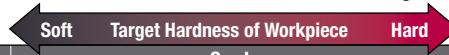
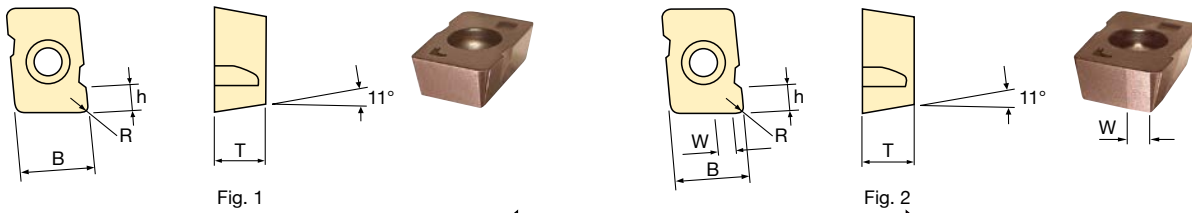


Indexable Milling Tools

INSERTS ASPV | Polish Mill V-Type

MPHW0603..ZEL/ZFL



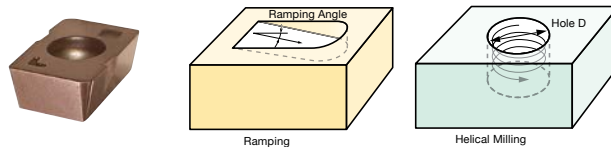
Inserts	Tolerance Class	Grade				Size (mm)					Shape
		SD5010	JX1045	JX1020	ATH08M	B	W	T	h	R	
Item Code		ID Code									
R 0.4	H	MPHW060304ZEL ATH08M			WF188	6.35	-	3.18	3	0.4	Fig-1
MPHW060304ZEL-0.5 ATH08M				WF189	0.5		Fig-2				
MPHW060304ZFL SD5010		WF190			-		Fig-1				
R 0.8		MPHW060308ZEL ATH08M			WF191	6.35	-	3.18	3	0.8	Fig-1
MPHW060308ZEL JX1020				WF192							
MPHW060308ZEL JX1045		WF193	×								
MPHW060308ZEL-1.5 ATH08M				WF194	1.5		Fig-2				
MPHW060308ZEL-1.5 JX1020				WF195							
R 2		MPHW060308ZEL-1.5 JX1045	WF196	×							Fig-1
MPHW060308ZFL SD5010		WF197				-				2	Fig-1
MPHW060320ZEL ATH08M				WF198		-				Fig-1	

SD5010	PVD · For Aluminium
JX1045	× to be replaced by JS4045
JX1020	PVD · For pre-hardened steels 40–55HRC
ATH08M	PVD · General grade from soft to hard

Parts	Clamp Screw		Screw Driver	
Shape				
Cutter body	ID Code	Item Code	ID Code	Item Code
ASPVM20..R-	ET175	250-141	ET13	104-T8

ASPV | Polish Mill V-Type | Recommended Cutting Conditions

- Ramping / Helical Milling
- Rampen-/ Helikalfräsen
- Rampa / Fresatura elicoidale
- Rampas / fresado helicoidal
- Rampe / Fraisage Hélicoïdal
- Rampa / Fresagem Helicoidal



Inserts	MPHW0603..ZEL/ZFL							
Tool diameter D (mm)	D16	D20	D25	D32	D35	D42	D52	D66
Maximum ramp angle °	2.5°	2.5°	2.1°	1.6°	1.4°	1.2°	1°	0.5°
Helical Milling / Hole Dia. (mm)	22~30	30~38	40~48	54~62	60~68	74~82	94~102	122~130

- The ramp angle should be set within the ranges listed above. Use at ramp angles of 0.5° is recommended.
 - For hole diameters outside the ranges listed above, a pilot hole should be drilled before milling.
1. Der Rampenfräswinkel sollte innerhalb der oben aufgelisteten Bereiche sein. Empfohlen wird ein Winkel von 0,5°.
- Für Bohrungen mit einem größeren Durchmesser als oben aufgeführt sollte vor dem Helikalfräsen eine Startbohrung durchgeführt werden.
1. L'angolo di rampa dovrebbe essere compreso tra i valori sopra esposti. E' comunque raccomandabile l'utilizzo di un angolo di 0.5°.
- Per i fori di diametro non compreso tra i valori sopra riportati è necessaria una pre-foratura da effettuare prima della fresatura elicoidale.

- El ángulo de rampa debe establecerse dentro de los rangos indicados en el cuadro. Es recomendable utilizar ángulos de rampa de 0,5°.
 - Para agujeros distintos a los rangos indicados en el cuadro, es necesario realizar un orificio previo antes del fresado.
1. L'angle de rampe utilise doit-étre tel que précisé dans la liste ci-dessous. L'utilisation d'un angle de rampe de 0.5° est recommandée.
- Pour la réalisation de perçage par fraisage, voir la liste ci-dessous. Un avant trou doit-étre réalisé au préalable.
1. O ângulo da rampa deve ser definido dentro dos intervalos listados acima. Use em ângulos de rampa de 0,5° é recomendado.
- Para diâmetros de furos fora dos intervalos listados acima, um furo piloto deve ser perfurado antes de maquinação.

Cutting Conditions Schnittwerte	Condizioni di taglio	Condiciones de Corte	Conditions de coupe Valores de corte:
Bottom finishing	Page 6–7:	Modular D16 – D42 Page 8: Bore Types D42 – D66	
Wall finishing Z constant	Page 9–10:	Modular D16 – D42 Page 11: Bore Types D42 – D66	
Vertical wall roughing	Page 12:	Modular D16 – D42, Bore Types D42 – D66	
Vertical wall finishing	Page 13:	Modular D16 – D42, Bore Types D42 – D66	
Contouring Z constant	Page 14–15:	Modular D16 – D42, Bore Types D42 – D66	

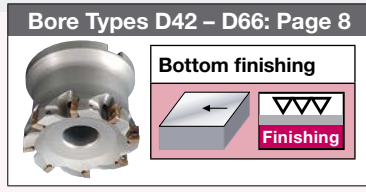
ASPV | Polish Mill V-Type | Recommended Cutting Conditions

