



End Mill

Solid Carbide



Endmill Solid Carb.

SERIES A-454

Volundrtools.com



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

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End Mill

Solid Carbide



Solid Carbide Endmill
4 Flutes Square End TiAlN
HRc 45

Series:

V-454
Inch

V-454M
Metric

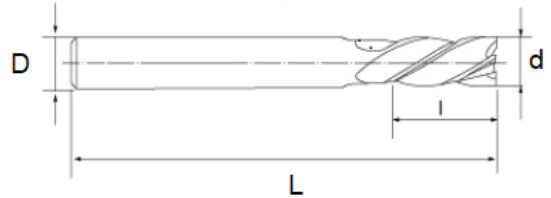
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INCH SQUARE END



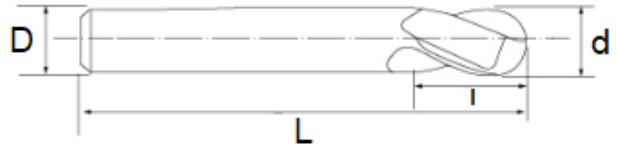
SERIES V-454						
EDP	CUTTING DIAMETER	FLUTE DIAMETER d	SHANK DIAMETER D	CUTTING LENGTH l	OVERALL LENGTH L	TYPE
222-100250	1/16	1/16	1/8	3/16	1-1/2	STD
222-100251	1/16	1/16	1/8	1	3	XL
222-100252	1/8	1/8	1/8	1/2	1-1/2	STD
222-100253	1/8	1/8	1/8	1	3	XL
222-100254	3/32	3/32	1/8	9/32	1-1/2	STD
222-100255	5/32	5/32	3/16	1/2	2	STD
222-100256	3/16	3/16	3/16	5/8	2	STD
222-100257	3/16	3/16	3/16	2	4	L
222-100258	3/16	3/16	3/16	1	4	L
222-100259	1/4	1/4	1/4	3/4	2-1/2	STD
222-100260	1/4	1/4	1/4	1-1/2	4	L
222-100261	1/4	1/4	1/4	2-1/2	6	XL
222-100262	5/16	5/16	5/16	7/8	2-1/2	STD
222-100263	3/8	3/8	3/8	1	2-1/2	STD
222-100264	3/8	3/8	3/8	2	4	L
222-100265	3/8	3/8	3/8	2-1/2	6	XL
222-100266	7/16	7/16	7/16	1	3	L
222-100267	1/2	1/2	1/2	1	3	STD
222-100268	1/2	1/2	1/2	3	6	XL
222-100269	5/8	5/8	5/8	1-1/4	3-1/2	L
222-100270	5/8	5/8	5/8	2-1/2	6	XL
222-100271	3/4	3/4	3/4	1-1/2	4	STD
222-100272	3/4	3/4	3/4	2-1/2	6	XL
222-100273	3/4	3/4	3/4	3	6	XL
222-100274	1	1	1	1-1/2	4	STD
222-100275	1	1	1	3	6	XL



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INCH BALL NOSE



SERIES V-454B							
EDP	EDP	CUTTING DIAMETER	FLUTE DIAMETER d	SHANK DIAMETER D	CUTTING LENGHT l	OVERALL LENGHT L	TYPE
222-100350		1/16	1/16	1/8	3/16	1-1/2	STD
222-100351		1/16	1/16	1/8	1	3	XL
222-100352		1/8	1/8	1/8	1/2	1-1/2	STD
222-100353		1/8	1/8	1/8	1	3	XL
222-100354		3/32	3/32	1/8	9/32	1-1/2	STD
222-100355		5/32	5/32	3/16	1/2	2	STD
222-100356		3/16	3/16	3/16	5/8	2	STD
222-100357		3/16	3/16	3/16	2	4	L
222-100358		3/16	3/16	3/16	1	4	L
222-100359		1/4	1/4	1/4	3/4	2-1/2	STD
222-100350		1/4	1/4	1/4	1-1/2	4	L
222-100351		1/4	1/4	1/4	2-1/2	6	XL
222-100352		5/16	5/16	5/16	7/8	2-1/2	STD
222-100353		3/8	3/8	3/8	1	2-1/2	STD
222-100354		3/8	3/8	3/8	2	4	L
222-100355		3/8	3/8	3/8	2-1/2	6	XL
222-100356		7/16	7/16	7/16	1	3	L
222-100357		1/2	1/2	1/2	1	3	STD
222-100358		1/2	1/2	1/2	3	6	XL
222-100359		5/8	5/8	5/8	1-1/4	3-1/2	L
222-100350		5/8	5/8	5/8	2-1/2	6	XL
222-100351		3/4	3/4	3/4	1-1/2	4	STD
222-100352		3/4	3/4	3/4	2-1/2	6	XL
222-100353		3/4	3/4	3/4	3	6	XL
222-100354		1	1	1	1-1/2	4	STD
222-100355		1	1	1	3	6	XL



