J3BQB	3/4	3/4	.705	1	2 1/2	6	.030
ABDE0750J3BQC	3/4	3/4	.705	1	2 1/2	6	.060
ABDE0750J3BQD	3/4	3/4	.705	1	2 1/2	6	.090
ABDE0750J3BQE	3/4	3/4	.705	1	2 1/2	6	.120
ABDE0750J3BQ	3/4	3/4	.705	1	2 1/2	6	—
ABDE0750J3CQB	3/4	3/4	.705	1	3 3/8	6	.030
ABDE0750J3CQ	3/4	3/4	.705	1	3 3/8	6	—
ABDE1000J3AQB	1	1	.940	1 1/4	2 3/8	5	.030
ABDE1000J3AQE *	1	1	.940	1 1/4	2 3/8	5	.120
ABDE1000J3AQ	1	1	.940	1 1/4	2 3/8	5	—
ABDE1000J3BQB	1	1	.940	1 1/4	3 3/8	7	.030
ABDE1000J3BQE	1	1	.940	1 1/4	3 3/8	7	.120
ABDE1000J3BQ	1	1	.940	1 1/4	3 3/8	7	—
ABDE1000J3CQB *	1	1	.940	1 1/4	4 3/8	7	.030
ABDE1000J3CQ	1	1	.940	1 1/4	4 3/8	7	—

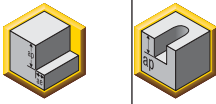
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ABDF...

Material Group															
	Side Milling (A) and Slotting (B)			K600		Recommended feed per tooth (IPT = inch/th) for side milling (A). For slotting (B), reduce IPT by 20%.									
	A		B	Cutting Speed — vc SFM			D1 — Diameter								
	ap	ae	ap	min	max	frac.	3/16	1/4	5/16	3/8	1/2	5/8	3/4	1	
						dec.	.1875	.2500	.3125	.3750	.5000	.6250	.7500	1.0000	
N	1	1.5 x D	0.5 x D	1.0 x D	1640	6560	IPT	.0017	.0023	.0028	.0034	.0045	.0056	.0068	.0090
	2	1.5 x D	0.5 x D	1.0 x D	1640	4920	IPT	.0014	.0018	.0023	.0027	.0036	.0045	.0054	.0072
	3	1.5 x D	0.5 x D	1.0 x D	1640	4920	IPT	.0012	.0016	.0020	.0024	.0032	.0039	.0047	.0063
	4	1.5 x D	0.5 x D	1.0 x D	1310	2460	IPT	.0012	.0016	.0020	.0024	.0032	.0039	.0047	.0063
	5	1.5 x D	0.5 x D	1.0 x D	820	3280	IPT	.0015	.0020	.0025	.0030	.0041	.0051	.0061	.0081

ABDE...

Material Group															
	Side Milling (A) and Slotting (B)			K600		Recommended feed per tooth (IPT = inch/th) for side milling (A). For slotting (B), reduce IPT by 20%.									
	A		B	Cutting Speed — vc SFM			D1 — Diameter								
	ap	ae	ap	min	max	frac.	3/16	1/4	5/16	3/8	1/2	5/8	3/4	1	
						dec.	.1875	.2500	.3125	.3750	.5000	.6250	.7500	1.0000	
N	1	1.5 x D	0.5 x D	1.0 x D	1640	6560	IPT	.0017	.0023	.0028	.0034	.0045	.0056	.0068	.0090
	2	1.5 x D	0.5 x D	1.0 x D	1640	4920	IPT	.0014	.0018	.0023	.0027	.0036	.0045	.0054	.0072
	3	1.5 x D	0.5 x D	1.0 x D	1640	4920	IPT	.0012	.0016	.0020	.0024	.0032	.0039	.0047	.0063
	4	1.5 x D	0.5 x D	1.0 x D	1310	2460	IPT	.0012	.0016	.0020	.0024	.0032	.0039	.0047	.0063
	5	1.5 x D	0.5 x D	1.0 x D	820	3280	IPT	.0015	.0020	.0025	.0030	.0041	.0051	.0061	.0081

NOTE: These guidelines may require variations to achieve optimum results. For better surface finish, reduce feed per tooth.
 Above parameters are based on ideal conditions. For smaller taper machining centers, please adjust parameters accordingly on >1/2" diameter.
 For cutting aluminum with high silicon, coating is recommended.
 Ap for spindle with ceramic bearings, multiply by 0.5.
 For better surface finish, reduce feed per tooth.
 For tools with reach > 3 x D, reduce fz by 20%.
 For tools with reach > 5 x D, reduce fz by 30%.
 For tools with reach > 10 x D, reduce vc and fz by 30%.

■ ABDF... with Neck

Material Group														
		Side Milling (A) and Slotting (B)			K600		Recommended feed per tooth (IPT = inch/th) for side milling (A). For slotting (B), reduce IPT by 20%.							
							D1 — Diameter							
		A		B	Cutting Speed — vc SFM		frac.	1/4	5/16	3/8	1/2	5/8	3/4	1
ap		ae	ap	min	max	dec.	.2500	.3125	.3750	.5000	.6250	.7500	1.0000	
N	1	1 x D	0.5 x D	1.0 x D	1640	6560	IPT	.0025	.0031	.0038	.0050	.0063	.0075	.0100
	2	1 x D	0.5 x D	1.0 x D	1640	4920	IPT	.0020	.0025	.0030	.0040	.0050	.0060	.0080
	3	1 x D	0.5 x D	1.0 x D	1640	4920	IPT	.0018	.0022	.0026	.0035	.0044	.0053	.0070
	4	1 x D	0.5 x D	1.0 x D	1310	2460	IPT	.0018	.0022	.0026	.0035	.0044	.0053	.0070
	5	1 x D	0.5 x D	1.0 x D	820	3280	IPT	.0023	.0028	.0034	.0045	.0056	.0068	.0090

■ ABDE... with Neck

Material Group														
		Side Milling (A) and Slotting (B)			K600		Recommended feed per tooth (IPT = inch/th) for side milling (A). For slotting (B), reduce IPT by 20%.							
							D1 — Diameter							
		A		B	Cutting Speed — vc SFM		frac.	1/4	5/16	3/8	1/2	5/8	3/4	1
ap		ae	ap	min	max	dec.	.2500	.3125	.3750	.5000	.6250	.7500	1.0000	
N	1	1 x D	0.5 x D	1.0 x D	1640	6560	IPT	.0025	.0031	.0038	.0050	.0063	.0075	.0100
	2	1 x D	0.5 x D	1.0 x D	1640	4920	IPT	.0020	.0025	.0030	.0040	.0050	.0060	.0080
	3	1 x D	0.5 x D	1.0 x D	1640	4920	IPT	.0018	.0022	.0026	.0035	.0044	.0053	.0070
	4	1 x D	0.5 x D	1.0 x D	1310	2460	IPT	.0018	.0022	.0026	.0035	.0044	.0053	.0070
	5	1 x D	0.5 x D	1.0 x D	820	3280	IPT	.0023	.0028	.0034	.0045	.0056	.0068	.0090

NOTE: These guidelines may require variations to achieve optimum results. For better surface finish, reduce feed per tooth.
 Above parameters are based on ideal conditions. For smaller taper machining centers, please adjust parameters accordingly on >1/2" diameter.
 For cutting aluminum with high silicon, coating is recommended.
 Ap for spindle with ceramic bearings, multiply by 0.5.
 For better surface finish, reduce feed per tooth.
 For tools with reach > 3 x D, reduce fz by 20%.
 For tools with reach > 5 x D, reduce fz by 30%.
 For tools with reach > 10 x D, reduce vc and fz by 30%.

➤ High-Performance Aluminum Solid Carbide End Mills

Primary Application

High-performance aluminum end mills from Kennametal provide the highest Metal Removal Rates (MRR) and high-quality surfaces while reducing machining time. The center-cutting design enables plunging, slotting, and profiling applications in any type of aluminum workpiece materials. Designed to deliver exceptional chip evacuation and generate the highest floor-to-wall straightness. The portfolio offers many styles to choose from.

- Tools combine roughing and finishing operations beside pure rougher with cord profile.
- Capable of full slot depths up to 1 x D and side milling up to 0.5 x D radially at 1.5 x D axially.
- Multiple corner radii and extended neck configurations available as standard.

Features and Benefits

Advanced Technology

- Double rake flute form for improved chip formation and evacuation.
- No specific tools for roughing and finishing necessary.
- Fewer passes due to 1 x D slotting capability.
- Best suited for MQL (minimum quantity lubrication) applications.

Tailored Grades

- K600 uncoated grade for highest tool life in aluminum and other non-ferrous materials.

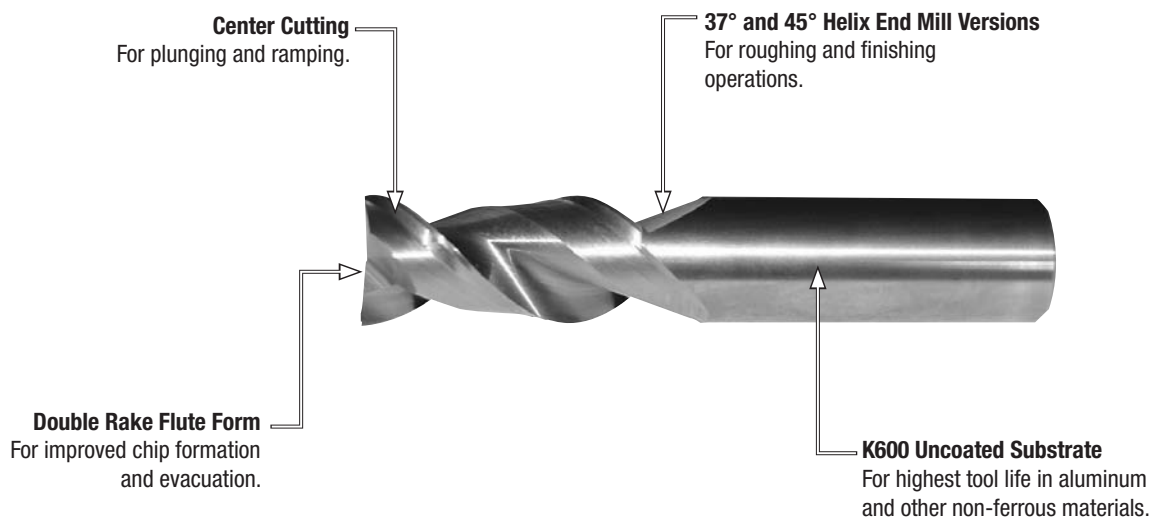
Customization

- Intermediate diameters available.
- Expanded length of tool and increased length of cut are possible.
- Internal coolant axial and radial available.
- Various shank options and non-standard coatings available.
- TiB₂ grade KC651M available as custom solution.

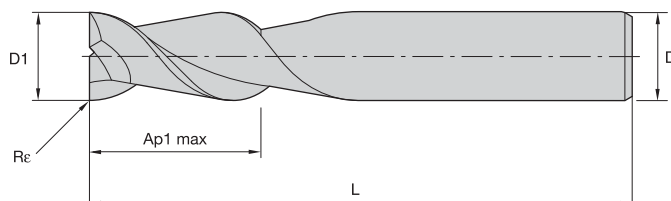
Extensive Standard Offering

- Diameter ranges 1/8–1".
- Extended neck for long-reach applications as well as radii and sharp corner configurations.

