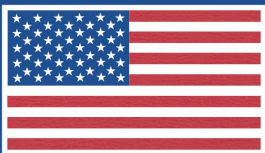


SPRING
2024

TAPPING

DRILLING

DEBURRING


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REAMING

THREAD MILLING



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REAMING

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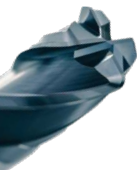
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Drill Mills



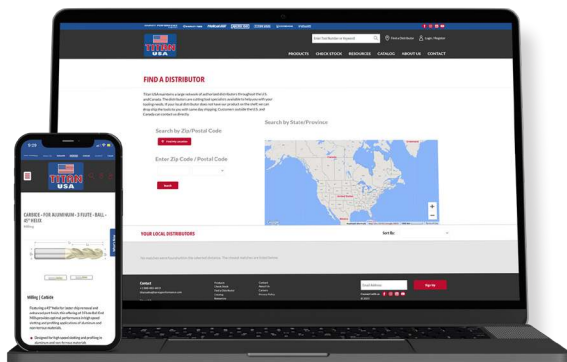
Chamfer Mills



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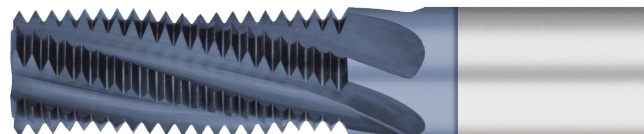
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MILLING

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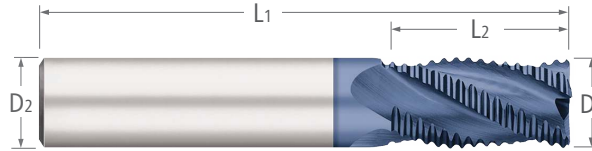


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GENERAL PURPOSE END MILLS - CARBIDE - ROUGHERS

4 Flute - Square - 30° Helix - Fine Pitch Rougher



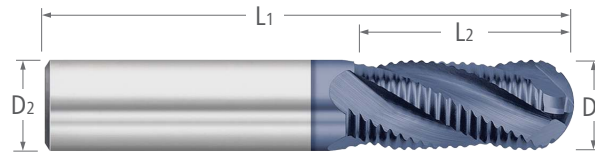
- Excellent performance in hardened steels, titanium, Inconel, and high temp alloys
- Offered in stub, regular, and long length styles
- Fine pitch for maximized material removal rates (MRR) and minimized vibration or chatter
- Center cutting
- AlTiN coating offers increased wear and heat resistance
- Solid carbide
- Precision manufactured in the USA

CUTTER DIA.	SHANK DIA.	LOC	OAL	UNCOATED		AlTiN COATED	
$D1^{+0.000}_{-0.002}$	$D2 (h6)$	$L2$	$L1$	TOOL #	PRICE	TOOL #	PRICE
1/8	1/8	1/4	1-1/2	TC20308	27.35	TC29308	29.70
	1/8	1/2	1-1/2	TC20508	28.50	TC29508	30.80
	1/8	3/4	2-1/4	TC20608	30.90	TC29608	35.60
	1/8	1	3	TC20609	35.85	TC29609	40.55
3/16	3/16	3/8	2	TC20312	30.35	TC29312	33.00
	3/16	5/8	2	TC20512	31.70	TC29512	34.30
	3/16	7/8	2	TC20612	34.40	TC29612	39.35
	3/16	1-1/4	3	TC20613	39.75	TC29613	42.55
1/4	1/4	3/8	2	TC20316	33.70	TC29316	36.80
	1/4	1/2	2	TC20517	34.95	TC29517	38.15
	1/4	3/4	2-1/2	TC20516	37.80	TC29516	41.15
	1/4	1-1/8	3	TC20617	43.95	TC29617	47.30
	1/4	1-1/2	4	TC20616	55.20	TC29616	58.85
5/16	5/16	1/2	2	TC20320	47.65	TC29320	51.50
	5/16	13/16	2-1/2	TC20520	53.15	TC29520	57.25
	5/16	1-1/8	3	TC20621	61.75	TC29621	65.90
	5/16	1-1/2	4	TC20620	71.05	TC29620	75.55
3/8	3/8	9/16	2	TC20324	55.50	TC29324	60.05
	3/8	7/8	2-1/2	TC20524	61.85	TC29524	66.75
	3/8	1-1/8	3	TC20625	72.85	TC29625	77.75
	3/8	1-1/2	4	TC20626	83.90	TC29626	89.15
	3/8	1-3/4	4	TC20624	89.60	TC29624	94.90
1/2	1/2	5/8	2-1/2	TC20332	68.60	TC29332	75.05
	1/2	1	3	TC20533	74.65	TC29533	81.20
	1/2	1-1/4	3	TC20532	77.60	TC29532	84.20
	1/2	1-1/2	4	TC20633	96.45	TC29633	103.55
	1/2	2	4	TC20632	102.50	TC29632	109.60
$D1^{+0.000}_{-0.003}$	$D2 (h6)$	$L2$	$L1$	TOOL #	PRICE	TOOL #	PRICE
5/8	5/8	3/4	3	TC20340	154.15	TC29340	162.15
	5/8	1-1/4	3-1/2	TC20541	165.05	TC29541	173.60
	5/8	1-5/8	3-1/2	TC20540	171.60	TC29540	180.20
	5/8	2-1/4	5	TC20641	234.25	TC29641	243.70
	5/8	2-1/2	5	TC20640	247.25	TC29640	256.75
	5/8	3	6	TC20642	263.90	TC29642	281.65
3/4	3/4	1	3	TC20348	186.10	TC29348	195.55
	3/4	1-5/8	4	TC20548	208.20	TC29548	218.35
	3/4	2-1/4	5	TC20649	286.20	TC29649	297.45
	3/4	2-1/2	5	TC20648	297.10	TC29648	308.40
	3/4	3	6	TC20650	317.65	TC29650	329.80
1	1	1-1/4	3-1/2	TC20364	333.95	TC29364	360.25
	1	2	4	TC20564	386.45	TC29564	401.60
	1	2-1/2	5	TC20664	511.95	TC29664	528.65

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GENERAL PURPOSE END MILLS - CARBIDE - ROUGHERS

4 Flute - Ball - 30° Helix - Fine Pitch Rougher



- Excellent performance in hardened steels, titanium, Inconel, and high temp alloys
- Offered in stub, regular, and long length styles
- Fine pitch for maximized material removal rates (MRR) and minimized vibration or chatter
- AlTiN coating offers increased wear and heat resistance
- Solid carbide
- Precision manufactured in the USA

CUTTER DIA.	SHANK DIA.	LOC	OAL	UNCOATED		AlTiN COATED	
$D_1^{+0.000''}_{-0.002''}$	$D_2 (h6)$	L_2	L_1	TOOL #	PRICE	TOOL #	PRICE
1/4	1/4	3/8	2	TC20715	44.00	TC29915	49.95
	1/4	3/4	2-1/2	TC20716	48.05	TC29916	51.55
	1/4	1-1/2	4	TC20717	65.45	TC29917	72.25
5/16	5/16	1/2	2	TC20718	61.50	TC29918	68.65
	5/16	7/8	2-1/2	TC20720	62.45	TC29920	70.05
	5/16	1-1/2	4	TC20721	84.90	TC29921	93.05
3/8	3/8	9/16	2	TC20722	73.30	TC29922	81.80
	3/8	1	2-1/2	TC20724	79.75	TC29924	84.65
	3/8	1-3/4	4	TC20725	107.40	TC29925	117.10
1/2	1/2	5/8	2-1/2	TC20726	100.45	TC29926	112.75
	1/2	1-1/4	3	TC20732	109.55	TC29932	116.30
	1/2	2	4	TC20733	134.40	TC29933	147.60
$D_1^{+0.000''}_{-0.003''}$	$D_2 (h6)$	L_2	L_1	TOOL #	PRICE	TOOL #	PRICE
5/8	5/8	3/4	3	TC20734	177.10	TC29934	191.40
	5/8	1-5/8	3-1/2	TC20740	194.55	TC29940	203.20
	5/8	2-1/2	5	TC20741	270.20	TC29941	286.65
3/4	3/4	1	3	TC20742	250.90	TC29942	267.90
	3/4	1-5/8	4	TC20748	272.90	TC29948	291.10
	3/4	2-1/2	5	TC20749	361.95	TC29949	381.50
1	1	2	4	TC20764	444.70	TC29964	471.00
	1	2-1/2	5	TC20765	570.15	TC29965	598.50



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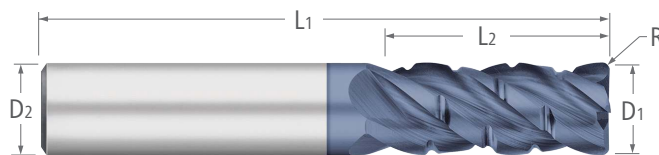
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GENERAL PURPOSE END MILLS - CARBIDE - ROUGHERS

4 Flute - Corner Radius - 40° Helix - Rougher/Finisher



- Excellent performance in hardened steels, titanium, Inconel, and high temp alloys
- Engineered with chipbreaker geometry for optimal chip evacuation, reduced harmonics, and reduced tool pressure
- Corner radius for increased edge strength
- Higher helix for enhanced cutting action
- AlTiN coating offers increased wear and heat resistance
- Solid carbide
- Precision manufactured in the USA

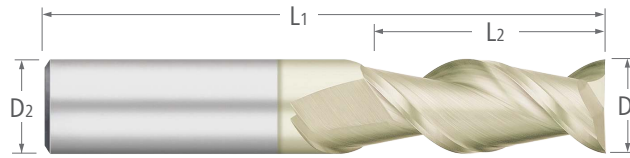
CUTTER DIA.	SHANK DIA.	RADIUS	LOC	OAL	UNCOATED		AlTiN COATED	
$D_{1+0.000}^{-0.002}$	D_2 (h6)	$R_{+0.001}^{-0.001}$	L_2	L_1	TOOL #	PRICE	TOOL #	PRICE
1/8	1/8	.010	1/2	1-1/2	TC29708	43.45	TC29808	47.85
	1/8	.010	3/4	2-1/4	TC29770	44.25	TC29870	48.95
	1/8	.010	1	3	TC29785	45.40	TC29885	50.10
3/16	3/16	.010	5/8	2	TC29712	51.60	TC29812	56.55
	3/16	.010	7/8	2-1/2	TC29771	53.20	TC29871	58.50
	3/16	.010	1-1/8	3	TC29786	55.10	TC29886	60.40
1/4	1/4	.020	3/4	2-1/2	TC29716	61.15	TC29816	67.50
	1/4	.020	1-1/8	3	TC29772	61.40	TC29872	67.75
	1/4	.020	1-1/2	4	TC29787	66.75	TC29887	73.55
5/16	5/16	.020	13/16	2-1/2	TC29720	65.80	TC29820	73.40
	5/16	.020	1-1/8	3	TC29773	75.70	TC29873	83.30
	5/16	.020	1-5/8	4	TC29788	84.45	TC29888	92.60
3/8	3/8	.020	7/8	2-1/2	TC29724	70.80	TC29824	79.85
	3/8	.020	1-1/8	3	TC29774	86.10	TC29874	95.15
	3/8	.020	1-1/2	4	TC29775	87.95	TC29875	97.65
	3/8	.020	2	4	TC29789	89.40	TC29889	99.10
1/2	1/2	.030	1-1/4	3	TC29733	86.90	TC29833	99.20
	1/2	.030	1-1/2	4	TC29776	80.35	TC29876	93.55
	1/2	.030	2	4	TC29777	81.95	TC29877	95.15
	1/2	.030	3	6	TC29790	89.00	TC29890	104.35
	1/2	.040	1-1/4	3	TC29732	80.00	TC29832	92.30
$D_{1+0.000}^{-0.003}$	D_2 (h6)	$R_{+0.001}^{-0.001}$	L_2	L_1	TOOL #	PRICE	TOOL #	PRICE
5/8	5/8	.030	1-5/8	3-1/2	TC29742*	177.05	TC29842*	192.30
	5/8	.030	2-1/4	5	TC29778*	188.45	TC29878*	213.90
	5/8	.030	3	6	TC29791*	193.50	TC29891*	220.25
	5/8	.040	1-1/4	3-1/2	TC29741*	174.90	TC29841*	199.15
	5/8	.040	1-5/8	3-1/2	TC29740*	168.45	TC29840*	192.70
3/4	3/4	.030	1-5/8	4	TC29749*	237.75	TC29849*	255.95
	3/4	.030	2-1/4	5	TC29779*	250.65	TC29879*	281.20
	3/4	.040	1-5/8	4	TC29748*	227.40	TC29848*	245.60
1	1	.030	1-5/8	4	TC29765*	387.20	TC29865*	413.50
	1	.040	1-5/8	4	TC29764*	387.20	TC29864*	413.50

*Includes Weldon Flat

For technical information, see page 101

GENERAL PURPOSE END MILLS - CARBIDE - FOR ALUMINUM

2 Flute - Square - 45° Helix



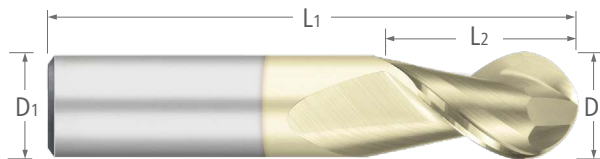
- Designed for high speed slotting and profiling in aluminum and non-ferrous materials
- Offered in stub, regular, and long length styles
- 45° helix for faster chip removal and a better finish
- Center cutting
- ZrN coating offers increased speed rates and prolonged tool life
- Solid carbide
- Precision manufactured in the USA

CUTTER DIA.	SHANK DIA.	LOC	OAL	UNCOATED		ZrN COATED	
D1 ^{+0.000"} _{-0.002"}	D2 (h6)	L2	L1	TOOL #	PRICE	TOOL #	PRICE
1/8	1/8	1/4	1-1/2	TC62000	10.15	TC62100	12.60
	1/8	1/2	1-1/2	TC62608	15.15	TC62708	17.60
	1/8	3/4	2-1/4	TC63208	27.10	TC63308	29.90
3/16	3/16	3/8	2	TC62002	15.95	TC62102	18.75
	3/16	5/8	2	TC62612	21.55	TC62712	24.45
	3/16	3/4	2-1/2	TC63212	31.25	TC63312	34.35
1/4	1/4	1/2	2	TC62004	23.35	TC62104	26.80
	1/4	3/4	2-1/2	TC62616	30.40	TC62716	34.15
	1/4	1-1/4	3	TC63216	43.05	TC63316	46.80
5/16	5/16	1/2	2	TC62006	28.45	TC62106	32.60
	5/16	13/16	2-1/2	TC62620	36.00	TC62720	40.50
	5/16	1-3/8	3	TC63220	59.10	TC63320	63.70
3/8	3/8	5/8	2	TC62008	30.70	TC62108	35.55
	3/8	1	2-1/2	TC62624	37.65	TC62724	42.90
	3/8	1-1/2	4	TC63224	70.55	TC63324	76.30
1/2	1/2	5/8	2-1/2	TC62010	52.90	TC62110	59.95
	1/2	1-1/4	3	TC62632	60.50	TC62732	67.75
	1/2	2	4	TC63232	99.40	TC63332	107.20
D1 ^{+0.000"} _{-0.003"}	D2 (h6)	L2	L1	TOOL #	PRICE	TOOL #	PRICE
5/8	5/8	3/4	3	TC62012	112.35	TC62112	128.05
	5/8	1-5/8	3-1/2	TC62640	126.95	TC62740	136.05
	5/8	2-3/8	5	TC63240	222.10	TC63340	232.25
3/4	3/4	1	3	TC62014	171.80	TC62114	182.10
	3/4	1-3/4	4	TC62648	184.35	TC62748	195.35
	3/4	2-1/2	5	TC63248	240.20	TC63348	252.25
1	1	1-1/4	3-1/2	TC62016	289.40	TC62116	318.35
	1	1-3/4	4	TC62664	304.00	TC62764	320.10
	1	2-1/4	5	TC63264	377.65	TC63364	408.80

For technical information, see page 104

GENERAL PURPOSE END MILLS - CARBIDE - FOR ALUMINUM

2 Flute - Ball - 45° Helix



- Designed for high speed slotting and profiling in aluminum and non-ferrous materials
- Offered in stub and regular length styles
- 45° helix for faster chip removal and a better finish
- Center cutting
- ZrN coating offers increased speed rates and prolonged tool life
- Solid carbide
- Precision manufactured in the USA

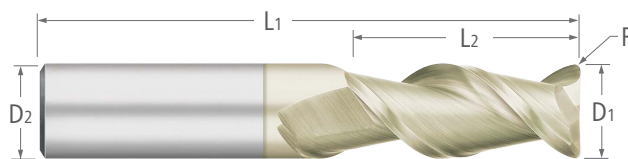
CUTTER DIA.	SHANK DIA.	LOC	OAL	UNCOATED		ZrN COATED	
$D1_{+0.000}^{-0.002}$	$D2 (h6)$	$L2$	$L1$	TOOL #	PRICE	TOOL #	PRICE
1/8	1/8	1/2	1-1/2	TC63050	19.00	TC63085	23.85
	1/8	3/4	2-1/4	TC63070	33.90	TC63100	39.10
3/16	3/16	5/8	2	TC63051	26.60	TC63086	32.05
	3/16	3/4	2-1/2	TC63071	39.20	TC63101	45.15
1/4	1/4	3/4	2-1/2	TC63052	35.40	TC63087	42.40
	1/4	1-1/4	3	TC63072	50.15	TC63102	57.15
5/16	5/16	13/16	2-1/2	TC63053	42.05	TC63088	50.45
	5/16	1-3/8	3	TC63073	68.90	TC63103	77.30
3/8	3/8	1	2-1/2	TC63054	43.90	TC63089	53.80
	3/8	1-1/2	4	TC63074	81.40	TC63104	92.10
1/2	1/2	1-1/4	3	TC63055	70.45	TC63090	83.95
	1/2	2	4	TC63075	114.60	TC63105	129.10

$D1_{+0.000}^{-0.003}$	$D2 (h6)$	$L2$	$L1$	TOOL #	PRICE	TOOL #	PRICE
5/8	5/8	1-5/8	3-1/2	TC63056	139.50	TC63091	156.30
	5/8	2-3/8	5	TC63076	244.90	TC63106	263.00
3/4	3/4	1-3/4	4	TC63057	202.55	TC63092	222.55
	3/4	2-1/2	5	TC63077	264.90	TC63107	286.45
1	1	1-3/4	4	TC63058	335.40	TC63093	364.35
	1	2-1/4	5	TC63078	416.60	TC63108	447.75

For technical information, see page 104

GENERAL PURPOSE END MILLS - CARBIDE - FOR ALUMINUM

2 Flute - Corner Radius - 45° Helix



- Designed for high speed slotting and profiling in aluminum and non-ferrous materials
- Offered in stub, regular, and long length styles
- Corner radius for increased edge strength
- 45° helix for faster chip removal and a better finish
- Center cutting
- ZrN coating offers increased speed rates and prolonged tool life
- Solid carbide
- Precision manufactured in the USA

CUTTER DIA.	SHANK DIA.	RADIUS	LOC	OAL	UNCOATED		ZrN COATED	
D1 $^{+.0001}_{-.002}$ "	D2 (h6)	R $^{+.001}_{-.001}$ "	L2	L1	TOOL #	PRICE	TOOL #	PRICE
1/8	1/8	.010	1/4	1-1/2	TC62300	13.00	TC62400	15.55
	1/8	.010	1/2	1-1/2	TC64608	18.40	TC64708	21.00
	1/8	.010	3/4	2-1/4	TC65208	33.00	TC65308	35.70
	1/8	.015	1/4	1-1/2	TC62363	13.00	TC62463	17.85
	1/8	.015	1/2	1-1/2	TC62390	18.40	TC62490	23.25
	1/8	.015	3/4	2-1/4	TC62436	33.00	TC62517	38.20
	1/8	.020	1/4	1-1/2	TC62364	13.00	TC62464	17.85
	1/8	.020	1/2	1-1/2	TC62391	18.40	TC62491	23.25
	1/8	.020	3/4	2-1/4	TC62437	33.00	TC62518	38.20
	1/8	.030	1/4	1-1/2	TC62365	13.00	TC62465	17.85
	1/8	.030	1/2	1-1/2	TC62392	18.40	TC62492	23.25
	1/8	.030	3/4	2-1/4	TC62438	33.00	TC62519	38.20
3/16	3/16	.010	3/8	2	TC62302	19.65	TC62402	22.45
	3/16	.010	5/8	2	TC64612	25.85	TC64712	28.75
	3/16	.010	3/4	2-1/2	TC65212	38.10	TC65312	41.25
	3/16	.020	3/8	2	TC62366	19.65	TC62466	25.10
	3/16	.020	5/8	2	TC62393	25.85	TC62493	31.30
	3/16	.020	3/4	2-1/2	TC62439	38.10	TC62520	43.95
	3/16	.030	3/8	2	TC62367	19.65	TC62467	25.10
	3/16	.030	5/8	2	TC62394	25.85	TC62494	31.30
1/4	1/4	.015	1/2	2	TC62368	28.10	TC62468	34.65
	1/4	.015	3/4	2-1/2	TC62395	34.30	TC62495	41.30
	1/4	.015	1-1/4	3	TC62441	48.80	TC62522	55.80
	1/4	.020	1/2	2	TC62304	28.10	TC62404	31.60
	1/4	.020	3/4	2-1/2	TC64616	34.30	TC64716	38.05
	1/4	.020	1-1/4	3	TC65216	48.80	TC65316	52.50
	1/4	.030	1/2	2	TC62369	28.10	TC62469	34.65
	1/4	.030	3/4	2-1/2	TC62396	34.30	TC62496	41.30
	1/4	.030	1-1/4	3	TC62442	48.80	TC62523	55.80
	1/4	.060	1/2	2	TC62370	28.10	TC62470	34.65
	1/4	.060	3/4	2-1/2	TC62397	34.30	TC62497	41.30
	1/4	.060	1-1/4	3	TC62443	48.80	TC62524	55.80

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GENERAL PURPOSE END MILLS - CARBIDE - FOR ALUMINUM

2 Flute - Corner Radius - 45° Helix (Cont.)

continued from previous page

CUTTER DIA.	SHANK DIA.	RADIUS	LOC	OAL	UNCOATED		ZrN COATED	
D1 ^{+.000"} - .002"	D2 (h6)	R ^{+.001"} - .001"	L2	L1	TOOL #	PRICE	TOOL #	PRICE
5/16	5/16	.020	1/2	2	TC62306	32.75	TC62406	40.65
	5/16	.020	13/16	2-1/2	TC64620	40.80	TC64720	45.20
	5/16	.020	1-3/8	3	TC65220	66.90	TC65320	71.45
	5/16	.030	1/2	2	TC62371	32.75	TC62471	40.65
	5/16	.030	13/16	2-1/2	TC62417	40.80	TC62498	49.20
	5/16	.030	1-3/8	3	TC62444	66.90	TC62525	75.30
	5/16	.060	1/2	2	TC62372	32.75	TC62472	40.65
	5/16	.060	13/16	2-1/2	TC62418	40.80	TC62499	49.20
	5/16	.060	1-3/8	3	TC62445	66.90	TC62526	75.30
3/8	3/8	.015	5/8	2	TC62373	34.60	TC62473	43.90
	3/8	.015	1	2-1/2	TC62419	42.60	TC62500	52.50
	3/8	.015	1-1/2	4	TC62446	79.05	TC62527	89.75
	3/8	.020	5/8	2	TC62308	34.60	TC62408	43.90
	3/8	.020	1	2-1/2	TC64624	42.60	TC64724	47.85
	3/8	.020	1-1/2	4	TC65224	79.05	TC65324	84.80
	3/8	.030	5/8	2	TC62374	34.60	TC62474	43.90
	3/8	.030	1	2-1/2	TC62420	42.60	TC62501	52.50
	3/8	.030	1-1/2	4	TC62447	79.05	TC62528	89.75
	3/8	.060	5/8	2	TC62375	34.60	TC62475	43.90
	3/8	.060	1	2-1/2	TC62421	42.60	TC62502	52.50
	3/8	.060	1-1/2	4	TC62448	79.05	TC62529	89.75
1/2	1/2	.015	5/8	2-1/2	TC62376	56.75	TC62476	70.25
	1/2	.015	1-1/4	3	TC62422	68.40	TC62503	81.90
	1/2	.015	2	4	TC62449	111.25	TC62530	125.75
	1/2	.020	5/8	2-1/2	TC62377	56.75	TC62477	70.25
	1/2	.020	1-1/4	3	TC62423	68.40	TC62504	81.90
	1/2	.020	2	4	TC62450	111.25	TC62531	125.75
	1/2	.030	5/8	2-1/2	TC62378	56.75	TC62478	70.25
	1/2	.030	1-1/4	3	TC62424	68.40	TC62505	81.90
	1/2	.030	2	4	TC62451	111.25	TC62532	125.75
	1/2	.040	5/8	2-1/2	TC62310	56.75	TC62410	63.90
	1/2	.040	1-1/4	3	TC64632	68.40	TC64732	75.60
	1/2	.040	2	4	TC65232	111.25	TC65332	119.15
	1/2	.060	5/8	2-1/2	TC62379	56.75	TC62479	70.25
	1/2	.060	1-1/4	3	TC62425	68.40	TC62506	81.90
	1/2	.060	2	4	TC62452	111.25	TC62533	125.75
	1/2	.125	5/8	2-1/2	TC62380	56.75	TC62480	70.25
	1/2	.125	1-1/4	3	TC62426	68.40	TC62507	81.90
	1/2	.125	2	4	TC62453	111.25	TC62534	125.75

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For technical information, see page 104

GENERAL PURPOSE END MILLS - CARBIDE - FOR ALUMINUM

2 Flute - Corner Radius - 45° Helix (Cont.)

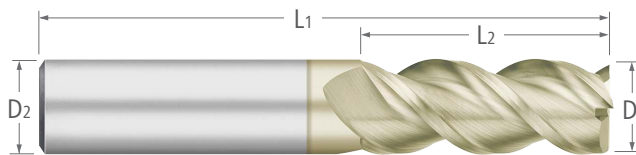
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CUTTER DIA.	SHANK DIA.	RADIUS	LOC	OAL	UNCOATED		ZrN COATED	
D1 ^{+0.000"} -0.003"	D2 (h6)	R ^{+0.001"} -0.001"	L2	L1	TOOL #	PRICE	TOOL #	PRICE
5/8	5/8	.015	3/4	3	TC62381	118.65	TC62481	134.35
	5/8	.015	1-5/8	3-1/2	TC62427	135.50	TC62508	152.30
	5/8	.015	2-3/8	5	TC62454	237.80	TC62535	255.90
	5/8	.040	3/4	3	TC62312	118.65	TC62412	134.35
	5/8	.040	1-5/8	3-1/2	TC64640	135.50	TC64740	152.30
	5/8	.040	2-3/8	5	TC65240	237.80	TC65340	255.90
	5/8	.060	3/4	3	TC62382	118.65	TC62482	134.35
	5/8	.060	1-5/8	3-1/2	TC62428	135.50	TC62509	152.30
	5/8	.060	2-3/8	5	TC62455	237.80	TC62536	255.90
3/4	3/4	.015	1	3	TC62383	177.80	TC62483	196.50
	3/4	.015	1-3/4	4	TC62429	196.60	TC62510	216.60
	3/4	.015	2-1/2	5	TC62456	257.20	TC62537	278.75
	3/4	.030	1	3	TC62384	177.80	TC62484	196.50
	3/4	.030	1-3/4	4	TC62430	196.60	TC62511	216.60
	3/4	.030	2-1/2	5	TC62457	257.20	TC62538	278.75
	3/4	.040	1	3	TC62314	177.80	TC62414	196.50
	3/4	.040	1-3/4	4	TC64648	196.60	TC64748	207.65
	3/4	.040	2-1/2	5	TC65248	257.20	TC65348	278.75
	3/4	.060	1	3	TC62835	177.80	TC62485	196.50
	3/4	.060	1-3/4	4	TC62431	196.60	TC62512	216.60
	3/4	.060	2-1/2	5	TC62458	257.20	TC62539	278.75
	3/4	.125	1	3	TC62836	177.80	TC62486	196.50
	3/4	.125	1-3/4	4	TC62432	196.60	TC62513	216.60
	3/4	.125	2-1/2	5	TC62459	257.20	TC62540	278.75
1	1	.030	1-1/4	3-1/2	TC62837	298.45	TC62487	327.40
	1	.030	1-3/4	4	TC62433	325.60	TC62514	354.55
	1	.030	2-1/4	5	TC62460	404.45	TC62541	435.60
	1	.040	1-1/4	3-1/2	TC62316	298.45	TC62416	327.40
	1	.040	1-3/4	4	TC64664	325.60	TC64764	354.55
	1	.040	2-1/4	5	TC65264	404.45	TC65364	435.60
	1	.060	1-1/4	3-1/2	TC62888	298.45	TC62488	327.40
	1	.060	1-3/4	4	TC62434	325.60	TC62515	354.55
	1	.060	2-1/4	5	TC62461	404.45	TC62542	435.60
	1	.125	1-1/4	3-1/2	TC62889	298.45	TC62489	327.40
	1	.125	1-3/4	4	TC62435	325.60	TC62516	354.55
	1	.125	2-1/4	5	TC62462	404.45	TC62543	435.60

For technical information, see page 104

GENERAL PURPOSE END MILLS - CARBIDE - FOR ALUMINUM

3 Flute - Square - 45° Helix



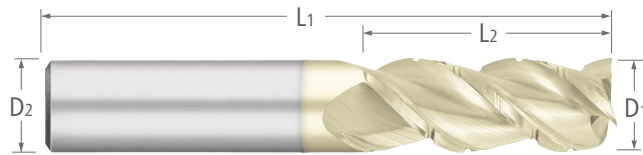
- Designed for high speed slotting and profiling in aluminum and non-ferrous materials
- Additional flute has 50% more cutting performance than certain 2 flute applications
- Offered in stub, regular, and long length styles
- 45° helix for faster chip removal and a better finish
- Center cutting
- ZrN coating offers increased speed rates and prolonged tool life
- Solid carbide
- Precision manufactured in the USA

CUTTER DIA.	SHANK DIA.	LOC	OAL	UNCOATED		ZrN COATED	
$D1^{+.000}_{-.002}$	$D2 (h6)$	$L2$	$L1$	TOOL #	PRICE	TOOL #	PRICE
1/8	1/8	1/4	1-1/2	TC62975	10.15	TC63000	12.60
	1/8	1/2	1-1/2	TC62808	15.15	TC62908	17.60
	1/8	3/4	2-1/4	TC63408	27.05	TC63508	29.85
3/16	3/16	3/8	2	TC62977	15.95	TC63002	18.75
	3/16	5/8	2	TC62812	21.55	TC62912	24.45
	3/16	3/4	2-1/2	TC63412	31.25	TC63512	34.35
1/4	1/4	1/2	2	TC62979	23.35	TC63004	26.80
	1/4	3/4	2-1/2	TC62816	30.40	TC62916	34.15
	1/4	1-1/4	3	TC63416	43.05	TC63516	46.80
5/16	5/16	1/2	2	TC62981	28.45	TC63006	32.60
	5/16	13/16	2-1/2	TC62820	36.00	TC62920	40.50
	5/16	1-3/8	3	TC63420	59.10	TC63520	63.70
3/8	3/8	5/8	2	TC62983	30.70	TC63008	35.55
	3/8	1	2-1/2	TC62824	37.65	TC62924	42.90
	3/8	1-1/2	4	TC63424	70.55	TC63524	76.30
1/2	1/2	5/8	2-1/2	TC62985	52.90	TC63010	59.95
	1/2	1-1/4	3	TC62832	60.50	TC62932	67.75
	1/2	2	4	TC63432	99.40	TC63532	107.20
$D1^{+.000}_{-.003}$	$D2 (h6)$	$L2$	$L1$	TOOL #	PRICE	TOOL #	PRICE
5/8	5/8	3/4	3	TC62987	112.85	TC63012	121.30
	5/8	1-5/8	3-1/2	TC62840	126.95	TC62940	136.05
	5/8	2-3/8	5	TC63440	222.10	TC63540	232.25
3/4	3/4	1	3	TC62989	171.80	TC63014	182.10
	3/4	1-3/4	4	TC62848	184.35	TC62948	195.35
	3/4	2-1/2	5	TC63448	240.20	TC63548	252.25
1	1	1-1/4	3-1/2	TC62991	290.85	TC63016	319.80
	1	1-3/4	4	TC62864	305.55	TC62964	321.60
	1	2-1/4	5	TC63464	377.65	TC63564	395.25

For technical information, see page 104

GENERAL PURPOSE END MILLS - CARBIDE - FOR ALUMINUM

3 Flute - Square - 45° Helix - Chipbreaker



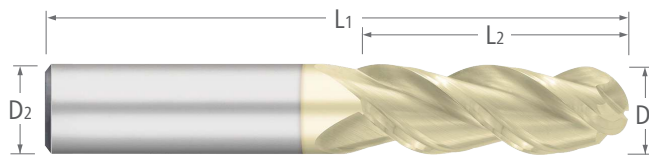
- Designed for roughing, high speed slotting, profiling, and certain finishing applications in aluminum and non-ferrous materials
- Chipbreaker geometry for optimal chip evacuation, reduced harmonics, and minimized tool pressure
- Additional flute has 50% more cutting performance than certain 2 flute applications
- Offered in stub, regular, and long length styles
- 45° helix for faster chip removal and a better finish
- Center cutting
- ZrN coating offers increased speed rates and prolonged tool life
- Solid carbide
- Precision manufactured in the USA

CUTTER DIA.	SHANK DIA.	LOC	OAL	UNCOATED		ZrN COATED	
$D_1^{+.000}_{-.002}$	$D_2 (h6)$	L_2	L_1	TOOL #	PRICE	TOOL #	PRICE
1/8	1/8	1/2	1-1/2	TC67207	17.75	TC67232	22.65
	1/8	3/4	2-1/4	TC67216	29.70	TC67241	34.85
3/16	3/16	5/8	2	TC67208	24.70	TC67233	30.15
	3/16	3/4	2-1/2	TC67217	34.40	TC67242	40.25
1/4	1/4	1/2	2	TC67200	26.70	TC67225	33.25
	1/4	3/4	2-1/2	TC67209	33.75	TC67234	40.75
	1/4	1-1/4	3	TC67218	46.40	TC67243	53.40
5/16	5/16	1/2	2	TC67201	31.90	TC67226	39.80
	5/16	13/16	2-1/2	TC67210	39.45	TC67235	47.85
	5/16	1-3/8	3	TC67219	62.55	TC67244	70.95
3/8	3/8	5/8	2	TC67202	34.90	TC67227	44.20
	3/8	1	2-1/2	TC67211	41.85	TC67236	51.75
	3/8	1-1/2	4	TC67220	74.75	TC67245	85.45
1/2	1/2	5/8	2-1/2	TC67203	57.30	TC67228	70.80
	1/2	1-1/4	3	TC67212	64.90	TC67237	78.40
	1/2	2	4	TC67221	104.65	TC67246	119.15
$D_1^{+.000}_{-.003}$	$D_2 (h6)$	L_2	L_1	TOOL #	PRICE	TOOL #	PRICE
5/8	5/8	3/4	3	TC67204	118.10	TC67229	133.80
	5/8	1-5/8	3-1/2	TC67213	132.20	TC67238	149.00
	5/8	2-3/8	5	TC67222	227.90	TC67247	245.95
3/4	3/4	1	3	TC67205	178.10	TC67230	196.80
	3/4	1-3/4	4	TC67214	190.65	TC67239	210.65
	3/4	2-1/2	5	TC67223	247.00	TC67248	268.60
1	1	1-1/4	3-1/2	TC67206	299.25	TC67231	328.20
	1	1-3/4	4	TC67215	313.95	TC67240	342.90
	1	2-1/4	5	TC67224	386.55	TC67249	417.70

For technical information, see page 104

GENERAL PURPOSE END MILLS - CARBIDE - FOR ALUMINUM

3 Flute - Ball - 45° Helix



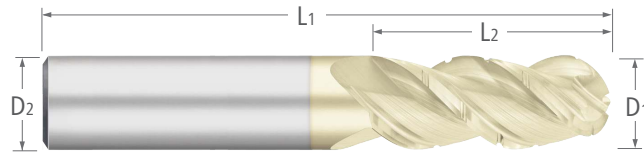
- Designed for high speed slotting and profiling in aluminum and non-ferrous materials
- Additional flute has 50% more cutting performance than certain 2 flute applications
- Offered in stub and regular length styles
- 45° helix for faster chip removal and a better finish
- Center cutting
- ZrN coating offers increased speed rates and prolonged tool life
- Solid carbide
- Precision manufactured in the USA

CUTTER DIA.	SHANK DIA.	LOC	OAL	UNCOATED		ZrN COATED	
$D1^{+.0001}_{-.002}$	$D2 (h6)$	$L2$	$L1$	TOOL #	PRICE	TOOL #	PRICE
1/8	1/8	1/2	1-1/2	TC63115	18.40	TC63145	23.25
	1/8	3/4	2-1/4	TC63130	33.00	TC63160	38.20
3/16	3/16	5/8	2	TC63116	25.85	TC63146	31.30
	3/16	3/4	2-1/2	TC63131	38.10	TC63161	43.95
1/4	1/4	3/4	2-1/2	TC63117	34.30	TC63147	41.30
	1/4	1-1/4	3	TC63132	48.80	TC63162	55.80
5/16	5/16	13/16	2-1/2	TC63118	40.80	TC63148	49.20
	5/16	1-3/8	3	TC63133	66.90	TC63163	75.30
3/8	3/8	1	2-1/2	TC63119	42.60	TC63149	52.50
	3/8	1-1/2	4	TC63134	79.05	TC63164	89.75
1/2	1/2	1-1/4	3	TC63120	68.40	TC63150	81.90
	1/2	2	4	TC63135	111.25	TC63165	125.75
$D1^{+.0001}_{-.003}$	$D2 (h6)$	$L2$	$L1$	TOOL #	PRICE	TOOL #	PRICE
5/8	5/8	1-5/8	3-1/2	TC63121	135.50	TC63151	152.30
	5/8	2-3/8	5	TC63136	237.80	TC63166	255.90
3/4	3/4	1-3/4	4	TC63122	196.60	TC63152	216.60
	3/4	2-1/2	5	TC63137	257.20	TC63167	278.75
1	1	1-3/4	4	TC63123	325.60	TC63153	354.55
	1	2-1/4	5	TC63138	404.45	TC63168	435.60

For technical information, see page 104

GENERAL PURPOSE END MILLS - CARBIDE - FOR ALUMINUM

3 Flute - Ball - 45° Helix - Chipbreaker



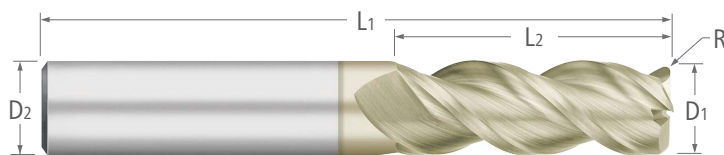
- Designed for roughing, high speed slotting, profiling, and certain finishing applications in aluminum and non-ferrous materials
- Additional flute has 50% more cutting performance than certain 2 flute applications
- Chipbreaker geometry for optimal chip evacuation, reduced harmonics, and minimized tool pressure
- Offered in stub and regular styles
- 45° helix for faster chip removal and a better finish
- Center cutting
- ZrN coating offers increased speed rates and prolonged tool life
- Solid carbide
- Precision manufactured in the USA

CUTTER DIA.	SHANK DIA.	LOC	OAL	UNCOATED		ZrN COATED	
$D1^{+.000}_{-.002}$	$D2 (h6)$	$L2$	$L1$	TOOL #	PRICE	TOOL #	PRICE
1/8	1/8	1/2	1-1/2	TC67452	21.00	TC67470	25.90
	1/8	3/4	2-1/4	TC67461	35.65	TC67479	40.80
3/16	3/16	5/8	2	TC67453	29.00	TC67471	34.45
	3/16	3/4	2-1/2	TC67462	41.25	TC67480	47.10
1/4	1/4	3/4	2-1/2	TC67454	37.65	TC67472	44.65
	1/4	1-1/4	3	TC67463	52.15	TC67481	59.15
5/16	5/16	13/16	2-1/2	TC67455	44.25	TC67473	52.65
	5/16	1-3/8	3	TC67464	70.35	TC67482	78.75
3/8	3/8	1	2-1/2	TC67456	46.80	TC67474	56.70
	3/8	1-1/2	4	TC67465	83.25	TC67483	93.95
1/2	1/2	1-1/4	3	TC67457	72.80	TC67475	86.30
	1/2	2	4	TC67466	116.50	TC67484	131.00
$D1^{+.000}_{-.003}$	$D2 (h6)$	$L2$	$L1$	TOOL #	PRICE	TOOL #	PRICE
5/8	5/8	1-5/8	3-1/2	TC67458	140.75	TC67476	157.55
	5/8	2-3/8	5	TC67467	243.60	TC67485	261.65
3/4	3/4	1-3/4	4	TC67459	202.90	TC67477	222.90
	3/4	2-1/2	5	TC67468	264.00	TC67486	285.60
1	1	1-3/4	4	TC67460	334.00	TC67478	362.95
	1	2-1/4	5	TC67469	413.40	TC67487	444.50

For technical information, see page 104

GENERAL PURPOSE END MILLS - CARBIDE - FOR ALUMINUM

3 Flute - Corner Radius - 45° Helix



- Designed for high speed slotting and profiling in aluminum and non-ferrous materials
- Additional flute has 50% more cutting performance than certain 2 flute applications
- Offered in stub, regular, and long length styles
- Corner radius for increased edge strength
- 45° helix for faster chip removal and a better finish
- Center cutting
- ZrN coating offers increased speed rates and prolonged tool life
- Solid carbide
- Precision manufactured in the USA

CUTTER DIA.	SHANK DIA.	RADIUS	LOC	OAL	UNCOATED		ZrN COATED	
$D1^{+.000}_{-.002}$	$D2 (h6)$	$R^{+.001}_{-.001}$	$L2$	$L1$	TOOL #	PRICE	TOOL #	PRICE
1/8	1/8	.010	1/4	1-1/2	TC63575	13.00	TC63600	15.55
	1/8	.010	1/2	1-1/2	TC65808	18.40	TC65908	21.00
	1/8	.010	3/4	2-1/4	TC66408	33.00	TC66508	35.70
	1/8	.015	1/4	1-1/2	TC65400	13.00	TC65481	17.85
	1/8	.015	1/2	1-1/2	TC65427	18.40	TC65508	23.25
	1/8	.015	3/4	2-1/4	TC65454	33.00	TC65535	38.20
	1/8	.020	1/4	1-1/2	TC65401	13.00	TC65482	17.85
	1/8	.020	1/2	1-1/2	TC65428	18.40	TC65509	23.25
	1/8	.020	3/4	2-1/4	TC65455	33.00	TC65536	38.20
	1/8	.030	1/4	1-1/2	TC65402	13.00	TC65483	17.85
	1/8	.030	1/2	1-1/2	TC65429	18.40	TC65510	23.25
	1/8	.030	3/4	2-1/4	TC65456	33.00	TC65537	38.20
3/16	3/16	.010	3/8	2	TC63577	19.65	TC63602	22.45
	3/16	.010	5/8	2	TC65812	25.85	TC65912	28.75
	3/16	.010	3/4	2-1/2	TC66412	38.10	TC66512	41.25
	3/16	.020	3/8	2	TC65403	19.65	TC65484	25.10
	3/16	.020	5/8	2	TC65430	25.85	TC65511	31.30
	3/16	.020	3/4	2-1/2	TC65457	38.10	TC65538	43.95
	3/16	.030	3/8	2	TC65404	19.65	TC65485	25.10
	3/16	.030	5/8	2	TC65431	25.85	TC65512	31.30
	3/16	.030	3/4	2-1/2	TC65458	38.10	TC65539	43.95
1/4	1/4	.015	1/2	2	TC65405	28.10	TC65486	34.65
	1/4	.015	3/4	2-1/2	TC65432	34.30	TC65513	41.30
	1/4	.015	1-1/4	3	TC65459	48.80	TC65540	55.80
	1/4	.020	1/2	2	TC63579	28.10	TC63604	31.60
	1/4	.020	3/4	2-1/2	TC65816	34.30	TC65916	38.05
	1/4	.020	1-1/4	3	TC66416	48.80	TC66516	52.50
	1/4	.030	1/2	2	TC65406	28.10	TC65487	34.65
	1/4	.030	3/4	2-1/2	TC65433	34.30	TC65514	41.30
	1/4	.030	1-1/4	3	TC65460	48.80	TC65541	55.80
	1/4	.060	1/2	2	TC65407	28.10	TC65488	34.65
	1/4	.060	3/4	2-1/2	TC65434	34.30	TC65515	41.30
	1/4	.060	1-1/4	3	TC65461	48.80	TC65542	55.80

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GENERAL PURPOSE END MILLS - CARBIDE - FOR ALUMINUM

3 Flute - Corner Radius - 45° Helix (Cont.)

continued from previous page

CUTTER DIA.	SHANK DIA.	RADIUS	LOC	OAL	UNCOATED		ZrN COATED	
$D1^{+.0001}_{-.0021}$	D2 (h6)	$R^{+.0011}_{-.0011}$	L2	L1	TOOL #	PRICE	TOOL #	PRICE
5/16	5/16	.020	1/2	2	TC63581	32.95	TC63606	40.85
	5/16	.020	13/16	2-1/2	TC65820	40.80	TC65920	45.20
	5/16	.020	1-3/8	3	TC66420	66.90	TC66520	71.45
	5/16	.030	1/2	2	TC65408	32.95	TC65489	40.85
	5/16	.030	13/16	2-1/2	TC65435	40.80	TC65516	49.20
	5/16	.030	1-3/8	3	TC65462	66.90	TC65543	75.30
	5/16	.060	1/2	2	TC65409	32.95	TC65490	40.85
	5/16	.060	13/16	2-1/2	TC65436	40.80	TC65517	49.20
	5/16	.060	1-3/8	3	TC65463	66.90	TC65544	75.30
3/8	3/8	.015	5/8	2	TC65410	34.80	TC65491	44.10
	3/8	.015	1	2-1/2	TC65437	42.60	TC65518	52.50
	3/8	.015	1-1/2	4	TC65464	79.05	TC65545	89.75
	3/8	.020	5/8	2	TC63583	34.80	TC63608	39.65
	3/8	.020	1	2-1/2	TC65824	42.60	TC65924	47.85
	3/8	.020	1-1/2	4	TC66424	79.05	TC66524	84.80
	3/8	.030	5/8	2	TC65411	34.80	TC65492	44.10
	3/8	.030	1	2-1/2	TC65438	42.60	TC65519	52.50
	3/8	.030	1-1/2	4	TC65465	79.05	TC65546	89.75
	3/8	.060	5/8	2	TC65412	34.80	TC65493	44.10
	3/8	.060	1	2-1/2	TC65439	42.60	TC65520	52.50
	3/8	.060	1-1/2	4	TC65466	79.05	TC65547	89.75
1/2	1/2	.015	5/8	2-1/2	TC65413	56.75	TC65494	70.25
	1/2	.015	1-1/4	3	TC65440	68.40	TC65521	81.90
	1/2	.015	2	4	TC65467	111.25	TC65548	125.75
	1/2	.020	5/8	2-1/2	TC65414	56.75	TC65495	70.25
	1/2	.020	1-1/4	3	TC65441	68.40	TC65522	81.90
	1/2	.020	2	4	TC65468	111.25	TC65549	125.75
	1/2	.030	5/8	2-1/2	TC65415	56.75	TC65496	70.25
	1/2	.030	1-1/4	3	TC65442	68.40	TC65523	81.90
	1/2	.030	2	4	TC65469	111.25	TC65550	125.75
	1/2	.040	5/8	2-1/2	TC63585	56.75	TC63610	63.90
	1/2	.040	1-1/4	3	TC65832	68.40	TC65932	75.60
	1/2	.040	2	4	TC66432	111.25	TC66532	119.15
	1/2	.060	5/8	2-1/2	TC65416	56.75	TC65497	70.25
	1/2	.060	1-1/4	3	TC65443	68.40	TC65524	81.90
	1/2	.060	2	4	TC65470	111.25	TC65551	125.75
	1/2	.125	5/8	2-1/2	TC65417	56.75	TC65498	70.25
	1/2	.125	1-1/4	3	TC65444	68.40	TC65525	81.90
	1/2	.125	2	4	TC65471	111.25	TC65552	125.75

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GENERAL PURPOSE END MILLS - CARBIDE - FOR ALUMINUM

3 Flute - Corner Radius - 45° Helix (Cont.)

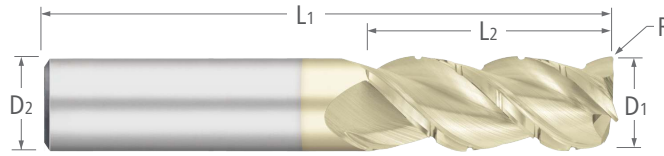
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CUTTER DIA.	SHANK DIA.	RADIUS	LOC	OAL	UNCOATED		ZrN COATED	
D ₁ ^{+0.000"} _{-0.003"}	D ₂ (h6)	R ^{+0.001"} _{-0.001"}	L ₂	L ₁	TOOL #	PRICE	TOOL #	PRICE
5/8	5/8	.015	3/4	3	TC65418	118.65	TC65499	134.35
	5/8	.015	1-5/8	3-1/2	TC65445	136.10	TC65526	152.90
	5/8	.015	2-3/8	5	TC65472	237.80	TC65553	255.90
	5/8	.040	3/4	3	TC63587	118.65	TC63612	134.35
	5/8	.040	1-5/8	3-1/2	TC65840	136.10	TC65940	145.25
	5/8	.040	2-3/8	5	TC66440	237.80	TC66540	248.05
	5/8	.060	3/4	3	TC65419	118.65	TC65500	134.35
	5/8	.060	1-5/8	3-1/2	TC65446	136.10	TC65527	152.90
	5/8	.060	2-3/8	5	TC65473	237.80	TC65554	255.90
3/4	3/4	.015	1	3	TC65420	177.80	TC65501	196.50
	3/4	.015	1-3/4	4	TC65447	196.60	TC65528	216.60
	3/4	.015	2-1/2	5	TC65474	257.20	TC65555	278.75
	3/4	.030	1	3	TC65421	177.80	TC65502	196.50
	3/4	.030	1-3/4	4	TC65448	196.60	TC65529	216.60
	3/4	.030	2-1/2	5	TC65475	257.20	TC65556	278.75
	3/4	.040	1	3	TC63589	177.80	TC63614	196.50
	3/4	.040	1-3/4	4	TC65848	196.60	TC65948	207.65
	3/4	.040	2-1/2	5	TC66448	257.20	TC66548	269.35
	3/4	.060	1	3	TC65422	177.80	TC65503	196.50
	3/4	.060	1-3/4	4	TC65449	196.60	TC65530	216.60
	3/4	.060	2-1/2	5	TC65476	257.20	TC65557	278.75
	3/4	.125	1	3	TC65423	177.80	TC65504	196.50
	3/4	.125	1-3/4	4	TC65450	196.60	TC65531	216.60
	3/4	.125	2-1/2	5	TC65477	257.20	TC65558	278.75
1	1	.030	1-1/4	3-1/2	TC65424	298.45	TC65505	327.40
	1	.030	1-3/4	4	TC65451	325.60	TC65532	354.55
	1	.030	2-1/4	5	TC65478	404.45	TC65559	435.60
	1	.040	1-1/4	3-1/2	TC63591	298.45	TC63616	327.40
	1	.040	1-3/4	4	TC65864	325.60	TC65964	354.55
	1	.040	2-1/4	5	TC66464	404.45	TC66564	435.60
	1	.060	1-1/4	3-1/2	TC65425	298.45	TC65506	327.40
	1	.060	1-3/4	4	TC65452	325.60	TC65533	354.55
	1	.060	2-1/4	5	TC65479	404.45	TC65560	435.60
	1	.125	1-1/4	3-1/2	TC65426	298.45	TC65507	327.40
	1	.125	1-3/4	4	TC65453	325.60	TC65534	354.55
	1	.125	2-1/4	5	TC65480	404.45	TC65561	435.60

For technical information, see page 104

GENERAL PURPOSE END MILLS - CARBIDE - FOR ALUMINUM

3 Flute - Corner Radius - 45° Helix - Chipbreaker



- Designed for roughing, high speed slotting, profiling, and certain finishing applications in aluminum and non-ferrous materials
- Chipbreaker geometry for optimal chip evacuation, reduced harmonics, and minimized tool pressure
- Additional flute has 50% more cutting performance than certain 2 flute applications
- Offered in stub, regular, and long length styles
- Corner radius for increased edge strength
- 45° helix for faster chip removal and a better finish
- ZrN coating offers increased speed rates and prolonged tool life
- Solid carbide
- Precision manufactured in the USA

CUTTER DIA.	SHANK DIA.	RADIUS	LOC	OAL	UNCOATED		ZrN COATED	
$D_1^{+.0001}_{-.0021}$	D2 (h6)	$R^{+.0011}_{-.0011}$	L2	L1	TOOL #	PRICE	TOOL #	PRICE
1/8	1/8	.010	1/2	1-1/2	TC67279	21.00	TC67380	25.90
	1/8	.010	3/4	2-1/4	TC67315	35.65	TC67416	40.80
	1/8	.015	1/2	1-1/2	TC67280	21.00	TC67381	25.90
	1/8	.015	3/4	2-1/4	TC67316	35.65	TC67417	40.80
	1/8	.020	1/2	1-1/2	TC67281	21.00	TC67382	25.90
	1/8	.020	3/4	2-1/4	TC67317	35.65	TC67418	40.80
	1/8	.030	1/2	1-1/2	TC67282	21.00	TC67383	25.90
	1/8	.030	3/4	2-1/4	TC67318	35.65	TC67419	40.80
3/16	3/16	.010	5/8	2	TC67283	29.00	TC67384	34.45
	3/16	.010	3/4	2-1/2	TC67319	41.25	TC67420	47.10
	3/16	.020	5/8	2	TC67284	29.00	TC67385	34.45
	3/16	.020	3/4	2-1/2	TC67320	41.25	TC67421	47.10
	3/16	.030	5/8	2	TC67285	29.00	TC67386	34.45
	3/16	.030	3/4	2-1/2	TC67321	41.25	TC67422	47.10
1/4	1/4	.015	1/2	2	TC67250	31.45	TC67351	38.00
	1/4	.015	3/4	2-1/2	TC67286	37.65	TC67387	44.65
	1/4	.015	1-1/4	3	TC67322	52.15	TC67423	59.15
	1/4	.020	1/2	2	TC67251	31.45	TC67352	38.00
	1/4	.020	3/4	2-1/2	TC67287	37.65	TC67388	44.65
	1/4	.020	1-1/4	3	TC67323	52.15	TC67424	59.15
	1/4	.030	1/2	2	TC67252	31.45	TC67353	38.00
	1/4	.030	3/4	2-1/2	TC67288	37.65	TC67389	44.65
	1/4	.030	1-1/4	3	TC67324	52.15	TC67425	59.15
	1/4	.060	1/2	2	TC67253	31.45	TC67354	38.00
	1/4	.060	3/4	2-1/2	TC67289	37.65	TC67390	44.65
	1/4	.060	1-1/4	3	TC67325	52.15	TC67426	59.15

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GENERAL PURPOSE END MILLS - CARBIDE - FOR ALUMINUM

3 Flute - Corner Radius - 45° Helix - Chipbreaker (Cont.)

continued from previous page

CUTTER DIA.	SHANK DIA.	RADIUS	LOC	OAL	UNCOATED		ZrN COATED	
D1 ^{+0.000"} -0.002"	D2 (h6)	R ^{+0.001"} -0.001"	L2	L1	TOOL #	PRICE	TOOL #	PRICE
5/16	5/16	.020	1/2	2	TC67254	36.40	TC67355	44.30
	5/16	.020	13/16	2-1/2	TC67290	44.25	TC67391	52.65
	5/16	.020	1-3/8	3	TC67326	70.35	TC67427	78.75
	5/16	.030	1/2	2	TC67255	36.40	TC67356	44.30
	5/16	.030	13/16	2-1/2	TC67291	44.25	TC67392	52.65
	5/16	.030	1-3/8	3	TC67327	70.35	TC67428	78.75
	5/16	.060	1/2	2	TC67256	36.40	TC67357	44.30
	5/16	.060	13/16	2-1/2	TC67292	44.25	TC67393	52.65
	5/16	.060	1-3/8	3	TC67328	70.35	TC67429	78.75
3/8	3/8	.015	5/8	2	TC67257	39.00	TC67358	48.30
	3/8	.015	1	2-1/2	TC67293	46.80	TC67394	56.70
	3/8	.015	1-1/2	4	TC67329	83.25	TC67430	93.95
	3/8	.020	5/8	2	TC67258	39.00	TC67359	48.30
	3/8	.020	1	2-1/2	TC67294	46.80	TC67395	56.70
	3/8	.020	1-1/2	4	TC67330	83.25	TC67431	93.95
	3/8	.030	5/8	2	TC67259	39.00	TC67360	48.30
	3/8	.030	1	2-1/2	TC67295	46.80	TC67396	56.70
	3/8	.030	1-1/2	4	TC67331	83.25	TC67432	93.95
	3/8	.060	5/8	2	TC67260	39.00	TC67361	48.30
	3/8	.060	1	2-1/2	TC67296	46.80	TC67397	56.70
	3/8	.060	1-1/2	4	TC67332	83.25	TC67433	93.95
1/2	1/2	.015	5/8	2-1/2	TC67261	61.15	TC67362	74.65
	1/2	.015	1-1/4	3	TC67297	72.80	TC67398	86.30
	1/2	.015	2	4	TC67333	116.50	TC67434	131.00
	1/2	.020	5/8	2-1/2	TC67262	61.15	TC67363	74.65
	1/2	.020	1-1/4	3	TC67298	72.80	TC67399	86.30
	1/2	.020	2	4	TC67334	116.50	TC67435	131.00
	1/2	.030	5/8	2-1/2	TC67263	61.15	TC67364	74.65
	1/2	.030	1-1/4	3	TC67299	72.80	TC67400	86.30
	1/2	.030	2	4	TC67335	116.50	TC67436	131.00
	1/2	.040	5/8	2-1/2	TC67264	61.15	TC67365	74.65
	1/2	.040	1-1/4	3	TC67300	72.80	TC67401	86.30
	1/2	.040	2	4	TC67336	116.50	TC67437	131.00
	1/2	.060	5/8	2-1/2	TC67265	61.15	TC67366	74.65
	1/2	.060	1-1/4	3	TC67301	72.80	TC67402	86.30
	1/2	.060	2	4	TC67337	116.50	TC67438	131.00
	1/2	.125	5/8	2-1/2	TC67266	61.15	TC67367	74.65
	1/2	.125	1-1/4	3	TC67302	72.80	TC67403	86.30
	1/2	.125	2	4	TC67338	116.50	TC67439	131.00

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GENERAL PURPOSE END MILLS - CARBIDE - FOR ALUMINUM

3 Flute - Corner Radius - 45° Helix - Chipbreaker (Cont.)

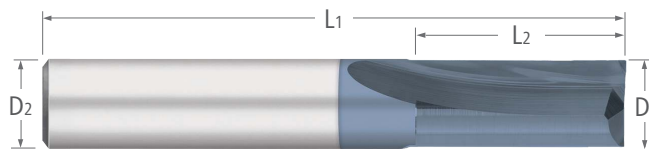
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CUTTER DIA.	SHANK DIA.	RADIUS	LOC	OAL	UNCOATED		ZrN COATED	
D1 $^{+.000"}_{-.003"}$	D2 (h6)	R $^{+.001"}_{-.001"}$	L2	L1	TOOL #	PRICE	TOOL #	PRICE
5/8	5/8	.015	3/4	3	TC67267	123.90	TC67368	139.60
	5/8	.015	1-5/8	3-1/2	TC67303	141.35	TC67404	158.15
	5/8	.015	2-3/8	5	TC67339	243.60	TC67440	261.65
	5/8	.040	3/4	3	TC67268	123.90	TC67369	139.60
	5/8	.040	1-5/8	3-1/2	TC67304	141.35	TC67405	158.15
	5/8	.040	2-3/8	5	TC67340	243.60	TC67441	261.65
	5/8	.060	3/4	3	TC67269	123.90	TC67370	139.60
	5/8	.060	1-5/8	3-1/2	TC67305	141.35	TC67406	158.15
	5/8	.060	2-3/8	5	TC67341	243.60	TC67442	261.65
3/4	3/4	.015	1	3	TC67270	184.10	TC67371	202.80
	3/4	.015	1-3/4	4	TC67306	202.90	TC67407	222.90
	3/4	.015	2-1/2	5	TC67342	264.00	TC67443	285.60
	3/4	.030	1	3	TC67271	184.10	TC67372	202.80
	3/4	.030	1-3/4	4	TC67307	202.90	TC67408	222.90
	3/4	.030	2-1/2	5	TC67343	264.00	TC67444	285.60
	3/4	.040	1	3	TC67272	184.10	TC67373	202.80
	3/4	.040	1-3/4	4	TC67308	202.90	TC67409	222.90
	3/4	.040	2-1/2	5	TC67344	264.00	TC67445	285.60
	3/4	.060	1	3	TC67273	184.10	TC67374	202.80
	3/4	.060	1-3/4	4	TC67309	202.90	TC67410	222.90
	3/4	.060	2-1/2	5	TC67345	264.00	TC67446	285.60
	3/4	.125	1	3	TC67274	184.10	TC67375	202.80
	3/4	.125	1-3/4	4	TC67310	202.90	TC67411	222.90
	3/4	.125	2-1/2	5	TC67346	264.00	TC67447	285.60
1	1	.030	1-1/4	3-1/2	TC67275	306.85	TC67376	335.80
	1	.030	1-3/4	4	TC67311	334.00	TC67412	362.95
	1	.030	2-1/4	5	TC67347	413.40	TC67448	444.50
	1	.040	1-1/4	3-1/2	TC67276	306.85	TC67377	335.80
	1	.040	1-3/4	4	TC67312	334.00	TC67413	362.95
	1	.040	2-1/4	5	TC67348	413.40	TC67449	444.50
	1	.060	1-1/4	3-1/2	TC67277	306.85	TC67378	335.80
	1	.060	1-3/4	4	TC67313	334.00	TC67414	362.95
	1	.060	2-1/4	5	TC67349	413.40	TC67450	444.50
	1	.125	1-1/4	3-1/2	TC67278	306.85	TC67379	335.80
	1	.125	1-3/4	4	TC67314	334.00	TC67415	362.95
	1	.125	2-1/4	5	TC67350	413.40	TC67451	444.50

For technical information, see page 104

GENERAL PURPOSE END MILLS - CARBIDE

2 Flute - Square - Straight Flute



- Straight flute design for cutting high Rc materials
- Offered in regular length styles
- AlTiN coating offers increased wear and heat resistance
- Solid carbide
- Precision manufactured in the USA

CUTTER DIA.	SHANK DIA.	LOC	OAL	UNCOATED		AlTiN COATED	
$D_1^{+.0001}_{-.0021}$	D2 (h6)	L2	L1	TOOL #	PRICE	TOOL #	PRICE
1/8	1/8	1/2	1-1/2	TC30700	9.50	TC30710	13.90
3/16	3/16	5/8	2	TC30701	13.05	TC30711	18.00
1/4	1/4	3/4	2-1/2	TC30702	15.95	TC30712	22.30
5/16	5/16	13/16	2-1/2	TC30703	20.90	TC30713	28.50
3/8	3/8	1	2-1/2	TC30704	24.80	TC30714	33.85
7/16	7/16	1	2-3/4	TC30705	38.10	TC30715	48.65
1/2	1/2	1-1/4	3	TC30706	46.00	TC30716	58.30
$D_1^{+.0001}_{-.0031}$	D2 (h6)	L2	L1	TOOL #	PRICE	TOOL #	PRICE
5/8	5/8	1-1/4	3-1/2	TC30707	87.90	TC30717	103.15
3/4	3/4	1-1/2	4	TC30708	122.90	TC30718	141.10
1	1	1-1/2	4	TC30709	206.90	TC30719	233.20

End Mills

Roughers

For Aluminum

Carbide

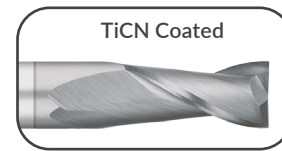
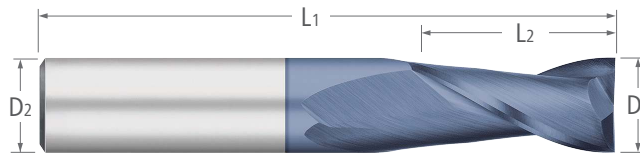
Cobalt

**Explore Solutions to Common Milling Issues with
Milling Trouble Shooting Guide**

titancuttingtools.com/resources

GENERAL PURPOSE END MILLS - CARBIDE

2 Flute - Square - 30° Helix



- Offered in stub, regular, long, and extra long length styles
- TiCN coating adds enhanced performance when AlTiN cannot be used
- AlTiN coating offers increased wear and heat resistance
- Solid carbide
- Precision manufactured in the USA

CUTTER DIA.	SHANK DIA.	LOC	OAL	UNCOATED		TiCN COATED		AlTiN COATED	
$D1_{+0.000}^{-0.001}$ "	$D2_{(h6)}$	$L2$	$L1$	TOOL #	PRICE	TOOL #	PRICE	TOOL #	PRICE
1/64	1/8	.023	1-1/2	TC10201	16.20	TC91271	19.75	TC11201	20.60
	1/8	1/32	1-1/2	TC10001	17.10	TC90001	20.65	TC10101	21.80
1/32	1/8	1/16	1-1/2	TC10202	9.95	TC91272	13.10	TC11202	13.10
	1/8	1/8	1-1/2	TC10002	11.40	TC90002	14.95	TC10102	15.55
3/64	1/8	3/32	1-1/2	TC10203	9.95	TC91273	13.50	TC11203	12.80
	1/8	1/8	1-1/2	TC10003	9.75	TC90003	13.30	TC10103	13.30
1/16	1/8	1/8	1-1/2	TC10204	7.55	TC91274	11.10	TC11204	9.85
	1/8	1/4	1-1/2	TC10004	9.80	TC90004	11.30	TC10104	11.30
5/64	1/8	1/8	1-1/2	TC10205	12.70	TC91275	16.25	TC11205	15.95
	1/8	1/4	1-1/2	TC10005	10.10	TC90005	13.65	TC10105	13.70
3/32	1/8	3/16	1-1/2	TC10206	7.55	TC91276	11.10	TC11206	9.85
	1/8	3/8	1-1/2	TC10006	8.95	TC90006	11.30	TC10106	11.30
7/64	1/8	3/8	1-1/2	TC10007	9.30	TC90007	12.55	TC10107	12.55

$D1_{+0.000}^{-0.002}$ "	$D2_{(h6)}$	$L2$	$L1$	TOOL #	PRICE	TOOL #	PRICE	TOOL #	PRICE
1/8	1/8	1/4	1-1/2	TC10208	7.25	TC91278	9.40	TC11208	9.40
	1/8	1/2	1-1/2	TC10008	8.45	TC90008	10.50	TC10108	10.50
	1/8	3/4	2-1/4	TC15008	13.75	TC95008	17.55	TC15108	17.85
	1/8	1	3	TC17008	15.40	TC97008	19.75	TC17108	20.10
9/64	3/16	9/16	2	TC10009	12.35	TC90009	16.30	TC10109	17.00
5/32	3/16	5/16	2	TC10210	11.85	TC91280	15.80	TC11210	14.80
	3/16	9/16	2	TC10010	12.60	TC90010	14.60	TC10110	14.60
11/64	3/16	5/8	2	TC10011	11.95	TC90011	15.90	TC10111	16.25
3/16	3/16	3/8	2	TC10212	11.15	TC91282	14.00	TC11212	13.70
	3/16	5/8	2	TC10012	11.65	TC90012	14.60	TC10112	14.60
	3/16	3/4	2-1/2	TC15012	17.30	TC95012	20.90	TC15112	20.90
	3/16	1-1/8	3	TC17012	16.75	TC97012	21.00	TC17112	21.55
13/64	1/4	5/8	2-1/2	TC10013	16.95	TC90013	21.55	TC10113	22.35
7/32	1/4	7/16	2	TC10214	15.00	TC91284	19.75	TC11214	18.05
	1/4	5/8	2-1/2	TC10014	17.25	TC90014	20.25	TC10114	20.25
15/64	1/4	3/4	2-1/2	TC10015	19.55	TC90015	24.60	TC10115	25.35
1/4	1/4	1/2	2	TC10216	13.15	TC91286	16.45	TC11216	16.45
	1/4	3/4	2-1/2	TC10016	14.25	TC90016	19.30	TC10116	20.25
	1/4	1	4	TC15017	24.30	TC95017	29.80	TC15117	31.10
	1/4	1-1/8	3	TC15016	23.05	TC95016	28.10	TC15116	29.40
	1/4	1-1/2	4	TC17016	25.10	TC97016	30.65	TC17116	31.90
	1/4	1-1/2	6	TC17017	32.05	TC97017	38.35	TC17117	39.95

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For technical information, see page 103

GENERAL PURPOSE END MILLS - CARBIDE

2 Flute - Square - 30° Helix (Cont.)

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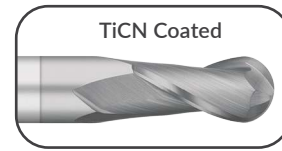
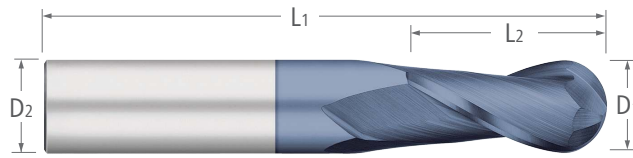
CUTTER DIA.	SHANK DIA.	LOC	OAL	UNCOATED		TiCN COATED		AlTiN COATED	
D ₁ ^{+0.000} _{-0.002} "	D ₂ (h6)	L ₂	L ₁	TOOL #	PRICE	TOOL #	PRICE	TOOL #	PRICE
17/64	5/16	3/4	2-1/2	TC10017	25.70	TC90017	31.75	TC10117	33.30
9/32	5/16	3/4	2-1/2	TC10018	25.70	TC90018	31.75	TC10118	33.30
19/64	5/16	13/16	2-1/2	TC10019	25.70	TC90019	31.75	TC10119	33.30
5/16	5/16	1/2	2	TC10220	17.70	TC91288	23.45	TC11220	23.30
	5/16	13/16	2-1/2	TC10020	18.70	TC90020	24.20	TC10120	24.20
	5/16	1-1/8	3	TC15020	26.20	TC95020	32.25	TC15120	33.80
	5/16	1-5/8	4	TC17020	32.15	TC97020	39.50	TC17120	40.30
21/64	3/8	1	2-1/2	TC10021	29.00	TC90021	36.20	TC10121	37.50
11/32	3/8	1	2-1/2	TC10022	29.00	TC90022	36.20	TC10122	37.50
23/64	3/8	1	2-1/2	TC10023	29.00	TC90023	36.20	TC10123	37.50
3/8	3/8	5/8	2	TC10224	23.05	TC91290	28.65	TC11224	28.65
	3/8	1	2-1/2	TC10024	22.20	TC90024	27.70	TC10124	27.70
	3/8	1	4	TC15025	35.00	TC95025	42.75	TC15125	44.70
	3/8	1-1/8	3	TC15024	30.00	TC95024	38.35	TC15124	39.05
	3/8	1-1/2	6	TC17025	55.50	TC97025	64.60	TC17125	67.85
	3/8	1-3/4	4	TC17024	36.65	TC97024	44.55	TC17124	46.35
25/64	7/16	1	2-3/4	TC10025	38.00	TC90025	46.45	TC10125	48.55
13/32	7/16	1	2-3/4	TC10026	38.00	TC90026	46.45	TC10126	48.55
27/64	7/16	1	2-3/4	TC10027	39.15	TC90027	47.60	TC10127	49.70
7/16	7/16	5/8	2-1/2	TC10228	28.70	TC91292	37.15	TC11228	35.80
	7/16	1	2-3/4	TC10028	34.05	TC90028	42.50	TC10128	42.30
	7/16	2	4	TC15028	47.30	TC95028	56.30	TC15128	58.55
	7/16	3	6	TC17028	74.80	TC97028	85.30	TC17128	90.95
29/64	1/2	1	3	TC10029	56.40	TC90029	66.20	TC10129	68.70
15/32	1/2	1	3	TC10030	56.40	TC90030	66.20	TC10130	68.70
31/64	1/2	1	3	TC10031	56.40	TC90031	66.20	TC10131	68.70
1/2	1/2	5/8	2-1/2	TC10232	36.30	TC91294	46.10	TC11232	45.40
	1/2	1	3	TC10032	41.00	TC90032	49.75	TC10132	51.50
	1/2	1	4	TC15032	52.60	TC95032	64.25	TC15132	65.80
	1/2	1-1/2	6	TC17032	84.10	TC97032	96.35	TC17132	99.45
	1/2	2	4	TC15033	55.70	TC95033	67.85	TC15133	68.90
	1/2	3	6	TC17033	88.65	TC97033	103.45	TC17133	104.00

