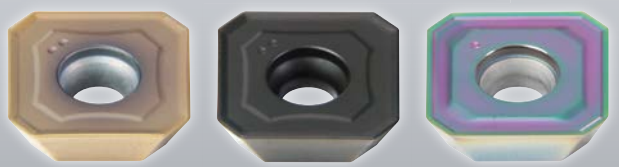


AFE45 Face Mill

D 50 ~ D 250 · Face Milling Cutter · HRC 60

D 50 ~ 250 mm

- ***8 Sizes of Body***
 - × *Equal Pitch & Un-Equal Pitch*
- ***7 Insert Grades***
 - × *3 Types of Chip Breaker*



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AFE45 | Face Mill

Q max	Jet			HRC	No. of Teeth
High Efficient	Air Hole	Roughing	Semi-Finishing	60	4-14

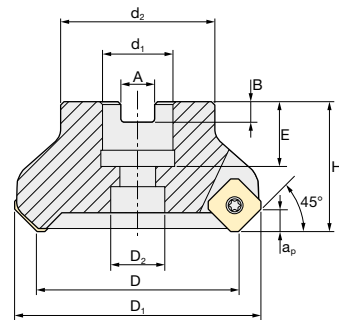


Fig. 1

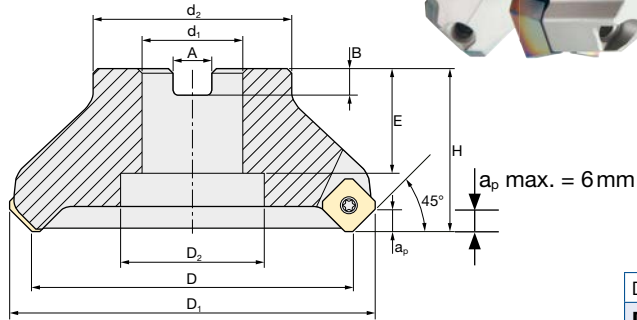


Fig. 2



Diameter Holder only [mm]




D50-80 mm	0/-0.2 mm
D100-125 mm	0/-0.3 mm
D160-250 mm	0/-0.4 mm




ID Code	Item Code	Z	D	D ₁	d ₁	D ₂	d ₂	A	B	H	E	a _p	Carbide Seat	Coolant hole	Fig.
FH193	AFE45-4050R-4-UE	4	50	63.4	22	18	48	10.4	6.3	40	20	6	-	•	1
FH194	AFE45-4050R-5-E	5													
FH195	AFE45-4063R-5-UE	5	63	76.6	27	20	58	12.4	7	50	22	6	-	•	2
FH196	AFE45-4063R-6-E	6													
FH198	AFE45-4080R-6-UE	6	80	93.5	32	26.5	78	14.4	8	63	29	6	•	-	2
FH199	AFE45-4080R-8-E	8													
FH201	AFE45-4100R-7-UE	7	100	113.5	40	32.5	90	16.4	9	63	39	6	•	-	2
FH202	AFE45-4100R-9-E	9													
FH204	AFE45-4125R-8-UE	8	125	138.5	56	114	145	25.7	14	63	39	6	•	-	2
FH205	AFE45-4125R-10-E	10													
FH206	AFE45-4160R-9-UE	9	160	173.5	60*	61	160	25.7	14	63	39	6	•	-	2
FH207	AFE45-4160R-11-E	11													
FH208	AFE45-4200R-10-UE	10	200	213.5	60*	61	160	25.7	14	63	39	6	•	-	2
FH209	AFE45-4200R-12-E	12													
FH210	AFE45-4250R-14-E	14	250	263.4											





* + Screws

Inserts

SE..T13T3AGTN
SEET13T3AG..N-S

	Parts	Screw			Wrench (15IP)		
							
	Type	ID Code	Item Code	Fastening Torque [Nm]		ID Code	Item Code
	D 50-80	ET062	242-143 Short	3 Nm		ET061	490-150