Extended neck for long-reach applications as well as radii and sharp corner configurations.



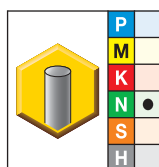
- Double-rake flute form.
- Center cutting.



End Mill Tolerances

D1	tolerance h6	D	tolerance h6
<1/8"	+0/-0.002"	<1/8"	+0/-0.00024"
1/8-7/32"	+0/-0.002"	1/8-7/32"	+0/-0.00031"
1/4-3/8"	+0/-0.00035"	1/4-3/8"	+0/-0.00035"
13/32-11/16"	+0/-0.00043"	13/32-11/16"	+0/-0.00043"
23/32-1 3/16"	+0/-0.00051"	23/32-1 3/16"	+0/-0.00051"

■ AADF • Double-Rake Flute Form

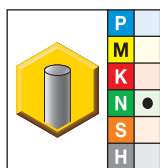


- first choice
- alternate choice

K600	D1	D	Ap1 max	L	Re
AADF0125J2A	1/8	1/8	1/4	2	—
AADF0125J2B	1/8	1/8	1/2	2	—
AADF0188J2A	3/16	3/16	5/16	2	—
AADF0188J2D	3/16	3/16	9/16	2 1/2	—
AADF0188J2B	3/16	3/16	5/8	2	—
AADF0250J2A	1/4	1/4	3/8	2	—
AADF0250J2E	1/4	1/4	5/8	2 1/2	—
AADF0250J2BRA	1/4	1/4	3/4	2 1/2	.015
AADF0250J2BRB	1/4	1/4	3/4	2 1/2	.030
AADF0250J2B	1/4	1/4	3/4	2 1/2	—
AADF0250J2FRB	1/4	1/4	1	3	.030
AADF0250J2F	1/4	1/4	1	3	—
AADF250J2I	1/4	1/4	1 1/8	3	—
AADF0250J2C	1/4	1/4	1 1/4	3 1/4	—
AADF0250J2G	1/4	1/4	1 3/4	4	—
AADF0375J2B	3/8	3/8	7/8	2 1/2	—
AADF0375J2DRA	3/8	3/8	1	3	.015
AADF0375J2DRB	3/8	3/8	1	3	.030
AADF0375J2D	3/8	3/8	1	3	—
AADF375J2H	3/8	3/8	1 1/8	3	—
AADF0375J2E	3/8	3/8	1 1/4	3 1/2	—
AADF0375J2CRB	3/8	3/8	1 1/2	4	.030
AADF0375J2CRC	3/8	3/8	1 1/2	4	.060
AADF0375J2C	3/8	3/8	1 1/2	4	—
AADF375J2G	3/8	3/8	1 3/4	4	—
AADF0500J2A	1/2	1/2	5/8	2 1/2	—
AADF0500J2E	1/2	1/2	5/8	3	—
AADF0500J2FRB	1/2	1/2	1	3	.030

(continued)

(AADF • Double-Rake Flute Form — continued)



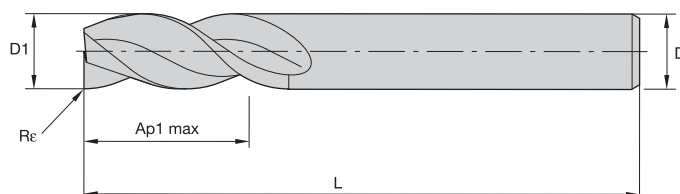
● first choice

○ alternate choice

K600	D1	D	Ap1 max	L	Re
AADF0500J2F	1/2	1/2	1	3	—
AADF500J2F	1/2	1/2	1	3	—
AADF0500J2BRA	1/2	1/2	1 1/4	3	.015
AADF0500J2BRB	1/2	1/2	1 1/4	3	.030
AADF0500J2B	1/2	1/2	1 1/4	3	—
AADF500J2B	1/2	1/2	1 1/4	3	—
AADF0500J2GRA	1/2	1/2	1 5/8	4	.015
AADF0500J2GRB	1/2	1/2	1 5/8	4	.030
AADF0500J2GRC	1/2	1/2	1 5/8	4	.060
AADF0500J2G	1/2	1/2	1 5/8	4	—
AADF0500J2CRA	1/2	1/2	2	4	.015
AADF0500J2CRB	1/2	1/2	2	4	.030
AADF0500J2CRC	1/2	1/2	2	4	.060
AADF0500J2C	1/2	1/2	2	4	—
AADF0500J2D	1/2	1/2	2	5	—
AADF0625J2BRB	5/8	5/8	2 1/4	5	.030
AADF0625J2FRB	5/8	5/8	2 1/2	5	.030
AADF0625J2GRB	5/8	5/8	3 1/4	6	.030
AADF0750J2F	3/4	3/4	1	4	—
AADF0750J2BRB	3/4	3/4	1 1/2	4	.030
AADF0750J2B	3/4	3/4	1 1/2	4	—
AADF0750J2CRA	3/4	3/4	2 1/4	5	.015
AADF0750J2CRB	3/4	3/4	2 1/4	5	.030
AADF0750J2C	3/4	3/4	2 1/4	5	—
AADF0750J2GRA	3/4	3/4	3 1/4	6	.015
AADF1000J2A	1	1	1 1/2	4	—
AADF1000J2D	1	1	2	5	—
AADF1000J2BRB	1	1	2 1/4	5	.030
AADF1000J2C	1	1	3	5	—

NOTE: For application data, see page P132.

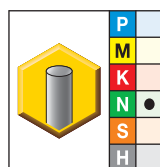
- Double-rake flute form.
- Center cutting.



End Mill Tolerances

D1	tolerance h6	D	tolerance h6
<1/8"	+0/-0.002"	<1/8"	+0/-0.00024"
1/8–7/32"	+0/-0.002"	1/8–7/32"	+0/-0.00031"
1/4–3/8"	+0/-0.00035"	1/4–3/8"	+0/-0.00035"
13/32–11/16"	+0/-0.00043"	13/32–11/16"	+0/-0.00043"
23/32–1 3/16"	+0/-0.00051"	23/32–1 3/16"	+0/-0.00051"

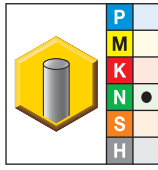
AADE • Double-Rake Flute Form



- first choice
- alternate choice

K600	D1	D	Ap1 max	L	Re
AADE125J3G	1/8	1/8	1/4	1 1/2	—
AADE125J3F	1/8	1/8	3/8	1 1/2	—
AADE0125J3D	1/8	1/8	1/2	3	—
AADE0125J3E	1/8	1/8	3/4	3	—
AADE0188J3C	3/16	3/16	5/16	3	—
AADE188J3F	3/16	3/16	9/16	2	—
AADE0188J3D	3/16	3/16	9/16	3	—
AADE0188J3E	3/16	3/16	3/4	3	—
AADE0250J3ARB	1/4	1/4	3/8	2	.030
AADE0250J3A	1/4	1/4	3/8	2	—
AADE0250J3D	1/4	1/4	1/2	2 1/2	—
AADE0250J3E	1/4	1/4	5/8	2 1/2	—
AADE0250J3BRA	1/4	1/4	3/4	2 1/2	.015
AADE0250J3BRB	1/4	1/4	3/4	2 1/2	.030
AADE0250J3B	1/4	1/4	3/4	2 1/2	—
AADE250J3B	1/4	1/4	3/4	2 1/2	—
AADE0250J3FRA	1/4	1/4	1	3	.015
AADE0250J3F	1/4	1/4	1	3	—
AADE250J3H	1/4	1/4	1 1/4	3	—
AADE0250J3CRA	1/4	1/4	1 1/4	3 1/4	.015
AADE0250J3CRB	1/4	1/4	1 1/4	3 1/4	.030
AADE0250J3C	1/4	1/4	1 1/4	3 1/4	—
AADE0250J3G	1/4	1/4	1 3/4	4	—
AADE0312J3A	5/16	5/16	13/16	2 1/2	—
AADE0312J3B	5/16	5/16	1	3	—
AADE0312J3DRB	5/16	5/16	1 1/4	3 1/4	.030
AADE0312J3D	5/16	5/16	1 1/4	3 1/4	—
AADE0375J3A	3/8	3/8	1/2	2	—
AADE0375J3F	3/8	3/8	1/2	3	—
AADE0375J3G	3/8	3/8	3/4	2 1/2	—
AADE0375J3BRB	3/8	3/8	7/8	2 1/2	.030
AADE0375J3BRC	3/8	3/8	7/8	2 1/2	.060

(continued)

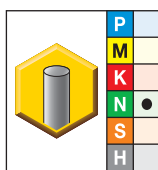
(AADE • Double-Rake Flute Form — continued)


- first choice
- alternate choice

K600	D1	D	Ap1 max	L	R _ε
AADE0375J3B	3/8	3/8	7/8	2 1/2	—
AADE0375J3DRA	3/8	3/8	1	3	.015
AADE0375J3DRB	3/8	3/8	1	3	.030
AADE0375J3D	3/8	3/8	1	3	—
AADE375J3I	3/8	3/8	1 1/8	3	—
AADE0375J3ERA	3/8	3/8	1 1/4	3 1/2	.015
AADE0375J3ERB	3/8	3/8	1 1/4	3 1/2	.030
AADE0375J3ERC	3/8	3/8	1 1/4	3 1/2	.060
AADE0375J3E	3/8	3/8	1 1/4	3 1/2	—
AADE0375J3CRB	3/8	3/8	1 1/2	4	.030
AADE0375J3CRC	3/8	3/8	1 1/2	4	.060
AADE0375J3C	3/8	3/8	1 1/2	4	—
AADE0375J3H	3/8	3/8	2	4	—
AADE0375J3KRB	3/8	3/8	2 1/2	4	.030
AADE0375J3KRC	3/8	3/8	2 1/2	4	.060
AADE0375J3J	3/8	3/8	2 1/2	5	—
AADE438J3A	7/16	7/16	9/16	2 1/2	—
AADE0438J3A	7/16	7/16	7/8	2 1/2	—
AADE0500J3ARB	1/2	1/2	5/8	2 1/2	.030
AADE0500J3ARC	1/2	1/2	5/8	2 1/2	.060
AADE0500J3A	1/2	1/2	5/8	2 1/2	—
AADE0500J3FRA	1/2	1/2	1	3	.015
AADE0500J3FRB	1/2	1/2	1	3	.030
AADE0500J3FRC	1/2	1/2	1	3	.060
AADE0500J3F	1/2	1/2	1	3	—
AADE0500J3BRA	1/2	1/2	1 1/4	3	.015
AADE0500J3BRB	1/2	1/2	1 1/4	3	.030
AADE0500J3BRC	1/2	1/2	1 1/4	3	.060
AADE0500J3BRE	1/2	1/2	1 1/4	3	.120
AADE0500J3B	1/2	1/2	1 1/4	3	—
AADE0500J3KRB	1/2	1/2	1 1/2	4	.030
AADE0500J3KRC	1/2	1/2	1 1/2	4	.060
AADE0500J3K	1/2	1/2	1 1/2	4	—
AADE0500J3GRB	1/2	1/2	1 5/8	4	.030
AADE0500J3GRC	1/2	1/2	1 5/8	4	.060
AADE0500J3GRD	1/2	1/2	1 5/8	4	.090
AADE0500J3G	1/2	1/2	1 5/8	4	—
AADE0500J3CRA	1/2	1/2	2	4	.015
AADE0500J3CRB	1/2	1/2	2	4	.030
AADE0500J3CRC	1/2	1/2	2	4	.060
AADE0500J3C	1/2	1/2	2	4	—
AADE500J3H	1/2	1/2	2	4 1/2	—
AADE0500J3DRB	1/2	1/2	2 1/2	5	.030
AADE0500J3DRC	1/2	1/2	2 1/2	5	.060
AADE0500J3D	1/2	1/2	2 1/2	5	—
AADE0500J3LRB	1/2	1/2	3	5	.030
AADE0500J3LRC	1/2	1/2	3	5	.060
AADE0500J3L	1/2	1/2	3	5	—
AADE0500J3H	1/2	1/2	3 1/8	6	—
AADE625J3I	5/8	5/8	3/4	3	—
AADE0625J3A	5/8	5/8	1 1/4	3 1/2	—
AADE0625J3DRA	5/8	5/8	1 5/8	3 1/2	.015