D ₁ ^{+0.000} _{-0.003} "	D ₂ (h6)	L ₂	L ₁	TOOL #	PRICE	TOOL #	PRICE	TOOL #	PRICE
9/16	9/16	1-1/4	3-1/2	TC10036	77.20	TC90036	89.45	TC10136	97.20
5/8	5/8	3/4	3	TC10240	76.75	TC91296	88.15	TC11240	91.05
	5/8	1-1/4	3-1/2	TC10040	78.50	TC90040	94.90	TC10140	94.90
	5/8	2-1/4	5	TC15040	120.50	TC95040	133.65	TC15140	142.05
	5/8	3	6	TC17040	130.00	TC97040	144.25	TC17140	147.75
3/4	3/4	1	3	TC10248	107.00	TC91298	120.55	TC11248	124.00
	3/4	1-1/2	4	TC10048	109.70	TC90048	134.65	TC10148	134.65
	3/4	2-1/4	5	TC15048	166.40	TC95048	204.60	TC15148	204.60
	3/4	3	6	TC17048	194.10	TC97048	226.20	TC17148	226.20
7/8	7/8	1-1/2	4	TC10056	201.65	TC90056	242.05	TC10156	242.05
	7/8	2-1/4	5	TC15056	315.35	TC95056	334.25	TC15156	339.00
	7/8	3	6	TC17056	345.65	TC97056	366.10	TC17156	371.25
1	1	1-1/4	3-1/2	TC10264	177.10	TC91299	198.15	TC11264	203.40
	1	1-1/2	4	TC10064	184.70	TC90064	225.15	TC10164	225.15
	1	2-1/4	5	TC15064	227.85	TC95064	250.50	TC15164	256.20
	1	3	6	TC17064	328.00	TC97064	352.55	TC17164	358.65

For technical information, see page 103

GENERAL PURPOSE END MILLS - CARBIDE

2 Flute - Ball - 30° Helix



- Offered in stub, regular, long, and extra long length styles
- TiCN coating adds enhanced performance when AlTiN cannot be used
- AlTiN coating offers increased wear and heat resistance
- Solid carbide
- Precision manufactured in the USA

CUTTER DIA.	SHANK DIA.	LOC	OAL	UNCOATED		TiCN COATED		AlTiN COATED	
D1 ^{+0.000"} -0.001"	D2 (h6)	L2	L1	TOOL #	PRICE	TOOL #	PRICE	TOOL #	PRICE
1/64	1/8	.023	1-1/2	TC10301	20.35	TC91301	23.90	TC11301	24.75
	1/8	1/32	1-1/2	TC11001	19.15	TC91001	22.70	TC11101	23.55
1/32	1/8	1/16	1-1/2	TC10302	13.00	TC91302	16.55	TC11302	16.75
	1/8	1/8	1-1/2	TC11002	12.25	TC91002	15.80	TC11102	16.05
3/64	1/8	3/32	1-1/2	TC10303	13.00	TC91303	16.55	TC11303	16.75
	1/8	1/8	1-1/2	TC11003	12.25	TC91003	15.80	TC11103	16.05
1/16	1/8	1/8	1-1/2	TC10304	9.75	TC91304	12.60	TC11304	12.60
	1/8	1/4	1-1/2	TC11004	11.40	TC91004	14.95	TC11104	15.40
5/64	1/8	1/8	1-1/2	TC10305	15.75	TC91305	19.30	TC11305	19.95
	1/8	1/4	1-1/2	TC11005	11.40	TC91005	14.95	TC11105	15.40
3/32	1/8	3/16	1-1/2	TC10306	9.75	TC91306	13.30	TC11306	12.60
	1/8	3/8	1-1/2	TC11006	11.95	TC91006	15.50	TC11106	16.35
7/64	1/8	3/8	1-1/2	TC11007	11.95	TC91007	15.50	TC11107	16.35

D1 ^{+0.000"} -0.002"	D2 (h6)	L2	L1	TOOL #	PRICE	TOOL #	PRICE	TOOL #	PRICE
1/8	1/8	1/4	1-1/2	TC10308	9.25	TC91308	11.95	TC11308	11.95
	1/8	1/2	1-1/2	TC11008	11.00	TC91008	14.55	TC11108	14.90
	1/8	3/4	2-1/4	TC16008	16.25	TC96008	20.00	TC16108	20.95
	1/8	1	3	TC18008	18.40	TC98008	23.45	TC18108	23.10
9/64	3/16	9/16	2	TC11009	15.90	TC91009	19.85	TC11109	20.85
5/32	3/16	5/16	2	TC10310	15.40	TC91310	19.35	TC11310	19.95
	3/16	9/16	2	TC11010	15.90	TC91010	19.85	TC11110	20.85
11/64	3/16	5/8	2	TC11011	15.90	TC91011	19.85	TC11111	20.85
3/16	3/16	3/8	2	TC10312	14.50	TC91312	18.45	TC11312	18.65
	3/16	5/8	2	TC11012	14.30	TC91012	18.25	TC11112	19.25
	3/16	3/4	2-1/2	TC16012	18.85	TC96012	23.10	TC16112	24.15
	3/16	1-1/8	3	TC18012	21.95	TC98012	26.20	TC18112	26.00
13/64	1/4	5/8	2-1/2	TC11013	20.90	TC91013	25.95	TC11113	27.25
7/32	1/4	7/16	2	TC10314	19.55	TC91314	24.30	TC11314	25.10
	1/4	5/8	2-1/2	TC11014	20.90	TC91014	25.95	TC11114	26.65
15/64	1/4	3/4	2-1/2	TC11015	20.90	TC91015	25.95	TC11115	27.25
1/4	1/4	1/2	2	TC10316	18.60	TC91316	23.35	TC11316	23.35
	1/4	3/4	2-1/2	TC11016	20.35	TC91016	24.55	TC11116	25.35
	1/4	1	4	TC16017	29.10	TC96017	34.50	TC16117	35.90
	1/4	1-1/8	3	TC16016	26.40	TC96016	31.45	TC16116	32.75
	1/4	1-1/2	4	TC18016	32.10	TC98016	36.10	TC18116	36.10
	1/4	1-1/2	6	TC18017	37.90	TC98017	43.30	TC18117	44.80
17/64	5/16	3/4	2-1/2	TC11017	26.40	TC91017	32.45	TC11117	34.00

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For technical information, see page 103

GENERAL PURPOSE END MILLS - CARBIDE

2 Flute - Ball - 30° Helix (Cont.)

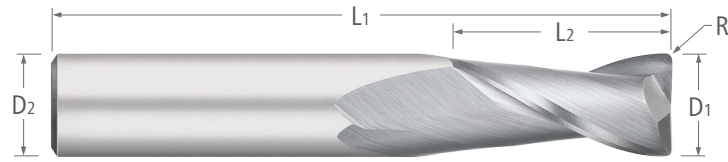
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CUTTER DIA.	SHANK DIA.	LOC	OAL	UNCOATED		TiCN COATED		AlTiN COATED	
D ₁ ^{+0.000} _{-0.002} "	D ₂ (h6)	L ₂	L ₁	TOOL #	PRICE	TOOL #	PRICE	TOOL #	PRICE
9/32	5/16	3/4	2-1/2	TC11018	26.45	TC91018	32.50	TC11118	34.05
19/64	5/16	13/16	2-1/2	TC11019	28.70	TC91019	34.75	TC11119	35.75
5/16	5/16	1/2	2	TC10320	23.05	TC91320	28.80	TC11320	29.75
	5/16	13/16	2-1/2	TC11020	24.35	TC91020	30.40	TC11120	31.55
	5/16	1-1/8	3	TC16020	31.00	TC96020	39.95	TC16120	38.60
	5/16	1-5/8	4	TC18020	38.75	TC98020	45.25	TC18120	46.90
21/64	3/8	1	2-1/2	TC11021	33.35	TC91021	40.55	TC11121	42.40
11/32	3/8	1	2-1/2	TC11022	35.05	TC91022	42.25	TC11122	44.10
23/64	3/8	1	2-1/2	TC11023	33.35	TC91023	40.55	TC11123	42.40
3/8	3/8	5/8	2	TC10324	29.80	TC91324	36.60	TC11324	36.60
	3/8	1	2-1/2	TC11024	26.20	TC91024	33.40	TC11124	35.25
	3/8	1	4	TC16025	43.90	TC96025	51.65	TC16125	53.60
	3/8	1-1/8	3	TC16024	36.05	TC96024	46.05	TC16124	45.10
	3/8	1-1/2	6	TC18025	59.10	TC98025	68.20	TC18125	68.90
	3/8	1-3/4	4	TC18024	41.75	TC98024	49.50	TC18124	51.45
25/64	7/16	1	2-3/4	TC11025	45.30	TC91025	53.75	TC11125	55.85
13/32	7/16	1	2-3/4	TC11026	45.50	TC91026	53.95	TC11126	56.05
27/64	7/16	1	2-3/4	TC11027	45.30	TC91027	53.75	TC11127	55.85
7/16	7/16	5/8	2-1/2	TC10328	37.35	TC91328	45.80	TC11328	45.80
	7/16	1	2-3/4	TC11028	38.50	TC91028	46.95	TC11128	49.05
	7/16	2	4	TC16028	59.95	TC96028	68.95	TC16128	71.20
	7/16	3	6	TC18028	88.30	TC98028	98.80	TC18128	101.40
29/64	1/2	1	3	TC11029	59.65	TC91029	69.45	TC11129	71.95
15/32	1/2	1	3	TC11030	59.65	TC91030	69.45	TC11130	71.95
31/64	1/2	1	3	TC11031	59.65	TC91031	69.45	TC11131	71.95
1/2	1/2	5/8	2-1/2	TC10332	46.80	TC91332	56.60	TC11332	59.10
	1/2	1	3	TC11032	53.10	TC91032	62.90	TC11132	65.40
	1/2	1	4	TC16032	61.40	TC96032	71.95	TC16132	74.60
	1/2	1-1/2	6	TC18032	94.10	TC98032	106.35	TC18132	109.45
	1/2	2	4	TC16033	62.00	TC96033	72.55	TC16133	75.20
	1/2	3	6	TC18033	94.60	TC98033	109.90	TC18133	109.95
D ₁ ^{+0.000} _{-0.003} "	D ₂ (h6)	L ₂	L ₁	TOOL #	PRICE	TOOL #	PRICE	TOOL #	PRICE
9/16	9/16	1-1/4	3-1/2	TC11036	80.90	TC91036	93.15	TC11136	96.15
5/8	5/8	3/4	3	TC10340	89.55	TC91340	100.95	TC11340	103.85
	5/8	1-1/4	3-1/2	TC11040	85.45	TC91040	97.70	TC11140	100.70
	5/8	2-1/4	5	TC16040	142.00	TC96040	155.15	TC16140	158.45
	5/8	3	6	TC18040	148.45	TC98040	162.70	TC18140	166.20
3/4	3/4	1	3	TC10348	136.70	TC91348	150.25	TC11348	153.70
	3/4	1-1/2	4	TC11048	125.90	TC91048	140.45	TC11148	156.25
	3/4	2-1/4	5	TC16048	196.85	TC96048	212.50	TC16148	216.40
	3/4	3	6	TC18048	210.60	TC98048	227.55	TC18148	231.75
7/8	7/8	1-1/2	4	TC11056	243.70	TC91056	261.25	TC11156	265.65
	7/8	2-1/4	5	TC16056	338.25	TC96056	357.15	TC16156	361.90
	7/8	3	6	TC18056	372.65	TC98056	393.10	TC18156	398.25
1	1	1-1/4	3-1/2	TC10364	210.85	TC91364	231.90	TC11364	237.15
	1	1-1/2	4	TC11064	224.75	TC91064	245.80	TC11164	251.05
	1	2-1/4	5	TC16064	389.45	TC96064	412.10	TC16164	417.80
	1	3	6	TC18064	375.70	TC98064	400.25	TC18164	406.35

For technical information, see pages 103

GENERAL PURPOSE END MILLS - CARBIDE

2 Flute - Corner Radius - 30° Helix



- Offered in stub, regular, and long length styles
- Corner radius for increased edge strength
- Solid carbide
- Precision manufactured in the USA

CUTTER DIA.	SHANK DIA.	RADIUS	LOC	OAL	UNCOATED	
D1 ^{+0.000"} -0.002"	D2 (h6)	R ^{+0.001"} -0.001"	L2	L1	TOOL #	PRICE
1/8	1/8	.005	1/4	1-1/2	TC71950	9.25
	1/8	.005	1/2	1-1/2	TC71951	12.70
	1/8	.010	1/4	1-1/2	TC71952	9.25
	1/8	.010	1/2	1-1/2	TC71953	12.70
	1/8	.015	1/4	1-1/2	TC71954	9.25
	1/8	.015	1/2	1-1/2	TC72003	12.70
	1/8	.020	1/4	1-1/2	TC71955	9.25
	1/8	.020	1/2	1-1/2	TC72005	12.70
	1/8	.030	1/4	1-1/2	TC71956	9.25
	1/8	.030	1/2	1-1/2	TC72007	12.70
3/16	3/16	.005	3/8	2	TC71957	14.50
	3/16	.005	5/8	2	TC71958	13.85
	3/16	.010	3/8	2	TC71959	14.50
	3/16	.010	5/8	2	TC71960	13.85
	3/16	.015	3/8	2	TC71961	14.50
	3/16	.015	5/8	2	TC72009	13.85
	3/16	.020	3/8	2	TC71962	14.50
	3/16	.020	5/8	2	TC72011	13.85
	3/16	.030	3/8	2	TC71963	14.50
	3/16	.030	5/8	2	TC72013	13.85
1/4	1/4	.005	1/2	2	TC71964	18.55
	1/4	.005	3/4	2-1/2	TC71965	18.50
	1/4	.005	1-1/2	4	TC71966	29.95
	1/4	.010	1/2	2	TC71967	18.55
	1/4	.010	3/4	2-1/2	TC71968	18.50
	1/4	.010	1-1/2	4	TC71969	29.95
	1/4	.015	1/2	2	TC71970	18.55
	1/4	.015	3/4	2-1/2	TC72015	18.50
	1/4	.015	1-1/2	4	TC71971	29.95
	1/4	.020	1/2	2	TC71972	18.55
	1/4	.020	3/4	2-1/2	TC72017	18.50
	1/4	.020	1-1/2	4	TC71973	29.95
	1/4	.030	1/2	2	TC71974	18.55
	1/4	.030	3/4	2-1/2	TC72019	18.50
	1/4	.030	1-1/2	4	TC71975	29.95
	1/4	.060	1/2	2	TC71976	18.55
	1/4	.060	3/4	2-1/2	TC72023	18.50
	1/4	.060	1-1/2	4	TC71977	29.95

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For technical information, see pages 103

GENERAL PURPOSE END MILLS - CARBIDE

2 Flute - Corner Radius - 30° Helix (Cont.)

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CUTTER DIA.	SHANK DIA.	RADIUS	LOC	OAL	UNCOATED	
$D_1^{+.000"}_{-.002"}$	$D_2 (h6)$	$R^{+.001"}_{-.001"}$	L_2	L_1	TOOL #	PRICE
5/16	5/16	.030	13/16	2-1/2	TC72029	29.25
	5/16	.060	13/16	2-1/2	TC72033	29.25
3/8	3/8	.015	5/8	2	TC71978	29.80
	3/8	.015	1	2-1/2	TC72035	34.70
	3/8	.015	1-3/4	4	TC71979	44.80
	3/8	.030	5/8	2	TC71980	29.80
	3/8	.030	1	2-1/2	TC72039	34.70
	3/8	.030	1-3/4	4	TC71981	44.80
	3/8	.060	5/8	2	TC71982	30.50
	3/8	.060	1	2-1/2	TC72043	34.70
	3/8	.060	1-3/4	4	TC71983	44.80
	3/8	.125	5/8	2	TC71984	29.80
	3/8	.125	1	2-1/2	TC71985	34.70
	3/8	.125	1-3/4	4	TC71986	44.80
1/2	1/2	.015	1	3	TC72045	59.40
	1/2	.015	2	4	TC71987	74.80
	1/2	.030	1	3	TC72049	59.40
	1/2	.030	2	4	TC71988	74.80
	1/2	.060	1	3	TC72053	59.40
	1/2	.060	2	4	TC71989	74.80
	1/2	.125	1	3	TC72057	59.40
	1/2	.125	2	4	TC71990	74.80
$D_1^{+.000"}_{-.003"}$	$D_2 (h6)$	$R^{+.001"}_{-.001"}$	L_2	L_1	TOOL #	PRICE
5/8	5/8	.060	1-1/4	3-1/2	TC72067	92.10
	5/8	.125	1-1/4	3-1/2	TC71991	92.10
3/4	3/4	.030	1-1/2	4	TC72075	136.30
	3/4	.060	1-1/2	4	TC72079	136.30
	3/4	.125	1-1/2	4	TC72083	136.30
1	1	.030	1-1/2	4	TC72089	257.90
	1	.060	1-1/2	4	TC72093	257.90
	1	.125	1-1/2	4	TC72097	257.90

End Mills

Roughers

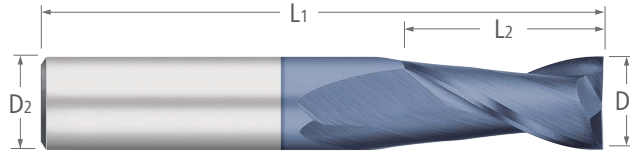
For Aluminum

Carbide

Cobalt

GENERAL PURPOSE END MILLS - CARBIDE

2 Flute - Square - 30° Helix - NC Tolerance



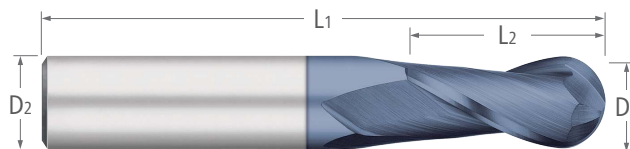
- Excellent for keyways
- Tight tolerance for precision machining
- AlTiN coating offers increased wear and heat resistance
- Solid carbide
- Precision manufactured in the USA

CUTTER DIA.	SHANK DIA.	LOC	OAL	UNCOATED		AlTiN COATED	
$D1^{+0.001}_{-0.000}$	$D2 (h6)$	$L2$	$L1$	TOOL #	PRICE	TOOL #	PRICE
1/16	1/8	3/16	1-1/2	TC65000	13.40	TC65020	17.80
3/32	1/8	3/8	1-1/2	TC65001	14.25	TC65021	18.65
1/8	1/8	1/2	1-1/2	TC65002	16.85	TC65022	21.25
5/32	3/16	9/16	2	TC65003	20.55	TC65023	25.50
3/16	3/16	5/8	2	TC65004	24.15	TC65024	29.10
7/32	1/4	5/8	2-1/2	TC65005	29.85	TC65025	36.20
1/4	1/4	3/4	2-1/2	TC65006	34.00	TC65026	40.35
9/32	5/16	3/4	2-1/2	TC65007	37.05	TC65027	44.65
5/16	5/16	13/16	2-1/2	TC65008	40.20	TC65028	47.80
3/8	3/8	1	2-1/2	TC65009	42.00	TC65029	51.05
7/16	7/16	1	2-3/4	TC65010	54.55	TC65030	65.10
1/2	1/2	1	3	TC65011	67.50	TC65031	79.80
5/8	5/8	1-1/4	3-1/2	TC65012	141.50	TC65032	156.75
3/4	3/4	1-1/2	4	TC65013	204.75	TC65033	222.95
1	1	1-1/2	4	TC65014	335.00	TC65034	361.30

For technical information, see pages 103

GENERAL PURPOSE END MILLS - CARBIDE

2 Flute - Ball - 30° Helix - NC Tolerance



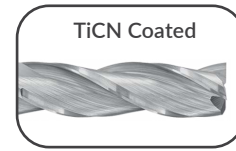
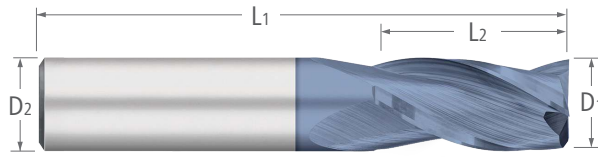
- Excellent for keyways
- Tight tolerance for precision machining
- AlTiN coating offers increased wear and heat resistance
- Solid carbide
- Precision manufactured in the USA

CUTTER DIA.	SHANK DIA.	LOC	OAL	UNCOATED		AlTiN COATED	
$D1^{+0.001''}_{-0.000''}$	$D2 (h6)$	$L2$	$L1$	TOOL #	PRICE	TOOL #	PRICE
1/16	1/8	3/16	1-1/2	TC65080	16.05	TC65100	20.45
3/32	1/8	3/8	1-1/2	TC65081	17.15	TC65101	21.55
1/8	1/8	1/2	1-1/2	TC65082	20.25	TC65102	24.65
5/32	3/16	9/16	2	TC65083	24.60	TC65103	29.55
3/16	3/16	5/8	2	TC65084	28.90	TC65104	33.85
7/32	1/4	5/8	2-1/2	TC65085	35.80	TC65105	42.15
1/4	1/4	3/4	2-1/2	TC65086	40.75	TC65106	47.10
9/32	5/16	3/4	2-1/2	TC65087	44.50	TC65107	52.10
5/16	5/16	13/16	2-1/2	TC65088	48.25	TC65108	55.85
3/8	3/8	1	2-1/2	TC65089	50.35	TC65109	59.40
7/16	7/16	1	2-3/4	TC65090	65.50	TC65110	76.05
1/2	1/2	1	3	TC65091	81.00	TC65111	93.30
5/8	5/8	1-1/4	3-1/2	TC65092	169.70	TC65112	184.95
3/4	3/4	1-1/2	4	TC65093	245.65	TC65113	263.85
1	1	1-1/2	4	TC65094	402.05	TC65114	428.35

For technical information, see pages 103

GENERAL PURPOSE END MILLS - CARBIDE

3 Flute - Square - 30° Helix



- Offered in stub, regular, long, and extra long length styles
- TiCN coating adds enhanced performance when AlTiN cannot be used
- AlTiN coating offers increased wear and heat resistance
- Solid carbide
- Precision manufactured in the USA

CUTTER DIA.	SHANK DIA.	LOC	OAL	UNCOATED		TiCN COATED		AlTiN COATED	
D1 ^{+0.000} _{-0.001} "	D2 (h6)	L2	L1	TOOL #	PRICE	TOOL #	PRICE	TOOL #	PRICE
1/64	1/8	.023	1-1/2	TC10401	16.20	TC91101	19.75	TC11401	20.60
	1/8	1/32	1-1/2	TC10801	17.10	TC90801	20.65	TC99801	21.50
1/32	1/8	1/16	1-1/2	TC10402	9.95	TC91102	13.50	TC11402	13.10
	1/8	1/8	1-1/2	TC10802	11.40	TC90802	14.95	TC99802	15.80
3/64	1/8	3/32	1-1/2	TC10403	9.95	TC91103	13.50	TC11403	14.35
	1/8	1/8	1-1/2	TC10803	9.75	TC90803	13.30	TC99803	14.15
1/16	1/8	1/8	1-1/2	TC10404	7.55	TC91104	11.10	TC11404	9.85
	1/8	1/4	1-1/2	TC10804	9.80	TC90804	11.30	TC99804	11.30
5/64	1/8	1/8	1-1/2	TC10405	12.70	TC91105	16.25	TC11405	17.10
	1/8	1/4	1-1/2	TC10805	10.10	TC90805	13.40	TC99805	14.50
3/32	1/8	3/16	1-1/2	TC10406	7.55	TC91106	11.10	TC11406	11.95
	1/8	3/8	1-1/2	TC10806	8.95	TC90806	12.50	TC99806	11.30
7/64	1/8	3/8	1-1/2	TC10807	9.30	TC90807	12.85	TC99807	13.70

D1 ^{+0.000} _{-0.002} "	D2 (h6)	L2	L1	TOOL #	PRICE	TOOL #	PRICE	TOOL #	PRICE
1/8	1/8	1/4	1-1/2	TC10408	7.25	TC91108	9.40	TC11408	9.40
	1/8	1/2	1-1/2	TC10808	8.45	TC90808	10.50	TC99808	10.50
	1/8	3/4	2-1/4	TC15308	13.75	TC95308	17.55	TC15408	17.85
	1/8	1	3	TC17308	15.40	TC97408	19.15	TC17408	20.10
9/64	3/16	9/16	2	TC10809	12.35	TC90809	16.30	TC99809	17.30
5/32	3/16	5/16	2	TC10410	11.85	TC91110	15.80	TC11410	14.80
	3/16	9/16	2	TC10810	12.60	TC90810	14.60	TC99810	14.60
11/64	3/16	5/8	2	TC10811	11.95	TC90811	15.90	TC99811	16.90
3/16	3/16	3/8	2	TC10412	11.15	TC91112	15.10	TC11412	14.00
	3/16	5/8	2	TC10812	11.65	TC90812	15.60	TC99812	14.60
	3/16	3/4	2-1/2	TC15312	17.30	TC95312	21.55	TC15412	20.90
	3/16	1-1/8	3	TC17312	16.75	TC97412	21.00	TC17412	21.55
13/64	1/4	5/8	2-1/2	TC10813	16.95	TC90813	22.00	TC99813	23.30
7/32	1/4	7/16	2	TC10414	15.00	TC91114	19.75	TC11414	20.95
	1/4	5/8	2-1/2	TC10814	17.25	TC90814	22.30	TC99814	23.60
15/64	1/4	3/4	2-1/2	TC10815	19.55	TC90815	24.60	TC99815	25.90
1/4	1/4	1/2	2	TC10416	13.15	TC91116	16.45	TC11416	16.45
	1/4	3/4	2-1/2	TC10816	14.25	TC90816	19.30	TC99816	20.25
	1/4	1	4	TC15317	24.30	TC95317	29.70	TC15417	31.10
	1/4	1-1/8	3	TC15316	23.05	TC95316	28.10	TC15416	29.40
	1/4	1-1/2	4	TC17316	23.65	TC97416	29.30	TC17416	30.60
	1/4	1-1/2	6	TC17317	32.05	TC97417	38.35	TC17417	39.05
17/64	5/16	3/4	2-1/2	TC10817	25.70	TC90817	31.75	TC99817	33.30
9/32	5/16	3/4	2-1/2	TC10818	25.70	TC90818	31.75	TC99818	33.30
19/64	5/16	13/16	2-1/2	TC10819	25.70	TC90819	31.75	TC99819	33.30

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For technical information, see page 103

GENERAL PURPOSE END MILLS - CARBIDE

3 Flute - Square - 30° Helix (Cont.)

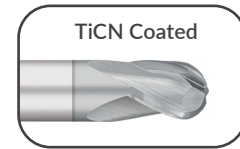
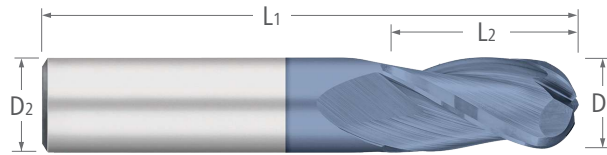
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CUTTER DIA.	SHANK DIA.	LOC	OAL	UNCOATED		TiCN COATED		AlTiN COATED	
D1 ^{+0.000"} _{-0.002"}	D2 (h6)	L2	L1	TOOL #	PRICE	TOOL #	PRICE	TOOL #	PRICE
5/16	5/16	1/2	2	TC10420	17.70	TC91120	23.45	TC11420	24.85
	5/16	13/16	2-1/2	TC10820	18.70	TC90820	24.75	TC99820	24.20
	5/16	1-1/8	3	TC15320	26.20	TC95320	32.25	TC15420	33.80
	5/16	1-5/8	4	TC17320	32.15	TC97420	38.65	TC17420	40.30
21/64	3/8	1	2-1/2	TC10821	29.00	TC90821	36.20	TC99821	37.50
11/32	3/8	1	2-1/2	TC10822	29.00	TC90822	36.20	TC99822	38.05
23/64	3/8	1	2-1/2	TC10823	29.00	TC90823	36.20	TC99823	38.05
3/8	3/8	5/8	2	TC10424	23.05	TC91124	29.85	TC11424	27.40
	3/8	1	2-1/2	TC10824	22.20	TC90824	27.70	TC99824	27.70
	3/8	1	4	TC15325	35.00	TC95325	42.75	TC15425	44.70
	3/8	1-1/8	3	TC15324	30.00	TC95324	37.20	TC15424	39.05
	3/8	1-1/2	6	TC17325	55.50	TC97425	64.60	TC17425	66.85
	3/8	1-3/4	4	TC17324	36.65	TC97424	44.40	TC17424	46.35
25/64	7/16	1	2-3/4	TC10825	38.00	TC90825	46.45	TC99825	48.55
13/32	7/16	1	2-3/4	TC10826	38.00	TC90826	46.45	TC99826	48.55
27/64	7/16	1	2-3/4	TC10827	39.15	TC90827	47.60	TC99827	49.70
7/16	7/16	5/8	2-1/2	TC10428	28.70	TC91128	37.15	TC11428	39.25
	7/16	1	2-3/4	TC10828	34.05	TC90828	42.50	TC99828	44.60
	7/16	2	4	TC15328	47.30	TC95328	56.30	TC15428	58.55
	7/16	3	6	TC17328	74.80	TC97428	85.30	TC17428	87.95
29/64	1/2	1	3	TC10829	56.40	TC90829	66.20	TC99829	68.70
15/32	1/2	1	3	TC10830	56.40	TC90830	66.20	TC99830	68.70
31/64	1/2	1	3	TC10831	56.40	TC90831	66.20	TC99831	68.70
1/2	1/2	5/8	2-1/2	TC10432	36.30	TC91132	46.10	TC11432	48.60
	1/2	1	3	TC10832	41.00	TC90832	50.80	TC99832	51.50
	1/2	1	4	TC15332	52.60	TC95332	63.15	TC15432	65.80
	1/2	1-1/4	3	TC10833	41.00	TC90833	50.80	TC99833	51.50
	1/2	1-1/2	6	TC17332	84.10	TC97432	96.35	TC17432	99.45
	1/2	2	4	TC15333	55.70	TC95333	66.25	TC15433	68.90
	1/2	3	6	TC17333	88.65	TC97433	100.90	TC17433	104.00
D1 ^{+0.000"} _{-0.003"}	D2 (h6)	L2	L1	TOOL #	PRICE	TOOL #	PRICE	TOOL #	PRICE
9/16	9/16	1-1/4	3-1/2	TC10836	77.20	TC90836	89.45	TC99836	92.45
5/8	5/8	3/4	3	TC10440	76.75	TC91140	88.15	TC11440	91.05
	5/8	1-1/4	3-1/2	TC10840	78.50	TC90840	90.75	TC99840	93.75
	5/8	2-1/4	5	TC15340	120.50	TC95340	133.65	TC15440	136.95
	5/8	3	6	TC17340	130.00	TC97440	144.25	TC17440	147.75
3/4	3/4	1	3	TC10448	107.00	TC91148	120.55	TC11448	124.00
	3/4	1-1/2	4	TC10848	109.70	TC90848	124.25	TC99848	127.90
	3/4	2-1/4	5	TC15348	166.40	TC95348	182.05	TC15448	185.95
	3/4	3	6	TC17348	194.10	TC97448	211.05	TC17448	216.15
	3/4	4	7	TC17349	333.20	TC97449	351.60	TC17449	356.20
7/8	7/8	1-1/2	4	TC10856	201.65	TC90856	219.20	TC99856	223.60
	7/8	2-1/4	5	TC15356	315.35	TC95356	334.25	TC15456	339.00
	7/8	3	6	TC17356	345.65	TC97456	366.10	TC17456	371.25
1	1	1-1/4	3-1/2	TC10464	177.10	TC91164	198.15	TC11464	203.40
	1	1-1/2	4	TC10864	184.70	TC90864	205.75	TC99864	211.00
	1	2-1/4	5	TC15364	227.85	TC95364	250.50	TC15464	256.20
	1	3	6	TC17364	328.00	TC97464	352.55	TC17464	358.65
	1	4	7	TC17365	429.95	TC97465	456.55	TC17465	463.20

For technical information, see page 103

GENERAL PURPOSE END MILLS - CARBIDE

3 Flute - Ball - 30° Helix



- Offered in stub, regular, long, and extra long length styles
- TiCN coating adds enhanced performance when AlTiN cannot be used
- AlTiN coating offers increased wear and heat resistance
- Solid carbide
- Precision manufactured in the USA

CUTTER DIA.	SHANK DIA.	LOC	OAL	UNCOATED		TiCN COATED		AlTiN COATED	
D1 ^{+0.000} _{-0.001} "	D2 (h6)	L2	L1	TOOL #	PRICE	TOOL #	PRICE	TOOL #	PRICE
1/64	1/8	.023	1-1/2	TC12201	20.35	TC92001	23.90	TC12301	24.75
	1/8	1/32	1-1/2	TC12901	19.15	TC92101	22.70	TC13201	23.55
1/32	1/8	1/16	1-1/2	TC12202	13.00	TC92002	16.55	TC12302	17.40
	1/8	1/8	1-1/2	TC12902	12.25	TC92102	15.80	TC13202	16.65
3/64	1/8	3/32	1-1/2	TC12203	13.00	TC92003	16.55	TC12303	17.40
	1/8	1/8	1-1/2	TC12903	12.25	TC92103	15.80	TC13203	16.65
1/16	1/8	1/8	1-1/2	TC12204	9.75	TC92004	13.30	TC12304	12.60
	1/8	1/4	1-1/2	TC12904	11.40	TC92104	14.95	TC13204	15.40
5/64	1/8	1/8	1-1/2	TC12205	15.75	TC92005	19.30	TC12305	19.95
	1/8	1/4	1-1/2	TC12905	11.40	TC92105	14.95	TC13205	15.80
3/32	1/8	3/16	1-1/2	TC12206	9.75	TC92006	13.30	TC12306	14.15
	1/8	3/8	1-1/2	TC12906	11.95	TC92106	15.50	TC13206	16.35
7/64	1/8	3/8	1-1/2	TC12907	11.95	TC92107	15.50	TC13207	16.35

D1 ^{+0.000} _{-0.002} "	D2 (h6)	L2	L1	TOOL #	PRICE	TOOL #	PRICE	TOOL #	PRICE
1/8	1/8	1/4	1-1/2	TC12208	9.25	TC92008	12.80	TC12308	11.95
	1/8	1/2	1-1/2	TC12908	11.00	TC92108	14.55	TC13208	15.40
	1/8	3/4	2-1/4	TC16208	16.25	TC92408	20.00	TC16308	20.95
	1/8	1	3	TC18308	18.40	TC99108	22.15	TC18408	23.10
9/64	3/16	9/16	2	TC12909	15.90	TC92109	19.85	TC13209	20.85
5/32	3/16	5/16	2	TC12210	15.40	TC92010	19.35	TC12310	19.95
	3/16	9/16	2	TC12910	15.90	TC92110	19.85	TC13210	20.85
11/64	3/16	5/8	2	TC12911	15.90	TC92111	19.85	TC13211	20.85
3/16	3/16	3/8	2	TC12212	14.50	TC92012	18.45	TC12312	18.65
	3/16	5/8	2	TC12912	14.30	TC92112	18.00	TC13212	19.25
	3/16	3/4	2-1/2	TC16212	18.85	TC92412	23.10	TC16312	24.15
	3/16	1-1/8	3	TC18312	21.95	TC99112	26.20	TC18412	26.00
13/64	1/4	5/8	2-1/2	TC12913	20.90	TC92113	25.95	TC13213	27.25
7/32	1/4	7/16	2	TC12214	19.55	TC92014	24.30	TC12314	25.50
	1/4	5/8	2-1/2	TC12914	20.90	TC92114	25.95	TC13214	27.25
15/64	1/4	3/4	2-1/2	TC12915	20.90	TC92115	25.95	TC13215	27.25
1/4	1/4	1/2	2	TC12216	18.60	TC92016	23.35	TC12316	24.20
	1/4	3/4	2-1/2	TC12916	19.55	TC92116	25.40	TC13216	26.00
	1/4	1	4	TC16217	29.10	TC92417	34.50	TC16317	35.90
	1/4	1-1/8	3	TC16216	26.40	TC92416	31.45	TC16316	32.75
	1/4	1-1/2	4	TC18316	32.10	TC99116	36.10	TC18416	36.10
	1/4	1-1/2	6	TC18317	37.90	TC99117	44.20	TC18417	45.80
17/64	5/16	3/4	2-1/2	TC12917	26.40	TC92117	32.45	TC13217	34.00
9/32	5/16	3/4	2-1/2	TC12918	26.45	TC92118	32.50	TC13218	34.05

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For technical information, see page 103

GENERAL PURPOSE END MILLS - CARBIDE

3 Flute - Ball - 30° Helix (Cont.)

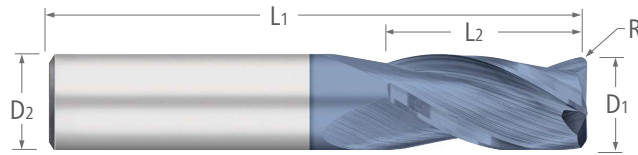
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CUTTER DIA.	SHANK DIA.	LOC	OAL	UNCOATED		TiCN COATED		AlTiN COATED	
D1 ^{+0.000"} _{-0.002"}	D2 (h6)	L2	L1	TOOL #	PRICE	TOOL #	PRICE	TOOL #	PRICE
19/64	5/16	13/16	2-1/2	TC12919	28.70	TC92119	34.75	TC13219	36.30
5/16	5/16	1/2	2	TC12220	23.05	TC92020	28.80	TC12320	30.20
	5/16	13/16	2-1/2	TC12920	24.35	TC92120	30.40	TC13220	31.95
	5/16	1-1/8	3	TC16220	31.00	TC92420	37.05	TC16320	38.60
	5/16	1-5/8	4	TC18320	38.75	TC99120	45.25	TC18420	46.90
21/64	3/8	1	2-1/2	TC12921	33.35	TC92121	40.55	TC13221	42.40
11/32	3/8	1	2-1/2	TC12922	35.05	TC92122	42.25	TC13222	44.10
23/64	3/8	1	2-1/2	TC12923	33.35	TC92123	40.55	TC13223	42.40
3/8	3/8	5/8	2	TC12224	29.80	TC92024	36.60	TC12324	38.30
	3/8	1	2-1/2	TC12924	26.20	TC92124	33.40	TC13224	35.25
	3/8	1	4	TC16225	43.90	TC92425	51.65	TC16325	53.60
	3/8	1-1/8	3	TC16224	36.05	TC92424	43.25	TC16324	45.10
	3/8	1-1/2	6	TC18325	59.10	TC99125	68.20	TC18425	70.45
	3/8	1-3/4	4	TC18324	41.75	TC99124	49.50	TC18424	51.45
25/64	7/16	1	2-3/4	TC12925	45.30	TC92125	53.75	TC13225	55.85
13/32	7/16	1	2-3/4	TC12926	45.50	TC92126	53.95	TC13226	56.05
27/64	7/16	1	2-3/4	TC12927	45.30	TC92127	53.75	TC13227	55.85
7/16	7/16	5/8	2-1/2	TC12228	37.35	TC92028	45.80	TC12328	47.90
	7/16	1	2-3/4	TC12928	38.50	TC92128	46.95	TC13228	49.05
	7/16	2	4	TC16228	59.95	TC92428	68.95	TC16328	71.20
	7/16	3	6	TC18328	88.30	TC99128	98.80	TC18428	101.40
29/64	1/2	1	3	TC12929	59.65	TC92129	69.45	TC13229	71.95
15/32	1/2	1	3	TC12930	59.65	TC92130	69.45	TC13230	71.95
31/64	1/2	1	3	TC12931	59.65	TC92131	69.45	TC13231	71.95
1/2	1/2	5/8	2-1/2	TC12232	46.80	TC92032	56.60	TC12332	59.10
	1/2	1	3	TC12932	53.10	TC92132	62.90	TC13232	65.40
	1/2	1	4	TC16232	61.40	TC92432	71.95	TC16332	74.60
	1/2	1-1/2	6	TC18332	94.10	TC99132	106.35	TC18432	109.45
	1/2	2	4	TC16233	62.00	TC92433	72.55	TC16333	75.20
	1/2	3	6	TC18333	94.60	TC99133	106.85	TC18433	109.95
D1 ^{+0.000"} _{-0.003"}	D2 (h6)	L2	L1	TOOL #	PRICE	TOOL #	PRICE	TOOL #	PRICE
9/16	9/16	1-1/4	3-1/2	TC12936	80.90	TC92136	93.15	TC13236	96.15
5/8	5/8	3/4	3	TC12240	89.55	TC92040	100.95	TC12340	103.85
	5/8	1-1/4	3-1/2	TC12940	85.45	TC92140	97.70	TC13240	100.70
	5/8	2-1/4	5	TC16240	142.00	TC92440	155.15	TC16340	158.45
	5/8	3	6	TC18340	148.45	TC99140	162.70	TC18440	166.20
3/4	3/4	1	3	TC12248	136.70	TC92048	150.25	TC12348	153.70
	3/4	1-1/2	4	TC12948	125.90	TC92148	140.45	TC13248	144.10
	3/4	2-1/4	5	TC16248	196.85	TC92448	212.50	TC16348	216.40
	3/4	3	6	TC18348	210.60	TC99148	227.55	TC18448	231.75
	3/4	4	7	TC18349	348.45	TC99149	366.85	TC18449	371.45
7/8	7/8	1-1/2	4	TC12956	243.70	TC92156	261.25	TC13256	265.65
	7/8	2-1/4	5	TC16256	338.25	TC92456	357.15	TC16356	361.90
	7/8	3	6	TC18356	372.65	TC99156	393.10	TC18456	398.25
1	1	1-1/4	3-1/2	TC12264	210.85	TC92064	231.90	TC12364	237.15
	1	1-1/2	4	TC12964	224.75	TC92164	245.80	TC13264	251.05
	1	2-1/4	5	TC16264	389.45	TC92464	412.10	TC16364	417.80
	1	3	6	TC18364	375.70	TC99164	400.25	TC18464	406.35
	1	4	7	TC18365	456.60	TC99166	483.20	TC18465	489.85

For technical information, see page 103

GENERAL PURPOSE END MILLS - CARBIDE

3 Flute - Corner Radius - 30° Helix



- Offered in stub, regular, long, and extra long length styles
- Corner radius for increased edge strength
- AlTiN coating offers increased wear and heat resistance
- Solid carbide
- Precision manufactured in the USA

CUTTER DIA.	SHANK DIA.	RADIUS	LOC	OAL	UNCOATED		AlTiN COATED	
$D_1^{+.0001}_{-.002}$	$D_2 (h6)$	$R^{+.001}_{-.001}$	L_2	L_1	TOOL #	PRICE	TOOL #	PRICE
1/8	1/8	.005	1/4	1-1/2	TC15200	9.25	TC16400	13.65
	1/8	.005	1/2	1-1/2	TC15700	12.70	TC16700	17.10
	1/8	.005	3/4	2-1/4	TC15800	17.30	TC16800	22.00
	1/8	.005	1	3	TC15900	19.60	TC16900	24.30
	1/8	.010	1/4	1-1/2	TC15201	9.25	TC16401	13.65
	1/8	.010	1/2	1-1/2	TC15701	12.70	TC16701	17.10
	1/8	.010	3/4	2-1/4	TC15801	17.30	TC16801	22.00
	1/8	.010	1	3	TC15901	19.60	TC16901	24.30
	1/8	.015	1/4	1-1/2	TC15202	9.25	TC16402	13.65
	1/8	.015	1/2	1-1/2	TC15702	12.70	TC16702	17.10
	1/8	.015	3/4	2-1/4	TC15802	17.30	TC16802	22.00
	1/8	.015	1	3	TC15902	19.60	TC16902	24.30
	1/8	.020	1/4	1-1/2	TC15203	9.25	TC16403	13.65
	1/8	.020	1/2	1-1/2	TC15703	12.70	TC16703	17.10
	1/8	.020	3/4	2-1/4	TC15803	17.30	TC16803	22.00
	1/8	.020	1	3	TC15903	19.60	TC16903	24.30
	1/8	.030	1/4	1-1/2	TC15204	9.25	TC16404	13.65
	1/8	.030	1/2	1-1/2	TC15704	12.70	TC16704	17.10
	1/8	.030	3/4	2-1/4	TC15804	17.30	TC16804	22.00
	1/8	.030	1	3	TC15904	19.60	TC16904	24.30
3/16	3/16	.005	3/8	2	TC15205	14.50	TC16405	19.45
	3/16	.005	5/8	2	TC15705	13.85	TC16705	18.80
	3/16	.005	3/4	2-1/2	TC15805	20.00	TC16805	25.30
	3/16	.005	1-1/8	3	TC15905	21.50	TC16905	26.80
	3/16	.010	3/8	2	TC15206	14.50	TC16406	19.45
	3/16	.010	5/8	2	TC15706	13.85	TC16706	18.80
	3/16	.010	3/4	2-1/2	TC15806	20.00	TC16806	25.30
	3/16	.010	1-1/8	3	TC15906	21.50	TC16906	26.80
	3/16	.015	3/8	2	TC15207	14.50	TC16407	19.45
	3/16	.015	5/8	2	TC15707	13.85	TC16707	18.80
	3/16	.015	3/4	2-1/2	TC15807	20.00	TC16807	25.30
	3/16	.015	1-1/8	3	TC15907	21.50	TC16907	26.80

continued on next page

GENERAL PURPOSE END MILLS - CARBIDE

3 Flute - Corner Radius - 30° Helix (Cont.)

continued from previous page

CUTTER DIA.	SHANK DIA.	RADIUS	LOC	OAL	UNCOATED		AlTiN COATED	
D1 ^{+0.000"} -0.002"	D2 (h6)	R ^{+0.001"} -0.001"	L2	L1	TOOL #	PRICE	TOOL #	PRICE
3/16	3/16	.020	3/8	2	TC15208	14.50	TC16408	19.45
	3/16	.020	5/8	2	TC15708	13.85	TC16708	18.80
	3/16	.020	3/4	2-1/2	TC15808	20.00	TC16808	25.30
	3/16	.020	1-1/8	3	TC15908	21.50	TC16908	26.80
	3/16	.030	3/8	2	TC15209	14.50	TC16409	19.45
	3/16	.030	5/8	2	TC15709	13.85	TC16709	18.80
	3/16	.030	3/4	2-1/2	TC15809	20.00	TC16809	25.30
	3/16	.030	1-1/8	3	TC15909	21.50	TC16909	26.80
1/4	1/4	.005	1/2	2	TC15210	18.55	TC16410	24.50
	1/4	.005	3/4	2-1/2	TC15710	18.50	TC16710	24.85
	1/4	.005	1	4	TC15816	29.40	TC16816	36.20
	1/4	.005	1-1/8	3	TC15810	28.05	TC16810	34.40
	1/4	.005	1-1/2	4	TC15910	29.95	TC16910	36.75
	1/4	.005	1-1/2	6	TC15916	40.20	TC16916	48.10
	1/4	.010	1/2	2	TC15211	18.55	TC16411	24.50
	1/4	.010	3/4	2-1/2	TC15711	18.50	TC16711	24.85
	1/4	.010	1	4	TC15817	29.40	TC16817	36.20
	1/4	.010	1-1/8	3	TC15811	28.05	TC16811	34.40
	1/4	.010	1-1/2	4	TC15911	29.95	TC16911	36.75
	1/4	.010	1-1/2	6	TC15917	40.20	TC16917	48.10
	1/4	.015	1/2	2	TC15212	18.55	TC16412	24.50
	1/4	.015	3/4	2-1/2	TC15712	18.50	TC16712	24.85
	1/4	.015	1	4	TC15818	29.40	TC16818	36.20
	1/4	.015	1-1/8	3	TC15812	28.05	TC16812	34.40
	1/4	.015	1-1/2	4	TC15912	29.95	TC16912	36.75
	1/4	.015	1-1/2	6	TC15918	40.20	TC16918	48.10
	1/4	.020	1/2	2	TC15213	18.55	TC16413	24.50
	1/4	.020	3/4	2-1/2	TC15713	18.50	TC16713	24.85
	1/4	.020	1	4	TC15819	29.40	TC16819	36.20
	1/4	.020	1-1/8	3	TC15813	28.05	TC16813	34.40
	1/4	.020	1-1/2	4	TC15913	29.95	TC16913	36.75
	1/4	.020	1-1/2	6	TC15919	40.20	TC16919	48.10
	1/4	.030	1/2	2	TC15214	18.55	TC16414	24.50
	1/4	.030	3/4	2-1/2	TC15714	18.50	TC16714	24.85
	1/4	.030	1	4	TC15820	29.40	TC16820	36.20
	1/4	.030	1-1/8	3	TC15814	28.05	TC16814	34.40
	1/4	.030	1-1/2	4	TC15914	29.95	TC16914	36.75
	1/4	.030	1-1/2	6	TC15920	40.20	TC16920	48.10
	1/4	.060	1/2	2	TC15215	18.55	TC16415	24.50
	1/4	.060	3/4	2-1/2	TC15715	18.50	TC16715	24.85
	1/4	.060	1	4	TC15821	29.40	TC16821	36.20
	1/4	.060	1-1/8	3	TC15815	28.05	TC16815	34.40
	1/4	.060	1-1/2	4	TC15915	29.95	TC16915	36.75
	1/4	.060	1-1/2	6	TC15921	40.20	TC16921	48.10

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For technical information, see pages 103

GENERAL PURPOSE END MILLS - CARBIDE

3 Flute - Corner Radius - 30° Helix (Cont.)

continued from previous page

CUTTER DIA.	SHANK DIA.	RADIUS	LOC	OAL	UNCOATED		AlTiN COATED	
D1 ^{+0.000"} -0.002"	D2 (h6)	R ^{+0.001"} -0.001"	L2	L1	TOOL #	PRICE	TOOL #	PRICE
5/16	5/16	.015	13/16	2-1/2	TC15716	29.25	TC16716	36.85
	5/16	.015	1-1/8	3	TC15822	31.80	TC16822	39.40
	5/16	.020	13/16	2-1/2	TC15717	29.25	TC16717	36.85
	5/16	.020	1-1/8	3	TC15823	31.80	TC16823	39.40
	5/16	.030	13/16	2-1/2	TC15718	29.25	TC16718	36.85
	5/16	.030	1-1/8	3	TC15824	31.80	TC16824	39.40
	5/16	.045	13/16	2-1/2	TC15719	29.25	TC16719	36.85
	5/16	.045	1-1/8	3	TC15825	31.80	TC16825	39.40
	5/16	.060	13/16	2-1/2	TC15720	29.25	TC16720	36.85
	5/16	.060	1-1/8	3	TC15826	31.80	TC16826	39.40
3/8	3/8	.010	5/8	2	TC15216	29.80	TC16416	38.30
	3/8	.010	1	2-1/2	TC15721	34.70	TC16721	43.75
	3/8	.015	5/8	2	TC15217	29.80	TC16417	38.30
	3/8	.015	1	2-1/2	TC15722	34.70	TC16722	43.75
	3/8	.020	5/8	2	TC15218	29.80	TC16418	38.30
	3/8	.020	1	2-1/2	TC15723	34.70	TC16723	43.75
	3/8	.030	5/8	2	TC15219	29.80	TC16419	38.30
	3/8	.030	1	2-1/2	TC15724	34.70	TC16724	43.75
	3/8	.045	5/8	2	TC15220	29.80	TC16420	38.30
	3/8	.045	1	2-1/2	TC15725	34.70	TC16725	43.75
	3/8	.060	5/8	2	TC15221	30.50	TC16421	55.30
	3/8	.060	1	2-1/2	TC15726	34.70	TC16726	43.75
	3/8	.090	5/8	2	TC15222	29.80	TC16422	38.30
	3/8	.090	1	2-1/2	TC15727	34.70	TC16727	43.75
	3/8	.125	5/8	2	TC15223	29.80	TC16423	38.30
	3/8	.125	1	2-1/2	TC15728	34.70	TC16728	43.75
1/2	1/2	.010	5/8	2-1/2	TC15224	46.80	TC16424	59.10
	1/2	.010	1	3	TC15729	59.40	TC16729	71.70
	1/2	.010	1	4	TC15827	70.15	TC16827	83.35
	1/2	.015	5/8	2-1/2	TC15225	46.80	TC16425	59.10
	1/2	.015	1	3	TC15730	59.40	TC16730	71.70
	1/2	.015	1	4	TC15828	70.15	TC16828	83.35
	1/2	.020	5/8	2-1/2	TC15226	46.80	TC16426	59.10
	1/2	.020	1	3	TC15731	59.40	TC16731	71.70
	1/2	.020	1	4	TC15829	70.15	TC16829	83.35
	1/2	.030	5/8	2-1/2	TC15227	46.80	TC16427	59.10
	1/2	.030	1	3	TC15732	59.40	TC16732	71.70
	1/2	.030	1	4	TC15830	70.15	TC16830	83.35
	1/2	.060	5/8	2-1/2	TC15228	46.80	TC16428	59.10
	1/2	.060	1	3	TC15733	59.40	TC16733	71.70
	1/2	.060	1	4	TC15831	70.15	TC16831	83.35
	1/2	.090	5/8	2-1/2	TC15229	46.80	TC16429	59.10
	1/2	.090	1	3	TC15734	59.40	TC16734	71.70
	1/2	.090	1	4	TC15832	70.15	TC16832	83.35
	1/2	.125	5/8	2-1/2	TC15230	46.80	TC16430	59.10
	1/2	.125	1	3	TC15735	59.40	TC16735	71.70
	1/2	.125	1	4	TC15833	70.15	TC16833	83.35

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For technical information, see pages 103

GENERAL PURPOSE END MILLS - CARBIDE

3 Flute - Corner Radius - 30° Helix (Cont.)

continued from previous page

CUTTER DIA.	SHANK DIA.	RADIUS	LOC	OAL	UNCOATED		AlTiN COATED	
D1 ^{+0.000"} _{-.003"}	D2 (h6)	R ^{+0.001"} _{-.001"}	L2	L1	TOOL #	PRICE	TOOL #	PRICE
5/8	5/8	.015	1-1/4	3-1/2	TC15736	92.10	TC16736	107.35
	5/8	.020	1-1/4	3-1/2	TC15737	92.10	TC16737	107.35
	5/8	.030	1-1/4	3-1/2	TC15738	92.10	TC16738	107.35
	5/8	.045	1-1/4	3-1/2	TC15739	92.10	TC16739	107.35
	5/8	.060	1-1/4	3-1/2	TC15740	92.10	TC16740	107.35
	5/8	.090	1-1/4	3-1/2	TC15741	92.10	TC16741	107.35
3/4	3/4	.015	1-1/2	4	TC15742	136.30	TC16742	154.50
	3/4	.020	1-1/2	4	TC15743	136.30	TC16743	154.50
	3/4	.030	1-1/2	4	TC15744	136.30	TC16744	154.50
	3/4	.045	1-1/2	4	TC15745	136.30	TC16745	154.50
	3/4	.060	1-1/2	4	TC15746	136.30	TC16746	154.50
	3/4	.090	1-1/2	4	TC15747	136.30	TC16747	154.50
	3/4	.125	1-1/2	4	TC15748	136.30	TC16748	154.50
	3/4	.250	1-1/2	4	TC15749	136.30	TC16749	154.50
1	1	.015	1-1/2	4	TC15750	257.90	TC16750	284.20
	1	.020	1-1/2	4	TC15751	257.90	TC16751	284.20
	1	.030	1-1/2	4	TC15752	257.90	TC16752	284.20
	1	.045	1-1/2	4	TC15753	257.90	TC16753	284.20
	1	.060	1-1/2	4	TC15754	257.90	TC16754	284.20
	1	.090	1-1/2	4	TC15755	257.90	TC16755	284.20
	1	.125	1-1/2	4	TC15756	257.90	TC16756	284.20

**DID YOU
KNOW?**



Premature tool wear and breakage are easily avoidable, but can lead to poor part finish, machine downtime, and even scrapped parts.

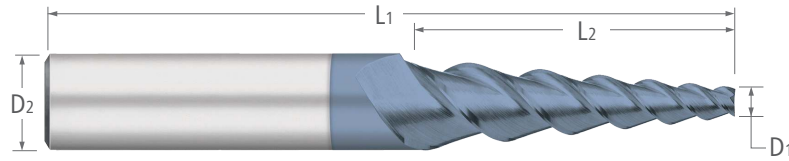
Read More : **End Mill and Milling Troubleshooting Guide**
on our technical blog, "In The Loupe"

harveyperformance.com/in-the-loupe/end-mill-troubleshooting-guide



GENERAL PURPOSE END MILLS - CARBIDE

3 Flute - Square - 30° Helix - Tapered



- Excellent for holding draft angles in mold and die applications
- Offered in 1°, 1.5°, 2°, 3°, 5°, and 7° angles per side
- AlTiN coating offers increased wear and heat resistance
- Solid carbide
- Precision manufactured in the USA

Angle Per Side	TIP DIA. $D1^{+0.001}_{-0.001}$	SHANK DIA. $D2 (h6)$	LOC $L2$	OAL $L1$	UNCOATED		AlTiN COATED	
					TOOL #	PRICE	TOOL #	PRICE
1°	1/8	1/4	1-1/2	3	TC85000	36.85	TC85016	43.20
	3/16	3/8	1-3/4	3-1/2	TC85001	56.10	TC85017	65.80
1.5°	1/8	1/4	1-1/2	3	TC85002	37.95	TC85018	44.30
	3/16	3/8	1-3/4	3-1/2	TC85003	58.40	TC85019	68.10
2°	1/8	1/4	1	3	TC85004	36.85	TC85020	43.20
	3/16	3/8	1-3/4	3-1/2	TC85005	56.10	TC85021	65.80
	1/4	1/2	2	4	TC85006	80.65	TC85022	93.85
3°	1/8	1/4	1	3	TC85007	37.95	TC85023	44.30
	5/32	3/8	1-3/4	3-1/2	TC85008	58.40	TC85024	68.10
	1/4	1/2	2	4	TC85009	80.65	TC85025	93.85
5°	1/8	1/4	3/4	3	TC85010	37.95	TC85026	44.30
	1/8	3/8	1-1/2	3-1/2	TC85011	58.15	TC85027	67.85
	1/4	1/2	1-1/4	4	TC85012	80.65	TC85028	93.85
7°	1/8	1/4	1/2	3	TC85013	37.95	TC85029	44.30
	5/32	3/8	3/4	3-1/2	TC85014	58.15	TC85030	67.85
	3/16	1/2	1-1/4	4	TC85015	80.65	TC85031	93.85

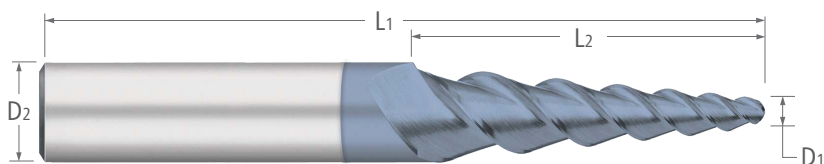


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GENERAL PURPOSE END MILLS - CARBIDE

3 Flute - Ball - 30° Helix - Tapered



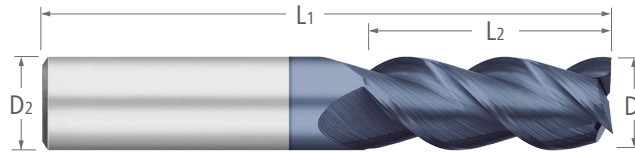
- Excellent for holding draft angles in mold and die applications
- Offered in 1°, 1.5°, 2°, 3°, 5°, and 7° angles per side
- AlTiN coating offers increased wear and heat resistance
- Solid carbide
- Precision manufactured in the USA

Angle Per Side	TIP DIA.	SHANK DIA.	LOC	OAL	UNCOATED		AlTiN COATED	
	$D1_{-0.001}^{+0.001}$	$D2 (h6)$	$L2$	$L1$	TOOL #	PRICE	TOOL #	PRICE
1°	1/8	1/4	1-1/2	3	TC85032	42.40	TC85048	48.75
	3/16	3/8	1-3/4	3-1/2	TC85033	64.50	TC85049	74.20
1.5°	1/8	1/4	1-1/2	3	TC85034	43.65	TC85050	50.00
	3/16	3/8	1-3/4	3-1/2	TC85035	67.25	TC85051	76.95
2°	1/8	1/4	1	3	TC85036	42.40	TC85052	48.75
	3/16	3/8	1-3/4	3-1/2	TC85037	64.75	TC85053	74.45
	1/4	1/2	2	4	TC85038	92.75	TC85054	105.95
3°	1/8	1/4	1	3	TC85039	43.65	TC85055	50.00
	5/32	3/8	1-3/4	3-1/2	TC85040	66.90	TC85056	76.60
	1/4	1/2	2	4	TC85041	92.75	TC85057	105.95
5°	1/8	1/4	3/4	3	TC85042	43.65	TC85058	50.00
	1/8	3/8	1-1/2	3-1/2	TC85043	66.90	TC85059	76.60
	1/4	1/2	1-1/4	4	TC85044	92.75	TC85060	105.95
7°	1/8	1/4	1/2	3	TC85045	43.65	TC85061	50.00
	5/32	3/8	3/4	3-1/2	TC85046	66.90	TC85062	76.60
	3/16	1/2	1-1/4	4	TC85047	92.75	TC85063	105.95

For technical information, see pages 103

GENERAL PURPOSE END MILLS - CARBIDE

3 Flute - Square - 45° Helix



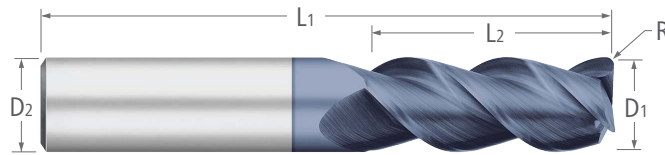
- Engineered to slot and profile at increased speed and feed rates
- Optimized shearing action for excellent part finish
- Proven performance in stainless steels and similar alloys
- 45° helix for faster chip removal and a better finish
- AlTiN coating offers increased wear and heat resistance
- Solid carbide
- Precision manufactured in the USA

CUTTER DIA.	SHANK DIA.	LOC	OAL	UNCOATED		AlTiN COATED	
$D1^{+.000}_{-.002}$	$D2 (h6)$	$L2$	$L1$	TOOL #	PRICE	TOOL #	PRICE
1/8	1/8	1/4	1-1/2	TC40507	10.05	TC49506	14.45
	1/8	1/2	1-1/2	TC40508	15.80	TC49508	19.55
3/16	3/16	3/8	2	TC40511	15.85	TC49511	20.80
	3/16	5/8	2	TC40512	18.95	TC49512	23.40
1/4	1/4	1/2	2-1/2	TC40515	23.25	TC49515	29.60
	1/4	3/4	2-1/2	TC40516	20.30	TC49516	25.15
5/16	5/16	1/2	2	TC40519	28.35	TC49518	35.50
	5/16	13/16	2-1/2	TC40520	24.55	TC49520	30.40
3/8	3/8	5/8	2	TC40523	30.60	TC49523	39.10
	3/8	1	2-1/2	TC40524	32.85	TC49524	40.65
1/2	1/2	5/8	2-1/2	TC40531	52.60	TC49530	64.90
	1/2	1-1/4	3	TC40532	56.05	TC49532	68.35
$D1^{+.000}_{-.003}$	$D2 (h6)$	$L2$	$L1$	TOOL #	PRICE	TOOL #	PRICE
5/8	5/8	3/4	3	TC40539	112.35	TC49539	126.65
	5/8	1-5/8	3-1/2	TC40540	111.65	TC49540	126.90
3/4	3/4	1	3	TC40547	171.00	TC49547	188.00
	3/4	1-5/8	4	TC40548	156.75	TC49548	174.95

For technical information, see page 104

GENERAL PURPOSE END MILLS - CARBIDE

3 Flute - Corner Radius - 45° Helix



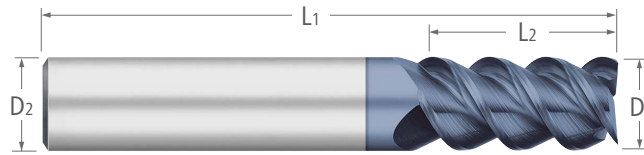
- Engineered to slot and profile at increased speed and feed rates
- Optimized shearing action for excellent part finish
- Proven performance in stainless steels and similar alloys
- Corner radius for increased edge strength
- 45° helix for faster chip removal and a better finish
- AlTiN coating offers increased wear and heat resistance
- Solid carbide
- Precision manufactured in the USA

CUTTER DIA.	SHANK DIA.	RADIUS	LOC	OAL	UNCOATED		AlTiN COATED	
$D_1^{+.0001}_{-.002}$	$D_2 (h6)$	$R^{+.001}_{-.001}$	L_2	L_1	TOOL #	PRICE	TOOL #	PRICE
1/8	1/8	.010	1/4	1-1/2	TC40707	13.00	TC49707	17.40
	1/8	.010	1/2	1-1/2	TC40708	17.65	TC49708	21.90
3/16	3/16	.010	3/8	2	TC40711	19.55	TC49710	24.50
	3/16	.010	5/8	2	TC40712	21.15	TC49712	26.10
1/4	1/4	.020	1/2	2-1/2	TC40715	28.00	TC49715	34.35
	1/4	.020	3/4	2-1/2	TC40716	22.70	TC49716	28.05
5/16	5/16	.020	1/2	2	TC40719	32.75	TC49719	37.75
	5/16	.020	13/16	2-1/2	TC40720	27.40	TC49720	33.95
3/8	3/8	.020	5/8	2	TC40723	34.60	TC49722	43.10
	3/8	.020	1	2-1/2	TC40724	36.75	TC49724	45.80
1/2	1/2	.040	5/8	2-1/2	TC40731	56.45	TC49730	68.75
	1/2	.040	1-1/4	3	TC40732	62.70	TC49732	75.00
$D_1^{+.0001}_{-.003}$	$D_2 (h6)$	$R^{+.001}_{-.001}$	L_2	L_1	TOOL #	PRICE	TOOL #	PRICE
5/8	5/8	.040	3/4	3	TC40739	118.15	TC49739	132.45
	5/8	.040	1-5/8	3-1/2	TC40740	119.25	TC49740	134.50
3/4	3/4	.040	1	3	TC40747	176.90	TC49746	193.90
	3/4	.040	1-5/8	4	TC40748	167.30	TC49748	185.50

For technical information, see page 104

GENERAL PURPOSE END MILLS - CARBIDE

3 Flute - Square - 60° Helix

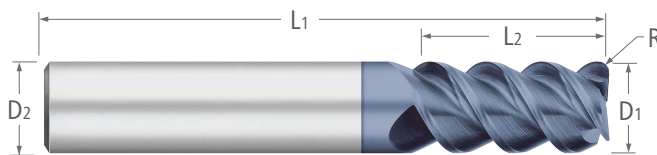


- "High shear" geometry for slotting and profiling
- Proven performance in high-temp alloys such as Inconel, hastelloy, waspalloy, and titanium
- 60° helix for improved surface finish
- AlTiN coating offers increased wear and heat resistance
- Solid carbide
- Precision manufactured in the USA

CUTTER DIA.	SHANK DIA.	LOC	OAL	UNCOATED		AlTiN COATED	
$D_1^{+0.000}_{-0.002}$	$D_2 (h6)$	L_2	L_1	TOOL #	PRICE	TOOL #	PRICE
1/8	1/8	1/2	1-1/2	TC30508	15.80	TC39508	19.55
3/16	3/16	5/8	2	TC30512	18.95	TC39512	23.40
1/4	1/4	3/4	2-1/2	TC30516	20.30	TC39516	25.15
5/16	5/16	13/16	2-1/2	TC30520	24.55	TC39520	30.40
3/8	3/8	1	2-1/2	TC30524	32.85	TC39524	39.70
1/2	1/2	1-1/4	3	TC30532	56.05	TC39532	68.35
$D_1^{+0.000}_{-0.003}$	$D_2 (h6)$	L_2	L_1	TOOL #	PRICE	TOOL #	PRICE
5/8	5/8	1-5/8	3-1/2	TC30540	111.65	TC39540	126.90
3/4	3/4	1-5/8	4	TC30548	156.75	TC39548	174.95

GENERAL PURPOSE END MILLS - CARBIDE

3 Flute - Corner Radius - 60° Helix

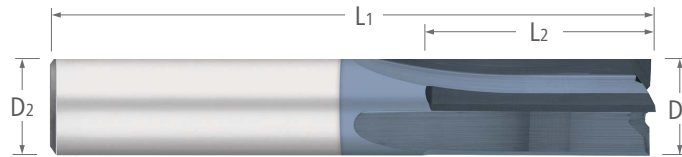


- "High shear" geometry for slotting and profiling
- Proven performance in high-temp alloys such as Inconel, hastelloy, waspalloy, and titanium
- Corner radius for increased edge strength
- 60° helix for improved surface finish
- AlTiN coating offers increased wear and heat resistance
- Solid carbide
- Precision manufactured in the USA

CUTTER DIA.	SHANK DIA.	RADIUS	LOC	OAL	UNCOATED		AlTiN COATED	
$D_1 \begin{smallmatrix} +.000" \\ -.002" \end{smallmatrix}$	$D_2 \text{ (h6)}$	$R \begin{smallmatrix} +.001" \\ -.001" \end{smallmatrix}$	L_2	L_1	TOOL #	PRICE	TOOL #	PRICE
1/8	1/8	.010	1/2	1-1/2	TC30608	17.65	TC39608	21.90
3/16	3/16	.010	5/8	2	TC30612	21.15	TC39612	26.10
1/4	1/4	.020	3/4	2-1/2	TC30616	22.70	TC39616	28.05
5/16	5/16	.020	13/16	2-1/2	TC30620	27.40	TC39620	35.00
3/8	3/8	.020	1	2-1/2	TC30624	36.75	TC39624	45.80
1/2	1/2	.040	1-1/4	3	TC30632	62.70	TC39632	74.95
$D_1 \begin{smallmatrix} +.000" \\ -.003" \end{smallmatrix}$	$D_2 \text{ (h6)}$	$R \begin{smallmatrix} +.001" \\ -.001" \end{smallmatrix}$	L_2	L_1	TOOL #	PRICE	TOOL #	PRICE
5/8	5/8	.040	1-5/8	3-1/2	TC30640	119.25	TC39640	134.50
3/4	3/4	.040	1-5/8	4	TC30648	167.30	TC39648	185.50

GENERAL PURPOSE END MILLS - CARBIDE

4 Flute - Square - Straight Flute

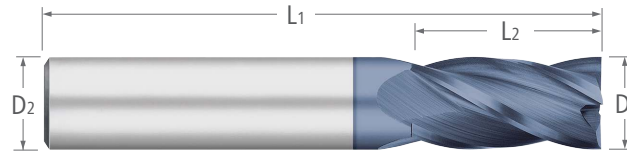
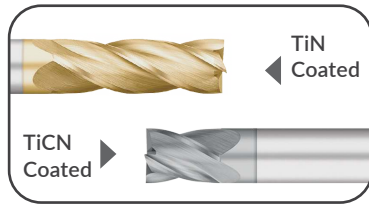


- Straight flute design for cutting high Rc materials
- Offered in regular length styles
- AlTiN coating offers increased wear and heat resistance
- Solid carbide
- Precision manufactured in the USA

CUTTER DIA.	SHANK DIA.	LOC	OAL	UNCOATED		AlTiN COATED	
$D1^{+.000}_{-.002}$	$D2 (h6)$	$L2$	$L1$	TOOL #	PRICE	TOOL #	PRICE
1/8	1/8	1/2	1-1/2	TC30720	9.50	TC30730	13.90
3/16	3/16	5/8	2	TC30721	13.05	TC30731	18.00
1/4	1/4	3/4	2-1/2	TC30722	15.95	TC30732	22.30
5/16	5/16	13/16	2-1/2	TC30723	20.90	TC30733	28.50
3/8	3/8	1	2-1/2	TC30724	24.80	TC30734	33.85
7/16	7/16	1	2-3/4	TC30725	38.10	TC30735	48.65
1/2	1/2	1-1/4	3	TC30726	46.00	TC30736	58.30
$D1^{+.000}_{-.003}$	$D2 (h6)$	$L2$	$L1$	TOOL #	PRICE	TOOL #	PRICE
5/8	5/8	1-1/4	3-1/2	TC30727	87.90	TC30737	103.15
3/4	3/4	1-1/2	4	TC30728	122.90	TC30738	141.10
1	1	1-1/2	4	TC30729	206.90	TC30739	233.20

GENERAL PURPOSE END MILLS - CARBIDE

4 Flute - Square - 30° Helix



- Offered in stub, regular, long, and extra long length styles
- TiN coating provides improved performance in a wide variety of materials, and generally used in applications with lower cutting speeds
- TiCN coating adds enhanced performance when AlTiN cannot be used
- AlTiN coating offers increased wear and heat resistance
- Solid carbide
- Precision manufactured in the USA

CUTTER DIA.	SHANK DIA.	LOC	OAL	UNCOATED		TiN COATED		TiCN COATED		AlTiN COATED	
D1 ^{+0.000"} -0.001"	D2 (h6)	L2	L1	TOOL #	PRICE	TOOL #	PRICE	TOOL #	PRICE	TOOL #	PRICE
1/64	1/8	.023	1-1/2	TC10601	16.20	TC95600	19.40	TC90901	19.75	TC10901	20.60
	1/8	1/32	1-1/2	TC10501	17.10	TC95636	20.30	TC90501	20.65	TC99501	21.80
1/32	1/8	1/16	1-1/2	TC10602	9.95	TC95601	13.15	TC90902	13.50	TC10902	13.10
	1/8	1/8	1-1/2	TC10502	11.40	TC95637	14.60	TC90502	14.95	TC99502	15.55
3/64	1/8	3/32	1-1/2	TC10603	9.95	TC95602	13.15	TC90903	13.50	TC10903	13.10
	1/8	1/8	1-1/2	TC10503	9.75	TC95638	12.95	TC90503	13.30	TC99503	13.30
1/16	1/8	1/8	1-1/2	TC10604	7.55	TC95603	10.75	TC90904	9.85	TC10904	9.85
	1/8	1/4	1-1/2	TC10504	9.80	TC95639	13.00	TC90504	11.30	TC99504	11.30
5/64	1/8	1/8	1-1/2	TC10605	12.70	TC95604	15.90	TC90905	16.25	TC10905	15.95
	1/8	1/4	1-1/2	TC10505	10.10	TC95640	13.30	TC90505	13.65	TC99505	13.70
3/32	1/8	3/16	1-1/2	TC10606	7.55	TC95605	10.75	TC90906	9.85	TC10906	9.85
	1/8	3/8	1-1/2	TC10506	8.95	TC95641	12.15	TC90506	11.30	TC99506	11.30
7/64	1/8	3/8	1-1/2	TC10507	9.30	TC95642	12.50	TC90507	12.55	TC99507	12.55