Bottom finishing			D16 Modular (Z2)					D20 Modular (Z3)					D25 Modular (Z4)				
			General	High Speed	3D-5D	5D-7D	>7D	General	High Speed	3D-5D	5D-7D	>7D	General	High Speed	3D-5D	5D-7D	>7D
Mild Steels (200HB or less)	ATH08M JX1020 JX1045	n min ⁻¹	2,980	5,970	3,980	2,980	2,590	2,390	4,770	3,180	2,390	2,070	1,910	3,820	2,550	1,910	1,660
		V_c m/min	150	300	200	150	130	150	300	200	150	130	150	300	200	150	130
		V_f mm/min	600	1,790	1,190	720	520	720	2,150	1,430	860	620	760	2,290	1,530	920	660
		f_z mm/t	0.1	0.15	0.15	0.12	0.1	0.1	0.15	0.15	0.12	0.1	0.1	0.15	0.15	0.12	0.1
		a_p mm	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
		a_e mm	8-16	8-16	8-16	8-16	8	10-20	10-20	10-20	10-20	10	12-25	12-25	12-25	12-25	12
Carbon Steels Alloy Steels (30HRC or less)	ATH08M JX1020 JX1045	n min ⁻¹	2,980	4,970	3,580	2,590	1,990	2,390	3,980	2,860	2,070	1,590	1,910	3,180	2,290	1,660	1,270
		V_c m/min	150	250	180	130	100	150	250	180	130	100	150	250	180	130	100
		V_f mm/min	600	1,490	1,070	620	400	720	1,790	1,290	740	480	760	1,910	1,380	790	510
		f_z mm/t	0.1	0.15	0.15	0.12	0.1	0.1	0.15	0.15	0.12	0.1	0.1	0.15	0.15	0.12	0.1
		a_p mm	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
		a_e mm	8-16	8-16	8-16	8-16	8	10-20	10-20	10-20	10-20	10	12-25	12-25	12-25	12-25	12
Carbon Steels Alloy Steels (30-45HRC)	ATH08M JX1020 JX1045	n min ⁻¹	2,590	3,980	3,180	2,590	1,790	2,070	3,180	2,550	2,070	1,430	1,660	2,550	2,040	1,660	1,150
		V_c m/min	130	200	160	130	90	130	200	160	130	90	130	200	160	130	90
		V_f mm/min	520	950	760	520	360	620	1,150	920	620	430	660	1,220	980	660	460
		f_z mm/t	0.1	0.12	0.12	0.1	0.1	0.1	0.12	0.12	0.1	0.1	0.1	0.12	0.12	0.1	0.1
		a_p mm	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
		a_e mm	8-16	8-16	8-16	8-16	8	10-20	10-20	10-20	10-20	10	12-25	12-25	12-25	12-25	12
SUS Stainless Steels	JX1020 ATH08M	n min ⁻¹	2,980	4,970	3,580	2,590	1,990	2,390	3,980	2,860	2,070	1,590	1,910	3,180	2,290	1,660	1,270
		V_c m/min	150	250	180	130	100	150	250	180	130	100	150	250	180	130	100
		V_f mm/min	600	1,490	1,070	620	400	720	1,790	1,290	740	480	760	1,910	1,380	790	510
		f_z mm/t	0.1	0.15	0.15	0.12	0.1	0.1	0.15	0.15	0.12	0.1	0.1	0.15	0.15	0.12	0.1
		a_p mm	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
		a_e mm	8-16	8-16	8-16	8-16	8	10-20	10-20	10-20	10-20	10	12-25	12-25	12-25	12-25	12
FC FCD Cast Iron	ATH08M JX1020 JX1045	n min ⁻¹	2,980	4,970	3,980	2,980	2,590	2,390	3,980	3,180	2,390	2,070	1,910	3,180	2,550	1,910	1,660
		V_c m/min	150	250	200	150	130	150	250	200	150	130	150	250	200	150	130
		V_f mm/min	600	1,990	1,590	900	520	720	2,390	1,910	1,070	620	760	2,550	2,040	1,150	660
		f_z mm/t	0.1	0.2	0.2	0.15	0.1	0.1	0.2	0.2	0.15	0.1	0.1	0.2	0.2	0.15	0.1
		a_p mm	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
		a_e mm	8-16	8-16	8-16	8-16	8	10-20	10-20	10-20	10-20	10	12-25	12-25	12-25	12-25	12
Hardened Steels (45-55HRC)	ATH08M JX1020	n min ⁻¹	1,590	2,390	1,990	1,590	1,590	1,270	1,910	1,590	1,270	1,270	1,020	1,530	1,270	1,020	1,020
		V_c m/min	80	120	100	80	80	80	120	100	80	80	80	120	100	80	80
		V_f mm/min	320	480	400	320	320	380	570	480	380	380	410	610	510	410	410
		f_z mm/t	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
		a_p mm	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
		a_e mm	8-16	8-16	8-16	8-16	8	10-20	10-20	10-20	10-20	10	12-25	12-25	12-25	12-25	12
Hardened Steels (55-62HRC)	ATH08M JX1020	n min ⁻¹	990	1,990	1,390	990	990	800	1,590	1,110	800	800	640	1,270	890	640	640
		V_c m/min	50	100	70	50	50	50	100	70	50	50	50	100	70	50	50
		V_f mm/min	100	280	190	100	100	120	330	230	120	120	130	360	250	130	130
		f_z mm/t	0.05	0.07	0.07	0.05	0.05	0.05	0.07	0.07	0.05	0.05	0.05	0.07	0.07	0.05	0.05
		a_p mm	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
		a_e mm	8-16	8-16	8-16	8-16	8	10-20	10-20	10-20	10-20	10	12-25	12-25	12-25	12-25	12
Titanium Alloy Ti-6Al-4V (wet condition)	ATH08M JX1020	n min ⁻¹	600	1,190	990	600	600	480	950	800	480	480	380	760	640	380	380
		V_c m/min	30	60	50	30	30	30	60	50	30	30	30	60	50	30	30
		V_f mm/min	120	360	300	120	120	140	430	360	140	140	150	460	380	150	150
		f_z mm/t	0.1	0.15	0.15	0.1	0.1	0.1	0.15	0.15	0.1	0.1	0.1	0.15	0.15	0.1	0.1
		a_p mm	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
		a_e mm	8-16	8-16	8-16	8-16	8	10-20	10-20	10-20	10-20	10	12-25	12-25	12-25	12-25	12
Aluminium Alloy	SD5010	n min ⁻¹	11,940	23,870	15,920	11,940	11,940	9,550	19,100	12,730	9,550	9,550	7,640	15,280	10,190	7,640	7,640
		V_c m/min	600	1,200	800	600	600	600	1,200	800	600	600	600	1,200	800	600	600
		V_f mm/min	2,390	7,160	4,770	2,860	2,390	2,860	8,590	5,730	3,440	2,860	3,060	9,170	6,110	3,670	3,060
		f_z mm/t	0.1	0.15	0.15	0.12	0.1	0.1	0.15	0.15	0.12	0.1	0.1	0.15	0.15	0.12	0.1
		a_p mm	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
		a_e mm	8-16	8-16	8-16	8-16	8	10-20	10-20	10-20	10-20	10	12-25	12-25	12-25	12-25	12
Maximum f _z (mm/t)			<0.35					<0.35					<0.35				
Maximum a _p (mm)			<2.8					<2.8					<2.8				

* Red indicates primary recommended material types

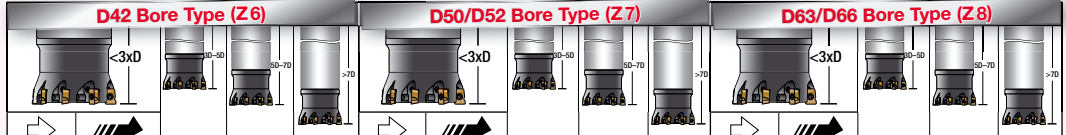
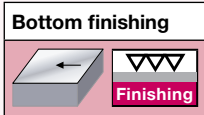
ASPV | Polish Mill V-Type | Recommended Cutting Conditions

D32 Modular (Z5)					D35 Modular (Z5)					D42 Modular (Z6)										
General		High Speed		3D-5D	5D-7D	>7D	General		High Speed		3D-5D	5D-7D	>7D	General		High Speed		3D-5D	5D-7D	>7D
1,490	2,980	1,990	1,490	1,290	1,360	2,730	1,820	1,360	1,180	1,140	2,270	1,520	1,140	990						
150	300	200	150	130	150	300	200	150	130	150	300	200	150	130						
750	2,240	1,490	900	650	680	2,050	1,360	820	590	680	2,050	1,360	820	590						
0.1	0.15	0.15	0.12	0.1	0.1	0.15	0.15	0.12	0.1	0.1	0.15	0.15	0.12	0.1						
0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2						
16-32	16-32	16-32	16-32	16	17.5-35	17.5-35	17.5-35	17.5-35	17.5	21-42	21-42	21-42	21-42	21						
1,490	2,490	1,790	1,290	990	1,360	2,270	1,640	1,180	910	1,140	1,890	1,360	990	760						
150	250	180	130	100	150	250	180	130	100	150	250	180	130	100						
750	1,870	1,340	780	500	680	1,710	1,230	710	450	680	1,710	1,230	710	450						
0.1	0.15	0.15	0.12	0.1	0.1	0.15	0.15	0.12	0.1	0.1	0.15	0.15	0.12	0.1						
0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2						
16-32	16-32	16-32	16-32	16	17.5-35	17.5-35	17.5-35	17.5-35	17.5	21-42	21-42	21-42	21-42	21						
1,290	1,990	1,590	1,290	900	1,180	1,820	1,460	1,180	820	990	1,520	1,210	990	680						
130	200	160	130	90	130	200	160	130	90	130	200	160	130	90						
650	1,190	950	650	450	590	1,090	870	590	410	590	1,090	870	590	410						
0.1	0.12	0.12	0.1	0.1	0.1	0.12	0.12	0.1	0.1	0.1	0.12	0.12	0.1	0.1						
0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2						
16-32	16-32	16-32	16-32	16	17.5-35	17.5-35	17.5-35	17.5-35	17.5	21-42	21-42	21-42	21-42	21						
1,490	2,490	1,790	1,290	990	1,360	2,270	1,640	1,180	910	1,140	1,890	1,360	990	760						
150	250	180	130	100	150	250	180	130	100	150	250	180	130	100						
750	1,870	1,340	780	500	680	1,710	1,230	710	450	680	1,710	1,230	710	450						
0.1	0.15	0.15	0.12	0.1	0.1	0.15	0.15	0.12	0.1	0.1	0.15	0.15	0.12	0.1						
0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2						
16-32	16-32	16-32	16-32	16	17.5-35	17.5-35	17.5-35	17.5-35	17.5	21-42	21-42	21-42	21-42	21						
1,490	2,490	1,990	1,490	1,290	1,360	2,270	1,820	1,360	1,180	1,140	1,890	1,520	1,140	990						
150	250	200	150	130	150	250	200	150	130	150	250	200	150	130						
750	2,490	1,990	1,120	650	680	2,270	1,820	1,020	590	680	2,270	1,820	1,020	590						
0.1	0.2	0.2	0.15	0.1	0.1	0.2	0.2	0.15	0.1	0.1	0.2	0.2	0.15	0.1						
0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2						
16-32	16-32	16-32	16-32	16	17.5-35	17.5-35	17.5-35	17.5-35	17.5	21-42	21-42	21-42	21-42	21						
800	1,190	990	800	800	730	1,090	910	730	730	610	910	760	610	610						
80	120	100	80	80	80	120	100	80	80	80	120	100	80	80						
400	600	500	400	400	360	550	450	360	360	360	550	450	360	360						
0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1						
0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2						
16-32	16-32	16-32	16-32	16	17.5-35	17.5-35	17.5-35	17.5-35	17.5	21-42	21-42	21-42	21-42	21						
500	990	700	500	500	450	910	640	450	450	380	760	530	380	380						
50	100	70	50	50	50	100	70	50	50	50	100	70	50	50						
120	350	240	120	120	110	320	220	110	110	110	320	220	110	110						
0.05	0.07	0.07	0.05	0.05	0.05	0.07	0.07	0.05	0.05	0.05	0.07	0.07	0.05	0.05						
0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2						
16-32	16-32	16-32	16-32	16	17.5-35	17.5-35	17.5-35	17.5-35	17.5	21-42	21-42	21-42	21-42	21						
300	600	500	300	300	270	550	450	270	270	230	450	380	230	230						
30	60	50	30	30	30	60	50	30	30	30	60	50	30	30						
150	450	370	150	150	140	410	340	140	140	140	410	340	140	140						
0.1	0.15	0.15	0.1	0.1	0.1	0.15	0.15	0.1	0.1	0.1	0.15	0.15	0.1	0.1						
0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2						
16-32	16-32	16-32	16-32	16	17.5-35	17.5-35	17.5-35	17.5-35	17.5	21-42	21-42	21-42	21-42	21						
5,970	11,940	7,960	5,970	5,970	5,460	10,910	7,280	5,460	5,460	4,550	9,090	6,060	4,550	4,550						
600	1,200	800	600	600	600	1,200	800	600	600	600	1,200	800	600	600						
2,980	8,950	5,970	3,580	2,980	2,730	8,190	5,460	3,270	2,730	2,730	8,190	5,460	3,270	2,730						
0.1	0.15	0.15	0.12	0.1	0.1	0.15	0.15	0.12	0.1	0.1	0.15	0.15	0.12	0.1						
0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2						
16-32	16-32	16-32	16-32	16	17.5-35	17.5-35	17.5-35	17.5-35	17.5	21-42	21-42	21-42	21-42	21						
<0.35					<0.35					<0.35										
<2.8					<2.8					<2.8										