(continued)

(AADE • Double-Rake Flute Form — continued)

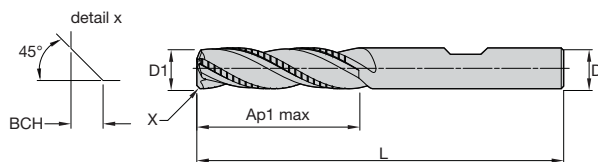


- first choice
- alternate choice

K600	D1	D	Ap1 max	L	Re
AADE0625J3DRE	5/8	5/8	1 5/8	3 1/2	.120
AADE0625J3D	5/8	5/8	1 5/8	3 1/2	—
AADE0625J3E	5/8	5/8	2 1/8	4	—
AADE0625J3B	5/8	5/8	2 1/4	5	—
AADE0625J3FRE	5/8	5/8	2 1/2	5	.120
AADE0625J3F	5/8	5/8	2 1/2	5	—
AADE0625J3HRC	5/8	5/8	3	5 1/4	.060
AADE0625J3H	5/8	5/8	3	5 1/4	—
AADE0625J3G	5/8	5/8	3 1/4	6	—
AADE0750J3ARB	3/4	3/4	7/8	3	.030
AADE0750J3ARC	3/4	3/4	7/8	3	.060
AADE0750J3A	3/4	3/4	7/8	3	—
AADE0750J3K	3/4	3/4	1	3	—
AADE0750J3F	3/4	3/4	1	4	—
AADE0750J3BRB	3/4	3/4	1 1/2	4	.030
AADE0750J3BRC	3/4	3/4	1 1/2	4	.060
AADE0750J3BRE	3/4	3/4	1 1/2	4	.120
AADE0750J3B	3/4	3/4	1 1/2	4	—
AADE0750J3HRB	3/4	3/4	1 5/8	4	.030
AADE0750J3HRD	3/4	3/4	1 5/8	4	.090
AADE0750J3H	3/4	3/4	1 5/8	4	—
AADE0750J3CRA	3/4	3/4	2 1/4	5	.015
AADE0750J3CRB	3/4	3/4	2 1/4	5	.030
AADE0750J3CRC	3/4	3/4	2 1/4	5	.060
AADE0750J3CRE	3/4	3/4	2 1/4	5	.120
AADE0750J3C	3/4	3/4	2 1/4	5	—
AADE0750J3DRB	3/4	3/4	3	5 1/4	.030
AADE0750J3DRC	3/4	3/4	3	5 1/4	.060
AADE0750J3D	3/4	3/4	3	5 1/4	—
AADE0750J3GRA	3/4	3/4	3 1/4	6	.015
AADE0750J3GRB	3/4	3/4	3 1/4	6	.030
AADE0750J3GRD	3/4	3/4	3 1/4	6	.090
AADE0750J3GRE	3/4	3/4	3 1/4	6	.120
AADE0750J3G	3/4	3/4	3 1/4	6	—
AADE0750J3K	3/4	3/4	4	6 1/4	—
AADE0750J3J	3/4	3/4	4	6 1/2	—
AADE1000J3ARB	1	1	1 1/2	4	.030
AADE1000J3A	1	1	1 1/2	4	—
AADE1000J3K	1	1	2	4 1/2	—
AADE1000J3D	1	1	2	5	—
AADE1000J3BRC	1	1	2 1/4	5	.060
AADE1000J3B	1	1	2 1/4	5	—
AADE1000J3GRB	1	1	2 5/8	6	.030
AADE1000J3CRB	1	1	3	5 1/2	.030
AADE1000J3CRC	1	1	3	5 1/2	.060
AADE1000J3C	1	1	3	5 1/2	—
AADE1000J3ERA	1	1	3 1/4	6	.015
AADE1000J3ERB	1	1	3 1/4	6	.030
AADE1000J3ERE	1	1	3 1/4	6	.120
AADE1000J3E	1	1	3 1/4	6	—
AADE1000J3I	1	1	4	7	—
AADE1000J3HRA	1	1	4 1/8	7	.015
AADE1000J3H	1	1	4 1/8	7	—

NOTE: For application data, see page P132.

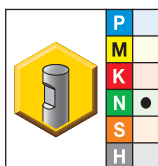
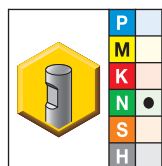
- Kennametal standard dimensions.
- Center cutting.
- Coarse pitch profile.



End Mill Tolerances

D1	d11	D	tolerance h6
<1/8"	-.0008/- .0031"	<1/8"	+0/- .00024"
1/8-7/32"	-.0012/- .0041"	1/8-7/32"	+0/- .00031"
1/4-3/8"	-.0016/- .0051"	1/4-3/8"	+0/- .00035"
13/32-11/16"	-.002/- .0063"	13/32-11/16"	+0/- .00043"
23/32-1-3/16"	-.0026/- .0077"	23/32-1-3/16"	+0/- .00051"

■ SFRHEC • Roughing Profile



- first choice
- alternate choice

K600	KC625M	D1	D	Ap1 max	L	BCH
SFRHEC250S3075	—	1/4	1/4	3/4	2 1/2	.024
—	SFRHEC312S3075	5/16	5/16	3/4	2 1/2	.024
SFRHEC375S3088	SFRHEC375S3088	3/8	3/8	7/8	2 1/2	.024
SFRHEC500S3100	SFRHEC500S3100	1/2	1/2	1	3	.039
SFRHEC500S3200	SFRHEC500S3200	1/2	1/2	2	4 1/2	.039
SFRHEC625S3225	SFRHEC625S3225	5/8	5/8	2 1/4	5	.039
SFRHEC750S3150	SFRHEC750S3150	3/4	3/4	1 1/2	4	.039
SFRHEC750S3225	SFRHEC750S3225	3/4	3/4	2 1/4	5	.039
—	SFRHEC100S3150	1	1	1 1/2	4	.039
SFRHEC100S3225	SFRHEC100S3225	1	1	2 1/4	5	.039

NOTE: For application data, see page P132.

■ AADF

Material Group																	
	Side Milling (A) and Slotting (B)			K600		Recommended feed per tooth (IPT = inch/th) for side milling (A). For slotting (B), reduce IPT by 20%.											
	A		B	Cutting Speed — vc SFM			D1 — Diameter										
	ap	ae	ap	min	max	frac. dec.	1/8	3/16	1/4	5/16	3/8	1/2	5/8	3/4	1		
N	1	1.5 x D	0.5 x D	1.0 x D	1640	6560	IPT	.0011	.0017	.0023	.0028	.0034	.0045	.0056	.0068	.0090	
	2	1.5 x D	0.5 x D	1.0 x D	1640	4920	IPT	.0009	.0014	.0018	.0023	.0027	.0036	.0045	.0054	.0072	
	3	1.5 x D	0.5 x D	1.0 x D	1640	4920	IPT	.0008	.0012	.0016	.0020	.0024	.0032	.0039	.0047	.0063	
	4	1.5 x D	0.5 x D	1.0 x D	1310	2460	IPT	.0008	.0012	.0016	.0020	.0024	.0032	.0039	.0047	.0063	
	5	1.5 x D	0.5 x D	1.0 x D	820	3280	IPT	.0010	.0015	.0020	.0025	.0030	.0041	.0051	.0061	.0081	

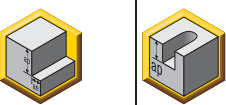
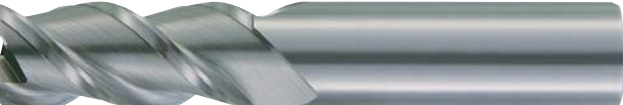
NOTE: These guidelines may require variations to achieve optimum results.

Lower value of cutting speed is used for high stock removal applications or for higher hardness (machinability) within group.

Higher value of cutting speed is used for finishing applications or for lower hardness (machinability) within group.

Above parameters are based on ideal conditions. For smaller taper machining centers, please adjust parameters accordingly on >1/2" diameter.

■ AADE

Material Group																		
	Side Milling (A) and Slotting (B)				K600		Recommended feed per tooth (IPT = inch/th) for side milling (A). For slotting (B), reduce IPT by 20%.											
	A		B	Cutting Speed — vc SFM			D1 — Diameter											
	ap	ae	ap	min	max	frac. dec.	1/8	3/16	1/4	5/16	3/8	1/2	5/8	3/4	1			
N	1	1.5 x D	0.5 x D	1.0 x D	1640	6560	IPT	.0011	.0017	.0023	.0028	.0034	.0045	.0056	.0068	.0090		
	2	1.5 x D	0.5 x D	1.0 x D	1640	4920	IPT	.0009	.0014	.0018	.0023	.0027	.0036	.0045	.0054	.0072		
	3	1.5 x D	0.5 x D	1.0 x D	1640	4920	IPT	.0008	.0012	.0016	.0020	.0024	.0032	.0039	.0047	.0063		
	4	1.5 x D	0.5 x D	1.0 x D	1310	2460	IPT	.0008	.0012	.0016	.0020	.0024	.0032	.0039	.0047	.0063		
	5	1.5 x D	0.5 x D	1.0 x D	820	3280	IPT	.0010	.0015	.0020	.0025	.0030	.0041	.0051	.0061	.0081		

NOTE: These guidelines may require variations to achieve optimum results.

Lower value of cutting speed is used for high stock removal applications or for higher hardness (machinability) within group.

Higher value of cutting speed is used for finishing applications or for lower hardness (machinability) within group.

Above parameters are based on ideal conditions. For smaller taper machining centers, please adjust parameters accordingly on >1/2" diameter.

■ SFRHEC

Material Group													
		Side Milling (A) and Slotting (B)			K600/KC625M		Feed per Tooth — fz information is for side milling (A). For slotting (B), reduce fz by 20%.						
		A		B	Cutting Speed — vc SFM		frac.	D1 — Diameter					
		ap	ae	ap	min	max	dec.	1/4	3/8	1/2	5/8	3/4	1
N	1	1.25 x D	0.5 x D	1 x D	1650	6500	fz	.0028	.0041	.0055	.0070	.0085	.0110
	2	1.25 x D	0.5 x D	1 x D	1650	5050	fz	.0025	.0037	.0050	.0060	.0075	.0010

NOTE: These guidelines may require variations to achieve optimum results.