D1 ^{+0.000"} -0.002"	D2 (h6)	L2	L1	TOOL #	PRICE	TOOL #	PRICE	TOOL #	PRICE	TOOL #	PRICE
1/8	1/8	1/4	1-1/2	TC10608	7.25	TC95606	10.35	TC90908	9.40	TC10908	9.40
	1/8	1/2	1-1/2	TC10508	8.45	TC95643	11.65	TC90508	10.30	TC99508	10.50
	1/8	3/4	2-1/4	TC15508	13.75	TC95675	17.10	TC95508	17.55	TC15608	17.85
	1/8	1	3	TC17508	15.40	TC95689	18.75	TC97508	19.75	TC17608	20.10
9/64	3/16	9/16	2	TC10509	12.35	TC95644	15.95	TC90509	16.30	TC99509	17.00
5/32	3/16	5/16	2	TC10610	11.85	TC95607	15.45	TC90910	15.80	TC10910	14.80
	3/16	9/16	2	TC10510	12.60	TC95645	16.20	TC90510	14.60	TC99510	14.60
11/64	3/16	5/8	2	TC10511	11.95	TC95646	15.55	TC90511	15.90	TC99511	16.25
3/16	3/16	3/8	2	TC10612	11.15	TC95608	14.75	TC90912	14.00	TC10912	14.00
	3/16	5/8	2	TC10512	11.65	TC95647	15.25	TC90512	14.60	TC99512	14.60
	3/16	3/4	2-1/2	TC15512	17.30	TC95676	21.10	TC95512	20.90	TC15612	20.90
	3/16	1-1/8	3	TC17512	16.75	TC95690	20.55	TC97512	21.00	TC17612	21.55
13/64	1/4	5/8	2-1/2	TC10513	16.95	TC95648	21.55	TC90513	22.00	TC99513	22.35
7/32	1/4	7/16	2	TC10614	15.00	TC95609	19.30	TC90914	18.80	TC10914	18.80
	1/4	5/8	2-1/2	TC10514	17.25	TC95649	21.85	TC90514	20.25	TC99514	20.25
15/64	1/4	3/4	2-1/2	TC10515	19.55	TC95650	24.15	TC90515	24.60	TC99515	25.35
1/4	1/4	1/2	2	TC10616	13.15	TC95610	17.15	TC90916	16.45	TC10916	16.45
	1/4	3/4	2-1/2	TC10516	14.25	TC95651	18.85	TC90516	19.30	TC99516	20.25
	1/4	1	4	TC15517	24.30	TC95678	29.20	TC95517	29.80	TC15617	31.10
	1/4	1-1/8	3	TC15516	23.05	TC95677	27.65	TC95516	28.35	TC15616	29.40
	1/4	1-1/2	4	TC17516	25.10	TC95691	30.00	TC97516	30.65	TC17616	31.90
	1/4	1-1/2	6	TC17517	32.05	TC95692	37.75	TC97517	38.35	TC17617	39.95
17/64	5/16	3/4	2-1/2	TC10517	25.70	TC95652	31.15	TC90517	31.75	TC99517	33.30
9/32	5/16	3/4	2-1/2	TC10518	25.70	TC95653	31.15	TC90518	31.75	TC99518	33.30

For technical information, see page 103

continued on next page

GENERAL PURPOSE END MILLS - CARBIDE

4 Flute- Square - 30° Helix (Cont.)

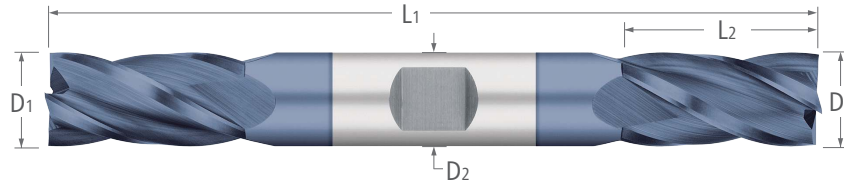
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CUTTER DIA.	SHANK DIA.	LOC	OAL	UNCOATED		TiN COATED		TiCN COATED		AlTiN COATED	
D ₁ ^{+0.000} _{-0.002} "	D ₂ (h6)	L ₂	L ₁	TOOL #	PRICE	TOOL #	PRICE	TOOL #	PRICE	TOOL #	PRICE
19/64	5/16	13/16	2-1/2	TC10519	25.70	TC95654	31.15	TC90519	31.75	TC99519	33.30
5/16	5/16	1/2	2	TC10620	17.70	TC95611	22.90	TC90920	23.45	TC10920	23.30
	5/16	13/16	2-1/2	TC10520	18.70	TC95655	24.15	TC90520	24.20	TC99520	24.20
	5/16	1-1/8	3	TC15520	26.20	TC95679	31.65	TC95520	33.40	TC15620	33.80
	5/16	1-5/8	4	TC17520	32.15	TC95693	38.05	TC97520	39.50	TC17620	40.30
21/64	3/8	1	2-1/2	TC10521	29.00	TC95656	35.50	TC90521	36.20	TC99521	37.50
11/32	3/8	1	2-1/2	TC10522	29.00	TC95657	35.50	TC90522	36.20	TC99522	37.50
23/64	3/8	1	2-1/2	TC10523	29.00	TC95658	35.50	TC90523	36.20	TC99523	37.50
3/8	3/8	5/8	2	TC10624	23.05	TC95612	29.15	TC90924	29.85	TC10924	28.65
	3/8	1	2-1/2	TC10524	22.20	TC95659	28.70	TC90524	27.70	TC99524	27.70
	3/8	1	4	TC15525	35.00	TC95681	42.00	TC95525	42.75	TC15625	44.70
	3/8	1-1/8	3	TC15524	30.00	TC95680	36.50	TC95524	38.35	TC15624	39.05
	3/8	1-1/2	6	TC17525	55.50	TC95695	63.65	TC97525	67.85	TC17625	67.85
	3/8	1-3/4	4	TC17524	36.65	TC95694	43.75	TC97524	44.55	TC17624	46.35
25/64	7/16	1	2-3/4	TC10525	38.00	TC95660	45.60	TC90525	46.45	TC99525	48.55
13/32	7/16	1	2-3/4	TC10526	38.00	TC95661	45.60	TC90526	46.45	TC99526	48.55
27/64	7/16	1	2-3/4	TC10527	39.15	TC95662	46.75	TC90527	48.05	TC99527	49.70
7/16	7/16	5/8	2-1/2	TC10628	28.70	TC95613	36.30	TC90928	37.15	TC10928	35.80
	7/16	1	2-3/4	TC10528	34.05	TC95663	41.65	TC90528	42.50	TC99528	42.30
	7/16	2	4	TC15528	47.30	TC95682	55.40	TC95528	58.25	TC15628	58.55
	7/16	3	6	TC17528	74.80	TC95696	84.25	TC97528	86.20	TC17628	90.95
29/64	1/2	1	3	TC10529	56.40	TC95664	65.25	TC90529	66.20	TC99529	68.70
15/32	1/2	1	3	TC10530	56.40	TC95665	65.25	TC90530	66.20	TC99530	68.70
31/64	1/2	1	3	TC10531	56.40	TC95666	65.25	TC90531	66.20	TC99531	68.70
1/2	1/2	5/8	2-1/2	TC10632	36.30	TC95614	45.15	TC90932	45.40	TC10932	45.40
	1/2	1	3	TC10532	41.00	TC95667	49.85	TC90532	50.80	TC99532	51.50
	1/2	1	4	TC15532	52.60	TC95683	62.10	TC95532	64.25	TC15632	65.80
	1/2	1-1/4	3	TC10533	41.00	TC95668	49.85	TC90533	50.80	TC99533	51.50
	1/2	1-1/2	6	TC17532	84.10	TC95697	95.15	TC97532	96.35	TC17632	99.45
	1/2	2	4	TC15533	55.70	TC95684	65.20	TC95533	67.85	TC15633	68.90
	1/2	3	6	TC17533	88.65	TC95698	99.65	TC97533	103.45	TC17633	104.00
	1/2	3	6	TC17533	88.65	TC95698	99.65	TC97533	103.45	TC17633	104.00
D ₁ ^{+0.000} _{-0.003} "	D ₂ (h6)	L ₂	L ₁	TOOL #	PRICE	TOOL #	PRICE	TOOL #	PRICE	TOOL #	PRICE
9/16	9/16	1-1/4	3-1/2	TC10536	77.20	TC95669	88.15	TC90536	97.20	TC99536	97.20
5/8	5/8	3/4	3	TC10640	76.75	TC95615	87.00	TC90942	88.15	TC10940	91.05
	5/8	1-1/4	3-1/2	TC10540	78.50	TC95670	89.45	TC90540	94.90	TC99540	94.90
	5/8	2-1/4	5	TC15540	120.50	TC95685	132.35	TC95540	142.05	TC15640	142.05
	5/8	3	6	TC17540	130.00	TC95699	142.80	TC97540	152.30	TC17640	152.30
3/4	3/4	1	3	TC10648	107.00	TC95616	119.25	TC90948	126.20	TC10948	126.20
	3/4	1-1/2	4	TC10548	109.70	TC95671	122.85	TC90548	134.65	TC99548	134.65
	3/4	2-1/4	5	TC15548	166.40	TC95686	180.50	TC95548	204.60	TC15648	204.60
	3/4	3	6	TC17548	194.10	TC95700	209.30	TC97548	226.20	TC17648	226.20
	3/4	4	7	TC17549	333.20	TC95701	349.75	TC97549	358.25	TC17649	358.25
	3/4	4	7	TC17549	333.20	TC95701	349.75	TC97549	358.25	TC17649	358.25
7/8	7/8	1-1/2	4	TC10556	201.65	TC95672	217.45	TC90556	242.05	TC99556	242.05
	7/8	2-1/4	5	TC15556	315.35	TC95687	332.40	TC95556	334.25	TC15656	339.00
	7/8	3	6	TC17556	345.65	TC95702	364.05	TC97556	366.10	TC17656	409.80
1	1	1-1/4	3-1/2	TC10664	177.10	TC95617	196.00	TC90964	198.15	TC10964	209.45
	1	1-1/2	4	TC10564	184.70	TC95673	203.60	TC90564	225.15	TC99564	225.15
	1	2-1/4	5	TC15564	227.85	TC95688	248.25	TC95564	250.50	TC15664	280.20
	1	3	6	TC17564	328.00	TC95703	350.05	TC97564	384.15	TC17664	384.15
	1	4	7	TC17565	429.95	TC95704	453.90	TC97565	502.95	TC17665	502.95
	1	4	7	TC17565	429.95	TC95704	453.90	TC97565	502.95	TC17665	502.95
1-1/4	1-1/4	2	4-1/2	TC10580	630.80	TC95674	654.85	TC90580	657.55	TC99580	664.20

For technical information, see page 106

GENERAL PURPOSE END MILLS - CARBIDE

4 Flute - Square - 30° Helix - Double-Ended



- Double-ended
- Offered in stub and regular length styles
- AlTiN coating offers increased wear and heat resistance
- Solid carbide
- Precision manufactured in the USA

CUTTER DIA.	SHANK DIA.	LENGTH OF CUT	OAL	UNCOATED		AlTiN COATED	
$D1^{+.0001}_{-.002}$	D2 (h6)	L2	L1	TOOL #	PRICE	TOOL #	PRICE
1/16	1/8	1/8	1-1/2	TC14504	15.25	TC14904	19.70
3/32	1/8	3/16	1-1/2	TC14506	15.70	TC14906	20.20
1/8	1/8	1/4	1-1/2	TC14508	12.70	TC14908	17.10
	3/8	3/8	3-1/8	TC12508*	56.90	TC12608*	67.50
5/32	3/16	5/16	2	TC14510	17.80	TC14910	22.85
	3/8	7/16	3-1/4	TC12510*	56.90	TC12610*	67.50
3/16	3/16	3/8	2	TC14512	17.80	TC14912	22.85
	3/8	1/2	3-1/4	TC12512*	56.90	TC12612*	67.50
7/32	1/4	1/2	2-1/2	TC14514	24.50	TC14914	30.85
	3/8	9/16	3-1/2	TC12514*	57.75	TC12614*	69.10
1/4	1/4	1/2	2-1/2	TC14516	24.50	TC14916	30.85
	3/8	5/8	3-1/2	TC12516*	57.75	TC12616*	71.50
9/32	3/8	11/16	3-1/2	TC12518*	59.20	TC12618*	74.15
5/16	5/16	1/2	2-1/2	TC14520	31.70	TC14920	39.15
	3/8	3/4	3-1/2	TC12520*	59.20	TC12620*	74.15
11/32	3/8	3/4	3-1/2	TC12522*	59.20	TC12622*	74.15
3/8	3/8	9/16	2-1/2	TC14524	34.90	TC14924	43.20
	3/8	3/4	3-1/2	TC12524*	59.20	TC12624*	74.15
7/16	7/16	9/16	2-3/4	TC14528	49.35	TC14928	59.85
	1/2	7/8	4	TC12528*	85.90	TC12628*	110.35
1/2	1/2	5/8	3	TC14532	60.35	TC14932	77.55
	1/2	1	4	TC12532*	96.45	TC12632*	123.95

*Includes weldon flat

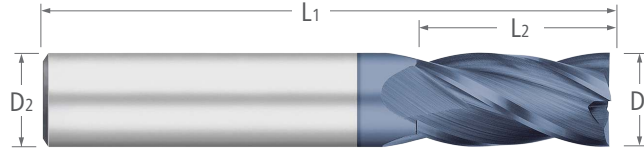


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GENERAL PURPOSE END MILLS - CARBIDE

4 Flute - Square - 30° Helix - Metric



- Offered in stub, regular, long, and extra long length styles
- AlTiN coating offers increased wear and heat resistance
- Solid carbide
- Precision manufactured in the USA

CUTTER DIA.	SHANK DIA.	LENGTH OF CUT	OAL	UNCOATED		AlTiN COATED	
$D_1^{+0.00 \text{ mm}}_{-0.05 \text{ mm}}$	$D_2 \text{ (h6)}$	L_2	L_1	TOOL #	PRICE	TOOL #	PRICE
1.0 mm	3 mm	3 mm	38 mm	TC11859	14.30	TC11959	18.10
1.5 mm	3 mm	4.5 mm	38 mm	TC11860	14.30	TC11960	18.10
2.0 mm	3 mm	6.3 mm	38 mm	TC11861	14.30	TC11961	18.10
2.5 mm	3 mm	9.5 mm	38 mm	TC11862	14.30	TC11962	18.10
3.0 mm	3 mm	6 mm	38 mm	TC82500	14.30	TC82509	18.70
	3 mm	12 mm	38 mm	TC11863	14.30	TC11963	18.10
	3 mm	18 mm	50 mm	TC82518	14.75	TC82534	19.15
	3 mm	25 mm	63 mm	TC82550	14.75	TC82565	19.45
3.5 mm	4 mm	12 mm	50 mm	TC11864	17.65	TC11964	21.55
4.0 mm	4 mm	8 mm	50 mm	TC82501	17.65	TC82510	22.60
	4 mm	14 mm	50 mm	TC11865	17.65	TC11965	22.30
	4 mm	20 mm	63 mm	TC82519	17.95	TC82535	23.25
	4 mm	25 mm	63 mm	TC82551	17.95	TC82566	23.25
4.5 mm	6 mm	16 mm	50 mm	TC11866	21.60	TC11966	27.25
5.0 mm	6 mm	10 mm	50 mm	TC82502	21.60	TC82511	27.55
	6 mm	16 mm	50 mm	TC11867	21.60	TC11967	27.25
	6 mm	25 mm	63 mm	TC82520	21.95	TC82536	28.30
	6 mm	32 mm	63 mm	TC82552	21.95	TC82567	28.30
5.5 mm	6 mm	16 mm	50 mm	TC11881	21.60	TC11981	27.25
6.0 mm	6 mm	12 mm	50 mm	TC82503	22.60	TC82512	28.60
	6 mm	19 mm	50 mm	TC11868	22.70	TC11968	28.50
	6 mm	25 mm	63 mm	TC82521	23.15	TC82537	29.50
	6 mm	32 mm	63 mm	TC82553	23.15	TC82568	29.50
6.5 mm	8 mm	19 mm	63 mm	TC11882	24.70	TC11982	31.00
7.0 mm	8 mm	19 mm	63 mm	TC11869	24.70	TC11969	31.00
7.5 mm	8 mm	19 mm	63 mm	TC11883	25.50	TC11983	32.25
8.0 mm	8 mm	12 mm	50 mm	TC82504	25.50	TC82513	34.00
	8 mm	20 mm	63 mm	TC11870	25.50	TC11970	32.25
	8 mm	26 mm	63 mm	TC82522	25.80	TC82538	34.85
	8 mm	32 mm	63 mm	TC82523	25.80	TC82539	34.85
	8 mm	38 mm	75 mm	TC82554	25.80	TC82569	34.85
	8 mm	45 mm	100 mm	TC82555	26.95	TC82570	36.65

continued on next page

GENERAL PURPOSE END MILLS - CARBIDE

4 Flute - Square - 30° Helix - Metric (Cont.)

continued from previous page

CUTTER DIA.	SHANK DIA.	LENGTH OF CUT	OAL	UNCOATED		AlTiN COATED	
D ₁ +0.00 mm -0.05 mm	D ₂ (h6)	L ₂	L ₁	TOOL #	PRICE	TOOL #	PRICE
9.0 mm	10 mm	22 mm	75 mm	TC11871	37.30	TC11971	47.15
10.0 mm	10 mm	16 mm	50 mm	TC82505	47.25	TC82514	57.15
	10 mm	22 mm	75 mm	TC11872	47.45	TC11972	57.95
	10 mm	28 mm	75 mm	TC82524	47.25	TC82540	57.75
	10 mm	34 mm	75 mm	TC82525	47.65	TC82541	58.20
	10 mm	40 mm	75 mm	TC82556	47.65	TC82571	58.20
	10 mm	45 mm	100 mm	TC82557	49.40	TC82572	60.65
11.0 mm	12 mm	25 mm	75 mm	TC11873	52.05	TC11973	64.35
12.0 mm	12 mm	16 mm	63 mm	TC82506	54.00	TC82515	66.30
	12 mm	25 mm	75 mm	TC11874	54.00	TC11974	66.30
	12 mm	35 mm	75 mm	TC82526	54.00	TC82542	66.30
	12 mm	50 mm	100 mm	TC82527	55.75	TC82543	68.95
	12 mm	63 mm	100 mm	TC82558	55.75	TC82573	68.95
	12 mm	75 mm	127 mm	TC82559	57.50	TC82574	71.65
14.0 mm	14 mm	18 mm	75 mm	TC82507	91.45	TC82516	105.75
	14 mm	32 mm	89 mm	TC11875	91.85	TC11975	108.90
	14 mm	50 mm	100 mm	TC82528	93.10	TC82544	108.35
	14 mm	75 mm	127 mm	TC82560	93.40	TC82575	109.85
16.0 mm	16 mm	20 mm	75 mm	TC82508	104.10	TC82517	121.10
	16 mm	32 mm	89 mm	TC11876	104.10	TC11976	124.10
	16 mm	50 mm	100 mm	TC82529	105.90	TC82545	124.10
	16 mm	75 mm	127 mm	TC82561	107.30	TC82576	126.85
18.0 mm	18 mm	38 mm	100 mm	TC11877	143.20	TC11977	169.75
	18 mm	50 mm	100 mm	TC82530	142.50	TC82546	160.70
	18 mm	75 mm	127 mm	TC82562	144.75	TC82577	164.30
20.0 mm	20 mm	38 mm	100 mm	TC11878	226.00	TC11978	269.20
	20 mm	50 mm	100 mm	TC82531	226.00	TC82547	247.95
	20 mm	63 mm	100 mm	TC82532	226.00	TC82548	247.95
	20 mm	75 mm	127 mm	TC82563	228.30	TC82578	251.95
25.0 mm	25 mm	38 mm	100 mm	TC11879	294.80	TC11979	321.10
	25 mm	50 mm	100 mm	TC82533	294.80	TC82549	321.10
	25 mm	75 mm	127 mm	TC82564	297.15	TC82579	325.50

End Mills

Roughers

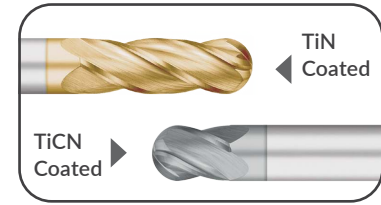
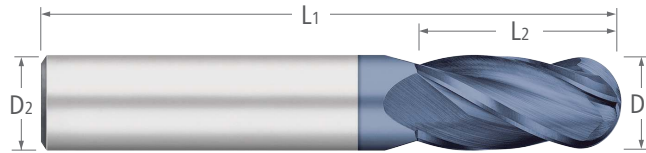
For Aluminum

Carbide

Cobalt

GENERAL PURPOSE END MILLS - CARBIDE

4 Flute - Ball - 30° Helix



- Offered in stub, regular, long, and extra long length styles
- TiN coating provides improved performance in a wide variety of materials, and generally used in applications with lower cutting speeds
- TiCN coating adds enhanced performance when AlTiN cannot be used
- AlTiN coating offers increased wear and heat resistance
- Solid carbide
- Precision manufactured in the USA

CUTTER DIA.	SHANK DIA.	LOC	OAL	UNCOATED		TiN COATED		TiCN COATED		AlTiN COATED	
D ₁ ^{+0.000} _{-0.001} "	D ₂ (h6)	L ₂	L ₁	TOOL #	PRICE	TOOL #	PRICE	TOOL #	PRICE	TOOL #	PRICE
1/64	1/8	.023	1-1/2	TC10701	20.35	TC95618	23.55	TC91701	23.90	TC11701	24.75
	1/8	1/32	1-1/2	TC11501	19.15	TC95705	22.35	TC91501	22.70	TC11601	23.55
1/32	1/8	1/16	1-1/2	TC10702	13.00	TC95619	16.20	TC91702	16.55	TC11702	16.75
	1/8	1/8	1-1/2	TC11502	12.25	TC95706	15.45	TC91502	15.80	TC11602	16.05
3/64	1/8	3/32	1-1/2	TC10703	13.00	TC95620	16.20	TC91703	16.55	TC11703	16.75
	1/8	1/8	1-1/2	TC11503	12.25	TC95707	15.45	TC91503	15.80	TC11603	16.05
1/16	1/8	1/8	1-1/2	TC10704	9.75	TC95621	12.95	TC91704	12.60	TC11704	12.60
	1/8	1/4	1-1/2	TC11504	11.40	TC95708	14.60	TC91504	14.95	TC11604	15.40
5/64	1/8	1/8	1-1/2	TC10705	15.75	TC95622	18.95	TC91705	19.30	TC11705	19.95
	1/8	1/4	1-1/2	TC11505	11.40	TC95709	14.60	TC91505	14.95	TC11605	15.40
3/32	1/8	3/16	1-1/2	TC10706	9.75	TC95623	12.95	TC91706	13.30	TC11706	12.60
	1/8	3/8	1-1/2	TC11506	11.95	TC95710	15.15	TC91506	15.50	TC11606	16.35
7/64	1/8	3/8	1-1/2	TC11507	11.95	TC95711	15.15	TC91507	15.50	TC11607	16.35

D ₁ ^{+0.000} _{-0.002} "	D ₂ (h6)	L ₂	L ₁	TOOL #	PRICE	TOOL #	PRICE	TOOL #	PRICE	TOOL #	PRICE
1/8	1/8	1/4	1-1/2	TC10708	9.25	TC95624	12.45	TC91708	12.80	TC11708	11.95
	1/8	1/2	1-1/2	TC11508	11.00	TC95712	14.20	TC91508	14.55	TC11608	14.90
	1/8	3/4	2-1/4	TC16508	16.25	TC95742	19.60	TC96508	20.00	TC16608	20.95
	1/8	1	3	TC18508	18.40	TC95756	21.75	TC98508	23.45	TC18608	23.10
9/64	3/16	9/16	2	TC11509	15.90	TC95713	19.55	TC91509	19.85	TC11609	20.85
5/32	3/16	5/16	2	TC10710	15.40	TC95625	19.00	TC91710	19.35	TC11710	19.95
	3/16	9/16	2	TC11510	15.90	TC95714	19.55	TC91510	19.85	TC11610	20.85
11/64	3/16	5/8	2	TC11511	15.90	TC95715	19.55	TC91511	19.85	TC11611	20.85
3/16	3/16	3/8	2	TC10712	14.50	TC95626	18.10	TC91712	18.45	TC11712	18.65
	3/16	5/8	2	TC11512	14.30	TC95716	17.90	TC91512	18.25	TC11612	19.25
	3/16	3/4	2-1/2	TC16512	18.85	TC95743	22.65	TC96512	23.10	TC16612	24.15
	3/16	1-1/8	3	TC18512	21.95	TC95757	25.75	TC98512	26.20	TC18612	26.00
13/64	1/4	5/8	2-1/2	TC11513	20.90	TC95717	25.50	TC91513	25.95	TC11613	26.65
7/32	1/4	7/16	2	TC10714	19.55	TC95627	23.85	TC91714	24.30	TC11714	25.10
	1/4	5/8	2-1/2	TC11514	20.90	TC95718	25.50	TC91514	25.95	TC11614	26.65
15/64	1/4	3/4	2-1/2	TC11515	20.90	TC95719	25.50	TC91515	25.95	TC11615	26.65
1/4	1/4	1/2	2	TC10716	18.60	TC95628	22.90	TC91716	23.35	TC11716	24.20
	1/4	3/4	2-1/2	TC11516	20.35	TC95720	24.95	TC91516	25.40	TC11616	25.35
	1/4	1	4	TC16517	29.10	TC95745	34.00	TC96517	34.50	TC16617	35.90
	1/4	1-1/8	3	TC16516	26.40	TC95744	31.00	TC96516	31.45	TC16616	32.75
	1/4	1-1/2	4	TC18516	32.10	TC95758	37.00	TC98516	36.10	TC18616	36.10
	1/4	1-1/2	6	TC18517	37.90	TC95759	43.60	TC98517	44.20	TC18617	44.80
17/64	5/16	3/4	2-1/2	TC11517	26.40	TC95721	31.85	TC91517	32.45	TC11617	34.00
9/32	5/16	3/4	2-1/2	TC11518	26.45	TC95722	31.90	TC91518	32.50	TC11618	34.05

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For technical information, see page 103

GENERAL PURPOSE END MILLS - CARBIDE

4 Flute - Ball - 30° Helix (Cont.)

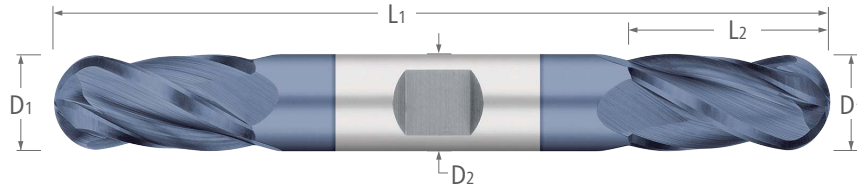
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CUTTER DIA.	SHANK DIA.	LOC	OAL	UNCOATED		TiN COATED		TiCN COATED		AlTiN COATED	
D ₁ ^{+0.000"} -0.002"	D ₂ (h6)	L ₂	L ₁	TOOL #	PRICE	TOOL #	PRICE	TOOL #	PRICE	TOOL #	PRICE
19/64	5/16	13/16	2-1/2	TC11519	28.70	TC95723	34.15	TC91519	34.75	TC11619	36.30
5/16	5/16	1/2	2	TC10720	23.05	TC95629	28.25	TC91720	28.80	TC11720	29.75
	5/16	13/16	2-1/2	TC11520	24.35	TC95724	29.80	TC91520	30.40	TC11620	31.55
	5/16	1-1/8	3	TC16520	31.00	TC95746	36.45	TC96520	39.95	TC16620	38.60
	5/16	1-5/8	4	TC18520	38.75	TC95760	44.65	TC98520	45.25	TC18620	46.90
	3/8	1	2-1/2	TC11521	33.35	TC95725	39.85	TC91521	40.55	TC11621	42.40
11/32	3/8	1	2-1/2	TC11522	35.05	TC95726	41.55	TC91522	42.25	TC11622	44.10
23/64	3/8	1	2-1/2	TC11523	33.35	TC95727	39.85	TC91523	40.55	TC11623	42.40
3/8	3/8	5/8	2	TC10724	29.80	TC95630	35.90	TC91724	36.60	TC11724	36.60
	3/8	1	2-1/2	TC11524	26.20	TC95728	32.70	TC91524	33.40	TC11624	35.25
	3/8	1	4	TC16525	43.90	TC95748	50.90	TC96525	51.65	TC16625	53.60
	3/8	1-1/8	3	TC16524	36.05	TC95747	42.55	TC96524	46.05	TC16624	45.10
	3/8	1-1/2	6	TC18525	59.10	TC95762	67.25	TC98525	68.20	TC18625	70.45
	3/8	1-3/4	4	TC18524	41.75	TC95761	48.75	TC98524	49.50	TC18624	51.45
25/64	7/16	1	2-3/4	TC11525	45.30	TC95729	52.90	TC91525	53.75	TC11625	55.85
13/32	7/16	1	2-3/4	TC11526	45.50	TC95730	53.10	TC91526	53.95	TC11626	56.05
27/64	7/16	1	2-3/4	TC11527	45.30	TC95731	52.90	TC91527	53.75	TC11627	55.85
7/16	7/16	5/8	2-1/2	TC10728	37.35	TC95631	44.95	TC91728	45.80	TC11728	45.80
	7/16	1	2-3/4	TC11528	38.50	TC95732	46.10	TC91528	46.95	TC11628	49.05
	7/16	2	4	TC16528	59.95	TC95749	68.05	TC96528	68.95	TC16628	71.20
	7/16	3	6	TC18528	88.30	TC95763	97.75	TC98528	98.80	TC18628	108.00
29/64	1/2	1	3	TC11529	59.65	TC95733	68.50	TC91529	69.45	TC11629	71.95
15/32	1/2	1	3	TC11530	59.65	TC95734	68.50	TC91530	69.45	TC11630	71.95
31/64	1/2	1	3	TC11531	59.65	TC95735	68.50	TC91531	69.45	TC11631	71.95
1/2	1/2	5/8	2-1/2	TC10732	46.80	TC95632	55.65	TC91733	56.60	TC11732	59.10
	1/2	1	3	TC11532	53.10	TC95736	61.95	TC91532	62.90	TC11632	65.40
	1/2	1	4	TC16532	61.40	TC95750	70.90	TC96532	71.95	TC16632	74.60
	1/2	1-1/2	6	TC18532	94.10	TC95764	105.15	TC98532	114.25	TC18632	109.45
	1/2	2	4	TC16533	62.00	TC95751	71.50	TC96533	72.55	TC16633	75.20
	1/2	3	6	TC18533	94.60	TC95765	105.65	TC98533	109.90	TC18633	109.95
D ₁ ^{+0.000"} -0.003"	D ₂ (h6)	L ₂	L ₁	TOOL #	PRICE	TOOL #	PRICE	TOOL #	PRICE	TOOL #	PRICE
9/16	9/16	1-1/4	3-1/2	TC11536	80.90	TC95737	91.85	TC91536	93.15	TC11636	96.15
5/8	5/8	3/4	3	TC10740	89.55	TC95633	99.80	TC91740	100.95	TC11740	103.85
	5/8	1-1/4	3-1/2	TC11540	85.45	TC95738	96.40	TC91540	97.70	TC11640	100.70
	5/8	2-1/4	5	TC16540	142.00	TC95752	153.85	TC96540	155.15	TC16640	171.00
	5/8	3	6	TC18540	148.45	TC95766	161.25	TC98540	162.70	TC18640	166.20
3/4	3/4	1	3	TC10748	136.70	TC95634	148.95	TC91748	150.25	TC11748	166.05
	3/4	1-1/2	4	TC11548	125.90	TC95739	139.05	TC91548	156.25	TC11648	156.25
	3/4	2-1/4	5	TC16548	196.85	TC95753	210.95	TC96548	212.50	TC16648	237.55
	3/4	3	6	TC18548	210.60	TC95767	225.80	TC98548	270.90	TC18648	270.90
	3/4	4	7	TC18549	348.45	TC95768	365.00	TC98549	366.85	TC18649	371.45
7/8	7/8	1-1/2	4	TC11556	243.70	TC95740	259.50	TC91556	261.25	TC11656	295.10
	7/8	2-1/4	5	TC16556	338.25	TC95754	355.30	TC96556	357.15	TC16656	361.90
	7/8	3	6	TC18556	372.65	TC95769	391.05	TC98556	393.10	TC18656	398.25
1	1	1-1/4	3-1/2	TC10764	210.85	TC95635	229.75	TC91764	231.90	TC11764	237.15
	1	1-1/2	4	TC11564	224.75	TC95741	243.65	TC91564	245.80	TC11664	276.00
	1	2-1/4	5	TC16564	389.45	TC95755	409.85	TC96564	412.10	TC16664	456.35
	1	3	6	TC18564	375.70	TC95770	397.75	TC98564	400.25	TC18664	461.00
	1	4	7	TC18565	456.60	TC95771	480.55	TC98565	483.20	TC18665	489.85

For technical information, see page 103

GENERAL PURPOSE END MILLS - CARBIDE

4 Flute - Ball - 30° Helix - Double-Ended



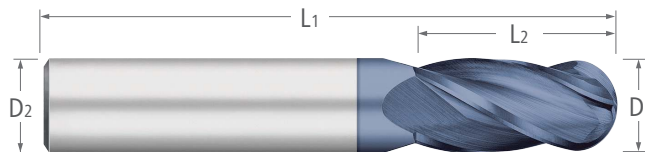
- Double-ended
- Offered in stub and regular length styles
- AlTiN coating offers increased wear and heat resistance
- Solid carbide
- Precision manufactured in the USA

CUTTER DIA.	SHANK DIA.	LENGTH OF CUT	OAL	UNCOATED		AlTiN COATED	
$D_1^{+0.000}_{-0.002}$	D_2 (h6)	L_2	L_1	TOOL #	PRICE	TOOL #	PRICE
1/16	1/8	1/8	1-1/2	TC14604	19.05	TC14704	24.55
3/32	1/8	3/16	1-1/2	TC14606	19.60	TC14706	25.20
1/8	1/8	1/4	1-1/2	TC14608	15.85	TC14708	20.35
	3/8	3/8	3-1/8	TC13508*	64.70	TC13608*	79.25
5/32	3/16	5/16	2	TC14610	22.30	TC14710	27.40
	3/8	7/16	3-1/4	TC13510*	64.70	TC13610*	79.25
3/16	3/16	3/8	2	TC14612	22.30	TC14712	27.40
	3/8	1/2	3-1/4	TC13512*	64.70	TC13612*	79.25
7/32	1/4	1/2	2-1/2	TC14614	29.20	TC14714	37.60
	3/8	9/16	3-1/2	TC13514*	65.50	TC13614*	80.05
1/4	1/4	1/2	2-1/2	TC14616	29.20	TC14716	37.60
	3/8	5/8	3-1/2	TC13516*	65.50	TC13616*	80.05
9/32	3/8	11/16	3-1/2	TC13518*	71.75	TC13618*	86.30
5/16	5/16	1/2	2-1/2	TC14620	39.60	TC14720	47.20
	3/8	3/4	3-1/2	TC13520*	71.75	TC13620*	92.25
11/32	3/8	3/4	3-1/2	TC13522*	71.75	TC13622*	86.30
3/8	3/8	9/16	2-1/2	TC14624	43.65	TC14724	52.75
	3/8	3/4	3-1/2	TC13524*	71.75	TC13624*	92.25
7/16	7/16	9/16	2-3/4	TC14628	61.65	TC14728	72.20
	1/2	7/8	4	TC13528*	103.90	TC13628*	123.65
1/2	1/2	5/8	3	TC14632	75.40	TC14732	93.85
	1/2	1	4	TC13532	106.20	TC13632	136.45

*Includes weldon flat

GENERAL PURPOSE END MILLS - CARBIDE

4 Flute - Ball - 30° Helix - Metric



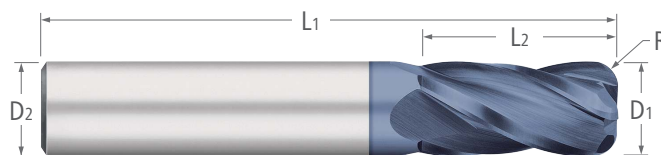
- Regular length for versatility
- AlTiN coating offers increased wear and heat resistance
- Solid carbide
- Precision manufactured in the USA

CUTTER DIA.	SHANK DIA.	LENGTH OF CUT	OAL	UNCOATED		AlTiN COATED	
$D1^{+0.00}_{-0.05} \text{ mm}$	$D2 \text{ (h6)}$	$L2$	$L1$	TOOL #	PRICE	TOOL #	PRICE
1.0 mm	3 mm	3 mm	38 mm	TC12701	16.25	TC12802	20.65
1.5 mm	3 mm	4.5 mm	38 mm	TC12703	16.25	TC12804	20.65
2.0 mm	3 mm	6.3 mm	38 mm	TC12705	16.25	TC12806	20.65
2.5 mm	3 mm	9.5 mm	38 mm	TC12707	16.25	TC12808	20.65
3.0 mm	3 mm	12 mm	38 mm	TC12709	16.25	TC12810	20.65
3.5 mm	4 mm	12 mm	50 mm	TC12711	20.00	TC12812	24.95
4.0 mm	4 mm	14 mm	50 mm	TC12713	20.00	TC12814	24.95
4.5 mm	6 mm	16 mm	50 mm	TC12715	24.55	TC12816	30.50
5.0 mm	6 mm	16 mm	50 mm	TC12717	24.55	TC12818	30.50
5.5 mm	6 mm	16 mm	50 mm	TC12719	24.55	TC12820	30.50
6.0 mm	6 mm	19 mm	50 mm	TC12721	25.60	TC12822	31.55
6.5 mm	8 mm	19 mm	63 mm	TC12723	29.10	TC12824	35.85
7.0 mm	8 mm	19 mm	63 mm	TC12725	29.10	TC12826	35.85
7.5 mm	8 mm	19 mm	63 mm	TC12727	30.30	TC12828	37.35
8.0 mm	8 mm	20 mm	63 mm	TC12729	30.40	TC12830	37.35
9.0 mm	10 mm	22 mm	75 mm	TC12731	42.35	TC12832	52.90
10.0 mm	10 mm	22 mm	75 mm	TC12733	55.45	TC12834	66.00
11.0 mm	12 mm	25 mm	75 mm	TC12735	59.15	TC12836	71.45
12.0 mm	12 mm	25 mm	75 mm	TC12737	61.65	TC12838	73.95
14.0 mm	14 mm	32 mm	89 mm	TC12739	104.25	TC12840	119.50
16.0 mm	16 mm	32 mm	89 mm	TC12741	118.30	TC12842	136.50
18.0 mm	18 mm	38 mm	100 mm	TC12743	161.80	TC12844	180.00
20.0 mm	20 mm	38 mm	100 mm	TC12745	256.70	TC12846	278.65
25.0 mm	25 mm	38 mm	100 mm	TC12747	334.80	TC12848	361.10

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GENERAL PURPOSE END MILLS - CARBIDE

4 Flute - Corner Radius - 30° Helix



- Offered in stub, regular, long, and extra long length styles
- Corner radius for increased edge strength
- AlTiN coating offers increased wear and heat resistance
- Solid carbide
- Precision manufactured in the USA

CUTTER DIA.	SHANK DIA.	RADIUS	LENGTH OF CUT	OAL	UNCOATED		AlTiN COATED	
$D1^{+.000"}_{- .002"}$	$D2 (h6)$	$R^{+.001"}_{- .001"}$	$L2$	$L1$	TOOL #	PRICE	TOOL #	PRICE
1/8	1/8	.005	1/4	1-1/2	TC73802	9.25	TC73902	16.20
	1/8	.005	1/2	1-1/2	TC74001	12.70	TC74102	18.75
	1/8	.005	3/4	2-1/4	TC74366	17.30	TC74466	22.00
	1/8	.005	1	3	TC74580	19.60	TC74680	24.30
	1/8	.010	1/4	1-1/2	TC73803	9.25	TC73903	16.20
	1/8	.010	1/2	1-1/2	TC74002	12.70	TC74103	18.75
	1/8	.010	3/4	2-1/4	TC74367	17.30	TC74467	21.85
	1/8	.010	1	3	TC74581	19.60	TC74681	24.30
	1/8	.015	1/4	1-1/2	TC73804	9.25	TC73904	16.20
	1/8	.015	1/2	1-1/2	TC74003	12.70	TC74104	18.75
	1/8	.015	3/4	2-1/4	TC74301	17.30	TC74401	21.85
	1/8	.015	1	3	TC74501	19.60	TC74601	23.85
	1/8	.020	1/4	1-1/2	TC73806	9.25	TC73906	16.20
	1/8	.020	1/2	1-1/2	TC74005	12.70	TC74106	18.75
	1/8	.020	3/4	2-1/4	TC74302	17.30	TC74402	21.85
	1/8	.020	1	3	TC74502	19.60	TC74602	24.30
	1/8	.030	1/4	1-1/2	TC73808	9.25	TC73908	16.20
	1/8	.030	1/2	1-1/2	TC74007	12.70	TC74108	18.75
	1/8	.030	3/4	2-1/4	TC74303	17.30	TC74403	21.85
	1/8	.030	1	3	TC74503	19.60	TC74603	24.30
3/16	3/16	.005	3/8	2	TC73809	14.50	TC73909	19.70
	3/16	.005	5/8	2	TC74008	13.85	TC74109	22.00
	3/16	.005	3/4	2-1/2	TC74368	20.00	TC74468	25.30
	3/16	.005	1-1/8	3	TC74582	21.50	TC74682	26.80
	3/16	.010	3/8	2	TC73811	14.50	TC73911	19.70
	3/16	.010	5/8	2	TC74010	13.85	TC74111	22.00
	3/16	.010	3/4	2-1/2	TC74369	20.00	TC74469	25.30
	3/16	.010	1-1/8	3	TC74583	21.50	TC74683	26.80
	3/16	.015	3/8	2	TC73810	14.50	TC73910	19.70
	3/16	.015	5/8	2	TC74009	13.85	TC74110	22.00
	3/16	.015	3/4	2-1/2	TC74304	20.00	TC74404	25.30
	3/16	.015	1-1/8	3	TC74504	21.50	TC74604	26.80
	3/16	.020	3/8	2	TC73812	14.50	TC73912	19.70
	3/16	.020	5/8	2	TC74011	13.85	TC74112	22.00
	3/16	.020	3/4	2-1/2	TC74305	20.00	TC74405	25.30
	3/16	.020	1-1/8	3	TC74505	21.50	TC74605	26.80
	3/16	.030	3/8	2	TC73814	14.50	TC73914	19.70
	3/16	.030	5/8	2	TC74013	13.85	TC74114	22.00
	3/16	.030	3/4	2-1/2	TC74306	20.00	TC74406	25.30
	3/16	.030	1-1/8	3	TC74506	21.50	TC74606	26.80

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GENERAL PURPOSE END MILLS - CARBIDE

4 Flute - Corner Radius - 30° Helix (Cont.)

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CUTTER DIA.	SHANK DIA.	RADIUS	LENGTH OF CUT	OAL	UNCOATED		AlTiN COATED	
D ₁ ^{+0.000"} _{-0.002"}	D ₂ (h6)	R ^{+0.001"} _{-0.001"}	L ₂	L ₁	TOOL #	PRICE	TOOL #	PRICE
1/4	1/4	.005	1/2	2	TC73815	18.55	TC73915	24.50
	1/4	.005	3/4	2-1/2	TC74014	18.50	TC74115	25.75
	1/4	.005	1	4	TC74372	29.40	TC74472	36.20
	1/4	.005	1-1/8	3	TC74370	28.05	TC74470	34.40
	1/4	.005	1-1/2	4	TC74584	29.95	TC74684	36.75
	1/4	.005	1-1/2	6	TC74586	40.20	TC74686	48.10
	1/4	.010	1/2	2	TC73817	18.55	TC73917	24.35
	1/4	.010	3/4	2-1/2	TC74016	18.50	TC74117	25.75
	1/4	.010	1	4	TC74373	29.40	TC74473	36.20
	1/4	.010	1-1/8	3	TC74371	28.05	TC74471	34.40
	1/4	.010	1-1/2	4	TC74585	29.95	TC74685	36.75
	1/4	.010	1-1/2	6	TC74587	40.20	TC74687	48.10
	1/4	.015	1/2	2	TC73816	18.55	TC73916	24.35
	1/4	.015	3/4	2-1/2	TC74015	18.50	TC74116	25.75
	1/4	.015	1	4	TC74312	29.40	TC74412	36.20
	1/4	.015	1-1/8	3	TC74307	28.05	TC74407	34.40
	1/4	.015	1-1/2	4	TC74507	29.95	TC74607	36.05
	1/4	.015	1-1/2	6	TC74512	40.20	TC74612	48.10
	1/4	.020	1/2	2	TC73818	18.55	TC73918	24.35
	1/4	.020	3/4	2-1/2	TC74017	18.50	TC74118	25.75
	1/4	.020	1	4	TC74313	29.40	TC74413	36.20
	1/4	.020	1-1/8	3	TC74308	28.05	TC74408	34.40
	1/4	.020	1-1/2	4	TC74508	29.95	TC74608	36.75
	1/4	.020	1-1/2	6	TC74513	40.20	TC74613	48.10
	1/4	.030	1/2	2	TC73820	18.55	TC73920	24.35
	1/4	.030	3/4	2-1/2	TC74019	18.50	TC74120	25.75
	1/4	.030	1	4	TC74314	29.40	TC74414	36.20
	1/4	.030	1-1/8	3	TC74309	28.05	TC74409	34.40
	1/4	.030	1-1/2	4	TC74509	29.95	TC74609	36.75
	1/4	.030	1-1/2	6	TC74514	40.20	TC74614	48.10
	1/4	.045	1/2	2	TC73822	18.55	TC73922	24.35
	1/4	.045	3/4	2-1/2	TC74021	18.50	TC74122	25.75
	1/4	.045	1	4	TC74315	29.40	TC74415	36.20
	1/4	.045	1-1/8	3	TC74310	28.05	TC74410	34.40
	1/4	.045	1-1/2	4	TC74510	29.95	TC74610	36.75
	1/4	.045	1-1/2	6	TC74515	40.20	TC74615	48.10
	1/4	.060	1/2	2	TC73824	18.55	TC73924	24.35
	1/4	.060	3/4	2-1/2	TC74023	18.50	TC74124	25.75
	1/4	.060	1	4	TC74316	29.40	TC74416	36.20
	1/4	.060	1-1/8	3	TC74311	28.05	TC74411	34.40
	1/4	.060	1-1/2	4	TC74511	29.95	TC74611	36.75
	1/4	.060	1-1/2	6	TC74516	40.20	TC74616	48.10
5/16	5/16	.015	1/2	2	TC73826	23.05	TC73926	30.30
	5/16	.015	13/16	2-1/2	TC74025	29.25	TC74126	36.55
	5/16	.015	1-1/8	3	TC74317	31.80	TC74417	39.40
	5/16	.015	1-5/8	4	TC74517	41.05	TC74617	49.20
	5/16	.020	1/2	2	TC73828	23.05	TC73928	30.30
	5/16	.020	13/16	2-1/2	TC74027	29.25	TC74128	36.55
	5/16	.020	1-1/8	3	TC74318	31.80	TC74418	39.40

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GENERAL PURPOSE END MILLS - CARBIDE

4 Flute - Corner Radius - 30° Helix (Cont.)

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CUTTER DIA.	SHANK DIA.	RADIUS	LENGTH OF CUT	OAL	UNCOATED		AlTiN COATED	
$D_1^{+.000^*}_{-.002^*}$	D ₂ (h6)	$R^{+.001^*}_{-.001^*}$	L ₂	L ₁	TOOL #	PRICE	TOOL #	PRICE
5/16	5/16	.020	1-5/8	4	TC74518	41.05	TC74618	49.20
	5/16	.030	1/2	2	TC73830	23.05	TC73930	30.30
	5/16	.030	13/16	2-1/2	TC74029	29.25	TC74130	36.55
	5/16	.030	1-1/8	3	TC74319	31.80	TC74419	39.40
	5/16	.030	1-5/8	4	TC74519	41.05	TC74619	49.20
	5/16	.045	1/2	2	TC73832	23.05	TC73932	30.30
	5/16	.045	13/16	2-1/2	TC74031	29.25	TC74132	36.55
	5/16	.045	1-1/8	3	TC74320	31.80	TC74420	39.40
	5/16	.045	1-5/8	4	TC74520	41.05	TC74620	49.20
	5/16	.060	1/2	2	TC73834	23.05	TC73934	30.30
	5/16	.060	13/16	2-1/2	TC74033	29.25	TC74134	36.55
	5/16	.060	1-1/8	3	TC74321	31.80	TC74421	39.40
	5/16	.060	1-5/8	4	TC74521	41.05	TC74621	49.20
3/8	3/8	.010	5/8	2	TC73835	29.80	TC73935	39.75
	3/8	.010	1	2-1/2	TC74034	34.70	TC74135	43.75
	3/8	.010	1	4	TC74375	49.95	TC74475	59.65
	3/8	.010	1-1/8	3	TC74374	40.85	TC74474	49.90
	3/8	.010	1-1/2	6	TC74589	63.55	TC74689	74.90
	3/8	.010	1-3/4	4	TC74588	44.80	TC74688	54.50
	3/8	.015	5/8	2	TC73836	29.80	TC73936	39.75
	3/8	.015	1	2-1/2	TC74035	34.70	TC74136	43.75
	3/8	.015	1	4	TC74327	49.95	TC74427	59.65
	3/8	.015	1-1/8	3	TC74322	40.85	TC74422	49.90
	3/8	.015	1-1/2	6	TC74527	63.55	TC74627	75.70
	3/8	.015	1-3/4	4	TC74522	44.80	TC74622	54.50
	3/8	.020	5/8	2	TC73838	29.80	TC73938	39.75
	3/8	.020	1	2-1/2	TC74037	34.70	TC74138	43.75
	3/8	.020	1	4	TC74328	49.95	TC74428	59.65
	3/8	.020	1-1/8	3	TC74323	40.85	TC74423	49.90
	3/8	.020	1-1/2	6	TC74528	63.55	TC74628	75.70
	3/8	.020	1-3/4	4	TC74523	44.80	TC74623	54.50
	3/8	.030	5/8	2	TC73840	29.80	TC73940	39.75
	3/8	.030	1	2-1/2	TC74039	34.70	TC74140	43.75
	3/8	.030	1	4	TC74329	49.95	TC74429	59.65
	3/8	.030	1-1/8	3	TC74324	40.85	TC74424	49.90
	3/8	.030	1-1/2	6	TC74529	63.55	TC74629	75.70
	3/8	.030	1-3/4	4	TC74524	44.80	TC74624	54.50
	3/8	.045	5/8	2	TC73842	29.80	TC73942	39.75
	3/8	.045	1	2-1/2	TC74041	34.70	TC74142	43.75
	3/8	.045	1	4	TC74330	49.95	TC74430	59.65
	3/8	.045	1-1/8	3	TC74325	40.85	TC74425	49.90
	3/8	.045	1-1/2	6	TC74530	63.55	TC74630	75.70
	3/8	.045	1-3/4	4	TC74525	44.80	TC74625	54.50
	3/8	.060	5/8	2	TC73844	46.80	TC73944	42.15
	3/8	.060	1	2-1/2	TC74043	34.70	TC74144	43.75
	3/8	.060	1	4	TC74331	49.95	TC74431	59.65
	3/8	.060	1-1/8	3	TC74326	40.85	TC74426	49.90
	3/8	.060	1-1/2	6	TC74531	63.55	TC74631	75.70
	3/8	.060	1-3/4	4	TC74526	44.80	TC74626	54.50
	3/8	.090	5/8	2	TC73845	29.80	TC73945	39.75

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GENERAL PURPOSE END MILLS - CARBIDE

4 Flute - Corner Radius - 30° Helix (Cont.)

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CUTTER DIA.	SHANK DIA.	RADIUS	LENGTH OF CUT	OAL	UNCOATED		AlTiN COATED	
D ₁ ^{+.000"} - .002"	D ₂ (h6)	R ^{+.001"} - .001"	L ₂	L ₁	TOOL #	PRICE	TOOL #	PRICE
3/8	3/8	.090	1	2-1/2	TC74044	34.70	TC74145	43.75
	3/8	.125	5/8	2	TC73847	29.80	TC73947	39.75
	3/8	.125	1	2-1/2	TC74046	34.70	TC74147	43.75
1/2	1/2	.010	5/8	2-1/2	TC73849	46.80	TC73949	59.10
	1/2	.010	1	3	TC74048	59.40	TC74149	69.20
	1/2	.010	1	4	TC74376	70.15	TC74476	83.35
	1/2	.010	2	4	TC74590	96.25	TC74690	114.55
	1/2	.010	1-1/2	6	TC74377	74.80	TC74477	88.00
	1/2	.010	3	6	TC74591	100.95	TC74691	116.30
	1/2	.015	5/8	2-1/2	TC73846	46.80	TC73946	59.10
	1/2	.015	1	3	TC74045	59.40	TC74146	69.20
	1/2	.015	1	4	TC74332	70.15	TC74432	83.35
	1/2	.015	1-1/2	6	TC74532	96.25	TC74632	114.55
	1/2	.015	2	4	TC74339	74.80	TC74439	88.00
	1/2	.015	3	6	TC74539	100.95	TC74639	116.30
	1/2	.020	5/8	2-1/2	TC73848	46.80	TC73948	59.10
	1/2	.020	1	3	TC74047	59.40	TC74148	69.20
	1/2	.020	1	4	TC74333	70.15	TC74433	83.35
	1/2	.020	1-1/2	6	TC74533	96.25	TC74633	111.60
	1/2	.020	2	4	TC74340	74.80	TC74440	88.00
	1/2	.020	3	6	TC74540	100.95	TC74640	120.15
	1/2	.030	5/8	2-1/2	TC73850	46.80	TC73950	59.10
	1/2	.030	1	3	TC74049	59.40	TC74150	69.20
	1/2	.030	1	4	TC74334	70.15	TC74434	83.35
	1/2	.030	1-1/2	6	TC74534	96.25	TC74634	114.55
	1/2	.030	2	4	TC74341	74.80	TC74441	88.00
	1/2	.030	3	6	TC74541	100.95	TC74641	120.15
	1/2	.045	5/8	2-1/2	TC73852	46.80	TC73952	59.10
	1/2	.045	1	3	TC74051	59.40	TC74152	69.20
	1/2	.045	1	4	TC74335	70.15	TC74435	83.35
	1/2	.045	1-1/2	6	TC74535	96.25	TC74635	114.55
	1/2	.045	2	4	TC74342	74.80	TC74442	88.00
	1/2	.045	3	6	TC74542	100.95	TC74642	120.15
	1/2	.060	5/8	2-1/2	TC73854	46.80	TC73954	59.10
	1/2	.060	1	3	TC74053	59.40	TC74154	69.20
	1/2	.060	1	4	TC74336	70.15	TC74436	83.35
	1/2	.060	1-1/2	6	TC74536	96.25	TC74636	114.55
	1/2	.060	2	4	TC74343	74.80	TC74443	88.00
	1/2	.060	3	6	TC74543	100.95	TC74643	120.15
	1/2	.090	5/8	2-1/2	TC73856	46.80	TC73956	59.10
	1/2	.090	1	3	TC74055	59.40	TC74156	69.20
	1/2	.090	1	4	TC74337	70.15	TC74437	83.35
	1/2	.090	1-1/2	6	TC74537	96.25	TC74637	114.55
	1/2	.090	2	4	TC74344	74.80	TC74444	88.00
	1/2	.090	3	6	TC74544	100.95	TC74644	116.30
	1/2	.125	5/8	2-1/2	TC73858	46.80	TC73958	59.10
	1/2	.125	1	3	TC74057	59.40	TC74158	69.20
	1/2	.125	1	4	TC74338	70.15	TC74438	83.35
	1/2	.125	1-1/2	6	TC74538	96.25	TC74638	114.55
	1/2	.125	2	4	TC74345	74.80	TC74445	88.00
	1/2	.125	3	6	TC74545	100.95	TC74645	120.15

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GENERAL PURPOSE END MILLS - CARBIDE

4 Flute - Corner Radius - 30° Helix (Cont.)

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CUTTER DIA.	SHANK DIA.	RADIUS	LENGTH OF CUT	OAL	UNCOATED		AlTiN COATED	
D1 ^{+.000"} _{-.002"}	D2 (h6)	R ^{+.001"} _{-.001"}	L2	L1	TOOL #	PRICE	TOOL #	PRICE
5/8	5/8	.015	3/4	3	TC73860	89.55	TC73960	103.85
	5/8	.015	1-1/4	3-1/2	TC74059	92.10	TC74160	107.35
	5/8	.015	2-1/4	5	TC74346	132.70	TC74446	149.75
	5/8	.015	3	6	TC74546	142.00	TC74646	160.30
	5/8	.020	3/4	3	TC73862	89.55	TC73962	103.85
	5/8	.020	1-1/4	3-1/2	TC74061	92.10	TC74162	107.35
	5/8	.020	2-1/4	5	TC74347	132.70	TC74447	149.15
	5/8	.020	3	6	TC74547	142.00	TC74647	160.30
	5/8	.030	3/4	3	TC73864	89.55	TC73964	103.85
	5/8	.030	1-1/4	3-1/2	TC74063	92.10	TC74164	107.35
	5/8	.030	2-1/4	5	TC74348	132.70	TC74448	149.75
	5/8	.030	3	6	TC74548	142.00	TC74648	160.30
	5/8	.045	3/4	3	TC73866	89.55	TC73966	103.85
	5/8	.045	1-1/4	3-1/2	TC74065	92.10	TC74166	107.35
	5/8	.045	2-1/4	5	TC74349	132.70	TC74449	149.75
	5/8	.045	3	6	TC74549	142.00	TC74649	159.75
	5/8	.060	3/4	3	TC73868	89.55	TC73968	103.85
	5/8	.060	1-1/4	3-1/2	TC74067	92.10	TC74168	107.35
	5/8	.060	2-1/4	5	TC74350	132.70	TC74450	149.75
	5/8	.060	3	6	TC74550	142.00	TC74650	159.75
	5/8	.090	3/4	3	TC73870	89.55	TC73970	103.85
	5/8	.090	1-1/4	3-1/2	TC74069	92.10	TC74170	107.35
	5/8	.090	2-1/4	5	TC74351	132.70	TC74451	149.15
	5/8	.090	3	6	TC74551	142.00	TC74651	159.75
3/4	3/4	.015	1	3	TC73872	136.15	TC73972	153.15
	3/4	.015	1-1/2	4	TC74071	136.30	TC74172	154.50
	3/4	.015	2-1/4	5	TC74352	185.00	TC74452	204.55
	3/4	.015	3	6	TC74552	198.10	TC74652	219.25
	3/4	.015	4	7	TC74559	320.10	TC74659	381.10
	3/4	.020	1	3	TC73874	136.15	TC73974	148.90
	3/4	.020	1-1/2	4	TC74073	136.30	TC74174	154.50
	3/4	.020	2-1/4	5	TC74353	185.00	TC74453	204.55
	3/4	.020	3	6	TC74553	198.10	TC74653	219.95
	3/4	.020	4	7	TC74560	320.10	TC74660	343.10
	3/4	.030	1	3	TC73876	136.15	TC73976	148.90
	3/4	.030	1-1/2	4	TC74075	136.30	TC74176	154.50
	3/4	.030	2-1/4	5	TC74354	185.00	TC74454	204.55
	3/4	.030	3	6	TC74554	198.10	TC74654	219.95
	3/4	.030	4	7	TC74561	320.10	TC74661	381.10
	3/4	.045	1	3	TC73878	136.15	TC73978	153.15
	3/4	.045	1-1/2	4	TC74077	136.30	TC74178	154.50
	3/4	.045	2-1/4	5	TC74355	185.00	TC74455	204.55
	3/4	.045	3	6	TC74555	198.10	TC74655	219.25
	3/4	.045	4	7	TC74562	320.10	TC74662	381.10
	3/4	.060	1	3	TC73880	136.15	TC73980	148.90
	3/4	.060	1-1/2	4	TC74079	136.30	TC74180	154.50
	3/4	.060	2-1/4	5	TC74356	185.00	TC74456	204.55
	3/4	.060	3	6	TC74556	198.10	TC74656	219.95
	3/4	.060	4	7	TC74563	320.10	TC74663	381.10
	3/4	.090	1	3	TC73882	136.15	TC73982	153.15

continued on next page

For technical information, see page 103

GENERAL PURPOSE END MILLS - CARBIDE

4 Flute - Corner Radius - 30° Helix (Cont.)

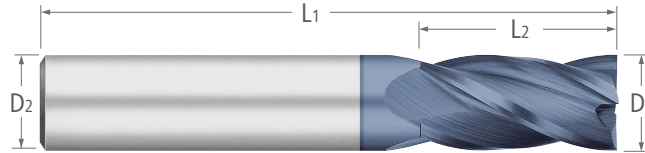
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CUTTER DIA.	SHANK DIA.	RADIUS	LENGTH OF CUT	OAL	UNCOATED		AlTiN COATED	
D1 ^{+.000"} _{-.003"}	D2 (h6)	R ^{+.001"} _{-.001"}	L2	L1	TOOL #	PRICE	TOOL #	PRICE
3/4	3/4	.090	1-1/2	4	TC74081	136.30	TC74182	154.50
	3/4	.090	2-1/4	5	TC74357	185.00	TC74457	204.55
	3/4	.090	3	6	TC74557	198.10	TC74657	219.25
	3/4	.090	4	7	TC74564	320.10	TC74664	381.10
	3/4	.125	1	3	TC73884	136.15	TC73984	148.90
	3/4	.125	1-1/2	4	TC74083	136.30	TC74184	154.50
	3/4	.125	2-1/4	5	TC74358	185.00	TC74458	204.55
	3/4	.125	3	6	TC74558	198.10	TC74658	219.95
	3/4	.125	4	7	TC74565	320.10	TC74665	381.10
	3/4	.250	1-1/2	4	TC74084	136.30	TC74185	154.50
	3/4	.250	2-1/4	5	TC74378	185.00	TC74478	204.55
	3/4	.250	3	6	TC74592	198.10	TC74692	219.95
1	1	.015	1-1/4	3-1/2	TC73886	210.85	TC73986	270.65
	1	.015	1-1/2	4	TC74085	257.90	TC74186	284.20
	1	.015	2-1/4	5	TC74359	271.30	TC74459	299.65
	1	.015	3	6	TC74566	334.55	TC74666	365.20
	1	.015	4	7	TC74573	457.95	TC74673	545.20
	1	.020	1-1/4	3-1/2	TC73888	210.85	TC73988	270.65
	1	.020	1-1/2	4	TC74087	257.90	TC74188	284.20
	1	.020	2-1/4	5	TC74360	271.30	TC74460	323.10
	1	.020	3	6	TC74567	334.55	TC74667	365.20
	1	.020	4	7	TC74574	457.95	TC74674	545.20
	1	.030	1-1/4	3-1/2	TC73890	210.85	TC73990	237.15
	1	.030	1-1/2	4	TC74089	257.90	TC74190	284.20
	1	.030	2-1/4	5	TC74361	271.30	TC74461	323.10
	1	.030	3	6	TC74568	334.55	TC74668	378.20
	1	.030	4	7	TC74575	457.95	TC74675	491.20
	1	.045	1-1/4	3-1/2	TC73892	210.85	TC73992	270.65
	1	.045	1-1/2	4	TC74091	257.90	TC74192	284.20
	1	.045	2-1/4	5	TC74362	271.30	TC74462	299.65
	1	.045	3	6	TC74569	334.55	TC74669	365.20
	1	.045	4	7	TC74576	457.95	TC74676	491.20
	1	.060	1-1/4	3-1/2	TC73894	210.85	TC73994	237.15
	1	.060	1-1/2	4	TC74093	257.90	TC74194	284.20
	1	.060	2-1/4	5	TC74363	271.30	TC74463	323.10
	1	.060	3	6	TC74570	334.55	TC74670	378.20
	1	.060	4	7	TC74577	457.95	TC74677	545.20
	1	.090	1-1/4	3-1/2	TC73896	210.85	TC73996	237.15
	1	.090	1-1/2	4	TC74095	257.90	TC74196	284.20
	1	.090	2-1/4	5	TC74364	271.30	TC74464	299.65
	1	.090	3	6	TC74571	334.55	TC74671	378.20
	1	.090	4	7	TC74578	457.95	TC74678	491.20
	1	.125	1-1/4	3-1/2	TC73898	210.85	TC73998	237.15
	1	.125	1-1/2	4	TC74097	257.90	TC74198	284.20
	1	.125	2-1/4	5	TC74365	271.30	TC74465	323.10
	1	.125	3	6	TC74572	334.55	TC74672	378.20
	1	.125	4	7	TC74579	457.95	TC74679	545.20

For technical information, see page 103

GENERAL PURPOSE END MILLS - CARBIDE

4 Flute - Square - 30° Helix - NC Tolerance

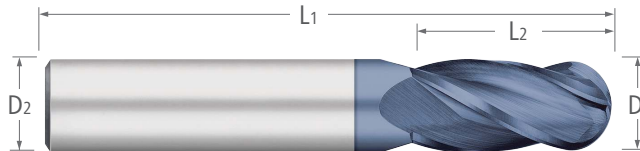


- Excellent for keyways
- Tight tolerance for precision machining
- AlTiN coating offers increased wear and heat resistance
- Solid carbide
- Precision manufactured in the USA

CUTTER DIA.	SHANK DIA.	LOC	OAL	UNCOATED		AlTiN COATED	
$D1^{+.001''}_{-.000''}$	D2 (h6)	L2	L1	TOOL #	PRICE	TOOL #	PRICE
1/16	1/8	3/16	1-1/2	TC65040	13.40	TC65060	17.80
3/32	1/8	3/8	1-1/2	TC65041	14.25	TC65061	18.65
1/8	1/8	1/2	1-1/2	TC65042	16.85	TC65062	21.25
5/32	3/16	9/16	2	TC65043	20.55	TC65063	25.50
3/16	3/16	5/8	2	TC65044	24.15	TC65064	29.10
7/32	1/4	5/8	2-1/2	TC65045	29.85	TC65065	36.20
1/4	1/4	3/4	2-1/2	TC65046	34.00	TC65066	40.35
9/32	5/16	3/4	2-1/2	TC65047	37.05	TC65067	44.65
5/16	5/16	13/16	2-1/2	TC65048	40.20	TC65068	47.80
3/8	3/8	1	2-1/2	TC65049	42.00	TC65069	51.05
7/16	7/16	1	2-3/4	TC65050	54.55	TC65070	65.10
1/2	1/2	1	3	TC65051	67.50	TC65071	79.80
5/8	5/8	1-1/4	3-1/2	TC65052	141.50	TC65072	156.75
3/4	3/4	1-1/2	4	TC65053	204.75	TC65073	222.95
1	1	1-1/2	4	TC65054	335.00	TC65074	361.30

GENERAL PURPOSE END MILLS - CARBIDE

4 Flute - Ball - 30° Helix - NC Tolerance



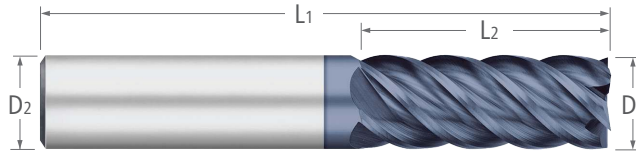
- Excellent for keyways
- Tight tolerance for precision machining
- AlTiN coating offers increased wear and heat resistance
- Solid carbide
- Precision manufactured in the USA

CUTTER DIA.	SHANK DIA.	LOC	OAL	UNCOATED		AlTiN COATED	
$D1^{+.001''}_{-.000''}$	D2 (h6)	L2	L1	TOOL #	PRICE	TOOL #	PRICE
1/16	1/8	3/16	1-1/2	TC65120	16.05	TC65140	20.45
3/32	1/8	3/8	1-1/2	TC65121	17.15	TC65141	21.55
1/8	1/8	1/2	1-1/2	TC65122	20.25	TC65142	24.65
5/32	3/16	9/16	2	TC65123	24.60	TC65143	29.55
3/16	3/16	5/8	2	TC65124	28.90	TC65144	33.85
7/32	1/4	5/8	2-1/2	TC65125	35.80	TC65145	42.15
1/4	1/4	3/4	2-1/2	TC65126	40.75	TC65146	47.10
9/32	5/16	3/4	2-1/2	TC65127	44.50	TC65147	52.10
5/16	5/16	13/16	2-1/2	TC65128	48.25	TC65148	55.85
3/8	3/8	1	2-1/2	TC65129	50.35	TC65149	59.40
7/16	7/16	1	2-3/4	TC65130	65.50	TC65150	76.05
1/2	1/2	1	3	TC65131	81.00	TC65151	93.30
5/8	5/8	1-1/4	3-1/2	TC65132	169.70	TC65152	184.95
3/4	3/4	1-1/2	4	TC65133	245.65	TC65153	263.85
1	1	1-1/2	4	TC65134	402.05	TC65154	428.35

For technical information, see page 103

GENERAL PURPOSE END MILLS - CARBIDE

5 Flute - Square - 45° Helix



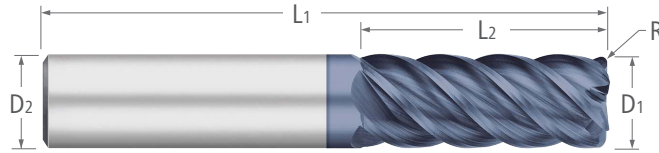
- Excellent performance in profiling and finishing applications
- Offered in stub and regular length styles
- 45° helix for faster chip removal and a better finish
- AlTiN coating offers increased wear and heat resistance
- Solid carbide
- Precision manufactured in the USA

CUTTER DIA.	SHANK DIA.	LENGTH OF CUT	OAL	UNCOATED		AlTiN COATED	
$D1^{+.0000}_{-.0020}$	$D2 (h6)$	$L2$	$L1$	TOOL #	PRICE	TOOL #	PRICE
1/8	1/8	1/4	1-1/2	TC61408	8.55	TC61508	10.70
	1/8	1/2	1-1/2	TC61808	16.55	TC61908	19.80
3/16	3/16	3/8	2	TC61412	13.55	TC61512	16.10
	3/16	3/4	2	TC61812	20.80	TC61912	24.50
1/4	1/4	1/2	2	TC61416	16.40	TC61516	19.25
	1/4	3/4	2-1/2	TC61816	22.35	TC61916	26.40
5/16	5/16	1/2	2	TC61420	19.65	TC61520	24.30
	5/16	7/8	2-1/2	TC61820	26.95	TC61920	31.70
3/8	3/8	5/8	2	TC61424	32.35	TC61524	38.15
	3/8	1	2-1/2	TC61824	36.10	TC61924	42.55
7/16	7/16	5/8	2-1/2	TC61428	36.95	TC61528	43.55
1/2	1/2	5/8	2-1/2	TC61432	42.70	TC61532	50.40
	1/2	1-1/4	3	TC61832	67.35	TC61932	79.65
$D1^{+.0000}_{-.0030}$	$D2 (h6)$	$L2$	$L1$	TOOL #	PRICE	TOOL #	PRICE
5/8	5/8	3/4	3	TC61440	75.85	TC61540	90.15
	5/8	1-5/8	3-1/2	TC61840	127.75	TC61940	151.45
3/4	3/4	1	3	TC61448	102.15	TC61548	119.25
	3/4	1-5/8	4	TC61848	179.60	TC61948	205.90

For technical information, see page 104

GENERAL PURPOSE END MILLS - CARBIDE

5 Flute - Corner Radius - 45° Helix



- Excellent performance in profiling and finishing applications
- 45° helix for faster chip removal and a better finish
- AlTiN coating offers increased wear and heat resistance
- Offered in stub and regular length styles
- Corner radius for increased edge strength
- Solid carbide
- Precision manufactured in the USA

CUTTER DIA.	SHANK DIA.	RADIUS	LOC	OAL	UNCOATED		AlTiN COATED	
$D1 \begin{smallmatrix} +.000" \\ -.002" \end{smallmatrix}$	$D2 \text{ (h6)}$	$R \begin{smallmatrix} +.001" \\ -.001" \end{smallmatrix}$	$L2$	$L1$	TOOL #	PRICE	TOOL #	PRICE
1/8	1/8	.010	1/4	1-1/2	TC61608	9.90	TC61708	11.90
	1/8	.010	1/2	1-1/2	TC63808	18.50	TC63908	22.85
	1/8	.020	1/4	1-1/2	TC61609	9.90	TC61709	14.30
	1/8	.020	1/2	1-1/2	TC63809	18.50	TC63909	22.90
	1/8	.030	1/4	1-1/2	TC61610	9.90	TC61710	14.30
	1/8	.030	1/2	1-1/2	TC63810	18.50	TC63910	22.90
3/16	3/16	.010	3/8	2	TC61612	15.20	TC61712	18.00
	3/16	.010	3/4	2	TC63812	23.20	TC63912	27.30
	3/16	.020	3/8	2	TC61613	15.20	TC61713	20.15
	3/16	.020	3/4	2	TC63813	23.20	TC63913	28.15
	3/16	.030	3/8	2	TC61614	15.20	TC61714	20.15
	3/16	.030	3/4	2	TC63814	23.20	TC63914	28.15
1/4	1/4	.010	1/2	2	TC61615	18.30	TC61715	24.25
	1/4	.010	3/4	2-1/2	TC63815	24.95	TC63915	31.30
	1/4	.020	1/2	2	TC61616	18.30	TC61716	21.45
	1/4	.020	3/4	2-1/2	TC63816	24.95	TC63916	29.40
	1/4	.030	1/2	2	TC61617	18.30	TC61717	24.25
	1/4	.030	3/4	2-1/2	TC63817	24.95	TC63917	31.30
5/16	5/16	.010	1/2	2	TC61618	21.90	TC61718	29.05
	5/16	.010	7/8	2-1/2	TC63818	30.10	TC63918	37.70
	5/16	.020	1/2	2	TC61620	21.90	TC61720	27.15
	5/16	.020	7/8	2-1/2	TC63820	30.10	TC63920	35.45
	5/16	.030	1/2	2	TC61621	21.90	TC61721	29.05
	5/16	.030	7/8	2-1/2	TC63821	30.10	TC63921	37.70
3/8	3/8	.010	5/8	2	TC61622	36.15	TC61722	44.65
	3/8	.010	1	2-1/2	TC63822	40.30	TC63922	49.35
	3/8	.020	5/8	2	TC61624	36.15	TC61724	42.50
	3/8	.020	1	2-1/2	TC63824	40.30	TC63924	47.55
	3/8	.030	5/8	2	TC61625	36.15	TC61725	44.65
	3/8	.030	1	2-1/2	TC63825	40.30	TC63925	49.35
7/16	7/16	.020	5/8	2-1/2	TC61628	41.30	TC61728	48.70