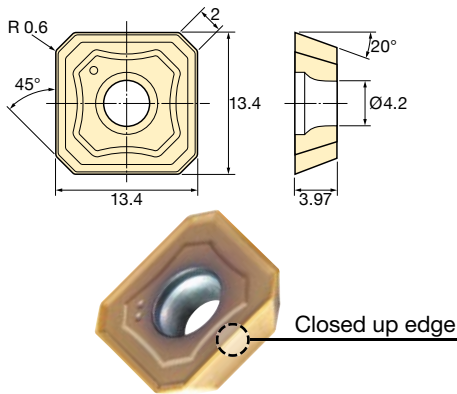
	Parts	Screw			Wrench (15IP)		
							
	Type	ID Code	Item Code	Fastening Torque [Nm]		ID Code	Item Code
	D 100-250	ET060	242-143	3 Nm		ET061	490-150

	Parts	Carbide Seat		Screw for Seat		Wrench for Seat (H3.5)		
								
	Type	ID Code	Item Code	ID Code	Item Code	Fastening Torque [Nm]	ID Code	Item Code
		D 100-250	ET058	212-271	ET059	212-280	5 Nm	ET057

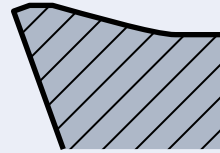
* The seat must be installed so that the surface indicated by * is facing the outside of the cutter.

* In consideration of reducing environmental loads, the screwdriver and wrench for seat are now sold separately to avoid sending unnecessary duplicate tools. We hope you will understand our reasoning.

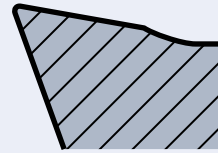
INSERTS AFE45 | Face Mill AFE45 Type



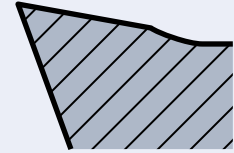
Cross sections of cutting edges:



SEM/ET - AGTN
Negative honing
+ Radius honing



SEET AGEN-S
Radius honing
+ chip breaker



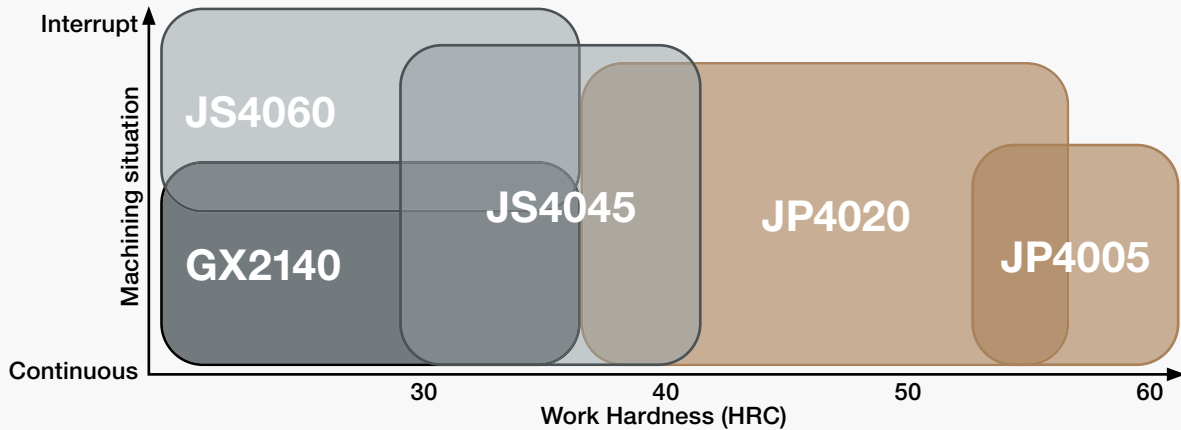
SEET AGFN-S
Sharp edge
+ chip breaker

			Target Hardness of Workpiece						
			Grade						
			SD5010	GX2140	JM4060	JS4045	JS4060	JP4020	JP4005
Grade Info			Aluminium	Mild steel Cast iron	SUS	General steel	Mild steel	Hardened steel Cast iron SUS	Hardened steel
			Emulsion Mist Air-blow	Air-blow	Emulsion Mist Air-blow	Air-blow	Emulsion Mist Air-blow	Emulsion Mist Air-blow	Emulsion Mist Air-blow
Item Code			Tolerance Class	Target hardness		ID Code			
SEMT13T3AGTN	M	Negative honing + chip breaker		WF250		WF251	WF220	WF219	
SEET13T3AGTN	E	Negative honing + chip breaker		WF246	WF247	WF249	WF218	WF217	WF248
SEET13T3AGEN-S	E	Radius honing + chip breaker			WF244	WF245		WF215	
SEET13T3AGFN-S	E	Sharp edge + chip breaker		WF216					