Lower value of cutting speed is used for high stock removal applications or for higher hardness (machinability) within group.

Higher value of cutting speed is used for finishing applications or for lower hardness (machinability) within group.

Above parameters are based on ideal conditions. For smaller taper machining centers, please adjust parameters accordingly on >1/2" diameter.

NOVO KNOWS CAD/CAM

With the addition of NOVO™ applications to your team, your CAD/CAM capabilities become much more accurate, streamlined, and productive.

Before NOVO: The programmer would be in their CAD/CAM software, programming a part. Using the tedious method of finding a tool in a catalog, and then manually inputting the tooling information from the catalog into the CAD/CAM software.

The concern is that assumptions are made, and only partial tooling information is entered.

With NOVO: The powerful digital intelligence of NOVO applications not only help the programmer find the right tool for the metalcutting job, but also automatically integrates all the tooling data into a complete CAD/CAM solution. The integration of all the tooling data increases the viability of the part being programmed, and is delivered quickly — saving you time.

NOVO applications can ensure you have the right tools on your machines, in the right sequence. Resulting in flawless execution that accelerates every job, and maximizes every shift. kennametal.com/novo



➤ CFRP KCN05™ Beyond™ Grade

Solid Carbide Routers

Primary Application

KCN05 solid carbide router products provide excellent tool life and produce smooth finishes with improved edge quality when machining difficult CFRP (carbon-fiber reinforced polymer) and non-ferrous components. The unique geometries are free cutting, reduce heat generation, and provide high-quality machined surfaces.

- Designed to avoid delamination and bur formation.
- Excellent tool life due to KCN05 diamond film coating.

Features and Benefits

Advanced Technology

- Compression-style routers for trimming designed to provide high feed rates and quality edges on both sides of the material. Up-cut/down-cut geometry promotes stable cutting conditions.
- Down-cut style routers intended for surface work. Excellent ramping capabilities eliminate surface delamination machining pockets.
- Bur style for highest material removal rates and superior surface quality. Designed for trimming fiberglass and CFRP, and for slotting and profiling.

Tailored Grades

- KCN05 diamond coating uses a proprietary substrate to optimize coating adhesion and improve tool life.

Customization

- Intermediate diameters available.
- Compression routers with six and eight flutes available for special wire CFRP.
- Bur-style routers with end cutting, drill-point cutting, and non-end cutting point styles available on request.
- K600 uncoated grade for fiberglass applications and as an economic alternative to KCN05 routers.

Extensive Standard Offering

- Diameters 1/4, 3/8, and 1/2".
- Different length versions.
- KCN05 routers.



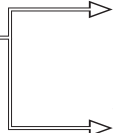
Up-Cut/Down-Cut Geometry

Prevents delamination because cutting forces are directed inside the workpiece.



KCN05™ Diamond Coating

For excellent tool life and smooth finishes with improved edge quality.



Highest Number of Cutting Edges

For excellent temperature control and highest metal removal rates.

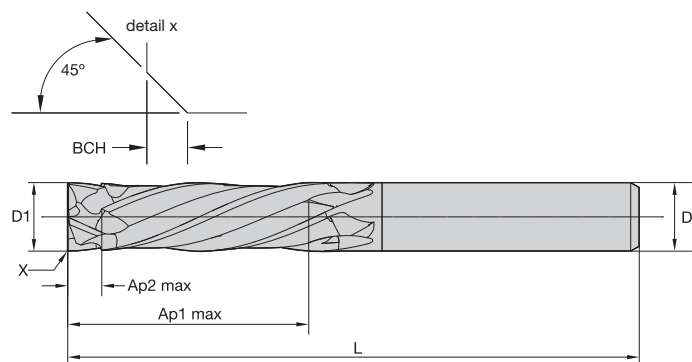


Extended Length of Cut Version

Enables machining in different levels for multiplying tool life of same tool.



- Kennametal standard dimensions.
- Aerospace composites and fiberglass.
- Internal air coolant for ZU = 4.

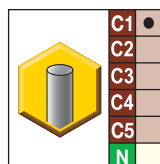


End Mill Tolerances

D1	tolerance	D	tolerance h6
All	+.000/- .003"	≤1/8"	+0/- .00024"
		>1/8-1/4"	+0/- .00031"
		>1/4-3/8"	+0/- .00035"
		>3/8-23/32"	+0/- .00043"
		>23/32-1 3/16"	+0/- .00051"



■ Compression-Style Router • CCNC • Inch



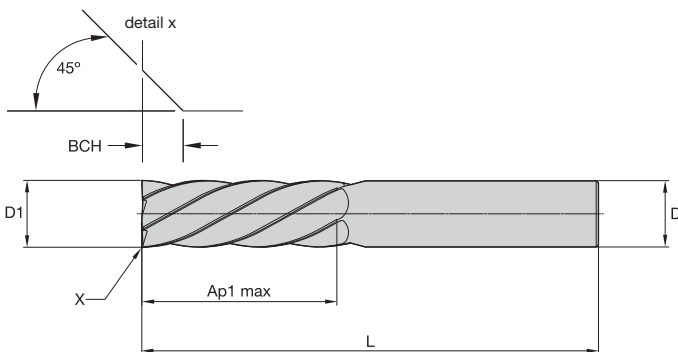
- first choice
- alternate choice

KCN05	D1	D	Ap1 max	Ap2 max	L	BCH	Z U
CCNC0250J3AH	1/4	1/4	3/4	0.1250	2 1/2	.005	3
CCNC0250J3BH	1/4	1/4	1 1/2	0.1250	4	.005	3
CCNC0375J4AH	3/8	3/8	3/4	0.1250	3 1/4	.005	4
CCNC0375J4BH	3/8	3/8	1 1/2	0.1250	4	.005	4
CCNC0500J4AH	1/2	1/2	3/4	0.1250	3 1/4	.005	4
CCNC0500J4BH	1/2	1/2	1 1/2	0.1250	4	.005	4

NOTE: For application data, see page P139.

C1	CFRP, CFRP/CFRP
C2	CFRP/Aluminum
C3	CFRP/Titanium
C4	CFRP/Stainless Steel
C5	CFRP/Aluminum/Titanium

- Kennametal standard dimensions.
- Aerospace composites and fiberglass.

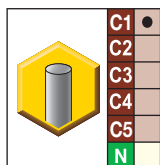


End Mill Tolerances

D1	tolerance	D	tolerance h6
All	+.000/- .003"	≤1/8"	+0/- .00024"
		>1/8-1/4"	+0/- .00031"
		>1/4-3/8"	+0/- .00035"
		>3/8-23/32"	+0/- .00043"
		>23/32-1 3/16"	+0/- .00051"



Down-Cut Router • CDDC • Inch



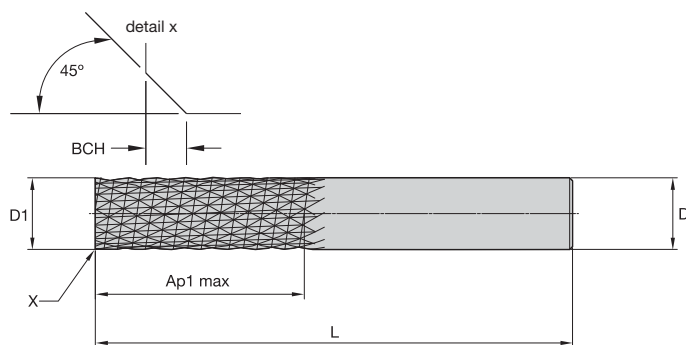
- first choice
- alternate choice

KCN05	D1	D	Ap1 max	L	BCH
CDDC0250J6AH	1/4	1/4	3/4	2 1/2	.010
CDDC0250J6BH	1/4	1/4	1 1/2	4	.010
CDDC0375J6AH	3/8	3/8	3/4	3 1/4	.010
CDDC0375J6BH	3/8	3/8	1 1/2	4	.010
CDDC0500J6AH	1/2	1/2	3/4	3 1/4	.010
CDDC0500J6BH	1/2	1/2	1 1/2	4	.010

NOTE: For application data, see page P139.

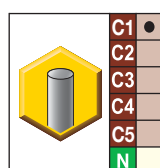
C1	CFRP, CFRP/CFRP
C2	CFRP/Aluminum
C3	CFRP/Titanium
C4	CFRP/Stainless Steel
C5	CFRP/Aluminum/Titanium

- Kennametal standard dimensions.
- Aerospace composites and fiberglass.



beyond

Bur-Style Router • CBDB • Inch



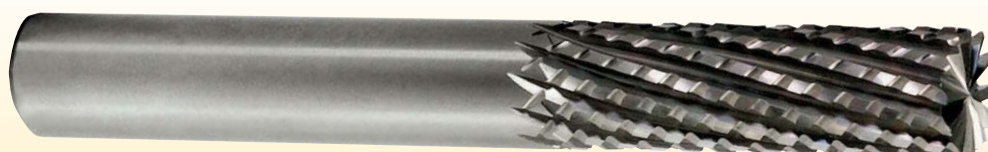
- first choice
- alternate choice

KCN05	D1	D	Ap1 max	L	BCH
CBDB0250JXAS	1/4	1/4	3/4	2 1/2	.020
CBDB0250JXBS	1/4	1/4	1 1/2	4	.020
CBDB0375JXAS	3/8	3/8	3/4	3 1/4	.035
CBDB0375JXBS	3/8	3/8	1 1/2	4	.035
CBDB0500JXAS	1/2	1/2	3/4	3 1/4	.045
CBDB0500JXBS	1/2	1/2	1 1/2	4	.045

NOTE: For application data, see page P139.
12 RHS/RHC flutes. 10 LHS/RHC flutes, 6 end teeth.
For tolerance table, see page P137.

C1	CFRP, CFRP/CFRP
C2	CFRP/Aluminum
C3	CFRP/Titanium
C4	CFRP/Stainless Steel
C5	CFRP/Aluminum/Titanium

Additional point styles are available upon request:



End Mill End Cutting



Drill-Point Cutting



Non-End Cutting

■ Compression-Style Router • CCNC • Inch

Material Group									
	Side Milling (A)		 KCN05		Feed per Tooth — fz information is for side milling (A).				
	A		Cutting Speed — vc SFM		D1 — Diameter				
	ap	ae	min	max	frac	1/4	3/8	1/2	
C	1	Ap1 max	0.5 x D	330	500	fz	.0007	.0012	.0014

NOTE: Lower value of cutting speed is used for high stock removal applications or for higher hardness (machinability) within group.
Higher value of cutting speed is used for finishing applications or for lower hardness (machinability) within group.
Above parameters are based on ideal conditions. For smaller taper machining centers, please adjust parameters accordingly on >1/2" diameter.