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GENERAL PURPOSE END MILLS - CARBIDE

5 Flute - Corner Radius - 45° Helix (Cont.)

continued from previous page

CUTTER DIA.	SHANK DIA.	RADIUS	LOC	OAL	UNCOATED		AITIN COATED	
D ₁ ^{+0.000"} -0.003"	D ₂ (h6)	R ^{+0.001"} -0.001"	L ₂	L ₁	TOOL #	PRICE	TOOL #	PRICE
1/2	1/2	.020	5/8	2-1/2	TC61629	47.70	TC61729	60.00
	1/2	.020	1-1/4	3	TC63826	75.20	TC63926	87.50
	1/2	.030	5/8	2-1/2	TC61630	47.70	TC61730	60.00
	1/2	.030	1-1/4	3	TC63827	75.20	TC63927	87.50
	1/2	.040	5/8	2-1/2	TC61632	47.70	TC61732	56.25
	1/2	.040	1-1/4	3	TC63832	75.20	TC63932	87.50
5/8	5/8	.020	3/4	3	TC61633	81.00	TC61733	95.30
	5/8	.030	3/4	3	TC61634	81.00	TC61734	95.30
	5/8	.040	3/4	3	TC61640	81.00	TC61740	95.30
	5/8	.040	1-5/8	3-1/2	TC63840	136.35	TC63940	161.75
3/4	3/4	.020	1	3	TC61641	109.15	TC61741	126.15
	3/4	.020	1-5/8	4	TC63841	191.80	TC63941	210.00
	3/4	.030	1	3	TC61642	109.15	TC61742	126.15
	3/4	.030	1-5/8	4	TC63842	191.80	TC63942	210.00
	3/4	.040	1	3	TC61648	109.15	TC61748	126.15
	3/4	.040	1-5/8	4	TC63848	191.80	TC63948	219.85

End Mills

Roughers

For Aluminum

Carbide

Cobalt

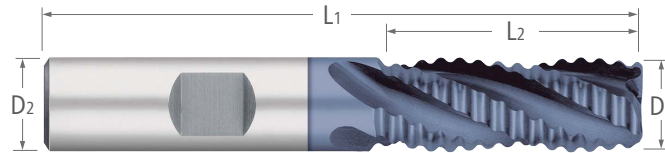


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GENERAL PURPOSE END MILLS - COBALT

Roughers - Coarse Pitch - 30° Helix



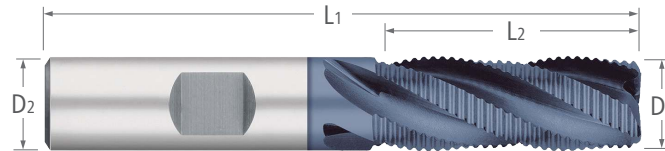
- Coarse pitch for increased metal removal rates (MRR) with decreased horse power requirements
- Weldon flat
- M42 cobalt
- AlTiN coating offers increased wear and heat resistance
- Precision manufactured in the USA

CUTTER DIA.	SHANK DIA.	LOC	FLUTES	OAL	UNCOATED		AlTiN COATED	
$D1^{+.005}_{-.005}$	$D2^{+.0001}_{-.0005}$	$L2$		$L1$	TOOL #	PRICE	TOOL #	PRICE
1/4	3/8	5/8	4	2-7/16	TE63404	59.75	TE63504	66.25
5/16	3/8	3/4	4	2-1/2	TE63409	65.65	TE63509	72.15
3/8	3/8	3/4	4	2-1/2	TE63414	68.80	TE63514	75.30
7/16	3/8	1	4	2-11/16	TE63419	69.25	TE63519	75.75
1/2	1/2	1	4	3	TE63428	68.95	TE63528	76.95
1/2	1/2	1-1/4	4	3-1/4	TE63429	71.10	TE63529	79.55
5/8	5/8	1-5/8	4	3-3/4	TE63436	91.25	TE63536	101.25
3/4*	3/4	1-5/8	4	3-7/8	TE63445	99.70	TE63545	111.40
7/8*	3/4	1-7/8	5	4-1/8	TE63454	141.05	TE63554	155.15
1*	1	2	5	4-1/2	TE63466	131.60	TE63566	149.25
1-1/8*	1	2	6	4-1/2	TE63471	211.05	TE63571	231.45
1-1/4*	1-1/4	2	6	4-1/2	TE63475	227.75	TE63575	251.80
1-1/2*	1-1/4	2	6	4-1/2	TE63483	270.00	TE63583	294.05
2*	1-1/4	2	8	4-1/2	TE63492	381.70	TE63592	405.75

*Non Center Cutting

GENERAL PURPOSE END MILLS - COBALT

Roughers - Fine Pitch - 30° Helix



- Fine pitch for maximized material removal rates (MRR) and minimized vibration or chatter
- Weldon flat
- M42 cobalt
- AlTiN coating offers increased wear and heat resistance
- Precision manufactured in the USA

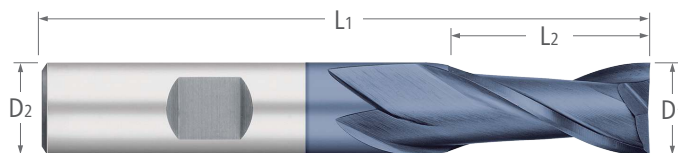
CUTTER DIA.	SHANK DIA.	LOC	FLUTES	OAL	UNCOATED		AlTiN COATED	
$D1^{+.005}_{-.005}$	$D2^{+.0001}_{-.0005}$	$L2$		$L1$	TOOL #	PRICE	TOOL #	PRICE
1/4	3/8	5/8	4	2-7/16	TE66104	59.75	TE66204	66.25
5/16	3/8	3/4	4	2-1/2	TE66109	65.65	TE66209	72.15
3/8	3/8	3/4	4	2-1/2	TE66114	69.25	TE66214	75.75
7/16	3/8	1	4	2-11/16	TE66119	69.60	TE66219	76.10
1/2	1/2	1-1/4	4	3-1/4	TE66129	68.55	TE66229	76.95
5/8	5/8	1-5/8	4	3-3/4	TE66136	91.25	TE66236	101.25
3/4*	3/4	1-5/8	4	3-7/8	TE66145	99.70	TE66245	111.40
7/8*	3/4	1-7/8	5	4-1/8	TE66154	131.90	TE66254	146.00
1*	1	2	5	4-1/2	TE66166	131.65	TE66266	149.30
1-1/8*	1	2	6	4-1/2	TE66171	226.40	TE66271	246.80
1-1/4*	1-1/4	2	6	4-1/2	TE66175	227.75	TE66275	251.80
1-1/2*	1-1/4	2	6	4-1/2	TE66183	285.40	TE66283	309.45
2*	1-1/4	2	8	4-1/2	TE66192	409.05	TE66292	433.10

*Non Center Cutting

For technical information, see page 102

GENERAL PURPOSE END MILLS - COBALT

2 Flute - Square - 30° Helix



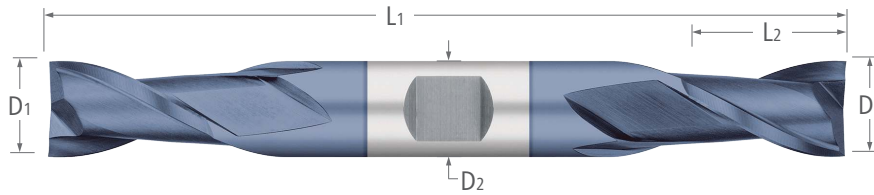
- Center cutting
- M42 cobalt
- AlTiN coating offers increased wear and heat resistance
- Precision manufactured in the USA

CUTTER DIA.	SHANK DIA.	LENGTH OF CUT	OAL	UNCOATED		AlTiN COATED	
$D_1^{+0.0015''}_{-0.0000''}$	$D_2^{-0.0001''}_{-0.0005''}$	L2	L1	TOOL #	PRICE	TOOL #	PRICE
1/8	3/8	3/8	2-5/16	TE82701	24.60	TE82802	31.50
3/16	3/8	7/16	2-5/16	TE82705	24.60	TE82806	31.50
1/4	3/8	1/2	2-5/16	TE82709	31.10	TE82810	31.50
5/16	3/8	9/16	2-5/16	TE82713	31.10	TE82814	31.50
3/8	3/8	9/16	2-5/16	TE82715	24.60	TE82816	31.50
7/16	3/8	13/16	2-1/2	TE82717	33.80	TE82818	42.90
1/2	3/8	13/16	2-1/2	TE82719	41.60	TE82820	43.50
	1/2	1	3	TE82721	35.95	TE82822	46.00
9/16	1/2	1-1/8	3-1/8	TE82723	40.45	TE82824	51.75
5/8	1/2	1-1/8	3-1/8	TE82725	55.10	TE82826	64.60
	5/8	1-5/16	3-7/16	TE82727	46.00	TE82828	58.85
3/4	1/2	1-5/16	3-5/16	TE82729	64.60	TE82830	67.35
	5/8	1-5/16	3-7/16	TE82731	64.60	TE82832	67.35
	3/4	1-5/16	3-9/16	TE82733	64.60	TE82834	67.35
13/16	5/8	1-1/2	3-5/8	TE82735	64.75	TE82836	80.05
	3/4	1-1/2	3-3/4	TE82737	65.15	TE82838	83.05
7/8	3/4	1-1/2	3-3/4	TE82741	71.65	TE82842	85.25
	7/8	1-1/2	3-3/4	TE82743	71.65	TE82844	87.45
15/16	5/8	1-1/2	3-5/8	TE82745	82.50	TE82846	93.50
	3/4	1-1/2	3-3/4	TE82747	87.95	TE82848	101.05
1	3/4	1-1/2	3-3/4	TE82753	89.00	TE82854	93.80
	1	1-5/8	4-1/8	TE82757	102.05	TE82858	122.45
1-1/8	1	1-5/8	4-1/8	TE82761	130.85	TE82862	151.25
1-1/4	1	1-5/8	4-1/8	TE82765	152.80	TE82866	181.25
1-1/2	1-1/4	1-5/8	4-1/8	TE82773	185.95	TE82874	219.50

For technical information, see page 105

GENERAL PURPOSE END MILLS - COBALT

2 Flute - Square - 30° Helix - Double-Ended



- Double-ended
- Center cutting
- Weldon flat
- AlTiN coating offers increased wear and heat resistance
- M42 cobalt
- Precision manufactured in the USA

CUTTER DIA.	SHANK DIA.	LENGTH OF CUT	OAL	UNCOATED		AlTiN COATED	
$D1_{+0.0000}^{-0.0015}$	$D2_{-0.0001}^{-0.0005}$	L2	L1	TOOL #	PRICE	TOOL #	PRICE
1/8	3/8	3/8	3-1/16	TE81701	37.90	TE81802	47.65
5/32	3/8	7/16	3-1/8	TE81703	40.30	TE81804	50.75
3/16	3/8	7/16	3-1/4	TE81705	37.90	TE81806	47.65
7/32	3/8	1/2	3-1/4	TE81707	40.30	TE81808	50.75
1/4	3/8	1/2	3-3/8	TE81709	38.10	TE81810	47.85
9/32	3/8	9/16	3-3/8	TE81711	40.30	TE81812	50.75
5/16	3/8	9/16	3-1/2	TE81713	44.50	TE81814	54.95
11/32	3/8	9/16	3-1/2	TE81715	40.30	TE81816	50.75
3/8*	3/8	9/16	3-1/2	TE81717	38.10	TE81818	47.85
13/32	1/2	13/16	4-1/8	TE81719	50.30	TE81820	64.55
7/16	1/2	13/16	4-1/8	TE81721	58.05	TE81822	73.35
1/2*	1/2	13/16	3-3/4	TE81725	58.35	TE81826	71.65
9/16	5/8	1-1/8	5	TE81727	74.45	TE81828	92.20
5/8*	5/8	1-1/8	5	TE81729	84.40	TE81830	102.15
3/4*	3/4	1-5/16	5	TE81733	102.20	TE81834	121.90
7/8*	7/8	1-9/16	5-1/2	TE81737	119.25	TE81838	146.90
1*	1	1-5/8	5-7/8	TE81741	166.90	TE81842	179.20

*Tolerance is +.000"/-.0025

GENERAL PURPOSE END MILLS - COBALT

4 & 6 Flute - Square - 30° Helix



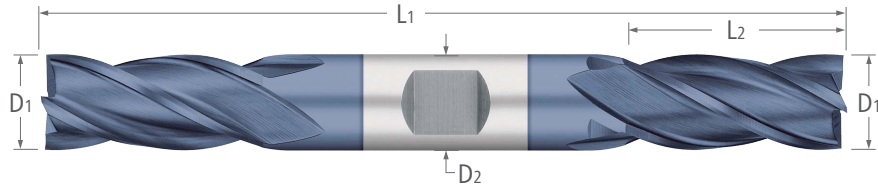
- Center cutting
- Stocked in 4 and 6 flute options
- Weldon flat
- AlTiN coating offers increased wear and heat resistance
- M42 cobalt
- Precision manufactured in the USA

CUTTER DIA.	SHANK DIA.	LOC	FLUTES	OAL	UNCOATED		AlTiN COATED	
$D_1^{+.0015" / -.0000"}$	$D_2^{-.0001" / -.0005"}$	L ₂		L ₁	TOOL #	PRICE	TOOL #	PRICE
1/8	3/8	3/8	4	2-5/16	TE81201	25.45	TE81302	32.05
5/32	3/8	7/16	4	2-5/16	TE81203	34.25	TE81304	43.30
3/16	3/8	1/2	4	2-3/8	TE81205	25.45	TE81306	32.05
7/32	3/8	1/2	4	2-3/8	TE81207	34.25	TE81308	43.30
1/4	3/8	5/8	4	2-7/16	TE81209	25.55	TE81310	32.05
9/32	3/8	11/16	4	2-1/2	TE81211	34.25	TE81312	43.30
5/16	3/8	3/4	4	2-1/2	TE81213	25.55	TE81314	32.05
11/32	3/8	3/4	4	2-1/2	TE81215	34.95	TE81316	44.05
3/8	3/8	3/4	4	2-1/2	TE81217	25.55	TE81318	32.05
13/32	3/8	1	4	2-11/16	TE81219	51.10	TE81320	57.60
7/16	3/8	1	4	2-11/16	TE81221	33.75	TE81322	42.85
15/32	3/8	1	4	2-11/16	TE81223	53.90	TE81324	60.40
1/2	3/8	1	4	2-11/16	TE81225	41.50	TE81326	43.35
	1/2	1-1/4	4	3-1/4	TE81227	33.95	TE81328	43.45
17/32	1/2	1-3/8	4	3-3/8	TE81229	63.25	TE81330	72.75
9/16	1/2	1-3/8	4	3-3/8	TE81231	40.50	TE81332	52.05
5/8	1/2	1-3/8	4	3-3/8	TE81233	46.15	TE81334	56.65
	5/8	1-5/8	4	3-3/4	TE81235	52.35	TE81336	63.35
11/16	1/2	1-5/8	4	3-5/8	TE81237	55.35	TE81338	65.65
	5/8	1-5/8	4	3-3/4	TE81239	56.85	TE81340	67.85
3/4	1/2	1-5/8	4	3-5/8	TE81241	78.80	TE81342	79.65
	5/8	1-5/8	4	3-3/4	TE81243	78.80	TE81344	79.65
	3/4	1-5/8	4	3-7/8	TE81245	66.95	TE81346	80.05
13/16	3/4	1-7/8	4	4-1/8	TE81247	74.00	TE81348	90.00
7/8	3/4	1-7/8	4	4-1/8	TE81249	73.10	TE81350	89.65
	7/8	1-7/8	4	4-1/8	TE81251	73.10	TE81352	90.15
15/16	3/4	1-7/8	4	4-1/8	TE81253	92.40	TE81354	106.50
1	3/4	1-7/8	4	4-1/8	TE81257	97.00	TE81358	102.00
	1	2	4	4-1/2	TE81261	87.60	TE81362	108.00
1-1/8	3/4	1-5/8	6	3-7/8	TE81265	129.60	TE81366	147.85
1-1/4	1	2	6	4-1/2	TE81269	140.80	TE81370	165.25
	1-1/4	2	6	4-1/2	TE81273	144.25	TE81374	168.60
1-3/8	3/4	2	6	4-1/4	TE81275	201.20	TE81376	220.80
1-1/2	1	2	6	4-1/2	TE81277	228.55	TE81378	248.95
	1-1/4	2	4	4-1/2	TE81279	187.90	TE81380	211.95
1-5/8	1-1/4	2	6	4-1/2	TE81283	305.85	TE81384	329.90
2	1-1/4	2	6	4-1/2	TE81291	346.60	TE81392	370.65

For technical information, see page 105

GENERAL PURPOSE END MILLS - COBALT

4 Flute - Square - 30° Helix - Double-Ended



- Double-ended
- Center cutting
- Weldon flat
- AlTiN coating offers increased wear and heat resistance
- M42 cobalt
- Precision manufactured in the USA

CUTTER DIA.	SHANK DIA.	LENGTH OF CUT	OAL	UNCOATED		AlTiN COATED	
$D_1^{+.0000/-0.0015}$	$D_2^{-.0001/-0.0005}$	L2	L1	TOOL #	PRICE	TOOL #	PRICE
1/8	3/8	3/8	3-1/16	TE82301	38.40	TE82402	48.10
5/32	3/8	7/16	3-1/8	TE82303	40.50	TE82404	50.20
3/16	3/8	1/2	3-1/4	TE82305	38.40	TE82406	48.10
7/32	3/8	9/16	3-1/4	TE82307	40.50	TE82408	50.20
1/4	3/8	5/8	3-3/8	TE82309	38.60	TE82410	48.35
9/32	3/8	11/16	3-3/8	TE82311	40.50	TE82412	50.20
5/16	3/8	3/4	3-1/2	TE82313	45.00	TE82414	48.65
11/32	3/8	3/4	3-1/2	TE82315	40.50	TE82416	50.20
3/8*	3/8	3/4	3-1/2	TE82317	38.60	TE82418	48.35
13/32	1/2	1	4-1/8	TE82319	59.25	TE82420	74.55
7/16	1/2	1	4-1/8	TE82321	57.65	TE82422	71.90
1/2*	1/2	1	4-1/8	TE82325	57.90	TE82426	72.15
9/16	5/8	1-3/8	5	TE82327	76.15	TE82428	93.90
5/8*	5/8	1-3/8	5	TE82329	76.50	TE82430	90.40
3/4*	3/4	1-5/8	5-5/8	TE82333	101.30	TE82434	124.15
7/8*	7/8	1-7/8	6-1/8	TE82337	118.80	TE82438	148.75
1*	1	1-7/8	6-3/8	TE82341	144.20	TE82442	180.10

*Tolerance is $+.000/-0.0025$

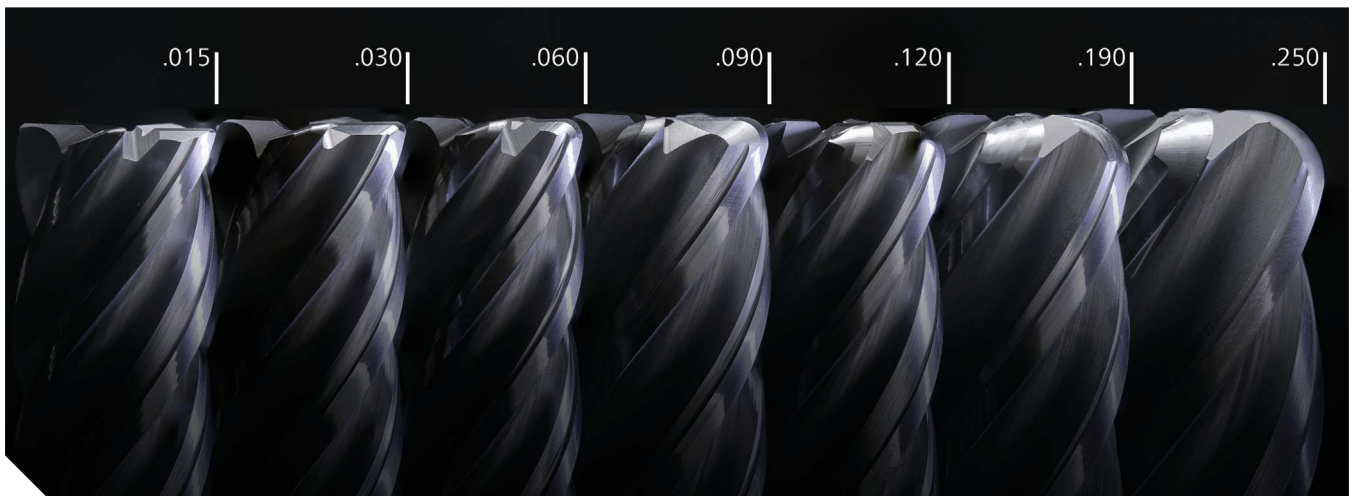


TITAN's VI-PRO® is a High Performance, carbide end mill, that incorporates the ultimate in variable index geometry. Our flute configuration produces a harmonics shift, resulting in minimal chatter and an exceptional finish.

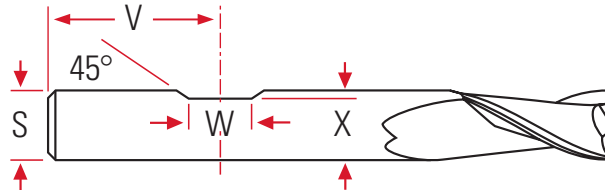
- 4, 5 and 6 flute square and corner radius chipbreakers
- 7 flute square and corner radius
- Post polished AlCrO-MAX coating covers a wide range of materials
- Made in the USA from premium micrograin carbide
- Used in all slotting, roughing, profiling and finishing applications
- High performance, chatter free machining provides versatility in use for all ferrous materials
- Designed for use in Alloy steels, Inconel, Cast Iron, Titanium, Stainless Steel, High Temp and all other exotic materials up to 50 Rc
- Enables higher SFM and heavier chip loads
- Eccentric relief on the cutting edge provides enhanced edge strength
- Available in 4, 5, 6, 7 Flute - stub, regular, long & extra long lengths
- Available in Square End, Ball Nose and various Corner Radius sizes
- 4 flute recommended for slotting up to 1 x Diameter

OUTPERFORM WITH CORNER RADIUS VI-PRO®

The sharp corner of an end mill is the weakest point on the tool. The corner radius design eliminates this vulnerability which reduces chipping and provides longer tool life. VI-PRO® tools are available with corner radii starting at .010" to .250". Longer tool life means increased productivity which has real impact on your bottom line.



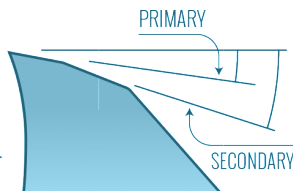
VI-PRO® WELDON FLAT SPECIFICATIONS



	Stub Length				Regular Length				Long Length				Extra Long Length			
S	V	W		X	V	W		X	V	W		X	V	W		X
Shank Dia.		Min.	Max.			Min.	Max.			Min.	Max.			Min.	Max.	
1/2 (1-1/4 LOC)	-	-	-	-	.750	.330	.332	.440	-	-	-	-	-	-	-	-
1/2 (2 LOC)	-	-	-	-	-	-	-	-	.875	.330	.332	.440	-	-	-	-
1/2	.750	.330	.332	.440	.875	.330	.332	.440	1.250	.330	.332	.440	1.500	.330	.332	.440
5/8 (1-1/4 LOC)	-	-	-	-	1.250	.400	.402	.560	-	-	-	-	-	-	-	-
5/8	.750	.400	.402	.560	.875	.400	.402	.560	1.250	.400	.402	.560	1.500	.400	.402	.560
3/4	.750	.455	.457	.675	.875	.455	.457	.675	1.250	.455	.457	.675	1.500	.455	.457	.675
1 (1-1/2 LOC)	-	-	-	-	1.375	.515	.517	.925	-	-	-	-	-	-	-	-
1	-	-	-	-	0.875	.515	.517	.925	1.250	.515	.517	0.925	1.500	.515	.517	0.925

TITAN's High-Performance VI-PRO® carbide end mills utilize an Eccentric Relief on the cutting edge to provide enhanced edge strength and a smoother cutting action.

General Purpose Standard Relief



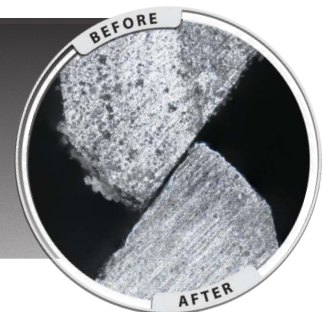
Most common relief for non-ferrous alloys. Includes a primary and secondary relief angle.

VI-PRO® Eccentric Relief



A powerful edge design for ferrous and tough material cutting. This design includes a primary relief measured radially along its edge.

4 on-site Otec Post Polish and Edge Prep machines

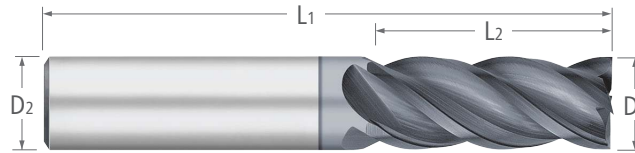


BENEFITS OF POST POLISHING

AlCrO-MAX by nature of the coating process leaves tiny "droplets" of the coating on the surface of the tool. Proven results have shown that the removal of these droplets provide a smoother tool surface which results in a better cut. Perhaps the most important benefit is that the tool is able to run at faster feed rates due to the smoothness of the flute area. This results in better chip evacuation and cooler temperatures resulting in longer tool life.

VI-PRO VARIABLE INDEX END MILLS

4 Flute - Square



- VI-Pro® variable index geometry offers outstanding performance in a wide range of materials, including high temp alloys, stainless steels, alloy steels, cast iron, and titanium
- Offered in stub, regular, long, and extra long length styles
- Delivers efficient, chatter-free machining in roughing, profiling, finishing, and slotting applications up to 1x diameter
- Large core and eccentric relief for improved tool life
- Post-polished AlCrO-MAX coating increases wear and high heat resistance
- Solid carbide
- Precision manufactured in the USA

CUTTER DIA.	SHANK DIA.	LOC	OAL	AlCrO-MAX COATED		AlCrO-MAX COATED + WELDON FLAT	
$D1^{+0.000}_{-0.002}$	D2 (h6)	L2	L1	TOOL #	PRICE	TOOL #	PRICE
1/8	1/8	1/4	1-1/2	TC21133	16.80		
	1/8	1/2	2	TC21821	20.10		
	1/8	3/4	2	TC23199	21.65		
	1/8	1	2-1/2	TC24404	25.65		
3/16	3/16	3/8	2	TC21136	21.65		
	3/16	9/16	2	TC21824	22.85		
	3/16	3/4	2	TC23200	24.35		
	3/16	1	2-1/2	TC24406	28.45		
1/4	1/4	3/8	2	TC21139	24.45		
	1/4	3/4	2-1/2	TC21827	29.00		
	1/4	1-1/8	3	TC23201	33.20		
	1/4	1-1/2	4	TC24408	39.45		
5/16	5/16	7/16	2	TC21142	35.60		
	5/16	13/16	2-1/2	TC21830	38.40		
	5/16	1-1/8	3	TC23204	45.65		
3/8	3/8	1/2	2	TC21145	39.25		
	3/8	1	2-1/2	TC21833	45.20		
	3/8	1-1/4	3	TC23207	61.65		
	3/8	2	4	TC24411	69.15		
7/16	7/16	5/8	2-1/2	TC21147	51.15		
	7/16	1	2-3/4	TC21835	56.05		
	7/16	2	4	TC23209	78.20		
	7/16	3	6	TC24413	113.95		
1/2	1/2	5/8	2-1/2	TC21148	58.70	TC21173	62.65
	1/2	1	3	TC21836	67.45	TC21863	71.50
	1/2	1-1/4	3	TC21839	67.45	TC21866	71.50
	1/2	1-1/2	4	TC23210	85.15	TC23331	88.90
	1/2	2	4	TC23213	93.90	TC23334	98.20
	1/2	3	6	TC24414	133.15	TC24543	137.15

continued on next page

VI-PRO VARIABLE INDEX END MILLS

4 Flute - Square (Cont.)

continued from previous page

CUTTER DIA.	SHANK DIA.	LOC	OAL	AlCrO-MAX COATED		AlCrO-MAX COATED + WELDON FLAT	
D1 ^{+0.000"} _{-0.003"}	D2 (h6)	L2	L1	TOOL #	PRICE	TOOL #	PRICE
5/8	5/8	3/4	3	TC21151	115.60	TC21176	120.05
	5/8	1-1/4	3-1/2	TC21841	119.75	TC21868	128.75
	5/8	1-5/8	3-1/2	TC21842	122.75	TC21869	126.70
	5/8	2-1/4	5	TC23216	174.70	TC23337	179.75
	5/8	3	6	TC24417	188.40	TC24546	193.60
3/4	3/4	1	3	TC21154	152.45	TC21179	157.30
	3/4	1-5/8	4	TC21845	169.55	TC21872	173.75
	3/4	2-1/4	5	TC23219	211.40	TC23340	216.80
	3/4	3	6	TC24420	249.90	TC24549	254.45
	3/4	4	7	TC24423	410.40	TC24552	415.70
1	1	1-1/2	4	TC21847	305.20	TC21874	319.20
	1	2	4	TC21848	315.05	TC21875	321.45
	1	2-1/4	5	TC23222	348.45	TC23343	355.15
	1	3	6	TC24426	407.45	TC24555	412.75
	1	4-1/4	7	TC24429	601.45	TC24558	607.95

DID YOU
KNOW?

Premature tool wear and breakage are easily avoidable, but can lead to poor part finish, machine downtime, and even scrapped parts.

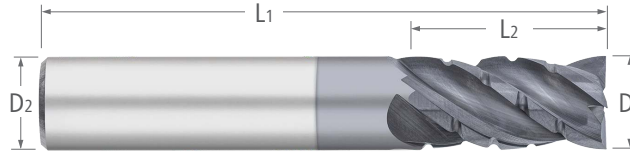
Read More : **End Mill and Milling Troubleshooting Guide**
on our technical blog, "In The Loupe"

harveypformance.com/in-the-loupe/end-mill-troubleshooting-guide



VI-PRO VARIABLE INDEX END MILLS

4 Flute - Square - Chipbreaker



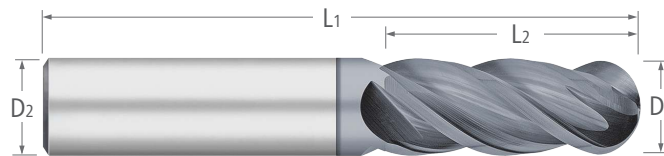
- VI-Pro® variable index geometry offers outstanding performance in a wide range of materials, including high temp alloys, stainless steels, alloy steels, cast iron, and titanium
- Engineered with chipbreaker geometry for optimal chip evacuation, reduced harmonics, and reduced tool pressure
- Offered in regular, long, and extra long length styles
- Delivers efficient, chatter-free machining in roughing, profiling, finishing, and slotting applications up to 1x diameter
- Large core and eccentric relief for improved tool life
- Post-polished AlCrO-MAX coating increases wear and high heat resistance
- Solid carbide
- Precision manufactured in the USA

CUTTER DIA.	SHANK DIA.	LENGTH OF CUT	OAL	AlCrO-MAX COATED		AlCrO-MAX COATED + WELDON FLAT	
D1 ^{+0.000"} -0.002"	D2 (h6)	L2	L1	TOOL #	PRICE	TOOL #	PRICE
1/8	1/8	1/2	2	TC28050	24.00		
	1/8	3/4	2	TC28070	25.55		
	1/8	1	2-1/2	TC28086	29.65		
3/16	3/16	9/16	2	TC28051	26.75		
	3/16	3/4	2	TC28071	28.35		
	3/16	1	2-1/2	TC28087	32.40		
1/4	1/4	3/4	2-1/2	TC28052	35.05		
	1/4	1-1/8	3	TC28072	39.65		
	1/4	1-1/2	4	TC28088	46.10		
5/16	5/16	13/16	2-1/2	TC28053	44.45		
	5/16	1-1/8	3	TC28073	52.30		
3/8	3/8	1	2-1/2	TC28054	51.05		
	3/8	1-1/4	3	TC28074	67.40		
	3/8	2	4	TC28089	75.20		
7/16	7/16	1	2-3/4	TC28055	61.85		
	7/16	2	4	TC28075	81.00		
	7/16	3	6	TC28090	122.20		
1/2	1/2	1	3	TC28056	75.40	TC28063	82.40
	1/2	1-1/4	3	TC28057	75.40	TC28064	82.40
	1/2	1-1/2	4	TC28076	92.65	TC28081	99.65
	1/2	2	4	TC28077	101.85	TC28082	108.85
	1/2	3	6	TC28091	141.30	TC28097	148.30
D1 ^{+0.000"} -0.003"	D2 (h6)	L2	L1	TOOL #	PRICE	TOOL #	PRICE
5/8	5/8	1-1/4	3-1/2	TC28058	128.45	TC28065	137.45
	5/8	1-5/8	3-1/2	TC28059	130.90	TC28066	139.90
	5/8	2-1/4	5	TC28078	183.55	TC28083	192.55
	5/8	3	6	TC28092	198.35	TC28098	207.35
3/4	3/4	1-5/8	4	TC28060	179.80	TC28067	190.80
	3/4	2-1/4	5	TC28079	222.45	TC28084	233.45
	3/4	3	6	TC28093	259.75	TC28099	270.75
	3/4	4	7	TC28094	419.40	TC28100	430.40
1	1	1-1/2	4	TC28061	316.20	TC28068	330.20
	1	2	4	TC28062	326.10	TC28069	340.10
	1	2-1/4	5	TC28080	359.45	TC28085	373.45
	1	3	6	TC28095	416.55	TC28101	430.55
	1	4-1/4	7	TC28096	609.65	TC28102	623.65

For technical information, see page 106

VI-PRO VARIABLE INDEX END MILLS

4 Flute - Ball



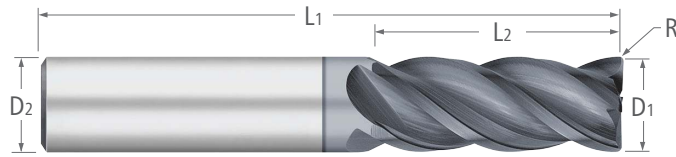
- VI-Pro® variable index geometry offers outstanding performance in a wide range of materials, including high temp alloys, stainless steels, alloy steels, cast iron, and titanium
- Delivers efficient, chatter-free machining in roughing, profiling, finishing, and slotting applications up to 1x diameter
- Post-polished AlCrO-MAX coating increases wear and high heat resistance
- Offered in stub, regular, long, and extra long length styles
- Large core and eccentric relief for improved tool life
- Solid carbide
- Precision manufactured in the USA

CUTTER DIA.	SHANK DIA.	LOC	OAL	AlCrO-MAX COATED		AlCrO-MAX COATED + WELDON FLAT	
D1 ^{+0.000"} _{-0.002"}	D2 (h6)	L2	L1	TOOL #	PRICE	TOOL #	PRICE
1/8	1/8	1/4	1-1/2	TC25499	19.35		
	1/8	1/2	2	TC25547	27.55		
3/16	3/16	3/8	2	TC25501	27.55		
	3/16	9/16	2	TC25549	30.50		
1/4	1/4	3/8	2	TC25502	31.35		
	1/4	3/4	2-1/2	TC25550	36.60		
	1/4	1-1/8	3	TC25602	38.25		
	1/4	1-1/2	4	TC25656	55.35		
5/16	5/16	7/16	2	TC25504	41.05		
	5/16	13/16	2-1/2	TC25552	44.50		
	5/16	1-1/8	3	TC25604	52.70		
3/8	3/8	1/2	2	TC25506	45.30		
	3/8	1	2-1/2	TC25554	52.15		
	3/8	1-1/4	3	TC25606	71.15		
	3/8	2	4	TC25658	80.15		
7/16	7/16	5/8	2-1/2	TC25507	61.25		
	7/16	1	2-3/4	TC25555	71.00		
	7/16	2	4	TC25607	88.65		
	7/16	3	6	TC25659	130.85		
1/2	1/2	5/8	2-1/2	TC25508	68.10	TC25514	72.25
	1/2	1	3	TC25556	77.85	TC25566	82.50
	1/2	1-1/4	3	TC25558	77.85	TC25568	82.50
	1/2	1-1/2	4	TC25608	97.75	TC25618	102.60
	1/2	2	4	TC25610	108.95	TC25620	113.30
	1/2	3	6	TC25660	153.60	TC25672	160.60
D1 ^{+0.000"} _{-0.003"}	D2 (h6)	L2	L1	TOOL #	PRICE	TOOL #	PRICE
5/8	5/8	3/4	3	TC25510	134.05	TC25516	138.55
	5/8	1-5/8	3-1/2	TC25560	141.65	TC25570	146.15
	5/8	2-1/4	5	TC25612	201.60	TC25622	210.60
	5/8	3	6	TC25662	217.40	TC25674	226.40
3/4	3/4	1	3	TC25512	176.75	TC25518	181.50
	3/4	1-5/8	4	TC25562	194.70	TC25572	200.50
	3/4	2-1/4	5	TC25614	245.10	TC25624	250.15
	3/4	3	6	TC25664	286.95	TC25676	297.95
	3/4	4	7	TC25666	471.25	TC25678	482.25
1	1	2	4	TC25564	363.50	TC25574	377.50
	1	2-1/4	5	TC25616	402.05	TC25626	409.75
	1	3	6	TC25668	467.90	TC25680	481.90
	1	4-1/4	7	TC25670	690.70	TC25682	704.70

For technical information, see page 106

VI-PRO VARIABLE INDEX END MILLS

4 Flute - Corner Radius



- VI-Pro® variable index geometry offers outstanding performance in a wide range of materials, including high temp alloys, stainless steels, alloy steels, cast iron, and titanium
- Offered in stub, regular, long, and extra long length styles
- Corner radius for increased edge strength
- Delivers efficient, chatter-free machining in roughing, profiling, finishing, and slotting applications up to 1x diameter
- Large core and eccentric relief for improved tool life
- Post-polished AlCrO-MAX coating increases wear and high heat resistance
- Solid carbide
- Precision manufactured in the USA

	CUTTER DIA.	SHANK DIA.	RADIUS	LOC	OAL	AlCrO-MAX COATED		AlCrO-MAX COATED + WELDON FLAT	
	D1 ^{+0.000"} -0.002"	D2 (h6)	R ^{+0.001"} -0.001"	L2	L1	TOOL #	PRICE	TOOL #	PRICE
NEW	1/8	1/8	.005	1/4	1-1/2	TC20960	19.25		
NEW		1/8	.005	1/2	2	TC20984	22.50		
		1/8	.010	1/4	1-1/2	TC21503	19.25		
		1/8	.010	1/2	2	TC22617	22.50		
NEW		1/8	.015	1/4	1-1/2	TC20961	19.25		
NEW		1/8	.015	1/2	2	TC20985	22.50		
		1/8	.020	1/2	2	TC22620	22.50		
		1/8	.030	1/2	2	TC22623	22.50		
NEW	3/16	3/16	.005	3/8	2	TC20964	24.20		
NEW		3/16	.005	9/16	2	TC20986	25.50		
		3/16	.010	3/8	2	TC21506	24.20		
		3/16	.010	9/16	2	TC22626	25.50		
NEW		3/16	.015	3/8	2	TC20965	24.20		
NEW		3/16	.015	9/16	2	TC20987	25.50		
		3/16	.020	9/16	2	TC22629	25.50		
		3/16	.030	9/16	2	TC22632	25.50		
NEW	1/4	1/4	.005	3/8	2	TC21300	28.50		
NEW		1/4	.005	3/4	2-1/2	TC21306	31.55		
NEW		1/4	.010	3/8	2	TC20968	28.50		
NEW		1/4	.010	3/4	2-1/2	TC20988	31.55		
		1/4	.015	3/8	2	TC21509	28.50		
		1/4	.015	3/4	2-1/2	TC22635	31.55		
		1/4	.015	1-1/8	3	TC23820	35.75		
		1/4	.015	1-1/2	4	TC25217	43.50		
NEW		1/4	.020	3/8	2	TC20969	28.50		
NEW		1/4	.020	3/4	2-1/2	TC20989	31.55		
		1/4	.030	3/4	2-1/2	TC22638	31.55		
		1/4	.030	1-1/8	3	TC23823	35.75		
		1/4	.030	1-1/2	4	TC25220	43.50		
		1/4	.060	3/4	2-1/2	TC22641	31.55		
NEW	5/16	5/16	.010	7/16	2	TC20972	38.40		
NEW		5/16	.010	13/16	2-1/2	TC20990	40.65		
		5/16	.015	7/16	2	TC21512	38.40		
		5/16	.015	13/16	2-1/2	TC22644	40.65		
		5/16	.015	1-1/8	3	TC23826	48.45		
NEW		5/16	.020	7/16	2	TC21301	38.40		
NEW		5/16	.020	13/16	2-1/2	TC21307	40.65		
		5/16	.030	13/16	2-1/2	TC22647	40.65		
		5/16	.030	1-1/8	3	TC23829	48.45		
		5/16	.060	13/16	2-1/2	TC22650	40.65		

For technical information, see page 106

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VI-PRO VARIABLE INDEX END MILLS

4 Flute - Corner Radius (Cont.)

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CUTTER DIA.	SHANK DIA.	RADIUS	LOC	OAL	AlCrO-MAX COATED		AlCrO-MAX COATED + WELDON FLAT		
D1 ^{+0.000"} -0.002"	D2 (h6)	R ^{+0.001"} -0.001"	L2	L1	TOOL #	PRICE	TOOL #	PRICE	
3/8	3/8	.010	1/2	2	TC20975	42.25		NEW NEW	
	3/8	.010	1	2-1/2	TC20991	47.45			
	3/8	.015	1/2	2	TC21515	42.25		NEW NEW	
	3/8	.015	1	2-1/2	TC22653	47.45			
	3/8	.020	1/2	2	TC21302	42.25			
	3/8	.020	1	2-1/2	TC21308	47.45			
	3/8	.030	1	2-1/2	TC22656	47.45			
	3/8	.030	1-1/4	3	TC23832	64.40			
	3/8	.030	2	4	TC25223	73.65			
	3/8	.060	1	2-1/2	TC22659	47.45			
3/8	.060	1-1/4	3	TC23835	64.40				
3/8	.060	2	4	TC25226	73.65				
7/16	7/16	.015	1	2-3/4	TC22660	62.20			
	7/16	.030	5/8	2-1/2	TC21517	53.85			
	7/16	.030	1	2-3/4	TC22661	62.20			
	7/16	.030	2	4	TC23836	82.35			
	7/16	.030	3	6	TC25227	116.15			
	7/16	.060	1	2-3/4	TC22663	62.20			
	7/16	.060	2	4	TC23837	82.35			
	7/16	.060	3	6	TC25228	116.15			
1/2	1/2	.010	5/8	2-1/2	TC20978	64.25	TC21024	71.25	NEW NEW
	1/2	.010	1	3	TC20992	75.80	TC21030	82.80	
	1/2	.010	1-1/4	3	TC20993	75.80	TC21031	82.80	NEW
	1/2	.015	1	3	TC22662	75.80	TC22801	80.40	
	1/2	.015	1-1/4	3	TC22677	75.80	TC22816	80.40	NEW NEW
	1/2	.020	5/8	2-1/2	TC21303	64.25	TC21313	71.25	
	1/2	.020	1	3	TC21310	75.80	TC21111	82.80	
	1/2	.020	1-1/4	3	TC21311	75.80	TC21112	82.80	NEW
	1/2	.030	5/8	2-1/2	TC21518	64.25	TC21541	68.25	
	1/2	.030	1	3	TC22665	75.80	TC22804	80.40	
	1/2	.030	1-1/4	3	TC22680	75.80	TC22819	80.40	
	1/2	.030	1-1/2	4	TC23838	90.25	TC23905	94.55	
	1/2	.030	2	4	TC23844	99.50	TC23911	103.80	
	1/2	.030	3	6	TC25229	137.30	TC25302	141.30	
	1/2	.060	1	3	TC22668	75.80	TC22807	80.40	
	1/2	.060	1-1/4	3	TC22683	75.80	TC22822	80.40	
	1/2	.060	1-1/2	4	TC23841	90.25	TC23908	94.55	
	1/2	.060	2	4	TC23847	99.50	TC23914	103.80	
	1/2	.060	3	6	TC25232	137.30	TC25305	144.30	
	1/2	.090	1	3	TC22671	75.80	TC22810	80.40	
	1/2	.090	1-1/4	3	TC22686	75.80	TC22825	80.40	
	1/2	.120	1	3	TC22674	75.80	TC22813	80.40	
	1/2	.120	1-1/4	3	TC22689	75.80	TC22828	80.40	

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VI-PRO VARIABLE INDEX END MILLS

4 Flute - Corner Radius (Cont.)

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	CUTTER DIA.	SHANK DIA.	RADIUS	LOC	OAL	AlCrO-MAX COATED		AlCrO-MAX COATED + WELDON FLAT	
	D ₁ ^{+.000"} - .003"	D ₂ (h6)	R ^{+.001"} - .001"	L ₂	L ₁	TOOL #	PRICE	TOOL #	PRICE
NEW NEW	5/8	5/8	.020	3/4	3	TC21304	121.75	TC21314	130.75
		5/8	.020	1-5/8	3-1/2	TC21309	127.75	TC21316	136.75
		5/8	.030	3/4	3	TC21521	121.75	TC21544	125.70
		5/8	.030	1-5/8	3-1/2	TC22692	127.75	TC22831	132.35
		5/8	.030	2-1/4	5	TC23850	181.15	TC23917	185.35
		5/8	.030	3	6	TC25235	192.55	TC25308	201.55
		5/8	.060	1-5/8	3-1/2	TC22695	127.75	TC22834	132.35
		5/8	.060	2-1/4	5	TC23853	181.15	TC23920	185.35
		5/8	.060	3	6	TC25238	192.55	TC25311	201.55
		5/8	.090	1-5/8	3-1/2	TC22698	127.75	TC22837	132.35
NEW NEW	3/4	3/4	.120	1-5/8	3-1/2	TC22701	127.75	TC22840	132.35
		3/4	.015	1	3	TC21305	158.75	TC21315	169.75
		3/4	.015	1-5/8	4	TC21312	177.95	TC21317	188.95
		3/4	.030	1	3	TC21524	158.75	TC21547	162.90
		3/4	.030	1-5/8	4	TC22704	177.95	TC22843	182.20
		3/4	.030	2-1/4	5	TC23856	227.00	TC23923	233.60
		3/4	.030	3	6	TC25241	254.25	TC25314	260.05
		3/4	.030	4	7	TC25247	413.95	TC25320	424.95
		3/4	.060	1-5/8	4	TC22707	177.95	TC22846	182.20
		3/4	.060	2-1/4	5	TC23859	227.00	TC23926	233.60
		3/4	.060	3	6	TC25244	254.25	TC25317	265.25
		3/4	.060	4	7	TC25250	413.95	TC25323	424.95
		3/4	.090	1-5/8	4	TC22710	177.15	TC22849	182.20
		3/4	.120	1-5/8	4	TC22713	177.95	TC22852	182.20
		3/4	.190	1-5/8	4	TC22714	177.15	TC22853	182.20
	1	3/4	.250	1-5/8	4	TC22715	177.95	TC22854	182.20
		1	.030	2	4	TC22716	323.40	TC22855	329.90
		1	.030	2-1/4	5	TC23862	355.70	TC23929	360.75
		1	.030	3	6	TC25253	418.15	TC25326	423.55
		1	.030	4-1/4	7	TC25259	607.20	TC25332	613.70
		1	.060	2	4	TC22719	323.40	TC22858	337.40
		1	.060	2-1/4	5	TC23865	354.00	TC23932	368.00
		1	.060	3	6	TC25256	416.20	TC25329	430.20
		1	.060	4-1/4	7	TC25262	604.35	TC25335	618.35
		1	.090	2	4	TC22722	323.40	TC22861	337.40
		1	.120	2	4	TC22725	323.40	TC22864	337.40
		1	.190	2	4	TC22728	323.40	TC22867	337.40
		1	.250	2	4	TC22731	323.40	TC22870	329.90

VI-PRO End Mills

For technical information, see page 106

VI-PRO VARIABLE INDEX END MILLS

4 Flute - Corner Radius - Chipbreaker



- VI-Pro® variable index geometry offers outstanding performance in a wide range of materials, including high temp alloys, stainless steels, alloy steels, cast iron, and titanium
- Engineered with chipbreaker geometry for optimal chip evacuation, reduced harmonics, and reduced tool pressure
- Offered in regular, long, and extra long length styles
- Corner radius for increased edge strength
- Delivers efficient, chatter-free machining in roughing, profiling, finishing, and slotting applications up to 1x diameter
- Large core and eccentric relief for improved tool life
- Post-polished AlCrO-MAX coating increases wear and high heat resistance
- Solid carbide
- Precision manufactured in the USA

CUTTER DIA.	SHANK DIA.	RADIUS	LOC	OAL	AlCrO-MAX COATED		AlCrO-MAX COATED + WELDON FLAT	
$D1^{+.000}_{-.002}$	$D2 (h6)$	$R^{+.001}_{-.001}$	$L2$	$L1$	TOOL #	PRICE	TOOL #	PRICE
1/8	1/8	.010	1/2	2	TC28103	27.85		
	1/8	.020	1/2	2	TC28104	28.05		
	1/8	.030	1/2	2	TC28105	28.05		
3/16	3/16	.010	9/16	2	TC28106	32.20		
	3/16	.020	9/16	2	TC28107	32.20		
	3/16	.030	9/16	2	TC28108	32.20		
1/4	1/4	.015	3/4	2-1/2	TC28109	38.90		
	1/4	.015	1-1/8	3	TC28173	45.45		
	1/4	.015	1-1/2	4	TC28201	51.90		
	1/4	.030	3/4	2-1/2	TC28110	39.50		
	1/4	.030	1-1/8	3	TC28174	45.45		
	1/4	.030	1-1/2	4	TC28202	51.90		
	1/4	.060	3/4	2-1/2	TC28111	39.50		
5/16	5/16	.015	13/16	2-1/2	TC28112	50.85		
	5/16	.015	1-1/8	3	TC28175	58.15		
	5/16	.030	13/16	2-1/2	TC28113	50.85		
	5/16	.030	1-1/8	3	TC28176	58.15		
	5/16	.060	13/16	2-1/2	TC28114	50.85		
3/8	3/8	.015	1	2-1/2	TC28115	59.10		
	3/8	.030	1	2-1/2	TC28116	59.10		
	3/8	.030	1-1/4	3	TC28177	75.45		
	3/8	.030	2	4	TC28203	84.00		
	3/8	.060	1	2-1/2	TC28117	59.10		
	3/8	.060	1-1/4	3	TC28178	75.45		
	3/8	.060	2	4	TC28204	84.00		
7/16	7/16	.015	1	2-3/4	TC28118	70.65		
	7/16	.030	1	2-3/4	TC28119	70.65		
	7/16	.030	2	4	TC28179	89.90		
	7/16	.030	3	6	TC28205	128.85		
	7/16	.060	1	2-3/4	TC28120	70.65		
	7/16	.060	2	4	TC28180	89.90		
	7/16	.060	3	6	TC28206	128.85		

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For technical information, see page 106

VI-PRO VARIABLE INDEX END MILLS

4 Flute - Corner Radius - Chipbreaker (Cont.)

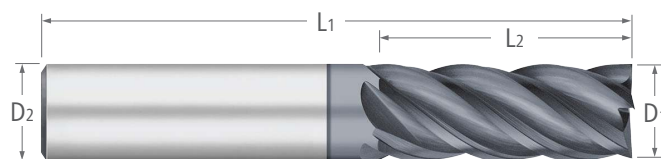
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CUTTER DIA.	SHANK DIA.	RADIUS	LOC	OAL	AlCrO-MAX COATED		AlCrO-MAX COATED + WELDON FLAT	
D1 ^{+0.000"} -0.002"	D2 (h6)	R ^{+0.001"} -0.001"	L2	L1	TOOL #	PRICE	TOOL #	PRICE
1/2	1/2	.015	1	3	TC28121	83.45	TC28147	90.45
	1/2	.015	1-1/4	3	TC28126	83.45	TC28152	90.45
	1/2	.030	1	3	TC28122	83.45	TC28148	90.45
	1/2	.030	1-1/4	3	TC28127	83.45	TC28153	90.45
	1/2	.030	1-1/2	4	TC28181	101.25	TC28191	108.25
	1/2	.030	2	4	TC28183	111.25	TC28193	118.25
	1/2	.030	3	6	TC28207	150.70	TC28219	157.70
	1/2	.060	1	3	TC28123	83.45	TC28149	90.45
	1/2	.060	1-1/4	3	TC28128	83.45	TC28154	90.45
	1/2	.060	1-1/2	4	TC28182	101.25	TC28192	108.25
	1/2	.060	2	4	TC28184	111.25	TC28194	118.25
	1/2	.060	3	6	TC28208	150.70	TC28220	157.70
	1/2	.090	1	3	TC28124	83.45	TC28150	90.45
	1/2	.090	1-1/4	3	TC28129	83.45	TC28155	90.45
	1/2	.120	1	3	TC28125	83.45	TC28151	90.45
	1/2	.120	1-1/4	3	TC28130	83.45	TC28156	90.45
D1 ^{+0.000"} -0.003"	D2 (h6)	R ^{+0.001"} -0.001"	L2	L1	TOOL #	PRICE	TOOL #	PRICE
5/8	5/8	.030	1-5/8	3-1/2	TC28131	143.10	TC28157	152.10
	5/8	.030	2-1/4	5	TC28185	195.70	TC28195	204.70
	5/8	.030	3	6	TC28209	209.35	TC28221	218.35
	5/8	.060	1-5/8	3-1/2	TC28132	143.10	TC28158	152.10
	5/8	.060	2-1/4	5	TC28186	195.70	TC28196	204.70
	5/8	.060	3	6	TC28210	209.35	TC28222	218.35
	5/8	.090	1-5/8	3-1/2	TC28133	143.10	TC28159	152.10
	5/8	.120	1-5/8	3-1/2	TC28134	143.10	TC28160	152.10
3/4	3/4	.030	1-5/8	4	TC28135	193.05	TC28161	204.05
	3/4	.030	2-1/4	5	TC28187	235.65	TC28197	246.65
	3/4	.030	3	6	TC28211	273.00	TC28223	284.00
	3/4	.030	4	7	TC28213	432.65	TC28225	443.65
	3/4	.060	1-5/8	4	TC28136	193.05	TC28162	204.05
	3/4	.060	2-1/4	5	TC28188	235.65	TC28198	246.65
	3/4	.060	3	6	TC28212	273.00	TC28224	284.00
	3/4	.060	4	7	TC28214	432.65	TC28226	443.65
	3/4	.090	1-5/8	4	TC28137	193.05	TC28163	204.05
	3/4	.120	1-5/8	4	TC28138	193.05	TC28164	204.05
	3/4	.190	1-5/8	4	TC28139	193.05	TC28165	204.05
	3/4	.250	1-5/8	4	TC28140	193.05	TC28166	204.05
1	1	.030	2	4	TC28141	343.70	TC28167	357.70
	1	.030	2-1/4	5	TC28189	377.10	TC28199	391.10
	1	.030	3	6	TC28215	434.20	TC28227	448.20
	1	.030	4-1/4	7	TC28217	627.25	TC28229	641.25
	1	.060	2	4	TC28142	343.70	TC28168	357.70
	1	.060	2-1/4	5	TC28190	377.10	TC28200	391.10
	1	.060	3	6	TC28216	434.20	TC28228	448.20
	1	.060	4-1/4	7	TC28218	627.25	TC28230	641.25
	1	.090	2	4	TC28143	343.70	TC28169	357.70
	1	.120	2	4	TC28144	343.70	TC28170	357.70
	1	.190	2	4	TC28145	343.70	TC28171	357.70
	1	.250	2	4	TC28146	343.70	TC28172	357.70

For technical information, see page 106

VI-PRO VARIABLE INDEX END MILLS

5 Flute - Square



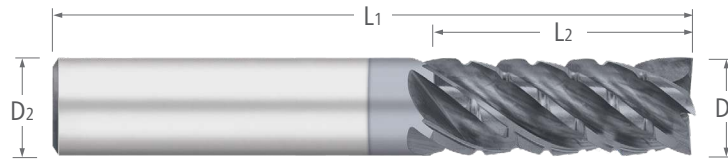
- VI-Pro® variable index geometry offers outstanding performance in a wide range of materials, including high temp alloys, stainless steels, alloy steels, cast iron, and titanium
- Delivers efficient, chatter-free machining in roughing, profiling, finishing
- Large core and eccentric relief for improved tool life
- Post-polished AlCrO-MAX coating increases wear and high heat resistance
- Solid carbide
- Precision manufactured in the USA
- Offered in stub, regular, long, and extra long length styles

CUTTER DIA.	SHANK DIA.	LOC	OAL	AlCrO-MAX COATED		AlCrO-MAX COATED + WELDON FLAT	
D1 ^{+0.000"} _{-0.002"}	D2 (h6)	L2	L1	TOOL #	PRICE	TOOL #	PRICE
1/8	1/8	1/4	1-1/2	TC25807	18.40		
	1/8	1/2	2	TC25829	22.10		
3/16	3/16	3/8	2	TC25809	23.80		
	3/16	9/16	2	TC25835	25.25		
1/4	1/4	3/8	2	TC25796	26.75		
	1/4	3/4	2-1/2	TC25836	32.10		
	1/4	1-1/8	3	TC25888	36.50		
	1/4	1-1/2	4	TC25942	43.60		
5/16	5/16	7/16	2	TC25797	38.95		
	5/16	13/16	2-1/2	TC25838	42.45		
	5/16	1-1/8	3	TC25890	50.25		
3/8	3/8	1/2	2	TC25798	43.40		
	3/8	1	2-1/2	TC25840	49.70		
	3/8	1-1/4	3	TC25892	67.85		
	3/8	2	4	TC25944	76.05		
1/2	1/2	5/8	2-1/2	TC25799	64.60	TC25802	68.95
	1/2	1	3	TC25842	74.60	TC25852	78.65
	1/2	1-1/4	3	TC25844	74.60	TC25854	78.65
	1/2	1-1/2	4	TC25894	93.20	TC25904	97.80
	1/2	2	4	TC25896	103.85	TC25906	108.05
	1/2	3	6	TC25946	146.40	TC25958	150.80
D1 ^{+0.000"} _{-0.003"}	D2 (h6)	L2	L1	TOOL #	PRICE	TOOL #	PRICE
5/8	5/8	3/4	3	TC25800	127.15	TC25803	132.10
	5/8	1-5/8	3-1/2	TC25846	134.35	TC25856	139.35
	5/8	2-1/4	5	TC25898	193.10	TC25908	197.75
	5/8	3	6	TC25948	207.25	TC25960	212.95
3/4	3/4	1	3	TC25801	168.55	TC25804	173.00
	3/4	1-5/8	4	TC25848	185.65	TC25858	191.15
	3/4	2-1/4	5	TC25900	233.70	TC25910	238.50
	3/4	3	6	TC25950	273.60	TC25962	279.90
	3/4	4	7	TC25952	451.40	TC25964	457.30
1	1	2	4	TC25850	346.55	TC25860	360.55
	1	2-1/4	5	TC25902	385.15	TC25912	399.15
	1	3	6	TC25954	448.15	TC25966	454.00
	1	4-1/4	7	TC25956	661.60	TC25968	675.60

For technical information, see page 107

VI-PRO VARIABLE INDEX END MILLS

5 Flute - Square - Chipbreaker



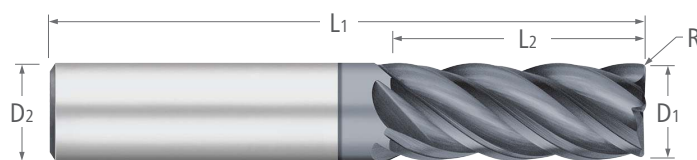
- VI-Pro® variable index geometry offers outstanding performance in a wide range of materials, including high temp alloys, stainless steels, alloy steels, cast iron, and titanium
- Engineered with chipbreaker geometry for optimal chip evacuation, reduced harmonics, and reduced tool pressure
- Offered in regular, long, and extra long length styles
- Delivers efficient, chatter-free machining in roughing, profiling, and finishing applications
- Large core and eccentric relief for improved tool life
- Post-polished AlCrO-MAX coating increases wear and high heat resistance
- Solid carbide
- Precision manufactured in the USA

CUTTER DIA.	SHANK DIA.	LOC	OAL	AlCrO-MAX COATED		AlCrO-MAX COATED + WELDON FLAT	
$D1^{+.000}_{-.002}$	$D2 (h6)$	$L2$	$L1$	TOOL #	PRICE	TOOL #	PRICE
1/8	1/8	1/2	2	TC13270	24.70		
3/16	3/16	9/16	2	TC13271	27.85		
1/4	1/4	3/4	2-1/2	TC13272	34.70		
	1/4	1-1/8	3	TC13285	39.10		
	1/4	1-1/2	4	TC13298	46.20		
5/16	5/16	13/16	2-1/2	TC13273	45.05		
	5/16	1-1/8	3	TC13286	52.85		
3/8	3/8	1	2-1/2	TC13274	52.30		
	3/8	1-1/4	3	TC13287	70.45		
	3/8	2	4	TC13299	78.65		
1/2	1/2	1	3	TC13275	77.20	TC13280	84.20
	1/2	1-1/4	3	TC13276	77.20	TC13281	84.20
	1/2	1-1/2	4	TC13288	95.80	TC13293	102.80
	1/2	2	4	TC13289	106.45	TC13294	113.45
	1/2	3	6	TC13300	149.00	TC13306	156.00
$D1^{+.000}_{-.003}$	$D2 (h6)$	$L2$	$L1$	TOOL #	PRICE	TOOL #	PRICE
5/8	5/8	1-5/8	3-1/2	TC13277	136.95	TC13282	145.95
	5/8	2-1/4	5	TC13290	195.70	TC13295	204.70
	5/8	3	6	TC13301	209.85	TC13307	218.85
3/4	3/4	1-5/8	4	TC13278	188.25	TC13283	199.25
	3/4	2-1/4	5	TC13291	236.30	TC13296	247.30
	3/4	3	6	TC13302	276.20	TC13308	287.20
	3/4	4	7	TC13303	454.00	TC13309	465.00
1	1	2	4	TC13279	349.15	TC13284	363.15
	1	2-1/4	5	TC13292	387.75	TC13297	401.75
	1	3	6	TC13304	450.75	TC13310	464.75
	1	4-1/4	7	TC13305	664.20	TC13311	678.20

For technical information, see page 107

VI-PRO VARIABLE INDEX END MILLS

5 Flute - Corner Radius



- VI-Pro® variable index geometry offers outstanding performance in a wide range of materials, including high temp alloys, stainless steels, alloy steels, cast iron, and titanium
- Offered in stub, regular, long, and extra long length styles
- Corner radius for increased edge strength
- Delivers efficient, chatter-free machining in roughing, profiling, and finishing applications
- Large core and eccentric relief for improved tool life
- Post-polished AlCrO-MAX coating increases wear and high heat resistance
- Solid carbide
- Precision manufactured in the USA

CUTTER DIA.	SHANK DIA.	RADIUS	LOC	OAL	AlCrO-MAX COATED		AlCrO-MAX COATED + WELDON FLAT	
$D1^{+.000"_{-.002"}}$	$D2 (h6)$	$R^{+.001"_{-.001"}}$	$L2$	$L1$	TOOL #	PRICE	TOOL #	PRICE
1/8	1/8	.005	1/4	1-1/2	TC21318	21.20		NEW
	1/8	.005	1/2	2	TC21330	25.45		NEW
	1/8	.010	1/4	1-1/2	TC25995	21.20		
	1/8	.010	1/2	2	TC26404	25.45		
	1/8	.015	1/4	1-1/2	TC21319	21.20		NEW
	1/8	.015	1/2	2	TC21331	25.45		NEW
	1/8	.020	1/2	2	TC26406	25.45		
	1/8	.030	1/2	2	TC26408	25.45		
3/16	3/16	.005	3/8	2	TC21320	26.45		NEW
	3/16	.005	9/16	2	TC21332	30.05		NEW
	3/16	.010	3/8	2	TC25996	26.45		
	3/16	.010	9/16	2	TC26410	30.05		
	3/16	.015	3/8	2	TC21321	26.45		NEW
	3/16	.015	9/16	2	TC21333	30.05		NEW
	3/16	.020	9/16	2	TC26412	30.05		
	3/16	.030	9/16	2	TC26414	30.05		
1/4	1/4	.005	3/8	2	TC21322	31.40		NEW
	1/4	.005	3/4	2-1/2	TC21334	34.70		NEW
	1/4	.010	3/8	2	TC21045	31.40		NEW
	1/4	.010	3/4	2-1/2	TC21067	34.70		NEW
	1/4	.015	3/8	2	TC25986	31.40		
	1/4	.015	3/4	2-1/2	TC26416	34.70		
	1/4	.015	1-1/8	3	TC27109	39.10		
	1/4	.015	1-1/2	4	TC27928	47.60		
	1/4	.020	3/8	2	TC21323	31.40		NEW
	1/4	.020	3/4	2-1/2	TC21335	34.70		NEW
	1/4	.030	3/4	2-1/2	TC26419	34.70		
	1/4	.030	1-1/8	3	TC27112	39.10		
	1/4	.030	1-1/2	4	TC27931	47.60		
	1/4	.060	3/4	2-1/2	TC26422	34.70		

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VI-PRO VARIABLE INDEX END MILLS

5 Flute - Corner Radius (Cont.)

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	CUTTER DIA.	SHANK DIA.	RADIUS	LOC	OAL	AlCrO-MAX COATED		AlCrO-MAX COATED + WELDON FLAT	
	D ₁ ^{+.000"} _{-.002"}	D ₂ (h6)	R ^{+.001"} _{-.001"}	L ₂	L ₁	TOOL #	PRICE	TOOL #	PRICE
NEW	5/16	5/16	.010	7/16	2	TC21048	42.20		
NEW		5/16	.010	13/16	2-1/2	TC21068	44.95		
		5/16	.015	7/16	2	TC25987	42.20		
		5/16	.015	13/16	2-1/2	TC26425	44.95		
		5/16	.015	1-1/8	3	TC27115	53.30		
NEW		5/16	.020	7/16	2	TC21324	42.20		
NEW		5/16	.020	13/16	2-1/2	TC21336	44.95		
		5/16	.030	13/16	2-1/2	TC26428	44.95		
		5/16	.030	1-1/8	3	TC27118	53.30		
		5/16	.060	13/16	2-1/2	TC26431	44.95		
NEW	3/8	3/8	.010	1/2	2	TC21051	46.45		
NEW		3/8	.010	1	2-1/2	TC21069	52.20		
		3/8	.015	1/2	2	TC25988	46.45		
		3/8	.015	1	2-1/2	TC26434	52.20		
NEW		3/8	.020	1/2	2	TC21325	46.45		
NEW		3/8	.020	1	2-1/2	TC21337	52.20		
		3/8	.030	1	2-1/2	TC26437	52.20		
		3/8	.030	1-1/4	3	TC27121	70.90		
		3/8	.030	2	4	TC27934	80.65		
		3/8	.060	1	2-1/2	TC26440	52.20		
		3/8	.060	1-1/4	3	TC27124	70.90		
		3/8	.060	2	4	TC27937	80.65		
NEW	1/2	1/2	.010	5/8	2-1/2	TC21326	71.05	TC21342	78.05
NEW		1/2	.010	1	3	TC21338	83.80	TC21346	90.80
		1/2	.015	1	3	TC26443	83.80	TC26625	88.40
		1/2	.015	1-1/4	3	TC26458	83.80	TC26640	88.40
NEW		1/2	.020	5/8	2-1/2	TC21327	71.05	TC21343	78.05
NEW		1/2	.020	1	3	TC21339	83.80	TC21347	90.80
		1/2	.030	5/8	2-1/2	TC25989	71.05	TC25992	75.05
		1/2	.030	1	3	TC26446	83.80	TC26628	88.40
		1/2	.030	1-1/4	3	TC26461	83.80	TC26643	88.40
		1/2	.030	2	4	TC27127	110.00	TC27262	114.20
		1/2	.030	3	6	TC27940	150.30	TC28002	157.30
		1/2	.060	1	3	TC26449	83.80	TC26631	88.40
		1/2	.060	1-1/4	3	TC26464	83.80	TC26646	88.40
		1/2	.060	2	4	TC27130	110.00	TC27265	117.00
		1/2	.060	3	6	TC27943	150.30	TC28005	157.30
		1/2	.090	1	3	TC26452	83.80	TC26634	90.80
		1/2	.090	1-1/4	3	TC26467	83.80	TC26649	90.80
		1/2	.120	1	3	TC26455	83.80	TC26637	88.40
		1/2	.120	1-1/4	3	TC26470	83.80	TC26652	88.40

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VI-PRO End Mills

VI-PRO VARIABLE INDEX END MILLS

5 Flute - Corner Radius (Cont.)

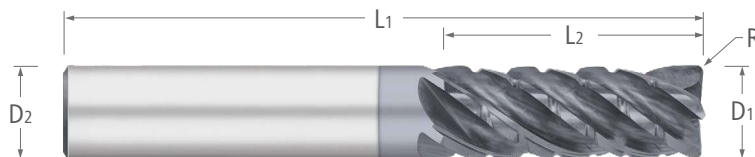
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CUTTER DIA.	SHANK DIA.	RADIUS	LOC	OAL	AlCrO-MAX COATED		AlCrO-MAX COATED + WELDON FLAT		
$D_1^{+.000^+}_{-.003^+}$	$D_2(h6)$	$R^{+.001^+}_{-.001^+}$	L_2	L_1	TOOL #	PRICE	TOOL #	PRICE	
5/8	5/8	.020	3/4	3	TC21328	133.25	TC21344	142.25	NEW
	5/8	.020	1-5/8	3-1/2	TC21340	140.50	TC21348	149.50	NEW
	5/8	.030	3/4	3	TC25990	133.25	TC25993	138.25	
	5/8	.030	1-5/8	3-1/2	TC26473	140.50	TC26655	145.55	
	5/8	.030	2-1/4	5	TC27133	198.30	TC27268	203.95	
	5/8	.030	3	6	TC27946	211.85	TC28008	217.55	
	5/8	.060	1-5/8	3-1/2	TC26476	140.50	TC26658	145.55	
	5/8	.060	2-1/4	5	TC27136	198.30	TC27271	207.30	
	5/8	.060	3	6	TC27949	211.85	TC28011	220.85	
	5/8	.090	1-5/8	3-1/2	TC26479	140.50	TC26661	149.50	
	5/8	.120	1-5/8	3-1/2	TC26482	140.50	TC26664	149.50	
3/4	3/4	.015	1	3	TC21329	174.65	TC21345	185.65	NEW
	3/4	.015	1-5/8	4	TC21341	194.85	TC21349	205.85	NEW
	3/4	.030	1	3	TC25991	174.65	TC25994	179.20	
	3/4	.030	1-5/8	4	TC26485	194.85	TC26667	200.40	
	3/4	.030	2-1/4	5	TC27139	249.70	TC27274	256.95	
	3/4	.030	3	6	TC27952	279.65	TC28014	286.05	
	3/4	.030	4	7	TC27958	457.55	TC28020	468.55	
	3/4	.060	1-5/8	4	TC26488	194.85	TC26670	200.40	
	3/4	.060	2-1/4	5	TC27142	249.70	TC27277	256.95	
	3/4	.060	3	6	TC27955	279.65	TC28017	286.05	
	3/4	.060	4	7	TC27961	455.40	TC28023	466.40	
	3/4	.090	1-5/8	4	TC26491	194.85	TC26673	205.85	
	3/4	.120	1-5/8	4	TC26494	194.85	TC26676	200.40	
	3/4	.190	1-5/8	4	TC26495	194.85	TC26677	205.85	
	3/4	.250	1-5/8	4	TC26496	194.85	TC26678	205.85	
1	1	.030	2	4	TC26497	355.75	TC26679	369.75	
	1	.030	2-1/4	5	TC27145	391.25	TC27280	405.25	
	1	.030	3	6	TC27964	457.80	TC28026	465.90	
	1	.030	4-1/4	7	TC27970	664.75	TC28032	678.75	
	1	.060	2	4	TC26500	355.75	TC26682	362.85	
	1	.060	2-1/4	5	TC27148	389.40	TC27283	403.40	
	1	.060	3	6	TC27967	457.80	TC28029	471.80	
	1	.060	4-1/4	7	TC27973	664.75	TC28035	678.75	
	1	.090	2	4	TC26503	355.75	TC26685	369.75	
	1	.120	2	4	TC26506	355.75	TC26688	369.75	
	1	.190	2	4	TC26507	355.75	TC26689	369.75	
	1	.250	2	4	TC26508	355.75	TC26690	369.75	