* Red indicates primary recommended material types

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Material	Grade	Overhang ratio	D42 Bore Type (Z6)					D50/D52 Bore Type (Z7)					D63/D66 Bore Type (Z8)				
			General	High Speed	3D-5D	5D-7D	>7D	General	High Speed	3D-5D	5D-7D	>7D	General	High Speed	3D-5D	5D-7D	>7D
Mild Steels (200HB or less)	ATH08M JX1020 JX1045	n min ⁻¹	1,140	2,270	1,520	1,140	990	920	1,530	1,220	920	800	720	1,210	960	720	630
		V_c m/min	150	300	200	150	130	150	250	200	150	130	150	250	200	150	130
		V_f mm/min	680	2,050	1,360	820	590	640	1,610	1,290	770	560	580	1,450	1,160	690	500
		f_z mm/t	0.1	0.15	0.15	0.12	0.1	0.1	0.15	0.15	0.12	0.1	0.1	0.15	0.15	0.12	0.1
		a_p mm	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
		a_e mm	21-42	21-42	21-42	21-42	21	26-52	26-52	26-52	26-52	26	33-66	33-66	33-66	33-66	33
Carbon Steels Alloy Steels (30HRC or less)	ATH08M JX1020 JX1045	n min ⁻¹	1,140	1,890	1,360	990	760	920	1,410	1,100	800	610	720	1,110	870	630	480
		V_c m/min	150	250	180	130	100	150	230	180	130	100	150	230	180	130	100
		V_f mm/min	680	1,710	1,230	710	450	640	1,480	1,160	670	430	580	1,330	1,040	600	390
		f_z mm/t	0.1	0.15	0.15	0.12	0.1	0.1	0.15	0.15	0.12	0.1	0.1	0.15	0.15	0.12	0.1
		a_p mm	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
		a_e mm	21-42	21-42	21-42	21-42	21	26-52	26-52	26-52	26-52	26	33-66	33-66	33-66	33-66	33
Carbon Steels Alloy Steels (30-45HRC)	ATH08M JX1020 JX1045	n min ⁻¹	990	1,520	1,210	990	680	800	1,100	920	800	550	630	870	720	630	430
		V_c m/min	130	200	160	130	90	130	180	150	130	90	130	180	150	130	90
		V_f mm/min	590	1,090	870	590	410	560	930	770	560	390	500	830	690	500	350
		f_z mm/t	0.1	0.12	0.12	0.1	0.1	0.1	0.12	0.12	0.1	0.1	0.1	0.12	0.12	0.1	0.1
		a_p mm	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
		a_e mm	21-42	21-42	21-42	21-42	21	26-52	26-52	26-52	26-52	26	33-66	33-66	33-66	33-66	33
SUS Stainless Steels	JX1020 ATH08M	n min ⁻¹	1,140	1,890	1,360	990	760	920	1,410	1,100	800	610	720	1,110	870	630	480
		V_c m/min	150	250	180	130	100	150	230	180	130	100	150	230	180	130	100
		V_f mm/min	680	1,710	1,230	710	450	640	1,480	1,160	670	430	580	1,330	1,040	600	390
		f_z mm/t	0.1	0.15	0.15	0.12	0.1	0.1	0.15	0.15	0.12	0.1	0.1	0.15	0.15	0.12	0.1
		a_p mm	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
		a_e mm	21-42	21-42	21-42	21-42	21	26-52	26-52	26-52	26-52	26	33-66	33-66	33-66	33-66	33
FC FCD Cast Iron	ATH08M JX1020 JX1045	n min ⁻¹	1,140	1,890	1,520	1,140	990	920	1,530	1,220	920	800	720	1,210	960	720	630
		V_c m/min	150	250	200	150	130	150	250	200	150	130	150	250	200	150	130
		V_f mm/min	680	2,270	1,820	1,020	590	640	2,140	1,710	960	560	580	1,930	1,540	870	500
		f_z mm/t	0.1	0.2	0.2	0.15	0.1	0.1	0.2	0.2	0.15	0.1	0.1	0.2	0.2	0.15	0.1
		a_p mm	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
		a_e mm	21-42	21-42	21-42	21-42	21	26-52	26-52	26-52	26-52	26	33-66	33-66	33-66	33-66	33
Hardened Steels (45-55HRC)	ATH08M JX1020	n min ⁻¹	610	910	760	610	610	370	610	490	370	370	290	480	390	290	290
		V_c m/min	80	120	100	80	80	60	100	80	60	60	60	100	80	60	60
		V_f mm/min	360	550	450	360	360	260	430	340	260	260	230	390	310	230	230
		f_z mm/t	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
		a_p mm	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
		a_e mm	21-42	21-42	21-42	21-42	21	26-52	26-52	26-52	26-52	26	33-66	33-66	33-66	33-66	33
Hardened Steels (55-62HRC)	ATH08M JX1020	n min ⁻¹	380	760	530	380	380	310	490	370	310	310	240	390	290	240	240
		V_c m/min	50	100	70	50	50	50	80	60	50	50	50	80	60	50	50
		V_f mm/min	110	320	220	110	110	110	240	180	110	110	100	220	160	100	100
		f_z mm/t	0.05	0.07	0.07	0.05	0.05	0.05	0.07	0.07	0.05	0.05	0.05	0.07	0.07	0.05	0.05
		a_p mm	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
		a_e mm	21-42	21-42	21-42	21-42	21	26-52	26-52	26-52	26-52	26	33-66	33-66	33-66	33-66	33
Titanium Alloy Ti-6Al-4V (wet condi- tion)	ATH08M JX1020	n min ⁻¹	230	450	380	230	230	180	370	310	180	180	140	290	240	140	140
		V_c m/min	30	60	50	30	30	30	60	50	30	30	30	60	50	30	30
		V_f mm/min	140	410	340	140	140	130	390	320	150	130	120	350	290	140	120
		f_z mm/t	0.1	0.15	0.15	0.1	0.1	0.1	0.15	0.15	0.12	0.1	0.1	0.15	0.15	0.12	0.1
		a_p mm	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
		a_e mm	21-42	21-42	21-42	21-42	21	26-52	26-52	26-52	26-52	26	33-66	33-66	33-66	33-66	33
Aluminium Alloy	SD5010	n min ⁻¹	4,550	9,090	6,060	4,550	4,550	3,670	9,180	6,120	3,670	3,670	2,890	7,230	4,820	2,890	2,890
		V_c m/min	600	1,200	800	600	600	600	1,500	1,000	600	600	600	1,500	1,000	600	600
		V_f mm/min	2,730	8,190	5,460	3,270	2,730	2,570	9,640	6,430	3,090	3,090	2,310	8,680	5,790	2,780	2,780
		f_z mm/t	0.1	0.15	0.15	0.12	0.1	0.1	0.15	0.15	0.12	0.12	0.1	0.15	0.15	0.12	0.12
		a_p mm	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
		a_e mm	21-42	21-42	21-42	21-42	21	26-52	26-52	26-52	26-52	26	33-66	33-66	33-66	33-66	33
Maximum f _z (mm/t)			<0.35					<0.35					<0.35				
Maximum a _p (mm)			<2.8					<2.8					<2.8				