■ Down-Cut Router • CDDC • Inch

Material Group									
	Side Milling (A)		 KCN05		Feed per Tooth — fz information is for side milling (A).				
	A		Cutting Speed — vc SFM		D1 — Diameter				
	ap	ae	min	max	frac	1/4	3/8	1/2	
C	1	Ap1 max	1 x D	330	500	fz	.0018	.0030	.0036

NOTE: Lower value of cutting speed is used for high stock removal applications or for higher hardness (machinability) within group.
Higher value of cutting speed is used for finishing applications or for lower hardness (machinability) within group.
Above parameters are based on ideal conditions. For smaller taper machining centers, please adjust parameters accordingly on >1/2" diameter.

■ Burr-Style Router • CBDB • Inch

Material Group										
	Side Milling (A) and Slotting (B)			 KCN05		Feed per Revolution — Inch per revolution (IPR) information is for side milling (A). For Slotting (B), reduce IPR by 10%.				
	A		B	Cutting Speed — vc SFM			D1 — Diameter			
	ap	ae	ap	min	max	frac	1/4	3/8	1/2	
C	1	Ap1 max	0.2 x D	1 x D	330	500	IPR	.0059	.0098	.0118

NOTE: Lower value of cutting speed is used for high stock removal applications or for higher hardness (machinability) within group.
Higher value of cutting speed is used for finishing applications or for lower hardness (machinability) within group.
Above parameters are based on ideal conditions. For smaller taper machining centers, please adjust parameters accordingly on >1/2" diameter.

KenFeed™

Primary Application

The numerous effective cutting edges of KenFeed end mills make them the right choice for machining heat-treated steels up to 67 HRC. The KenFeed system combines roughing and semi-finishing into one tool by taking very shallow-depth cuts at extremely high feed rates to maximize metal removal. The 3 x D neck and extended-reach design is perfectly suited for pocketing using 3D machining techniques, such as ramping and helical interpolation. During face milling, the proprietary front end geometry of the KenFeed system is entirely in contact with the workpiece, providing up to 55% engagement compared to regular ball nose-type tooling that provides only 5–10%.

- Unique tool with new 6-flute style for high productivity.
- Innovative new geometry maximizes metal removal rates.
- High metal removal rates help to reduce manufacturing costs.

Features and Benefits

Advanced Technology

- Provides the benefits of indexable-style high-feed milling starting at 1/4".
- One tool for roughing and semi-finishing operations.
- Increases output by performing 3D machining, helical ramping, circular interpolation, face milling, and pocketing.
- Use in hardened materials from 40 to 67 HRC with two dedicated geometry variants.

Tailored Grades

- KC639M AlTiN-coated grade for longest tool life in hardened steels from 40 to 67 HRC.

Customization

- Intermediate diameters available.
- Custom solutions available for machining titanium and other high-temperature alloys.
- Internal coolant axial and radial available.
- Various shank options and non-standard coatings available.

Extensive Standard Offering

- Diameter ranges 1/4–3/4".
- Extended neck for long-reach applications.

End mills for high-feed milling of medium and hard steels.



Proprietary Geometry
Maximizes metal removal rates.

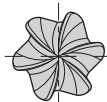
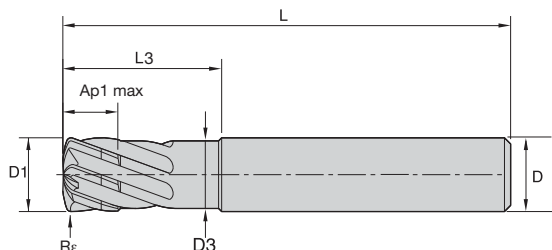


6-Flute Design
Enables helical ramping, circular interpolation, and face milling.

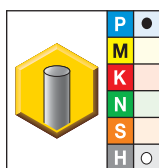
Necked Shank
Provides extended reach in deep cavities.

KC639M™ AlTiN Coating
For maximum tool life.

- Kennametal standard dimensions.
- Non-center cutting.
- High feed.



■ KenFeed • KMDA • <52 HRC • Medium Steels



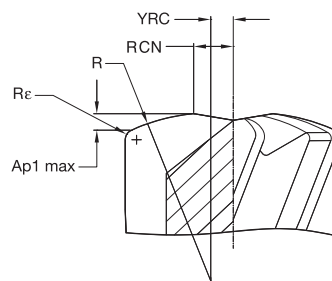
- first choice
- alternate choice

KC639M	D1	D	D3	Ap1 max	L3	L	Re
KMDA0250J6ANA	1/4	1/4	.211	.013	3/4	2 1/2	.016
KMDA0312J6ANA	5/16	5/16	.273	.017	1	3	.020
KMDA0375J6ANA	3/8	3/8	.336	.023	1 1/4	3 1/2	.023
KMDA0500J6ANA	1/2	1/2	.461	.027	1 1/2	4	.032
KMDA0625J6ANA	5/8	5/8	.586	.033	2	5	.040
KMDA0750J6ANA	3/4	3/4	.711	.040	2 1/2	5	.047

NOTE: For application data, see page P144.

End Mill Tolerances

D1	tolerance	D	tolerance h6
All	+.000/- .002"	≤1/8"	+0/- .00024"
		>1/8-1/4"	+0/- .00031"
		>1/4-3/8"	+0/- .00035"
		>3/8-23/32"	+0/- .00043"
		>23/32-1 3/16"	+0/- .00051"



■ Programming Data

geometrical parameters							ramping guide for circular and linear ramping						
							circular interpolation		linear ramping				
							optimal range of circle diameter for a single pass		calculated length per ramp angle				
catalog number	D1	Ap1 max	R	Re	YRC	RCN	smallest	largest	1°	2°	3°	4°	5°
KMDA0250J6ANA	1/4	0.0133	0.250	0.0160	0.0313	0.0525	0.355	0.500	0.762	0.381	0.254	0.190	0.152
KMDA0312J6ANA	5/16	0.0166	0.313	0.0200	0.0391	0.0656	0.444	0.625	0.953	0.476	0.317	0.238	0.190
KMDA0375J6ANA	3/8	0.0200	0.375	0.0235	0.0469	0.0788	0.533	0.750	1.143	0.572	0.381	0.285	0.228
KMDA0500J6ANA	1/2	0.0266	0.500	0.0320	0.0625	0.1050	0.710	1.000	1.525	0.762	0.508	0.381	0.304
KMDA0625J6ANA	5/8	0.0333	0.625	0.0400	0.0781	0.1313	0.888	1.250	1.906	0.953	0.635	0.476	0.380
KMDA0750J6ANA	3/4	0.0399	0.750	0.0470	0.0938	0.1575	1.065	1.500	2.287	1.143	0.762	0.571	0.456

recommended % of programmed feed rate to use while ramping 100% 70% 50% 30% 10%

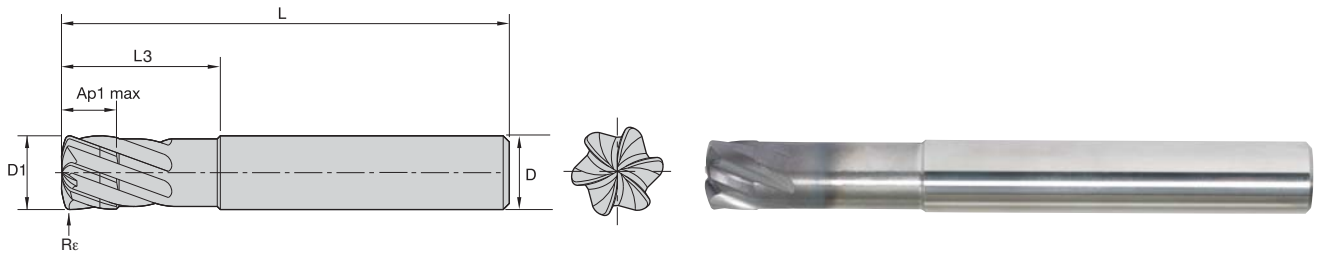
NOTE: YRC = distance from center line to the crown of the R radius.

RCN = distance from center line to the start of the cutting edge. This dimension can also help determine the minimum circle size when helical ramping.

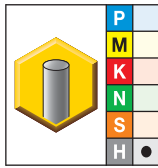
R = the head radius size.

Re = the shoulder radius or radius at the corner of the cutter.

- Kennametal standard dimensions.
- Non-center cutting.
- High feed.



■ KHDA • Steels with Hardness • >52 HRC



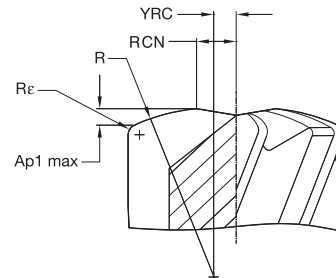
- first choice
- alternate choice

KC639M	D1	D	Ap1 max	L3	L	Re
KHDA0250J6ANA	1/4	1/4	.0082	.750	2 1/2	.016
KHDA0312J6ANA	5/16	5/16	.0103	1.000	3	.020
KHDA0375J6ANA	3/8	3/8	.0123	1.250	3 1/2	.020
KHDA0500J6ANA	1/2	1/2	.0164	1.500	4	.023
KHDA0625J6ANA	5/8	5/8	.0205	2.000	4 1/2	.032
KHDA0750J6ANA	3/4	3/4	.0250	2.500	5	.040

NOTE: For application data, see page P144.

End Mill Tolerances

D1	tolerance	D	tolerance h6
All	+.000/- .002"	≤1/8"	+0/- .00024"
		>1/8–1/4"	+0/- .00031"
		>1/4–3/8"	+0/- .00035"
		>3/8–23/32"	+0/- .00043"
		>23/32–1 3/16"	+0/- .00051"



■ Programming Data

geometrical parameters							ramping guide for circular and linear ramping							
							circular interpolation				linear ramping			
							optimal range of circle diameter for a single pass				calculated length per ramp angle			
catalog number	D1	Ap1 max	R	Re	YRC	RCN	smallest	largest	1°	2°	3°	4°	5°	
KHDA0250J6ANA	1/4	0.0082	0.375	0.0160	0.0313	0.0550	0.360	0.500	0.470	0.235	0.157	0.117	0.094	
KHDA0312J6ANA	5/16	0.0103	0.469	0.0200	0.0391	0.0688	0.450	0.625	0.588	0.294	0.196	0.147	0.117	
KHDA0375J6ANA	3/8	0.0123	0.563	0.0240	0.0469	0.0825	0.540	0.750	0.706	0.353	0.235	0.176	0.141	
KHDA0500J6ANA	1/2	0.0164	0.750	0.0320	0.0625	0.1100	0.720	1.000	0.941	0.470	0.313	0.235	0.188	
KHDA0625J6ANA	5/8	0.0205	0.938	0.0400	0.0781	0.1375	0.900	1.250	1.176	0.588	0.392	0.294	0.235	
KHDA0750J6ANA	3/4	0.0246	1.125	0.0470	0.0938	0.1650	1.080	1.500	1.411	0.705	0.470	0.352	0.282	
recommended % of programmed feed rate to use while ramping									100%	70%	50%	30%	10%	

recommended % of programmed feed rate to use while ramping 100% 70% 50% 30% 10%

NOTE: YRC = distance from center line to the crown of the R radius.

RCN = distance from center line to the start of the cutting edge. This dimension can also help determine the minimum circle size when helical ramping.

R = the head radius size.

Re = the shoulder radius or radius at the corner of the cutter.