For technical information, see page 107

VI-PRO VARIABLE INDEX END MILLS

5 Flute - Corner Radius - Chipbreaker



- VI-Pro® variable index geometry offers outstanding performance in a wide range of materials, including high temp alloys, stainless steels, alloy steels, cast iron, and titanium
- Engineered with chipbreaker geometry for optimal chip evacuation, reduced harmonics, and reduced tool pressure
- Offered in regular, long, and extra long length styles
- Delivers efficient, chatter free machining in light profiling, High Efficiency Milling (HEM), and finishing applications
- Corner radius for increased edge strength
- Large core and eccentric relief for improved tool life
- Post-polished AlCrO-MAX coating increases wear and high heat resistance
- Solid carbide
- Precision manufactured in the USA

CUTTER DIA.	SHANK DIA.	RADIUS	LOC	OAL	AlCrO-MAX COATED		AlCrO-MAX COATED + WELDON FLAT	
$D1^{+.000}_{-.002}$	$D2 (h6)$	$R^{+.001}_{-.001}$	$L2$	$L1$	TOOL #	PRICE	TOOL #	PRICE
1/8	1/8	.010	1/2	2	TC13312	28.05		
	1/8	.020	1/2	2	TC13313	28.05		
	1/8	.030	1/2	2	TC13314	28.05		
3/16	3/16	.010	9/16	2	TC13315	32.65		
	3/16	.020	9/16	2	TC13316	32.65		
	3/16	.030	9/16	2	TC13317	32.65		
1/4	1/4	.015	3/4	2-1/2	TC13318	37.30		
	1/4	.015	1-1/8	3	TC13379	41.70		
	1/4	.015	1-1/2	4	TC13401	50.20		
	1/4	.030	3/4	2-1/2	TC13319	37.30		
	1/4	.030	1-1/8	3	TC13380	41.70		
	1/4	.030	1-1/2	4	TC13402	50.20		
	1/4	.060	3/4	2-1/2	TC13320	37.30		
5/16	5/16	.015	13/16	2-1/2	TC13321	47.55		
	5/16	.015	1-1/8	3	TC13381	55.90		
	5/16	.030	13/16	2-1/2	TC13322	47.55		
	5/16	.030	1-1/8	3	TC13382	55.90		
	5/16	.060	13/16	2-1/2	TC13323	47.55		
3/8	3/8	.015	1	2-1/2	TC13324	54.80		
	3/8	.030	1	2-1/2	TC13325	54.80		
	3/8	.030	1-1/4	3	TC13383	73.45		
	3/8	.030	2	4	TC13403	83.25		
	3/8	.060	1	2-1/2	TC13326	54.80		
	3/8	.060	1-1/4	3	TC13384	73.45		
	3/8	.060	2	4	TC13404	83.25		

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VI-PRO VARIABLE INDEX END MILLS

5 Flute - Corner Radius - Chipbreaker (Cont.)

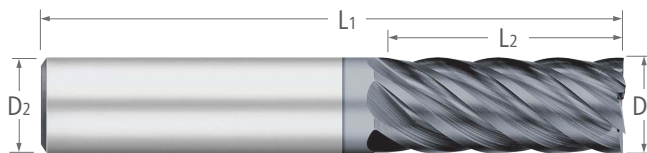
continued from previous page

CUTTER DIA.	SHANK DIA.	RADIUS	LOC	OAL	AlCrO-MAX COATED		AlCrO-MAX COATED + WELDON FLAT	
D1 ^{+0.000"} -0.002"	D2 (h6)	R ^{+0.001"} -0.001"	L2	L1	TOOL #	PRICE	TOOL #	PRICE
1/2	1/2	.015	1	3	TC13327	86.40	TC13353	93.40
	1/2	.015	1-1/4	3	TC13332	86.40	TC13358	93.40
	1/2	.030	1	3	TC13328	86.40	TC13354	93.40
	1/2	.030	1-1/4	3	TC13333	86.40	TC13359	93.40
	1/2	.030	2	4	TC13385	112.60	TC13393	119.60
	1/2	.030	3	6	TC13405	152.90	TC13417	159.90
	1/2	.060	1	3	TC13329	86.40	TC13355	93.40
	1/2	.060	1-1/4	3	TC13334	86.40	TC13360	93.40
	1/2	.060	2	4	TC13386	112.60	TC13394	119.60
	1/2	.060	3	6	TC13406	152.90	TC13418	159.90
	1/2	.090	1	3	TC13330	86.40	TC13356	93.40
	1/2	.090	1-1/4	3	TC13335	86.40	TC13361	93.40
	1/2	.120	1	3	TC13331	86.40	TC13357	93.40
	1/2	.120	1-1/4	3	TC13336	86.40	TC13362	93.40
5/8	5/8	.030	1-5/8	3-1/2	TC13337	143.10	TC13363	152.10
	5/8	.030	2-1/4	5	TC13387	200.90	TC13395	209.90
	5/8	.030	3	6	TC13407	214.45	TC13419	223.45
	5/8	.060	1-5/8	3-1/2	TC13338	143.10	TC13364	152.10
	5/8	.060	2-1/4	5	TC13388	200.90	TC13396	209.90
	5/8	.060	3	6	TC13408	214.45	TC13420	223.45
	5/8	.090	1-5/8	3-1/2	TC13339	143.10	TC13365	152.10
	5/8	.120	1-5/8	3-1/2	TC13340	143.10	TC13366	152.10
3/4	3/4	.030	1-5/8	4	TC13341	197.45	TC13367	208.45
	3/4	.030	2-1/4	5	TC13389	252.30	TC13397	263.30
	3/4	.030	3	6	TC13409	282.25	TC13421	293.25
	3/4	.030	4	7	TC13411	460.15	TC13423	471.15
	3/4	.060	1-5/8	4	TC13342	197.45	TC13368	208.45
	3/4	.060	2-1/4	5	TC13390	252.30	TC13398	263.30
	3/4	.060	3	6	TC13410	282.25	TC13422	293.25
	3/4	.060	4	7	TC13412	458.00	TC13424	469.00
	3/4	.090	1-5/8	4	TC13343	197.45	TC13369	208.45
	3/4	.120	1-5/8	4	TC13344	197.45	TC13370	208.45
	3/4	.190	1-5/8	4	TC13345	197.45	TC13371	208.45
	3/4	.250	1-5/8	4	TC13346	197.45	TC13372	208.45
1	1	.030	2	4	TC13347	358.35	TC13373	372.35
	1	.030	2-1/4	5	TC13391	393.85	TC13399	407.85
	1	.030	3	6	TC13413	460.40	TC13425	474.40
	1	.030	4-1/4	7	TC13415	667.35	TC13427	681.35
	1	.060	2	4	TC13348	358.35	TC13374	372.35
	1	.060	2-1/4	5	TC13392	392.00	TC13400	406.00
	1	.060	3	6	TC13414	460.40	TC13426	474.40
	1	.060	4-1/4	7	TC13416	667.35	TC13428	681.35
	1	.090	2	4	TC13349	358.35	TC13375	372.35
	1	.120	2	4	TC13350	358.35	TC13376	372.35
	1	.190	2	4	TC13351	358.35	TC13377	372.35
	1	.250	2	4	TC13352	358.35	TC13378	372.35

For technical information, see page 107

VI-PRO VARIABLE INDEX END MILLS

6 Flute - Square

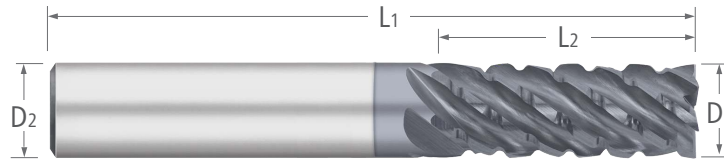


- VI-Pro® variable index geometry offers outstanding performance in a wide range of materials, including high temp alloys, stainless steels, alloy steels, cast iron, and titanium
- Offered in stub, regular, long, and extra long length styles
- Delivers efficient, chatter-free machining in High Efficiency Milling (HEM), profiling, and finishing applications
- Large core and eccentric relief for improved tool life
- Post-polished AlCrO-MAX coating increases wear and high heat resistance
- Solid carbide
- Precision manufactured in the USA

CUTTER DIA.	SHANK DIA.	LOC	OAL	AlCrO-MAX COATED		AlCrO-MAX COATED + WELDON FLAT	
D1 ^{+0.000"} -0.002"	D2 (h6)	L2	L1	TOOL #	PRICE	TOOL #	PRICE
1/4	1/4	3/8	2	TC64404	28.55		
	1/4	3/4	2-1/2	TC64516	56.95		
	1/4	1-1/8	3	TC61316	62.50		
5/16	5/16	7/16	2	TC64406	42.50		
	5/16	13/16	2-1/2	TC64520	67.30		
	5/16	1-1/8	3	TC61320	72.90		
3/8	3/8	1/2	2	TC64408	47.35		
	3/8	1	2-1/2	TC64524	72.55		
	3/8	1-1/4	3	TC61324	83.25		
1/2	1/2	5/8	2-1/2	TC64410	70.20	TC64416	75.15
	1/2	1-1/4	3	TC64532	97.50	TC64579	102.80
	1/2	2	4	TC61332	128.90	TC61384	135.90
D1 ^{+0.000"} -0.003"	D2 (h6)	L2	L1	TOOL #	PRICE	TOOL #	PRICE
5/8	5/8	3/4	3	TC64412	134.65	TC64418	143.65
	5/8	1-5/8	3-1/2	TC64540	161.65	TC64581	168.10
	5/8	2-1/4	5	TC61340	200.25	TC61386	208.20
3/4	3/4	1	3	TC64414	174.65	TC64420	185.65
	3/4	1-5/8	4	TC64548	202.90	TC64583	211.00
	3/4	2-1/4	5	TC61348	250.05	TC61388	261.05
1	1	2	4	TC64564	310.80	TC64585	320.05
	1	3	6	TC61364	506.85	TC61390	520.85

VI-PRO VARIABLE INDEX END MILLS

6 Flute - Square - Chipbreaker



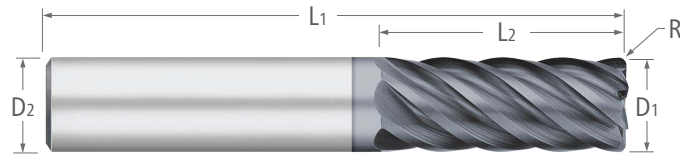
- VI-Pro® variable index geometry offers outstanding performance in a wide range of materials, including high temp alloys, stainless steels, alloy steels, cast iron, and titanium
- Engineered with chipbreaker geometry for optimal chip evacuation, reduced harmonics, and reduced tool pressure
- Offered in regular, long, and extra long length styles
- Delivers efficient, chatter free machining in light profiling, High Efficiency Milling (HEM), and finishing applications
- Large core and eccentric relief for improved tool life
- Post-polished AlCrO-MAX coating increases wear and high heat resistance
- Solid carbide
- Precision manufactured in the USA

CUTTER DIA.	SHANK DIA.	LOC	OAL	AlCrO-MAX COATED		AlCrO-MAX COATED + WELDON FLAT	
$D_1 \begin{smallmatrix} +.000" \\ -.002" \end{smallmatrix}$	$D_2 \text{ (h6)}$	L_2	L_1	TOOL #	PRICE	TOOL #	PRICE
1/4	1/4	3/4	2-1/2	TC13429	59.55		
	1/4	1-1/8	3	TC13440	65.10		
5/16	5/16	13/16	2-1/2	TC13430	69.90		
	5/16	1-1/8	3	TC13441	75.50		
3/8	3/8	1	2-1/2	TC13431	75.15		
	3/8	1-1/4	3	TC13442	85.85		
1/2	1/2	1-1/4	3	TC13432	100.10	TC13436	107.10
	1/2	2	4	TC13443	131.50	TC13447	138.50
$D_1 \begin{smallmatrix} +.000" \\ -.003" \end{smallmatrix}$	$D_2 \text{ (h6)}$	L_2	L_1	TOOL #	PRICE	TOOL #	PRICE
5/8	5/8	1-5/8	3-1/2	TC13433	164.25	TC13437	173.25
	5/8	2-1/4	5	TC13444	202.85	TC13448	211.85
3/4	3/4	1-5/8	4	TC13434	205.50	TC13438	216.50
	3/4	2-1/4	5	TC13445	252.65	TC13449	263.65
1	1	2	4	TC13435	313.40	TC13439	327.40
	1	3	6	TC13446	509.45	TC13450	523.45

For technical information, see page 108

VI-PRO VARIABLE INDEX END MILLS

6 Flute - Corner Radius

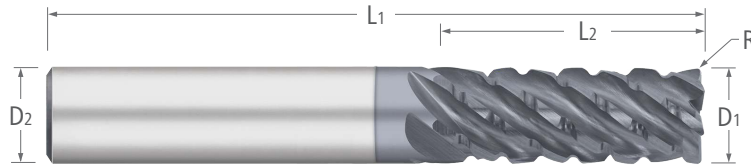


- VI-Pro® variable index geometry offers outstanding performance in a wide range of materials, including high temp alloys, stainless steels, alloy steels, cast iron, and titanium
- Offered in stub, regular, long, and extra long length styles
- Corner radius for increased edge strength
- Delivers efficient, chatter-free machining in High Efficiency Milling (HEM), profiling, and finishing applications
- Large core and eccentric relief for improved tool life
- Post-polished AlCrO-MAX coating increases wear and high heat resistance
- Solid carbide
- Precision manufactured in the USA

CUTTER DIA.	SHANK DIA.	RADIUS	LOC	OAL	AlCrO-MAX COATED		AlCrO-MAX COATED + WELDON FLAT	
$D_1^{+.000" \atop -.002"}$	$D_2 \text{ (h6)}$	$R^{+.001" \atop -.001"}$	L_2	L_1	TOOL #	PRICE	TOOL #	PRICE
1/4	1/4	.015	3/8	2	TC64426	34.35		
	1/4	.015	3/4	2-1/2	TC67116	63.25		
	1/4	.015	1-1/8	3	TC61216	70.15		
5/16	5/16	.015	7/16	2	TC64428	45.85		
	5/16	.015	13/16	2-1/2	TC67120	75.20		
	5/16	.015	1-1/8	3	TC61220	81.45		
3/8	3/8	.015	1/2	2	TC64430	50.45		
	3/8	.015	1	2-1/2	TC67124	81.00		
	3/8	.015	1-1/4	3	TC61224	93.00		
1/2	1/2	.030	5/8	2-1/2	TC64432	77.50	TC64438	81.90
	1/2	.030	1-1/4	3	TC67132	108.30	TC67184	114.85
	1/2	.030	2	4	TC61232	143.90	TC61287	150.90
$D_1^{+.000" \atop -.003"}$	$D_2 \text{ (h6)}$	$R^{+.001" \atop -.001"}$	L_2	L_1	TOOL #	PRICE	TOOL #	PRICE
5/8	5/8	.030	3/4	3	TC64434	141.85	TC64440	150.85
	5/8	.030	1-5/8	3-1/2	TC67140	173.45	TC67186	179.50
	5/8	.030	2-1/4	5	TC61240	213.85	TC61289	222.85
3/4	3/4	.030	1	3	TC64436	184.65	TC64442	188.90
	3/4	.060	1-5/8	4	TC67148	216.70	TC67188	225.35
	3/4	.060	2-1/4	5	TC61248	267.05	TC61291	278.05
1	1	.060	2	4	TC67164	331.90	TC67190	345.90
	1	.060	3	6	TC61264	543.85	TC61293	557.85

VI-PRO VARIABLE INDEX END MILLS

6 Flute - Corner Radius - Chipbreaker



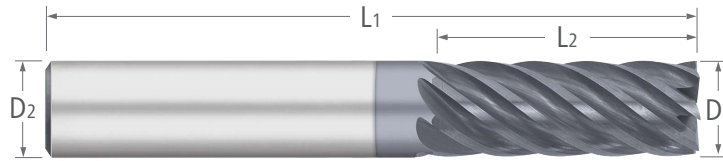
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- Engineered with chipbreaker geometry for optimal chip evacuation, reduced harmonics, and reduced tool pressure
- Offered in stub, regular, long, and extra long length styles
- Delivers efficient, chatter-free machining in High Efficiency Milling (HEM), profiling, and finishing applications
- Corner radius for increased edge strength
- Large core and eccentric relief for improved tool life
- Post-polished AlCrO-MAX coating increases wear and high heat resistance
- Solid carbide
- Precision manufactured in the USA

CUTTER DIA.	SHANK DIA.	RADIUS	LOC	OAL	AlCrO-MAX COATED		AlCrO-MAX COATED + WELDON FLAT	
$D_1^{+.000''}_{-.002''}$	D_2 (h6)	$R^{+.001''}_{-.001''}$	L_2	L_1	TOOL #	PRICE	TOOL #	PRICE
1/4	1/4	.015	3/4	2-1/2	TC13451	65.85		
	1/4	.015	1-1/8	3	TC13462	72.75		
5/16	5/16	.015	13/16	2-1/2	TC13452	77.80		
	5/16	.015	1-1/8	3	TC13463	84.05		
3/8	3/8	.015	1	2-1/2	TC13453	83.60		
	3/8	.015	1-1/4	3	TC13464	95.60		
1/2	1/2	.030	1-1/4	3	TC13454	110.90	TC13458	117.90
	1/2	.030	2	4	TC13465	146.50	TC13469	153.50
$D_1^{+.000''}_{-.003''}$	D_2 (h6)	$R^{+.001''}_{-.001''}$	L_2	L_1	TOOL #	PRICE	TOOL #	PRICE
5/8	5/8	.030	1-5/8	3-1/2	TC13455	176.05	TC13459	185.05
	5/8	.030	2-1/4	5	TC13466	216.45	TC13470	225.45
3/4	3/4	.060	1-5/8	4	TC13456	219.30	TC13460	230.30
	3/4	.060	2-1/4	5	TC13467	269.65	TC13471	280.65
1	1	.060	2	4	TC13457	334.50	TC13461	348.50
	1	.060	3	6	TC13468	546.45	TC13472	560.45

For technical information, see page 108

VI-PRO VARIABLE INDEX END MILLS

7 Flute - Square

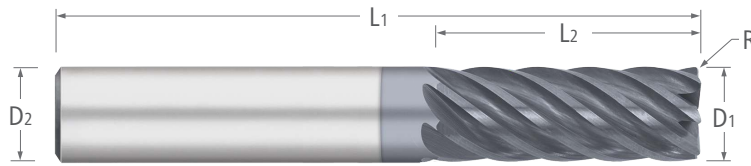


- VI-Pro® variable index geometry offers outstanding performance in a wide range of materials, including high temp alloys, stainless steels, alloy steels, cast iron, and titanium
- Delivers efficient, chatter free machining in light profiling, High Efficiency Milling (HEM), and finishing applications
- Large core and eccentric relief for improved tool life
- Post-polished AlCrO-MAX coating increases wear and high heat resistance
- Solid carbide
- Precision manufactured in the USA
- Offered in regular, long, and extra long length styles

CUTTER DIA.	SHANK DIA.	LOC	OAL	AlCrO-MAX COATED	
$D1^{+0.000}_{-0.002}$	$D2 (h6)$	$L2$	$L1$	TOOL #	PRICE
1/4	1/4	3/8	2	TC64800	30.55
	1/4	3/4	2-1/2	TC64806	37.40
	1/4	1-1/8	3	TC64813	43.25
5/16	5/16	7/16	2	TC64801	45.50
	5/16	13/16	2-1/2	TC64807	48.40
	5/16	1-1/8	3	TC64814	57.80
3/8	3/8	1/2	2	TC64802	50.65
	3/8	1	2-1/2	TC64808	57.45
	3/8	1-1/4	3	TC64815	77.85
1/2	1/2	5/8	2-1/2	TC64803	75.15
	1/2	1-1/4	3	TC64809	93.10
	1/2	2	4	TC64816	121.45
$D1^{+0.000}_{-0.003}$	$D2 (h6)$	$L2$	$L1$	TOOL #	PRICE
5/8	5/8	3/4	3	TC64804	144.10
	5/8	1-5/8	3-1/2	TC64810	161.75
	5/8	2-1/4	5	TC64817	214.25
3/4	3/4	1	3	TC64805	186.90
	3/4	1-5/8	4	TC64811	205.90
	3/4	2-1/4	5	TC64818	267.55
1	1	2	4	TC64812	399.95
	1	3	6	TC64819	491.75

VI-PRO VARIABLE INDEX END MILLS

7 Flute - Corner Radius



- VI-Pro® variable index geometry offers outstanding performance in a wide range of materials, including high temp alloys, stainless steels, alloy steels, cast iron, and titanium
- Delivers efficient, chatter free machining in light profiling, High Efficiency Milling (HEM), and finishing applications
- Large core and eccentric relief for improved tool life
- Offered in regular, long, and extra long length styles
- Corner radius for increased edge strength
- Post-polished AlCrO-MAX coating increases wear and high heat resistance
- Solid carbide
- Precision manufactured in the USA

CUTTER DIA.	SHANK DIA.	RADIUS	LOC	OAL	ALCRO-MAX COATED	
$D_1 \begin{smallmatrix} +.000'' \\ -.002'' \end{smallmatrix}$	$D_2 \text{ (h6)}$	$R \begin{smallmatrix} +.001'' \\ -.001'' \end{smallmatrix}$	L_2	L_1	TOOL #	PRICE
1/4	1/4	.015	3/8	2	TC64820	35.70
	1/4	.015	3/4	2-1/2	TC64826	39.60
	1/4	.015	1-1/8	3	TC64833	44.55
5/16	5/16	.015	7/16	2	TC64821	47.65
	5/16	.015	13/16	2-1/2	TC64827	50.85
	5/16	.015	1-1/8	3	TC64834	59.60
3/8	3/8	.015	1/2	2	TC64822	52.45
	3/8	.015	1	2-1/2	TC64828	58.05
	3/8	.015	1-1/4	3	TC64835	74.85
1/2	1/2	.030	5/8	2-1/2	TC64823	80.60
	1/2	.030	1-1/4	3	TC64829	94.10
	1/2	.030	2	4	TC64836	120.15
$D_1 \begin{smallmatrix} +.000'' \\ -.003'' \end{smallmatrix}$	$D_2 \text{ (h6)}$	$R \begin{smallmatrix} +.001'' \\ -.001'' \end{smallmatrix}$	L_2	L_1	TOOL #	PRICE
5/8	5/8	.030	3/4	3	TC64824	147.55
	5/8	.030	1-5/8	3-1/2	TC64830	180.40
	5/8	.030	2-1/4	5	TC64837	222.40
3/4	3/4	.060	1	3	TC64825	192.05
	3/4	.060	1-5/8	4	TC64831	225.40
	3/4	.060	2-1/4	5	TC64838	277.75
1	1	.060	2	4	TC64832	399.80
	1	.060	3	6	TC64839	511.00

For technical information, see page 108

GENERAL PURPOSE END MILLS - CARBIDE - ROUGHING

Technical Information

Carbide Fine Pitch Roughers									
Material Guide		SFM	Feed Per Tooth						
			1/8" - 1/4"	1/4" - 5/16"	5/16" - 3/8"	3/8" - 1/2"	1/2" - 5/8"	5/8" - 3/4"	3/4" - 1"
COBALT BASE ALLOYS	Stellite, HS - 21, Haynes 25/188, X - 40, L - 605	85 - 120	.0002 - .0004 .0002 - .0005	.0004 - .0006 .0005 - .0007	.0006 - .0008 .0008 - .0009	.0008 - .0012 .0009 - .0014	.0012 - .0015 .0014 - .0018	.0015 - .0018 .0018 - .0022	.0018 - .0025 .0022 - .0029
NICKEL BASE ALLOYS	Inconel - 625/718, Waspalloy, Rene, Hastelloy	60 - 85	.0001 - .0003 .0003 - .0004	.0003 - .0005 .0004 - .0006	.0005 - .0006 .0006 - .0007	.0006 - .0010 .0007 - .0011	.0010 - .0012 .0011 - .0014	.0012 - .0015 .0014 - .0017	.0015 - .0020 .0017 - .0023
IRON BASE ALLOYS	Incoloy 800 - 802, Multimet N - 155, Timkin 16 - 25 - 6, Carpeneter 22 - b3	70 - 100	.0002 - .0004 .0002 - .0005	.0004 - .0006 .0005 - .0007	.0006 - .0008 .0008 - .0009	.0008 - .0012 .0009 - .0014	.0012 - .0015 .0014 - .0018	.0015 - .0018 .0018 - .0022	.0018 - .0025 .0022 - .0029
STAINLESS STEEL (PRECIPITATION)	13/8, 15/5, 17 - 4	175 - 245	.0006 - .0011 .0009 - .0015	.0011 - .0013 .0015 - .0016	.0013 - .0016 .0016 - .0022	.0016 - .0022 .0022 - .0030	.0022 - .0028 .0030 - .0039	.0028 - .0034 .0039 - .0047	.0034 - .0046 .0047 - .0063
STAINLESS STEEL (AUSTENITIC)	200 Series, 302, 303, 304, 304L, 316, 316L	225 - 315	.0007 - .0013 .0010 - .0018	.0013 - .0017 .0018 - .0023	.0017 - .0020 .0023 - .0028	.0020 - .0027 .0028 - .0037	.0027 - .0034 .0037 - .0047	.0034 - .0041 .0047 - .0056	.0041 - .0055 .0056 - .0075
STAINLESS STEEL (MARTENSITIC)	403, 410, 416, 440	200 - 280	.0009 - .0014 .0014 - .0019	.0014 - .0018 .0019 - .0023	.0018 - .0021 .0023 - .0029	.0021 - .0029 .0029 - .0040	.0029 - .0036 .0040 - .0050	.0036 - .0043 .0050 - .0060	.0043 - .0059 .0060 - .0081
HIGH STRENGTH TOOL STEELS	4140, 4340, 6150, 5210, A2, D2 P20, H11, H13, S2, 01	225 - 315	.0007 - .0013 .0010 - .0018	.0013 - .0017 .0018 - .0023	.0017 - .0020 .0023 - .0028	.0020 - .0027 .0028 - .0037	.0027 - .0034 .0037 - .0047	.0034 - .0041 .0047 - .0056	.0041 - .0055 .0056 - .0075
MEDIUM ALLOY STEELS	200, 250, 300	250 - 350	.0007 - .0013 .0010 - .0018	.0013 - .0017 .0018 - .0023	.0017 - .0020 .0023 - .0028	.0020 - .0027 .0028 - .0037	.0027 - .0034 .0037 - .0047	.0034 - .0041 .0047 - .0056	.0041 - .0055 .0056 - .0075
CARBON STEELS	1000's, 1100's, 1300's	265 - 370	.0007 - .0013 .0010 - .0018	.0013 - .0017 .0018 - .0023	.0017 - .0020 .0023 - .0028	.0020 - .0027 .0028 - .0037	.0027 - .0034 .0037 - .0047	.0034 - .0041 .0047 - .0056	.0041 - .0055 .0056 - .0075

Slotting @ $\leq .5 \times D$ Profiling @ $2 \times D$ Axial / $\leq .5D$ Radial

GENERAL PURPOSE END MILLS - COBALT - ROUGHING

Technical Information

General Purpose Cobalt Roughing End Mills										
Material Guide		Rc	SFM	Feed Per Tooth						
				1/4"	1/2"	3/4"	1"	1 1/4"	1 1/2"	2"
COBALT BASE ALLOYS	Stellite, HS-21, Haynes 25/188, X-40, L-605	< 32	5-25	.0009 - .0011	.0012 - .0014	.0018 - .0020	.0026 - .0029	.0033 - .0037	.0040 - .0045	.0053 - .0059
NICKEL BASE ALLOYS	Inconel-625/718, Waspalloy, Rene, Hastelloy	< 32	10-20	.0009 - .0011	.0012 - .0014	.0018 - .0020	.0026 - .0029	.0033 - .0037	.0040 - .0045	.0053 - .0059
IRON BASE ALLOYS	Incoloy 800-802, Multimet N-155, Timkin 16-25-6, Carpeneter 22-b3	< 32	15-35	.0009 - .0011	.0012 - .0014	.0018 - .0020	.0026 - .0029	.0033 - .0037	.0040 - .0045	.0053 - .0059
MONEL	Monel-65% Nickel		10-20	.0009 - .0011	.0012 - .0014	.0018 - .0020	.0026 - .0029	.0033 - .0037	.0040 - .0045	.0053 - .0059
TITANIUM ALLOYS	Commercially Pure, 6AL-4V, Astm 1/2/3, 6Al-25N-4Zr-2Mo-Si		50-90	.0015 - .0017	.0020 - .0022	.0028 - .0030	.0040 - .0045	.0052 - .0057	.0062 - .0067	.0080 - .0090
STAINLESS STEEL (PRECIPITATION)	13/8, 15/5, 17-4, AM-350/355	< 32	60-80	.0011 - .0015	.0016 - .0020	.0026 - .0029	.0036 - .0040	.0046 - .0050	.0054 - .0060	.0070 - .0075
STAINLESS STEEL (AUSTENITIC)	200 Series, 302, 303, 304, 316, 304L, 316L	< 32	60-80	.0015 - .0019	.0020 - .0025	.0030 - .0034	.0045 - .0049	.0056 - .0061	.0067 - .0074	.0090 - .0098
STAINLESS STEEL (MARTENSITIC)	403, 410, 416, 440	< 32	60-100	.0015 - .0019	.0020 - .0025	.0030 - .0034	.0045 - .0049	.0056 - .0061	.0067 - .0074	.0090 - .0098
HIGH STRENGTH TOOL STEELS	4140, 4340, 6150, 5210, A2, D2 P20, H11, H13, S2, 01	< 32	50-80	.0011 - .0015	.0015 - .0020	.0025 - .0028	.0035 - .0039	.0045 - .0050	.0053 - .0059	.0071 - .0079
MEDIUM ALLOY STEELS	200, 250, 300	< 32	60-120	.0016 - .0020	.0023 - .0027	.0033 - .0040	.0050 - .0054	.0032 - .0070	.0075 - .0082	.0093 - .0110
CARBON STEELS	1000's, 1100's, 1300's	< 32	70-150	.0018 - .0022	.0025 - .0029	.0037 - .0042	.0053 - .0059	.0068 - .0074	.0080 - .0090	.0100 - .0115
DUCTILE	Ductile Cast Irons		40-80	.0015 - .0018	.0019 - .0024	.0030 - .0034	.0042 - .0048	.0056 - .0061	.0065 - .0073	.0087 - .0093
CAST IRONS	Gray Cast Irons		60-150	.0010 - .0014	.0014 - .0018	.0024 - .0027	.0034 - .0038	.0044 - .0050	.0053 - .0058	.0070 - .0078
ALUMINUM	2014, 2024, 6061-(T1-T6), 7075, Die Cast, Extruded		400-650	.0024 - .0027	.0058 - .0063	.0067 - .0076	.0103 - .0110	.0112 - .0120	.0180 - .0205	.0210 - .0260

These values are a starting point based on an uncoated tool.

For AlTiN Coated tools increase SFM values by up to +40%

GENERAL PURPOSE END MILLS - CARBIDE

Technical Information

General Purpose Carbide End Mills											
Material Guide		Rc	SFM				Suggested Chip Load Per Tooth				
			2 Flute		3 & 4 Flute						
			Stub, Std	Long, X-Long	Stub, Std	Long, X-Long	1/32" - 1/8"	1/8" - 1/4"	1/4" - 1/2"	1/2" - 1"	1" - 1 - 1/4"
COBALT BASE ALLOYS	Stellite, HS-21, Haynes 25/188, X-40, L-605	under 32 over 32			175 - 225 125 - 175	140 - 180 100 - 140	.0005 - .0010 .0003 - .0005	.0008 - .0020 .0005 - .0015	.0010 - .0030 .0010 - .0020	.0020 - .0040 .0010 - .0030	.0030 - .0050 .0020 - .0040
NICKEL BASE ALLOYS	Inconel-625/718, Waspalloy, Rene, Hastelloy	under 32 over 32			125 - 175 70 - 115	100 - 140 55 - 95	.0005 - .0010 .0003 - .0005	.0008 - .0020 .0005 - .0015	.0010 - .0030 .0010 - .0020	.0020 - .0040 .0010 - .0030	.0030 - .0050 .0020 - .0040
IRON BASE ALLOYS	Incoloy 800-802, Multimet N-155, Timkin 16-25-6, Carpeneter 22-b3	under 32 over 32			175 - 225 125 - 175	140 - 180 100 - 140	.0005 - .0010 .0003 - .0005	.0008 - .0020 .0005 - .0015	.0010 - .0030 .0010 - .0020	.0020 - .0040 .0010 - .0030	.0030 - .0050 .0020 - .0040
MONEL	Monel-65% Nickel		175 - 300	125 - 175	175 - 300	140 - 240	.0007 - .0015	.0010 - .0025	.0015 - .0040	.0030 - .0050	.0040 - .0060
TITANIUM ALLOYS	Commercially Pure, 6AL-4V, Astm 1/2/3, 6Al-25N-4Zr-2Mo-Si		200 - 300	125 - 250	200 - 300	160 - 240	.0007 - .0015	.0010 - .0025	.0015 - .0040	.0030 - .0050	.0040 - .0060
STAINLESS STEEL (PRECIPITATION)	13/8, 15/5, 17-4	under 32 over 32			150 - 250 125 - 175	120 - 200 100 - 140	.0005 - .0010 .0003 - .0005	.0008 - .0020 .0005 - .0015	.0010 - .0030 .0010 - .0020	.0020 - .0040 .0010 - .0030	.0030 - .0050 .0020 - .0040
STAINLESS STEEL (AUSTENITIC)	200 Series, 302, 303, 304, 304L, 316, 316L	under 32 over 32			200 - 250 150 - 200	160 - 200 120 - 160	.0005 - .0010 .0003 - .0005	.0008 - .0020 .0005 - .0015	.0010 - .0030 .0010 - .0020	.0020 - .0040 .0010 - .0030	.0030 - .0050 .0020 - .0040
STAINLESS STEEL (MARTENSITIC)	403, 410, 416, 440	under 32 over 32			150 - 250 125 - 175	120 - 200 100 - 140	.0005 - .0010 .0003 - .0005	.0008 - .0020 .0005 - .0015	.0010 - .0030 .0010 - .0020	.0020 - .0040 .0010 - .0030	.0030 - .0050 .0020 - .0040
HIGH STRENGTH TOOL STEELS	4140, 4340, 6150, 5210, A2, D2 P20, H11, H13, S2, 01	under 32 over 32			150 - 225 60 - 125	120 - 180 50 - 100	.0005 - .0010 .0003 - .0005	.0008 - .0020 .0005 - .0015	.0010 - .0030 .0010 - .0020	.0020 - .0040 .0010 - .0030	.0030 - .0050 .0020 - .0040
MEDIUM ALLOY STEELS	200, 250, 300	under 32 over 32			200 - 250 125 - 175	160 - 200 100 - 140	.0007 - .0015 .0005 - .0010	.0010 - .0025 .0008 - .0020	.0015 - .0040 .0010 - .0030	.0030 - .0050 .0020 - .0040	.0040 - .0060 .0030 - .0050
CARBON STEELS	1000's, 1100's, 1300's	under 32 over 32			200 - 250 125 - 175	160 - 200 100 - 140	.0007 - .0015 .0005 - .0010	.0010 - .0025 .0008 - .0020	.0015 - .0040 .0010 - .0030	.0030 - .0050 .0020 - .0040	.0040 - .0060 .0030 - .0050
DUCTILE	Ductile Cast Irons		200 - 300	125 - 200	200 - 300	160 - 240	.0010 - .0020	.0015 - .0040	.0020 - .0060	.0030 - .0100	.0030 - .0080
CAST IRONS	Gray Cast Irons		225 - 325	175 - 250	250 - 350	200 - 280	.0010 - .0020	.0015 - .0040	.0020 - .0060	.0030 - .0100	.0050 - .0100
ALUMINUM	2014, 2024, 6061-(T1-T6), 7075, Die Cast, Extruded		300 - 500	300 - 500	300 - 500	240 - 400	.0010 - .0020	.0015 - .0040	.0020 - .0060	.0030 - .0100	.0030 - .0150
MAGNESIUM			300 - 500	300 - 500	300 - 500	240 - 400	.0010 - .0020	.0015 - .0040	.0020 - .0060	.0030 - .0100	.0050 - .0100
COPPER, COPPER ALLOYS			400 - 500	250 - 350	300 - 400	240 - 320	.0007 - .0015	.0010 - .0025	.0015 - .0035	.0020 - .0080	.0040 - .0100
BRASS, BRONZE	Brass, Alum/Bronze, Low Silicon Bronze		300 - 400	200 - 300	250 - 350	200 - 280	.0007 - .0015	.0010 - .0025	.0015 - .0035	.0020 - .0080	.0040 - .0100
COMPOSITES	G-10 Fiberglass, Graphite, Graphite/Epoxy, Plastics		250 - 1000	250 - 1000	250 - 1000	200 - 800	.0010 - .0020	.0015 - .0040	.0020 - .0060	.0030 - .0100	.0050 - .0100

These values are a starting point based on an uncoated tool.

For AlTiN Coated tools increase SFM values by up to +40%

GENERAL PURPOSE END MILLS - CARBIDE

45° & 60° Helix - Technical Information

General Purpose Carbide 45°& 60° Helix End Mills									
Material Guide		Rc	SFM			Feed Per Tooth			
			2, 3 Flute	3 Flute	5 Flute				
			45° Helix Aluminum	45°,60° Helix	45° Helix	UP TO 1/8"	1/8" - 1/4"	1/4" - 1/2"	1/2" - 1"
COBALT BASE ALLOYS	Stellite, HS - 21, Haynes 25/188, X - 40, L - 605	under 32 over 32		200 - 275 125 - 175	200 - 275 125 - 175	.0005 - .0010 .0003 - .0005	.0008 - .0020 .0005 - .0015	.0010 - .0030 .0010 - .0020	.0020 - .0040 .0010 - .0030
NICKEL BASE ALLOYS	Inconel - 625/718, Waspalloy, Rene, Hastelloy	under 32 over 32		150 - 200 90 - 125	150 - 200 90 - 125	.0005 - .0010 .0003 - .0005	.0008 - .0020 .0005 - .0015	.0010 - .0030 .0010 - .0020	.0020 - .0040 .0010 - .0030
IRON BASE ALLOYS	Incoloy 800 - 802, Multimet N - 155, Timkin 16 - 25 - 6, Carpeneter 22 - b3	under 32 over 32		200 - 300 150 - 200	200 - 300 150 - 200	.0005 - .0010 .0003 - .0005	.0008 - .0020 .0005 - .0015	.0010 - .0030 .0010 - .0020	.0020 - .0040 .0010 - .0030
MONEL	Monel - 65% Nickel			200 - 300	200 - 300	.0007 - .0015	.0010 - .0025	.0015 - .0040	.0030 - .0050
TITANIUM ALLOYS	Commercially Pure, 6AL - 4V, Astm 1/2/3, 6AL - 25N - 4Zr - 2Mo - Si		125 - 400	150 - 300	150 - 300	.0007 - .0015	.0010 - .0025	.0015 - .0040	.0030 - .0050
STAINLESS STEEL (PRECIPITATION)	13/8, 15/5, 17 - 4, AM - 350/355	under 32 over 32		200 - 300 150 - 200	200 - 300 150 - 200	.0005 - .0010 .0003 - .0005	.0008 - .0020 .0005 - .0015	.0010 - .0030 .0010 - .0020	.0020 - .0040 .0010 - .0030
STAINLESS STEEL (AUSTENITIC)	200 Series, 302, 303, 304, 316, 304L, 316L	under 32 over 32		250 - 350 175 - 275	250 - 350 175 - 275	.0005 - .0010 .0003 - .0005	.0008 - .0020 .0005 - .0015	.0010 - .0030 .0010 - .0020	.0020 - .0040 .0010 - .0030
STAINLESS STEEL (MARTENSITIC)	403, 410, 416, 440	under 32 over 32		200 - 300 150 - 200	200 - 300 150 - 200	.0005 - .0010 .0003 - .0005	.0008 - .0020 .0005 - .0015	.0010 - .0030 .0010 - .0020	.0020 - .0040 .0010 - .0030
HIGH STRENGTH TOOL STEELS	4140, 4340, 6150, 5210, A2, D2 P20, H11, H13, S2, 01	under 32 over 32		225 - 300 125 - 200	225 - 300 125 - 200	.0005 - .0010 .0003 - .0005	.0008 - .0020 .0005 - .0015	.0010 - .0030 .0010 - .0020	.0020 - .0040 .0010 - .0030
MEDIUM ALLOY STEELS	200, 250, 300	under 32 over 32		250 - 350 150 - 200	250 - 350 150 - 200	.0007 - .0015 .0005 - .0010	.0010 - .0025 .0008 - .0020	.0015 - .0040 .0010 - .0030	.0030 - .0050 .0020 - .0040
CARBON STEELS	1000's, 1100's, 1300's	under 32 over 32		250 - 350 150 - 200	250 - 350 150 - 200	.0007 - .0015 .0005 - .0010	.0010 - .0025 .0008 - .0020	.0015 - .0040 .0010 - .0030	.0030 - .0050 .0020 - .0040
DUCTILE	Ductile Cast Irons			200 - 300	200 - 300	.0010 - .0020	.0015 - .0040	.0020 - .0060	.0030 - .0100
CAST IRONS	Gray Cast Irons			175 - 250	175 - 250	.0010 - .0020	.0015 - .0040	.0020 - .0060	.0030 - .0100
ALUMINUM	2014, 2024, 6061-(T1-T6), 7075, Die Cast, Extruded		300 - 500	200 - 400	200 - 400	.0010 - .0020	.0015 - .0040	.0020 - .0060	.0030 - .0150
MAGNESIUM			200 - 500	200 - 300	200 - 300	.0010 - .0020	.0015 - .0040	.0020 - .0060	.0030 - .0100
COPPER, COPPER ALLOYS			200 - 500	200 - 300	200 - 300	.0007 - .0015	.0010 - .0025	.0015 - .0035	.0020 - .0080
BRASS, BRONZE	Brass, Alum/Bronze, Low Silicon Bronze		200 - 500	200 - 300	200 - 300	.0007 - .0015	.0010 - .0025	.0015 - .0035	.0020 - .0080

These values are a starting point based on an uncoated tool.

For AlTiN Coated tools increase SFM values by up to +40%

GENERAL PURPOSE END MILLS - COBALT & HIGH SPEED STEEL

30° Helix - Technical Information

General Purpose Cobalt & HSS 30° Helix End Mills									
Material Guide		Rc	SFM	Feed Per Tooth					
			30° Helix	1/8"	1/8" - 1/4"	1/4" - 1/2"	1/2" - 1"	1" - 1 - 3/8"	1-1/2" - 2"
COBALT BASE ALLOYS	Stellite, HS - 21, Haynes 25/188, X - 40, L - 605	<32	5 - 10	.0002 - .0006	.0002 - .0010	.0002 - .0010	.0005 - .0030	.0010 - .0040	.0030 - .0060
NICKEL BASE ALLOYS	Inconel - 625/718, Waspalloy, Rene, Hastelloy	<32	10 - 15	.0002 - .0006	.0002 - .0010	.0002 - .0010	.0005 - .0030	.0010 - .0040	.0030 - .0060
IRON BASE ALLOYS	Incoloy 800 - 802, Multimet N - 155, Timkin 16 - 25 - 6, Carpeneter 22 - b3	<32	15 - 20	.0002 - .0006	.0002 - .0010	.0002 - .0010	.0005 - .0030	.0010 - .0040	.0030 - .0060
MONEL	Monel - 65% Nickel	<32	10 - 15	.0002 - .0006	.0002 - .0010	.0002 - .0010	.0005 - .0030	.0010 - .0040	.0030 - .0060
TITANIUM ALLOYS	Commercially Pure, 6AL - 4V, Astm 1/2/3, 6Al - 25N - 4Zr - 2Mo - Si	<32	15 - 20	.0002 - .0006	.0002 - .0010	.0002 - .0010	.0005 - .0030	.0010 - .0040	.0030 - .0060
STAINLESS STEEL (PRECIPITATION)	13/8, 15/5, 17 - 4	<32	15 - 20	.0002 - .0006	.0002 - .0010	.0002 - .0010	.0005 - .0030	.0010 - .0040	.0030 - .0060
STAINLESS STEEL (AUSTENITIC)	200 Series, 302, 303, 304, 304L, 316, 316L	<32	20 - 40	.0002 - .0006	.0002 - .0010	.0002 - .0010	.0005 - .0030	.0010 - .0040	.0030 - .0060
STAINLESS STEEL (MARTENSITIC)	403, 410, 416, 440	<32	40 - 60	.0002 - .0006	.0002 - .0010	.0002 - .0010	.0005 - .0030	.0010 - .0040	.0030 - .0060
HIGH STRENGTH TOOL STEELS	4140, 4340, 6150, 5210, A2, D2 P20, H11, H13, S2, 01	<32	20 - 40	.0002 - .0006	.0002 - .0010	.0002 - .0010	.0005 - .0030	.0010 - .0040	.0030 - .0060
MEDIUM ALLOY STEELS	200, 250, 300	<32	60 - 80	.0002 - .0006	.0002 - .0010	.0002 - .0010	.0005 - .0030	.0010 - .0040	.0030 - .0060
CARBON STEELS	1000's, 1100's, 1300's		80 - 100	.0002 - .0006	.0002 - .0010	.0002 - .0010	.0005 - .0030	.0010 - .0040	.0030 - .0060
DUCTILE	Ductile Cast Irons		40 - 60	.0002 - .0006	.0002 - .0010	.0002 - .0010	.0005 - .0030	.0010 - .0040	.0030 - .0060
CAST IRONS	Gray Cast Irons		80 - 100	.0002 - .0006	.0002 - .0010	.0002 - .0010	.0005 - .0030	.0010 - .0040	.0030 - .0060
ALUMINUM	2014, 2024, 6061 - (T1 - T6), 7075, Die Cast, Extruded		200 - 500	.0002 - .0006	.0002 - .0010	.0002 - .0010	.0005 - .0030	.0010 - .0040	.0030 - .0060
COPPER, COPPER ALLOYS			150 - 250	.0002 - .0006	.0002 - .0010	.0002 - .0010	.0005 - .0030	.0010 - .0040	.0030 - .0060
BRASS, BRONZE	Brass, Alum/Bronze, Low Silicon Bronze		100 - 200	.0002 - .0006	.0002 - .0010	.0002 - .0010	.0005 - .0030	.0010 - .0040	.0030 - .0060
COMPOSITES	G - 10 Fiberglass, Graphite, Graphite/ Epoxy, Plastics		200 - 500	.0002 - .0006	.0002 - .0010	.0002 - .0010	.0005 - .0030	.0010 - .0040	.0030 - .0060

These values are a starting point based on an uncoated tool.

For AlTiN Coated tools increase SFM values by up to +40%

VI-PRO VARIABLE INDEX END MILLS

4 Flute - Technical Information

VI-Pro Variable Index End Mills - 4 Flute

Material Guide		Rc	SFM		Feed Per Tooth									
			Stub, Reg Length	Long, Xlong Length	1/8"	3/16"	1/4"	5/16"	3/8"	7/16"	1/2"	5/8"	3/4"	1"
COBALT BASE ALLOYS	Stellite, HS - 21, Haynes 25/188, X - 40, L - 605	under 32 over 32	275 - 350 175 - 250	220 - 280 140 - 200	.0004 - .0008	.0005 - .0011	.0009 - .0016	.0010 - .0018	.0012 - .0019	.0014 - .0021	.0016 - .0028	.0019 - .0031	.0024 - .0037	.0029 - .0041
NICKEL BASE ALLOYS	Inconel - 625/718, Waspalloy, Rene, Hastelloy	under 32 over 32	200 - 300 125 - 200	160 - 240 100 - 160	.0004 - .0008	.0005 - .0011	.0009 - .0016	.0010 - .0018	.0012 - .0019	.0014 - .0021	.0016 - .0028	.0019 - .0031	.0024 - .0037	.0029 - .0041
IRON BASE ALLOYS	Incoloy 800 - 802, Multimet N - 155, Timkin 16 - 25 - 6, Carpeneter 22 - b3	under 32 over 32	250 - 350 200 - 250	200 - 280 160 - 200	.0004 - .0008	.0005 - .0011	.0009 - .0016	.0010 - .0018	.0012 - .0019	.0014 - .0021	.0016 - .0028	.0019 - .0031	.0024 - .0037	.0029 - .0041
MONEL	Monel - 65% Nickel		275 - 350	220 - 280	.0004 - .0008	.0009 - .0011	.0014 - .0016	.0015 - .0017	.0017 - .0019	.0019 - .0021	.0026 - .0028	.0029 - .0031	.0035 - .0037	.0039 - .0041
TITANIUM ALLOYS	Commercially Pure, 6AL - 4V, Astm 1/2/3, 6Al - 25N - 4Zr - 2Mo - Si		250 - 400	200 - 320	.0004 - .0008	.0009 - .0011	.0014 - .0016	.0015 - .0017	.0017 - .0019	.0019 - .0021	.0026 - .0028	.0029 - .0031	.0035 - .0037	.0039 - .0041
STAINLESS STEEL (PRECIPITATION)	13/8, 15/5, 17 - 4, AM - 350/355	under 32 over 32	250 - 300 200 - 250	200 - 240 160 - 200	.0004 - .0008	.0009 - .0011	.0014 - .0016	.0016 - .0020	.0017 - .0025	.0019 - .0031	.0026 - .0032	.0029 - .0037	.0035 - .0039	.0039 - .0041
STAINLESS STEEL (AUSTENITIC)	200 Series, 302, 303, 304, 304L, 316, 316L	under 32 over 32	250 - 375 200 - 250	200 - 300 160 - 200	.0004 - .0008	.0009 - .0011	.0014 - .0016	.0016 - .0020	.0017 - .0025	.0019 - .0031	.0026 - .0032	.0029 - .0037	.0035 - .0039	.0039 - .0041
STAINLESS STEEL (MARTENSITIC)	403, 410, 416, 440		250 - 300	200 - 240	.0004 - .0008	.0009 - .0011	.0014 - .0016	.0016 - .0020	.0017 - .0025	.0019 - .0031	.0026 - .0032	.0029 - .0037	.0035 - .0039	.0039 - .0041
HIGH STRENGTH TOOL STEELS	4140, 4340, 6150, 5210, A2, D2 P20, H11, H13, S2, 01	under 32 over 32	250 - 350 150 - 200	200 - 280 120 - 160	.0004 - .0008	.0009 - .0011	.0014 - .0016	.0016 - .0020	.0017 - .0025	.0019 - .0031	.0026 - .0032	.0029 - .0037	.0035 - .0039	.0039 - .0041
MEDIUM ALLOY STEELS	200, 250, 300	under 32 over 32	210 - 300 130 - 170	170 - 240 100 - 135	.0004 - .0008	.0009 - .0011	.0014 - .0016	.0016 - .0020	.0017 - .0025	.0019 - .0031	.0026 - .0032	.0029 - .0037	.0035 - .0039	.0039 - .0041
CARBON STEELS	1000's, 1100's, 1300's		420 - 450	335 - 360	.0004 - .0008	.0011 - .0013	.0018 - .0020	.0024 - .0026	.0030 - .0032	.0033 - .0035	.0035 - .0037	.0039 - .0041	.0041 - .0043	.0054 - .0056
DUCTILE	Ductile Cast Irons		420 - 450	335 - 360	.0004 - .0008	.0011 - .0013	.0018 - .0020	.0024 - .0026	.0030 - .0032	.0033 - .0035	.0035 - .0037	.0039 - .0041	.0041 - .0043	.0054 - .0056
CAST IRONS	Gray Cast Irons		420 - 450	335 - 360	.0004 - .0008	.0011 - .0013	.0018 - .0020	.0024 - .0026	.0030 - .0032	.0033 - .0035	.0035 - .0037	.0039 - .0041	.0041 - .0043	.0054 - .0056

VI-PRO VARIABLE INDEX END MILLS

5 Flute - Technical Information

VI-Pro Variable Index End Mills - 5 Flute														
Material Guide		Rc	SFM		Feed Per Tooth									
			Stub, Reg Length	Long, Xlong Length	1/8"	3/16"	1/4"	5/16"	3/8"	7/16"	1/2"	5/8"	3/4"	1"
COBALT BASE ALLOYS	Stellite, HS - 21, Haynes 25/188, X - 40, L - 605	under 32 over 32	315 - 400 200 - 290	250 - 320 160 - 230	.0004 - .0008	.0005 - .0011	.0009 - .0016	.0010 - .0018	.0012 - .0019	.0014 - .0021	.0016 - .0028	.0019 - .0031	.0024 - .0037	.0029 - .0041
NICKEL BASE ALLOYS	Inconel - 625/718, Waspalloy, Rene, Hastelloy	under 32 over 32	230 - 345 145 - 230	185 - 275 115 - 185	.0004 - .0008	.0005 - .0011	.0009 - .0016	.0010 - .0018	.0012 - .0019	.0014 - .0021	.0016 - .0028	.0019 - .0031	.0024 - .0037	.0029 - .0041
IRON BASE ALLOYS	Incoloy 800 - 802, Multimet N - 155, Timkin 16 - 25 - 6, Carpeneter 22 - b3	under 32 over 32	290 - 400 230 - 290	230 - 320 185 - 230	.0004 - .0008	.0005 - .0011	.0009 - .0016	.0010 - .0018	.0012 - .0019	.0014 - .0021	.0016 - .0028	.0019 - .0031	.0024 - .0037	.0029 - .0041
MONEL	Monel - 65% Nickel		315 - 400	250 - 320	.0004 - .0008	.0009 - .0011	.0014 - .0016	.0015 - .0017	.0017 - .0019	.0019 - .0021	.0026 - .0028	.0029 - .0031	.0035 - .0037	.0039 - .0041
TITANIUM ALLOYS	Commercially Pure, 6AL - 4V, Astm 1/2/3, 6Al - 25N - 4Zr - 2Mo - Si		290 - 460	230 - 370	.0004 - .0008	.0009 - .0011	.0014 - .0016	.0015 - .0017	.0017 - .0019	.0019 - .0021	.0026 - .0028	.0029 - .0031	.0035 - .0037	.0039 - .0041
STAINLESS STEEL (PRECIPITATION)	13/8, 15/5, 17 - 4	under 32 over 32	290 - 345 230 - 290	230 - 275 185 - 230	.0004 - .0008	.0009 - .0011	.0014 - .0016	.0016 - .0020	.0017 - .0025	.0019 - .0031	.0026 - .0032	.0029 - .0037	.0035 - .0039	.0039 - .0041
STAINLESS STEEL (AUSTENTIC)	200 Series, 302, 303, 304, 304L, 316, 316L	under 32 over 32	290 - 430 230 - 290	230 - 345 185 - 230	.0004 - .0008	.0009 - .0011	.0014 - .0016	.0016 - .0020	.0017 - .0025	.0019 - .0031	.0026 - .0032	.0029 - .0037	.0035 - .0039	.0039 - .0041
STAINLESS STEEL (MARTENSITIC)	403, 410, 416, 440		290 - 345	230 - 275	.0004 - .0008	.0009 - .0011	.0014 - .0016	.0016 - .0020	.0017 - .0025	.0019 - .0031	.0026 - .0032	.0029 - .0037	.0035 - .0039	.0039 - .0041
HIGH STRENGTH TOOL STEELS	4140, 4340, 6150, 5210, A2, D2 P20, H11, H13, S2, 01	under 32 over 32	290 - 400 170 - 230	230 - 420 135 - 185	.0004 - .0008	.0009 - .0011	.0014 - .0016	.0016 - .0020	.0017 - .0025	.0019 - .0031	.0026 - .0032	.0029 - .0037	.0035 - .0039	.0039 - .0041
MEDIUM ALLOY STEELS	200, 250, 300	under 32 over 32	240 - 345 150 - 200	190 - 275 120 - 160	.0004 - .0008	.0009 - .0011	.0014 - .0016	.0016 - .0020	.0017 - .0025	.0019 - .0031	.0026 - .0032	.0029 - .0037	.0035 - .0039	.0039 - .0041
CARBON STEELS	1000's, 1100's, 1300's		480 - 510	385 - 405	.0004 - .0008	.0011 - .0013	.0018 - .0020	.0024 - .0026	.0030 - .0032	.0033 - .0035	.0035 - .0037	.0039 - .0041	.0041 - .0043	.0054 - .0056
DUCTILE	Ductile Cast Irons		480 - 510	385 - 405	.0004 - .0008	.0011 - .0013	.0018 - .0020	.0024 - .0026	.0030 - .0032	.0033 - .0035	.0035 - .0037	.0039 - .0041	.0041 - .0043	.0054 - .0056
CAST IRONS	Gray Cast Irons		480 - 510	385 - 405	.0004 - .0008	.0011 - .0013	.0018 - .0020	.0024 - .0026	.0030 - .0032	.0033 - .0035	.0035 - .0037	.0039 - .0041	.0041 - .0043	.0054 - .0056

VI-PRO VARIABLE INDEX END MILLS

6 & 7 Flute - Technical Information

VI-Pro Variable Index End Mills - 6 & 7 Flute											
Material Guide		Rc	Reg Length	Long Length	Suggested Chip Load Per Tooth						
					1/4"	5/16"	3/8"	1/2"	5/8"	3/4"	1"
COBALT BASE ALLOYS	Stellite, HS - 21, Haynes 25/188, X - 40, L - 605	under 32 over 32	360 - 460 235 - 300	290 - 370 190 - 240	.0009 - .0016	.0010 - .0018	.0012 - .0019	.0016 - .0028	.0019 - .0031	.0024 - .0037	.0029 - .0041
NICKEL BASE ALLOYS	Inconel - 625/718, Waspalloy, Rene, Hastelloy	under 32 over 32	265 - 400 170 - 260	210 - 320 135 - 210	.0009 - .0016	.0010 - .0018	.0012 - .0019	.0016 - .0028	.0019 - .0031	.0024 - .0037	.0029 - .0041
IRON BASE ALLOYS	Incoloy 800 - 802, Multimet N - 155, Timkin 16 - 25 - 6, Carpeneter 22 - b3	under 32 over 32	335 - 460 215 - 300	270 - 370 170 - 240	.0009 - .0016	.0010 - .0018	.0012 - .0019	.0016 - .0028	.0019 - .0031	.0024 - .0037	.0029 - .0041
MONEL	Monel - 65% Nickel		360 - 460	290 - 370	.0014 - .0016	.0015 - .0017	.0017 - .0019	.0026 - .0028	.0029 - .0031	.0035 - .0037	.0039 - .0041
TITANIUM ALLOYS	Commercially Pure, 6AL - 4V, Astm 1/2/3, 6Al - 25N - 4Zr - 2Mo - Si		335 - 530	270 - 425	.0014 - .0016	.0015 - .0017	.0017 - .0019	.0026 - .0028	.0029 - .0031	.0035 - .0037	.0039 - .0041
STAINLESS STEEL (PRECIPITATION)	13/8, 15/5, 17 - 4	under 32 over 32	335 - 400 270 - 320	270 - 320 215 - 260	.0014 - .0016	.0016 - .0020	.0017 - .0025	.0026 - .0032	.0029 - .0037	.0035 - .0039	.0039 - .0041
STAINLESS STEEL (AUSTENITIC)	200 Series, 302, 303, 304, 304L, 316, 316L	under 32 over 32	335 - 500 270 - 400	270 - 400 215 - 320	.0014 - .0016	.0016 - .0020	.0017 - .0025	.0026 - .0032	.0029 - .0037	.0035 - .0039	.0039 - .0041
STAINLESS STEEL (MARTENSITIC)	403, 410, 416, 440		335 - 400	270 - 320	.0014 - .0016	.0016 - .0020	.0017 - .0025	.0026 - .0032	.0029 - .0037	.0035 - .0039	.0039 - .0041
HIGH STRENGTH TOOL STEELS	4140, 4340, 6150, 5210, A2, D2 P20, H11, H13, S2, 01	under 32 over 32	335 - 460 215 - 300	270 - 370 170 - 240	.0014 - .0016	.0016 - .0020	.0017 - .0025	.0026 - .0032	.0029 - .0037	.0035 - .0039	.0039 - .0041
MEDIUM ALLOY STEELS	200, 250, 300	under 32 over 32	275 - 400 180 - 260	220 - 320 145 - 210	.0014 - .0016	.0016 - .0020	.0017 - .0025	.0026 - .0032	.0029 - .0037	.0035 - .0039	.0039 - .0041
CARBON STEELS	1000's, 1100's, 1300's		550 - 585	440 - 470	.0018 - .0020	.0024 - .0026	.0030 - .0032	.0035 - .0037	.0039 - .0041	.0041 - .0043	.0054 - .0056
DUCTILE	Ductile Cast Irons		550 - 585	440 - 470	.0018 - .0020	.0024 - .0026	.0030 - .0032	.0035 - .0037	.0039 - .0041	.0041 - .0043	.0054 - .0056
CAST IRONS	Gray Cast Irons		550 - 585	440 - 470	.0018 - .0020	.0024 - .0026	.0030 - .0032	.0035 - .0037	.0039 - .0041	.0041 - .0043	.0054 - .0056

MICRO END MILLS

2 Flute - Square - 30° Helix - Stub & Regular Flute



- Offered in stub and regular flute styles
- Center cutting
- AlTiN coating offers increased wear and heat resistance
- Solid carbide
- Precision manufactured in the USA

CUTTER DIA.	LENGTH OF CUT	SHANK DIA.	OAL	UNCOATED		AlTiN COATED	
$D1^{+0.0005"}_{-0.0005"}$	L2	D2 (h6)	L1	TOOL #	PRICE	TOOL #	PRICE
.0050	.008	1/8	1-1/2	TC52005	39.70	TC52205	44.10
	.015	1/8	1-1/2	TC56005	34.50	TC56205	38.90
.0060	.018	1/8	1-1/2	TC56006	34.50	TC56206	38.90
.0070	.021	1/8	1-1/2	TC56007	34.50	TC56207	38.90
.0080	.024	1/8	1-1/2	TC56008	34.50	TC56208	38.90
.0090	.027	1/8	1-1/2	TC56009	31.10	TC56209	35.50
.0100	.015	1/8	1-1/2	TC52010	35.50	TC52210	39.90
	.030	1/8	1-1/2	TC56010	30.90	TC56210	35.30
.0110	.033	1/8	1-1/2	TC56011	27.90	TC56211	32.30
.0120	.036	1/8	1-1/2	TC56012	27.65	TC56212	32.05
.0130	.039	1/8	1-1/2	TC56013	22.95	TC56213	27.35
.0140	.042	1/8	1-1/2	TC56014	22.95	TC56214	27.35
.0150	.023	1/8	1-1/2	TC52015	22.25	TC52215	26.65
	.045	1/8	1-1/2	TC56015	19.40	TC56215	23.20
.0160	.048	1/8	1-1/2	TC56016	19.50	TC56216	23.90
.0170	.051	1/8	1-1/2	TC56017	19.40	TC56217	23.20
.0180	.054	1/8	1-1/2	TC56018	19.40	TC56218	23.80
.0190	.057	1/8	1-1/2	TC56019	19.40	TC56219	23.80
.0200	.030	1/8	1-1/2	TC52020	20.20	TC52220	24.30
	.060	1/8	1-1/2	TC56020	17.60	TC56220	21.10
.0210	.063	1/8	1-1/2	TC56021	17.70	TC56221	22.10
.0220	.066	1/8	1-1/2	TC56022	17.60	TC56222	21.10
.0230	.069	1/8	1-1/2	TC56023	17.60	TC56223	21.10
.0240	.072	1/8	1-1/2	TC56024	17.60	TC56224	22.00
.0250	.038	1/8	1-1/2	TC52025	20.20	TC52225	24.30
	.075	1/8	1-1/2	TC56025	17.60	TC56225	21.10
.0260	.078	1/8	1-1/2	TC56026	16.50	TC56226	19.85
.0270	.081	1/8	1-1/2	TC56027	16.50	TC56227	19.85
.0280	.084	1/8	1-1/2	TC56028	16.50	TC56228	20.90
.0290	.087	1/8	1-1/2	TC56029	16.50	TC56229	19.85
.0300	.045	1/8	1-1/2	TC52030	18.95	TC52230	22.75
	.090	1/8	1-1/2	TC56030	16.50	TC56230	19.85
.0310	.047	1/8	1-1/2	TC52031	17.85	TC52231	21.30
	.093	1/8	1-1/2	TC56031	15.40	TC56231	18.50
.0320	.096	1/8	1-1/2	TC56032	15.40	TC56232	18.20
.0330	.099	1/8	1-1/2	TC56033	15.60	TC56233	20.00
.0340	.102	1/8	1-1/2	TC56034	15.70	TC56234	20.10

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For technical information, see page 143

MICRO END MILLS

2 Flute - Square - 30° Helix - Stub & Regular Flute (Cont.)

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CUTTER DIA.	LENGTH OF CUT	SHANK DIA.	OAL	UNCOATED		AlTiN COATED	
$D1_{+0.0005}^{-0.0005}$	L ₂	D ₂ (h6)	L ₁	TOOL #	PRICE	TOOL #	PRICE
.0350	.053	1/8	1-1/2	TC52035	17.85	TC52235	21.30
	.105	1/8	1-1/2	TC56035	15.40	TC56235	18.50
.0360	.108	1/8	1-1/2	TC56036	15.60	TC56236	20.00
.0370	.111	1/8	1-1/2	TC56037	15.40	TC56237	19.80
.0380	.114	1/8	1-1/2	TC56038	15.40	TC56238	18.50
.0390	.117	1/8	1-1/2	TC56039	15.40	TC56239	18.50
.0400	.060	1/8	1-1/2	TC52040	17.85	TC52240	21.30
	.120	1/8	1-1/2	TC56040	15.40	TC56240	18.50
.0410	.123	1/8	1-1/2	TC56041	15.60	TC56241	20.00
.0420	.126	1/8	1-1/2	TC56042	15.60	TC56242	20.00
.0430	.129	1/8	1-1/2	TC56043	15.60	TC56243	20.00
.0440	.132	1/8	1-1/2	TC56044	15.05	TC56244	19.45
.0450	.068	1/8	1-1/2	TC52045	17.40	TC52245	21.80
	.135	1/8	1-1/2	TC56045	15.05	TC56245	18.15
.0460	.138	1/8	1-1/2	TC56046	15.10	TC56246	19.50
.0470	.071	1/8	1-1/2	TC52047	17.40	TC52247	20.85
	.141	1/8	1-1/2	TC56047	15.05	TC56247	18.15
.0480	.144	1/8	1-1/2	TC56048	15.15	TC56248	18.15
.0490	.147	1/8	1-1/2	TC56049	15.10	TC56249	19.50
.0500	.075	1/8	1-1/2	TC52050	17.40	TC52250	20.85
	.150	1/8	1-1/2	TC56050	15.05	TC56250	18.15
.0510	.153	1/8	1-1/2	TC56051	15.10	TC56251	19.50
.0520	.156	1/8	1-1/2	TC56052	15.05	TC56252	19.45
.0530	.159	1/8	1-1/2	TC56053	15.15	TC56253	19.55
.0540	.162	1/8	1-1/2	TC56054	15.15	TC56254	18.15
.0550	.083	1/8	1-1/2	TC52055	17.40	TC52255	20.85
	.165	1/8	1-1/2	TC56055	15.05	TC56255	18.15
.0560	.168	1/8	1-1/2	TC56056	15.20	TC56256	19.60
.0570	.171	1/8	1-1/2	TC56057	15.05	TC56257	19.45
.0580	.174	1/8	1-1/2	TC56058	15.05	TC56258	18.15
.0590	.177	1/8	1-1/2	TC56059	15.05	TC56259	18.15
.0600	.090	1/8	1-1/2	TC52060	17.40	TC52260	20.85
	.180	1/8	1-1/2	TC56060	15.05	TC56260	18.15
.0610	.183	1/8	1-1/2	TC56061	15.05	TC56261	18.15
.0620	.093	1/8	1-1/2	TC52062	17.40	TC52262	20.85
	.186	1/8	1-1/2	TC56062	15.05	TC56262	18.15
.0630	.189	1/8	1-1/2	TC56063	15.15	TC56263	19.55
.0640	.192	1/8	1-1/2	TC56064	15.05	TC56264	19.45
.0650	.098	1/8	1-1/2	TC52065	17.40	TC52265	20.85
	.195	1/8	1-1/2	TC56065	15.05	TC56265	18.15
.0660	.198	1/8	1-1/2	TC56066	15.20	TC56266	19.60
.0670	.201	1/8	1-1/2	TC56067	15.05	TC56267	18.15
.0680	.204	1/8	1-1/2	TC56068	15.15	TC56268	18.15
.0690	.207	1/8	1-1/2	TC56069	15.15	TC56269	19.55
.0700	.105	1/8	1-1/2	TC52070	17.55	TC52270	21.95
	.210	1/8	1-1/2	TC56070	15.05	TC56270	18.15
.0710	.213	1/8	1-1/2	TC56071	15.05	TC56271	19.45

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For technical information, see page 143

MICRO END MILLS

2 Flute - Square - 30° Helix - Stub & Regular Flute (Cont.)

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CUTTER DIA.	LENGTH OF CUT	SHANK DIA.	OAL	UNCOATED		AlTiN COATED	
$D_{1 \pm .0005}^{+.0005}$	L ₂	D ₂ (h6)	L ₁	TOOL #	PRICE	TOOL #	PRICE
.0720	.216	1/8	1-1/2	TC56072	15.05	TC56272	18.15
.0730	.219	1/8	1-1/2	TC56073	15.05	TC56273	18.15
.0740	.222	1/8	1-1/2	TC56074	15.05	TC56274	19.45
.0750	.113	1/8	1-1/2	TC52075	17.45	TC52275	21.85
	.225	1/8	1-1/2	TC56075	15.05	TC56275	18.15
.0760	.228	1/8	1-1/2	TC56076	15.05	TC56276	19.45
.0770	.231	1/8	1-1/2	TC56077	15.15	TC56277	19.55
.0780	.117	1/8	1-1/2	TC52078	17.40	TC52278	20.85
	.234	1/8	1-1/2	TC56078	15.05	TC56278	18.15
.0790	.237	1/8	1-1/2	TC56079	15.05	TC56279	19.45
.0800	.120	1/8	1-1/2	TC52080	17.50	TC52280	21.90
	.240	1/8	1-1/2	TC56080	15.05	TC56280	19.45
.0810	.243	1/8	1-1/2	TC56081	15.05	TC56281	19.45
.0820	.246	1/8	1-1/2	TC56082	15.10	TC56282	19.50
.0830	.249	1/8	1-1/2	TC56083	15.05	TC56283	19.45
.0840	.252	1/8	1-1/2	TC56084	15.15	TC56284	19.55
.0850	.128	1/8	1-1/2	TC52085	17.40	TC52285	21.80
	.255	1/8	1-1/2	TC56085	15.15	TC56285	19.55
.0860	.258	1/8	1-1/2	TC56086	15.15	TC56286	19.55
.0870	.261	1/8	1-1/2	TC56087	15.05	TC56287	19.45
.0880	.264	1/8	1-1/2	TC56088	15.15	TC56288	19.55
.0890	.267	1/8	1-1/2	TC56089	15.05	TC56289	18.15
.0900	.135	1/8	1-1/2	TC52090	17.40	TC52290	20.85
	.270	1/8	1-1/2	TC56090	15.05	TC56290	19.45
.0910	.273	1/8	1-1/2	TC56091	15.05	TC56291	19.45
.0920	.276	1/8	1-1/2	TC56092	15.15	TC56292	19.55
.0930	.140	1/8	1-1/2	TC52093	17.40	TC52293	20.85
	.279	1/8	1-1/2	TC56093	15.05	TC56293	18.15
.0940	.282	1/8	1-1/2	TC56094	15.05	TC56294	18.15
.0950	.143	1/8	1-1/2	TC52095	17.55	TC52295	21.95
	.285	1/8	1-1/2	TC56095	15.20	TC56295	19.60
.0960	.288	1/8	1-1/2	TC56096	15.15	TC56296	19.55
.0970	.291	1/8	1-1/2	TC56097	15.05	TC56297	19.45
.0980	.294	1/8	1-1/2	TC56098	15.05	TC56298	18.15
.0990	.297	1/8	1-1/2	TC56099	15.05	TC56299	19.45
.1000	.150	1/8	1-1/2	TC52100	17.40	TC52300	20.85
	.300	1/8	1-1/2	TC56100	15.05	TC56300	18.15
.1010	.303	1/8	1-1/2	TC56101	15.20	TC56301	19.60
.1020	.306	1/8	1-1/2	TC56102	15.05	TC56302	19.45
.1030	.309	1/8	1-1/2	TC56103	15.20	TC56303	19.60
.1040	.312	1/8	1-1/2	TC56104	15.10	TC56304	19.50
.1050	.315	1/8	1-1/2	TC56105	15.15	TC56305	19.55
.1060	.318	1/8	1-1/2	TC56106	15.05	TC56306	19.45
.1070	.321	1/8	1-1/2	TC56107	15.20	TC56307	19.60
.1080	.324	1/8	1-1/2	TC56108	15.05	TC56308	19.45
.1090	.327	1/8	1-1/2	TC56109	15.15	TC56309	19.55
.1100	.330	1/8	1-1/2	TC56110	15.05	TC56310	19.45
.1150	.345	1/8	1-1/2	TC56115	15.05	TC56315	18.15
.1200	.360	1/8	1-1/2	TC56120	15.05	TC56320	18.15

For technical information, see page 143

MICRO END MILLS

2 Flute - Ball - 30° Helix - Stub & Regular Flute

2 Flute



- Offered in stub and regular flute styles
- Center cutting
- TiN coating offers increased wear and heat resistance
- Solid carbide
- Precision manufactured in the USA