Modular Types D16 – D42: Page 6-7

*Red indicates primary recommended material types

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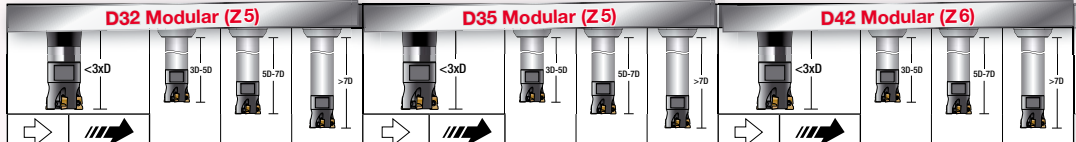
Material	Grade	Overhang ratio	D16 Modular (Z2)					D20 Modular (Z3)					D25 Modular (Z4)				
			General	High Speed	3D-5D	5D-7D	>7D	General	High Speed	3D-5D	5D-7D	>7D	General	High Speed	3D-5D	5D-7D	>7D
Mild Steels (200HB or less)	ATH08M JX1020 JX1045	n min ⁻¹	7,960	15,920	11,940	7,960	7,960	6,370	12,730	9,550	6,370	6,370	5,090	10,190	7,640	5,090	5,090
		V _c m/min	400	800	600	400	400	400	800	600	400	400	400	800	600	400	400
		V _f mm/min	1,590	4,770	3,580	1,910	1,590	1,910	5,730	4,300	2,290	1,910	2,040	6,110	4,580	2,440	2,040
		f _z mm/t	0.1	0.15	0.15	0.12	0.1	0.1	0.15	0.15	0.12	0.1	0.1	0.15	0.15	0.12	0.1
		a _p mm	2	2	1.5	1	0.7	2	2	1.5	1	0.7	2	2	1.5	1	0.7
		a _e mm	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Carbon Steels Alloy Steels (30HRC or less)	ATH08M JX1020 JX1045	n min ⁻¹	5,970	11,940	7,960	7,960	5,970	4,770	9,550	6,370	6,370	4,770	3,820	7,640	5,090	5,090	3,820
		V _c m/min	300	600	400	400	300	300	600	400	400	300	300	600	400	400	300
		V _f mm/min	1,190	3,580	2,390	1,910	1,190	1,430	4,300	2,860	2,290	1,430	1,530	4,580	3,060	2,440	1,530
		f _z mm/t	0.1	0.15	0.15	0.12	0.1	0.1	0.15	0.15	0.12	0.1	0.1	0.15	0.15	0.12	0.1
		a _p mm	2	2	1.5	1	0.7	2	2	1.5	1	0.7	2	2	1.5	1	0.7
		a _e mm	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Carbon Steels Alloy Steels (30-45HRC)	ATH08M JX1020 JX1045	n min ⁻¹	3,980	9,950	6,960	5,970	5,970	3,180	7,960	5,570	4,770	4,770	2,550	6,370	4,460	3,820	3,820
		V _c m/min	200	500	350	300	300	200	500	350	300	300	200	500	350	300	300
		V _f mm/min	800	2,390	1,670	1,190	950	950	2,860	2,010	1,430	1,150	1,020	3,060	2,140	1,530	1,220
		f _z mm/t	0.1	0.12	0.12	0.1	0.08	0.1	0.12	0.12	0.1	0.08	0.1	0.12	0.12	0.1	0.08
		a _p mm	2	2	1.5	1	0.7	2	2	1.5	1	0.7	2	2	1.5	1	0.7
		a _e mm	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
SUS Stainless Steels	JX1020 ATH08M	n min ⁻¹	5,970	11,940	7,960	7,960	5,970	4,770	9,550	6,370	6,370	4,770	3,820	7,640	5,090	5,090	3,820
		V _c m/min	300	600	400	400	300	300	600	400	400	300	300	600	400	400	300
		V _f mm/min	1,190	3,580	2,390	1,910	1,190	1,430	4,300	2,860	2,290	1,430	1,530	4,580	3,060	2,440	1,530
		f _z mm/t	0.1	0.15	0.15	0.12	0.1	0.1	0.15	0.15	0.12	0.1	0.1	0.15	0.15	0.12	0.1
		a _p mm	2	2	1.5	1	0.7	2	2	1.5	1	0.7	2	2	1.5	1	0.7
		a _e mm	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
FC FCD Cast Iron	ATH08M JX1020 JX1045	n min ⁻¹	5,970	11,940	9,950	7,960	7,960	4,770	9,550	7,960	6,370	6,370	3,820	7,640	6,370	5,090	5,090
		V _c m/min	300	600	500	400	400	300	600	500	400	400	300	600	500	400	400
		V _f mm/min	1,190	3,580	2,980	1,910	1,590	1,430	4,300	3,580	2,290	1,910	1,530	4,580	3,820	2,440	2,040
		f _z mm/t	0.1	0.15	0.15	0.12	0.1	0.1	0.15	0.15	0.12	0.1	0.1	0.15	0.15	0.12	0.1
		a _p mm	2	2	1.5	1	0.7	2	2	1.5	1	0.7	2	2	1.5	1	0.7
		a _e mm	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Hardened Steels (45-55HRC)	ATH08M JX1020	n min ⁻¹	2,980	4,970	3,580	2,980	2,980	2,390	3,980	2,860	2,390	2,390	1,910	3,180	2,290	1,910	1,910
		V _c m/min	150	250	180	150	150	150	250	180	150	150	150	250	180	150	150
		V _f mm/min	600	990	720	480	480	720	1,190	860	570	570	760	1,270	920	610	610
		f _z mm/t	0.1	0.1	0.1	0.08	0.08	0.1	0.1	0.1	0.08	0.08	0.1	0.1	0.1	0.08	0.08
		a _p mm	2	2	1.5	1	0.7	2	2	1.5	1	0.7	2	2	1.5	1	0.7
		a _e mm	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Hardened Steels (55-62HRC)	ATH08M JX1020	n min ⁻¹	2,590	3,980	3,180	2,590	2,590	2,070	3,180	2,550	2,070	2,070	1,660	2,550	2,040	1,660	1,660
		V _c m/min	130	200	160	130	130	130	200	160	130	130	130	200	160	130	130
		V _f mm/min	520	800	640	410	260	620	950	760	500	310	660	1,020	810	530	330
		f _z mm/t	0.1	0.1	0.1	0.08	0.05	0.1	0.1	0.1	0.08	0.05	0.1	0.1	0.1	0.08	0.05
		a _p mm	1.5	1.5	1	0.7	0.5	1.5	1.5	1	0.7	0.5	1.5	1.5	1	0.7	0.5
		a _e mm	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Titanium Alloy Ti-6Al-4V (wet condition)	ATH08M JX1020	n min ⁻¹	1,190	1,790	1,590	1,190	1,190	950	1,430	1,270	950	950	760	1,150	1,020	760	760
		V _c m/min	60	90	80	60	60	60	90	80	60	60	60	90	80	60	60
		V _f mm/min	240	430	380	240	190	290	520	460	290	230	310	550	490	310	240
		f _z mm/t	0.1	0.12	0.12	0.1	0.08	0.1	0.12	0.12	0.1	0.08	0.1	0.12	0.12	0.1	0.08
		a _p mm	2	2	1.5	1	0.7	2	2	1.5	1	0.7	2	2	1.5	1	0.7
		a _e mm	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Aluminium Alloy	SD5010	n min ⁻¹	11,940	23,870	15,920	11,940	11,940	9,550	19,100	12,730	9,550	9,550	7,640	15,280	10,190	7,640	7,640
		V _c m/min	600	1,200	800	600	600	600	1,200	800	600	600	600	1,200	800	600	600
		V _f mm/min	2,390	7,160	4,770	2,860	2,390	2,860	8,590	5,730	3,440	2,860	3,060	9,170	6,110	3,670	3,060
		f _z mm/t	0.1	0.15	0.15	0.12	0.1	0.1	0.15	0.15	0.12	0.1	0.1	0.15	0.15	0.12	0.1
		a _p mm	2	2	2	1.5	1	2	2	2	1.5	1	2	2	2	1.5	1
		a _e mm	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Maximum f _z (mm/t)			<0.35					<0.35					<0.35				
Maximum a _p (mm)			<2.8					<2.8					<2.8				

