Völundr
Cutting tools

End Mill

Solid Carbide

Endmill Solid Carb.

V-A 453 ALUMINIUM

Volundrtools.com

Völundr Cutting tools

End Mill

Solid Carbide

SELECTOR SERIES

V	-	55	4	M	CR	H
V-VOLUNDR		45 HRc	1 FLUTE	( ) STANDAR	( ) SQUARE END	( ) STEEL
		55 HRc	2 FLUTES	(M) METRIC	(B) BALL NOSE	(A) ALUMINUM
		65 HRc	3 FLUTES		(CR) CORNER RADIUS	(W) WOOD
			4-FLUTES		(CS) COMPRESSION SPIRAL	
			6-FLUTES			

Endmill Carb.
Series V-554 MCR

Voluntdrtools.com

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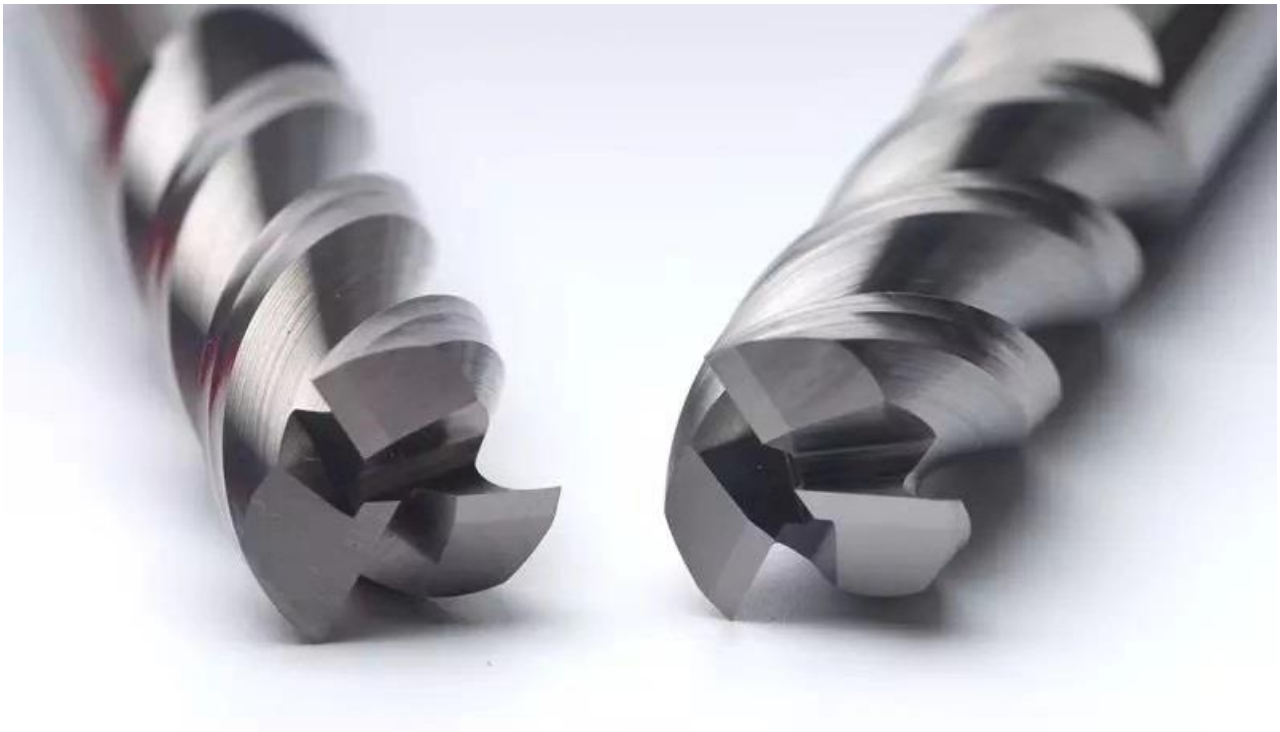

Völundr
Cutting tools

Endmill Carb.
Series V-453 Al.