CUTTER DIA.	LENGTH OF CUT	SHANK DIA.	OAL	UNCOATED		TiN COATED	
$D1^{+0.0005}_{-0.0005}$	L2	D2 (h6)	L1	TOOL #	PRICE	TOOL #	PRICE
.0050	.008	1/8	1-1/2	TC53005	49.80	TC53205	54.20
	.015	1/8	1-1/2	TC57005	43.10	TC57205	47.50
.0060	.018	1/8	1-1/2	TC57006	43.10	TC57206	47.70
.0070	.021	1/8	1-1/2	TC57007	43.10	TC57207	47.70
.0080	.024	1/8	1-1/2	TC57008	43.10	TC57208	47.50
.0090	.027	1/8	1-1/2	TC57009	38.85	TC57209	43.25
.0100	.015	1/8	1-1/2	TC53010	44.45	TC53210	50.35
	.030	1/8	1-1/2	TC57010	38.65	TC57210	43.80
.0110	.033	1/8	1-1/2	TC57011	34.75	TC57211	39.15
.0120	.036	1/8	1-1/2	TC57012	34.75	TC57212	39.35
.0130	.039	1/8	1-1/2	TC57013	28.95	TC57213	33.35
.0140	.042	1/8	1-1/2	TC57014	28.70	TC57214	33.25
.0150	.023	1/8	1-1/2	TC53015	27.75	TC53215	32.35
	.045	1/8	1-1/2	TC57015	24.15	TC57215	28.70
.0160	.048	1/8	1-1/2	TC57016	24.15	TC57216	28.70
.0170	.051	1/8	1-1/2	TC57017	24.35	TC57217	28.75
.0180	.054	1/8	1-1/2	TC57018	24.15	TC57218	28.70
.0190	.057	1/8	1-1/2	TC57019	24.35	TC57219	28.75
.0200	.030	1/8	1-1/2	TC53020	25.30	TC53220	29.85
	.060	1/8	1-1/2	TC57020	22.00	TC57220	26.40
.0210	.063	1/8	1-1/2	TC57021	22.00	TC57221	26.40
.0220	.066	1/8	1-1/2	TC57022	22.00	TC57222	26.40
.0230	.069	1/8	1-1/2	TC57023	22.20	TC57223	26.60
.0240	.072	1/8	1-1/2	TC57024	22.00	TC57224	26.40
.0250	.038	1/8	1-1/2	TC53025	25.30	TC53225	29.85
	.075	1/8	1-1/2	TC57025	22.00	TC57225	26.40
.0260	.078	1/8	1-1/2	TC57026	20.60	TC57226	23.95
.0270	.081	1/8	1-1/2	TC57027	20.70	TC57227	25.25
.0280	.084	1/8	1-1/2	TC57028	20.70	TC57228	25.25
.0290	.087	1/8	1-1/2	TC57029	20.80	TC57229	25.20
.0300	.045	1/8	1-1/2	TC53030	23.70	TC53230	28.25
	.090	1/8	1-1/2	TC57030	20.60	TC57230	24.75
.0310	.047	1/8	1-1/2	TC53031	22.25	TC53231	26.65
	.093	1/8	1-1/2	TC57031	19.40	TC57231	23.20
.0320	.096	1/8	1-1/2	TC57032	19.40	TC57232	23.20
.0330	.099	1/8	1-1/2	TC57033	19.60	TC57233	24.00
.0340	.102	1/8	1-1/2	TC57034	19.40	TC57234	23.80

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MICRO END MILLS

2 Flute - Ball - 30° Helix - Stub & Regular Flute (Cont.)

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CUTTER DIA.	LENGTH OF CUT	SHANK DIA.	OAL	UNCOATED		AlTiN COATED	
D1 ^{+.0005"} D1 _{-.0005"}	L2	D2 (h6)	L1	TOOL #	PRICE	TOOL #	PRICE
.0350	.053	1/8	1-1/2	TC53035	22.30	TC53235	26.70
	.105	1/8	1-1/2	TC57035	19.40	TC57235	23.80
.0360	.108	1/8	1-1/2	TC57036	19.40	TC57236	23.80
.0370	.111	1/8	1-1/2	TC57037	19.50	TC57237	23.90
.0380	.114	1/8	1-1/2	TC57038	19.40	TC57238	23.80
.0390	.117	1/8	1-1/2	TC57039	19.40	TC57239	23.20
.0400	.060	1/8	1-1/2	TC53040	22.25	TC53240	26.65
	.120	1/8	1-1/2	TC57040	19.40	TC57240	23.20
.0410	.123	1/8	1-1/2	TC57041	19.50	TC57241	23.90
.0420	.126	1/8	1-1/2	TC57042	19.50	TC57242	23.90
.0430	.129	1/8	1-1/2	TC57043	19.60	TC57243	24.00
.0440	.132	1/8	1-1/2	TC57044	19.00	TC57244	23.40
.0450	.068	1/8	1-1/2	TC53045	21.70	TC53245	26.10
	.135	1/8	1-1/2	TC57045	18.85	TC57245	23.25
.0460	.138	1/8	1-1/2	TC57046	19.00	TC57246	23.40
.0470	.071	1/8	1-1/2	TC53047	21.70	TC53247	26.10
	.141	1/8	1-1/2	TC57047	18.85	TC57247	22.65
.0480	.144	1/8	1-1/2	TC57048	19.00	TC57248	23.40
.0490	.147	1/8	1-1/2	TC57049	19.00	TC57249	23.40
.0500	.075	1/8	1-1/2	TC53050	21.70	TC53250	26.10
	.150	1/8	1-1/2	TC57050	18.85	TC57250	22.65
.0510	.153	1/8	1-1/2	TC57051	18.85	TC57251	23.25
.0520	.156	1/8	1-1/2	TC57052	18.85	TC57252	23.25
.0530	.159	1/8	1-1/2	TC57053	18.90	TC57253	23.30
.0540	.162	1/8	1-1/2	TC57054	18.90	TC57254	23.30
.0550	.083	1/8	1-1/2	TC53055	21.85	TC53255	26.10
	.165	1/8	1-1/2	TC57055	18.85	TC57255	23.25
.0560	.168	1/8	1-1/2	TC57056	18.85	TC57256	23.25
.0570	.171	1/8	1-1/2	TC57057	18.85	TC57257	23.25
.0580	.174	1/8	1-1/2	TC57058	18.85	TC57258	23.25
.0590	.177	1/8	1-1/2	TC57059	18.95	TC57259	22.65
.0600	.090	1/8	1-1/2	TC53060	21.70	TC53260	26.10
	.180	1/8	1-1/2	TC57060	18.85	TC57260	22.65
.0610	.183	1/8	1-1/2	TC57061	19.00	TC57261	23.40
.0620	.093	1/8	1-1/2	TC53062	21.70	TC53262	26.10
	.186	1/8	1-1/2	TC57062	18.85	TC57262	22.65
.0630	.189	1/8	1-1/2	TC57063	18.85	TC57263	22.65
.0640	.192	1/8	1-1/2	TC57064	18.95	TC57264	22.65
.0650	.098	1/8	1-1/2	TC53065	21.85	TC53265	26.10
	.195	1/8	1-1/2	TC57065	18.85	TC57265	23.25
.0660	.198	1/8	1-1/2	TC57066	19.00	TC57266	23.40
.0670	.201	1/8	1-1/2	TC57067	18.85	TC57267	22.65
.0680	.204	1/8	1-1/2	TC57068	18.95	TC57268	22.65
.0690	.207	1/8	1-1/2	TC57069	19.00	TC57269	23.40
.0700	.105	1/8	1-1/2	TC53070	21.70	TC53270	26.10
	.210	1/8	1-1/2	TC57070	18.85	TC57270	22.65
.0710	.213	1/8	1-1/2	TC57071	19.00	TC57271	23.40
.0720	.216	1/8	1-1/2	TC57072	18.95	TC57272	22.65

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For technical information, see page 143

MICRO END MILLS

2 Flute - Ball - 30° Helix - Stub & Regular Flute (Cont.)

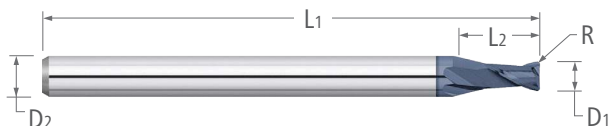
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CUTTER DIA.	LENGTH OF CUT	SHANK DIA.	OAL	UNCOATED		AlTiN COATED	
D ₁ ^{+0.0005"} -0.0005"	L ₂	D ₂ (h6)	L ₁	TOOL #	PRICE	TOOL #	PRICE
.0730	.219	1/8	1-1/2	TC57073	18.85	TC57273	23.25
.0740	.222	1/8	1-1/2	TC57074	18.95	TC57274	23.35
.0750	.113	1/8	1-1/2	TC53075	21.90	TC53275	26.30
	.225	1/8	1-1/2	TC57075	18.95	TC57275	22.65
.0760	.228	1/8	1-1/2	TC57076	18.95	TC57276	23.35
.0770	.231	1/8	1-1/2	TC57077	19.00	TC57277	23.40
.0780	.117	1/8	1-1/2	TC53078	21.70	TC53278	26.10
	.234	1/8	1-1/2	TC57078	18.90	TC57278	23.30
.0790	.237	1/8	1-1/2	TC57079	18.85	TC57279	22.65
.0800	.120	1/8	1-1/2	TC53080	21.70	TC53280	26.10
	.240	1/8	1-1/2	TC57080	18.85	TC57280	23.25
.0810	.243	1/8	1-1/2	TC57081	18.95	TC57281	23.35
.0820	.246	1/8	1-1/2	TC57082	18.95	TC57282	22.65
.0830	.249	1/8	1-1/2	TC57083	18.95	TC57283	22.65
.0840	.252	1/8	1-1/2	TC57084	19.00	TC57284	23.40
.0850	.128	1/8	1-1/2	TC53085	21.90	TC53285	26.30
	.255	1/8	1-1/2	TC57085	19.00	TC57285	23.40
.0860	.258	1/8	1-1/2	TC57086	18.85	TC57286	22.65
.0870	.261	1/8	1-1/2	TC57087	18.85	TC57287	22.65
.0880	.264	1/8	1-1/2	TC57088	18.95	TC57288	22.65
.0890	.267	1/8	1-1/2	TC57089	18.95	TC57289	23.35
.0900	.135	1/8	1-1/2	TC53090	21.90	TC53290	26.30
	.270	1/8	1-1/2	TC57090	18.85	TC57290	22.65
.0910	.273	1/8	1-1/2	TC57091	18.95	TC57291	23.35
.0920	.276	1/8	1-1/2	TC57092	18.95	TC57292	23.35
.0930	.140	1/8	1-1/2	TC53093	21.70	TC53293	26.25
	.279	1/8	1-1/2	TC57093	18.85	TC57293	22.65
.0940	.282	1/8	1-1/2	TC57094	19.00	TC57294	23.40
.0950	.143	1/8	1-1/2	TC53095	21.90	TC53295	26.30
	.285	1/8	1-1/2	TC57095	19.00	TC57295	23.40
.0960	.288	1/8	1-1/2	TC57096	18.85	TC57296	22.65
.0970	.291	1/8	1-1/2	TC57097	18.95	TC57297	22.65
.0980	.294	1/8	1-1/2	TC57098	18.95	TC57298	22.65
.0990	.297	1/8	1-1/2	TC57099	18.95	TC57299	23.35
.1000	.150	1/8	1-1/2	TC53100	21.85	TC53300	26.10
	.300	1/8	1-1/2	TC57100	18.85	TC57300	22.65
.1010	.303	1/8	1-1/2	TC57101	19.00	TC57301	23.40
.1020	.306	1/8	1-1/2	TC57102	19.00	TC57302	23.40
.1030	.309	1/8	1-1/2	TC57103	19.00	TC57303	23.40
.1040	.312	1/8	1-1/2	TC57104	18.95	TC57304	22.65
.1050	.315	1/8	1-1/2	TC57105	18.95	TC57305	23.35
.1060	.318	1/8	1-1/2	TC57106	18.85	TC57306	22.65
.1070	.321	1/8	1-1/2	TC57107	19.00	TC57307	23.40
.1080	.324	1/8	1-1/2	TC57108	19.00	TC57308	23.40
.1090	.327	1/8	1-1/2	TC57109	19.00	TC57309	23.40
.1100	.330	1/8	1-1/2	TC57110	19.00	TC57310	23.40
.1150	.345	1/8	1-1/2	TC57115	19.00	TC57315	23.40
.1200	.360	1/8	1-1/2	TC57120	18.85	TC57320	22.65

For technical information, see page 143

MICRO END MILLS

2 Flute - Corner Radius - 30° Helix - Stub & Regular Flute



- Offered in stub and regular flute styles
- Corner radius for increased edge strength
- Center cutting
- AlTiN coating offers increased wear and heat resistance
- Solid carbide
- Precision manufactured in the USA

CUTTER DIA.	LENGTH OF CUT	RADIUS	SHANK DIA.	OAL	UNCOATED		AlTiN COATED	
D1 ^{+0.0005"} _{-0.0005"}	L2	R ^{+0.0002"} _{-0.0002"}	D2 (h6)	L1	TOOL #	PRICE	TOOL #	PRICE
.0150	.023	.003	1/8	1 - 1/2	TC50100	47.30	TC50330	51.70
	.045	.003	1/8	1 - 1/2	TC50725	47.30	TC50925	51.70
.0200	.030	.005	1/8	1 - 1/2	TC50101	44.15	TC50331	48.55
	.060	.005	1/8	1 - 1/2	TC50726	44.15	TC50926	48.55
.0250	.038	.005	1/8	1 - 1/2	TC50102	44.30	TC50332	48.70
	.075	.005	1/8	1 - 1/2	TC50727	44.15	TC50927	48.55
.0300	.045	.005	1/8	1 - 1/2	TC50103	31.35	TC50333	35.75
	.090	.005	1/8	1 - 1/2	TC50728	31.50	TC50928	35.90
	.045	.010	1/8	1 - 1/2	TC50104	31.65	TC50334	36.05
	.090	.010	1/8	1 - 1/2	TC50729	31.50	TC50929	35.90
.0310	.047	.005	1/8	1 - 1/2	TC50105	31.50	TC50335	35.90
	.093	.005	1/8	1 - 1/2	TC50730	31.35	TC50930	35.75
	.047	.010	1/8	1 - 1/2	TC50106	31.50	TC50336	35.90
	.093	.010	1/8	1 - 1/2	TC50731	31.35	TC50931	35.75
.0350	.053	.005	1/8	1 - 1/2	TC50107	31.65	TC50337	36.05
	.105	.005	1/8	1 - 1/2	TC50732	31.50	TC50932	35.90
	.053	.010	1/8	1 - 1/2	TC50108	31.65	TC50338	36.05
	.105	.010	1/8	1 - 1/2	TC50733	31.65	TC50933	36.05
.0400	.060	.005	1/8	1 - 1/2	TC50109	31.50	TC50339	35.90
	.120	.005	1/8	1 - 1/2	TC50734	31.50	TC50934	35.90
	.060	.010	1/8	1 - 1/2	TC50110	31.35	TC50340	35.75
	.120	.010	1/8	1 - 1/2	TC50735	31.50	TC50935	35.90
.0450	.068	.005	1/8	1 - 1/2	TC50111	31.50	TC50341	35.90
	.135	.005	1/8	1 - 1/2	TC50736	31.65	TC50936	36.05
	.068	.010	1/8	1 - 1/2	TC50112	31.65	TC50342	36.05
	.135	.010	1/8	1 - 1/2	TC50737	31.65	TC50937	36.05
	.068	.015	1/8	1 - 1/2	TC50113	31.65	TC50343	36.05
	.135	.015	1/8	1 - 1/2	TC50738	31.65	TC50938	36.05
.0470	.071	.005	1/8	1 - 1/2	TC50114	31.35	TC50344	35.75
	.141	.005	1/8	1 - 1/2	TC50739	31.35	TC50939	35.75
	.071	.010	1/8	1 - 1/2	TC50115	31.50	TC50345	35.90
	.141	.010	1/8	1 - 1/2	TC50740	31.50	TC50940	35.90
	.071	.015	1/8	1 - 1/2	TC50116	31.65	TC50346	36.05
	.141	.015	1/8	1 - 1/2	TC50741	31.50	TC50941	35.90

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MICRO END MILLS

2 Flute - Corner Radius - 30° Helix - Stub & Regular Flute (Cont.)

2 Flute

continued from previous page

CUTTER DIA.	LENGTH OF CUT	RADIUS	SHANK DIA.	OAL	UNCOATED		AlTiN COATED	
D1 ^{+.0005"} _{-.0005"}	L2	R ^{+.0002"} _{-.0002"}	D2 (h6)	L1	TOOL #	PRICE	TOOL #	PRICE
.0500	.075	.005	1/8	1 - 1/2	TC50117	31.35	TC50347	35.75
	.150	.005	1/8	1 - 1/2	TC50742	31.35	TC50942	35.75
	.075	.010	1/8	1 - 1/2	TC50118	31.50	TC50348	35.90
	.150	.010	1/8	1 - 1/2	TC50743	31.35	TC50943	35.75
	.075	.015	1/8	1 - 1/2	TC50119	31.50	TC50349	35.90
	.150	.015	1/8	1 - 1/2	TC50744	31.35	TC50944	35.75
.0600	.090	.005	1/8	1 - 1/2	TC50120	31.50	TC50350	35.90
	.180	.005	1/8	1 - 1/2	TC50745	31.35	TC50945	35.75
	.090	.010	1/8	1 - 1/2	TC50121	31.50	TC50351	35.90
	.180	.010	1/8	1 - 1/2	TC50746	31.50	TC50946	35.90
	.090	.015	1/8	1 - 1/2	TC50122	31.50	TC50352	35.90
	.180	.015	1/8	1 - 1/2	TC50747	31.50	TC50947	35.90
.0620	.093	.005	1/8	1 - 1/2	TC50123	31.50	TC50353	35.90
	.186	.005	1/8	1 - 1/2	TC50748	31.50	TC50948	35.90
	.093	.010	1/8	1 - 1/2	TC50124	31.35	TC50354	35.75
	.186	.010	1/8	1 - 1/2	TC50749	31.35	TC50949	35.75
	.093	.015	1/8	1 - 1/2	TC50125	31.50	TC50355	35.90
	.186	.015	1/8	1 - 1/2	TC50750	31.35	TC50950	35.75
.0750	.113	.005	1/8	1 - 1/2	TC50126	31.65	TC50356	36.05
	.225	.005	1/8	1 - 1/2	TC50751	31.65	TC50951	36.05
	.113	.010	1/8	1 - 1/2	TC50127	31.35	TC50357	35.75
	.225	.010	1/8	1 - 1/2	TC50752	31.65	TC50952	36.05
	.113	.015	1/8	1 - 1/2	TC50128	31.50	TC50358	35.90
	.225	.015	1/8	1 - 1/2	TC50753	31.65	TC50953	36.05
.0780	.117	.005	1/8	1 - 1/2	TC50129	31.35	TC50359	35.75
	.234	.005	1/8	1 - 1/2	TC50754	31.35	TC50954	35.75
	.117	.010	1/8	1 - 1/2	TC50130	31.50	TC50360	35.90
	.234	.010	1/8	1 - 1/2	TC50755	31.50	TC50955	35.90
	.117	.015	1/8	1 - 1/2	TC50131	31.50	TC50361	35.90
	.234	.015	1/8	1 - 1/2	TC50756	31.50	TC50956	35.90
.0900	.135	.005	1/8	1 - 1/2	TC50132	31.50	TC50362	35.90
	.270	.005	1/8	1 - 1/2	TC50757	31.50	TC50957	35.90
	.135	.010	1/8	1 - 1/2	TC50133	31.65	TC50363	36.05
	.270	.010	1/8	1 - 1/2	TC50758	31.50	TC50958	35.90
	.135	.015	1/8	1 - 1/2	TC50134	31.50	TC50364	35.90
	.270	.015	1/8	1 - 1/2	TC50759	31.50	TC50959	35.90
.0930	.140	.005	1/8	1 - 1/2	TC50135	31.50	TC50365	35.90
	.279	.005	1/8	1 - 1/2	TC50760	31.35	TC50960	35.75
	.140	.010	1/8	1 - 1/2	TC50136	31.50	TC50366	35.90
	.279	.010	1/8	1 - 1/2	TC50761	31.35	TC50961	35.75
	.140	.015	1/8	1 - 1/2	TC50137	31.50	TC50367	35.90
	.279	.015	1/8	1 - 1/2	TC50762	31.35	TC50962	35.75
.1000	.150	.005	1/8	1 - 1/2	TC50138	31.50	TC50368	35.90
	.300	.005	1/8	1 - 1/2	TC50763	31.65	TC50963	36.05
	.150	.010	1/8	1 - 1/2	TC50139	31.50	TC50369	35.90
	.300	.010	1/8	1 - 1/2	TC50764	31.50	TC50964	35.90
	.150	.015	1/8	1 - 1/2	TC50140	31.35	TC50370	35.75
	.300	.015	1/8	1 - 1/2	TC50765	31.50	TC50965	35.90

For technical information, see page 143

MICRO END MILLS

3 Flute - Square - 30° Helix - Stub & Regular Flute



- Offered in stub and regular flute styles
- Center cutting
- AlTiN coating offers increased wear and heat resistance
- Solid carbide
- Precision manufactured in the USA

CUTTER DIA.	LENGTH OF CUT	SHANK DIA.	OAL	UNCOATED		AlTiN COATED	
$D_1^{+.0005''}_{-.0005''}$	L_2	D_2 (h6)	L_1	TOOL #	PRICE	TOOL #	PRICE
.0050	.008	1/8	1-1/2	TC30800	35.50	TC30824	39.90
	.015	1/8	1-1/2	TC30848	30.90	TC30872	35.30
.0100	.015	1/8	1-1/2	TC30801	35.50	TC30825	39.90
	.030	1/8	1-1/2	TC30849	30.90	TC30873	35.30
.0150	.023	1/8	1-1/2	TC30802	22.25	TC30826	26.65
	.045	1/8	1-1/2	TC30850	19.40	TC30874	23.80
.0200	.030	1/8	1-1/2	TC30803	20.20	TC30827	24.60
	.060	1/8	1-1/2	TC30851	17.60	TC30875	22.00
.0250	.038	1/8	1-1/2	TC30804	20.20	TC30828	24.60
	.075	1/8	1-1/2	TC30852	17.60	TC30876	22.00
.0300	.045	1/8	1-1/2	TC30805	18.95	TC30829	23.35
	.090	1/8	1-1/2	TC30853	16.50	TC30877	20.90
.0350	.053	1/8	1-1/2	TC30806	17.85	TC30830	22.25
	.105	1/8	1-1/2	TC30854	15.40	TC30878	19.80
.0400	.060	1/8	1-1/2	TC30807	17.85	TC30831	22.25
	.120	1/8	1-1/2	TC30855	15.40	TC30879	19.80
.0450	.068	1/8	1-1/2	TC30808	17.45	TC30832	21.85
	.135	1/8	1-1/2	TC30856	15.05	TC30880	19.45
.0500	.075	1/8	1-1/2	TC30809	17.40	TC30833	21.80
	.150	1/8	1-1/2	TC30857	15.05	TC30881	19.45
.0550	.083	1/8	1-1/2	TC30810	17.40	TC30834	21.80
	.165	1/8	1-1/2	TC30858	15.05	TC30882	19.45
.0600	.090	1/8	1-1/2	TC30811	17.45	TC30835	21.85
	.180	1/8	1-1/2	TC30859	15.05	TC30883	19.45
.0650	.098	1/8	1-1/2	TC30812	17.40	TC30836	21.80
	.195	1/8	1-1/2	TC30860	15.05	TC30884	19.45
.0700	.105	1/8	1-1/2	TC30813	17.40	TC30837	21.80
	.210	1/8	1-1/2	TC30861	15.05	TC30885	19.45
.0750	.113	1/8	1-1/2	TC30814	17.40	TC30838	21.80
	.225	1/8	1-1/2	TC30862	15.05	TC30886	19.45
.0800	.120	1/8	1-1/2	TC30815	17.45	TC30839	21.85
	.240	1/8	1-1/2	TC30863	15.05	TC30887	19.45
.0850	.128	1/8	1-1/2	TC30816	17.45	TC30840	21.85
	.255	1/8	1-1/2	TC30864	15.05	TC30888	19.45

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MICRO END MILLS

3 Flute - Square - 30° Helix - Stub & Regular Flute (Cont.)

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CUTTER DIA.	LENGTH OF CUT	SHANK DIA.	OAL	UNCOATED		AlTiN COATED	
$D_1^{+.0005"}_{-.0005"}$	L ₂	D ₂ (h6)	L ₁	TOOL #	PRICE	TOOL #	PRICE
.0900	.135	1/8	1-1/2	TC30817	17.40	TC30841	21.80
	.270	1/8	1-1/2	TC30865	15.05	TC30889	19.45
.0950	.143	1/8	1-1/2	TC30818	17.40	TC30842	21.80
	.285	1/8	1-1/2	TC30866	15.05	TC30890	19.45
.1000	.150	1/8	1-1/2	TC30819	17.40	TC30843	21.80
	.300	1/8	1-1/2	TC30867	15.05	TC30891	19.45
.1050	.160	1/8	1-1/2	TC30820	17.40	TC30844	21.80
	.315	1/8	1-1/2	TC30868	15.15	TC30892	19.55
.1100	.165	1/8	1-1/2	TC30821	17.40	TC30845	21.80
	.330	1/8	1-1/2	TC30869	15.05	TC30893	19.45
.1150	.170	1/8	1-1/2	TC30822	17.40	TC30846	21.80
	.345	1/8	1-1/2	TC30870	15.05	TC30894	19.45
.1200	.180	1/8	1-1/2	TC30823	17.40	TC30847	21.80
	.360	1/8	1-1/2	TC30871	15.05	TC30895	19.45

3 Flute

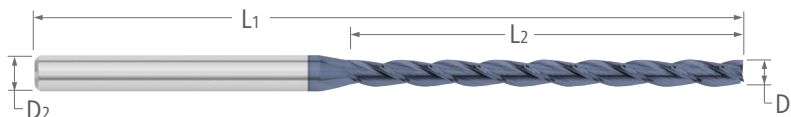


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MICRO END MILLS

3 Flute - Square - 30° Helix - Long Flute



- Long flute design for deep cavities
- Center cutting
- AlTiN coating offers increased wear and heat resistance
- Solid carbide
- Precision manufactured in the USA

CUTTER DIA.	LENGTH OF CUT	SHANK DIA.	OAL	UNCOATED		AlTiN COATED	
$D_1^{+.0005"}_{-.0005"}$	L2	D2 (h6)	L1	TOOL #	PRICE	TOOL #	PRICE
.0100	.050 (5x)	1/8	2-1/2	TC53420	40.25	TC53602	44.95
	.080 (8x)	1/8	2-1/2	TC53421	67.50	TC53603	72.20
	.120 (12x)	1/8	2-1/2	TC53422	80.20	TC53604	84.90
.0150	.078 (5x)	1/8	2-1/2	TC53423	37.20	TC53605	41.90
	.125 (8x)	1/8	2-1/2	TC53424	64.20	TC53606	68.90
	.187 (12x)	1/8	2-1/2	TC53425	79.45	TC53607	84.60
.0200	.100 (5x)	1/8	2-1/2	TC53426	32.15	TC53608	36.85
	.160 (8x)	1/8	2-1/2	TC53427	58.25	TC53609	62.95
	.250 (12x)	1/8	2-1/2	TC53428	76.20	TC53610	80.90
.0250	.125 (5x)	1/8	2-1/2	TC53429	30.55	TC53611	35.25
	.203 (8x)	1/8	2-1/2	TC53430	57.75	TC53612	62.45
	.312 (12x)	1/8	2-1/2	TC53431	67.70	TC53613	72.40
.0300	.150 (5x)	1/8	2-1/2	TC53432	29.35	TC53614	34.25
	.250 (8x)	1/8	2-1/2	TC53433	49.45	TC53615	54.15
	.375 (12x)	1/8	2-1/2	TC53434	64.00	TC53616	68.70
.0310	.156 (5x)	1/8	2-1/2	TC53435	29.50	TC53617	34.20
	.250 (8x)	1/8	2-1/2	TC53436	47.25	TC53618	53.45
	.375 (12x)	1/8	2-1/2	TC53437	63.75	TC53619	68.45
.0350	.175 (5x)	1/8	2-1/2	TC53438	29.50	TC53620	34.20
	.280 (8x)	1/8	2-1/2	TC53439	47.65	TC53621	52.35
	.425 (12x)	1/8	2-1/2	TC53440	64.00	TC53622	68.70
.0400	.200 (5x)	1/8	2-1/2	TC53441	29.35	TC53623	34.25
	.325 (8x)	1/8	2-1/2	TC53442	47.25	TC53624	53.45
	.480 (12x)	1/8	2-1/2	TC53443	63.75	TC53625	68.45
.0450	.225 (5x)	1/8	2-1/2	TC53444	29.35	TC53626	34.25
	.375 (8x)	1/8	2-1/2	TC53445	47.65	TC53627	52.35
	.550 (12x)	1/8	2-1/2	TC53446	63.65	TC53628	68.35
.0470	.250 (5x)	1/8	2-1/2	TC53447	29.35	TC53629	34.25
	.375 (8x)	1/8	2-1/2	TC53448	47.25	TC53630	53.45
	.570 (12x)	1/8	2-1/2	TC53449	63.65	TC53631	68.35
.0500	.250 (5x)	1/8	2-1/2	TC53450	29.50	TC53632	34.20
	.400 (8x)	1/8	2-1/2	TC53451	47.45	TC53633	53.45
	.600 (12x)	1/8	2-1/2	TC53452	64.30	TC53634	69.00
.0550	.275 (5x)	1/8	2-1/2	TC53453	29.50	TC53635	34.20
	.440 (8x)	1/8	2-1/2	TC53454	47.65	TC53636	52.35
	.660 (12x)	1/8	2-1/2	TC53455	64.00	TC53637	68.70
.0600	.312 (5x)	1/8	2-1/2	TC53456	26.10	TC53638	30.95
	.500 (8x)	1/8	2-1/2	TC53457	29.35	TC53639	34.25
	.720 (12x)	1/8	2-1/2	TC53458	63.75	TC53640	68.45

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For technical information, see page 143

MICRO END MILLS

3 Flute - Square - 30° Helix - Long Flute (Cont.)

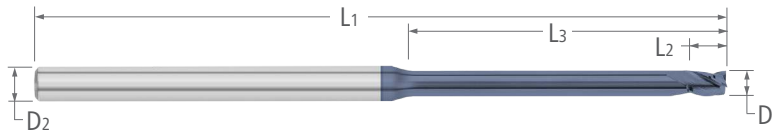
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CUTTER DIA.	LENGTH OF CUT	SHANK DIA.	OAL	UNCOATED		AlTiN COATED	
$D1^{+.0005}_{-.0005}$	L ₂	D ₂ (h6)	L ₁	TOOL #	PRICE	TOOL #	PRICE
.0620	.312 (5x)	1/8	2-1/2	TC53459	26.10	TC53641	30.95
	.500 (8x)	1/8	2-1/2	TC53460	29.25	TC53642	34.10
	.750 (12x)	1/8	2-1/2	TC53461	49.90	TC53643	56.60
	.950 (15x)	1/8	2-1/2	TC53462	68.30	TC53644	73.20
.0650	.325 (5x)	1/8	2-1/2	TC53463	26.10	TC53645	30.95
	.500 (8x)	1/8	2-1/2	TC53464	29.25	TC53646	34.10
	.780 (12x)	1/8	2-1/2	TC53465	50.45	TC53647	55.15
.0700	.375 (5x)	1/8	2-1/2	TC53466	26.25	TC53648	30.95
	.560 (8x)	1/8	2-1/2	TC53467	29.35	TC53649	34.05
	.850 (12x)	1/8	2-1/2	TC53468	50.45	TC53650	55.15
.0750	.375 (5x)	1/8	2-1/2	TC53469	26.25	TC53651	30.95
	.625 (8x)	1/8	2-1/2	TC53470	29.35	TC53652	34.05
	.900 (12x)	1/8	2-1/2	TC53471	49.90	TC53653	54.60
.0780	.406 (5x)	1/8	2-1/2	TC53472	26.10	TC53654	30.95
	.625 (8x)	1/8	2-1/2	TC53473	29.25	TC53655	34.10
	.940 (12x)	1/8	2-1/2	TC53474	50.25	TC53656	56.60
	1.187 (15x)	1/8	2-1/2	TC53475	68.30	TC53657	73.20
.0800	.406 (5x)	1/8	2-1/2	TC53476	26.35	TC53658	31.05
	.750 (8x)	1/8	2-1/2	TC53477	29.25	TC53659	34.10
	.960 (12x)	1/8	2-1/2	TC53478	50.10	TC53660	54.80
.0850	.425 (5x)	1/8	2-1/2	TC53479	26.25	TC53661	30.95
	.750 (8x)	1/8	2-1/2	TC53480	29.50	TC53662	34.20
	1.020 (12x)	1/8	2-1/2	TC53481	50.45	TC53663	55.15
.0900	.450 (5x)	1/8	2-1/2	TC53482	26.25	TC53664	30.30
	.750 (8x)	1/8	2-1/2	TC53483	29.25	TC53665	34.10
	1.080 (12x)	1/8	2-1/2	TC53484	50.45	TC53666	55.15
.0930	.500 (5x)	1/8	2-1/2	TC53485	26.10	TC53667	30.95
	.750 (8x)	1/8	2-1/2	TC53486	29.25	TC53668	34.10
	1.125 (12x)	1/8	2-1/2	TC53487	49.90	TC53669	56.60
	1.400 (15x)	1/8	2-1/2	TC53488	71.05	TC53670	75.75
.0950	.500 (5x)	1/8	2-1/2	TC53489	26.10	TC53671	30.95
	.750 (8x)	1/8	2-1/2	TC53490	29.35	TC53672	34.05
	1.140 (12x)	1/8	2-1/2	TC53491	50.10	TC53673	54.80
.1000	.500 (5x)	1/8	2-1/2	TC53492	26.10	TC53674	30.95
	.800 (8x)	1/8	2-1/2	TC53493	29.25	TC53675	34.10
	1.200 (12x)	1/8	2-1/2	TC53494	50.45	TC53676	55.15
.1090	.570 (5x)	1/8	2-1/2	TC53495	26.10	TC53677	30.95
	.900 (8x)	1/8	2-1/2	TC53496	29.35	TC53678	34.05
	1.320 (12x)	1/8	2-1/2	TC53497	50.45	TC53679	55.15
.1180	.625 (5x)	1/8	2-1/2	TC53498	26.10	TC53680	30.95
	.950 (8x)	1/8	2-1/2	TC53499	29.35	TC53681	34.05
	1.375 (12x)	1/8	2-1/2	TC53500	50.45	TC53682	55.15
.1200	.600 (5x)	1/8	2-1/2	TC53501	26.10	TC53683	30.95
	1.000 (8x)	1/8	2-1/2	TC53502	29.25	TC53684	34.10
	1.500 (12x)	1/8	2-1/2	TC53503	49.90	TC53685	56.60

For technical information, see page 143

MICRO END MILLS

3 Flute - Square - 30° Helix - Long Reach, Stub Flute



- Long reach design for deep cavities
- Center cutting
- Solid carbide
- Stub flutes for maximum rigidity
- AlTiN coating offers increased wear and heat resistance
- Precision manufactured in the USA

CUTTER DIA.	LOC	OVERALL REACH	SHANK DIA.	OAL	UNCOATED		AlTiN COATED	
$D_{1 \pm .0005}^{+ .0005}$	L2	$L_{3 \pm .000}^{+ .010}$	D2 (h6)	L1	TOOL #	PRICE	TOOL #	PRICE
.0100	.015	.030 (3x)	1/8	2-1/2	TC54310	49.50	TC59501	54.20
	.015	.050 (5x)	1/8	2-1/2	TC54313	49.30	TC59504	54.00
	.015	.080 (8x)	1/8	2-1/2	TC54316	49.50	TC59507	54.20
	.015	.125 (12x)	1/8	2-1/2	TC54319	52.05	TC59510	58.60
.0150	.022	.045 (3x)	1/8	2-1/2	TC54322	40.80	TC59513	45.50
	.022	.078 (5x)	1/8	2-1/2	TC54325	40.85	TC59516	45.55
	.022	.125 (8x)	1/8	2-1/2	TC54328	40.65	TC59519	45.35
	.022	.187 (12x)	1/8	2-1/2	TC54331	42.45	TC59522	47.15
.0200	.030	.060 (3x)	1/8	2-1/2	TC54334	39.40	TC59525	44.10
	.030	.100 (5x)	1/8	2-1/2	TC54337	38.95	TC59528	43.65
	.030	.160 (8x)	1/8	2-1/2	TC54340	39.15	TC59531	43.85
	.030	.250 (12x)	1/8	2-1/2	TC54343	40.55	TC59534	45.25
.0250	.037	.075 (3x)	1/8	2-1/2	TC54346	37.85	TC59537	42.55
	.037	.125 (5x)	1/8	2-1/2	TC54349	37.85	TC59540	42.55
	.037	.203 (8x)	1/8	2-1/2	TC54352	37.65	TC59543	42.35
	.037	.312 (12x)	1/8	2-1/2	TC54355	39.10	TC59546	43.80
.0300	.045	.090 (3x)	1/8	2-1/2	TC54358	37.85	TC59549	42.55
	.045	.156 (5x)	1/8	2-1/2	TC54361	37.70	TC59552	42.40
	.045	.250 (8x)	1/8	2-1/2	TC54364	37.50	TC59555	42.20
	.045	.375 (12x)	1/8	2-1/2	TC54367	39.10	TC59558	43.80
.0310	.046	.093 (3x)	1/8	2-1/2	TC54370	37.50	TC59561	42.20
	.046	.156 (5x)	1/8	2-1/2	TC54373	37.50	TC59564	42.20
	.046	.250 (8x)	1/8	2-1/2	TC54376	37.50	TC59567	42.20
	.046	.375 (12x)	1/8	2-1/2	TC54379	38.70	TC59570	43.40
.0350	.052	.105 (3x)	1/8	2-1/2	TC54382	37.85	TC59573	42.55
	.052	.187 (5x)	1/8	2-1/2	TC54385	37.85	TC59576	42.55
	.052	.281 (8x)	1/8	2-1/2	TC54388	37.50	TC59579	42.20
	.052	.425 (12x)	1/8	2-1/2	TC54391	38.90	TC59582	43.60
.0400	.060	.120 (3x)	1/8	2-1/2	TC54394	37.65	TC59585	42.35
	.060	.203 (5x)	1/8	2-1/2	TC54397	37.50	TC59588	42.20
	.060	.325 (8x)	1/8	2-1/2	TC54400	37.50	TC59591	42.20
	.060	.480 (12x)	1/8	2-1/2	TC54403	38.70	TC59594	43.40
.0450	.067	.135 (3x)	1/8	2-1/2	TC54406	37.05	TC59597	41.75
	.067	.225 (5x)	1/8	2-1/2	TC54409	37.05	TC59600	41.75
	.067	.375 (8x)	1/8	2-1/2	TC54412	36.80	TC59603	41.50
	.067	.550 (12x)	1/8	2-1/2	TC54415	38.25	TC59606	42.95
.0470	.070	.141 (3x)	1/8	2-1/2	TC54418	37.05	TC59609	41.75
	.070	.250 (5x)	1/8	2-1/2	TC54421	36.65	TC59612	41.60
	.070	.375 (8x)	1/8	2-1/2	TC54424	36.65	TC59615	41.60
	.070	.570 (12x)	1/8	2-1/2	TC54427	37.85	TC59618	42.55
.0500	.075	.150 (3x)	1/8	2-1/2	TC54430	37.05	TC59621	41.75
	.075	.250 (5x)	1/8	2-1/2	TC54433	37.05	TC59624	41.75
	.075	.400 (8x)	1/8	2-1/2	TC54436	36.65	TC59627	41.60
	.075	.600 (12x)	1/8	2-1/2	TC54439	37.85	TC59630	42.55

For technical information, see page 143

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MICRO END MILLS

3 Flute - Square - 30° Helix - Long Reach, Stub Flute (Cont.)

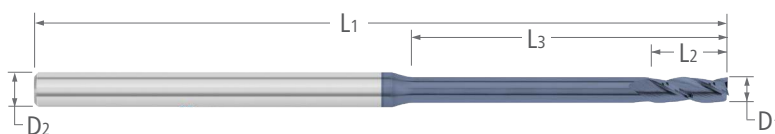
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CUTTER DIA.	LOC	OVERALL REACH	SHANK DIA.	OAL	UNCOATED		AlTiN COATED	
D1 ^{+0.005"} -0.005"	L2	L3 ^{+0.10"} -0.000"	D2 (h6)	L1	TOOL #	PRICE	TOOL #	PRICE
.0550	.082	.165 (3x)	1/8	2-1/2	TC54442	37.05	TC59633	41.75
	.082	.275 (5x)	1/8	2-1/2	TC54445	36.65	TC59636	41.60
	.082	.450 (8x)	1/8	2-1/2	TC54448	36.85	TC59639	41.55
	.082	.660 (12x)	1/8	2-1/2	TC54451	38.10	TC59642	42.80
	.090	.180 (3x)	1/8	2-1/2	TC54454	36.85	TC59645	41.55
.0600	.090	.312 (5x)	1/8	2-1/2	TC54457	37.05	TC59648	41.75
	.090	.500 (8x)	1/8	2-1/2	TC54460	36.65	TC59651	41.60
	.090	.720 (12x)	1/8	2-1/2	TC54463	38.05	TC59654	42.75
	.093	.186 (3x)	1/8	2-1/2	TC54466	36.85	TC59657	41.55
	.093	.312 (5x)	1/8	2-1/2	TC54469	36.65	TC59660	41.60
.0620	.093	.500 (8x)	1/8	2-1/2	TC54472	36.65	TC59663	41.60
	.093	.750 (12x)	1/8	2-1/2	TC54475	37.85	TC59666	42.55
	.097	.195 (3x)	1/8	2-1/2	TC54478	37.05	TC59669	41.75
	.097	.325 (5x)	1/8	2-1/2	TC54481	37.05	TC59672	41.75
	.097	.530 (8x)	1/8	2-1/2	TC54484	36.65	TC59675	41.60
.0650	.097	.800 (12x)	1/8	2-1/2	TC54487	38.25	TC59678	42.95
	.105	.210 (3x)	1/8	2-1/2	TC54490	36.85	TC59681	41.55
	.105	.375 (5x)	1/8	2-1/2	TC54493	37.05	TC59684	41.75
	.105	.570 (8x)	1/8	2-1/2	TC54496	37.05	TC59687	41.75
	.105	.850 (12x)	1/8	2-1/2	TC54499	38.25	TC59690	42.95
.0700	.112	.225 (3x)	1/8	2-1/2	TC54502	37.05	TC59693	41.75
	.112	.375 (5x)	1/8	2-1/2	TC54505	37.05	TC59696	41.75
	.112	.625 (8x)	1/8	2-1/2	TC54508	36.85	TC59699	41.55
	.112	.900 (12x)	1/8	2-1/2	TC54511	38.25	TC59702	42.95
	.117	.234 (3x)	1/8	2-1/2	TC54514	36.85	TC59705	41.55
.0780	.117	.406 (5x)	1/8	2-1/2	TC54517	36.85	TC59708	41.55
	.117	.625 (8x)	1/8	2-1/2	TC54520	36.65	TC59711	41.60
	.117	.940 (12x)	1/8	2-1/2	TC54523	38.10	TC59714	42.80
	.120	.240 (3x)	1/8	2-1/2	TC54526	37.05	TC59717	41.75
	.120	.406 (5x)	1/8	2-1/2	TC54529	37.05	TC59720	41.75
.0800	.120	.650 (8x)	1/8	2-1/2	TC54532	37.05	TC59723	41.75
	.120	.960 (12x)	1/8	2-1/2	TC54535	38.05	TC59726	42.75
	.127	.255 (3x)	1/8	2-1/2	TC54538	36.85	TC59729	41.55
	.127	.425 (5x)	1/8	2-1/2	TC54541	37.05	TC59732	41.75
	.127	.700 (8x)	1/8	2-1/2	TC54544	37.05	TC59735	41.75
.0850	.127	1.020 (12x)	1/8	2-1/2	TC54547	38.05	TC59738	42.75
	.135	.270 (3x)	1/8	2-1/2	TC54550	36.85	TC59741	41.55
	.135	.450 (5x)	1/8	2-1/2	TC54553	36.85	TC59744	41.55
	.135	.750 (8x)	1/8	2-1/2	TC54556	36.65	TC59747	41.60
	.135	1.080 (12x)	1/8	2-1/2	TC54559	38.05	TC59750	42.75
.0900	.139	.279 (3x)	1/8	2-1/2	TC54562	36.65	TC59753	41.60
	.139	.500 (5x)	1/8	2-1/2	TC54565	36.65	TC59756	41.60
	.139	.750 (8x)	1/8	2-1/2	TC54568	36.65	TC59759	41.60
	.139	1.125 (12x)	1/8	2-1/2	TC54571	37.85	TC59762	42.55
	.142	.285 (3x)	1/8	2-1/2	TC54574	37.05	TC59765	41.75
.0950	.142	.500 (5x)	1/8	2-1/2	TC54577	37.05	TC59768	41.75
	.142	.750 (8x)	1/8	2-1/2	TC54580	37.05	TC59771	41.75
	.142	1.150 (12x)	1/8	2-1/2	TC54583	38.25	TC59774	42.95
	.150	.300 (3x)	1/8	2-1/2	TC54586	37.05	TC59777	41.75
	.150	.500 (5x)	1/8	2-1/2	TC54589	36.80	TC59780	41.50
.1000	.150	.800 (8x)	1/8	2-1/2	TC54592	36.65	TC59783	41.60
	.150	1.200 (12x)	1/8	2-1/2	TC54595	37.85	TC59786	42.55

For technical information, see page 143

MICRO END MILLS

3 Flute - Square - 30° Helix - Long Reach, Regular Flute



- Long reach design for deep cavities
- Center cutting
- AlTiN coating offers increased wear and heat resistance
- Solid carbide
- Precision manufactured in the USA

CUTTER DIA.	LOC	OVERALL REACH	SHANK DIA.	OAL	UNCOATED		AlTiN COATED	
$D1^{+.0005}_{-.0005}$	L2	$L3^{+.010}_{-.000}$	D2 (h6)	L1	TOOL #	PRICE	TOOL #	PRICE
.0100	.030	.050 (5x)	1/8	2-1/2	TC57400	49.50	TC57701	54.20
	.030	.080 (8x)	1/8	2-1/2	TC57403	49.05	TC57704	53.75
	.030	.125 (12x)	1/8	2-1/2	TC57406	52.05	TC57707	56.75
.0150	.045	.078 (5x)	1/8	2-1/2	TC57409	41.10	TC57710	45.80
	.045	.128 (8x)	1/8	2-1/2	TC57412	40.65	TC57713	45.35
	.045	.187 (12x)	1/8	2-1/2	TC57415	42.45	TC57716	47.15
.0200	.060	.100 (5x)	1/8	2-1/2	TC57418	39.15	TC57719	43.85
	.060	.170 (8x)	1/8	2-1/2	TC57421	38.95	TC57722	43.65
	.060	.250 (12x)	1/8	2-1/2	TC57424	40.70	TC57725	45.40
.0250	.075	.125 (5x)	1/8	2-1/2	TC57427	37.70	TC57728	42.40
	.075	.213 (8x)	1/8	2-1/2	TC57430	37.50	TC57731	42.20
	.075	.312 (12x)	1/8	2-1/2	TC57433	39.30	TC57734	44.00
.0300	.090	.156 (5x)	1/8	2-1/2	TC57436	37.85	TC57737	42.55
	.090	.270 (9x)	1/8	2-1/2	TC57439	37.50	TC57740	42.20
	.090	.375 (12x)	1/8	2-1/2	TC57442	38.90	TC57743	43.60
.0310	.093	.156 (5x)	1/8	2-1/2	TC57445	37.50	TC57746	42.20
	.093	.279 (9x)	1/8	2-1/2	TC57448	37.50	TC57749	42.20
	.093	.375 (12x)	1/8	2-1/2	TC57451	38.90	TC57752	43.60
.0350	.105	.175 (5x)	1/8	2-1/2	TC57454	37.85	TC57755	42.55
	.105	.315 (9x)	1/8	2-1/2	TC57457	37.65	TC57758	42.35
	.105	.420 (12x)	1/8	2-1/2	TC57460	39.10	TC57761	43.80
.0400	.120	.203 (5x)	1/8	2-1/2	TC57463	37.65	TC57764	42.35
	.120	.360 (9x)	1/8	2-1/2	TC57466	37.50	TC57767	42.20
	.120	.480 (12x)	1/8	2-1/2	TC57469	38.70	TC57770	43.40
.0450	.135	.225 (5x)	1/8	2-1/2	TC57472	36.85	TC57773	41.55
	.135	.405 (9x)	1/8	2-1/2	TC57475	36.80	TC57776	41.50
	.135	.540 (12x)	1/8	2-1/2	TC57478	39.10	TC57779	43.80
.0470	.141	.250 (5x)	1/8	2-1/2	TC57481	36.65	TC57782	41.60
	.141	.423 (9x)	1/8	2-1/2	TC57484	36.65	TC57785	41.60
	.141	.570 (12x)	1/8	2-1/2	TC57487	38.10	TC57788	42.80
.0500	.150	.250 (5x)	1/8	2-1/2	TC57490	36.85	TC57791	41.55
	.150	.400 (8x)	1/8	2-1/2	TC57493	36.65	TC57794	41.60
	.150	.600 (12x)	1/8	2-1/2	TC57496	38.10	TC57797	42.80
.0550	.165	.275 (5x)	1/8	2-1/2	TC57499	37.05	TC57800	41.75
	.165	.440 (8x)	1/8	2-1/2	TC57502	36.65	TC57803	41.60
	.165	.660 (12x)	1/8	2-1/2	TC57505	38.25	TC57806	42.95

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MICRO END MILLS

3 Flute - Square - 30° Helix - Long Reach, Regular Flute (Cont.)

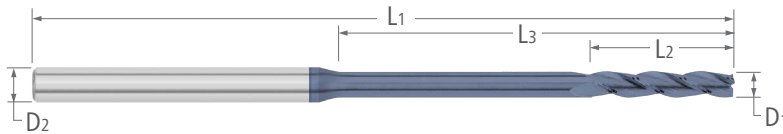
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CUTTER DIA.	LOC	OVERALL REACH	SHANK DIA.	OAL	UNCOATED		AlTiN COATED	
$D_1^{+.0005"}_{-.0005"}\text{ (h6)}$	L ₂	$L_3^{+.010"}_{-.000"}\text{ (h6)}$	D ₂ (h6)	L ₁	TOOL #	PRICE	TOOL #	PRICE
.0600	.180	.312 (5x)	1/8	2-1/2	TC57508	36.85	TC57809	41.15
	.180	.500 (8x)	1/8	2-1/2	TC57511	36.65	TC57812	41.60
	.180	.720 (12x)	1/8	2-1/2	TC57514	38.05	TC57815	42.75
.0620	.186	.312 (5x)	1/8	2-1/2	TC57517	36.65	TC57818	41.60
	.186	.500 (8x)	1/8	2-1/2	TC57520	36.65	TC57821	41.60
	.186	.750 (12x)	1/8	2-1/2	TC57523	37.85	TC57824	42.55
.0650	.195	.325 (5x)	1/8	2-1/2	TC57526	37.05	TC57827	41.75
	.195	.500 (8x)	1/8	2-1/2	TC57529	36.65	TC57830	41.60
	.195	.780 (12x)	1/8	2-1/2	TC57532	38.25	TC57833	42.95
.0700	.210	.350 (5x)	1/8	2-1/2	TC57535	36.85	TC57836	41.55
	.210	.560 (8x)	1/8	2-1/2	TC57538	36.65	TC57839	41.60
	.210	.850 (12x)	1/8	2-1/2	TC57541	38.10	TC57842	42.80
.0750	.225	.375 (5x)	1/8	2-1/2	TC57544	37.05	TC57845	41.75
	.225	.600 (8x)	1/8	2-1/2	TC57547	36.80	TC57848	41.50
	.225	.900 (12x)	1/8	2-1/2	TC57550	38.25	TC57851	42.95
.0780	.234	.390 (5x)	1/8	2-1/2	TC57553	37.05	TC57854	41.75
	.234	.624 (8x)	1/8	2-1/2	TC57556	36.65	TC57857	41.60
	.234	.940 (12x)	1/8	2-1/2	TC57559	38.10	TC57860	42.80
.0800	.240	.400 (5x)	1/8	2-1/2	TC57562	36.85	TC57863	41.55
	.240	.640 (8x)	1/8	2-1/2	TC57565	36.65	TC57866	41.60
	.240	.960 (12x)	1/8	2-1/2	TC57568	38.10	TC57869	42.80
.0850	.255	.425 (5x)	1/8	2-1/2	TC57571	37.05	TC57872	41.75
	.255	.680 (8x)	1/8	2-1/2	TC57574	36.80	TC57875	41.50
	.255	1.020 (12x)	1/8	2-1/2	TC57577	38.25	TC57878	42.95
.0900	.270	.450 (5x)	1/8	2-1/2	TC57580	36.85	TC57881	41.55
	.270	.720 (8x)	1/8	2-1/2	TC57583	36.80	TC57884	41.50
	.270	1.080 (12x)	1/8	2-1/2	TC57586	38.25	TC57887	42.95
.0930	.279	.500 (5x)	1/8	2-1/2	TC57589	36.65	TC57890	41.60
	.279	.744 (8x)	1/8	2-1/2	TC57592	36.65	TC57893	41.60
	.279	1.125 (12x)	1/8	2-1/2	TC57595	38.25	TC57896	42.95
.0950	.285	.475 (5x)	1/8	2-1/2	TC57598	37.05	TC57899	41.75
	.285	.760 (8x)	1/8	2-1/2	TC57601	36.80	TC57902	41.50
	.285	1.140 (12x)	1/8	2-1/2	TC57604	38.25	TC57905	42.95
.1000	.300	.500 (5x)	1/8	2-1/2	TC57607	36.85	TC57908	41.55
	.300	.800 (8x)	1/8	2-1/2	TC57610	36.65	TC57911	41.60
	.300	1.200 (12x)	1/8	2-1/2	TC57613	38.25	TC57914	42.95

For technical information, see page 143

MICRO END MILLS

3 Flute - Square - 30° Helix - Long Reach, Long Flute



- Long flute and long reach design for deep cavities
- Center cutting
- AlTiN coating offers increased wear and heat resistance
- Solid carbide
- Precision manufactured in the USA

CUTTER DIA.	LOC	OVERALL REACH	SHANK DIA.	OAL	UNCOATED		AlTiN COATED	
$D_1^{+.0005''}_{-.0005''}$	L_2	$L_3^{+.010''}_{-.000''}$	D_2 (h6)	L_1	TOOL #	PRICE	TOOL #	PRICE
.0100	.050	.100 (10x)	1/8	2-1/2	TC54650	50.05	TC54801	54.75
	.050	.150 (15x)	1/8	2-1/2	TC54653	62.10	TC54804	66.80
.0150	.075	.150 (10x)	1/8	2-1/2	TC54656	42.00	TC54807	46.70
	.075	.225 (15x)	1/8	2-1/2	TC54659	53.15	TC54810	57.85
.0200	.100	.200 (10x)	1/8	2-1/2	TC54662	40.05	TC54813	44.75
	.100	.300 (15x)	1/8	2-1/2	TC54665	51.00	TC54816	55.70
.0250	.125	.250 (10x)	1/8	2-1/2	TC54668	38.35	TC54819	43.05
	.125	.375 (15x)	1/8	2-1/2	TC54671	49.85	TC54822	54.55
.0300	.150	.300 (10x)	1/8	2-1/2	TC54674	38.70	TC54825	43.40
	.150	.450 (15x)	1/8	2-1/2	TC54677	49.45	TC54828	54.15
.0310	.155	.310 (10x)	1/8	2-1/2	TC54680	38.35	TC54831	43.05
	.155	.470 (15x)	1/8	2-1/2	TC54683	49.45	TC54834	54.15
.0350	.175	.350 (10x)	1/8	2-1/2	TC54686	38.50	TC54837	43.20
	.175	.525 (15x)	1/8	2-1/2	TC54689	49.65	TC54840	54.35
.0400	.200	.400 (10x)	1/8	2-1/2	TC54692	38.35	TC54843	43.05
	.200	.600 (15x)	1/8	2-1/2	TC54695	49.65	TC54846	54.35
.0450	.225	.450 (10x)	1/8	2-1/2	TC54698	37.65	TC54849	42.35
	.225	.675 (15x)	1/8	2-1/2	TC54701	47.45	TC54852	52.15
.0470	.250	.500 (10x)	1/8	2-1/2	TC54704	38.00	TC54855	42.70
	.250	.710 (15x)	1/8	2-1/2	TC54707	47.00	TC54858	51.70
.0500	.300	.500 (10x)	1/8	2-1/2	TC54710	38.00	TC54861	42.70
	.300	.750 (15x)	1/8	2-1/2	TC54713	47.25	TC54864	51.95
.0550	.385	.550 (10x)	1/8	2-1/2	TC54716	37.65	TC54867	42.35
	.385	.825 (15x)	1/8	2-1/2	TC54719	47.45	TC54870	52.15
.0600	.312	.625 (10x)	1/8	2-1/2	TC54722	37.80	TC54873	42.50
	.500	1.000 (16x)	1/8	2-1/2	TC54725	37.80	TC54876	42.50
.0620	.312	.625 (10x)	1/8	2-1/2	TC54728	37.65	TC54879	42.35
	.500	1.000 (16x)	1/8	2-1/2	TC54731	37.65	TC54882	42.35
.0650	.325	.650 (10x)	1/8	2-1/2	TC54734	38.00	TC54885	42.70
	.500	1.000 (15x)	1/8	2-1/2	TC54737	38.00	TC54888	42.70
.0700	.350	.700 (10x)	1/8	2-1/2	TC54740	38.00	TC54891	42.70
	.500	1.000 (14x)	1/8	2-1/2	TC54743	37.80	TC54894	42.50
.0750	.375	.750 (10x)	1/8	2-1/2	TC54746	38.00	TC54897	42.70
	.500	1.000 (13x)	1/8	2-1/2	TC54749	38.00	TC54900	42.70
.0780	.406	.800 (10x)	1/8	2-1/2	TC54752	37.80	TC54903	42.50
	.406	1.187 (15x)	1/8	2-1/2	TC54755	37.80	TC54906	42.50

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MICRO END MILLS

3 Flute - Square - 30° Helix - Long Reach, Long Flute (Cont.)

continued from previous page

CUTTER DIA.	LOC	OVERALL REACH	SHANK DIA.	OAL	UNCOATED		AlTiN COATED	
$D_1 \begin{smallmatrix} +.0005'' \\ -.0005'' \end{smallmatrix}$	L ₂	L ₃ $\begin{smallmatrix} +.010'' \\ -.000'' \end{smallmatrix}$	D ₂ (h6)	L ₁	TOOL #	PRICE	TOOL #	PRICE
.0800	.400	.800 (10x)	1/8	2-1/2	TC54758	37.80	TC54909	42.50
	.750	1.250 (15x)	1/8	2-1/2	TC54761	38.00	TC54912	42.70
.0850	.425	.850 (10x)	1/8	2-1/2	TC54764	38.00	TC54915	42.70
	.750	1.250 (14x)	1/8	2-1/2	TC54767	37.65	TC54918	42.35
.0900	.450	.900 (10x)	1/8	2-1/2	TC54770	38.00	TC54921	42.70
	.750	1.250 (13x)	1/8	2-1/2	TC54773	37.80	TC54924	42.50
.0930	.500	.950 (10x)	1/8	2-1/2	TC54776	37.80	TC54927	42.50
	.500	1.400 (15x)	1/8	2-1/2	TC54779	37.65	TC54930	42.35
.0950	.500	.950 (10x)	1/8	2-1/2	TC54782	37.80	TC54933	42.50
	.750	1.250 (13x)	1/8	2-1/2	TC54785	37.80	TC54936	42.50
.1000	.500	1.000 (10x)	1/8	2-1/2	TC54788	37.80	TC54939	42.50
	.750	1.250 (12x)	1/8	2-1/2	TC54791	37.80	TC54942	42.50

3 Flute

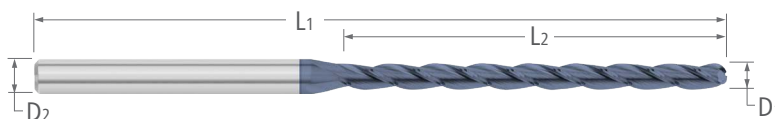


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MICRO END MILLS

3 Flute - Ball - 30° Helix - Long Flute



- Long flute design for deep cavities
- Center cutting
- AlTiN coating offers increased wear and heat resistance
- Solid carbide
- Precision manufactured in the USA

CUTTER DIA.	LENGTH OF CUT	SHANK DIA.	OAL	UNCOATED		AlTiN COATED	
$D_1^{+.0005"}$ $- .0005"$	L2	D2 (h6)	L1	TOOL #	PRICE	TOOL #	PRICE
.0100	.050 (5x)	1/8	2-1/2	TC53730	46.25	TC53861	50.95
	.080 (8x)	1/8	2-1/2	TC53731	77.00	TC53862	81.70
	.120 (12x)	1/8	2-1/2	TC53732	90.10	TC53863	94.80
.0150	.078 (5x)	1/8	2-1/2	TC53733	42.60	TC53864	47.30
	.125 (8x)	1/8	2-1/2	TC53734	74.50	TC53865	79.20
	.187 (12x)	1/8	2-1/2	TC53735	91.15	TC53866	95.85
.0200	.100 (5x)	1/8	2-1/2	TC53736	36.65	TC53867	41.60
	.160 (8x)	1/8	2-1/2	TC53737	68.50	TC53868	73.35
	.250 (12x)	1/8	2-1/2	TC53738	86.00	TC53869	90.70
.0250	.125 (5x)	1/8	2-1/2	TC53739	35.05	TC53870	39.75
	.203 (8x)	1/8	2-1/2	TC53740	67.35	TC53871	72.05
	.312 (12x)	1/8	2-1/2	TC53741	83.25	TC53872	87.95
.0300	.150 (5x)	1/8	2-1/2	TC53742	33.80	TC53873	38.50
	.250 (8x)	1/8	2-1/2	TC53743	55.75	TC53874	60.45
	.375 (12x)	1/8	2-1/2	TC53744	81.90	TC53875	86.60
.0310	.156 (5x)	1/8	2-1/2	TC53745	33.80	TC53876	38.50
	.250 (8x)	1/8	2-1/2	TC53746	53.10	TC53877	57.80
	.375 (12x)	1/8	2-1/2	TC53747	73.10	TC53878	77.80
.0350	.175 (5x)	1/8	2-1/2	TC53748	33.90	TC53879	38.60
	.281 (8x)	1/8	2-1/2	TC53749	55.75	TC53880	60.45
	.425 (12x)	1/8	2-1/2	TC53750	73.80	TC53881	78.50
.0400	.200 (5x)	1/8	2-1/2	TC53751	33.80	TC53882	38.50
	.325 (8x)	1/8	2-1/2	TC53752	55.15	TC53883	59.85
	.480 (12x)	1/8	2-1/2	TC53753	73.45	TC53884	78.15
.0450	.225 (5x)	1/8	2-1/2	TC53754	33.90	TC53885	38.60
	.375 (8x)	1/8	2-1/2	TC53755	55.75	TC53886	60.45
	.550 (12x)	1/8	2-1/2	TC53756	73.80	TC53887	78.50
.0470	.250 (5x)	1/8	2-1/2	TC53757	33.80	TC53888	38.50
	.375 (8x)	1/8	2-1/2	TC53758	55.40	TC53889	60.10
	.570 (12x)	1/8	2-1/2	TC53759	73.80	TC53890	78.50
.0500	.250 (5x)	1/8	2-1/2	TC53760	33.90	TC53891	38.60
	.400 (8x)	1/8	2-1/2	TC53761	55.75	TC53892	60.45
	.600 (12x)	1/8	2-1/2	TC53762	73.80	TC53893	78.50
.0550	.275 (5x)	1/8	2-1/2	TC53763	30.20	TC53894	34.90
	.440 (8x)	1/8	2-1/2	TC53764	36.40	TC53895	41.10
	.660 (12x)	1/8	2-1/2	TC53765	68.95	TC53896	73.65
.0600	.312 (5x)	1/8	2-1/2	TC53766	29.95	TC53897	34.65
	.500 (8x)	1/8	2-1/2	TC53767	34.05	TC53898	38.75
	.720 (12x)	1/8	2-1/2	TC53768	62.30	TC53899	67.00

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For technical information, see page 143

MICRO END MILLS

3 Flute - Ball - 30° Helix - Long Flute (Cont.)

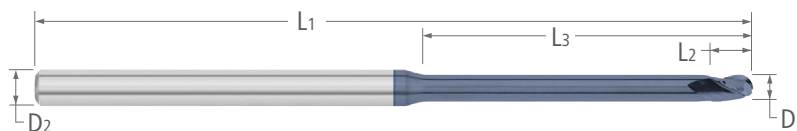
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CUTTER DIA.	LENGTH OF CUT	SHANK DIA.	OAL	UNCOATED		AlTiN COATED	
$D_{1 \pm .0005}^{+ .0005}$	L ₂	D ₂ (h6)	L ₁	TOOL #	PRICE	TOOL #	PRICE
.0620	.312 (5x)	1/8	2-1/2	TC53769	29.80	TC53900	34.50
	.500 (8x)	1/8	2-1/2	TC53770	33.35	TC53901	38.05
	.750 (12x)	1/8	2-1/2	TC53771	57.25	TC53902	64.90
	.950 15	1/8	2-1/2	TC53772	78.80	TC53903	83.50
.0650	.325 (5x)	1/8	2-1/2	TC53773	30.20	TC53904	34.90
	.500 (8x)	1/8	2-1/2	TC53774	33.60	TC53905	38.30
	.780 (12x)	1/8	2-1/2	TC53775	57.90	TC53906	62.60
.0700	.375 (5x)	1/8	2-1/2	TC53776	30.20	TC53907	34.90
	.560 (8x)	1/8	2-1/2	TC53777	33.45	TC53908	38.15
	.900 (12x)	1/8	2-1/2	TC53778	57.90	TC53909	62.60
.0750	.375 (5x)	1/8	2-1/2	TC53779	30.20	TC53910	34.90
	.625 (8x)	1/8	2-1/2	TC53780	33.60	TC53911	38.30
	.900 (12x)	1/8	2-1/2	TC53781	57.90	TC53912	62.60
.0780	.406 (5x)	1/8	2-1/2	TC53782	30.00	TC53913	34.70
	.625 (8x)	1/8	2-1/2	TC53783	33.45	TC53914	38.15
	.940 (12x)	1/8	2-1/2	TC53784	57.65	TC53915	62.35
	1.187 15	1/8	2-1/2	TC53785	79.15	TC53916	83.85
.0800	.406 (5x)	1/8	2-1/2	TC53786	30.20	TC53917	34.90
	.750 (8x)	1/8	2-1/2	TC53787	33.60	TC53918	38.30
	.960 (12x)	1/8	2-1/2	TC53788	57.90	TC53919	62.60
.0850	.425 (5x)	1/8	2-1/2	TC53789	30.20	TC53920	34.90
	.750 (8x)	1/8	2-1/2	TC53790	33.60	TC53921	38.30
	1.020 (12x)	1/8	2-1/2	TC53791	57.90	TC53922	62.60
.0900	.450 (5x)	1/8	2-1/2	TC53792	30.20	TC53923	34.90
	.750 (8x)	1/8	2-1/2	TC53793	33.60	TC53924	38.30
	1.080 (12x)	1/8	2-1/2	TC53794	57.90	TC53925	62.60
.0930	.500 (5x)	1/8	2-1/2	TC53795	29.80	TC53926	34.50
	.750 (8x)	1/8	2-1/2	TC53796	33.45	TC53927	38.15
	1.125 (12x)	1/8	2-1/2	TC53797	57.90	TC53928	62.60
	1.400 15	1/8	2-1/2	TC53798	80.45	TC53929	85.15
.0950	.500 (5x)	1/8	2-1/2	TC53799	30.20	TC53930	34.90
	.750 (8x)	1/8	2-1/2	TC53800	33.60	TC53931	38.30
	1.140 (12x)	1/8	2-1/2	TC53801	57.90	TC53932	62.60
.1000	.500 (5x)	1/8	2-1/2	TC53802	30.20	TC53933	34.90
	.800 (8x)	1/8	2-1/2	TC53803	33.60	TC53934	38.30
	1.200 (12x)	1/8	2-1/2	TC53804	57.90	TC53935	62.60
.1090	.570 (5x)	1/8	2-1/2	TC53805	30.00	TC53936	34.70
	.900 (8x)	1/8	2-1/2	TC53806	33.60	TC53937	38.30
	1.320 (12x)	1/8	2-1/2	TC53807	57.90	TC53938	62.60
.1180	.625 (5x)	1/8	2-1/2	TC53808	30.20	TC53939	34.90
	.950 (8x)	1/8	2-1/2	TC53809	33.60	TC53940	38.30
	1.375 (12x)	1/8	2-1/2	TC53810	57.65	TC53941	62.35
.1200	.600 (5x)	1/8	2-1/2	TC53811	30.20	TC53942	34.90
	1.000 (8x)	1/8	2-1/2	TC53812	33.45	TC53943	38.15
	1.500 (12x)	1/8	2-1/2	TC53813	57.90	TC53944	62.60

For technical information, see page 143

MICRO END MILLS

3 Flute - Ball - 30° Helix - Long Reach, Stub Flute



- Long reach design for deep cavities
- Center cutting
- Solid carbide
- Stub flutes for maximum rigidity
- AlTiN coating offers increased wear and heat resistance
- Precision manufactured in the USA

CUTTER DIA.	LOC	OVERALL REACH	SHANK DIA.	OAL	UNCOATED		AlTiN COATED	
$D1^{+.0005}_{-.0005}$	L2	$L3^{+.010}_{-.000}$	D2 (h6)	L1	TOOL #	PRICE	TOOL #	PRICE
.0100	.015	.030 (3x)	1/8	2-1/2	TC55400	62.10	TC55701	66.80
	.015	.050 (5x)	1/8	2-1/2	TC55403	62.10	TC55704	66.80
	.015	.080 (8x)	1/8	2-1/2	TC55406	64.55	TC55707	69.25
	.015	.125 (12x)	1/8	2-1/2	TC55409	72.60	TC55710	77.30
	.022	.045 (3x)	1/8	2-1/2	TC55412	53.15	TC55713	57.85
.0150	.022	.078 (5x)	1/8	2-1/2	TC55415	52.90	TC55716	57.60
	.022	.125 (8x)	1/8	2-1/2	TC55418	53.15	TC55719	57.85
	.022	.187 (12x)	1/8	2-1/2	TC55421	54.00	TC55722	58.70
	.030	.060 (3x)	1/8	2-1/2	TC55424	51.20	TC55725	55.90
	.030	.100 (5x)	1/8	2-1/2	TC55427	51.20	TC55728	57.75
.0200	.030	.160 (8x)	1/8	2-1/2	TC55430	51.45	TC55731	56.15
	.030	.250 (12x)	1/8	2-1/2	TC55433	52.45	TC55734	59.35
	.037	.075 (3x)	1/8	2-1/2	TC55436	44.45	TC55737	49.15
	.037	.125 (5x)	1/8	2-1/2	TC55439	44.45	TC55740	49.15
	.037	.203 (8x)	1/8	2-1/2	TC55442	44.45	TC55743	49.15
.0250	.037	.312 (12x)	1/8	2-1/2	TC55445	45.55	TC55746	50.25
	.045	.090 (3x)	1/8	2-1/2	TC55448	44.45	TC55749	49.15
	.045	.156 (5x)	1/8	2-1/2	TC55451	44.25	TC55752	48.95
	.045	.250 (8x)	1/8	2-1/2	TC55454	44.45	TC55755	49.15
	.045	.375 (12x)	1/8	2-1/2	TC55457	45.75	TC55758	50.45
.0300	.046	.093 (3x)	1/8	2-1/2	TC55460	44.25	TC55761	48.95
	.046	.156 (5x)	1/8	2-1/2	TC55463	44.45	TC55764	49.15
	.046	.250 (8x)	1/8	2-1/2	TC55466	44.00	TC55767	49.85
	.046	.375 (12x)	1/8	2-1/2	TC55469	45.35	TC55770	51.30
	.052	.105 (3x)	1/8	2-1/2	TC55472	44.45	TC55773	49.15
.0350	.052	.187 (5x)	1/8	2-1/2	TC55475	44.45	TC55776	49.15
	.052	.281 (8x)	1/8	2-1/2	TC55478	44.45	TC55779	49.15
	.052	.425 (12x)	1/8	2-1/2	TC55481	45.75	TC55782	50.45
	.060	.120 (3x)	1/8	2-1/2	TC55484	44.25	TC55785	48.95
	.060	.203 (5x)	1/8	2-1/2	TC55487	44.25	TC55788	48.95
.0400	.060	.325 (8x)	1/8	2-1/2	TC55490	44.20	TC55791	48.90
	.060	.480 (12x)	1/8	2-1/2	TC55493	45.35	TC55794	50.05
	.067	.135 (3x)	1/8	2-1/2	TC55496	43.40	TC55797	48.10
	.067	.225 (5x)	1/8	2-1/2	TC55499	43.40	TC55800	48.10
	.067	.375 (8x)	1/8	2-1/2	TC55502	43.40	TC55803	48.10
.0450	.067	.550 (12x)	1/8	2-1/2	TC55505	44.55	TC55806	49.25
	.070	.141 (3x)	1/8	2-1/2	TC55508	43.40	TC55809	48.10
	.070	.250 (5x)	1/8	2-1/2	TC55511	43.25	TC55812	47.95
	.070	.375 (8x)	1/8	2-1/2	TC55514	43.05	TC55815	47.75
	.070	.570 (12x)	1/8	2-1/2	TC55517	44.15	TC55818	48.85
.0500	.075	.150 (3x)	1/8	2-1/2	TC55520	43.40	TC55821	48.10
	.075	.250 (5x)	1/8	2-1/2	TC55523	43.40	TC55824	48.10
	.075	.400 (8x)	1/8	2-1/2	TC55526	43.40	TC55827	48.10
	.075	.600 (12x)	1/8	2-1/2	TC55529	44.55	TC55830	49.25