* Red indicates primary recommended material types

Modular Types D32 – D42 / Bore Types D42 – D66: Page 10-11

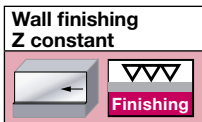
Wall finishing
Z constant
Finishing

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Material	Grade	Overhang ratio		D32 Modular (Z5)					D35 Modular (Z5)					D42 Modular (Z6)					
				General	High Speed	3D-5D	5D-7D	>7D	General	High Speed	3D-5D	5D-7D	>7D	General	High Speed	3D-5D	5D-7D	>7D	
Mild Steels (200HB or less)	ATH08M JX1020 JX1045	n	min ⁻¹	3,980	7,960	5,970	3,980	3,980	3,640	7,280	5,460	3,640	3,640	3,030	6,060	4,550	3,030	3,030	3,030
		V _c	m/min	400	800	600	400	400	400	800	600	400	400	400	800	600	400	400	400
		V _f	mm/min	1,990	5,970	4,480	2,390	1,990	1,820	5,460	4,090	2,180	1,820	1,820	5,460	4,090	2,180	1,820	1,820
		f _z	mm/t	0.1	0.15	0.15	0.12	0.1	0.1	0.15	0.15	0.12	0.1	0.1	0.15	0.15	0.12	0.1	0.1
		a _p	mm	2	2	1.5	1	0.7	2	2	1.5	1	0.7	2	2	1.5	1	0.7	2
		a _e	mm	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Carbon Steels Alloy Steels (30HRC or less)	ATH08M JX1020 JX1045	n	min ⁻¹	2,980	5,970	3,980	3,980	2,980	2,730	5,460	3,640	3,640	2,730	2,270	4,550	3,030	3,030	2,270	2,270
		V _c	m/min	300	600	400	400	300	300	600	400	400	300	300	600	400	400	300	300
		V _f	mm/min	1,490	4,480	2,980	2,390	1,490	1,360	4,090	2,730	2,180	1,360	1,360	4,090	2,730	2,180	1,360	1,360
		f _z	mm/t	0.1	0.15	0.15	0.12	0.1	0.1	0.15	0.15	0.12	0.1	0.1	0.15	0.15	0.12	0.1	0.1
		a _p	mm	2	2	1.5	1	0.7	2	2	1.5	1	0.7	2	2	1.5	1	0.7	2
		a _e	mm	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Carbon Steels Alloy Steels (30~45HRC)	ATH08M JX1020 JX1045	n	min ⁻¹	1,990	4,970	3,480	2,980	2,980	1,820	4,550	3,180	2,730	2,730	1,520	3,790	2,650	2,270	2,270	2,270
		V _c	m/min	200	500	350	300	300	200	500	350	300	300	200	500	350	300	300	300
		V _f	mm/min	990	2,980	2,090	1,490	1,190	910	2,730	1,910	1,360	1,090	910	2,730	1,910	1,360	1,090	1,090
		f _z	mm/t	0.1	0.12	0.12	0.1	0.08	0.1	0.12	0.12	0.1	0.08	0.1	0.12	0.12	0.1	0.08	0.1
		a _p	mm	2	2	1.5	1	0.7	2	2	1.5	1	0.7	2	2	1.5	1	0.7	2
		a _e	mm	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
SUS Stainless Steels	JX1020 ATH08M	n	min ⁻¹	2,980	5,970	3,980	3,980	2,980	2,730	5,460	3,640	3,640	2,730	2,270	4,550	3,030	3,030	2,270	2,270
		V _c	m/min	300	600	400	400	300	300	600	400	400	300	300	600	400	400	300	300
		V _f	mm/min	1,490	4,480	2,980	2,390	1,490	1,360	4,090	2,730	2,180	1,360	1,360	4,090	2,730	2,180	1,360	1,360
		f _z	mm/t	0.1	0.15	0.15	0.12	0.1	0.1	0.15	0.15	0.12	0.1	0.1	0.15	0.15	0.12	0.1	0.1
		a _p	mm	2	2	1.5	1	0.7	2	2	1.5	1	0.7	2	2	1.5	1	0.7	2
		a _e	mm	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
FC FCD Cast Iron	ATH08M JX1020 JX1045	n	min ⁻¹	2,980	5,970	4,970	3,980	3,980	2,730	5,460	4,550	3,640	3,640	2,270	4,550	3,790	3,030	3,030	3,030
		V _c	m/min	300	600	500	400	400	300	600	500	400	400	300	600	500	400	400	400
		V _f	mm/min	1,490	4,480	3,730	2,390	1,990	1,360	4,090	3,410	2,180	1,820	1,360	4,090	3,410	2,180	1,820	1,820
		f _z	mm/t	0.1	0.15	0.15	0.12	0.1	0.1	0.15	0.15	0.12	0.1	0.1	0.15	0.15	0.12	0.1	0.1
		a _p	mm	2	2	1.5	1	0.7	2	2	1.5	1	0.7	2	2	1.5	1	0.7	2
		a _e	mm	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Hardened Steels (45~55HRC)	ATH08M JX1020	n	min ⁻¹	1,490	2,490	1,790	1,490	1,490	1,360	2,270	1,640	1,360	1,360	1,140	1,890	1,360	1,140	1,140	1,140
		V _c	m/min	150	250	180	150	150	150	250	180	150	150	150	250	180	150	150	150
		V _f	mm/min	750	1,240	900	600	600	680	1,140	820	550	550	680	1,140	820	550	550	550
		f _z	mm/t	0.1	0.1	0.1	0.08	0.08	0.1	0.1	0.1	0.08	0.08	0.1	0.1	0.1	0.08	0.08	0.08
		a _p	mm	2	2	1.5	1	0.7	2	2	1.5	1	0.7	2	2	1.5	1	0.7	2
		a _e	mm	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Hardened Steels (55~62HRC)	ATH08M JX1020	n	min ⁻¹	1,290	1,990	1,590	1,290	1,290	1,180	1,820	1,460	1,180	1,180	990	1,520	1,210	990	990	990
		V _c	m/min	130	200	160	130	130	130	200	160	130	130	130	200	160	130	130	130
		V _f	mm/min	650	990	800	520	320	590	910	730	470	300	590	910	730	470	300	300
		f _z	mm/t	0.1	0.1	0.1	0.08	0.05	0.1	0.1	0.1	0.08	0.05	0.1	0.1	0.1	0.08	0.05	0.05
		a _p	mm	1.5	1.5	1	0.7	0.5	1.5	1.5	1	0.7	0.5	1.5	1.5	1	0.7	0.5	0.5
		a _e	mm	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Titanium Alloy Ti-6Al-4V (wet condition)	ATH08M JX1020	n	min ⁻¹	600	900	800	600	600	550	820	730	550	550	450	680	610	450	450	450
		V _c	m/min	60	90	80	60	60	60	90	80	60	60	60	90	80	60	60	60
		V _f	mm/min	300	540	480	300	240	270	490	440	270	220	270	490	440	270	220	220
		f _z	mm/t	0.1	0.12	0.12	0.1	0.08	0.1	0.12	0.12	0.1	0.08	0.1	0.12	0.12	0.1	0.08	0.08
		a _p	mm	2	2	1.5	1	0.7	2	2	1.5	1	0.7	2	2	1.5	1	0.7	2
		a _e	mm	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Aluminium Alloy	SD5010	n	min ⁻¹	5,970	11,940	7,960	5,970	5,970	5,460	10,910	7,280	5,460	5,460	4,550	9,090	6,060	4,550	4,550	4,550
		V _c	m/min	600	1,200	800	600	600	600	1,200	800	600	600	600	1,200	800	600	600	600
		V _f	mm/min	2,980	8,950	5,970	3,580	2,980	2,730	8,190	5,460	3,270	2,730	2,730	8,190	5,460	3,270	2,730	2,730
		f _z	mm/t	0.1	0.15	0.15	0.12	0.1	0.1	0.15	0.15	0.12	0.1	0.1	0.15	0.15	0.12	0.1	0.1
		a _p	mm	2	2	2	1.5	1	2	2	2	1.5	1	2	2	2	1.5	1	2
		a _e	mm	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Maximum f _z (mm/t)				<0.35					<0.35					<0.35					
Maximum a _p (mm)				<2.8					<2.8					<2.8					

Modular Types D16 - D25: Page 9



*Red indicates primary recommended material types

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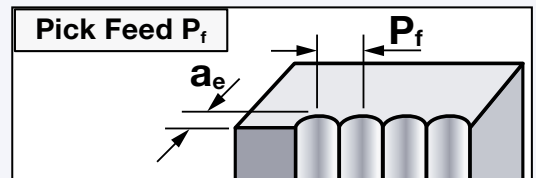
D42 Bore Type (Z6)					D50/D52 Bore Type (Z7)					D63/D66 Bore Type (Z8)				
		$<3xD$			$3D-5D$			$5D-7D$			$>7D$			
General	High Speed	3D-5D	5D-7D	>7D	General	High Speed	3D-5D	5D-7D	>7D	General	High Speed	3D-5D	5D-7D	>7D
3,030	6,060	4,550	3,030	3,030	2,450	4,900	3,670	2,450	2,450	1,930	3,860	2,890	1,930	1,930
400	800	600	400	400	400	800	600	400	400	400	800	600	400	400
1,820	5,460	4,090	2,180	1,820	1,710	5,140	3,860	2,060	1,710	1,540	4,630	3,470	1,850	1,540
0.1	0.15	0.15	0.12	0.1	0.1	0.15	0.15	0.12	0.1	0.1	0.15	0.15	0.12	0.1
2	2	1.5	1	0.7	2	2	2	1.5	1	2	2	2	1.5	1
<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
2,270	4,550	3,030	3,030	2,270	1,840	3,670	2,450	2,450	1,840	1,450	2,890	1,930	1,930	1,450
300	600	400	400	300	300	600	400	400	300	300	600	400	400	300
1,360	4,090	2,730	2,180	1,360	1,290	3,860	2,570	2,060	1,290	1,160	3,470	2,310	1,850	1,160
0.1	0.15	0.15	0.12	0.1	0.1	0.15	0.15	0.12	0.1	0.1	0.15	0.15	0.12	0.1
2	2	1.5	1	0.7	2	2	2	1.5	1	2	2	2	1.5	1
<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
1,520	3,790	2,650	2,270	2,270	1,220	3,060	2,140	1,840	1,840	960	2,410	1,690	1,450	1,450
200	500	350	300	300	200	500	350	300	300	200	500	350	300	300
910	2,730	1,910	1,360	1,090	860	2,570	1,800	1,290	1,030	770	2,310	1,620	1,160	930
0.1	0.12	0.12	0.1	0.08	0.1	0.12	0.12	0.1	0.08	0.1	0.12	0.12	0.1	0.08
2	2	1.5	1	0.7	2	2	2	1.5	1	2	2	2	1.5	1
<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
2,270	4,550	3,030	3,030	2,270	1,840	3,670	2,450	2,450	1,840	1,450	2,890	1,930	1,930	1,450
300	600	400	400	300	300	600	400	400	300	300	600	400	400	300
1,360	4,090	2,730	2,180	1,360	1,290	3,860	2,570	2,060	1,290	1,160	3,470	2,310	1,850	1,160
0.1	0.15	0.15	0.12	0.1	0.1	0.15	0.15	0.12	0.1	0.1	0.15	0.15	0.12	0.1
2	2	1.5	1	0.7	2	2	2	1.5	1	2	2	2	1.5	1
<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
2,270	4,550	3,790	3,030	3,030	1,840	3,670	3,060	2,450	2,450	1,450	2,890	2,410	1,930	1,930
300	600	500	400	400	300	600	500	400	400	300	600	500	400	400
1,360	4,090	3,410	2,180	1,820	1,290	3,860	3,210	2,060	1,710	1,160	3,470	2,890	1,850	1,540
0.1	0.15	0.15	0.12	0.1	0.1	0.15	0.15	0.12	0.1	0.1	0.15	0.15	0.12	0.1
2	2	1.5	1	0.7	2	2	2	1.5	1	2	2	2	1.5	1
<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
1,140	1,890	1,360	1,140	1,140	920	1,530	1,100	920	920	720	1,210	870	720	720
150	250	180	150	150	150	250	180	150	150	150	250	180	150	150
680	1,140	820	550	550	640	1,070	770	510	510	580	960	690	460	460
0.1	0.1	0.1	0.08	0.08	0.1	0.1	0.1	0.08	0.08	0.1	0.1	0.1	0.08	0.08
2	2	1.5	1	0.7	2	2	2	1.5	1	2	2	2	1.5	1
<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
990	1,520	1,210	990	990	800	1,220	980	800	800	630	960	770	630	630
130	200	160	130	130	130	200	160	130	130	130	200	160	130	130
590	910	730	470	300	560	860	690	450	280	500	770	620	400	250
0.1	0.1	0.1	0.08	0.05	0.1	0.1	0.1	0.08	0.05	0.1	0.1	0.1	0.08	0.05
1.5	1.5	1	0.7	0.5	1.5	1.5	1.5	1	0.7	1.5	1.5	1.5	1.2	1
<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
450	680	610	450	450	370	550	490	370	370	290	430	390	290	290
60	90	80	60	60	60	90	80	60	60	60	90	80	60	60
270	490	440	270	220	260	460	410	260	210	230	420	370	230	190
0.1	0.12	0.12	0.1	0.08	0.1	0.12	0.12	0.1	0.08	0.1	0.12	0.12	0.1	0.08
2	2	1.5	1	0.7	2	2	2	1.5	1	2	2	2	1.5	1
<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
4,550	9,090	6,060	4,550	4,550	3,670	9,180	6,120	3,670	3,670	2,890	7,230	4,820	2,890	2,890
600	1,200	800	600	600	600	1,500	1,000	600	600	600	1,500	1,000	600	600
2,730	8,190	5,460	3,270	2,730	2,570	9,640	6,430	3,090	2,570	2,310	8,680	5,790	2,780	2,310
0.1	0.15	0.15	0.12	0.1	0.1	0.15	0.15	0.12	0.1	0.1	0.15	0.15	0.12	0.1
2	2	2	1.5	1	2	2	2	1.5	1	2	2	2	1.5	1
<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
		<0.35				<0.35					<0.35			
		<2.8				<2.8					<2.8			