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Cutting speed chart

Workpiece Material Group		Example	SFM
Steel	P	Steel - Mild (.2 - .3 Carbon) 1018	350 - 500
		Steel - Mild (.4 - .5 Carbon) 4140	250 - 350
		Tool Steels (1.2 carbon) A2/D2/H13/P20	200 - 250
		Forgings	125 - 250
Cast Iron	K	Iron Cast (Soft)	450 - 600
		Iron - Cast (Medium Hard)	300 - 400
		Iron (Hard Chilled)	250 - 300
		Iron (Malleable)	225 - 300
Stainless Steel	M	Stainless Free Machining	300 - 400
		Austenitic Stainless 304/316	180 - 225
		Ferritic	200 - 275
		Martensitic	150 - 200
		PH Stainless 17-4 PH	125 - 200

Workpiece Material Group		Example	SFM
Special Alloys	S	Titanium 6AL-4V	175 - 375
		Cobalt-Based Alloys Stellite	100 - 200
		Nickel-Based Alloys Inconel 625/718	100 - 200
		Iron-Based Alloys Incoloy 800-802	125 - 200
Hardened Steels	H	Hardened Steels 35-45 Rc	200 - 250
		Hardened Steels 45-55 Rc	150 - 200
		Hardened Steels 55-65 Rc	50 - 100
Non-Ferrous	N	Aluminium / Aluminium Alloys	500 - 700
		Brass / Bronze	400 - 600
		Magnesium / Magnesium Alloys	700 - 1000
		Plastics / Bakelite	800 - 1200

Feed rate chart

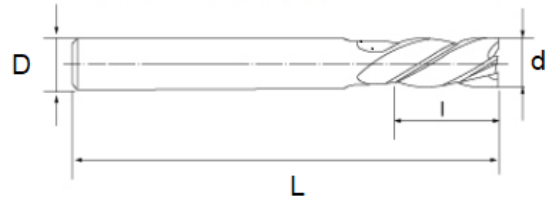
Workpiece Material Group	Example	Tool Diameter (inch)									
		1/8	3/16	1/4	5/16	3/8	1/2	5/8	3/4	1	
		Inch/Tooth									
Steel	P	Steel - Mild (.2-.3 Carbon) 1018	.0005 - .0008	.0010 - .0012	.0015 - .0020	.0015 - .0025	.0021 - .0030	.0020 - .0035	.0023 - .0040	.0022 - .0043	.0032 - .0050
		Steel - Mild (.4-.5 Carbon) 4140									
		Tool Steels (1.2 carbon) A2/D2/H13/P20 Forgings	.0003 - .0005	.0008 - .0010	.0012 - .0015	.0014 - .0018	.0018 - .0020	.0020 - .0023	.0023 - .0030	.0024 - .0032	.0024 - .0032
Cast Iron	K	Iron Cast (Soft)	.0005 - .0008	.0010 - .0012	.0015 - .0020	.0015 - .0025	.0021 - .0030	.0020 - .0035	.0023 - .0040	.0022 - .0043	.0032 - .0050
		Iron - Cast (Medium Hard)									
		Iron (Hard Chilled) Iron (Malleable)									
Stainless Steel	M	Stainless Steel Free Machining Ferritic	.0005 - .0008	.0010 - .0012	.0012 - .0015	.0015 - .0025	.0021 - .0030	.0020 - .0035	.0023 - .0040	.0022 - .0043	.0032 - .0050
		Austenitic Stainless 304/316									
		Martensitic PH Stainless 17-4 PH	.0003 - .0005	.0008 - .0010	.0012 - .0015	.0014 - .0018	.0018 - .0020	.0020 - .0023	.0023 - .0030	.0024 - .0032	.0024 - .0032
Special Alloys	S	Titanium 6AL-4V	.0003 - .0004	.0004 - .0006	.0006 - .0008	.0008 - .0012	.0008 - .0012	.0012 - .0016	.0016 - .0018	.0018 - .0020	.0020 - .0030
		Stellite Inconel 625/718 Incoloy 800-802	.0003 - .0005	.0005 - .0015	.0005 - .0015	.0010 - .0020	.0010 - .0020	.0010 - .0030	.0020 - .0030	.0025 - .0035	.0025 - .0035
Hardened Steel	H	Hardened Steels 35-45 Rc	.0003 - .0005	.0005 - .0015	.0005 - .0015	.0010 - .0020	.0010 - .0020	.0010 - .0030	.0020 - .0030	.0025 - .0035	.0025 - .0035
		Hardened Steels 45-55 Rc									
		Hardened Steels 55-65 Rc									
Non-Ferrous	N	Aluminium/Aluminium Alloys	.0008 - .0015	.0015 - .0020	.0020 - .0025	.0025 - .0030	.0030 - .0035	.0035 - .0050	.0050 - .0080	.0075 - .0095	.0085 - .100
		Brass/Bronze									
		Magnesium/Magnesium Alloys Plastics/Bakelite									