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MICRO END MILLS

3 Flute - Ball - 30° Helix - Long Reach, Stub Flute (Cont.)

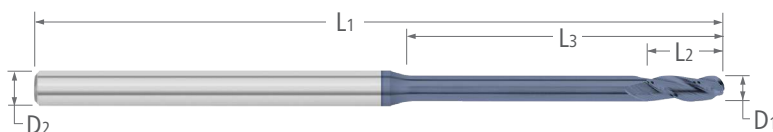
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CUTTER DIA.	LOC	OVERALL REACH	SHANK DIA.	OAL	UNCOATED		AlTiN COATED	
D1 ^{+0.005"} _{-0.005"}	L2	L3 ^{+0.010"} _{-0.000"}	D2 (h6)	L1	TOOL #	PRICE	TOOL #	PRICE
.0550	.082	.165 (3x)	1/8	2-1/2	TC55532	43.40	TC55833	48.10
	.082	.275 (5x)	1/8	2-1/2	TC55535	43.40	TC55836	48.10
	.082	.450 (8x)	1/8	2-1/2	TC55538	43.25	TC55839	47.95
	.082	.660 (12x)	1/8	2-1/2	TC55541	44.55	TC55842	49.25
.0600	.090	.180 (3x)	1/8	2-1/2	TC55544	43.40	TC55845	48.10
	.090	.312 (5x)	1/8	2-1/2	TC55547	43.25	TC55848	47.95
	.090	.500 (8x)	1/8	2-1/2	TC55550	43.25	TC55851	47.95
	.090	.720 (12x)	1/8	2-1/2	TC55553	44.35	TC55854	50.05
.0620	.093	.186 (3x)	1/8	2-1/2	TC55556	43.25	TC55857	47.95
	.093	.312 (5x)	1/8	2-1/2	TC55559	43.05	TC55860	48.70
	.093	.500 (8x)	1/8	2-1/2	TC55562	43.05	TC55863	48.70
	.093	.750 (12x)	1/8	2-1/2	TC55565	44.15	TC55866	50.05
.0650	.097	.195 (3x)	1/8	2-1/2	TC55568	43.40	TC55869	48.10
	.097	.325 (5x)	1/8	2-1/2	TC55571	43.40	TC55872	48.10
	.097	.530 (8x)	1/8	2-1/2	TC55574	43.40	TC55875	48.10
	.097	.780 (12x)	1/8	2-1/2	TC55577	44.55	TC55878	49.25
.0700	.105	.210 (3x)	1/8	2-1/2	TC55580	43.40	TC55881	48.10
	.105	.375 (5x)	1/8	2-1/2	TC55583	43.40	TC55884	48.10
	.105	.570 (8x)	1/8	2-1/2	TC55586	43.40	TC55887	48.10
	.105	.840 (12x)	1/8	2-1/2	TC55589	44.55	TC55890	49.25
.0750	.112	.225 (3x)	1/8	2-1/2	TC55592	43.40	TC55893	48.10
	.112	.375 (5x)	1/8	2-1/2	TC55595	43.25	TC55896	47.95
	.112	.625 (8x)	1/8	2-1/2	TC55598	43.40	TC55899	48.10
	.112	.900 (12x)	1/8	2-1/2	TC55601	44.55	TC55902	49.25
.0780	.117	.234 (3x)	1/8	2-1/2	TC55604	43.40	TC55905	48.10
	.117	.406 (5x)	1/8	2-1/2	TC55607	43.05	TC55908	48.70
	.117	.625 (8x)	1/8	2-1/2	TC55610	43.25	TC55911	47.95
	.117	.940 (12x)	1/8	2-1/2	TC55613	44.35	TC55914	49.05
.0800	.120	.240 (3x)	1/8	2-1/2	TC55616	43.40	TC55917	48.10
	.120	.406 (5x)	1/8	2-1/2	TC55619	43.40	TC55920	48.10
	.120	.650 (8x)	1/8	2-1/2	TC55622	43.40	TC55923	48.10
	.120	.960 (12x)	1/8	2-1/2	TC55625	44.55	TC55926	49.25
.0850	.127	.255 (3x)	1/8	2-1/2	TC55628	43.25	TC55929	47.95
	.127	.425 (5x)	1/8	2-1/2	TC55631	43.25	TC55932	47.95
	.127	.700 (8x)	1/8	2-1/2	TC55634	43.40	TC55935	48.10
	.127	1.020 (12x)	1/8	2-1/2	TC55637	44.55	TC55938	49.25
.0900	.135	.270 (3x)	1/8	2-1/2	TC55640	43.40	TC55941	48.10
	.135	.450 (5x)	1/8	2-1/2	TC55643	43.40	TC55944	48.10
	.135	.750 (8x)	1/8	2-1/2	TC55646	43.40	TC55947	48.10
	.135	1.080 (12x)	1/8	2-1/2	TC55649	44.55	TC55950	49.25
.0930	.139	.279 (3x)	1/8	2-1/2	TC55652	43.40	TC55953	48.10
	.139	.500 (5x)	1/8	2-1/2	TC55655	43.05	TC55956	48.70
	.139	.750 (8x)	1/8	2-1/2	TC55658	43.05	TC55959	48.70
	.139	1.125 (12x)	1/8	2-1/2	TC55661	44.35	TC55962	49.05
.0950	.142	.285 (3x)	1/8	2-1/2	TC55664	43.40	TC55965	48.10
	.142	.500 (5x)	1/8	2-1/2	TC55667	43.40	TC55968	48.10
	.142	.750 (8x)	1/8	2-1/2	TC55670	43.40	TC55971	48.10
	.142	1.150 (12x)	1/8	2-1/2	TC55673	44.55	TC55974	49.25
.1000	.150	.300 (3x)	1/8	2-1/2	TC55676	43.40	TC55977	48.10
	.150	.500 (5x)	1/8	2-1/2	TC55679	43.25	TC55980	47.95
	.150	.800 (8x)	1/8	2-1/2	TC55682	43.25	TC55983	47.95
	.150	1.200 (12x)	1/8	2-1/2	TC55685	44.55	TC55986	49.25

For technical information, see page 143

MICRO END MILLS

3 Flute - Ball - 30° Helix - Long Reach, Regular Flute



- Long reach design for deep cavities
- Center cutting
- AlTiN coating offers increased wear and heat resistance
- Solid carbide
- Precision manufactured in the USA

CUTTER DIA.	LOC	OVERALL REACH	SHANK DIA.	OAL	UNCOATED		AlTiN COATED	
$D_1^{+.0005''}_{-.0005''}$	L2	$L_3^{+.010''}_{-.000''}$	D_2 (h6)	L1	TOOL #	PRICE	TOOL #	PRICE
.0100	.030	.050 (5x)	1/8	2-1/2	TC58400	67.10	TC58701	71.80
	.030	.080 (8x)	1/8	2-1/2	TC58403	66.75	TC58704	71.45
	.030	.125 (12x)	1/8	2-1/2	TC58406	68.20	TC58707	72.90
.0150	.045	.078 (5x)	1/8	2-1/2	TC58409	53.90	TC58710	58.60
	.045	.128 (8x)	1/8	2-1/2	TC58412	53.30	TC58713	58.00
	.045	.187 (12x)	1/8	2-1/2	TC58415	54.95	TC58716	59.65
.0200	.060	.100 (5x)	1/8	2-1/2	TC58418	51.70	TC58719	56.40
	.060	.170 (8x)	1/8	2-1/2	TC58421	51.45	TC58722	56.15
	.060	.250 (12x)	1/8	2-1/2	TC58424	52.90	TC58725	57.60
.0250	.075	.125 (5x)	1/8	2-1/2	TC58427	47.35	TC58728	52.05
	.075	.213 (8x)	1/8	2-1/2	TC58430	46.90	TC58731	51.60
	.075	.312 (12x)	1/8	2-1/2	TC58433	48.55	TC58734	53.25
.0300	.090	.156 (5x)	1/8	2-1/2	TC58436	47.10	TC58737	51.80
	.090	.270 (9x)	1/8	2-1/2	TC58439	46.90	TC58740	51.60
	.090	.375 (12x)	1/8	2-1/2	TC58442	48.25	TC58743	54.40
.0310	.093	.156 (5x)	1/8	2-1/2	TC58445	46.90	TC58746	51.60
	.093	.279 (9x)	1/8	2-1/2	TC58448	47.10	TC58749	51.80
	.093	.375 (12x)	1/8	2-1/2	TC58451	48.25	TC58752	52.95
.0350	.105	.175 (5x)	1/8	2-1/2	TC58454	47.35	TC58755	52.05
	.105	.280 (8x)	1/8	2-1/2	TC58457	46.90	TC58758	51.60
	.105	.420 (12x)	1/8	2-1/2	TC58460	48.25	TC58761	52.95
.0400	.120	.200 (5x)	1/8	2-1/2	TC58463	47.10	TC58764	51.80
	.120	.320 (8x)	1/8	2-1/2	TC58466	47.10	TC58767	51.80
	.120	.480 (12x)	1/8	2-1/2	TC58469	48.25	TC58770	52.95
.0450	.135	.225 (5x)	1/8	2-1/2	TC58472	45.55	TC58773	50.25
	.135	.360 (8x)	1/8	2-1/2	TC58475	45.55	TC58776	50.25
	.135	.540 (12x)	1/8	2-1/2	TC58478	46.75	TC58779	51.45
.0470	.141	.250 (5x)	1/8	2-1/2	TC58481	45.55	TC58782	50.25
	.141	.376 (8x)	1/8	2-1/2	TC58484	45.55	TC58785	50.25
	.141	.570 (12x)	1/8	2-1/2	TC58487	46.75	TC58788	51.45
.0500	.150	.250 (5x)	1/8	2-1/2	TC58490	45.55	TC58791	50.25
	.150	.400 (8x)	1/8	2-1/2	TC58493	45.35	TC58794	50.05
	.150	.600 (12x)	1/8	2-1/2	TC58496	46.75	TC58797	51.45
.0550	.165	.275 (5x)	1/8	2-1/2	TC58499	45.75	TC58800	50.45
	.165	.440 (8x)	1/8	2-1/2	TC58502	45.75	TC58803	50.45
	.165	.660 (12x)	1/8	2-1/2	TC58505	46.95	TC58806	51.65
.0600	.180	.300 (5x)	1/8	2-1/2	TC58508	45.75	TC58809	50.45
	.180	.500 (8x)	1/8	2-1/2	TC58511	45.35	TC58812	51.30
	.180	.720 (12x)	1/8	2-1/2	TC58514	46.75	TC58815	51.45

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For technical information, see page 143

MICRO END MILLS

3 Flute - Ball - 30° Helix - Long Reach, Regular Flute (Cont.)

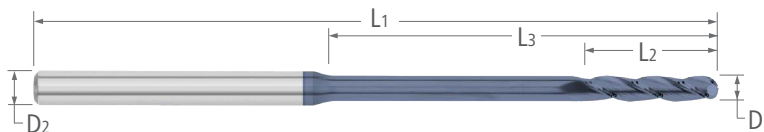
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CUTTER DIA.	LOC	OVERALL REACH	SHANK DIA.	OAL	UNCOATED		AlTiN COATED	
D ₁ ^{+0.0005"} -0.0005"	L ₂	L ₃ ^{+0.010"} -0.000"	D ₂ (h6)	L ₁	TOOL #	PRICE	TOOL #	PRICE
.0620	.186	.312 (5x)	1/8	2-1/2	TC58517	45.35	TC58818	51.30
	.186	.500 (8x)	1/8	2-1/2	TC58520	45.35	TC58821	51.30
	.186	.750 (12x)	1/8	2-1/2	TC58523	46.45	TC58824	51.15
.0650	.195	.325 (5x)	1/8	2-1/2	TC58526	45.75	TC58827	50.45
	.195	.500 (8x)	1/8	2-1/2	TC58529	45.75	TC58830	50.45
	.195	.780 (12x)	1/8	2-1/2	TC58532	46.95	TC58833	51.65
.0700	.210	.350 (5x)	1/8	2-1/2	TC58535	45.75	TC58836	50.45
	.210	.560 (8x)	1/8	2-1/2	TC58538	45.75	TC58839	50.45
	.210	.840 (12x)	1/8	2-1/2	TC58541	46.95	TC58842	51.65
.0750	.225	.375 (5x)	1/8	2-1/2	TC58544	45.55	TC58845	50.25
	.225	.600 (8x)	1/8	2-1/2	TC58547	45.75	TC58848	50.45
	.225	.900 (12x)	1/8	2-1/2	TC58550	46.75	TC58851	51.45
.0780	.234	.390 (5x)	1/8	2-1/2	TC58553	45.75	TC58854	50.45
	.234	.624 (8x)	1/8	2-1/2	TC58556	45.35	TC58857	51.30
	.234	.940 (12x)	1/8	2-1/2	TC58559	46.75	TC58860	51.45
.0800	.240	.400 (5x)	1/8	2-1/2	TC58562	45.55	TC58863	50.25
	.240	.640 (8x)	1/8	2-1/2	TC58565	45.75	TC58866	50.45
	.240	.960 (12x)	1/8	2-1/2	TC58568	46.95	TC58869	51.65
.0850	.255	.425 (5x)	1/8	2-1/2	TC58571	45.75	TC58872	50.45
	.255	.680 (8x)	1/8	2-1/2	TC58574	45.75	TC58875	50.45
	.255	1.020 (12x)	1/8	2-1/2	TC58577	46.95	TC58878	51.65
.0900	.270	.450 (5x)	1/8	2-1/2	TC58580	45.55	TC58881	50.25
	.270	.720 (8x)	1/8	2-1/2	TC58583	45.55	TC58884	50.25
	.270	1.080 (12x)	1/8	2-1/2	TC58586	46.95	TC58887	51.65
.0930	.279	.500 (5x)	1/8	2-1/2	TC58589	45.55	TC58890	50.25
	.279	.744 (8x)	1/8	2-1/2	TC58592	45.55	TC58893	50.25
	.279	1.125 (12x)	1/8	2-1/2	TC58595	46.75	TC58896	51.45
.0950	.285	.475 (5x)	1/8	2-1/2	TC58598	45.75	TC58899	50.45
	.285	.760 (8x)	1/8	2-1/2	TC58601	45.75	TC58902	50.45
	.285	1.140 (12x)	1/8	2-1/2	TC58604	46.95	TC58905	51.65
.1000	.300	.500 (5x)	1/8	2-1/2	TC58607	45.55	TC58908	50.25
	.300	.800 (8x)	1/8	2-1/2	TC58610	45.55	TC58911	50.25
	.300	1.200 (12x)	1/8	2-1/2	TC58613	46.45	TC58914	51.15

For technical information, see page 143

MICRO END MILLS

3 Flute - Ball - 30° Helix - Long Reach, Long Flute



- Long flute, long reach
- Center cutting
- AlTiN coating offers increased wear and heat resistance
- Solid carbide
- Precision manufactured in the USA

CUTTER DIA.	LOC	OVERALL REACH	SHANK DIA.	OAL	UNCOATED		AlTiN COATED	
$D1^{+.0005^+}_{-.0005^-}$	L2	$L3^{+.010^+}_{-.000^-}$	D2 (h6)	L1	TOOL #	PRICE	TOOL #	PRICE
.0100	.050	.100 (10x)	1/8	2-1/2	TC52750	62.85	TC52900	67.55
	.050	.150 (15x)	1/8	2-1/2	TC52753	62.85	TC52902	67.55
.0150	.075	.150 (10x)	1/8	2-1/2	TC52756	54.00	TC52904	58.70
	.075	.225 (15x)	1/8	2-1/2	TC52759	54.00	TC52906	58.70
.0200	.100	.200 (10x)	1/8	2-1/2	TC52762	52.05	TC52908	58.60
	.100	.300 (15x)	1/8	2-1/2	TC52765	52.05	TC52910	58.60
.0250	.125	.250 (10x)	1/8	2-1/2	TC52768	45.05	TC52912	49.75
	.125	.375 (15x)	1/8	2-1/2	TC52771	45.25	TC52914	49.95
.0300	.150	.300 (10x)	1/8	2-1/2	TC52774	45.25	TC52916	49.95
	.150	.450 (15x)	1/8	2-1/2	TC52777	45.05	TC52918	50.75
.0310	.155	.310 (10x)	1/8	2-1/2	TC52780	44.85	TC52920	49.55
	.155	.470 (15x)	1/8	2-1/2	TC52783	44.85	TC52922	49.55
.0350	.175	.350 (10x)	1/8	2-1/2	TC52786	45.25	TC52924	49.95
	.175	.525 (15x)	1/8	2-1/2	TC52789	45.25	TC52926	49.95
.0400	.200	.400 (10x)	1/8	2-1/2	TC52792	45.05	TC52928	49.75
	.200	.600 (15x)	1/8	2-1/2	TC52795	45.25	TC52930	49.95
.0450	.225	.450 (10x)	1/8	2-1/2	TC52798	44.05	TC52932	48.75
	.225	.675 (15x)	1/8	2-1/2	TC52801	44.05	TC52934	48.75
.0470	.250	.500 (10x)	1/8	2-1/2	TC52804	43.85	TC52936	48.55
	.250	.710 (15x)	1/8	2-1/2	TC52807	44.05	TC52938	48.75
.0500	.300	.500 (10x)	1/8	2-1/2	TC52810	44.05	TC52940	48.75
	.300	.750 (15x)	1/8	2-1/2	TC52813	44.05	TC52942	48.75
.0550	.385	.550 (10x)	1/8	2-1/2	TC52816	44.05	TC52944	48.75
	.385	.825 (15x)	1/8	2-1/2	TC52819	44.05	TC52946	48.75
.0600	.312	.625 (10x)	1/8	2-1/2	TC52822	44.05	TC52948	48.75
	.500	1.000 (16x)	1/8	2-1/2	TC52825	43.85	TC52950	49.40
.0620	.312	.625 (10x)	1/8	2-1/2	TC52828	43.85	TC52952	49.40
	.500	1.000 (16x)	1/8	2-1/2	TC52831	43.65	TC52954	49.40
.0650	.325	.650 (10x)	1/8	2-1/2	TC52834	44.05	TC52956	48.75
	.500	1.000 (15x)	1/8	2-1/2	TC52837	44.05	TC52958	48.75
.0700	.350	.700 (10x)	1/8	2-1/2	TC52840	44.05	TC52960	48.75
	.500	1.000 (14x)	1/8	2-1/2	TC52843	44.05	TC52962	48.75
.0750	.375	.750 (10x)	1/8	2-1/2	TC52846	44.05	TC52964	48.75
	.500	1.000 (13x)	1/8	2-1/2	TC52849	44.05	TC52966	48.75
.0780	.406	.800 (10x)	1/8	2-1/2	TC52852	44.05	TC52968	48.75
	.406	1.187 (15x)	1/8	2-1/2	TC52855	44.05	TC52970	48.75

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MICRO END MILLS

3 Flute - Ball - 30° Helix - Long Reach, Long Flute (Cont.)

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CUTTER DIA.	LOC	OVERALL REACH	SHANK DIA.	OAL	UNCOATED		AlTiN COATED	
$D1^{+.0005"}_{-.0005"}$	L ₂	L ₃ $^{+.010"}_{-.000"}$	D ₂ (h6)	L ₁	TOOL #	PRICE	TOOL #	PRICE
.0800	.400	.800 (10x)	1/8	2-1/2	TC52858	44.05	TC52972	48.75
	.750	1.250 (15x)	1/8	2-1/2	TC52861	44.05	TC52974	48.75
.0850	.425	.850 (10x)	1/8	2-1/2	TC52864	44.05	TC52976	48.75
	.750	1.250 (14x)	1/8	2-1/2	TC52867	44.05	TC52978	48.75
.0900	.450	.900 (10x)	1/8	2-1/2	TC52870	44.05	TC52980	48.75
	.750	1.250 (13x)	1/8	2-1/2	TC52873	43.85	TC52982	48.55
.0930	.500	.950 (10x)	1/8	2-1/2	TC52876	43.85	TC52984	48.55
	.500	1.400 (15x)	1/8	2-1/2	TC52879	43.85	TC52986	48.55
.0950	.500	.950 (10x)	1/8	2-1/2	TC52882	44.05	TC52988	48.75
	.750	1.250 (13x)	1/8	2-1/2	TC52885	44.05	TC52990	48.75
.1000	.500	1.000 (10x)	1/8	2-1/2	TC52888	44.05	TC52992	48.75
	.750	1.250 (12x)	1/8	2-1/2	TC52891	44.05	TC52994	48.75

3 Flute

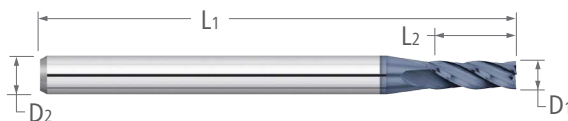


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MICRO END MILLS

4 Flute - Square - 30° Helix - Stub & Regular Flute



- Offered in stub and regular flute styles
- Center cutting
- AlTiN coating offers increased wear and heat resistance
- Solid carbide
- Precision manufactured in the USA

CUTTER DIA.	LENGTH OF CUT	SHANK DIA.	OAL	UNCOATED		AlTiN COATED	
$D_1^{+.0005"}_{-.0005"}$	L ₂	D ₂ (h6)	L ₁	TOOL #	PRICE	TOOL #	PRICE
.0100	.015	1/8	1-1/2	TC54010	35.50	TC54210	39.90
	.030	1/8	1-1/2	TC58010	30.90	TC58210	35.30
.0110	.033	1/8	1-1/2	TC58011	27.75	TC58211	32.15
.0120	.036	1/8	1-1/2	TC58012	27.65	TC58212	32.05
.0130	.039	1/8	1-1/2	TC58013	23.05	TC58213	27.45
.0140	.042	1/8	1-1/2	TC58014	23.05	TC58214	27.45
.0150	.023	1/8	1-1/2	TC54015	22.25	TC54215	26.65
	.045	1/8	1-1/2	TC58015	19.40	TC58215	23.20
.0160	.048	1/8	1-1/2	TC58016	19.50	TC58216	23.20
.0170	.051	1/8	1-1/2	TC58017	19.40	TC58217	23.20
.0180	.054	1/8	1-1/2	TC58018	19.40	TC58218	23.20
.0190	.057	1/8	1-1/2	TC58019	19.50	TC58219	23.20
.0200	.030	1/8	1-1/2	TC54020	20.20	TC54220	24.30
	.060	1/8	1-1/2	TC58020	17.60	TC58220	21.10
.0210	.063	1/8	1-1/2	TC58021	17.70	TC58221	21.10
.0220	.066	1/8	1-1/2	TC58022	17.60	TC58222	21.10
.0230	.069	1/8	1-1/2	TC58023	17.60	TC58223	21.10
.0240	.072	1/8	1-1/2	TC58024	17.60	TC58224	21.10
.0250	.038	1/8	1-1/2	TC54025	20.20	TC54225	24.30
	.075	1/8	1-1/2	TC58025	17.60	TC58225	21.10
.0260	.078	1/8	1-1/2	TC58026	16.55	TC58226	19.85
.0270	.081	1/8	1-1/2	TC58027	16.55	TC58227	19.85
.0280	.084	1/8	1-1/2	TC58028	16.50	TC58228	19.85
.0290	.087	1/8	1-1/2	TC58029	16.60	TC58229	21.00
.0300	.045	1/8	1-1/2	TC54030	18.95	TC54230	22.75
	.090	1/8	1-1/2	TC58030	16.50	TC58230	19.85
.0310	.047	1/8	1-1/2	TC54031	17.85	TC54231	21.30
	.093	1/8	1-1/2	TC58031	15.40	TC58231	18.50
.0320	.096	1/8	1-1/2	TC58032	15.40	TC58232	18.50
.0330	.099	1/8	1-1/2	TC58033	15.60	TC58233	20.00
.0340	.102	1/8	1-1/2	TC58034	15.40	TC58234	19.80
.0350	.053	1/8	1-1/2	TC54035	17.85	TC54235	21.30
	.105	1/8	1-1/2	TC58035	15.40	TC58235	17.85
.0360	.108	1/8	1-1/2	TC58036	15.40	TC58236	18.50
.0370	.111	1/8	1-1/2	TC58037	15.40	TC58237	18.50
.0380	.114	1/8	1-1/2	TC58038	15.40	TC58238	19.80

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MICRO END MILLS

4 Flute - Square - 30° Helix - Stub & Regular Flute (Cont.)

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CUTTER DIA.	LENGTH OF CUT	SHANK DIA.	OAL	UNCOATED		AlTiN COATED	
D1 ^{+0.0005"} _{-.0005"}	L2	D2 (h6)	L1	TOOL #	PRICE	TOOL #	PRICE
.0390	.117	1/8	1-1/2	TC58039	15.40	TC58239	18.50
.0400	.060	1/8	1-1/2	TC54040	17.85	TC54240	21.30
	.120	1/8	1-1/2	TC58040	15.40	TC58240	18.50
.0410	.123	1/8	1-1/2	TC58041	15.70	TC58241	20.10
.0420	.126	1/8	1-1/2	TC58042	15.60	TC58242	18.50
.0430	.129	1/8	1-1/2	TC58043	15.60	TC58243	18.50
.0440	.132	1/8	1-1/2	TC58044	15.05	TC58244	18.15
.0450	.068	1/8	1-1/2	TC54045	17.45	TC54245	20.85
	.135	1/8	1-1/2	TC58045	15.05	TC58245	18.15
.0460	.138	1/8	1-1/2	TC58046	15.05	TC58246	18.15
.0470	.071	1/8	1-1/2	TC54047	17.45	TC54247	20.85
	.141	1/8	1-1/2	TC58047	15.05	TC58247	18.15
.0480	.144	1/8	1-1/2	TC58048	15.15	TC58248	18.15
.0490	.147	1/8	1-1/2	TC58049	15.05	TC58249	18.15
.0500	.075	1/8	1-1/2	TC54050	17.40	TC54250	20.85
	.150	1/8	1-1/2	TC58050	15.05	TC58250	18.15
.0510	.153	1/8	1-1/2	TC58051	15.15	TC58251	18.15
.0520	.156	1/8	1-1/2	TC58052	15.05	TC58252	18.15
.0530	.159	1/8	1-1/2	TC58053	15.05	TC58253	19.45
.0540	.162	1/8	1-1/2	TC58054	15.15	TC58254	18.15
.0550	.083	1/8	1-1/2	TC54055	17.40	TC54255	20.85
	.165	1/8	1-1/2	TC58055	15.05	TC58255	18.15
.0560	.168	1/8	1-1/2	TC58056	15.15	TC58256	18.15
.0570	.171	1/8	1-1/2	TC58057	15.15	TC58257	18.15
.0580	.174	1/8	1-1/2	TC58058	15.15	TC58258	18.15
.0590	.177	1/8	1-1/2	TC58059	15.05	TC58259	18.15
.0600	.090	1/8	1-1/2	TC54060	17.45	TC54260	20.85
	.180	1/8	1-1/2	TC58060	15.05	TC58260	18.15
.0610	.183	1/8	1-1/2	TC58061	15.15	TC58261	19.55
.0620	.093	1/8	1-1/2	TC54062	17.40	TC54262	20.85
	.186	1/8	1-1/2	TC58062	15.05	TC58262	18.15
.0630	.189	1/8	1-1/2	TC58063	15.05	TC58263	18.15
.0640	.192	1/8	1-1/2	TC58064	15.15	TC58264	19.55
.0650	.098	1/8	1-1/2	TC54065	17.40	TC54265	20.85
	.195	1/8	1-1/2	TC58065	15.05	TC58265	18.15
.0660	.198	1/8	1-1/2	TC58066	15.05	TC58266	18.15
.0670	.201	1/8	1-1/2	TC58067	15.05	TC58267	18.15
.0680	.204	1/8	1-1/2	TC58068	15.20	TC58268	19.60
.0690	.207	1/8	1-1/2	TC58069	15.15	TC58269	18.15
.0700	.105	1/8	1-1/2	TC54070	17.40	TC54270	20.85
	.210	1/8	1-1/2	TC58070	15.05	TC58270	18.15
.0710	.213	1/8	1-1/2	TC58071	15.15	TC58271	18.15
.0720	.216	1/8	1-1/2	TC58072	15.05	TC58272	18.15
.0730	.219	1/8	1-1/2	TC58073	15.05	TC58273	18.15
.0740	.222	1/8	1-1/2	TC58074	15.10	TC58274	19.50

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MICRO END MILLS

4 Flute - Square - 30° Helix - Stub & Regular Flute (Cont.)

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CUTTER DIA.	LENGTH OF CUT	SHANK DIA.	OAL	UNCOATED		AlTiN COATED	
D1 ^{+0.0005"} _{-0.0005"}	L ₂	D ₂ (h6)	L ₁	TOOL #	PRICE	TOOL #	PRICE
.0750	.113	1/8	1-1/2	TC54075	17.40	TC54275	20.85
	.225	1/8	1-1/2	TC58075	15.05	TC58275	18.15
.0760	.228	1/8	1-1/2	TC58076	15.15	TC58276	18.15
.0770	.231	1/8	1-1/2	TC58077	15.15	TC58277	19.55
.0780	.117	1/8	1-1/2	TC54078	17.45	TC54278	20.85
	.234	1/8	1-1/2	TC58078	15.05	TC58278	18.15
.0790	.237	1/8	1-1/2	TC58079	15.15	TC58279	19.55
.0800	.120	1/8	1-1/2	TC54080	17.45	TC54280	20.85
	.240	1/8	1-1/2	TC58080	15.05	TC58280	18.15
.0810	.243	1/8	1-1/2	TC58081	15.05	TC58281	19.45
.0820	.246	1/8	1-1/2	TC58082	15.05	TC58282	18.15
.0830	.249	1/8	1-1/2	TC58083	15.05	TC58283	18.15
.0840	.252	1/8	1-1/2	TC58084	15.15	TC58284	18.15
.0850	.128	1/8	1-1/2	TC54085	17.45	TC54285	20.85
	.255	1/8	1-1/2	TC58085	15.05	TC58285	18.15
.0860	.258	1/8	1-1/2	TC58086	15.05	TC58286	18.15
.0870	.261	1/8	1-1/2	TC58087	15.05	TC58287	18.15
.0880	.264	1/8	1-1/2	TC58088	15.15	TC58288	18.15
.0890	.267	1/8	1-1/2	TC58089	15.05	TC58289	18.15
.0900	.135	1/8	1-1/2	TC54090	17.40	TC54290	20.85
	.270	1/8	1-1/2	TC58090	15.05	TC58290	18.15
.0910	.273	1/8	1-1/2	TC58091	15.05	TC58291	18.15
.0920	.276	1/8	1-1/2	TC58092	15.05	TC58292	19.45
.0930	.140	1/8	1-1/2	TC54093	17.40	TC54293	20.85
	.279	1/8	1-1/2	TC58093	15.05	TC58293	18.15
.0940	.282	1/8	1-1/2	TC58094	15.15	TC58294	18.15
.0950	.143	1/8	1-1/2	TC54095	17.40	TC54295	20.85
	.285	1/8	1-1/2	TC58095	15.05	TC58295	19.45
.0960	.288	1/8	1-1/2	TC58096	15.05	TC58296	18.15
.0970	.291	1/8	1-1/2	TC58097	15.10	TC58297	19.50
.0980	.294	1/8	1-1/2	TC58098	15.05	TC58298	18.15
.0990	.297	1/8	1-1/2	TC58099	15.05	TC58299	18.15
.1000	.150	1/8	1-1/2	TC54100	17.40	TC54300	20.85
	.300	1/8	1-1/2	TC58100	15.05	TC58300	18.15
.1010	.303	1/8	1-1/2	TC58101	15.15	TC58301	18.15
.1020	.306	1/8	1-1/2	TC58102	15.05	TC58302	18.30
.1030	.309	1/8	1-1/2	TC58103	15.10	TC58303	19.50
.1040	.312	1/8	1-1/2	TC58104	15.15	TC58304	18.15
.1050	.315	1/8	1-1/2	TC58105	15.15	TC58305	18.15
.1060	.318	1/8	1-1/2	TC58106	15.10	TC58306	19.50
.1070	.321	1/8	1-1/2	TC58107	15.05	TC58307	18.15
.1080	.324	1/8	1-1/2	TC58108	15.05	TC58308	19.45
.1090	.327	1/8	1-1/2	TC58109	15.05	TC58309	18.15
.1100	.330	1/8	1-1/2	TC58110	15.05	TC58310	18.15
.1150	.345	1/8	1-1/2	TC58115	15.05	TC58315	18.15
.1200	.360	1/8	1-1/2	TC58120	15.05	TC58320	18.15

4 Flute

For technical information, see page 143

MICRO END MILLS

4 Flute - Ball - 30° Helix - Stub & Regular Flute



- Offered in stub and regular flute styles
- Center cutting
- TiN coating offers increased wear and heat resistance
- Solid carbide
- Precision manufactured in the USA

CUTTER DIA.	LENGTH OF CUT	SHANK DIA.	OAL	UNCOATED		TiN COATED	
$D1^{+0.0005"}_{-0.0005"}$	L2	D2 (h6)	L1	TOOL #	PRICE	TOOL #	PRICE
.0100	.015	1/8	1-1/2	TC55010	38.80	TC55210	50.35
	.030	1/8	1-1/2	TC59010	38.65	TC59210	43.80
.0110	.033	1/8	1-1/2	TC59011	34.90	TC59211	39.30
.0120	.036	1/8	1-1/2	TC59012	34.60	TC59212	39.00
.0130	.039	1/8	1-1/2	TC59013	28.95	TC59213	33.35
.0140	.042	1/8	1-1/2	TC59014	28.85	TC59214	33.25
.0150	.023	1/8	1-1/2	TC55015	24.15	TC55215	31.50
	.045	1/8	1-1/2	TC59015	24.15	TC59215	28.70
.0160	.048	1/8	1-1/2	TC59016	24.15	TC59216	28.70
.0170	.051	1/8	1-1/2	TC59017	24.35	TC59217	28.75
.0180	.054	1/8	1-1/2	TC59018	24.25	TC59218	28.65
.0190	.057	1/8	1-1/2	TC59019	24.35	TC59219	28.75
.0200	.030	1/8	1-1/2	TC55020	22.00	TC55220	28.65
	.060	1/8	1-1/2	TC59020	22.00	TC59220	26.40
.0210	.063	1/8	1-1/2	TC59021	22.20	TC59221	26.60
.0220	.066	1/8	1-1/2	TC59022	22.00	TC59222	26.40
.0230	.069	1/8	1-1/2	TC59023	22.10	TC59223	26.50
.0240	.072	1/8	1-1/2	TC59024	22.00	TC59224	26.40
.0250	.038	1/8	1-1/2	TC55025	22.00	TC55225	28.65
	.075	1/8	1-1/2	TC59025	22.00	TC59225	26.40
.0260	.078	1/8	1-1/2	TC59026	20.60	TC59226	25.00
.0270	.081	1/8	1-1/2	TC59027	20.70	TC59227	25.10
.0280	.084	1/8	1-1/2	TC59028	20.70	TC59228	24.75
.0290	.087	1/8	1-1/2	TC59029	20.70	TC59229	24.75
.0300	.045	1/8	1-1/2	TC55030	20.60	TC55230	26.85
	.090	1/8	1-1/2	TC59030	20.60	TC59230	24.75
.0310	.047	1/8	1-1/2	TC55031	19.40	TC55231	25.25
	.093	1/8	1-1/2	TC59031	19.40	TC59231	23.20
.0320	.096	1/8	1-1/2	TC59032	19.50	TC59232	23.20
.0330	.099	1/8	1-1/2	TC59033	19.60	TC59233	24.00
.0340	.102	1/8	1-1/2	TC59034	19.60	TC59234	24.00
.0350	.053	1/8	1-1/2	TC55035	19.40	TC55235	25.25
	.105	1/8	1-1/2	TC59035	19.40	TC59235	23.20
.0360	.108	1/8	1-1/2	TC59036	19.60	TC59236	24.00
.0370	.111	1/8	1-1/2	TC59037	19.60	TC59237	24.00
.0380	.114	1/8	1-1/2	TC59038	19.60	TC59238	24.00

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MICRO END MILLS

4 Flute - Ball - 30° Helix - Stub & Regular Flute (Cont.)

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CUTTER DIA.	LENGTH OF CUT	SHANK DIA.	OAL	UNCOATED		AlTiN COATED	
D1 ^{+0.0005"} -0.0005"	L2	D2 (h6)	L1	TOOL #	PRICE	TOOL #	PRICE
.0390	.117	1/8	1-1/2	TC59039	19.40	TC59239	23.20
.0400	.060	1/8	1-1/2	TC55040	19.40	TC55240	25.25
	.120	1/8	1-1/2	TC59040	19.40	TC59240	23.20
.0410	.123	1/8	1-1/2	TC59041	19.50	TC59241	23.20
.0420	.126	1/8	1-1/2	TC59042	19.50	TC59242	23.20
.0430	.129	1/8	1-1/2	TC59043	19.50	TC59243	23.90
.0440	.132	1/8	1-1/2	TC59044	19.00	TC59244	23.40
.0450	.068	1/8	1-1/2	TC55045	18.95	TC55245	23.35
	.135	1/8	1-1/2	TC59045	18.85	TC59245	23.25
.0460	.138	1/8	1-1/2	TC59046	18.95	TC59246	22.65
.0470	.071	1/8	1-1/2	TC55047	18.95	TC55247	23.35
	.141	1/8	1-1/2	TC59047	18.85	TC59247	22.65
.0480	.144	1/8	1-1/2	TC59048	18.95	TC59248	22.65
.0490	.147	1/8	1-1/2	TC59049	19.00	TC59249	23.40
.0500	.075	1/8	1-1/2	TC55050	18.95	TC55250	23.35
	.150	1/8	1-1/2	TC59050	18.85	TC59250	22.65
.0510	.153	1/8	1-1/2	TC59051	18.95	TC59251	22.65
.0520	.156	1/8	1-1/2	TC59052	18.90	TC59252	23.30
.0530	.159	1/8	1-1/2	TC59053	18.95	TC59253	23.35
.0540	.162	1/8	1-1/2	TC59054	18.95	TC59254	22.65
.0550	.083	1/8	1-1/2	TC55055	18.95	TC55255	23.35
	.165	1/8	1-1/2	TC59055	18.85	TC59255	22.65
.0560	.168	1/8	1-1/2	TC59056	19.00	TC59256	23.40
.0570	.171	1/8	1-1/2	TC59057	18.95	TC59257	23.35
.0580	.174	1/8	1-1/2	TC59058	19.00	TC59258	23.40
.0590	.177	1/8	1-1/2	TC59059	18.95	TC59259	22.65
.0600	.090	1/8	1-1/2	TC55060	18.85	TC55260	24.60
	.180	1/8	1-1/2	TC59060	18.85	TC59260	22.65
.0610	.183	1/8	1-1/2	TC59061	19.00	TC59261	23.40
.0620	.093	1/8	1-1/2	TC55062	18.85	TC55262	24.60
	.186	1/8	1-1/2	TC59062	18.85	TC59262	22.65
.0630	.189	1/8	1-1/2	TC59063	18.85	TC59263	22.65
.0640	.192	1/8	1-1/2	TC59064	19.00	TC59264	23.40
.0650	.098	1/8	1-1/2	TC55065	18.85	TC55265	24.60
	.195	1/8	1-1/2	TC59065	18.95	TC59265	22.65
.0660	.198	1/8	1-1/2	TC59066	18.95	TC59266	22.65
.0670	.201	1/8	1-1/2	TC59067	19.00	TC59267	23.40
.0680	.204	1/8	1-1/2	TC59068	18.95	TC59268	22.65
.0690	.207	1/8	1-1/2	TC59069	19.00	TC59269	23.40
.0700	.105	1/8	1-1/2	TC55070	18.85	TC55270	24.60
	.210	1/8	1-1/2	TC59070	18.85	TC59270	22.65
.0710	.213	1/8	1-1/2	TC59071	18.95	TC59271	23.35
.0720	.216	1/8	1-1/2	TC59072	18.85	TC59272	22.65
.0730	.219	1/8	1-1/2	TC59073	18.95	TC59273	22.65
.0740	.222	1/8	1-1/2	TC59074	18.95	TC59274	23.35
.0750	.113	1/8	1-1/2	TC55075	18.95	TC55275	23.35
	.225	1/8	1-1/2	TC59075	18.85	TC59275	23.25

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For technical information, see page 143

MICRO END MILLS

4 Flute - Ball - 30° Helix - Stub & Regular Flute (Cont.)

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CUTTER DIA.	LENGTH OF CUT	SHANK DIA.	OAL	UNCOATED		AlTiN COATED	
D ₁ ^{+0.0005"} _{-0.0005"}	L ₂	D ₂ (h6)	L ₁	TOOL #	PRICE	TOOL #	PRICE
.0760	.228	1/8	1-1/2	TC59076	18.95	TC59276	23.35
.0770	.231	1/8	1-1/2	TC59077	19.00	TC59277	23.40
.0780	.117	1/8	1-1/2	TC55078	18.85	TC55278	24.60
	.234	1/8	1-1/2	TC59078	18.85	TC59278	22.65
.0790	.237	1/8	1-1/2	TC59079	19.00	TC59279	23.40
.0800	.120	1/8	1-1/2	TC55080	18.95	TC55280	23.35
	.240	1/8	1-1/2	TC59080	18.85	TC59280	22.65
.0810	.243	1/8	1-1/2	TC59081	18.95	TC59281	23.35
.0820	.246	1/8	1-1/2	TC59082	18.95	TC59282	23.35
.0830	.249	1/8	1-1/2	TC59083	19.00	TC59283	23.40
.0840	.252	1/8	1-1/2	TC59084	18.95	TC59284	23.35
.0850	.128	1/8	1-1/2	TC55085	19.00	TC55285	23.40
	.255	1/8	1-1/2	TC59085	19.00	TC59285	22.90
.0860	.258	1/8	1-1/2	TC59086	19.00	TC59286	23.40
.0870	.261	1/8	1-1/2	TC59087	19.00	TC59287	23.40
.0880	.264	1/8	1-1/2	TC59088	18.95	TC59288	23.35
.0890	.267	1/8	1-1/2	TC59089	18.95	TC59289	23.35
.0900	.135	1/8	1-1/2	TC55090	18.95	TC55290	23.35
	.270	1/8	1-1/2	TC59090	18.95	TC59290	23.35
.0910	.273	1/8	1-1/2	TC59091	18.95	TC59291	23.35
.0920	.276	1/8	1-1/2	TC59092	19.00	TC59292	23.40
.0930	.140	1/8	1-1/2	TC55093	18.95	TC55293	23.35
	.279	1/8	1-1/2	TC59093	18.85	TC59293	22.65
.0940	.282	1/8	1-1/2	TC59094	18.95	TC59294	23.35
.0950	.143	1/8	1-1/2	TC55095	18.95	TC55295	23.35
	.285	1/8	1-1/2	TC59095	18.85	TC59295	23.25
.0960	.288	1/8	1-1/2	TC59096	18.95	TC59296	22.65
.0970	.291	1/8	1-1/2	TC59097	18.95	TC59297	23.35
.0980	.294	1/8	1-1/2	TC59098	18.85	TC59298	22.65
.0990	.297	1/8	1-1/2	TC59099	18.95	TC59299	22.65
.1000	.150	1/8	1-1/2	TC55100	18.95	TC55300	23.35
	.300	1/8	1-1/2	TC59100	18.85	TC59300	22.65
.1010	.303	1/8	1-1/2	TC59101	19.00	TC59301	23.40
.1020	.306	1/8	1-1/2	TC59102	18.95	TC59302	23.35
.1030	.309	1/8	1-1/2	TC59103	18.95	TC59303	22.65
.1040	.312	1/8	1-1/2	TC59104	18.95	TC59304	23.35
.1050	.315	1/8	1-1/2	TC59105	18.95	TC59305	23.35
.1060	.318	1/8	1-1/2	TC59106	18.95	TC59306	22.65
.1070	.321	1/8	1-1/2	TC59107	19.00	TC59307	23.40
.1080	.324	1/8	1-1/2	TC59108	19.00	TC59308	23.40
.1090	.327	1/8	1-1/2	TC59109	18.95	TC59309	22.65
.1100	.330	1/8	1-1/2	TC59110	18.95	TC59310	22.65
.1150	.345	1/8	1-1/2	TC59115	18.95	TC59315	23.35
.1200	.360	1/8	1-1/2	TC59120	18.95	TC59320	23.35

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MICRO END MILLS

4 Flute - Corner Radius - 30° Helix - Stub & Regular Flute



- Offered in stub and regular flute styles
- Corner radius for increased edge strength
- Center cutting
- AlTiN coating offers increased wear and heat resistance
- Solid carbide
- Precision manufactured in the USA

CUTTER DIA.	LENGTH OF CUT	RADIUS	SHANK DIA.	OAL	UNCOATED		AlTiN COATED	
$D1^{+0.0005''}_{-0.0005''}$	L2	$R^{+0.0002''}_{-0.0002''}$	D2 (h6)	L1	TOOL #	PRICE	TOOL #	PRICE
.0150	.023	.003	1/8	1 - 1/2	TC50203	47.30	TC50404	55.00
	.045	.003	1/8	1 - 1/2	TC50603	47.30	TC50804	55.00
.0200	.030	.005	1/8	1 - 1/2	TC50205	44.15	TC50406	48.55
	.060	.005	1/8	1 - 1/2	TC50605	44.15	TC50806	48.55
.0250	.038	.005	1/8	1 - 1/2	TC50207	44.30	TC50408	48.70
	.075	.005	1/8	1 - 1/2	TC50607	44.15	TC50808	48.55
.0300	.045	.005	1/8	1 - 1/2	TC50209	31.35	TC50410	35.75
	.090	.005	1/8	1 - 1/2	TC50609	31.50	TC50810	36.70
	.045	.010	1/8	1 - 1/2	TC50211	31.65	TC50412	36.05
	.090	.010	1/8	1 - 1/2	TC50611	31.50	TC50812	35.90
.0310	.047	.005	1/8	1 - 1/2	TC50213	31.50	TC50414	36.70
	.093	.005	1/8	1 - 1/2	TC50613	31.35	TC50814	36.70
	.047	.010	1/8	1 - 1/2	TC50215	31.50	TC50416	36.70
	.093	.010	1/8	1 - 1/2	TC50615	31.35	TC50816	36.70
.0350	.053	.005	1/8	1 - 1/2	TC50217	31.65	TC50418	36.70
	.105	.005	1/8	1 - 1/2	TC50617	31.50	TC50818	36.70
	.053	.010	1/8	1 - 1/2	TC50219	31.65	TC50420	36.70
	.105	.010	1/8	1 - 1/2	TC50619	31.65	TC50820	36.70
.0400	.060	.005	1/8	1 - 1/2	TC50221	31.50	TC50422	36.70
	.120	.005	1/8	1 - 1/2	TC50621	31.50	TC50822	36.70
	.060	.010	1/8	1 - 1/2	TC50223	31.35	TC50424	36.70
	.120	.010	1/8	1 - 1/2	TC50623	31.50	TC50824	35.90
.0450	.068	.005	1/8	1 - 1/2	TC50225	31.50	TC50426	36.70
	.135	.005	1/8	1 - 1/2	TC50625	31.65	TC50826	36.70
	.068	.010	1/8	1 - 1/2	TC50227	31.65	TC50428	36.05
	.135	.010	1/8	1 - 1/2	TC50627	31.65	TC50828	36.70
	.068	.015	1/8	1 - 1/2	TC50229	31.65	TC50430	36.05
	.135	.015	1/8	1 - 1/2	TC50629	31.65	TC50830	36.05
.0470	.071	.005	1/8	1 - 1/2	TC50231	31.35	TC50432	36.70
	.141	.005	1/8	1 - 1/2	TC50631	31.35	TC50832	36.70
	.071	.010	1/8	1 - 1/2	TC50233	31.50	TC50434	36.70
	.141	.010	1/8	1 - 1/2	TC50633	31.50	TC50834	36.70
	.071	.015	1/8	1 - 1/2	TC50235	31.65	TC50436	36.70
	.141	.015	1/8	1 - 1/2	TC50635	31.50	TC50836	36.70

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MICRO END MILLS

4 Flute - Corner Radius - 30° Helix - Stub & Regular Flute (Cont.)

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CUTTER DIA.	LENGTH OF CUT	RADIUS	SHANK DIA.	OAL	UNCOATED		AlTiN COATED	
D1 ^{+0.0005"} _{-0.0005"}	L2	R ^{+0.0002"} _{-0.0002"}	D2 (h6)	L1	TOOL #	PRICE	TOOL #	PRICE
.0500	.075	.005	1/8	1 - 1/2	TC50237	31.35	TC50438	36.70
	.150	.005	1/8	1 - 1/2	TC50637	31.35	TC50838	36.70
	.075	.010	1/8	1 - 1/2	TC50239	31.50	TC50440	36.70
	.150	.010	1/8	1 - 1/2	TC50639	31.35	TC50840	36.70
	.075	.015	1/8	1 - 1/2	TC50241	31.50	TC50442	36.70
	.150	.015	1/8	1 - 1/2	TC50641	31.35	TC50842	36.70
.0600	.090	.005	1/8	1 - 1/2	TC50249	31.50	TC50450	36.70
	.180	.005	1/8	1 - 1/2	TC50649	31.35	TC50850	36.70
	.090	.010	1/8	1 - 1/2	TC50251	31.50	TC50452	36.70
	.180	.010	1/8	1 - 1/2	TC50651	31.50	TC50852	36.70
	.090	.015	1/8	1 - 1/2	TC50253	31.50	TC50454	36.70
	.180	.015	1/8	1 - 1/2	TC50653	31.50	TC50854	36.70
.0620	.093	.005	1/8	1 - 1/2	TC50255	31.50	TC50456	36.70
	.186	.005	1/8	1 - 1/2	TC50655	31.50	TC50856	36.70
	.093	.010	1/8	1 - 1/2	TC50257	31.35	TC50458	36.70
	.186	.010	1/8	1 - 1/2	TC50657	31.35	TC50858	36.70
	.093	.015	1/8	1 - 1/2	TC50259	31.50	TC50460	35.90
	.186	.015	1/8	1 - 1/2	TC50659	31.35	TC50860	36.70
.0750	.113	.005	1/8	1 - 1/2	TC50273	31.65	TC50474	36.05
	.225	.005	1/8	1 - 1/2	TC50673	31.65	TC50874	36.70
	.113	.010	1/8	1 - 1/2	TC50275	31.35	TC50476	35.75
	.225	.010	1/8	1 - 1/2	TC50675	31.65	TC50876	36.05
	.113	.015	1/8	1 - 1/2	TC50277	31.50	TC50478	36.70
	.225	.015	1/8	1 - 1/2	TC50677	31.65	TC50878	36.05
.0780	.117	.005	1/8	1 - 1/2	TC50279	31.35	TC50480	36.70
	.234	.005	1/8	1 - 1/2	TC50679	31.35	TC50880	36.70
	.117	.010	1/8	1 - 1/2	TC50281	31.50	TC50482	36.70
	.234	.010	1/8	1 - 1/2	TC50681	31.50	TC50882	36.70
	.117	.015	1/8	1 - 1/2	TC50283	31.50	TC50484	36.70
	.234	.015	1/8	1 - 1/2	TC50683	31.50	TC50884	36.70
.0900	.135	.005	1/8	1 - 1/2	TC50297	31.50	TC50498	35.90
	.270	.005	1/8	1 - 1/2	TC50697	31.50	TC50898	36.70
	.135	.010	1/8	1 - 1/2	TC50299	31.65	TC50500	36.70
	.270	.010	1/8	1 - 1/2	TC50699	31.50	TC50900	36.70
	.135	.015	1/8	1 - 1/2	TC50301	31.50	TC50502	35.90
	.270	.015	1/8	1 - 1/2	TC50701	31.50	TC50902	36.70
.0930	.140	.005	1/8	1 - 1/2	TC50303	31.50	TC50504	36.70
	.279	.005	1/8	1 - 1/2	TC50703	31.35	TC50904	36.70
	.140	.010	1/8	1 - 1/2	TC50305	31.50	TC50506	36.70
	.279	.010	1/8	1 - 1/2	TC50705	31.35	TC50906	36.70
	.140	.015	1/8	1 - 1/2	TC50307	31.50	TC50508	36.70
	.279	.015	1/8	1 - 1/2	TC50707	31.35	TC50908	36.70
.1000	.150	.005	1/8	1 - 1/2	TC50315	31.50	TC50516	36.70
	.300	.005	1/8	1 - 1/2	TC50715	31.65	TC50916	36.70
	.150	.010	1/8	1 - 1/2	TC50317	31.50	TC50518	36.70
	.300	.010	1/8	1 - 1/2	TC50717	31.50	TC50918	35.90
	.150	.015	1/8	1 - 1/2	TC50319	31.35	TC50520	36.70
	.300	.015	1/8	1 - 1/2	TC50719	31.50	TC50920	35.90

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MICRO END MILLS

Technical Information

General Purpose Carbide Micro End Mills

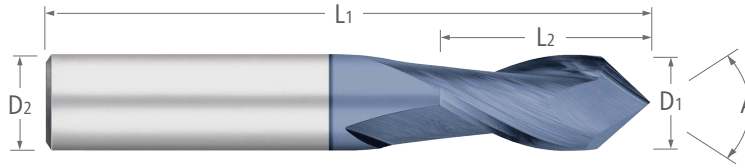
Material Guide		Conditions	SFM	Feed Per Tooth							
				.005"	.015"	.003"	.045"	.060"	.075"	.090"	.105"
				.015"	.003"	.045"	.060"	.075"	.090"	.105"	.125"
COBALT BASE ALLOYS	Stellite, HS-21, Haynes 25/188, X-40, L-605	Slotting at ≤7% of D	50	.0001	.0001	.0002	.0002	.0003	.0003	.0004	.0004
		Profiling at 5% of D Axial/≤20% of D Radial	80	.0001	.0001	.0002	.0002	.0003	.0003	.0004	.0004
NICKEL BASE ALLOYS	Inconel-625/718, Waspalloy, Rene, Hastelloy	Slotting at ≤7% of D	40	.0001	.0001	.0002	.0002	.0003	.0003	.0004	.0004
		Profiling at 5% of D Axial/≤20% of D Radial	60	.0001	.0001	.0002	.0002	.0003	.0003	.0004	.0004
IRON BASE ALLOYS	Incoloy 800-802, Multimet N-155, Timkin 16-25-6, Carpeneter 22-b3	Slotting at ≤7% of D	80	.0001	.0001	.0002	.0002	.0003	.0003	.0004	.0004
		Profiling at 5% of D Axial/≤20% of D Radial	100	.0001	.0001	.0002	.0002	.0003	.0003	.0004	.0004
MONEL	Monel-65% Nickel	Slotting at ≤7% of D	40	.0001	.0001	.0002	.0002	.0003	.0003	.0004	.0004
		Profiling at 5% of D Axial/≤20% of D Radial	60	.0001	.0001	.0002	.0002	.0003	.0003	.0004	.0004
TITANIUM ALLOYS	Commercially Pure, 6AL-4V, Astm 1/2/3, 6Al-25N-4Zr-2Mo-Si	Slotting at ≤15% of D	125	.0002	.0002	.0003	.0003	.0004	.0004	.0005	.0005
		Profiling at 6% of D Axial/≤20% of D Radial	250	.0002	.0002	.0003	.0003	.0004	.0004	.0005	.0005
STAINLESS STEEL (PRECIPITATION)	13/8, 15/5, 17-4, AM-350/355	Slotting at ≤10% of D	90	.0002	.0002	.0003	.0003	.0004	.0004	.0005	.0005
		Profiling at 6% of D Axial/≤20% of D Radial	250	.0002	.0002	.0003	.0003	.0004	.0004	.0005	.0005
STAINLESS STEEL (AUSTENITIC)	200 Series, 302, 303, 304, 316, 304L, 316L	Slotting at ≤15% of D	100	.0002	.0002	.0003	.0003	.0004	.0004	.0005	.0005
		Profiling at 6% of D Axial/≤30% of D Radial	250	.0002	.0002	.0003	.0003	.0004	.0004	.0005	.0005
STAINLESS STEEL (MARTENSITIC)	403, 410, 416, 440	Slotting at ≤15% of D	100	.0002	.0002	.0003	.0003	.0004	.0004	.0005	.0005
		Profiling at 6% of D Axial/≤30% of D Radial	250	.0002	.0002	.0003	.0003	.0004	.0004	.0005	.0005
HIGH STRENGTH TOOL STEELS	4140, 4340, 6150, 5210, A2, D2 P20, H11, H13, S2, 01	Slotting at ≤15% of D	100	.0002	.0002	.0003	.0003	.0004	.0004	.0005	.0005
		Profiling at 6% of D Axial/≤30% of D Radial	180	.0002	.0002	.0003	.0003	.0004	.0004	.0005	.0005
MEDIUM ALLOY STEELS	200, 250, 300	Slotting at ≤15% of D	125	.0003	.0003	.0004	.0004	.0005	.0005	.0006	.0006
		Profiling at 6% of D Axial/≤30% of D Radial	250	.0003	.0003	.0004	.0004	.0005	.0005	.0006	.0006
CARBON STEELS	A36, 12L14, 12L15, 1005, 1018, 1020, 1108- 1119, 1213-1215, 1513-1518, 4012, 5015, 9310	Slotting at ≤15% of D	150	.0004	.0004	.0005	.0005	.0006	.0006	.0007	.0007
		Profiling at 6% of D Axial/≤35% of D Radial	300	.0004	.0004	.0005	.0005	.0006	.0006	.0007	.0007
DUCTILE	Ductile Cast Irons	Slotting at ≤15% of D	100	.0004	.0004	.0005	.0005	.0006	.0006	.0007	.0007
		Profiling at 10% of D Axial/≤25% of D Radial	250	.0004	.0004	.0005	.0005	.0006	.0006	.0007	.0007
CAST IRONS	Gray Cast Irons	Slotting at ≤25% of D	125	.0004	.0004	.0005	.0005	.0008	.0008	.0010	.0010
		Profiling at 10% of D Axial/≤35% of D Radial	400	.0004	.0004	.0005	.0005	.0008	.0008	.0010	.0010
ALUMINUM	2014, 2024, 6061-(T1-T6), 7075, Die Cast, Extruded	Slotting at ≤15% of D	650	.0004	.0004	.0005	.0006	.0008	.0008	.0010	.0010
		Profiling at 10% of D Axial/≤35% of D Radial	775	.0004	.0004	.0005	.0006	.0008	.0008	.0010	.0010

These values are a starting point based on an uncoated tool.

For AlTiN Coated tools increase SFM values by up to +40%

DRILL / END MILLS

2 Flute



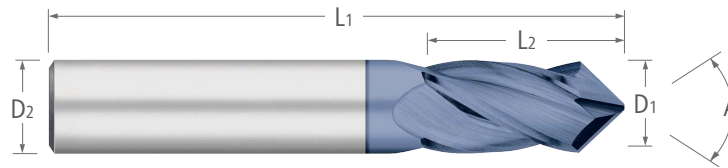
- Versatile tool engineered for drilling, chamfering, countersinking, spotting, and profiling applications
- Offered in 60°, 90°, and 120° point angles
- AlTiN coating offers increased wear and heat resistance
- Solid carbide
- Precision manufactured in the USA

INCLUDED ANGLE	CUTTER DIAMETER	LENGTH OF CUT	SHANK DIAMETER	OVERALL LENGTH	UNCOATED		AlTiN COATED	
A	D ₁ ^{+0.003"} _{-0.002"}	L ₂	D ₂ (h6)	L ₁	TOOL #	PRICE	TOOL #	PRICE
60°	1/32	1/8	1/8	1-1/2	TC31602	15.80	TC31802	20.00
	1/16	3/16	1/8	1-1/2	TC31604	15.85	TC31804	20.00
	3/32	3/8	1/8	1-1/2	TC31606	15.85	TC31806	20.00
	1/8	1/2	1/8	1-1/2	TC31608	15.20	TC31808	19.20
	3/16	5/8	3/16	2	TC31612	21.45	TC31812	26.40
	1/4	3/4	1/4	2-1/2	TC31616	26.85	TC31816	33.20
	5/16	13/16	5/16	2-1/2	TC31620	33.30	TC31820	40.90
	3/8	1	3/8	2-1/2	TC31624	41.75	TC31824	50.80
	7/16	1	7/16	2-3/4	TC31628	56.35	TC31828	67.20
	1/2	1	1/2	3	TC31632	69.50	TC31832	82.45
90°	1/32	1/8	1/8	1-1/2	TC32002	15.80	TC32202	20.00
	1/16	3/16	1/8	1-1/2	TC32004	15.85	TC32204	20.00
	3/32	3/8	1/8	1-1/2	TC32006	15.85	TC32206	19.30
	1/8	1/2	1/8	1-1/2	TC32008	15.20	TC32208	19.20
	3/16	5/8	3/16	2	TC32012	21.45	TC32212	26.40
	1/4	3/4	1/4	2-1/2	TC32016	26.85	TC32216	33.20
	5/16	13/16	5/16	2-1/2	TC32020	33.30	TC32220	40.90
	3/8	1	3/8	2-1/2	TC32024	41.75	TC32224	50.80
	7/16	1	7/16	2-3/4	TC32028	56.35	TC32228	67.20
	1/2	1	1/2	3	TC32032	69.50	TC32232	82.45
120°	1/32	1/8	1/8	1-1/2	TC31702	15.80	TC31902	20.20
	1/16	3/16	1/8	1-1/2	TC31704	15.85	TC31904	20.25
	3/32	3/8	1/8	1-1/2	TC31706	15.85	TC31906	20.25
	1/8	1/2	1/8	1-1/2	TC31708	15.20	TC31908	19.60
	3/16	5/8	3/16	2	TC31712	21.45	TC31912	26.40
	1/4	3/4	1/4	2-1/2	TC31716	26.85	TC31916	33.20
	5/16	13/16	5/16	2-1/2	TC31720	33.30	TC31920	40.90
	3/8	1	3/8	2-1/2	TC31724	41.75	TC31924	50.80
	7/16	1	7/16	2-3/4	TC31728	56.35	TC31928	66.90
	1/2	1	1/2	3	TC31732	69.50	TC31932	81.80
A	D ₁ ^{+0.003"} _{-0.003"}	L ₂	D ₂ (h6)	L ₁	TOOL #	PRICE	TOOL #	PRICE
60°	5/8	1-1/4	5/8	3-1/2	TC31640	132.05	TC31840	157.35
	3/4	1-1/2	3/4	4	TC31648	195.45	TC31848	231.70
90°	5/8	1-1/4	5/8	3-1/2	TC32040	132.05	TC32240	157.35
	3/4	1-1/2	3/4	4	TC32048	195.45	TC32248	231.70
120°	5/8	1-1/4	5/8	3-1/2	TC31740	132.05	TC31940	147.30
	3/4	1-1/2	3/4	4	TC31748	195.45	TC31948	213.65

For technical information, see page 154

DRILL / END MILLS

4 Flute



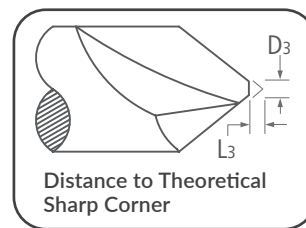
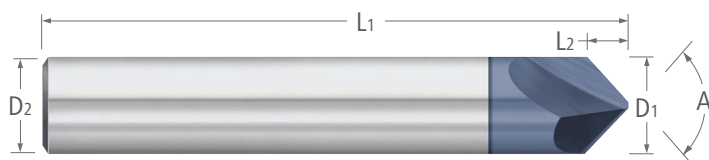
- Versatile tool engineered for drilling, chamfering, countersinking, spotting, and profiling applications
- Offered in 60°, 90°, and 120° point angles
- AlTiN coating offers increased wear and heat resistance
- Solid carbide
- Precision manufactured in the USA

INCLUDED ANGLE	CUTTER DIAMETER	LENGTH OF CUT	SHANK DIAMETER	OVERALL LENGTH	UNCOATED		AlTiN COATED	
A	$D1^{+0.000}_{-0.002}$	L2	D2 (h6)	L1	TOOL #	PRICE	TOOL #	PRICE
60°	1/32	1/8	1/8	1-1/2	TC34702	15.80	TC34902	20.00
	1/16	3/16	1/8	1-1/2	TC34704	15.85	TC34904	20.00
	3/32	3/8	1/8	1-1/2	TC34706	15.85	TC34906	20.00
	1/8	1/2	1/8	1-1/2	TC34708	15.20	TC34908	19.20
	3/16	5/8	3/16	2	TC34712	21.45	TC34912	26.40
	1/4	3/4	1/4	2-1/2	TC34716	26.85	TC34916	33.20
	5/16	13/16	5/16	2-1/2	TC34720	33.30	TC34920	40.50
	3/8	1	3/8	2-1/2	TC34724	41.75	TC34924	50.80
	7/16	1	7/16	2-3/4	TC34728	56.35	TC34928	67.20
	1/2	1	1/2	3	TC34732	69.50	TC34932	82.45
90°	1/32	1/8	1/8	1-1/2	TC34102	15.80	TC34302	20.00
	1/16	3/16	1/8	1-1/2	TC34104	15.85	TC34304	20.00
	3/32	3/8	1/8	1-1/2	TC34106	15.85	TC34306	20.00
	1/8	1/2	1/8	1-1/2	TC34108	15.20	TC34308	19.20
	3/16	5/8	3/16	2	TC34112	21.45	TC34312	26.40
	1/4	3/4	1/4	2-1/2	TC34116	26.85	TC34316	33.20
	5/16	13/16	5/16	2-1/2	TC34120	33.30	TC34320	40.90
	3/8	1	3/8	2-1/2	TC34124	41.75	TC34324	50.80
	7/16	1	7/16	2-3/4	TC34128	56.35	TC34328	67.20
	1/2	1	1/2	3	TC34132	69.50	TC34332	82.45
120°	1/32	1/8	1/8	1-1/2	TC34802	15.80	TC35102	20.20
	1/16	3/16	1/8	1-1/2	TC34804	15.85	TC35104	20.25
	3/32	3/8	1/8	1-1/2	TC34806	15.85	TC35106	20.25
	1/8	1/2	1/8	1-1/2	TC34808	15.20	TC35108	19.60
	3/16	5/8	3/16	2	TC34812	21.45	TC35112	26.40
	1/4	3/4	1/4	2-1/2	TC34816	26.85	TC35116	33.20
	5/16	13/16	5/16	2-1/2	TC34820	33.30	TC35120	40.90
	3/8	1	3/8	2-1/2	TC34824	41.75	TC35124	50.80
	7/16	1	7/16	2-3/4	TC34828	56.35	TC35128	66.90
	1/2	1	1/2	3	TC34832	69.50	TC35132	81.80
A	$D1^{+0.000}_{-0.003}$	L2	D2 (h6)	L1	TOOL #	PRICE	TOOL #	PRICE
60°	5/8	1-1/4	5/8	3-1/2	TC34740	132.05	TC34940	157.35
	3/4	1-1/2	3/4	4	TC34748	195.45	TC34948	231.70
90°	5/8	1-1/4	5/8	3-1/2	TC34140	132.05	TC34340	157.35
	3/4	1-1/2	3/4	4	TC34148	195.45	TC34348	231.70
120°	5/8	1-1/4	5/8	3-1/2	TC34840	132.05	TC35140	147.30
	3/4	1-1/2	3/4	4	TC34848	195.45	TC35148	213.65

For technical information, see page 154

CHAMFER MILLS

2 Flute - Flat Tip



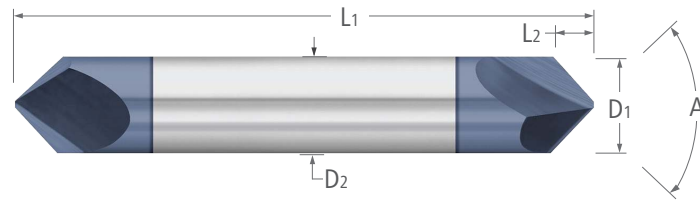
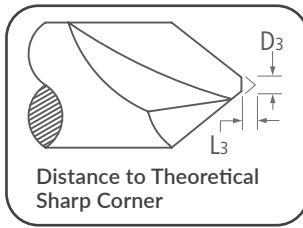
- Flat tip (non-cutting) design for increased strength in chamfering and profiling applications
- Fully stocked in 60°, 82°, 90°, 100°, and 120° styles
- AlTiN coating offers increased wear and heat resistance
- Solid carbide
- Precision manufactured in the USA

INCLUDED ANGLE	CUTTER DIA.	LENGTH OF CUT	TIP DIA.	THEORETICAL TIP LENGTH	SHANK DIA.	OVERALL LENGTH	UNCOATED		AlTiN COATED	
A	D ₁	L ₂	D ₃	L ₃	D ₂ (h6)	L ₁	TOOL #	PRICE	TOOL #	PRICE
60°	1/8	.091	.020	.017	1/8	1-1/2	TC87600	13.55	TC87660	17.10
	3/16	.137	.030	.026	3/16	2-1/2	TC87601	18.75	TC87661	24.05
	1/4	.178	.044	.038	1/4	2-1/2	TC87603	24.05	TC87663	30.05
	5/16	.219	.060	.052	5/16	2-1/2	TC87604	30.00	TC87664	37.60
	3/8	.273	.060	.052	3/8	2-1/2	TC87606	37.20	TC87666	46.25
	1/2	.364	.080	.069	1/2	3	TC87609	61.90	TC87669	74.20
82°	1/8	.060	.020	.012	1/8	1-1/2	TC87612	13.55	TC87672	17.10
	3/16	.091	.030	.017	3/16	2-1/2	TC87613	18.75	TC87673	24.05
	1/4	.119	.044	.025	1/4	2-1/2	TC87615	24.05	TC87675	30.05
	5/16	.145	.060	.035	5/16	2-1/2	TC87616	30.00	TC87676	37.60
	3/8	.181	.060	.035	3/8	2-1/2	TC87618	37.20	TC87678	46.25
	1/2	.242	.080	.046	1/2	3	TC87621	61.90	TC87681	74.20
90°	1/8	.053	.020	.010	1/8	1-1/2	TC87624	13.55	TC87684	17.10
	3/16	.079	.030	.015	3/16	2-1/2	TC87625	18.75	TC87685	23.60
	1/4	.103	.044	.022	1/4	2-1/2	TC87627	24.05	TC87687	30.05
	5/16	.126	.060	.030	5/16	2-1/2	TC87628	30.00	TC87688	37.60
	3/8	.158	.060	.030	3/8	2-1/2	TC87630	37.20	TC87690	46.25
	1/2	.210	.080	.040	1/2	3	TC87633	61.90	TC87693	74.20
100°	1/8	.052	.020	.008	1/8	1-1/2	TC87636	13.55	TC87696	17.95
	3/16	.066	.030	.013	3/16	2-1/2	TC87637	18.75	TC87697	24.05
	1/4	.086	.044	.019	1/4	2-1/2	TC87639	24.05	TC87699	30.05
	5/16	.106	.060	.025	5/16	2-1/2	TC87640	30.00	TC87700	37.60
	3/8	.132	.060	.025	3/8	2-1/2	TC87642	37.20	TC87702	46.25
	1/2	.176	.080	.034	1/2	3	TC87645	61.90	TC87705	74.20
120°	1/8	.030	.020	.006	1/8	1-1/2	TC87648	13.55	TC87708	17.95
	3/16	.045	.030	.009	3/16	2-1/2	TC87649	18.75	TC87709	24.05
	1/4	.059	.044	.013	1/4	2-1/2	TC87651	24.05	TC87711	30.05
	5/16	.073	.060	.017	5/16	2-1/2	TC87652	30.00	TC87712	37.60
	3/8	.091	.060	.017	3/8	2-1/2	TC87654	37.20	TC87714	46.25
	1/2	.121	.080	.023	1/2	3	TC87657	61.90	TC87717	74.20

For technical information, see page 155

CHAMFER MILLS

2 Flute - Flat Tip - Double Ended



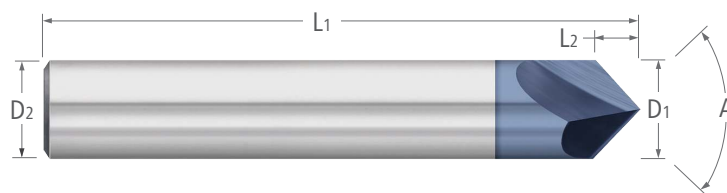
- Flat tip (non-cutting) design for increased strength in chamfering and profiling applications
- Double-ended
- Fully stocked in 60°, 82°, 90°, 100°, and 120° styles
- AlTiN coating offers increased wear and heat resistance
- Solid carbide
- Precision manufactured in the USA