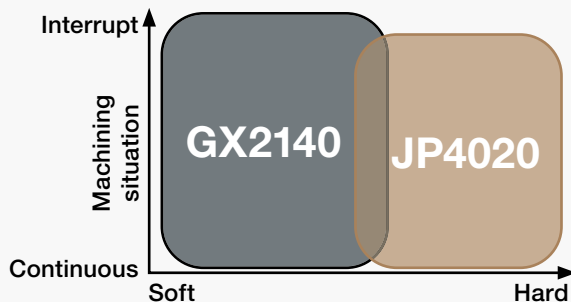
SD5010: DLC coated grade for Aluminium

AFE45 Insert grade – target material

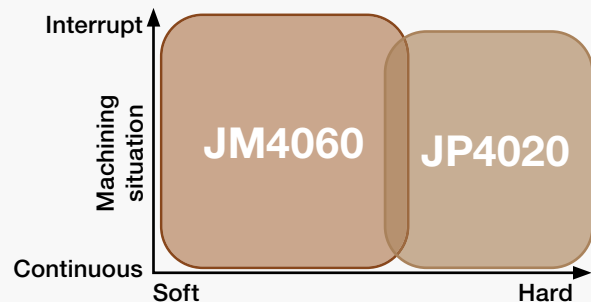
Mild steel ~ Hardened steel



Cast iron



SUS

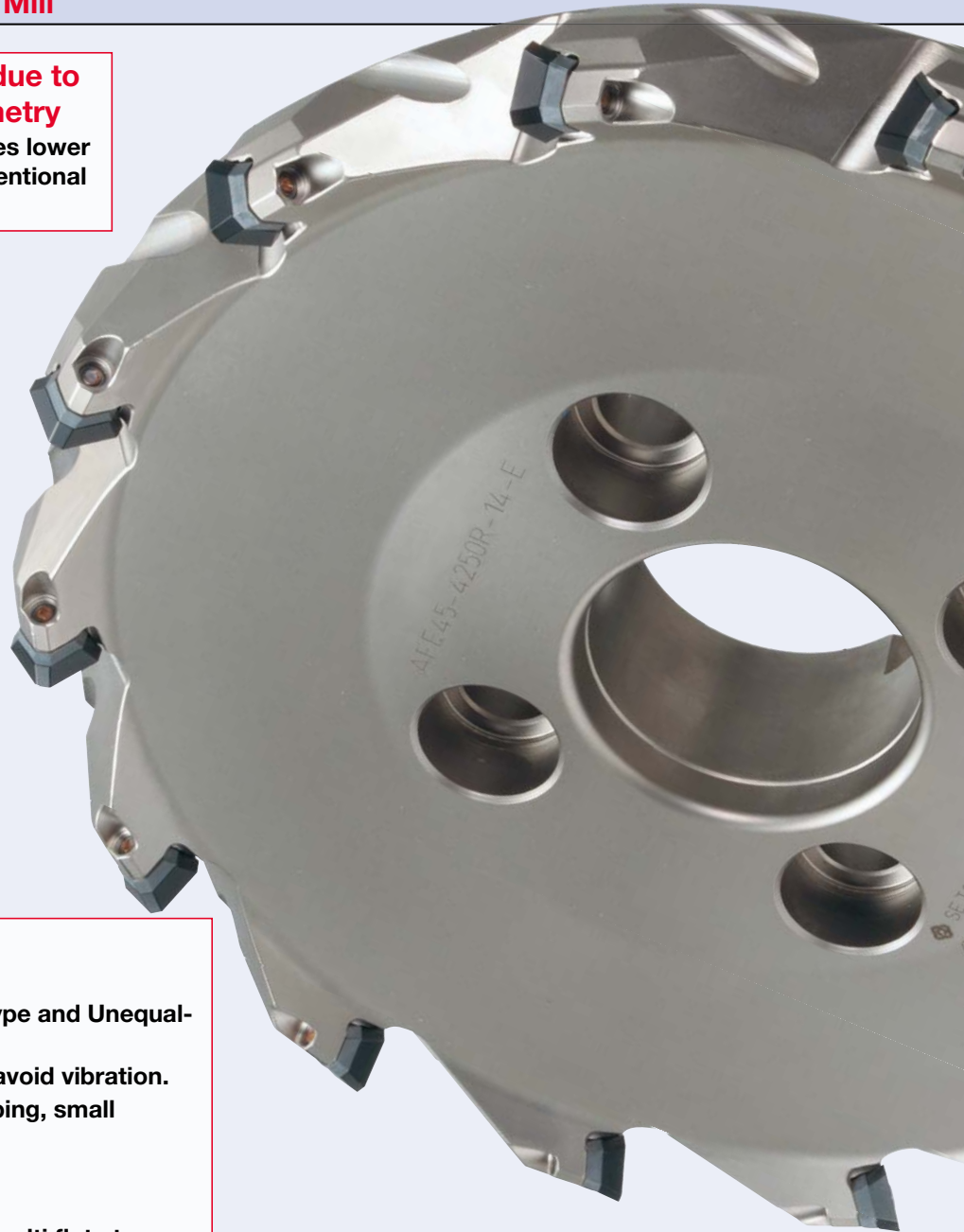


AFE45 | Face Mill

Tool Features **AFE45 Face Mill**

Low cutting force due to unique insert geometry

High-rake insert provides lower cutting force than conventional face milling cutter



Body:

E or UE

Each body has Equal-pitch type and Unequal-pitch type.

UE type is recommended to avoid vibration.
e.x. long OH, less-rigid clamping, small spindle and so on.
(D 250 has only E type)

No. of Flutes

Equal pitch types are set as multi flute type.
Keep dia, change UE to E for increase cutting volume.

Change D, change from E to UE for avoid vibration with keeping cutting volume... as you want.

Carbide Seat

Bigger than D 100 are with Carbide Seat for body protection.



AFE45 | Face Mill



AFE45 | Face Mill | Recommended Cutting Conditions

Showing values are recommended, please start machining with slower feed.