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METRIC SQUARE END



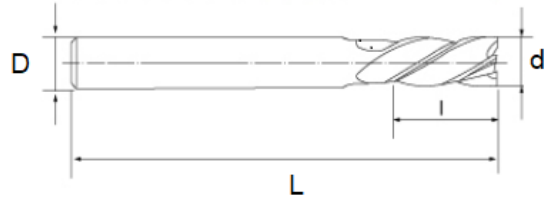
SERIES V-454M					
EDP	CUTTING DIAMETER	FLUTE DIAMETER d	SHANK DIAMETER D	OVERALL LENGHT L	TYPE
222-100300	1	1	4	50	STD
222-100301	1.5	1.5	4	50	STD
222-100302	2	2	4	50	STD
222-100303	2.5	2.5	4	50	STD
222-100304	3	3	4	50	STD
222-100305	3.5	3.5	4	50	STD
222-100306	4	4	4	50	STD
222-100307	4	4	4	75	L
222-100308	4	4	4	100	XL
222-100309	5	5	6	50	STD
222-100310	6	6	6	50	STD
222-100311	6	6	6	75	L
222-100312	6	6	6	100	XL
222-100313	8	8	8	60	STD
222-100314	8	8	8	75	L
222-100315	8	8	8	100	L
222-100316	10	10	10	75	STD
222-100317	10	10	10	100	L
222-100318	12	12	12	75	STD
222-100319	12	12	12	100	L
222-100320	14	14	14	100	STD
222-100321	16	16	16	100	STD
222-100322	18	18	18	100	STD
222-100323	20	20	20	100	STD



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METRIC SQUARE END



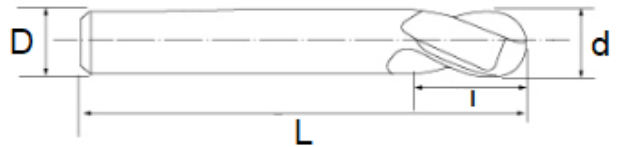
SERIES V-454M					
EDP	CUTTING DIAMETER	FLUTE DIAMETER d	SHANK DIAMETER D	OVERALL LENGHT L	TYPE
222-100324	6	6	6	150	XL
222-100325	8	8	8	150	XL
222-100326	10	10	10	150	XL
222-100327	12	12	12	150	XL
222-100328	14	14	14	150	XL
222-100329	16	16	16	150	XL
222-100330	18	18	18	150	XL
222-100331	20	20	20	150	XL
222-100332	0.5	0.5	4	50	STD
222-100333	0.6	0.6	4	50	STD