Solid Carbide Endmill

3 Flutes Square End
HRc 45

Voluntrtools.com

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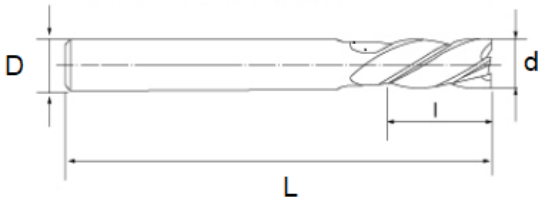
INCH SQUARE END



SERIES V-A453						
EDP	CUTTING DIAMETER	FLUTE DIAMETER d	SHANK DIAMETER D	CUTTING LENGHT l	OVERALL LENGHT L	TYPE
222-100450	1/16	1/16	1/8	3/16	1-1/2	STD
222-100451	1/16	1/16	1/8	1	3	XL
222-100452	1/8	1/8	1/8	1/2	1-1/2	STD
222-100453	1/8	1/8	1/8	1	3	XL
222-100454	3/32	3/32	1/8	9/32	1-1/2	STD
222-100455	5/32	5/32	3/16	1/2	2	STD
222-100456	3/16	3/16	3/16	5/8	2	STD
222-100457	3/16	3/16	3/16	2	4	L
222-100458	3/16	3/16	3/16	1	4	L
222-100459	1/4	1/4	1/4	3/4	2-1/2	STD
222-100460	1/4	1/4	1/4	1-1/2	4	L
222-100461	1/4	1/4	1/4	2-1/2	6	XL
222-100462	5/16	5/16	5/16	7/8	2-1/2	STD
222-100463	3/8	3/8	3/8	1	2-1/2	STD
222-100464	3/8	3/8	3/8	2	4	L
222-100465	3/8	3/8	3/8	2-1/2	6	XL
222-100466	7/16	7/16	7/16	1	3	L
222-100467	1/2	1/2	1/2	1	3	STD
222-100468	1/2	1/2	1/2	3	6	XL
222-100469	5/8	5/8	5/8	1-1/4	3-1/2	L
222-100470	5/8	5/8	5/8	2-1/2	6	XL
222-100471	3/4	3/4	3/4	1-1/2	4	STD
222-100472	3/4	3/4	3/4	2-1/2	6	XL
222-100473	3/4	3/4	3/4	3	6	XL
222-100474	1	1	1	1-1/2	4	STD
222-100475	1	1	1	3	6	XL

Völundr Cutting tools

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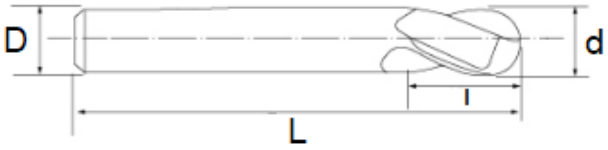
INCH BALL NOSE



SERIES V-A453B EDP	CUTTING DIAMETER	FLUTE DIAMETER d	SHANK DIAMETER D	CUTTING LENGHT l	OVERALL LENGHT L	TYPE
222-100550	1/16	1/16	1/8	3/16	1-1/2	STD
222-100551	1/16	1/16	1/8	1	3	XL
222-100552	1/8	1/8	1/8	1/2	1-1/2	STD
222-100553	1/8	1/8	1/8	1	3	XL
222-100554	3/32	3/32	1/8	9/32	1-1/2	STD
222-100555	5/32	5/32	3/16	1/2	2	STD
222-100556	3/16	3/16	3/16	5/8	2	STD
222-100557	3/16	3/16	3/16	2	4	L
222-100558	3/16	3/16	3/16	1	4	L
222-100559	1/4	1/4	1/4	3/4	2-1/2	STD
222-100560	1/4	1/4	1/4	1-1/2	4	L
222-100561	1/4	1/4	1/4	2-1/2	6	XL
222-100562	5/16	5/16	5/16	7/8	2-1/2	STD
222-100563	3/8	3/8	3/8	1	2-1/2	STD
222-100564	3/8	3/8	3/8	2	4	L
222-100565	3/8	3/8	3/8	2-1/2	6	XL
222-100566	7/16	7/16	7/16	1	3	L
222-100567	1/2	1/2	1/2	1	3	STD
222-100568	1/2	1/2	1/2	3	6	XL
222-100569	5/8	5/8	5/8	1-1/4	3-1/2	L
222-100570	5/8	5/8	5/8	2-1/2	6	XL
222-100571	3/4	3/4	3/4	1-1/2	4	STD
222-100572	3/4	3/4	3/4	2-1/2	6	XL
222-100573	3/4	3/4	3/4	3	6	XL
222-100574	1	1	1	1-1/2	4	STD
222-100575	1	1	1	3	6	XL