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Vertical wall roughing			D16 Modular (Z2)						D20 Modular (Z3)						D25 Modular (Z4)							
			General		High Speed		3D-5D	5D-7D	>7D	General		High Speed		3D-5D	5D-7D	>7D	General		High Speed		3D-5D	5D-7D
Carbon Steels Alloy Steels (30HRC or less)	JX1020 JX1045 JX1060	n min ⁻¹	2,980	3,980	2,980	2,980	2,390	2,390	3,180	2,390	2,390	1,910	1,910	1,910	2,550	1,910	1,910	1,530	1,910	1,910	1,530	1,910
		V _e m/min	150	200	150	150	120	150	200	150	150	120	150	150	200	150	150	200	150	150	150	150
		V _f mm/min	900	1,190	720	600	330	1,070	1,430	860	720	400	1,150	1,530	920	760	430	920	760	430	920	760
		f _z mm/t	0.15	0.15	0.12	0.1	0.07	0.15	0.15	0.12	0.1	0.07	0.15	0.15	0.12	0.1	0.07	0.15	0.15	0.12	0.1	0.07
		P _f mm	3.6	3.6	3.6	3.6	3	4	4	4	4	4	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
		a _e mm	<4	<4	<3	<2	<2	<4	<4	<3	<2	<4	<4	<3	<2	<4	<4	<3	<2	<4	<4	<3
FC FCD Cast Iron	ATH08M JX1020 JX1045	n min ⁻¹	2,980	4,970	3,980	3,980	2,980	2,390	3,980	3,180	3,180	2,390	1,910	3,180	2,550	2,550	1,910	2,550	2,550	1,910	2,550	
		V _e m/min	150	250	200	200	150	150	250	200	200	150	150	250	200	200	150	250	200	200	150	
		V _f mm/min	1,190	1,990	1,190	1,030	600	1,430	2,390	1,430	1,240	720	1,530	2,550	1,530	1,320	760	1,530	1,320	760		
		f _z mm/t	0.2	0.2	0.15	0.13	0.1	0.2	0.2	0.15	0.13	0.1	0.2	0.2	0.15	0.13	0.1	0.2	0.2	0.15	0.13	
		P _f mm	3.6	3.6	3.6	3.6	3	4	4	4	4	4	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	
		a _e mm	<4	<4	<4	<4	<3	<4	<4	<4	<4	<3	<4	<4	<3	<4	<4	<4	<4	<4	<4	
Maximum f _z (mm/t)			<0.25						<0.25						<0.25							
Maximum a _e (mm)			<5						<5						<5							

Vertical wall roughing			D32 Modular (Z5)						D35 Modular (Z5)						D42 Modular (Z6)							
			General		High Speed		3D-5D	5D-7D	>7D	General		High Speed		3D-5D	5D-7D	>7D	General		High Speed		3D-5D	5D-7D
Carbon Steels Alloy Steels (30HRC or less)	JX1020 JX1045 JX1060	n min ⁻¹	1,490	1,990	1,490	1,490	1,190	1,360	1,820	1,360	1,360	1,090	1,140	1,520	1,140	1,140	910	1,140	1,520	1,140	1,140	910
		V _e m/min	150	200	150	150	120	150	200	150	150	120	150	200	150	150	120	150	200	150	150	120
		V _f mm/min	1,120	1,490	900	750	420	1,020	1,360	820	680	380	1,020	1,360	820	680	380	1,020	1,360	820	680	380
		f _z mm/t	0.15	0.15	0.12	0.1	0.07	0.15	0.15	0.12	0.1	0.07	0.15	0.15	0.12	0.1	0.07	0.15	0.15	0.12	0.1	0.07
		P _f mm	5.1	5.1	5.1	5.1	5.1	5.3	5.3	5.3	5.3	5.3	5.3	5.8	5.8	5.8	5.8	5.8	5.8	5.8	5.8	5.8
		a _e mm	<4	<4	<3	<2	<2	<4	<4	<3	<2	<4	<4	<3	<2	<4	<4	<3	<2	<4	<4	<3
FC FCD Cast Iron	ATH08M JX1020 JX1045	n min ⁻¹	1,490	2,490	1,990	1,990	1,490	1,360	2,270	1,820	1,820	1,360	1,140	1,890	1,520	1,520	1,140	1,890	1,520	1,520	1,140	
		V _e m/min	150	250	200	200	150	150	250	200	200	150	150	250	200	200	150	250	200	200	150	
		V _f mm/min	1,490	3,110	1,990	1,990	1,120	1,360	2,840	1,820	1,820	1,020	1,360	2,840	1,820	1,820	1,020	1,360	2,840	1,820	1,820	1,020
		f _z mm/t	0.2	0.25	0.2	0.2	0.15	0.2	0.25	0.2	0.2	0.15	0.2	0.25	0.2	0.2	0.15	0.2	0.25	0.2	0.2	
		P _f mm	5.1	5.1	5.1	5.1	5.1	5.3	5.3	5.3	5.3	5.3	5.3	5.8	5.8	5.8	5.8	5.8	5.8	5.8	5.8	
		a _e mm	<4	<4	<4	<4	<3	<4	<4	<4	<4	<3	<4	<4	<4	<4	<3	<4	<4	<4	<4	
Maximum f _z (mm/t)			<0.25						<0.25						<0.25							
Maximum a _e (mm)			<5						<5						<5							