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METRIC BALL END

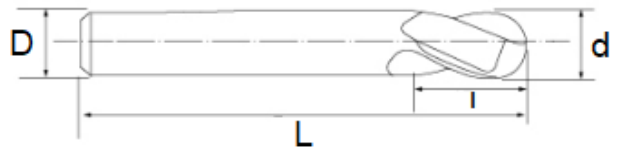


SERIES V-454MB					
EDP	CUTTING DIAMETER	FLUTE DIAMETER d	SHANK DIAMETER D	OVERALL LENGHT L	TYPE
222-100402	2	2	4	50	STD
222-100403	2.5	2.5	4	50	STD
222-100404	3	3	4	50	STD
222-100405	3.5	3.5	4	50	STD
222-100406	4	4	4	50	STD
222-100407	4	4	4	75	L
222-100408	4	4	4	100	XL
222-100409	5	5	6	50	STD
222-100410	6	6	6	50	STD
222-100411	6	6	6	75	L
222-100412	6	6	6	100	XL
222-100413	8	8	8	60	STD
222-100414	8	8	8	75	L
222-100415	8	8	8	100	L
222-100416	10	10	10	75	STD
222-100417	10	10	10	100	L
222-100418	12	12	12	75	STD
222-100419	12	12	12	100	L
222-100420	14	14	14	100	STD
222-100421	16	16	16	100	STD
222-100422	18	18	18	100	STD
222-100423	20	20	20	100	STD

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METRIC BALL END



SERIES V-454MB					
EDP	CUTTING DIAMETER	FLUTE DIAMETER d	SHANK DIAMETER D	OVERALL LENGHT L	TYPE
222-100424	6	6	6	150	XL
222-100425	8	8	8	150	XL
222-100426	10	10	10	150	XL
222-100427	12	12	12	150	XL
222-100428	14	14	14	150	XL
222-100429	16	16	16	150	XL
222-100430	18	18	18	150	XL
222-100431	20	20	20	150	XL
222-100432	0.5	0.5	4	50	STD
222-100433	0.6	0.6	4	50	STD
222-100434	0.8	0.8	4	50	STD



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Cutting speed chart

Workpiece Material Group		Example	Vc m/min
Steel	P	Steel - Mild (.2 - .3 Carbon) 1018	105 - 150
		Steel - Mild (.4 - .5 Carbon) 4140	75 - 105
		Tool Steels (1.2 carbon) A2/D2/H13/P20	60 - 75
		Forgings	40 - 75
Cast Iron	K	Iron Cast (Soft)	140 - 185
		Iron - Cast (Medium Hard)	90 - 120
		Iron (Hard Chilled)	75 - 90
		Iron (Malleable)	70 - 90
Stainless Steel	M	Stainless Free Machining	90 - 120
		Austenitic Stainless 304/316	55 - 70
		Ferritic	60 - 85
		Martensitic	45 - 60
		PH Stainless 17-4 PH	40 - 60

Workpiece Material Group		Example	Vc m/min
Special Alloys	S	Titanium 6AL-4V	55 - 115
		Cobalt-Based Alloys Stellite	30 - 60
		Nickel-Based Alloys Inconel 625/718	30 - 60
		Iron-Based Alloys Incoloy 800-802	40 - 60
Hardened Steel	H	Hardened Steels 35-45 Rc	60 - 75
		Hardened Steels 45-55 Rc	45 - 60
		Hardened Steels 55-65 Rc	15 - 30
		Aluminium / Aluminium Alloys	150 - 215
Non-Ferrous	N	Brass / Bronze	120 - 185
		Magnesium / Magnesium Alloys	215 - 305
		Plastics / Bakelite	245 - 365