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Cutting speed chart

SERIES V-A453 XL

Material			Side Milling		Slot Milling	Cutting Speed Vc (SFM)		Recommended feed per tooth (fz = inch/th) for side milling & For slotting, reduce fz by 20%.						
								Diameter in inch						
			ap	ae	ap	min	max	inch	1/4	5/16	3/8	1/2	5/8	3/4
Non-Ferrous	N	1	1.0xD	0.5xD	1xD	1641	6562	Fz	0.00237	0.00315	0.00394	0.00473	0.0063	0.00788
		2	1.0xD	0.5xD	1xD	1641	4922	Fz	0.00213	0.00284	0.00355	0.00426	0.00567	0.00709

SERIES V-A453

Material			Side Milling		Slot Milling	Cutting Speed Vc (SFM)		Recommended feed per tooth (fz = inch/th) for side milling & For slotting, reduce fz by 20%.							
								Diameter in inch							
			ap	ae	ap	min	max	inch	1/8	1/4	5/16	3/8	1/2	5/8	3/4
Non-Ferrous	N	1	1.5xD	0.5xD	1xD	1641	6562	Fz	0.00107	0.00213	0.00284	0.00355	0.00426	0.00567	0.00709
		2	1.5xD	0.5xD	1xD	1641	4922	Fz	0.00095	0.00193	0.00256	0.00319	0.00382	0.00512	0.00638

Völundr Cutting tools

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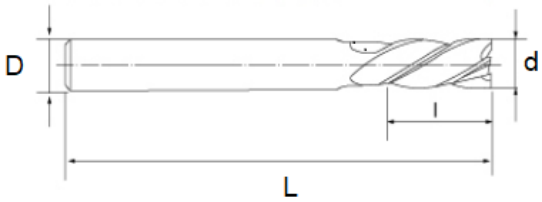
METRIC SQUARE END



SERIES V-A453M					
EDP	CUTTING DIAMETER	FLUTE DIAMETER d	SHANK DIAMETER D	OVERALL LENGHT L	TYPE
222-100500	1	1	4	50	STD
222-100501	1.5	1.5	4	50	STD
222-100502	2	2	4	50	STD
222-100503	2.5	2.5	4	50	STD
222-100504	3	3	4	50	STD
222-100505	3.5	3.5	4	50	STD
222-100506	4	4	4	50	STD
222-100507	4	4	4	75	L
222-100508	4	4	4	100	XL
222-100509	5	5	6	50	STD
222-100510	6	6	6	50	STD
222-100511	6	6	6	75	L
222-100512	6	6	6	100	XL
222-100513	8	8	8	60	STD
222-100514	8	8	8	75	L
222-100515	8	8	8	100	L
222-100516	10	10	10	75	STD
222-100517	10	10	10	100	L
222-100518	12	12	12	75	STD
222-100519	12	12	12	100	L
222-100520	14	14	14	100	STD
222-100521	16	16	16	100	STD
222-100522	18	18	18	100	STD
222-100523	20	20	20	100	STD

Völundr Cutting tools

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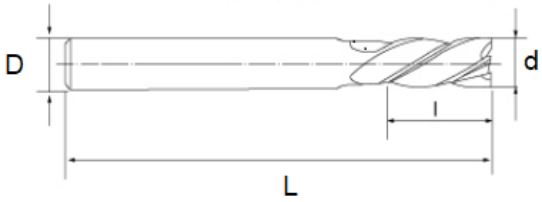
METRIC SQUARE END