			D 50				D 63				D 80			
Work piece material	Insert Grade	Parameter	Z4 (UE)		Z5 (E)		Z5 (UE)		Z6 (E)		Z6 (UE)		Z8 (E)	
			Roughing	Finishing	Roughing	Finishing	Roughing	Finishing	Roughing	Finishing	Roughing	Finishing	Roughing	Finishing
I II	Carbon-Steel Alloy-Steel <30HRC	JS4060 GX2140	V _c	m/min	180	250	180	250	180	250	180	250	180	250
			n	min ⁻¹	1150	1590	1150	1590	910	1260	910	1260	720	990
			f _z	mm/t	0.3	0.1	0.3	0.1	0.3	0.1	0.3	0.1	0.3	0.1
			V _f	mm/min	1,380	640	1,720	800	1,360	630	1,640	760	1,290	600
			a _p	mm	3	0.3	3	0.3	3	0.3	3	0.3	3	0.3
			a _e	mm	35	35	35	35	44	44	44	44	56	56
			Q	cm ³ /min	145	7	181	8	180	8	216	10	217	10
III	Alloy-Steel Tool-Steel 30~40HRC	JS4045 JS4060 JP4020	V _c	m/min	140	200	140	200	140	200	140	200	140	200
			n	min ⁻¹	890	1,270	890	1,270	710	1,010	710	1,010	560	800
			f _z	mm/t	0.2	0.1	0.2	0.1	0.2	0.1	0.2	0.1	0.2	0.1
			V _f	mm/min	710	510	890	640	710	510	850	610	670	480
			a _p	mm	2.5	0.3	2.5	0.3	2.5	0.3	2.5	0.3	2.5	0.3
			a _e	mm	35	35	35	35	44	44	44	44	56	56
			Q	cm ³ /min	62	5	78	7	78	7	94	8	94	8
IV	Pre-Hardened Steel Tool-Steel 40~50HRC	JP4020 JS4045	V _c	m/min	100	160	100	160	100	160	100	160	100	160
			n	min ⁻¹	640	1,020	640	1,020	510	810	510	810	400	640
			f _z	mm/t	0.15	0.07	0.15	0.07	0.15	0.07	0.15	0.07	0.15	0.07
			V _f	mm/min	380	290	480	360	380	280	450	340	360	270
			a _p	mm	2	0.2	2.5	0.2	2	0.2	2	0.2	2	0.2
			a _e	mm	35	35	35	35	44	44	44	44	56	56
			Q	cm ³ /min	27	2	42	3	33	2	40	3	40	3
V	Pre-Hardened Steel Tool-Steel 50~55HRC	JP4005 JP4020	V _c	m/min	80	120	80	120	80	120	80	120	80	120
			n	min ⁻¹	510	760	510	760	400	610	400	610	320	480
			f _z	mm/t	0.1	0.05	0.1	0.05	0.1	0.05	0.1	0.05	0.1	0.05
			V _f	mm/min	200	150	250	190	200	150	240	180	190	140
			a _p	mm	1.5	0.2	1.5	0.2	1.5	0.2	1.5	0.2	1.5	0.2
			a _e	mm	35	35	35	35	44	44	44	44	56	56
			Q	cm ³ /min	11	1.1	13	1	13	1	16	2	16	2
V	Pre-Hardened Steel Tool-Steel >55HRC	JP4005	V _c	m/min	65	90	65	90	65	90	65	90	65	90
			n	min ⁻¹	410	570	410	570	330	450	330	450	260	360
			f _z	mm/t	0.08	0.03	0.08	0.03	0.08	0.03	0.08	0.03	0.08	0.03
			V _f	mm/min	130	70	170	90	130	70	160	80	120	60
			a _p	mm	1	0.1	1	0.1	1	0.1	1	0.1	1	0.1
			a _e	mm	35	35	35	35	44	44	44	44	56	56
			Q	cm ³ /min	5	0.2	6	0	6	0	7	0	7	0
VI	Stainless steel	JM4060 JP4020	V _c	m/min	90	180	90	180	90	180	90	180	90	180
			n	min ⁻¹	570	1,150	570	1,150	450	910	450	910	360	720
			f _z	mm/t	0.2	0.1	0.2	0.1	0.2	0.1	0.2	0.1	0.2	0.1
			V _f	mm/min	460	460	570	570	450	450	550	550	430	430
			a _p	mm	2	0.1	2	0.1	2	0.1	2	0.1	2	0.1
			a _e	mm	35	35	35	35	44	44	44	44	56	56
			Q	cm ³ /min	32	1.6	40	2	40	2	48	2	48	2
VII	Cast-Iron EN-JL(GG) EN-JS(GGG)	GX2140 JP4020 JS4045	V _c	m/min	140	200	140	200	140	200	140	200	140	200
			n	min ⁻¹	890	1,270	890	1,270	710	1,010	710	1,010	560	800
			f _z	mm/t	0.25	0.1	0.25	0.1	0.25	0.1	0.25	0.1	0.25	0.1
			V _f	mm/min	890	510	1,110	640	880	510	1,060	610	840	480
			a _p	mm	3	0.3	3	0.3	3	0.3	3	0.3	3	0.3
			a _e	mm	35	35	35	35	44	44	44	44	56	56
			Q	cm ³ /min	93	5	117	7	116	7	140	8	141	8
VIII	Aluminium	SD5010	V _c	m/min	600	900	600	900	600	900	600	900	600	900
			n	min ⁻¹	3,820	5,730	3,820	5,730	3,030	4,550	3,030	4,550	2,390	3,580
			f _z	mm/t	0.2	0.1	0.2	0.1	0.2	0.1	0.2	0.1	0.2	0.1
			V _f	mm/min	3,060	2,290	3,820	2,860	3,030	2,270	3,640	2,730	2,860	2,150
			a _p	mm	2.5	0.5	2.5	0.5	2.5	0.5	2.5	0.5	2.5	0.5
			a _e	mm	35	35	35	35	44	44	44	44	56	56
			Q	cm ³ /min	268	40	334	50	333	50	400	60	400	60
IX	Titanium	JP4020 Recom- -AGEN-S type	V _c	m/min	50		50		50		50		50	
			n	min ⁻¹	320		320		250		200		200	
			f _z	mm/t	0.15		0.15		0.15		0.15		0.15	
			V _f	mm/min	190		240		190		230		180	
			a _p	mm	1.5		1.5		1.5		1.5		1.5	
			a _e	mm	35		35		44		44		56	
			Q	cm ³ /min	10		13		13		15		15	
X	Inconel Heat resistant alloy	JP4020 Recom- -AGEN-S type	V _c	m/min	30		30		30		30		30	
			n	min ⁻¹	190		190		150		120		120	
			f _z	mm/t	0.12		0.12		0.12		0.12		0.12	
			V _f	mm/min	90		110		90		110		90	
			a _p	mm	1.5		1.5		1.5		1.5		1.5	
			a _e	mm	35		35		44		44		56	
			Q	cm ³ /min	5		6		6		7		8	