Feed rate chart

Workpiece Material Group	Example	Tool Diameter (mm)									
		3	5	6	8	10	12	16	20	25	
		mm/Tooth									
Steel	P	Steel - Mild (.2-.3 Carbon) 1018	.013 - .020	.025 - .030	.038 - .051	.038 - .051	.053 - .076	.051 - .089	.058 - .102	.056 - .109	.081 - .127
		Steel - Mild (.4-.5 Carbon) 4140	.013 - .020	.025 - .030	.038 - .051	.038 - .051	.053 - .076	.051 - .089	.058 - .102	.056 - .109	.081 - .127
		Tool Steels (1.2 carbon) A2/D2/H13/P20 Forgings	.008 - .013	.020 - .025	.030 - .038	.036 - .046	.046 - .051	.051 - .058	.058 - .076	.061 - .081	.061 - .081
Cast Iron	K	Iron Cast (Soft)	.013 - .020	.025 - .030	.038 - .051	.038 - .051	.053 - .076	.051 - .089	.058 - .102	.056 - .109	.081 - .127
		Iron - Cast (Medium Hard)	.013 - .020	.025 - .030	.038 - .051	.038 - .051	.053 - .076	.051 - .089	.058 - .102	.056 - .109	.081 - .127
		Iron (Hard Chilled) Iron (Malleable)	.013 - .020	.025 - .030	.038 - .051	.038 - .051	.053 - .076	.051 - .089	.058 - .102	.056 - .109	.081 - .127
Stainless Steel	M	Stainless Steel Free Machining	.013 - .020	.025 - .030	.038 - .051	.038 - .051	.053 - .076	.051 - .089	.058 - .102	.056 - .109	.081 - .127
		Ferritic	.013 - .020	.025 - .030	.038 - .051	.038 - .051	.053 - .076	.051 - .089	.058 - .102	.056 - .109	.081 - .127
		Austenitic Stainless 304/316 Martensitic PH Stainless 17-4 PH	.008 - .013	.020 - .025	.030 - .038	.036 - .046	.046 - .051	.051 - .058	.058 - .076	.061 - .081	.061 - .081
Special Alloys	S	Titanium 6AL-4V	.008 - .010	.010 - .015	.015 - .020	.020 - .030	.020 - .030	.030 - .041	.041 - .046	.046 - .051	.051 - .076
		Stellite Inconel 625/718 Incoloy 800-802	.008 - .013	.013 - .038	.013 - .038	.025 - .051	.025 - .051	.025 - .076	.051 - .076	.064 - .089	.064 - .089
		Hardened Steels 35-45 Rc Hardened Steels 45-55 Rc Hardened Steels 55-65 Rc	.008 - .013	.013 - .038	.013 - .038	.025 - .051	.025 - .051	.025 - .076	.051 - .076	.064 - .089	.064 - .089
Non-Ferrous	N	Aluminium/Aluminium Alloys Brass/Bronze Magnesium/Magnesium Alloys Plastics/Bakelite	.020 - .038	.038 - .051	.051 - .064	.064 - .076	.076 - .089	.089 - .127	.127 - .216	.191 - .241	.216 - .254

End Mill

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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
	P2	1035, 1045, 10L45, 1050, 10L50, 1080, 1137, 1144, 11L44, 1525, 1545, 1572
	P3	1300, 2000, 3000, 4000, 5000, 8000, P20, SAE: A, D, H, O, S, M, T
	P4	1300, 2000, 3000, 4000, 5000, 8000, P20, SAE: A, D, H, O, S, M, T
	P5	15-5 PH, 13-8 PH, 17-4 PH, 400 and 500 Series
	P6	15-5 PH, 13-8 PH, 17-4 PH, 400 and 500 Series
Stainless Steel	M1	200 Series, 301, 302, 304, 304L, 309
	M2	310, 316, 316L, 321, 347, 384 ASTM Cast XM-1, XM-5, XM-7, XM-21
	M3	323, 329, F55, 2205, S329000
Cast Iron	K1	class 20, 25, 30, 35, 40, 45, 50, 55, 60, G1800, G3000, G3500, G4000
	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
	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
Non-Ferrous	N1	2025, 5050, 7050, 1000, 2017
	N2	2024, 6061, 7075
	N3	—
	N4	C81500
	N5	—
	N6	Graphite, CFK, CFRP
	N7	G63000
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
	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
	S3	Astrolloy™, 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®
	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
Hardened Steel	H1	Tool Steel H10, H11, H13, D2, D3, 4340, P20
	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



End Mill

Solid Carbide



Völundr

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