SERIES V-A453M					
EDP	CUTTING DIAMETER	FLUTE DIAMETER d	SHANK DIAMETER D	OVERALL LENGHT L	TYPE
222-100524	6	6	6	150	XL
222-100525	8	8	8	150	XL
222-100526	10	10	10	150	XL
222-100527	12	12	12	150	XL
222-100528	14	14	14	150	XL
222-100529	16	16	16	150	XL
222-100530	18	18	18	150	XL
222-100531	20	20	20	150	XL
222-100532	0.5	0.5	4	50	STD
222-100533	0.6	0.6	4	50	STD
222-100534	0.8	0.8	4	50	STD

Völundr Cutting tools

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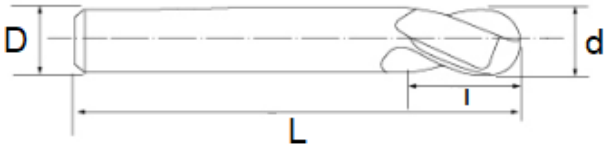
METRIC BALL END



SERIES V-A453MB					
EDP	CUTTING DIAMETER	FLUTE DIAMETER d	SHANK DIAMETER D	OVERALL LENGHT L	TYPE
222-100600	1	1	4	50	STD
222-100601	1.5	1.5	4	50	STD
222-100602	2	2	4	50	STD
222-100603	2.5	2.5	4	50	STD
222-100604	3	3	4	50	STD
222-100605	3.5	3.5	4	50	STD
222-100606	4	4	4	50	STD
222-100607	4	4	4	75	L
222-100608	4	4	4	100	XL
222-100609	5	5	6	50	STD
222-100610	6	6	6	50	STD
222-100611	6	6	6	75	L
222-100612	6	6	6	100	XL
222-100613	8	8	8	60	STD
222-100614	8	8	8	75	L
222-100615	8	8	8	100	L
222-100616	10	10	10	75	STD
222-100617	10	10	10	100	L
222-100618	12	12	12	75	STD
222-100619	12	12	12	100	L
222-100620	14	14	14	100	STD
222-100621	16	16	16	100	STD
222-100622	18	18	18	100	STD
222-100623	20	20	20	100	STD

Völundr Cutting tools

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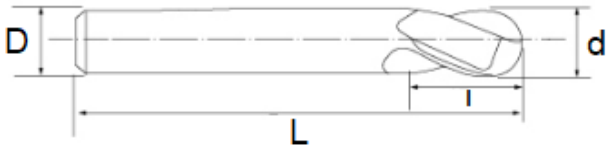
METRIC BALL END



SERIES V-A453MB					
EDP	CUTTING DIAMETER	FLUTE DIAMETER d	SHANK DIAMETER D	OVERALL LENGHT L	TYPE
222-100624	6	6	6	150	XL
222-100625	8	8	8	150	XL
222-100626	10	10	10	150	XL
222-100627	12	12	12	150	XL
222-100628	14	14	14	150	XL
222-100629	16	16	16	150	XL
222-100630	18	18	18	150	XL
222-100631	20	20	20	150	XL

Völundr Cutting tools

End Mill

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Cutting speed chart

SERIES V-A453M XL

Material			Side Milling		Slot Milling	Cutting Speed Vc (m/min)		Recommended feed per tooth (fz = mm/th) for side milling & For slotting , reduce fz by 20%.						
								Diameter in mm						
			ap	ae	ap	min	max	mm	6.0	8.0	10.0	12.0	16.0	20.0
Non-Ferrous	N	1	1.0xD	0.5xD	1xD	500	2000	fz	0.060	0.080	0.100	0.120	0.160	0.200
		2	1.0xD	0.5xD	1xD	500	1500	fz	0.054	0.072	0.090	0.108	0.144	0.180

SERIES V-A453M

Material			Side Milling		Slot Milling	Cutting Speed Vc (m/min)		Recommended feed per tooth (fz = mm/th) for side milling & For slotting , reduce fz by 20%.							
								Diameter in mm							
			ap	ae	ap	min	max	mm	3.0	6.0	8.0	10.0	12.0	16.0	20.0
Non-Ferrous	N	1	1.5xD	0.5xD	1xD	500	2000	fz	0.027	0.054	0.072	0.090	0.108	0.144	0.180
		2	1.5xD	0.5xD	1xD	500	1500	fz	0.024	0.049	0.065	0.081	0.097	0.130	0.162