Vertical wall roughing			D42 Bore Type (Z6)						D50/D52 Bore Type (Z7)						D63/D66 Bore Type (Z8)							
			General		High Speed		3D-5D	5D-7D	>7D	General		High Speed		3D-5D	5D-7D	>7D	General		High Speed		3D-5D	5D-7D
Carbon Steels Alloy Steels (30HRC or less)	JX1020 JX1045 JX1060	n min ⁻¹	1,140	1,520	1,140	1,140	910	920	1,220	920	920	730	720	960	720	720	580	720	960	720	720	580
		V _e m/min	150	200	150	150	120	150	200	150	150	120	150	200	150	150	120	150	200	150	150	120
		V _f mm/min	1,020	1,360	820	680	380	960	1,290	770	640	360	870	1,160	690	580	320	870	1,160	690	580	320
		f _z mm/t	0.15	0.15	0.12	0.1	0.07	0.15	0.15	0.12	0.1	0.07	0.15	0.15	0.12	0.1	0.07	0.15	0.15	0.12	0.1	0.07
		P _f mm	5.8	5.8	5.8	5.8	5.8	6.4	6.4	6.4	6.4	6.4	6.4	7.3	7.3	7.3	7.3	7.3	7.3	7.3	7.3	
		a _e mm	<4	<4	<3	<2	<2	<4	<4	<3	<2	<4	<4	<3	<2	<4	<4	<3	<2	<4	<4	
FC FCD Cast Iron	ATH08M JX1020 JX1045	n min ⁻¹	1,140	1,890	1,520	1,520	1,140	920	1,530	1,220	1,220	920	720	1,210	960	960	720	1,210	960	960	720	
		V _e m/min	150	250	200	200	150	150	250	200	200	150	150	250	200	200	150	250	200	200	150	
		V _f mm/min	1,360	2,840	1,820	1,820	1,020	1,290	2,680	1,710	1,710	960	1,160	2,410	1,540	1,540	870	1,160	2,410	1,540	1,540	870
		f _z mm/t	0.2	0.25	0.2	0.2	0.15	0.2	0.25	0.2	0.2	0.15	0.2	0.25	0.2	0.2	0.15	0.2	0.25	0.2	0.2	
		P _f mm	5.8	5.8	5.8	5.8	5.8	6.4	6.4	6.4	6.4	6.4	6.4	7.3	7.3	7.3	7.3	7.3	7.3	7.3	7.3	
		a _e mm	<4	<4	<4	<4	<3	<4	<4	<4	<4	<3	<4	<4	<3	<4	<4	<3	<4	<4	<4	
Maximum f _z (mm/t)			<0.25						<0.25						<0.25							
Maximum a _e (mm)			<5						<5						<5							



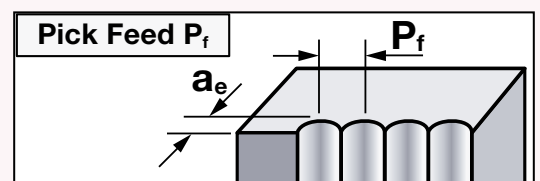
* Red indicates primary recommended material types

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Vertical wall finishing			D16 Modular (Z2)					D20 Modular (Z3)					D25 Modular (Z4)				
Material	Grade*	Overhang ratio	General		High Speed			General		High Speed			General		High Speed		
			3D-5D	5D-7D	>7D	3D-5D	5D-7D	>7D	3D-5D	5D-7D	>7D	3D-5D	5D-7D	>7D			
Carbon Steels Alloy Steels (30HRC or less)	ATH08M JX1020 JX1045	n min ⁻¹	5,970	11,940	7,960	7,960	5,970	4,770	9,550	6,370	6,370	4,770	3,820	7,640	5,090	5,090	3,820
		V_e m/min	300	600	400	400	300	300	600	400	400	300	600	400	400	300	300
		V_r mm/min	1,550	4,770	2,390	2,070	1,190	1,860	5,730	2,860	2,480	1,430	2,290	6,110	3,670	3,060	1,830
		f_z mm/t	0.13	0.2	0.15	0.13	0.1	0.13	0.2	0.15	0.13	0.1	0.15	0.2	0.18	0.15	0.12
		P_r mm	0.5	0.5	0.5	0.5	0.5	0.6	0.6	0.6	0.6	0.6	0.7	0.7	0.7	0.7	0.7
		a_e mm	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
FC FCD Cast Iron	ATH08M JX1020 JX1045	n min ⁻¹	5,970	11,940	9,950	7,960	7,960	4,770	9,550	7,960	6,370	6,370	3,820	7,640	6,370	5,090	5,090
		V_e m/min	300	600	500	400	400	300	600	500	400	400	300	600	500	400	400
		V_r mm/min	1,790	4,770	3,980	3,180	2,390	2,150	5,730	4,770	3,820	2,860	3,060	7,640	5,090	4,070	3,060
		f_z mm/t	0.15	0.2	0.2	0.2	0.15	0.15	0.2	0.2	0.2	0.15	0.2	0.25	0.2	0.2	0.15
		P_r mm	0.5	0.5	0.5	0.5	0.5	0.6	0.6	0.6	0.6	0.6	0.7	0.7	0.7	0.7	0.7
		a_e mm	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Maximum f _z (mm/t)			<0.3			<0.3			<0.3			<0.3					
Maximum a _e (mm)			<0.5			<0.5			<0.5			<0.5					

Vertical wall finishing			D32 Modular (Z5)					D35 Modular (Z5)					D42 Modular (Z6)				
Material	Grade*	Overhang ratio	General		High Speed			General		High Speed			General		High Speed		
			3D-5D	5D-7D	>7D	3D-5D	5D-7D	>7D	3D-5D	5D-7D	>7D	3D-5D	5D-7D	>7D			
Carbon Steels Alloy Steels (30HRC or less)	ATH08M JX1020 JX1045	n min ⁻¹	2,980	5,970	3,980	3,980	2,980	2,730	5,460	3,640	3,640	2,730	2,270	4,550	3,030	3,030	2,270
		V_e m/min	300	600	400	400	300	300	600	400	400	300	300	600	400	400	300
		V_r mm/min	2,240	5,970	3,580	2,980	1,790	2,050	5,460	3,270	2,730	1,640	2,050	5,460	3,270	2,730	1,640
		f_z mm/t	0.15	0.2	0.18	0.15	0.12	0.15	0.2	0.18	0.15	0.12	0.15	0.2	0.18	0.15	0.12
		P_r mm	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.9	0.9	0.9	0.9	0.9
		a_e mm	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
FC FCD Cast Iron	ATH08M JX1020 JX1045	n min ⁻¹	2,980	5,970	4,970	3,980	3,980	2,730	5,460	4,550	3,640	3,640	2,270	4,550	3,790	3,030	3,030
		V_e m/min	300	600	500	400	400	300	600	500	400	400	300	600	500	400	400
		V_r mm/min	2,980	7,460	4,970	3,980	2,980	2,730	6,820	4,550	3,640	2,730	2,730	6,820	4,550	3,640	2,730
		f_z mm/t	0.2	0.25	0.2	0.2	0.15	0.2	0.25	0.2	0.2	0.15	0.2	0.25	0.2	0.2	0.15
		P_r mm	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.9	0.9	0.9	0.9	0.9
		a_e mm	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Maximum f _z (mm/t)			<0.3			<0.3			<0.3			<0.3					
Maximum a _e (mm)			<0.5			<0.5			<0.5			<0.5					

Vertical wall finishing			D42 Bore Type (Z6)					D50/D52 Bore Type (Z7)					D63/D66 Bore Type (Z8)				
Material	Grade*	Overhang ratio	General		High Speed			General		High Speed			General		High Speed		
			3D-5D	5D-7D	>7D	3D-5D	5D-7D	>7D	3D-5D	5D-7D	>7D	3D-5D	5D-7D	>7D			
Carbon Steels Alloy Steels (30HRC or less)	ATH08M JX1020 JX1045	n min ⁻¹	2,270	4,550	3,030	3,030	2,270	1,840	3,670	2,450	2,450	1,840	1,450	2,890	1,930	1,930	1,450
		V_e m/min	300	600	400	400	300	300	600	400	400	300	300	600	400	400	300
		V_r mm/min	2,050	5,460	3,270	2,730	1,640	1,930	5,140	3,090	2,570	1,670	1,740	4,630	2,780	2,310	1,500
		f_z mm/t	0.15	0.2	0.18	0.15	0.12	0.15	0.2	0.18	0.15	0.13	0.15	0.2	0.18	0.15	0.13
		P_r mm	0.9	0.9	0.9	0.9	0.9	1	1	1	1	1	1.2	1.2	1.2	1.2	1.2
		a_e mm	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
FC FCD Cast Iron	ATH08M JX1020 JX1045	n min ⁻¹	2,270	4,550	3,790	3,030	3,030	1,840	3,670	3,060	2,450	2,450	1,450	2,890	2,410	1,930	1,930
		V_e m/min	300	600	500	400	400	300	600	500	400	400	300	600	500	400	400
		V_r mm/min	2,730	6,820	4,550	3,640	2,730	2,570	6,430	4,710	3,430	3,090	2,310	5,790	4,240	3,090	2,780
		f_z mm/t	0.2	0.25	0.2	0.2	0.15	0.2	0.25	0.22	0.2	0.18	0.2	0.25	0.22	0.2	0.18
		P_r mm	0.9	0.9	0.9	0.9	0.9	1	1	1	1	1	1.2	1.2	1.2	1.2	1.2
		a_e mm	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Maximum f _z (mm/t)			<0.3			<0.3			<0.3			<0.3					
Maximum a _e (mm)			<0.5			<0.5			<0.5			<0.5					



* Red indicates primary recommended material types

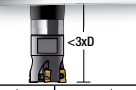
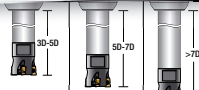
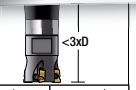
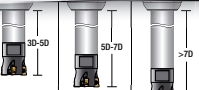
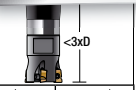
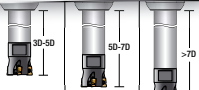
ASPV | Polish Mill V-Type | Recommended Cutting Conditions