■ KMDA • Steels with Hardness <52 HRC

Material Group												
	3D Milling/Profiling		KC639M		frac.	D1 — Diameter						
			Cutting Speed — vc SFM			1/4	5/16	3/8	1/2	5/8	3/4	
	ap	ae	min	max	dec.	0.250	0.313	0.375	0.500	0.625	0.750	
P	4	0.05 x D	0.55 x D	528	594	fz	.0130	.0160	.0190	.0250	.0260	.0280
H	1	0.05 x D	0.55 x D	462	528	fz	.0130	.0160	.0190	.0250	.0260	.0280
	2	0.05 x D	0.55 x D	330	396	fz	.0080	.0090	.0110	.0150	.0190	.0230

NOTE: These guidelines may require variations to achieve optimum results.

Lower value of cutting speed is used for high stock removal applications or for higher hardness (machinability) within group.

Higher value of cutting speed is used for finishing applications or for lower hardness (machinability) within group.

Above parameters are based on ideal conditions. For smaller taper machining centers, please adjust parameters accordingly on >1/2" diameter.

■ KHDA • Steels with Hardness >52 HRC

Material Group												
		3D Milling/Profiling		KC639M		frac.	D1 — Diameter					
				Cutting Speed — vc SFM			1/4	5/16	3/8	1/2	5/8	3/4
		ap	ae	min	max	dec.	0.250	0.313	0.375	0.500	0.625	0.750
H	2	0.03 x D	0.55 x D	330	396	fz	.0080	.0090	.0110	.0150	.0190	.0230
	3	0.03 x D	0.55 x D	265	330	fz	.0080	.0090	.0110	.0150	.0190	.0230
	4	0.03 x D	0.55 x D	165	230	fz	.0060	.0080	.0090	.0130	.0160	.0190

NOTE: These guidelines may require variations to achieve optimum results.

Lower value of cutting speed is used for high stock removal applications or for higher hardness (machinability) within group.

Higher value of cutting speed is used for finishing applications or for lower hardness (machinability) within group.

Above parameters are based on ideal conditions. For smaller taper machining centers, please adjust parameters accordingly on >1/2" diameter.

G0mill™ GP

General Purpose End Mill Series

- Flexible — plunging, slotting, and profiling.
- Complete — wide range of diameters and lengths.
- Adaptive — wide range of applications and workpiece materials.
- Economical — excellent cost-benefit ratio.

Offering

- 2-flute version for unstable conditions.
- 3-flute version as alternative to 2 and 4 flutes.
- 4-flute version for high metal removal rates.

Advanced Technology

- Roughing and finishing with one tool.
- Eccentric relief increases edge stability.



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kennametal.com

➤ High-Performance Hard-Machining Solid Carbide End Mills

Primary Application

These end mills from Kennametal for hard machining are engineered to machine hardened steels up to 67 HRC at extreme speeds and feeds. Designed with special coatings, substrates, and geometries to extend tool life in any application that requires machining of hardened workpiece materials.

- Capable of machining hardened steels more than 60 HRC.
- Unique design enables higher feeds and speeds to increase Metal Removal Rates (MRR).
- Sophisticated coatings for maximum wear resistance.

Features and Benefits

Advanced Technology

- Negative geometry for increased edge strength.
- Reinforced core for better rigidity.
- High helix for better surface finishes.

Tailored Grades

- Universal grade KC633M™.

Customization

- Intermediate diameters available.
- Expanded length of tool and increased length of cut possible.
- Toroidal as well as undercutting end mills (Spherical Lollipop-Style).
- Various shank options and non-standard coatings available.
- TiAlN wear-resistant substrate grade KC637M and AlTiN grade KC643M available as custom solution.

Extensive Standard Offering

- Diameter ranges 1/8–1".
- Extended neck for long-reach applications and radii and sharp corner configurations.
- Roughing and ball nose finishing geometries.

Sophisticated coatings for maximum wear resistance.



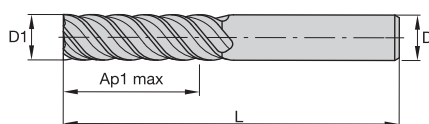
Parabolic Core Design
Proprietary technology stabilizes end mill to avoid deflection in longer length of cut.

Various Helix End Mill Versions
Dedicated application-specific design.



KC633M™ TiAlN-Coated Substrate
For longest tool life in challenging applications.

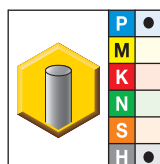
- Kennametal standard dimensions.
- Center cutting.



End Mill Tolerances

D1	tolerance	D	tolerance h6
All	+.000/- .002"	≤1/8"	+0/- .00024"
		>1/8-1/4"	+0/- .00031"
		>1/4-3/8"	+0/- .00035"
		>3/8-23/32"	+0/- .00043"
		>23/32-1 3/16"	+0/- .00051"

■ HPFDM • Medium and Hardened Steels



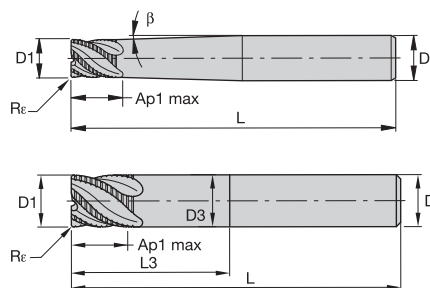
- first choice
- alternate choice

KC633M	D1	D	Ap1 max	L	Z U
HPFDM250S4038	1/4	1/4	3/8	3	4
HPFDM250S4063	1/4	1/4	5/8	3	4
HPFDM250S4088	1/4	1/4	7/8	3	4
HPFDM312S4050	5/16	5/16	1/2	4	4
HPFDM312S4075	5/16	5/16	3/4	4	4
HPFDM312S4113	5/16	5/16	1 1/8	4	4
HPFDM375S4056	3/8	3/8	9/16	4	4
HPFDM375S5094	3/8	3/8	15/16	4	5
HPFDM375S5131	3/8	3/8	1 5/16	4	5
HPFDM500S4075	1/2	1/2	3/4	5	4
HPFDM500S6125	1/2	1/2	1 1/4	5	6
HPFDM500S6175	1/2	1/2	1 3/4	5	6
HPFDM625S4094	5/8	5/8	15/16	5	4
HPFDM625S6156	5/8	5/8	1 9/16	5	6
HPFDM625S6219 *	5/8	5/8	2 3/16	5	6
HPFDM750S4113	3/4	3/4	1 1/8	6	4
HPFDM750S6188	3/4	3/4	1 7/8	6	6
HPFDM750S6263	3/4	3/4	2 5/8	6	6
HPFDM1000S5150	1	1	1 1/2	6	5
HPFDM1000S6250	1	1	2 1/2	6	6
HPFDM1000S6350	1	1	3 1/2	6	6

NOTE: For application data, see page P151.

*Made-to-order standard item. Standard pricing, manufacturing lead time, and minimum order quantity applies.

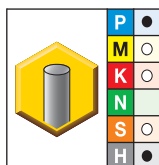
- Kennametal standard dimensions.
- Center cutting.
- Shallow-pitch profile.



End Mill Tolerances

D1	d11	D	tolerance h6
<1/8"	-.0008/- .0031"	<1/8"	+0/- .00024"
1/8-7/32"	-.0012/- .0041"	1/8-7/32"	+0/- .00031"
1/4-3/8"	-.0016/- .0051"	1/4-3/8"	+0/- .00035"
13/32-11/16"	-.002/- .0063"	13/32-11/16"	+0/- .00043"
23/32-1-3/16"	-.0026/- .0077"	23/32-1-3/16"	+0/- .00051"

■ HPRDM • Rougher for Medium and Hardened Steels

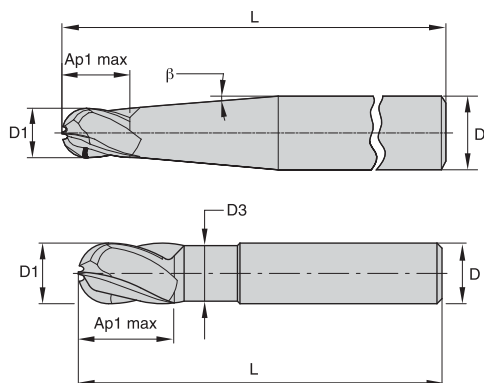


- first choice
- alternate choice

KC633M	D1	D	Ap1 max	L	Re	β	Z U
HPRDM188S3019	3/16	1/4	3/16	3	.030	2.5	3
HPRDM250S4025	1/4	3/8	1/4	4	.030	2.5	4
HPRDM312S4031	5/16	3/8	5/16	4	.030	2.5	4
HPRDM375S4038	3/8	1/2	3/8	5	.030	2.5	4
HPRDM500S4050	1/2	5/8	1/2	5	.040	2.5	4

NOTE: For application data, see page P151.

- Kennametal standard dimensions.
- Center cutting.

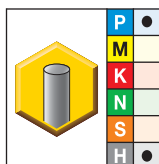


End Mill Tolerances

D1	tolerance	D	tolerance h6
All	+.000/- .002"	≤1/8"	+0/- .00024"
		>1/8-1/4"	+0/- .00031"
		>1/4-3/8"	+0/- .00035"
		>3/8-23/32"	+0/- .00043"
		>23/32-1 3/16"	+0/- .00051"

■ HPBNDM • Medium and Hardened Steels

- first choice
- alternate choice



KC633M	D1	D	D3	Ap1 max	L3	L	β
HPBNDM125S4013	1/8	1/4	—	1/8	1.56	3	2.5
HPBNDM188S4019	3/16	1/4	—	3/16	.90	3	2.5
HPBNDM250S4025	1/4	3/8	—	1/4	1.68	4	2.5
HPBNDM375S4038	3/8	1/2	—	3/8	1.81	5	2.5
HPBNDM500S4050	1/2	5/8	—	1/2	1.93	5	2.5
HPBNDM625S4063	5/8	5/8	.59	5/8	1.87	5	—
HPBNDM750S4075	3/4	3/4	.71	3/4	2.25	6	—

NOTE: For application data, see page P152.

HPFDM

Material Group															
		Side Milling (A) and Slotting (B)			KC633M		Feed per Tooth — fz information is for side milling (A). For slotting (B), reduce fz by 20%.								
							D1 — Diameter								
		A		B		Cutting Speed — vc SFM		frac.							
ap		ae		ap		min	max	dec.	1/4	5/16	3/8	1/2	5/8	3/4	1
P	3	1 x D	0.4 x D	1 x D	390	520	fz	.0017	.0021	.0025	.0032	.0037	.0042	.0050	
	4	1 x D	0.4 x D	0.75 x D	300	490	fz	.0015	.0019	.0022	.0029	.0033	.0036	.0043	
H	1	1 x D	0.4 x D	0.75 x D	260	460	fz	.0015	.0019	.0022	.0029	.0033	.0036	.0043	
	2	1 x D	0.3 x D	0.5 x D	230	390	fz	.0011	.0014	.0017	.0021	.0024	.0027	.0031	
	3	1 x D	0.15 x D	0.3 x D	200	300	fz	.0009	.0011	.0013	.0017	.0020	.0022	.0027	
	4	1 x D	0.1 x D	0.15 x D	160	230	fz	.0006	.0008	.0009	.0011	.0013	.0015	.0018	

NOTE: These guidelines may require variations to achieve optimum results.

Lower value of cutting speed is used for high stock removal applications or for higher hardness (machinability) within group.