Völundr Cutting tools

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Material details

Material Group		Material Description	Content	Tensile Strength RM (MPa)*	Hardness (HB)	Hardness (HRC)
Steel	P0	Low-Carbon Steels, Long Chipping	C <0,25%	<530	<125	—
	P1	Low-Carbon Steels, Short Chipping, Free Machining	C <0,25%	<530	<125	—
	P2	Medium- and High-Carbon Steels	C >0,25%	<530	<220	<25
	P3	Alloy Steels and Tool Steels	C >0,25%	600-850	<330	<35
	P4	Alloy Steels and Tool Steels	C >0,25%	850-1400	340–450	35-48
	P5	Ferritic, Martensitic, and PH Stainless Steels	—	600-900	<330	<35
	P6	High-Strength Ferritic, Martensitic, and PH Stainless Steels	—	900-1350	350–450	35-48
Stainless Steel	M1	Austenitic Stainless Steel	—	<600	130-200	-
	M2	High-Strength Austenitic Stainless and Cast Stainless Steels	—	600-800	150–230	<25
	M3	Duplex Stainless Steel	—	<800	135–275	<30
Cast Iron	K1	Grey Cast Iron	—	125-500	120–290	<32
	K2	Low- and Medium-Strength Ductile Irons (Nodular Irons) and Compacted Graphite Irons (CGI)	—	<600	130–260	<28
	K3	High-Strength Ductile Irons and Austempered Ductile Iron (ADI)	—	>600	180–350	<43
Non-Ferrous	N1	Wrought Aluminium	—	—	—	—
	N2	Low-Silicon Aluminium Alloys and Magnesium Alloys	Si <12,2%	—	—	—
	N3	High-Silicon Aluminium Alloys and Magnesium Alloys	Si > 12,2%	—	—	—
	N4	Copper-, Brass-, Zinc-Based on Machinability Index Range of 70–100	—	—	—	—
	N5	Nylon, Plastics, Rubbers, Phenolics, Resins, Fibreglass	—	—	—	—
	N6	Carbon, Graphite Composites, CFRP	—	—	—	—
	N7	Metal Matrix Composites (MMC)	—	—	—	—
Special Alloys	S1	Iron-Based, Heat-Resistant Alloys	—	500-1200	160-260	25-48
	S2	Cobalt-Based, Heat-Resistant Alloys	—	1000-1500	250-450	25-48
	S3	Nickel-Based, Heat-Resistant Alloys	—	600-1700	160-450	<48
	S4	Titanium and Titanium Alloys	—	900-1600	300-400	33-48
Hardened Steel	H1	Hardened Materials	—	—	—	44-48
	H2	Hardened Materials	—	—	—	48-55
	H3	Hardened Materials	—	—	—	56-60
	H4	Hardened Materials	—	—	—	>60