AFE45 | Face Mill | Recommended Cutting Conditions

D 100				D 125				D 160				D 200				D 250			
Z7 (UE)		Z9 (E)		Z8 (UE)		Z10 (E)		Z9 (UE)		Z11 (E)		Z10 (UE)		Z12 (E)		Z14 (E)			
Roughing	Finishing	Roughing	Finishing	Roughing	Finishing	Roughing	Finishing	Roughing	Finishing	Roughing	Finishing	Roughing	Finishing	Roughing	Finishing	Roughing	Finishing		
180	250	180	250	180	250	180	250	180	250	180	250	180	250	180	250	180	250		
570	800	570	800	460	640	460	640	360	500	360	500	290	400	290	400	230	320		
0.35	0.1	0.35	0.1	0.35	0.1	0.35	0.1	0.35	0.1	0.35	0.1	0.35	0.1	0.35	0.1	0.35	0.1		
1,400	560	1,800	720	1,280	510	1,600	640	1,130	450	1,380	550	1,000	400	1,200	480	1,120	450		
3.5	0.3	3.5	0.3	3.5	0.3	3.5	0.3	3.5	0.3	3.5	0.3	3.5	0.3	3.5	0.3	3.5	0.3		
70	70	70	70	88	88	88	88	112	112	112	112	140	140	140	140	175	175		
343	12	441	15	394	13	493	17	443	15	541	18	490	17	588	20	686	24		
140	200	140	200	140	200	140	200	140	200	140	200	140	200	140	200	140	200		
450	640	450	640	360	510	360	510	280	400	280	400	220	320	220	320	180	250		
0.25	0.1	0.25	0.1	0.25	0.1	0.25	0.1	0.25	0.1	0.25	0.1	0.25	0.1	0.25	0.1	0.25	0.1		
780	450	1,000	570	710	410	890	510	630	360	770	440	560	320	670	380	620	360		
3	0.3	3	0.3	3	0.3	3	0.3	3	0.3	3	0.3	3	0.3	3	0.3	3	0.3		
70	70	70	70	88	88	88	88	112	112	112	112	140	140	140	140	175	175		
164	9	210	12	187	11	235	13	212	12	259	15	235	13	281	16	326	19		
100	160	100	160	100	160	100	160	100	160	100	160	100	160	100	160	100	160		
320	510	320	510	250	410	250	410	200	320	200	320	160	250	160	250	130	200		
0.18	0.07	0.18	0.07	0.18	0.07	0.18	0.07	0.18	0.07	0.18	0.07	0.18	0.07	0.18	0.07	0.18	0.07		
400	250	520	320	370	230	460	290	320	200	390	250	290	180	340	210	320	200		
2.5	0.2	2.5	0.2	2.5	0.2	2.5	0.2	2.5	0.2	2.5	0.2	2.5	0.2	2.5	0.2	2.5	0.2		
70	70	70	70	88	88	88	88	112	112	112	112	140	140	140	140	175	175		
70	4	91	4	81	4	101	5	90	4	109	6	102	5	119	6	140	7		
80	120	80	120	80	120	80	120	80	120	80	120	80	120	80	120	80	120		
250	380	250	380	200	310	200	310	160	240	160	240	130	190	130	190	100	150		
0.12	0.05	0.12	0.05	0.12	0.05	0.12	0.05	0.12	0.05	0.12	0.05	0.12	0.05	0.12	0.05	0.12	0.05		
210	130	280	170	200	120	240	150	170	110	210	130	150	100	180	110	170	110		
1.8	0.2	1.8	0.2	1.8	0.2	1.8	0.2	1.8	0.2	1.8	0.2	1.8	0.2	1.8	0.2	1.8	0.2		
70	70	70	70	88	88	88	88	112	112	112	112	140	140	140	140	175	175		
26	2	35	2	32	2	38	3	34	2	42	3	38	3	45	3	54	4		
65	90	65	90	65	90	65	90	65	90	65	90	65	90	65	90	65	90		
210	290	210	290	170	230	170	230	130	180	130	180	100	140	100	140	80	110		