Higher value of cutting speed is used for finishing applications or for lower hardness (machinability) within group.

For better surface finish, reduce feed per tooth.

HPRDM

Material Group													
	Side Milling (A) and Slotting (B)		KC633M		Feed per Tooth — fz information is for side milling (A). For slotting (B), reduce fz by 20%.								
	A		Cutting Speed — vc SFM		D1 — Diameter								
	ap	ae	ap	min	max	frac.	3/16	1/4	5/16	3/8	1/2		
P	3	0.8 x D	0.5 x D	0.75 x D	390	520	IPT	.0011	.0015	.0020	.0023	.0029	
	4	0.8 x D	0.4 x D	0.5 x D	300	490	IPT	.0010	.0014	.0017	.0020	.0026	
	5	0.8 x D	0.5 x D	0.75 x D	200	330	IPT	.0009	.0012	.0016	.0018	.0023	
	6	0.8 x D	0.4 x D	0.5 x D	160	250	IPT	.0008	.0010	.0013	.0015	.0019	
M	1	0.8 x D	0.5 x D	0.75 x D	300	380	IPT	.0011	.0015	.0020	.0023	.0029	
	2	0.8 x D	0.4 x D	0.75 x D	200	260	IPT	.0009	.0012	.0016	.0018	.0023	
	3	0.8 x D	0.4 x D	0.75 x D	200	230	IPT	.0008	.0010	.0013	.0015	.0019	
K	1	0.8 x D	0.5 x D	0.75 x D	390	490	IPT	.0013	.0018	.0023	.0027	.0034	
	2	0.8 x D	0.5 x D	0.75 x D	360	460	IPT	.0011	.0015	.0020	.0023	.0029	
	3	0.8 x D	0.4 x D	0.75 x D	360	430	IPT	.0009	.0012	.0016	.0018	.0023	
S	1	0.8 x D	0.4 x D	0.75 x D	160	300	IPT	.0011	.0015	.0020	.0023	.0029	
	2	0.8 x D	0.4 x D	0.75 x D	80	130	IPT	.0006	.0008	.0010	.0012	.0015	
	3	0.8 x D	0.4 x D	0.75 x D	80	130	IPT	.0006	.0008	.0010	.0012	.0015	
	4	0.8 x D	0.3 x D	0.5 x D	160	200	IPT	.0008	.0011	.0014	.0017	.0021	
H	1	0.8 x D	0.5 x D	0.5 x D	260	460	IPT	.0010	.0014	.0017	.0020	.0026	
	2	0.8 x D	0.2 x D	0.3 x D	230	390	IPT	.0008	.0010	.0013	.0015	.0019	
	3	0.8 x D	0.15 x D	0.2 x D	200	300	IPT	.0006	.0008	.0010	.0012	.0015	

NOTE: These guidelines may require variations to achieve optimum results.

Lower value of cutting speed is used for high stock removal applications or for higher hardness (machinability) within group.

Higher value of cutting speed is used for finishing applications or for lower hardness (machinability) within group.

Above parameters are based on ideal conditions. For smaller taper machining centers, please adjust parameters accordingly on >1/2" diameter.

■ HPBNDM

Material Group				KC633M											
				3D Milling/Profiling		Cutting Speed — vc SFM		Feed per Tooth — Finishing							
								D1 — Diameter							
								frac.	1/8	5/32	3/16	1/4	5/16	3/8	1/2
		ap	ae	min	max	dec.	0.125	0.156	0.188	0.250	0.313	0.375	0.500	0.625	0.750
P	3	0.04 x D	0.04 x D	1360	1540	fz	.0033	.0042	.0052	.0070	.0090	.0105	.0135	.0157	.0175
	4	0.04 x D	0.04 x D	1190	1360	fz	.0031	.0039	.0047	.0063	.0081	.0093	.0120	.0139	.0152
H	1	0.03 x D	0.03 x D	950	1330	fz	.0033	.0041	.0050	.0068	.0086	.0100	.0128	.0148	.0163
	2	0.03 x D	0.03 x D	670	1140	fz	.0025	.0031	.0038	.0051	.0065	.0075	.0096	.0110	.0120
	3	0.02 x D	0.02 x D	710	1060	fz	.0021	.0026	.0032	.0043	.0054	.0063	.0082	.0095	.0107
	4	0.02 x D	0.02 x D	590	830	fz	.0014	.0017	.0021	.0028	.0036	.0042	.0054	.0063	.0070

Material Group				KC633M											
				3D Milling/Profiling		Cutting Speed — vc SFM		Feed per Tooth — Semi-Finishing							
								D1 — Diameter							
								frac.	1/8	5/32	3/16	1/4	5/16	3/8	1/2
		ap	ae	min	max	dec.	0.125	0.156	0.188	0.250	0.313	0.375	0.500	0.625	0.750
P	3	0.1 x D	0.05 x D	890	1000	fz	.0022	.0027	.0033	.0045	.0059	.0068	.0088	.0102	.0114
	4	0.1 x D	0.05 x D	780	890	fz	.0020	.0025	.0030	.0041	.0053	.0061	.0078	.0090	.0099
H	1	0.07 x D	0.1 x D	660	920	fz	.0025	.0031	.0038	.0051	.0066	.0076	.0098	.0113	.0124
	2	0.05 x D	0.04 x D	530	910	fz	.0022	.0027	.0033	.0044	.0057	.0065	.0084	.0096	.0105
	3	0.03 x D	0.03 x D	570	860	fz	.0019	.0025	.0030	.0040	.0051	.0059	.0076	.0089	.0100
	4	0.03 x D	0.03 x D	480	670	fz	.0013	.0016	.0020	.0027	.0034	.0039	.0051	.0059	.0066

Material Group				KC633M											
				3D Milling/Profiling		Cutting Speed — vc SFM		Feed per Tooth — Roughing							
								D1 — Diameter							
								frac.	1/8	5/32	3/16	1/4	5/16	3/8	1/2
		ap	ae	min	max	dec.	0.125	0.156	0.188	0.250	0.313	0.375	0.500	0.625	0.750
P	3	0.2 x D	0.1 x D	680	770	fz	.0010	.0012	.0015	.0020	.0026	.0030	.0039	.0046	.0051
	4	0.2 x D	0.1 x D	600	680	fz	.0009	.0011	.0014	.0018	.0023	.0027	.0035	.0040	.0044
H	1	0.15 x D	0.1 x D	460	640	fz	.0013	.0017	.0020	.0028	.0035	.0041	.0052	.0060	.0066
	2	0.1 x D	0.75 x D	390	670	fz	.0015	.0019	.0023	.0031	.0039	.0045	.0058	.0067	.0073
	3	0.05 x D	0.05 x D	450	680	fz	.0017	.0021	.0026	.0035	.0044	.0052	.0067	.0078	.0087
	4	0.05 x D	0.05 x D	380	530	fz	.0011	.0014	.0017	.0023	.0030	.0034	.0044	.0052	.0058

NOTE: These guidelines may require variations to achieve optimum results.

HARVI™ III Family

High-temperature alloy machining

- Profiling, semi-finishing, and finishing.
- Maximum metal removal rates in titanium and stainless steel.
- Supreme surface conditions.
- Complete family of square end, ball nose, and taper ball nose cutters.

KCSM15™

- Proprietary Beyond™ grade for exceptional tool life in titanium and stainless steels.

Advanced Technology

- Six unequally spaced flutes for chatter-free machining.
- Eccentric relief design increases tool life through higher edge stability.
- Proprietary tapered core provides highest tool stability in roughing and finishing operations.



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➤ Beyond™ EADE

Solid Ceramic End Mills

Primary Application

EADE solid ceramic end mills offer higher productivity and tool life in roughing nickel-based high-temperature alloys. Beyond grade KYS40™ delivers best-in-class tool life and exceptionally high Metal Removal Rates (MRR), surpassing those of other solutions on the market today.

- Outstanding reduction of machining time.
- Fewer tool changes due to longer tool life.
- Benefit from throw-away type of tooling.

Features and Benefits

Advanced Technology

- KYS40 Beyond grade solid SiAlON ceramic designed for machining nickel-based high-temperature alloys.
- Cutting speeds up to 3300 SFM increase metal removal rates.
- Tool life up to 5x that of carbide end mills.

Extensive Standard Offering

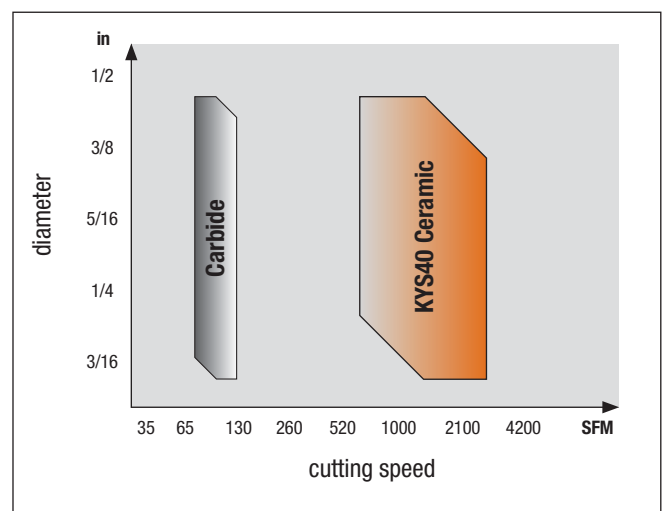
- 4-flute tooling for pocketing and slotting. Undersize end mills leaving stock for finishing operations.
- 6-flute tooling for face milling and profiling.

Customization

- Engineered solutions are available upon request.

Highest Cutting Speed Capability

- Increase compared to carbide.





Ceramic Optimized End Geometry
Increases shearing action.
Improves corner stability.

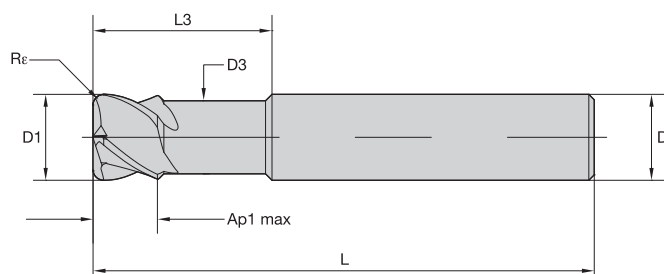
Enlarged Core Design
Increases tool rigidity for less deflection.

40° Helix Angle
Improves chip evacuation.

KYS40™ Beyond™ Grade
Enables highest cutting speeds.



- Kennametal standard dimensions.
- Non-center cutting.
- Ramping up to 2,5°.
- Optimized geometry for roughing nickel-based high-temperature alloys.