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Material details

Material Group		ANSI	DIN
Steel	P0	A36, 1008, 1010, 1018 through 1029; 1108, 1117	
	P1	10L18, 1200 Series, 1213, 12L14	C15, Ck22, ST37-2, S235JR, 9SMnPb28, GS38
	P2	1035, 1045, 10L45, 1050, 10L50, 1080, 1137, 1144, 11L44, 1525, 1545, 1572	ST52, S355JR, C35, GS60, Cf53
	P3	1300, 2000, 3000, 4000, 5000, 8000, P20, SAE: A, D, H, O, S, M, T	16MnCr5, Ck45, 21CrMoV5-7, 38SMn28
	P4	1300, 2000, 3000, 4000, 5000, 8000, P20, SAE: A, D, H, O, S, M, T	100Cr6, 30CrNiMo8, 42CrMo4, C70W2, S6525, X120Mn12
	P5	15–5 PH, 13–8 PH, 17–4 PH, 400 and 500 Series	100Cr6, 30CrNiMo8, 42CrMo4, C70W2, S6525, X120Mn12
	P6	15–5 PH, 13–8 PH, 17–4 PH, 400 and 500 Series	X102CrMo17, G-X120Cr29
Stainless Steel	M1	200 Series, 301, 302, 304, 304L, 309	X5CrNi 18 10, X2CrNiMo 17 13 2, G-X25CrNiSi18 9, X15CrNiSi 20 12
	M2	310, 316, 316L, 321, 347, 384 ASTM Cast XM-1, XM-5, XM-7, XM-21	X2CrNiMo 13 4, X5NiCr 32 21, X5CrNiNb 18 10, G-X15CrNi 25-20
	M3	323, 329, F55, 2205, S329000	X8CrNiMo27 5, X2CrNiMoN22 5 3, X20CrNiSi25 4, G-X40CrNiSi27 4
Cast Iron	K1	class 20, 25, 30, 35, 40, 45, 50, 55, 60, G1800, G3000, G3500, G4000	GG15, GG25, GG30, GG40, GTW40
	K2	60-40-18, 65-45-12, 80-55-06, SAE J434:D4018, D4512, D5506, ASTM A47: Grade 32510, 35018, SAE J158: Grade M3210, M4504, M5003, M5503, M7002,ASTM A842: Grade 250, 300, 350, 400, 450	GGG40, GTS35
	K3	ASTM A536:100-70-03, 120-90-02, SAE J434: D7003, SAE J158:Grade M8501AST A897: 125-80-10, 150-100-7, 175-125-4, 200-150-1, 230-185	GGG60, GTW55, GTS65
Non-Ferrous	N1	2025, 5050, 7050, 1000, 2017	AlMg1, Al99.5, AlCuMg1, AlCuBiPb, AlMgSi1, ALMgSiPb
	N2	2024, 6061, 7075	GAlSiCu4, GDAlSi10Mg
	N3	—	G-ALSi12, G-AlSi17Cu4, G-AlSi21CuNiMg
	N4	C81500	CuZn40, Ms60, G-CuSn5ZnPb, CuZn37, CuSi3Mn
	N5	—	LEXAN®, HOSTALEN™, Polystyrol, Makralon®
	N6	Graphite, CFK, CFRP	CFK, GFK
	N7	C63000	—
Special Alloys	S1	INCOLOY® 800 Series, A608, A567, Discaloy™, INVAR®, N-155, 16-25-6, 19-9 DL; Cast: ASTM A-297, A-351, A-567, A-608	X1NiCrMoCu32 28 7, X12NiCrSi36 16, X5NiCrAlTi31 20, X40CoCrNi20 20
	S2	Haynes® 25 (L605), Haynes 188, J-1570, Stellite®, AiResist 213; Cast: AiResist 13, Haynes 21, MAR-M302, MAR-M509, NASA Co-W-Re, WI-52	Haynes® 188, Stelllite® 6,21,31
	S3	Astroloy™, Hastelloy® B/C/ C-276 /X, INCONEL® 600 and 700 Series, IN102,INCOLOY 900 Series, Rene 41, Waspalloy®, Monel®, K-500, MAR-M20, NIMONIC®, UDIMET®	INCONEL® 690, INCONEL 625, Hastelloy®, NIMONIC® 75
	S4	Pure: Ti 98.8, Ti 98.9,Ti 99.9; Alloyed: Ti 5Al-2.5Sn, Ti6Al-4V, Ti6Al-2Sn-4Zr-2Mo,Ti-3Al-8V-6Cr-4Mo-4Zr, Ti-10V-2Fe-3Al, Ti-13V-11Cr-3Al	Ti1, TiAl5Sn2, TiAl6V4, TiAl4Mo4Sn2
Hardened Steel	H1	Tool Steel H10, H11, H13, D2, D3, 4340, P20	GX260NiCr42, GX330NiCr42, GX300CrNiSi952, GX300CrMo153, HARDOX® 400
	H2	Tool Steel H10, H11, H13, D2, D3, 4340, P20	—
	H3	Tool Steel H10, H11, H13, D2, D3, 4340, P20	—
	H4	Tool Steel H10, H11, H13, D2, D3, 4340, P20	—

Völundr
Cutting tools

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Cutting Tools

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