		Contouring Z constant		D16 Modular (Z2)					D20 Modular (Z3)					D25 Modular (Z4)				
				General	High Speed	3D-5D	5D-7D	>7D	General	High Speed	3D-5D	5D-7D	>7D	General	High Speed	3D-5D	5D-7D	>7D
Carbon Steels Alloy Steels (30HRC or less)	JX1020 JX1045 JX1060	n	min ⁻¹	2,590	3,980	2,590	2,590	1,790	2,070	3,180	2,070	2,070	1,430	1,660	2,550	1,660	1,660	1,150
		V _c	m/min	130	200	130	130	90	130	200	130	130	90	130	200	130	130	90
		V _f	mm/min	2,590	3,980	2,590	2,590	1,790	3,100	4,770	3,100	3,100	2,150	3,310	5,090	3,310	3,310	2,290
		f _z	mm/t	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
		a _p	mm	0.5	0.5	0.4	0.3	0.25	0.5	0.5	0.4	0.3	0.25	0.5	0.5	0.4	0.3	0.25
		a _e	mm	13	13	13	13	13	16	16	16	16	16	16	20	20	20	20
Carbon Steels Alloy Steels (30-45HRC)	JX1020 JX1045 JX1060	n	min ⁻¹	1,790	3,580	2,590	2,590	1,790	1,430	2,860	2,070	2,070	1,430	1,150	2,290	1,660	1,660	1,150
		V _c	m/min	90	180	130	130	90	90	180	130	130	90	90	180	130	130	90
		V _f	mm/min	1,430	2,860	2,070	2,070	1,430	1,720	3,440	2,480	2,480	1,720	1,830	3,670	2,650	2,650	1,830
		f _z	mm/t	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
		a _p	mm	0.5	0.5	0.4	0.3	0.25	0.5	0.5	0.4	0.3	0.25	0.5	0.5	0.4	0.3	0.25
		a _e	mm	13	13	13	13	13	16	16	16	16	16	16	20	20	20	20
SUS Stainless Steels	JX1045 JX1060	n	min ⁻¹	2,590	3,980	2,590	2,590	1,790	2,070	3,180	2,070	2,070	1,430	1,660	2,550	1,660	1,660	1,150
		V _c	m/min	130	200	130	130	90	130	200	130	130	90	130	200	130	130	90
		V _f	mm/min	2,590	3,980	2,590	2,590	1,790	3,100	4,770	3,100	3,100	2,150	3,310	5,090	3,310	3,310	2,290
		f _z	mm/t	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
		a _p	mm	0.5	0.5	0.4	0.3	0.25	0.5	0.5	0.4	0.3	0.25	0.5	0.5	0.4	0.3	0.25
		a _e	mm	13	13	13	13	13	16	16	16	16	16	16	20	20	20	20
FC FCD Cast Iron	JX1020 JX1045	n	min ⁻¹	2,980	3,980	2,590	2,590	1,790	2,390	3,180	2,070	2,070	1,430	1,910	2,550	1,660	1,660	1,150
		V _c	m/min	150	200	130	130	90	150	200	130	130	90	150	200	130	130	90
		V _f	mm/min	4,180	5,570	3,620	3,620	2,510	5,010	6,680	4,340	4,340	3,010	5,350	7,130	4,630	4,630	3,210
		f _z	mm/t	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
		a _p	mm	0.5	0.5	0.5	0.4	0.3	0.5	0.5	0.5	0.4	0.3	0.5	0.5	0.5	0.4	0.3
		a _e	mm	13	13	13	13	13	16	16	16	16	16	16	20	20	20	20
		Maximum f _z (mm/t)		<0.8					<0.8					<0.8				
		Maximum a _p (mm)		<1.0					<1.0					<1.0				

		Contouring Z constant		D42 Bore Type (Z6)					D50/D52 Bore Type (Z7)					D63/D66 Bore Type (Z8)				
				General	High Speed	3D-5D	5D-7D	>7D	General	High Speed	3D-5D	5D-7D	>7D	General	High Speed	3D-5D	5D-7D	>7D
Carbon Steels Alloy Steels (30HRC or less)	JX1020 JX1045 JX1060	n	min ⁻¹	990	1,520	990	990	680	800	1,220	800	800	550	630	960	630	630	430
		V _c	m/min	130	200	130	130	90	130	200	130	130	90	130	200	130	130	90
		V _f	mm/min	2,960	4,550	2,960	2,960	2,050	2,790	4,280	2,790	2,790	1,930	2,510	3,860	2,510	2,510	1,740
		f _z	mm/t	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
		a _p	mm	0.5	0.5	0.4	0.3	0.25	0.5	0.5	0.4	0.3	0.25	0.5	0.5	0.4	0.3	0.25
		a _e	mm	34	34	34	34	34	42	42	42	42	42	42	53	53	53	53
Carbon Steels Alloy Steels (30-45HRC)	JX1020 JX1045 JX1060	n	min ⁻¹	680	1,360	990	990	680	800	1,220	800	800	550	430	870	630	630	430
		V _c	m/min	90	180	130	130	90	130	200	130	130	90	90	180	130	130	90
		V _f	mm/min	1,640	3,270	2,360	2,360	1,640	2,230	3,430	2,230	2,230	1,540	1,390	2,780	2,010	2,010	1,390
		f _z	mm/t	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
		a _p	mm	0.5	0.5	0.4	0.3	0.25	0.5	0.5	0.4	0.3	0.25	0.5	0.5	0.4	0.3	0.25
		a _e	mm	34	34	34	34	34	42	42	42	42	42	42	53	53	53	53
SUS Stainless Steels	JX1045 JX1060	n	min ⁻¹	990	1,520	990	990	680	920	1,410	1,100	800	610	630	960	630	630	430
		V _c	m/min	130	200	130	130	90	150	230	180	130	100	130	200	130	130	90
		V _f	mm/min	2,960	4,550	2,960	2,960	2,050	3,210	4,930	3,860	2,790	2,140	2,510	3,860	2,510	2,510	1,740
		f _z	mm/t	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
		a _p	mm	0.5	0.5	0.4	0.3	0.25	0.5	0.5	0.4	0.3	0.25	0.5	0.5	0.4	0.3	0.25
		a _e	mm	34	34	34	34	34	42	42	42	42	42	42	53	53	53	53
FC FCD Cast Iron	JX1020 JX1045	n	min ⁻¹	1,140	1,520	990	990	680	920	1,220	800	800	550	720	960	630	630	430
		V _c	m/min	150	200	130	130	90	150	200	130	130	90	150	200	130	130	90
		V _f	mm/min	4,770	6,370	4,140	4,140	2,860	4,500	6,000	3,900	3,900	2,700	4,050	5,400	3,510	3,510	2,430
		f _z	mm/t	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
		a _p	mm	0.5	0.5	0.5	0.4	0.3	0.5	0.5	0.5	0.4	0.3	0.5	0.5	0.5	0.4	0.3
		a _e	mm	34	34	34	34	34	42	42	42	42	42	42	53	53	53	53
		Maximum f _z (mm/t)		<0.8					<0.8					<0.8				
		Maximum a _p (mm)		<1.0					<1.0					<1.0				

* Red indicates primary recommended material types

ASPV | Polish Mill V-Type | Recommended Cutting Conditions

D32 Modular (Z5)					D35 Modular (Z5)					D42 Modular (Z6)				
														
General	High Speed	3D-5D	5D-7D	>7D	General	High Speed	3D-5D	5D-7D	>7D	General	High Speed	3D-5D	5D-7D	>7D
1,290	1,990	1,290	1,290	900	1,180	1,820	1,180	1,180	820	990	1,520	990	990	680
130	200	130	130	90	130	200	130	130	90	130	200	130	130	90
3,230	4,970	3,230	3,230	2,240	2,960	4,550	2,960	2,960	2,050	2,960	4,550	2,960	2,960	2,050
0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
0.5	0.5	0.4	0.3	0.25	0.5	0.5	0.4	0.3	0.25	0.5	0.5	0.4	0.3	0.25
26	26	26	26	26	28	28	28	28	28	34	34	34	34	34
900	1,790	1,290	1,290	900	820	1,640	1,180	1,180	820	680	1,360	990	990	680
90	180	130	130	90	90	180	130	130	90	90	180	130	130	90
1,790	3,580	2,590	2,590	1,790	1,640	3,270	2,360	2,360	1,640	1,640	3,270	2,360	2,360	1,640
0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
0.5	0.5	0.4	0.3	0.25	0.5	0.5	0.4	0.3	0.25	0.5	0.5	0.4	0.3	0.25
26	26	26	26	26	28	28	28	28	28	34	34	34	34	34
1,290	1,990	1,290	1,290	900	1,180	1,820	1,180	1,180	820	990	1,520	990	990	680
130	200	130	130	90	130	200	130	130	90	130	200	130	130	90
3,230	4,970	3,230	3,230	2,240	2,960	4,550	2,960	2,960	2,050	2,960	4,550	2,960	2,960	2,050
0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
0.5	0.5	0.4	0.3	0.25	0.5	0.5	0.4	0.3	0.25	0.5	0.5	0.4	0.3	0.25
26	26	26	26	26	28	28	28	28	28	34	34	34	34	34
1,490	1,990	1,290	1,290	900	1,360	1,820	1,180	1,180	820	1,140	1,520	990	990	680
150	200	130	130	90	150	200	130	130	90	150	200	130	130	90
5,220	6,960	4,530	4,530	3,130	4,770	6,370	4,140	4,140	2,860	4,770	6,370	4,140	4,140	2,860
0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
0.5	0.5	0.5	0.4	0.3	0.5	0.5	0.5	0.4	0.3	0.5	0.5	0.5	0.4	0.3
26	26	26	26	26	28	28	28	28	28	34	34	34	34	34
		<0.8					<0.8					<0.8		
		<1.0					<1.0					<1.0		