0.08	0.03	0.08	0.03	0.08	0.03	0.08	0.03	0.08	0.03	0.08	0.03	0.08	0.03	0.08	0.03	0.08	0.03		
120	60	150	80	110	60	130	70	90	50	110	60	80	40	100	50	90	50		
1	0.1	1	0.1	1	0.1	1	0.1	1	0.1	1	0.1	1	0.1	1	0.1	1	0.1		
70	70	70	70	88	88	88	88	112	112	112	112	140	140	140	140	175	175		
8	0	11	1	10	1	11	1	10	1	12	1	11	1	14	1	16	1		
90	180	90	180	90	180	90	180	90	180	90	180	90	180	90	180	90	180		
290	570	290	570	230	460	230	460	180	360	180	360	140	290	140	290	110	230		
0.25	0.1	0.25	0.1	0.25	0.1	0.25	0.1	0.25	0.1	0.25	0.1	0.25	0.1	0.25	0.1	0.25	0.1		
500	400	640	520	460	370	570	460	400	320	490	390	360	290	430	340	400	320		
2.5	0.1	2.5	0.1	2.5	0.1	2.5	0.1	2.5	0.1	2.5	0.1	2.5	0.1	2.5	0.1	2.5	0.1		
70	70	70	70	88	88	88	88	112	112	112	112	140	140	140	140	175	175		
88	3	112	4	101	3	125	4	112	4	137	4	126	4	151	5	175	6		
140	200	140	200	140	200	140	200	140	200	140	200	140	200	140	200	140	200		
450	640	450	640	360	510	360	510	280	400	280	400	220	320	220	320	180	250		
0.3	0.1	0.3	0.1	0.3	0.1	0.3	0.1	0.3	0.1	0.3	0.1	0.3	0.1	0.3	0.1	0.3	0.1		
940	450	1,200	570	860	410	1,070	510	750	360	920	440	670	320	800	380	750	360		
3.5	0.3	3.5	0.3	3.5	0.3	3.5	0.3	3.5	0.3	3.5	0.3	3.5	0.3	3.5	0.3	3.5	0.3		
70	70	70	70	88	88	88	88	112	112	112	112	140	140	140	140	175	175		
230	9	294	12	265	11	330	13	294	12	361	15	328	13	392	16	459	19		
600	900	60	900	600	900	600	900	600	900	600	900	600	900	600	900	600	900		
1,910	2,860	190	2,860	1,530	2,290	1,530	2,290	1,190	1,790	1,190	1,790	950	1,430	950	1,430	760	1,150		
0.25	0.1	0.25	0.1	0.25	0.1	0.25	0.1	0.25	0.1	0.25	0.1	0.25	0.1	0.25	0.1	0.25	0.1		
3,340	2,010	430	2,580	3,060	1,830	3,820	2,290	2,690	1,610	3,280	1,970	2,390	1,430	2,860	1,720	2,670	1,600		
3	0.5	3	0.5	3	0.5	3	0.5	3	0.5	3	0.5	3	0.5	3	0.5	3	0.5		
70	70	70	70	88	88	88	88	112	112	112	112	140	140	140	140	175	175		
701	70	90	90	808	81	1,008	101	904	90	1,102	110	1,004	100	1,201	120	1,402	140		
50		50		50		50		50		50		50		50		50			
160		160		130		130		100		100		80		80		60			
0.15		0.15		0.15		0.15		0.15		0.15		0.15		0.15		0.15			
170		210		150		190		130		160		120		140		130			
1.5		1.5		1.5		1.5		1.5		1.5		1.5		1.5		1.5			
70		70		88		88		112		112		140		140		175			
18		22		20		25		22		27		25		29		34			
30		30		30		30		30		30		30		30		30			
100		100		80		80		60		60		50		50		40			
0.12		0.12		0.12		0.12		0.12		0.12		0.12		0.12		0.12			
80		100		70		90		60		80		60		70		60			
1.5		1.5		1.5		1.5		1.5		1.5		1.5		1.5		1.5			
70		70		88		88		112		112		140		140		175			
8		11		9		12		10		13		13		15		16			