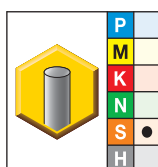


End Mill Tolerances

D1	tolerance e8	D	tolerance h6
≤1/8"	-.00055/-.00110"	≤1/8"	+0/-.00024"
>1/8-1/4"	-.00079/-.00150"	>1/8-1/4"	+0/-.00031"
>1/4-3/8"	-.00098/-.00185"	>1/4-3/8"	+0/-.00035"
>13/32-23/32"	-.00126/-.00232"	>13/32-23/32"	+0/-.00043"
>23/32-1-3/16"	-.00157/-.00287"	>23/32-1-3/16"	+0/-.00051"



EADE • 4 Flute with Neck • Inch



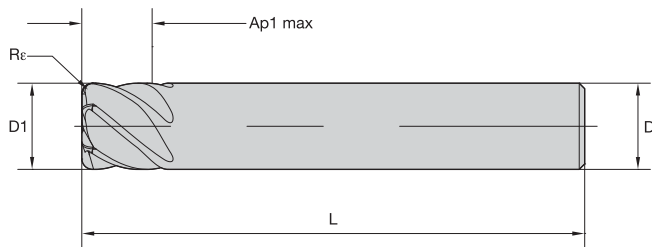
- first choice
- alternate choice

KYS40	D1	D1	D	D3	Ap1 max	L	L3	Rε
EADE0178J4AQX	—	.180	1/4	.173	9/64	2	3/8	.023
EADE0188J4AQX	3/16	.188	1/4	.180	9/64	2	3/8	.023
EADE0238J4AQB	—	.238	1/4	.229	3/16	2	1/2	.031
EADE0250J4AQB	1/4	.250	1/4	.240	3/16	2	1/2	.031
EADE0297J4AQX	19/64	.297	5/16	.285	15/64	2 1/4	5/8	.039
EADE0313J4AQX	5/16	.313	5/16	.300	15/64	2 1/4	5/8	.039
EADE0356J4AQX	—	.356	3/8	.341	9/32	2 1/2	3/4	.047
EADE0375J4AQX	3/8	.375	3/8	.360	9/32	2 1/2	3/4	.047
EADE0475J4AQC	—	.477	1/2	.458	3/8	2 3/4	1	.063
EADE0500J4AQC	1/2	.500	1/2	.480	3/8	2 3/4	1	.063

NOTE: For application data, see page P158.

For face milling, profiling, and 3D milling, do not exceed .019" of Ap.

- Kennametal standard dimensions.
- Non-center cutting.
- Ramping up to 2°.
- Optimized geometry for roughing nickel-based high-temperature alloys.

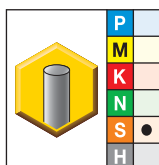


End Mill Tolerances

D1	tolerance e8	D	tolerance h6
≤1/8"	-.00055/-.00110"	≤1/8"	+0/-.00024"
>1/8-1/4"	-.00079/-.00150"	>1/8-1/4"	+0/-.00031"
>1/4-3/8"	-.00098/-.00185"	>1/4-3/8"	+0/-.00035"
>13/32-23/32"	-.00126/-.00232"	>13/32-23/32"	+0/-.00043"
>23/32-1-3/16"	-.00157/-.00287"	>23/32-1-3/16"	+0/-.00051"



EADE • 6 Flute • Inch



- first choice
- alternate choice

KYS40	D1	D	Ap1 max	L	Re
EADE0188J6ARX	3/16	3/16	9/64	2	.023
EADE0250J6ARB	1/4	1/4	3/16	2	.031
EADE0313J6ARX	5/16	5/16	15/64	2 1/4	.039
EADE0375J6ARX	3/8	3/8	9/32	2 1/2	.047
EADE0500J6ARC	1/2	1/2	3/8	2 3/4	.063

NOTE: For application data, see page P158.
For face milling, profiling, and 3D-milling, do not exceed .019" of Ap.

4-Flute with Neck • Inch

Material Group												
	Side Milling (A) and Slotting (B)			KYS40		Recommended feed per tooth (IPT = inch/th) for side milling (A). For slotting (B), reduce IPT by 20%.						
	A		B	Cutting Speed — vc SFM			D1 — Diameter					
	ap	ae	ap	min	max	frac.	3/16	1/4	5/16	3/8	1/2	
	dec.					dec.	.1875	.2500	.3125	.3750	.5000	
S	3	Ap1 max	0.1 x D*	0.5 x D*	825	3300	IPT	.0094	.0100	.0109	.0113	.0133

NOTE: *For above cutting data, do not exceed an overall ae of .039".
Use ap of .039" as starting condition.

6-Flute • Inch

Material Group										
	Side Milling (A) and Profiling		KYS40		Recommended feed per tooth (IPT = inch/th) for side milling (A).					
	A		Cutting Speed – vc SFM		D1 – Diameter					
	ap	ae	min	max	frac.	3/16	1/4	5/16	3/8	1/2
	dec.					.1875	.2500	.3125	.3750	.5000
S	3	Ap1 max*	825	3300	IPT	.0094	.0100	.0109	.0113	.0133

NOTE: *For above cutting data, do not exceed an overall ae of .039".
Use ap of .039" as starting condition.

A New Dimension **HARVI™ II**

The next generation high-performance end mill, HARVI II dramatically improves metal removal rates without reducing tool life.

- Best suited for applications in the aerospace, medical, die and mold, automotive, and general engineering markets.
- Outstanding performance in stainless steel, titanium, INCONEL®, and other high-temperature alloys and steels.
- Increased metal removal rates in roughing and finishing operations.

Advanced Technology

- Five unequally-spaced flutes for chatter-free machining at high feed rates.
- 1 x D full slotting capability in:
 - Titanium
 - Stainless steel

Tailored Grades

- Proprietary KCPM15™ Beyond™ grade.
- Universal KC643M™ grade.



Visit kennametal.com or contact your local Authorized Kennametal Distributor.



kennametal.com



EADE 4-Flute End Mill

CHALLENGE

- Roughing a slot on turbine blade.
- Depth of slot .866".
- INCONEL® 718 material.
- Dry machining.

SOLUTION

- Engineered solution EADE KYS40™ ceramic end mill with extended neck.
- Ø .449" (11,4mm) with 4 effective cutting edges and .059" (1,5mm) corner radii.

CUTTING DATA

- vc 2625 SFM
- fz .0012 IPT
- ap .0197"
- ae .866"

RESULT

- Customer proprietary information.

BENEFIT

- Machining time of 1 minute 54 seconds for one slot only.
- Metal removal rate of .9 in³/m consistently achieved.
- Productivity significantly increased.

EADE 4-Flute End Mill

CHALLENGE

- Rough profiling of small turbine blades.
- INCONEL 718 material.
- Dry machining.

SOLUTION

- Standard EADE KYS40 ceramic end mill.
- Ø .449" (11,4mm) with 4 effective cutting edges and standard neck.

CUTTING DATA

- vc 2116 SFM
- fz .0012 IPT
- ap .0197"
- ae .866"

RESULT

- 3x tool life compared to 2x tool life with competitive solution in less time.

BENEFIT

- 3x higher productivity as a result of increased cutting data.
- 50% longer tool life compared to competitive carbide end mill.

(continued)

(continued)



EADE 6-Flute End Mill

- Rough profiling of aerospace parts.
- Haynes® 288 and INCONEL® 718 material.
- Dry machining.

CHALLENGE

- Standard EADE KYS40™ ceramic end mill.
- Ø .394" (10mm) with 6 effective cutting edges.

SOLUTION

- vc 1516 SFM
- fz .0012 IPT
- ap .0197–.0394"
- ae varying

CUTTING DATA

- Customer proprietary information.

RESULT

- Machining time reduced.
- Productivity significantly increased.

BENEFIT

EADE 6-Flute End Mill

- Rough profiling of blisk (blade integrated disc).
- INCONEL 718 material (42 HRC).
- Compressed air coolant.

CHALLENGE

- Standard EADE KYS40 ceramic end mill.
- Ø .472" (12mm) with 6 effective cutting edges.

SOLUTION

- vc 2228 SFM
- fz .0012 IPT
- ap varying up to .0197"
- ae varying

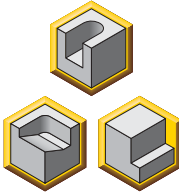
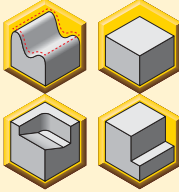
CUTTING DATA

- 2 blisk segments machined with one tool.
- 12 minute machining time per segment.

RESULT

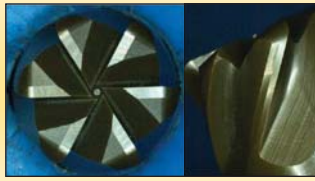
- Unprecedented reduction in machining time.

BENEFIT

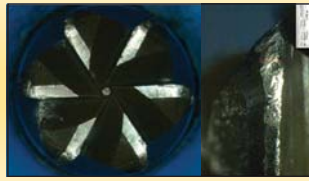
Materials to Cut	• Nickel-based high-temperature alloys. • Cobalt-based alloys after consulting technical assistance. • P6 and M1-3 stainless steels after consulting technical assistance. • Do not apply on iron-based high-temperature alloys.
Cutting Speed	• Maximum RPM machine can provide recommended cutting speed: 1.300–3.300 SFM. • Highly dynamic machines recommended. • Use of spindle speeders applicable (no wet coolant).
Feed Rate	• Refer to application data recommendation. • General starting condition fz .0012 IPT.
Depth of Cut	• Refer to application data recommendation. • General starting condition ap .019".
Coolant	• Power cool nozzle preferred to flush chips away. • Pressurized air applicable. • Minimal quantity lubrication (MQL) and dry applicable. • No coolant with emulsion or oil due to thermal shock.
Adaptation	• Hydraulic chuck with or without sleeve preferred. • Collet or milling power chucks applicable. • Balancing at 25,000 RPM (2,5G) preferred.
Roughing Application	Yes
Finishing Application	No
Milling Strategy	• Conventional milling preferred at lower speeds. • Climb milling preferred at higher speeds.
4-Flute EADE	• Slotting and pocketing. • Common sizes and undersize leaving finishing stock. • Side milling possible up to ap max with increased feed. • Non-center cutting. • Ramping and helical interpolation possible under 2.5°. 
6-Flute EADE	• Profiling and face milling. • Non-center cutting. • Side milling possible up to ap max with increased feed. • Ramping and helical interpolation possible under 2°. 
Engineered Solutions	Available upon request.
Reconditioning Service	Not applicable.

Wear Indication

New

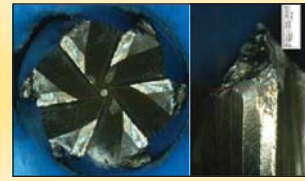


Used



Wear rate .019".
Still good to use.

End of Tool Life



Wear rate .055".
End of tool life reached.

Chip Formation

Carbide



Regular curled chips. Shape and length depend on end mill geometry and cutting data.

Ceramic



Chips are nearly like dust. Pressurized air coolant recommended to blow away chips.

Causes of and Remedies for End Milling Problems

problem	cause	remedy
Excessive bur formation	- Softness of material to cut. - Excessive wear on radii.	- Use undersize end mills that leave stock for finishing operation. - Replace tool as end of tool life reached. - Check tool runout.
Sudden breakage	- Vibration of the workpiece. - Unstable tool clamping. - Use of 6-flute tooling in slotting.	- Check workpiece and tool clamping. - Use of 4-flute EADE recommended.
Chips sticking	Lack of cutting speed.	Increase cutting speed.
Chipping	- Unstable tool and/or workpiece clamping. - Initial cutting speed too high.	- Check workpiece and tool clamping. - Reduce cutting speed during initial cut and increase as cutting continues.
Thermal cracks	Wet coolant.	Do not use wet coolant.