Always up to date: Please check our P50 QuickFinder



Attentions on Safety

1. Cautions regarding handling

- (1) When removing the tool from its case (packaging), be careful that the tool does not pop out or is dropped. Be particularly careful regarding contact with the tool flutes.
- (2) When handling tools with sharp cutting flutes, be careful not to touch the cutting flutes directly with your bare hands.

2. Cautions regarding mounting

- (1) Before use, check the outside appearance of the tool for scratches, cracks, etc. and that it is firmly mounted in the collet chuck, etc.
- (2) When preparing for use, be sure that the inserts are firmly mounted in place and that they are firmly mounted on the arbor, etc.
- (3) If abnormal chattering, etc. occurs during use, stop the machine immediately and remove the cause of the chattering.

3. Cautions during use

- (1) Before use, confirm the dimensions and direction of rotation of the tool and milling work material.
- (2) The numerical values in the standard cutting conditions table should be used as criteria when starting new work. The cutting conditions should be adjusted as appropriate when the cutting depth is large, the rigidity of the machine being used is low, or according to the conditions of the work material.
- (3) Cutting tools are made of a hard material. During use, they may break and fly off. In addition, cutting chips may also fly off. Since there is a danger of injury to workers, fire, or eye damage from such flying pieces, a safety cover should be attached when work is performed and safety equipment such as safety goggles should be worn to create a safe environment for work.
- (4) There is a risk of fire or inflammation due to sparks, heat due to breakage, and cutting chips. Do not use where there is a risk of fire or explosion. Please caution of fire while using oil base coolant, fire prevention is necessary.
- (5) Do not use the tool for any purpose other than that for which it is intended.

4. Cautions regarding regrinding

- (1) If regrinding is not performed at the proper time, there is a risk of the tool breaking. Replace the tool with one in good condition, or perform regrinding.
- (2) Grinding dust will be created when regrinding a tool. When regrinding, be sure to attach a safety cover over the work area and wear safety clothes such as safety goggles, etc.
- (3) This product contains the specified chemical substance cobalt and its inorganic compounds. When performing regrinding or similar processing, be sure to handle the processing in accordance with the local laws and regulations regarding prevention of hazards due to specified chemical substances.

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