INCLUDED ANGLE	CUTTER DIA.	LENGTH OF CUT	TIP DIA.	THEORETICAL TIP LENGTH	SHANK DIA.	OVERALL LENGTH	UNCOATED		AlTiN COATED	
A	D ₁	L ₂	D ₃	L ₃	D ₂ (h6)	L ₁	TOOL #	PRICE	TOOL #	PRICE
60°	1/8	.091	.020	.017	1/8	2	TC87840	24.40	TC87930	29.05
	3/16	.137	.030	.026	3/16	2-1/2	TC87843	33.50	TC87933	40.05
	1/4	.178	.044	.038	1/4	2-1/2	TC87846	43.10	TC87936	51.05
	5/16	.219	.060	.052	5/16	2-1/2	TC87849	55.00	TC87939	62.60
	3/8	.273	.060	.052	3/8	2-1/2	TC87852	67.05	TC87942	79.85
	1/2	.364	.080	.069	1/2	3	TC87855	110.90	TC87945	132.25
82°	1/8	.060	.020	.012	1/8	2	TC87858	24.40	TC87948	29.05
	3/16	.091	.028	.017	3/16	2-1/2	TC87861	33.50	TC87951	40.05
	1/4	.119	.044	.025	1/4	2-1/2	TC87864	42.95	TC87954	51.05
	5/16	.145	.060	.035	5/16	2-1/2	TC87867	55.00	TC87957	66.40
	3/8	.181	.060	.035	3/8	2-1/2	TC87870	67.30	TC87960	79.85
	1/2	.242	.080	.046	1/2	3	TC87873	110.90	TC87963	132.25
90°	1/8	.053	.020	.010	1/8	2	TC87876	24.40	TC87966	29.05
	3/16	.079	.028	.015	3/16	2-1/2	TC87879	33.50	TC87969	40.05
	1/4	.103	.044	.022	1/4	2-1/2	TC87882	43.10	TC87972	51.05
	5/16	.126	.060	.030	5/16	2-1/2	TC87885	55.00	TC87975	65.45
	3/8	.158	.060	.030	3/8	2-1/2	TC87888	67.30	TC87978	79.85
	1/2	.210	.080	.040	1/2	3	TC87891	110.90	TC87981	132.25
100°	1/8	.052	.020	.008	1/8	2	TC87894	24.40	TC87984	31.00
	3/16	.066	.028	.013	3/16	2-1/2	TC87897	33.50	TC87987	41.45
	1/4	.086	.044	.019	1/4	2-1/2	TC87900	42.95	TC87990	52.45
	5/16	.106	.060	.025	5/16	2-1/2	TC87903	55.00	TC87993	62.60
	3/8	.132	.060	.025	3/8	2-1/2	TC87906	67.05	TC87996	80.60
	1/2	.176	.080	.034	1/2	3	TC87909	110.90	TC87999	129.35
120°	1/8	.030	.020	.006	1/8	2	TC87912	24.40	TC88002	29.05
	3/16	.045	.028	.009	3/16	2-1/2	TC87915	33.50	TC88005	40.05
	1/4	.059	.044	.013	1/4	2-1/2	TC87918	42.95	TC88008	51.05
	5/16	.073	.060	.017	5/16	2-1/2	TC87921	55.00	TC88011	62.60
	3/8	.091	.060	.017	3/8	2-1/2	TC87924	67.05	TC88014	79.85
	1/2	.121	.080	.023	1/2	3	TC87927	110.90	TC88017	132.25

For technical information, see page 155

CHAMFER MILLS

2 Flute - Pointed Tip



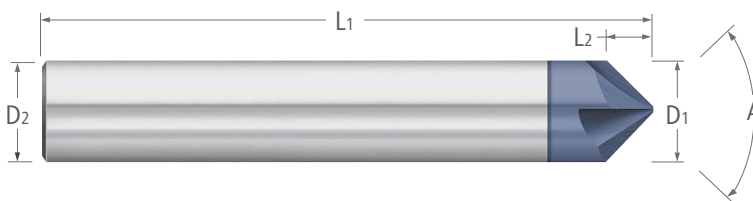
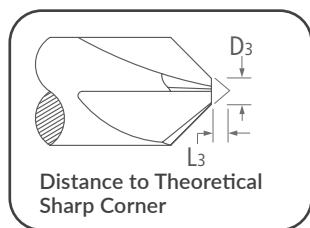
- Pointed tip geometry for general purpose chamfering and deburring applications in narrow grooves, slots, and small holes
- Fully stocked in 60°, 82°, 90°, 100°, and 120° styles
- AlTiN coating offers increased wear and heat resistance
- Solid carbide
- Precision manufactured in the USA

INCLUDED ANGLE	CUTTER DIAMETER	LENGTH OF CUT	TIP DIAMETER	SHANK DIAMETER	OVERALL LENGTH	UNCOATED		AlTiN COATED	
A	D ₁	L ₂	D ₃	D ₂ (h6)	L ₁	TOOL #	PRICE	TOOL #	PRICE
60°	1/8	.108	.010	1/8	1-1/2	TC85100	13.55	TC85300	17.95
	3/16	.163	.010	3/16	2-1/2	TC85102	18.80	TC85302	23.60
	1/4	.216	.010	1/4	2-1/2	TC85104	23.85	TC85304	30.20
	5/16	.271	.010	5/16	2-1/2	TC85106	30.00	TC85306	37.60
	3/8	.325	.010	3/8	2-1/2	TC85108	37.20	TC85308	46.25
	1/2	.433	.010	1/2	3	TC85110	61.65	TC85310	73.95
82°	1/8	.072	.010	1/8	1-1/2	TC85112	13.55	TC85312	17.95
	3/16	.108	.010	3/16	2-1/2	TC85114	18.80	TC85314	24.10
	1/4	.144	.010	1/4	2-1/2	TC85116	23.85	TC85316	30.20
	5/16	.180	.010	5/16	2-1/2	TC85118	30.00	TC85318	37.60
	3/8	.216	.010	3/8	2-1/2	TC85120	37.20	TC85320	46.25
	1/2	.288	.010	1/2	3	TC85122	61.65	TC85322	73.95
90°	1/8	.063	.010	1/8	1-1/2	TC85124	13.55	TC85324	17.10
	3/16	.094	.010	3/16	2-1/2	TC85126	18.80	TC85326	23.60
	1/4	.125	.010	1/4	2-1/2	TC85128	23.85	TC85328	30.20
	5/16	.156	.010	5/16	2-1/2	TC85130	30.00	TC85330	37.60
	3/8	.188	.010	3/8	2-1/2	TC85132	37.20	TC85332	45.40
	1/2	.250	.010	1/2	3	TC85134	61.65	TC85334	73.95
100°	1/8	.052	.010	1/8	1-1/2	TC85136	13.55	TC85336	17.95
	3/16	.079	.010	3/16	2-1/2	TC85138	18.80	TC85338	24.10
	1/4	.105	.010	1/4	2-1/2	TC85140	23.85	TC85340	30.20
	5/16	.131	.010	5/16	2-1/2	TC85142	30.00	TC85342	37.60
	3/8	.157	.010	3/8	2-1/2	TC85144	37.20	TC85344	46.25
	1/2	.210	.010	1/2	3	TC85146	61.65	TC85346	73.95
120°	1/8	.036	.010	1/8	1-1/2	TC85148	13.55	TC85348	17.95
	3/16	.054	.010	3/16	2-1/2	TC85150	18.80	TC85350	24.10
	1/4	.072	.010	1/4	2-1/2	TC85152	23.85	TC85352	30.20
	5/16	.090	.010	5/16	2-1/2	TC85154	30.00	TC85354	37.60
	3/8	.108	.010	3/8	2-1/2	TC85156	37.20	TC85356	46.25
	1/2	.144	.010	1/2	3	TC85158	61.65	TC85358	73.95

For technical information, see page 155

CHAMFER MILLS

4 Flute - Flat Tip



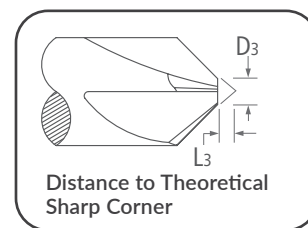
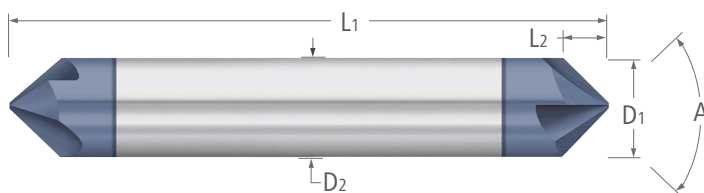
- Flat tip (non-cutting) design for increased strength in chamfering and profiling applications
- Fully stocked in 60°, 82°, 90°, 100°, and 120° styles
- Solid carbide
- Precision manufactured in the USA
- AlTiN coating offers increased wear and heat resistance

INCLUDED ANGLE	CUTTER DIA.	LENGTH OF CUT	TIP DIA.	THEORETICAL TIP LENGTH	SHANK DIA.	OVERALL LENGTH	UNCOATED		AlTiN COATED	
A	D ₁	L ₂	D ₃	L ₃	D ₂ (h6)	L ₁	TOOL #	PRICE	TOOL #	PRICE
60°	1/8	.091	.020	.017	1/8	1-1/2	TC87720	13.55	TC87780	17.10
	3/16	.137	.030	.026	3/16	2-1/2	TC87721	18.75	TC87781	24.05
	1/4	.178	.044	.038	1/4	2-1/2	TC87723	24.05	TC87783	30.05
	5/16	.219	.060	.052	5/16	2-1/2	TC87724	30.00	TC87784	37.60
	3/8	.273	.060	.052	3/8	2-1/2	TC87726	37.20	TC87786	46.25
	1/2	.364	.080	.069	1/2	3	TC87729	61.90	TC87789	74.20
82°	1/8	.060	.020	.012	1/8	1-1/2	TC87732	13.55	TC87792	17.10
	3/16	.091	.030	.017	3/16	2-1/2	TC87733	18.75	TC87793	24.05
	1/4	.119	.044	.025	1/4	2-1/2	TC87735	24.05	TC87795	30.05
	5/16	.145	.060	.035	5/16	2-1/2	TC87736	30.00	TC87796	37.60
	3/8	.181	.060	.035	3/8	2-1/2	TC87738	37.20	TC87798	46.25
	1/2	.242	.080	.046	1/2	3	TC87741	61.90	TC87801	74.20
90°	1/8	.053	.020	.010	1/8	1-1/2	TC87744	13.55	TC87804	17.10
	3/16	.079	.030	.015	3/16	2-1/2	TC87745	18.75	TC87805	23.60
	1/4	.103	.044	.022	1/4	2-1/2	TC87747	24.05	TC87807	30.05
	5/16	.126	.060	.030	5/16	2-1/2	TC87748	30.00	TC87808	37.60
	3/8	.158	.060	.030	3/8	2-1/2	TC87750	37.20	TC87810	46.25
	1/2	.210	.080	.040	1/2	3	TC87753	61.90	TC87813	74.20
100°	1/8	.052	.020	.008	1/8	1-1/2	TC87756	13.55	TC87816	17.10
	3/16	.066	.030	.013	3/16	2-1/2	TC87757	18.75	TC87817	24.05
	1/4	.086	.044	.019	1/4	2-1/2	TC87759	24.05	TC87819	30.05
	5/16	.106	.060	.025	5/16	2-1/2	TC87760	30.00	TC87820	37.60
	3/8	.132	.060	.025	3/8	2-1/2	TC87762	37.20	TC87822	46.25
	1/2	.176	.080	.034	1/2	3	TC87765	61.90	TC87825	74.20
120°	1/8	.030	.020	.006	1/8	1-1/2	TC87768	13.55	TC87828	17.10
	3/16	.045	.030	.009	3/16	2-1/2	TC87770	18.75	TC87829	24.05
	1/4	.059	.044	.013	1/4	2-1/2	TC87771	24.05	TC87831	30.05
	5/16	.073	.060	.017	5/16	2-1/2	TC87772	30.00	TC87832	37.60
	3/8	.091	.060	.017	3/8	2-1/2	TC87774	37.20	TC87834	45.40
	1/2	.121	.080	.023	1/2	3	TC87777	61.90	TC87837	74.20

For technical information, see page 155

CHAMFER MILLS

4 Flute - Flat Tip - Double-Ended



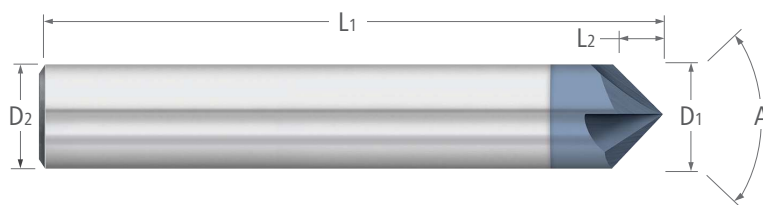
- Flat tip (non-cutting) design for increased strength in chamfering and profiling applications
- Fully stocked in 60°, 82°, 90°, 100°, and 120° styles
- Double-ended
- AlTiN coating offers increased wear and heat resistance
- Solid carbide
- Precision manufactured in the USA

INCLUDED ANGLE	CUTTER DIA.	LENGTH OF CUT	TIP DIA.	THEORETICAL TIP LENGTH	SHANK DIA.	OVERALL LENGTH	UNCOATED		AlTiN COATED	
A	D ₁	L ₂	D ₃	L ₃	D ₂ (h6)	L ₁	TOOL #	PRICE	TOOL #	PRICE
60°	1/8	.091	.020	.017	1/8	2	TC88020	24.40	TC88110	29.05
	3/16	.137	.030	.026	3/16	2-1/2	TC88023	33.50	TC88113	40.05
	1/4	.178	.044	.038	1/4	2-1/2	TC88026	43.10	TC88116	51.05
	5/16	.219	.060	.052	5/16	2-1/2	TC88029	55.00	TC88119	62.60
	3/8	.273	.060	.052	3/8	2-1/2	TC88032	67.30	TC88122	79.85
	1/2	.364	.080	.069	1/2	3	TC88035	110.90	TC88125	132.25
82°	1/8	.060	.020	.012	1/8	2	TC88038	24.40	TC88128	29.05
	3/16	.091	.030	.017	3/16	2-1/2	TC88041	33.50	TC88131	40.05
	1/4	.119	.044	.025	1/4	2-1/2	TC88044	42.95	TC88134	51.05
	5/16	.145	.060	.035	5/16	2-1/2	TC88047	55.00	TC88137	62.60
	3/8	.181	.060	.035	3/8	2-1/2	TC88050	67.30	TC88140	79.85
	1/2	.242	.080	.046	1/2	3	TC88053	110.90	TC88143	132.25
90°	1/8	.053	.020	.010	1/8	2	TC88056	24.40	TC88146	29.05
	3/16	.079	.030	.015	3/16	2-1/2	TC88059	33.50	TC88149	40.05
	1/4	.103	.044	.022	1/4	2-1/2	TC88062	43.10	TC88152	51.05
	5/16	.126	.060	.030	5/16	2-1/2	TC88065	55.00	TC88155	65.45
	3/8	.158	.060	.030	3/8	2-1/2	TC88068	67.30	TC88158	79.85
	1/2	.210	.080	.040	1/2	3	TC88071	110.90	TC88161	132.25
100°	1/8	.052	.020	.008	1/8	2	TC88074	24.40	TC88164	29.05
	3/16	.066	.030	.013	3/16	2-1/2	TC88077	33.50	TC88167	40.05
	1/4	.086	.044	.019	1/4	2-1/2	TC88080	43.10	TC88170	51.05
	5/16	.106	.060	.025	5/16	2-1/2	TC88083	55.00	TC88173	62.60
	3/8	.132	.060	.025	3/8	2-1/2	TC88086	67.30	TC88176	79.85
	1/2	.176	.080	.034	1/2	3	TC88089	110.90	TC88179	132.25
120°	1/8	.030	.020	.006	1/8	2	TC88092	24.40	TC88182	29.05
	3/16	.045	.030	.009	3/16	2-1/2	TC88095	33.50	TC88185	40.05
	1/4	.059	.044	.013	1/4	2-1/2	TC88098	43.10	TC88188	51.05
	5/16	.073	.060	.017	5/16	2-1/2	TC88101	55.00	TC88191	62.60
	3/8	.091	.060	.017	3/8	2-1/2	TC88104	67.30	TC88194	79.85
	1/2	.121	.080	.023	1/2	3	TC88107	110.90	TC88197	132.25

For technical information, see page 155

CHAMFER MILLS

4 Flute - Pointed Tip

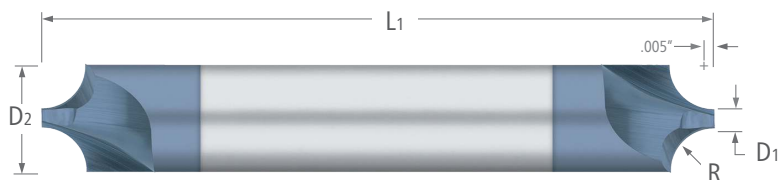


- Pointed tip geometry for general purpose chamfering and deburring application in narrow grooves, slots, and small holes
- Fully stocked in 60° and 90° styles
- AlTiN coating offers increased wear and heat resistance
- Solid carbide
- Precision manufactured in the USA

	INCLUDED ANGLE	CUTTER DIA.	LENGTH OF CUT	TIP DIA.	SHANK DIA.	OVERALL LENGTH	UNCOATED		AlTiN COATED	
	A	D ₁	L ₂	D ₃	D ₂ (h6)	L ₁	TOOL #	PRICE	TOOL #	PRICE
NEW	60°	1/4	.216	.010	1/4	2-1/2	TC95418	23.85	TC95436	30.20
NEW		3/8	.325	.010	3/8	2-1/2	TC95420	37.20	TC95438	46.25
NEW		1/2	.433	.010	1/2	3	TC95421	61.65	TC95439	73.95
NEW	90°	1/8	.063	.010	1/8	1-1/2	TC95422	13.55	TC95440	17.95
NEW		1/4	.125	.010	1/4	2-1/2	TC95424	23.85	TC95442	30.20
NEW		3/8	.188	.010	3/8	2-1/2	TC95426	37.20	TC95444	46.25
NEW		1/2	.250	.010	1/2	3	TC95427	61.65	TC95445	73.95

CORNER ROUNDING END MILLS

2 Flute - Unflared - Double-Ended - Carbide

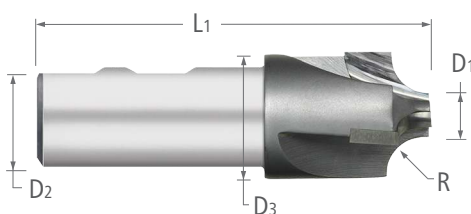
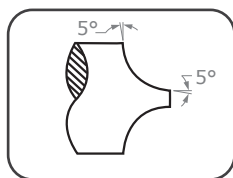


- Unflared shoulder and pilot for full radius form
- Axial depth of cut = radius plus .005"
- Solid carbide
- Double-ended
- End cutting
- Precision manufactured in the USA

RADIUS	PILOT DIA.	SHANK DIA.	OAL	UNCOATED		AItIN COATED		
R $\begin{smallmatrix} +.0005" \\ -.0005" \end{smallmatrix}$	D1	D2 (h6)	L1	TOOL #	PRICE	TOOL #	PRICE	
.005	.047	1/8	1-1/2	TC95370	34.90	TC95390	41.50	NEW
.010	.047	1/8	1-1/2	TC95371	34.30	TC95391	40.90	NEW
.015	.047	1/8	1-1/2	TC95372	34.30	TC95392	40.90	NEW
.020	.047	1/8	1-1/2	TC95373	34.30	TC95393	40.90	NEW
.025	.047	1/8	1-1/2	TC95374	34.30	TC95394	40.90	NEW
.030	.047	1/8	1-1/2	TC95375	34.90	TC95395	41.50	NEW
.031	.047	1/8	1-1/2	TC95376	34.30	TC95396	40.90	NEW
.039	.047	1/8	1-1/2	TC95377	38.70	TC95397	45.30	NEW
.047	.047	3/16	2	TC95378	45.30	TC95398	52.75	NEW
.050	.047	3/16	2	TC95379	45.30	TC95399	52.75	NEW
.060	.047	3/16	2	TC95380	46.80	TC95400	54.25	NEW
.062	.047	3/16	2	TC95381	46.00	TC95401	53.45	NEW
.078	.047	1/4	2	TC95382	52.90	TC95402	61.85	NEW
.093	.047	1/4	2	TC95383	53.70	TC95403	62.65	NEW
.100	.047	1/4	2	TC95384	52.90	TC95404	61.85	NEW
.118	.060	5/16	2-1/2	TC95385	74.70	TC95405	86.10	NEW
.125	.060	5/16	2-1/2	TC95386	74.70	TC95406	86.10	NEW
.156	.060	3/8	2-1/2	TC95387	92.70	TC95407	106.25	NEW
.187	.060	7/16	2-1/2	TC95388	157.10	TC95408	172.90	NEW
.250	.110	5/8	3-1/2	TC95389	279.60	TC95409	302.50	NEW

CORNER ROUNDING END MILLS

3 Flute - Flared - Carbide Tipped



- Carbide tipped – cutting of radius and flares only
- 5° flares tangent to radius at pilot and shoulder to avoid steps
- 3 flutes
- Weldon flats
- Precision manufactured in the USA

	RADIUS	PILOT DIA.	HEAD DIA.	SHANK DIA.	OAL	UNCOATED	
	R	D ₁	D ₃	D ₂	L ₁	TOOL #	PRICE
NEW	.250	13/32	1	3/4	3-1/4	TC95410	226.40
NEW	.312	13/32	1-1/8	7/8	3-1/2	TC95411	232.10
NEW	.375	13/32	1-1/4	7/8	3-3/4	TC95412	240.50
NEW	.437	13/32	1-3/8	1	4	TC95413	269.90
NEW	.500	13/32	1-1/2	1	4	TC95414	298.90
NEW	.625	21/32	2	1-1/4	4-1/4	TC95415	371.70

DRILL / END MILLS - CARBIDE

Technical Information

Drill / End Mills											
Material Guide		Rc	SFM				Suggested Chip Load Per Tooth				
			2 Flute		3 & 4 Flute						
			Stub, Std	Long, X-Long	Stub, Std	Long, X-Long	1/32" - 1/8"	1/8" - 1/4"	1/4" - 1/2"	1/2" - 1"	1" - 1 - 1/4"
COBALT BASE ALLOYS	Stellite, HS-21, Haynes 25/188, X-40, L-605	under 32 over 32			175 - 225 125 - 175	140 - 180 100 - 140	.0005 - .0010 .0003 - .0005	.0008 - .0020 .0005 - .0015	.0010 - .0030 .0010 - .0020	.0020 - .0040 .0010 - .0030	.0030 - .0050 .0020 - .0040
NICKEL BASE ALLOYS	Inconel-625/718, Waspalloy, Rene, Hastelloy	under 32 over 32			125 - 175 70 - 115	100 - 140 55 - 95	.0005 - .0010 .0003 - .0005	.0008 - .0020 .0005 - .0015	.0010 - .0030 .0010 - .0020	.0020 - .0040 .0010 - .0030	.0030 - .0050 .0020 - .0040
IRON BASE ALLOYS	Incoloy 800-802, Multimet N-155, Timkin 16-25-6, Carpeneter 22-b3	under 32 over 32			175 - 225 125 - 175	140 - 180 100 - 140	.0005 - .0010 .0003 - .0005	.0008 - .0020 .0005 - .0015	.0010 - .0030 .0010 - .0020	.0020 - .0040 .0010 - .0030	.0030 - .0050 .0020 - .0040
MONEL	Monel-65% Nickel		175 - 300	125 - 175	175 - 300	140 - 240	.0007 - .0015	.0010 - .0025	.0015 - .0040	.0030 - .0050	.0040 - .0060
TITANIUM ALLOYS	Commercially Pure, 6AL-4V, Astm 1/2/3, 6Al-25N-4Zr-2Mo-Si		200 - 300	125 - 250	200 - 300	160 - 240	.0007 - .0015	.0010 - .0025	.0015 - .0040	.0030 - .0050	.0040 - .0060
STAINLESS STEEL (PRECIPITATION)	13/8, 15/5, 17-4	under 32 over 32			150 - 250 125 - 175	120 - 200 100 - 140	.0005 - .0010 .0003 - .0005	.0008 - .0020 .0005 - .0015	.0010 - .0030 .0010 - .0020	.0020 - .0040 .0010 - .0030	.0030 - .0050 .0020 - .0040
STAINLESS STEEL (AUSTENITIC)	200 Series, 302, 303, 304, 304L, 316, 316L	under 32 over 32			200 - 250 150 - 200	160 - 200 120 - 160	.0005 - .0010 .0003 - .0005	.0008 - .0020 .0005 - .0015	.0010 - .0030 .0010 - .0020	.0020 - .0040 .0010 - .0030	.0030 - .0050 .0020 - .0040
STAINLESS STEEL (MARTENSITIC)	403, 410, 416, 440	under 32 over 32			150 - 250 125 - 175	120 - 200 100 - 140	.0005 - .0010 .0003 - .0005	.0008 - .0020 .0005 - .0015	.0010 - .0030 .0010 - .0020	.0020 - .0040 .0010 - .0030	.0030 - .0050 .0020 - .0040
HIGH STRENGTH TOOL STEELS	4140, 4340, 6150, 5210, A2, D2 P20, H11, H13, S2, O1	under 32 over 32			150 - 225 60 - 125	120 - 180 50 - 100	.0005 - .0010 .0003 - .0005	.0008 - .0020 .0005 - .0015	.0010 - .0030 .0010 - .0020	.0020 - .0040 .0010 - .0030	.0030 - .0050 .0020 - .0040
MEDIUM ALLOY STEELS	200, 250, 300	under 32 over 32			200 - 250 125 - 175	160 - 200 100 - 140	.0007 - .0015 .0005 - .0010	.0010 - .0025 .0008 - .0020	.0015 - .0040 .0010 - .0030	.0030 - .0050 .0020 - .0040	.0040 - .0060 .0030 - .0050
CARBON STEELS	1000's, 1100's, 1300's	under 32 over 32			200 - 250 125 - 175	160 - 200 100 - 140	.0007 - .0015 .0005 - .0010	.0010 - .0025 .0008 - .0020	.0015 - .0040 .0010 - .0030	.0030 - .0050 .0020 - .0040	.0040 - .0060 .0030 - .0050
DUCTILE	Ductile Cast Irons		200 - 300	125 - 200	200 - 300	160 - 240	.0010 - .0020	.0015 - .0040	.0020 - .0060	.0030 - .0100	.0030 - .0080
CAST IRONS	Gray Cast Irons		225 - 325	175 - 250	250 - 350	200 - 280	.0010 - .0020	.0015 - .0040	.0020 - .0060	.0030 - .0100	.0050 - .0100
ALUMINUM	2014, 2024, 6061-(T1-T6), 7075, Die Cast, Extruded		300 - 500	300 - 500	300 - 500	240 - 400	.0010 - .0020	.0015 - .0040	.0020 - .0060	.0030 - .0100	.0030 - .0150
MAGNESIUM			300 - 500	300 - 500	300 - 500	240 - 400	.0010 - .0020	.0015 - .0040	.0020 - .0060	.0030 - .0100	.0050 - .0100
COPPER, COPPER ALLOYS			400 - 500	250 - 350	300 - 400	240 - 320	.0007 - .0015	.0010 - .0025	.0015 - .0035	.0020 - .0080	.0040 - .0100
BRASS, BRONZE	Brass, Alum/Bronze, Low Silicon Bronze		300 - 400	200 - 300	250 - 350	200 - 280	.0007 - .0015	.0010 - .0025	.0015 - .0035	.0020 - .0080	.0040 - .0100
COMPOSITES	G-10 Fiberglass, Graphite, Graphite/ Epoxy, Plastics		250 - 1000	250 - 1000	250 - 1000	200 - 800	.0010 - .0020	.0015 - .0040	.0020 - .0060	.0030 - .0100	.0050 - .0100

These values are a starting point based on an uncoated tool.

For AlTiN Coated tools increase SFM values by up to +40%

CHAMFER MILLS

Technical Information

Chamfer Mills									
Material Guide		Rc	SFM	Feed Per Tooth					
				UP TO 1/8"	1/8" - 3/16"	3/16" - 1/4"	1/4" - 5/16"	5/16" - 3/8"	3/8" - 1/2"
COBALT BASE ALLOYS	Stellite, HS-21, Haynes 25/188, X-40, L-605	< 32	30 - 50	.0004	.0005	.0010	.0010	.0010	.0010
NICKEL BASE ALLOYS	Inconel-625/718, Waspalloy, Rene, Hastelloy	< 32	30 - 50	.0004	.0005	.0010	.0010	.0010	.0010
IRON BASE ALLOYS	Incoloy 800-802, Multimet N-155, Timkin 16-25-6, Carpeneter 22-b3	< 32	40 - 65	.0005	.0005	.0010	.0010	.0015	.0020
TITANIUM ALLOYS	Commercially Pure, 6AL-4V, Astm 1/2/3, 6Al-25N-4Zr-2Mo-Si		25 - 125	.0005	.0005	.0005	.0005	.0010	.0010
STAINLESS STEEL (PRECIPITATION)	13/8, 15/5, 17-4, AM-350/355	< 32	40 - 125	.0005	.0005	.0010	.0010	.0010	.0020
STAINLESS STEEL (AUSTENITIC)	200 Series, 302, 303, 304, 316, 304L, 316L	< 32	50 - 175	.0001	.0002	.0005	.0005	.0010	.0015
STAINLESS STEEL (MARTENSITIC)	403, 410, 416, 440	< 32	50 - 125	.0001	.0002	.0005	.0005	.0005	.0010
HIGH STRENGTH TOOL STEELS	4140, 4340, 6150, 5210, A2, D2 P20, H11, H13, S2, 01	< 32	25 - 150	.0005	.0005	.0010	.0010	.0010	.0010
MEDIUM ALLOY STEELS	200, 250, 300	< 32	75 - 175	.0005	.0005	.0010	.0010	.0020	.0025
CARBON STEELS	A36, 12L14, 12L15, 1005, 1018, 1020, 1108-1119, 1213-1215, 1513-1518, 4012, 5015, 9310	< 32	50 - 200	.0005	.0010	.0015	.0015	.0020	.0030
DUCTILE	Ductile Cast Irons		50 - 200	.0005	.0010	.0015	.0015	.0020	.0020
CAST IRONS	Gray Cast Irons		50 - 200	.0005	.0010	.0020	.0020	.0030	.0040
ALUMINUM	2014, 2024, 6061-(T1-T6), 7075, Die Cast, Extruded		500 - 1000	.0010	.0020	.0020	.0020	.0030	.0040
MAGNESIUM			450 - 650	.0010	.0020	.0020	.0020	.0030	.0040
COPPER, COPPER ALLOYS	Yellow Brass, High Lead Brass, Red Brass		400 - 750	.0010	.0010	.0020	.0020	.0025	.0030
BRASS, BRONZE	Brass, Alum/Bronze, Low Silicon Bronze		400 - 500	.0010	.0010	.0020	.0020	.0025	.0030
PLASTICS	Acrylics, Phenolics		100 - 300	.0010	.0020	.0030	.0030	.0040	.0060
CARBON, GRAPHITES			100 - 200	.0040	.0040	.0060	.0060	.0080	.0100

These values are a starting point based on an uncoated tool.

For AlTiN Coated tools increase SFM values by up to +40%

CORNER ROUNDING END MILLS

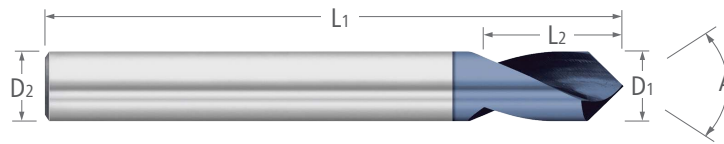
Technical Information

Corner Rounding End Mills															
Material Guide		Hardness	SFM	Chip Load (IPT) By Effective Cutter Diameter											
				0.062	0.078	0.093	0.125	0.187	0.25	0.375	0.5	0.625	0.75	1	1.25
TITANIUM ALLOYS	Ti 3Al-2.5V,Ti 6Al-4V	29-37 Rc	150	.00016	.00020	.00024	.00032	.00048	.00064	.00096	.00128	.00160	.00192	.00257	.00321
		38-45 Rc	75	.00016	.00020	.00024	.00032	.00048	.00064	.00096	.00128	.00160	.00192	.00257	.00321
HIGH TEMP ALLOYS	Inconel, Hastelloy< Waspalloy, Monel, Nimonic, Haynes, Discoloy, Incoloy	29-37 Rc	70	.00016	.00020	.00024	.00032	.00048	.00064	.00096	.00128	.00160	.00192	.00257	.00321
		38-45 Rc	50	.00016	.00020	.00024	.00032	.00048	.00064	.00096	.00128	.00160	.00192	.00257	.00321
STAINLESS STEEL	203 EZ, 303 (all types), 416, 416Se, 416 Plus X, 420F, 420FSe, 430F, 430FSe, 440F, 440FSe	29-37 Rc	450	.00028	.00035	.00042	.00056	.00084	.00112	.00168	.00224	.00281	.00337	.00449	.00561
	201, 202, 203, 205, 301, 302, 304, 304L	29-37 Rc	200	.00025	.00032	.00038	.00051	.00077	.00103	.00154	.00205	.00257	.00308	.00410	.00513
	314, 316, 316L, 317, 321, 403, 405, 409, 410, 413, 501, 502	38-45 Rc	100	.00025	.00032	.00038	.00051	.00077	.00103	.00154	.00205	.00257	.00308	.00410	.00513
	414, 431, 440A, 440B, 440C	29-37 Rc	150	.00016	.00020	.00024	.00032	.00048	.00064	.00096	.00128	.00160	.00192	.00257	.00321
	13-8, 15-5, 15-7, 17-4, 17-7	38-45 Rc	90	.00016	.00020	.00024	.00032	.00048	.00064	.00096	.00128	.00160	.00192	.00257	.00321
TOOL STEELS	A, L, O, P, W series	29-37 Rc	200	.00025	.00032	.00038	.00051	.00077	.00103	.00154	.00205	.00257	.00308	.00410	.00513
		38-45 Rc	100	.00025	.00032	.00038	.00051	.00077	.00103	.00154	.00205	.00257	.00308	.00410	.00513
	D, H, M, T, S series	29-37 Rc	150	.00016	.00020	.00024	.00032	.00048	.00064	.00096	.00128	.00160	.00192	.00257	.00321
		38-45 Rc	90	.00016	.00020	.00024	.00032	.00048	.00064	.00096	.00128	.00160	.00192	.00257	.00321
CARBON STEELS	A36, 12L14, 12L15, 1005, 1018, 1020, 1108-1119, 1213-1215, 1513-1518, 4012, 5015, 9310	29-37 Rc		.00028	.00035	.00042	.00056	.00084	.00112	.00168	.00224	.00281	.00337	.00449	.00561
	1030 - 1095, 1140 - 1151, 13xx, 15xx, 2xxx, 3xxx, 4xxx & 4xLxx, 5xxx & 5xLxx, 50xxx & 50Lxxx, 51xxx & 51Lxxx, 52xxx & 52Lxxx,		200	.00025	.00032	.00038	.00051	.00077	.00103	.00154	.00205	.00257	.00308	.00410	.00513
ALUMINUM ALLOYS	Casting (2xx, 5xx, 7xx, 8xx)	≤ 28 Rc	750	.00065	.00082	.00097	.00131	.00195	.00261	.00392	.00523	.00653	.00784	.01045	.01306
	Wrought (1xxx, 2xxx, 3xxx, 5xxx, 6xxx,7xxx, 8xxx)	≤ 28 Rc	1000												
ALUMINUM ALLOYS (CASTINGS)	Casting - 3%-5% Si (3xx, A3xx, C3xx, 4xx, A4xx, B4xx)	≤ 28 Rc	750												
	Casting - 5%-8% Si (3xx, A3xx, C3xx, 4xx, A4xx, B4xx)		700												
	Casting - 8%-12% Si (3xx, A3xx, C3xx, 4xx, A4xx, B4xx)		650												
	Casting - 12%-16% Si (3xx, A3xx, C3xx, 4xx, A4xx, B4xx)		475												
ALUMINUM ALLOYS (WROUGHT)	Wrought - 5%-8% Si (4xxx)	≤ 28 Rc	1000												
	Wrought - 8%-12% Si (4xxx)		800												
MAGNESIUM ALLOYS		≤ 28 Rc	1500	.00065	.00082	.00097	.00131	.00195	.00261	.00392	.00523	.00653	.00784	.01045	.01306
ZINC ALLOYS		800													
COPPER ALLOYS	High Coppers - 90%+ (C1xxxx)	≤ 28 Rc	225												
BRASS	Brass (Copper Zinc alloys, C2xxxx, C3xxxx, C4xxxx,)		500												
PHOSPHOR BRONZES	Phosphor Bronzes (Copper Tin alloys, C5xxxx)		225												
SILICON BRONZES	Silicon Bronzes (Copper Silicon alloys, C64700-C66100)		500												
COPPER NICKELS, NICKEL SILVERS	Copper Nickels, Nickel Silvers (Copper Nickel alloys, C7xxxx)		225												
CAST COPPER ALLOYS	(C83300-C86200, C86400-C87900, C92200-C95800, C97300-C97800, C99400-C99700)		550												

MILLING PROCESS	HARDNESS	ADOC	RDOC
Non-Ferrous Corner Rounding	n/a	100%	2 Passes at Full Depth
Ferrous Corner Rounding	< 37 HRC	100%	3 Passes at Full Depth
	> 37 HRC	100%	4 Passes at Full Depth

All posted speed and feed parameters are suggested starting values that may be increased given optimal setup conditions. Chip loads reflect uncoated cutters and may be increased 10%-20% if coated. For ferrous materials with hardness ≤ 28 Rc, chip loads can be increased 10%-20%.

SPOT DRILLS - CARBIDE

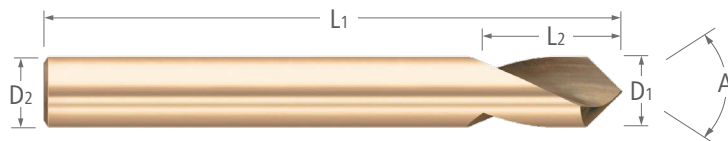


- Optimized for spotting applications to improve drilling accuracy
- 90°, 120°, 142° included angle options
- A point angle equal to or larger than a drill's point angle is recommended for optimal results
- Also effective in chamfering top of drilled holes
- AlTiN coating offers increased wear and heat resistance
- Solid carbide
- Precision manufactured in the USA

INCLUDED ANGLE	SIZE	SHANK DIA.	FLUTE LENGTH	OAL	UNCOATED		AlTiN COATED	
A	D ₁	D ₂ (h6)	L ₂	L ₁	TOOL #	PRICE	TOOL #	PRICE
90°	1/8	1/8	1/4	2	TC18708	19.05	TC28708	23.45
	3/16	3/16	3/8	2	TC18712	22.70	TC28712	27.65
	1/4	1/4	3/8	3	TC18716	27.40	TC28716	33.75
	3/8	3/8	1	3	TC18724	45.15	TC28724	54.20
	1/2	1/2	1	3	TC18732	72.90	TC28732	90.40
	5/8	5/8	1-1/4	3	TC18740	130.40	TC28740	158.10
	3/4	3/4	1-3/4	4	TC18748	175.05	TC28748	207.55
120°	1/8	1/8	1/4	2	TC18808	19.05	TC28808	23.15
	3/16	3/16	3/8	2	TC18812	22.70	TC28812	27.65
	1/4	1/4	3/8	3	TC18816	27.40	TC28816	33.75
	3/8	3/8	1	3	TC18824	45.15	TC28824	54.20
	1/2	1/2	1	3	TC18832	72.90	TC28832	90.40
	5/8	5/8	1-1/4	3	TC18840	130.40	TC28840	158.10
	3/4	3/4	1-3/4	4	TC18848	174.25	TC28848	207.55
142°	1/8	1/8	1/4	2	TC18908	19.05	TC28908	23.45
	3/16	3/16	3/8	2	TC18912	22.70	TC28912	27.65
	1/4	1/4	3/8	3	TC18916	27.40	TC28916	33.75
	3/8	3/8	1	3	TC18924	45.15	TC28924	54.20
	1/2	1/2	1	3	TC18932	72.90	TC28932	90.40
	5/8	5/8	1-1/4	3	TC18940	130.40	TC28940	158.10
	3/4	3/4	1-3/4	4	TC18948	175.05	TC28948	207.55

For technical information, see 223

SPOT DRILLS - COBALT



- Optimized for spotting applications to improve drilling accuracy
- 90° and 120° included angle options
- Gold Oxide finish extends tool life, improves lubricity, and reduces grinding stresses
- M42 Cobalt
- Precision manufactured in the USA

INCLUDED ANGLE	SIZE	SHANK DIA.	FLUTE LENGTH	OAL	GOLD OXIDE FINISH	
A	D ₁	D ₂ (h6)	L ₂	L ₁	TOOL #	PRICE
90°	1/4	1/4	1	2-1/2	TC95452	18.50
	3/8	3/8	1-1/8	3-1/8	TC95453	35.10
	1/2	1/2	1-1/2	3-3/4	TC95454	55.00
	5/8	5/8	1-5/8	4-1/4	TC95455	85.30
	3/4	3/4	1-3/4	5	TC95456	148.50
120°	1/4	1/4	1	2-1/2	TC95458	18.50
	3/8	3/8	1-1/8	3-1/8	TC95459	35.10
	1/2	1/2	1-1/2	3-3/4	TC95460	55.00
	5/8	5/8	1-5/8	4-1/4	TC95461	85.30
	3/4	3/4	1-3/4	5	TC95462	148.50

NEW

NEW

NEW

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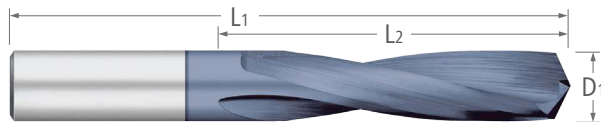
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DRILLS - CARBIDE

Stub Length - 135° Split Point



- Stub length for increased rigidity
- 135° split point (diameters < .125" are not split)
- AlTiN coating offers increased wear and heat resistance
- Solid carbide
- Precision manufactured in the USA

DRILL DIAMETER dec. equiv. size		FLUTE LENGTH	OAL	UNCOATED		AlTiN COATED	
D1 +.0000" -.0005"		L2	L1	TOOL #	PRICE	TOOL #	PRICE
.0313	1/32	3/8	1-1/2	TC20002	11.55	TC29002	14.60
.0400	#60	3/8	1-1/2	TC20260	11.55	TC29260	14.60
.0410	#59	3/8	1-1/2	TC20259	11.55	TC29259	15.95
.0420	#58	3/8	1-1/2	TC20258	11.55	TC29258	14.60
.0430	#57	3/8	1-1/2	TC20257	11.55	TC29257	14.60
.0465	#56	3/8	1-1/2	TC20256	11.55	TC29256	14.60
.0469	3/64	3/8	1-1/2	TC20003	11.55	TC29003	14.60
.0520	#55	13/32	1-1/2	TC20255	11.55	TC29255	14.60
.0550	#54	13/32	1-1/2	TC20254	11.55	TC29254	14.60
.0595	#53	13/32	1-1/2	TC20253	11.55	TC29253	14.60
.0625	1/16	13/32	1-1/2	TC20004	11.05	TC29004	13.80
.0635	#52	7/16	1-1/2	TC20252	11.05	TC29252	13.80
.0670	#51	7/16	1-1/2	TC20251	11.05	TC29251	13.80
.0700	#50	7/16	1-1/2	TC20250	11.40	TC29250	14.30
.0730	#49	7/16	1-1/2	TC20249	11.40	TC29249	14.30
.0760	#48	7/16	1-1/2	TC20248	11.90	TC29248	14.95
.0781	5/64	7/16	1-1/2	TC20005	11.55	TC29005	14.60
.0785	#47	1/2	1-1/2	TC20247	11.90	TC29247	14.95
.0810	#46	1/2	1-1/2	TC20246	11.90	TC29246	14.95
.0820	#45	1/2	1-1/2	TC20245	11.90	TC29245	14.95
.0860	#44	1/2	1-1/2	TC20244	12.25	TC29244	15.40
.0890	#43	1/2	1-1/2	TC20243	13.00	TC29243	16.25
.0935	#42	1/2	1-1/2	TC20242	13.00	TC29242	16.25
.0938	3/32	1/2	1-1/2	TC20006	12.90	TC29006	16.10
.0960	#41	5/8	2	TC20241	13.25	TC29241	16.75
.0980	#40	5/8	2	TC20240	13.25	TC29240	16.75
.0995	#39	5/8	2	TC20239	13.85	TC29239	17.35
.1015	#38	5/8	2	TC20238	13.85	TC29238	17.35
.1040	#37	5/8	2	TC20237	14.00	TC29237	17.65
.1065	#36	5/8	2	TC20236	14.80	TC29236	18.60
.1094	7/64	5/8	2	TC20007	14.60	TC29007	18.30
.1100	#35	3/4	2	TC20235	14.80	TC29235	18.60
.1110	#34	3/4	2	TC20234	14.80	TC29234	18.60
.1130	#33	3/4	2	TC20233	14.90	TC29233	18.90

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For technical information, see 223

DRILLS - CARBIDE

Stub Length - 135° Split Point (Cont.)

continued from previous page

DRILL DIAMETER dec. equiv. size		FLUTE LENGTH	OAL	UNCOATED		AlTiN COATED	
D1 ^{+0.000"} -0.005"		L2	L1	TOOL #	PRICE	TOOL #	PRICE
.1160	#32	3/4	2	TC20232	15.10	TC29232	19.05
.1200	#31	3/4	2	TC20231	15.10	TC29231	19.05
.1250	1/8	3/4	2	TC20008	15.45	TC29008	19.45
.1285	#30	3/4	2	TC20230	16.25	TC29230	20.45
.1360	#29	3/4	2	TC20229	17.10	TC29229	21.55
.1405	#28	3/4	2	TC20228	17.10	TC29228	21.55
.1406	9/64	3/4	2	TC20009	17.10	TC29009	21.55
.1440	#27	7/8	2	TC20227	18.05	TC29227	22.75
.1470	#26	7/8	2	TC20226	18.05	TC29226	22.75
.1495	#25	7/8	2	TC20225	18.05	TC29225	22.75
.1520	#24	7/8	2	TC20224	19.05	TC29224	24.00
.1540	#23	7/8	2	TC20223	19.15	TC29223	24.10
.1563	5/32	7/8	2	TC20010	19.15	TC29010	24.10
.1570	#22	7/8	2	TC20222	19.15	TC29222	24.10
.1590	#21	7/8	2	TC20221	19.90	TC29221	24.85
.1610	#20	7/8	2	TC20220	19.90	TC29220	24.85
.1660	#19	7/8	2	TC20219	21.00	TC29219	25.95
.1695	#18	7/8	2	TC20218	21.35	TC29218	26.30
.1719	11/64	7/8	2	TC20011	22.65	TC29011	27.60
.1730	#17	7/8	2	TC20217	22.65	TC29217	27.60
.1770	#16	7/8	2	TC20216	23.75	TC29216	28.70
.1800	#15	7/8	2	TC20215	23.75	TC29215	28.70
.1820	#14	7/8	2	TC20214	24.25	TC29214	29.20
.1850	#13	7/8	2	TC20213	25.00	TC29213	29.95
.1875	3/16	7/8	2	TC20012	23.40	TC29012	28.35
.1890	#12	1-1/8	2-1/2	TC20212	25.80	TC29212	32.15
.1910	#11	1-1/8	2-1/2	TC20211	25.80	TC29211	32.15
.1935	#10	1-1/8	2-1/2	TC20210	26.55	TC29210	32.90
.1960	#9	1-1/8	2-1/2	TC20209	26.55	TC29209	32.90
.1990	#8	1-1/8	2-1/2	TC20208	26.55	TC29208	32.90
.2010	#7	1-1/8	2-1/2	TC20207	26.65	TC29207	33.00
.2031	13/64	1-1/8	2-1/2	TC20013	26.90	TC29013	33.25
.2040	#6	1-1/8	2-1/2	TC20206	27.30	TC29206	33.65
.2055	#5	1-1/8	2-1/2	TC20205	27.30	TC29205	33.65
.2090	#4	1-1/8	2-1/2	TC20204	30.75	TC29204	37.10
.2130	#3	1-1/8	2-1/2	TC20203	31.05	TC29203	37.40
.2188	7/32	1-1/8	2-1/2	TC20014	29.90	TC29014	36.25
.2210	#2	1-1/4	2-1/2	TC20202	31.05	TC29202	37.40
.2280	#1	1-1/4	2-1/2	TC20201	31.05	TC29201	37.40
.2340	A	1-1/4	2-1/2	TC20101	34.30	TC29101	40.65
.2344	15/64	1-1/4	2-1/2	TC20015	33.80	TC29015	40.15
.2380	B	1-1/4	2-1/2	TC20102	35.75	TC29102	42.10
.2420	C	1-1/4	2-1/2	TC20103	35.80	TC29103	42.15
.2460	D	1-1/4	2-1/2	TC20104	36.25	TC29104	42.60
.2500	1/4	1-1/4	2-1/2	TC20016	35.75	TC29016	42.10

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For technical information, see 223

DRILLS - CARBIDE

Stub Length - 135° Split Point (Cont.)

continued from previous page

DRILL DIAMETER dec. equiv. size		FLUTE LENGTH	OAL	UNCOATED		AlTiN COATED	
D ₁ ^{+0.000"} _{-0.005"}		L ₂	L ₁	TOOL #	PRICE	TOOL #	PRICE
.2500	E	1-1/4	2-1/2	TC20105	35.60	TC29105	41.95
.2570	F	1-1/4	2-1/2	TC20106	39.75	TC29106	47.35
.2610	G	1-1/4	2-1/2	TC20107	41.90	TC29107	49.50
.2656	17/64	1-1/4	2-1/2	TC20017	40.05	TC29017	47.65
.2660	H	1-1/4	2-1/2	TC20108	42.95	TC29108	50.55
.2720	I	1-1/4	2-1/2	TC20109	43.55	TC29109	51.15
.2770	J	1-1/4	2-1/2	TC20110	44.80	TC29110	52.40
.2810	K	1-1/4	2-1/2	TC20111	45.35	TC29111	52.95
.2813	9/32	1-1/4	2-1/2	TC20018	41.75	TC29018	49.35
.2900	L	1-1/4	2-1/2	TC20112	47.65	TC29112	55.25
.2950	M	1-1/4	2-1/2	TC20113	48.80	TC29113	56.40
.2969	19/64	1-1/4	2-1/2	TC20019	46.80	TC29019	54.40
.3020	N	1-1/4	2-1/2	TC20114	51.90	TC29114	59.50
.3125	5/16	1-1/4	2-1/2	TC20020	49.40	TC29020	57.00
.3160	O	1-3/8	3	TC20115	54.40	TC29115	63.45
.3230	P	1-3/8	3	TC20116	56.85	TC29116	65.90
.3281	21/64	1-3/8	3	TC20021	54.05	TC29021	63.10
.3320	Q	1-3/8	3	TC20117	58.90	TC29117	67.95
.3390	R	1-3/8	3	TC20118	61.15	TC29118	70.20
.3438	11/32	1-3/8	3	TC20022	59.15	TC29022	68.20
.3480	S	1-3/8	3	TC20119	65.15	TC29119	74.20
.3580	T	1-3/8	3	TC20120	67.45	TC29120	76.50
.3594	23/64	1-3/8	3	TC20023	66.05	TC29023	75.10
.3680	U	1-3/8	3	TC20121	71.15	TC29121	80.20
.3750	3/8	1-3/8	3	TC20024	70.15	TC29024	79.20
.3770	V	1-3/8	3	TC20122	78.45	TC29122	89.00
.3860	W	1-3/8	3	TC20123	84.45	TC29123	95.40
.3906	25/64	1-3/8	3	TC20025	81.75	TC29025	92.30
.3970	X	1-3/8	3	TC20124	92.65	TC29124	103.20
.4040	Y	1-3/8	3	TC20125	95.30	TC29125	113.50
.4063	13/32	1-3/8	3	TC20026	89.95	TC29026	106.60
.4130	Z	1-3/8	3	TC20126	103.25	TC29126	113.80
.4219	27/64	1-3/8	3	TC20027	97.80	TC29027	115.95
.4375	7/16	1-3/8	3	TC20028	102.25	TC29028	121.25
.4531	29/64	1-3/8	3	TC20029	118.70	TC29029	140.75
.4688	15/32	1-3/8	3	TC20030	123.05	TC29030	146.65
.4844	31/64	1-3/8	3	TC20031	126.55	TC29031	150.75
.5000	1/2	1-3/8	3	TC20032	126.80	TC29032	151.10

Drills
Carbide
Cobalt
HSS

For technical information, see 223

DRILLS - CARBIDE**Jobber Length - 118° Split Point**

- 118° split point jobber drills ideal for general purpose drilling (diameters < .125" are not split)
- AlTiN coating offers increased wear and heat resistance
- Solid carbide
- Precision manufactured in the USA

dec. equiv.	DRILL DIAMETER		FLUTE LENGTH	OAL	UNCOATED		AlTiN COATED	
	size	metric			TOOL #	PRICE	TOOL #	PRICE
$D1 \begin{smallmatrix} +.0000" \\ -.0005" \end{smallmatrix}$			L2	L1				
.0276		0.7 mm	12 mm	31 mm	TC19307	13.50	TC79307	17.10
.0313	1/32		5/16	1-1/4	TC19002	11.00	TC79002	13.75
.0315		0.8 mm	12 mm	31 mm	TC19308	13.50	TC79308	17.10
.0354		0.9 mm	16 mm	38 mm	TC19309	13.50	TC79309	17.90
.0394		1 mm	16 mm	38 mm	TC19310	13.50	TC79310	17.10
.0400	#60		3/4	1-1/2	TC19260	11.00	TC79260	13.75
.0410	#59		3/4	1-1/2	TC19259	11.00	TC79259	15.40
.0420	#58		3/4	1-1/2	TC19258	11.00	TC79258	13.75
.0430	#57		3/4	1-1/2	TC19257	11.00	TC79257	13.75
.0433		1.1 mm	19 mm	38 mm	TC19311	13.50	TC79311	17.10
.0465	#56		3/4	1-1/2	TC19256	11.00	TC79256	13.75
.0469	3/64		3/4	1-1/2	TC19003	11.00	TC79003	13.75
.0472		1.2 mm	19 mm	38 mm	TC19312	13.50	TC79312	17.90
.0512		1.3 mm	19 mm	38 mm	TC19313	13.50	TC79313	17.10
.0520	#55		3/4	1-1/2	TC19255	11.00	TC79255	13.75
.0550	#54		3/4	1-1/2	TC19254	11.00	TC79254	13.75
.0551		1.4 mm	19 mm	38 mm	TC19314	13.50	TC79314	17.10
.0591		1.5 mm	19 mm	38 mm	TC19315	13.60	TC79315	17.25
.0595	#53		3/4	1-1/2	TC19253	11.00	TC79253	13.75
.0625	1/16		3/4	1-1/2	TC19004	10.25	TC79004	13.05
.0630		1.6 mm	19 mm	38 mm	TC19316	13.60	TC79316	18.00
.0635	#52		3/4	1-1/2	TC19252	10.25	TC79252	13.05
.0669		1.7 mm	19 mm	38 mm	TC19317	13.60	TC79317	17.25
.0670	#51		3/4	1-1/2	TC19251	10.25	TC79251	13.05
.0700	#50		7/8	1-3/4	TC19250	10.75	TC79250	13.45
.0709		1.8 mm	22 mm	38 mm	TC19318	13.60	TC79318	17.25
.0730	#49		7/8	1-3/4	TC19249	10.75	TC79249	13.45
.0748		1.9 mm	22 mm	38 mm	TC19319	13.60	TC79319	17.25
.0760	#48		7/8	1-3/4	TC19248	11.25	TC79248	14.10
.0781	5/64		7/8	1-3/4	TC19005	11.00	TC79005	13.75
.0785	#47		7/8	1-3/4	TC19247	11.25	TC79247	14.10
.0787		2 mm	22 mm	44 mm	TC19320	14.60	TC79320	18.30
.0810	#46		7/8	1-3/4	TC19246	11.25	TC79246	14.10
.0820	#45		7/8	1-3/4	TC19245	11.25	TC79245	14.10
.0827		2.1 mm	22 mm	44 mm	TC19321	14.60	TC79321	18.30
.0860	#44		1	2	TC19244	11.55	TC79244	14.50
.0866		2.2 mm	25 mm	50 mm	TC19322	14.60	TC79322	19.00

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DRILLS - CARBIDE

Jobber Length - 118° Split Point (Cont.)

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DRILL DIAMETER			FLUTE LENGTH	OAL	UNCOATED		AlTiN COATED	
dec. equiv.	size	metric			TOOL #	PRICE	TOOL #	PRICE
$D1^{+0.0000"}_{-0.0005"}$			L ₂	L ₁				
.0890	#43		1	2	TC19243	12.10	TC79243	15.30
.0906		2.3 mm	25 mm	50 mm	TC19323	14.60	TC79323	18.30
.0935	#42		1	2	TC19242	12.10	TC79242	15.30
.0938	3/32		1	2	TC19006	12.05	TC79006	15.15
.0945		2.4 mm	25 mm	50 mm	TC19324	14.60	TC79324	18.30
.0960	#41		1	2	TC19241	12.60	TC79241	15.75
.0980	#40		1	2	TC19240	12.60	TC79240	15.75
.0984		2.5 mm	25 mm	50 mm	TC19325	16.75	TC79325	21.00
.0995	#39		1-1/4	2-1/4	TC19239	13.00	TC79239	16.35
.1015	#38		1-1/4	2-1/4	TC19238	13.00	TC79238	16.35
.1024		2.6 mm	32 mm	57 mm	TC19326	16.75	TC79326	21.45
.1040	#37		1-1/4	2-1/4	TC19237	13.20	TC79237	16.65
.1063		2.7 mm	32 mm	57 mm	TC19327	16.70	TC79327	21.00
.1065	#36		1-1/4	2-1/4	TC19236	14.00	TC79236	17.55
.1094	7/64		1-1/4	2-1/4	TC19007	13.60	TC79007	17.25
.1100	#35		1-1/4	2-1/4	TC19235	14.00	TC79235	17.55
.1102		2.8 mm	32 mm	57 mm	TC19328	16.75	TC79328	21.45
.1110	#34		1-1/4	2-1/4	TC19234	14.00	TC79234	17.55
.1130	#33		1-1/4	2-1/4	TC19233	14.10	TC79233	17.80
.1142		2.9 mm	32 mm	57 mm	TC19329	16.75	TC79329	21.00
.1160	#32		1-1/4	2-1/4	TC19232	14.20	TC79232	17.95
.1181		3 mm	32 mm	57 mm	TC19330	18.75	TC79330	23.45
.1200	#31		1-1/4	2-1/4	TC19231	14.20	TC79231	17.95
.1220		3.1 mm	32 mm	57 mm	TC19331	18.75	TC79331	23.45
.1250	1/8		1-1/4	2-1/4	TC19008	14.65	TC79008	18.35
.1260		3.2 mm	32 mm	57 mm	TC19332	18.75	TC79332	23.55
.1285	#30		1-1/4	2-1/4	TC19230	15.35	TC79230	19.25
.1299		3.3 mm	32 mm	57 mm	TC19333	18.75	TC79333	23.55
.1339		3.4 mm	35 mm	63 mm	TC19334	20.35	TC79334	25.60
.1360	#29		1-3/8	2-1/2	TC19229	16.15	TC79229	20.30
.1378		3.5 mm	35 mm	63 mm	TC19335	20.35	TC79335	25.60
.1405	#28		1-3/8	2-1/2	TC19228	16.15	TC79228	19.60
.1406	9/64		1-3/8	2-1/2	TC19009	16.15	TC79009	20.30
.1440	#27		1-3/8	2-1/2	TC19227	16.95	TC79227	21.40
.1470	#26		1-3/8	2-1/2	TC19226	16.95	TC79226	21.40
.1495	#25		1-3/8	2-1/2	TC19225	16.95	TC79225	21.40
.1520	#24		1-3/8	2-1/2	TC19224	17.95	TC79224	22.65
.1540	#23		1-3/8	2-1/2	TC19223	18.00	TC79223	22.85
.1563	5/32		1-3/8	2-1/2	TC19010	18.00	TC79010	22.85
.1570	#22		1-3/8	2-1/2	TC19222	18.00	TC79222	22.85
.1575		4 mm	35 mm	63 mm	TC19340	24.95	TC79340	30.25
.1590	#21		1-3/8	2-1/2	TC19221	18.80	TC79221	23.70
.1610	#20		1-3/8	2-1/2	TC19220	18.80	TC79220	23.70
.1660	#19		1-5/8	2-3/4	TC19219	19.60	TC79219	24.75
.1695	#18		1-5/8	2-3/4	TC19218	20.00	TC79218	25.30
.1719	11/64		1-5/8	2-3/4	TC19011	21.40	TC79011	26.70

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DRILLS - CARBIDE

Jobber Length - 118° Split Point (Cont.)

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dec. equiv.	DRILL DIAMETER		FLUTE LENGTH	OAL	UNCOATED		AlTiN COATED	
	size	metric			TOOL #	PRICE	TOOL #	PRICE
D1 $\begin{smallmatrix} +.0000" \\ -.0005" \end{smallmatrix}$			L2	L1				
.1730	#17		1-5/8	2-3/4	TC19217	21.40	TC79217	26.70
.1770	#16		1-5/8	2-3/4	TC19216	22.55	TC79216	27.85
.1772		4.5 mm	41 mm	70 mm	TC19345	26.80	TC79345	32.10
.1800	#15		1-5/8	2-3/4	TC19215	22.55	TC79215	27.85
.1820	#14		1-5/8	2-3/4	TC19214	22.80	TC79214	28.05
.1850	#13		1-5/8	2-3/4	TC19213	23.35	TC79213	28.65
.1875	3/16		1-5/8	2-3/4	TC19012	21.90	TC79012	27.20
.1890	#12		1-5/8	2-3/4	TC19212	24.40	TC79212	30.55
.1910	#11		1-5/8	2-3/4	TC19211	24.40	TC79211	30.55
.1935	#10		1-5/8	2-3/4	TC19210	25.00	TC79210	31.35
.1960	#9		1-3/4	3	TC19209	25.00	TC79209	31.35
.1969		5 mm	44 mm	75 mm	TC19350	29.65	TC79350	36.00
.1990	#8		1-3/4	3	TC19208	25.00	TC79208	31.35
.2010	#7		1-3/4	3	TC19207	25.10	TC79207	31.45
.2031	13/64		1-3/4	3	TC19013	25.30	TC79013	31.65
.2040	#6		1-3/4	3	TC19206	25.75	TC79206	31.55
.2055	#5		1-3/4	3	TC19205	25.75	TC79205	32.10
.2090	#4		1-3/4	3	TC19204	28.90	TC79204	35.25
.2130	#3		1-3/4	3	TC19203	29.05	TC79203	35.40
.2165		5.5 mm	44 mm	75 mm	TC19355	34.95	TC79355	41.60
.2188	7/32		1-3/4	3	TC19014	28.10	TC79014	34.45
.2210	#2		1-3/4	3	TC19202	29.05	TC79202	35.40
.2280	#1		1-3/4	3	TC19201	29.05	TC79201	35.40
.2340	A		2	3-1/4	TC19101	32.30	TC79101	39.10
.2344	15/64		2	3-1/4	TC19015	32.05	TC79015	38.85
.2362		6 mm	50 mm	82 mm	TC19360	36.90	TC79360	44.00
.2380	B		2	3-1/4	TC19102	33.65	TC79102	40.45
.2420	C		2	3-1/4	TC19103	33.90	TC79103	40.70
.2460	D		2	3-1/4	TC19104	34.30	TC79104	41.10
.2500	1/4		2	3-1/4	TC19016	33.65	TC79016	40.45
.2500	E		2	3-1/4	TC19105	33.65	TC79105	40.45
.2559		6.5 mm	50 mm	82 mm	TC19365	58.90	TC79365	70.15
.2570	F		2	3-1/4	TC19106	39.90	TC79106	46.95
.2610	G		2-1/8	3-1/2	TC19107	42.90	TC79107	49.75
.2656	17/64		2-1/8	3-1/2	TC19017	37.85	TC79017	46.05
.2660	H		2-1/8	3-1/2	TC19108	44.30	TC79108	50.85
.2720	I		2-1/8	3-1/2	TC19109	44.90	TC79109	51.70
.2756		7 mm	54 mm	89 mm	TC19370	64.50	TC79370	76.80
.2770	J		2-1/8	3-1/2	TC19110	47.75	TC79110	53.05
.2810	K		2-1/8	3-1/2	TC19111	47.85	TC79111	53.55
.2813	9/32		2-1/8	3-1/2	TC19018	39.20	TC79018	47.50
.2900	L		2-1/8	3-1/2	TC19112	48.05	TC79112	56.20
.2950	M		2-3/8	3-3/4	TC19113	48.35	TC79113	56.50
.2953		7.5 mm	60 mm	95 mm	TC19375	66.60	TC79375	74.80
.2969	19/64		2-3/8	3-3/4	TC19019	44.35	TC79019	52.50
.3020	N		2-3/8	3-3/4	TC19114	53.10	TC79114	61.25

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DRILLS - CARBIDE

Jobber Length - 118° Split Point (Cont.)

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DRILL DIAMETER			FLUTE LENGTH	OAL	UNCOATED		AlTiN COATED	
dec. equiv.	size	metric			TOOL #	PRICE	TOOL #	PRICE
$D_1^{+.0000"$ $-.0005"$			L ₂	L ₁				
.3125	5/16		2-3/8	3-3/4	TC19020	46.40	TC79020	55.30
.3150		8 mm	60 mm	95 mm	TC19380	70.80	TC79380	83.85
.3160	O		2-3/8	3-3/4	TC19115	56.10	TC79115	64.65
.3230	P		2-3/8	3-3/4	TC19116	57.95	TC79116	67.10
.3281	21/64		2-1/2	4	TC19021	50.95	TC79021	60.65
.3320	Q		2-1/2	4	TC19117	61.60	TC79117	69.60
.3346		8.5 mm	63 mm	100 mm	TC19385	87.40	TC79385	98.15
.3390	R		2-1/2	4	TC19118	63.45	TC79118	73.15
.3438	11/32		2-1/2	4	TC19022	55.40	TC79022	65.95
.3480	S		2-1/2	4	TC19119	68.00	TC79119	77.35
.3543		9 mm	70 mm	100 mm	TC19390	98.65	TC79390	117.60
.3580	T		2-3/4	4-1/4	TC19120	70.55	TC79120	80.15
.3594	23/64		2-3/4	4-1/4	TC19023	61.90	TC79023	73.80
.3680	U		2-3/4	4-1/4	TC19121	73.95	TC79121	82.10
.3740		9.5 mm	70 mm	108 mm	TC19395	112.70	TC79395	123.15
.3750	3/8		2-3/4	4-1/4	TC19024	66.00	TC79024	78.25
.3770	V		2-3/4	4-1/4	TC19122	80.10	TC79122	92.25
.3860	W		2-7/8	4-1/2	TC19123	83.75	TC79123	95.90
.3906	25/64		2-7/8	4-1/2	TC19025	77.25	TC79025	91.65
.3937		10 mm	73 mm	114 mm	TC19400	130.00	TC79400	154.10
.3970	X		2-7/8	4-1/2	TC19124	91.50	TC79124	103.65
.4040	Y		2-7/8	4-1/2	TC19125	94.85	TC79125	107.00
.4063	13/32		2-7/8	4-1/2	TC19026	84.60	TC79026	100.35
.4130	Z		2-7/8	4-1/2	TC19126	117.70	TC79126	122.65
.4134		10.5 mm	73 mm	114 mm	TC19405	144.65	TC79405	156.80
.4219	27/64		2-7/8	4-1/2	TC19027	92.05	TC79027	109.10
.4331		11 mm	73 mm	114 mm	TC19410	172.15	TC79410	184.30
.4375	7/16		2-7/8	4-1/2	TC19028	95.85	TC79028	114.20
.4528		11.5 mm	76 mm	120 mm	TC19415	177.25	TC79415	191.40
.4531	29/64		3	4-3/4	TC19029	111.70	TC79029	132.45
.4688	15/32		3	4-3/4	TC19030	116.45	TC79030	138.00
.4724		12 mm	76 mm	120 mm	TC19420	197.65	TC79420	211.80
.4844	31/64		3	4-3/4	TC19031	119.65	TC79031	141.90
.5000	1/2		3	4-3/4	TC19032	119.35	TC79032	142.20

Drills
Carbide
Cobalt
HSS

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DRILLS - CARBIDE**Straight Flute - 140° Split Point**

- Straight flute style
- Engineered for excellent performance in high rockwell and difficult to machine materials
- AlTiN coating offers increased wear and heat resistance
- Solid carbide
- Precision manufactured in the USA

DRILL DIAMETER dec. equiv. size		FLUTE LENGTH	OAL	UNCOATED		AlTiN COATED	
D1 ^{+0.0000"} _{-.0005"}		L2	L1	TOOL #	PRICE	TOOL #	PRICE
.1250	1/8	3/4	2	TC19508	16.95	TC79508	21.35
.1285	#30	3/4	2	TC19730	18.05	TC79730	22.75
.1360	#29	3/4	2	TC19729	18.45	TC79729	23.40
.1405	#28	3/4	2	TC19728	18.75	TC79728	23.70
.1406	9/64	3/4	2	TC19509	19.40	TC79509	24.35
.1440	#27	7/8	2	TC19727	19.45	TC79727	24.40
.1470	#26	7/8	2	TC19726	19.75	TC79726	24.70
.1495	#25	7/8	2	TC19725	20.00	TC79725	24.95
.1520	#24	7/8	2	TC19724	20.65	TC79724	25.60
.1540	#23	7/8	2	TC19723	21.20	TC79723	26.15
.1563	5/32	7/8	2	TC19510	21.80	TC79510	26.75
.1570	#22	7/8	2	TC19722	22.15	TC79722	27.10
.1590	#21	7/8	2	TC19721	22.55	TC79721	27.50
.1610	#20	7/8	2	TC19720	22.70	TC79720	27.65
.1660	#19	7/8	2	TC19719	23.45	TC79719	28.40
.1695	#18	7/8	2	TC19718	23.60	TC79718	28.55
.1719	11/64	7/8	2	TC19511	24.15	TC79511	29.10
.1730	#17	7/8	2	TC19717	24.50	TC79717	29.45
.1770	#16	7/8	2	TC19716	24.95	TC79716	29.90
.1800	#15	7/8	2	TC19715	25.05	TC79715	30.00
.1820	#14	7/8	2	TC19714	25.25	TC79714	30.20
.1850	#13	7/8	2	TC19713	25.55	TC79713	30.50
.1875	3/16	7/8	2	TC19512	22.40	TC79512	27.35
.1890	#12	1-1/8	2-1/2	TC19712	25.80	TC79712	32.15
.1910	#11	1-1/8	2-1/2	TC19711	26.40	TC79711	32.75
.1935	#10	1-1/8	2-1/2	TC19710	26.95	TC79710	33.30
.1960	#9	1-1/8	2-1/2	TC19709	27.25	TC79709	33.60
.1990	#8	1-1/8	2-1/2	TC19708	28.10	TC79708	34.45
.2010	#7	1-1/8	2-1/2	TC19707	28.65	TC79707	35.00
.2031	13/64	1-1/8	2-1/2	TC19513	28.90	TC79513	35.25
.2040	#6	1-1/8	2-1/2	TC19706	29.60	TC79706	35.95
.2055	#5	1-1/8	2-1/2	TC19705	30.20	TC79705	36.55
.2090	#4	1-1/8	2-1/2	TC19704	29.80	TC79704	36.15
.2130	#3	1-1/8	2-1/2	TC19703	31.40	TC79703	37.75
.2188	7/32	1-1/8	2-1/2	TC19514	32.70	TC79514	39.05
.2210	#2	1-1/4	2-1/2	TC19702	32.95	TC79702	39.30
.2280	#1	1-1/4	2-1/2	TC19701	33.30	TC79701	39.65

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DRILLS - CARBIDE

Straight Flute - 140° Split Point (Cont.)

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DRILL DIAMETER dec. equiv. size		FLUTE LENGTH	OAL	UNCOATED		AlTiN COATED	
$D_1^{+0.0000^-0.0005}$		L ₂	L ₁	TOOL #	PRICE	TOOL #	PRICE
.2340	A	1-1/4	2-1/2	TC19601	34.30	TC79601	40.65
.2344	15/64	1-1/4	2-1/2	TC19515	34.30	TC79515	40.65
.2380	B	1-1/4	2-1/2	TC19602	34.30	TC79602	40.65
.2420	C	1-1/4	2-1/2	TC19603	34.30	TC79603	40.65
.2460	D	1-1/4	2-1/2	TC19604	34.30	TC79604	40.65
.2500	1/4	1-1/4	2-1/2	TC19516	32.60	TC79516	38.95
.2500	E	1-1/4	2-1/2	TC19605	32.60	TC79605	38.95
.2570	F	1-1/4	2-1/2	TC19606	45.15	TC79606	52.75
.2610	G	1-1/4	2-1/2	TC19607	45.15	TC79607	52.75
.2656	17/64	1-1/4	2-1/2	TC19517	45.15	TC79517	52.75
.2660	H	1-1/4	2-1/2	TC19608	45.15	TC79608	52.75
.2720	I	1-1/4	2-1/2	TC19609	47.20	TC79609	54.80
.2770	J	1-1/4	2-1/2	TC19610	46.85	TC79610	54.45
.2810	K	1-1/4	2-1/2	TC19611	46.85	TC79611	54.45
.2813	9/32	1-1/4	2-1/2	TC19518	47.20	TC79518	54.80
.2900	L	1-1/4	2-1/2	TC19612	49.65	TC79612	57.25
.2950	M	1-1/4	2-1/2	TC19613	49.65	TC79613	57.25
.2969	19/64	1-1/4	2-1/2	TC19519	49.65	TC79519	57.25
.3020	N	1-1/4	2-1/2	TC19614	51.40	TC79614	59.00
.3125	5/16	1-1/4	2-1/2	TC19520	51.65	TC79520	59.25
.3160	O	1-3/8	3	TC19615	51.65	TC79615	60.70
.3230	P	1-3/8	3	TC19616	55.30	TC79616	64.35
.3281	21/64	1-3/8	3	TC19521	55.50	TC79521	64.55
.3320	Q	1-3/8	3	TC19617	61.30	TC79617	70.35
.3390	R	1-3/8	3	TC19618	61.60	TC79618	70.65
.3438	11/32	1-3/8	3	TC19522	61.60	TC79522	70.65
.3480	S	1-3/8	3	TC19619	67.05	TC79619	76.10
.3580	T	1-3/8	3	TC19620	67.05	TC79620	76.10
.3594	23/64	1-3/8	3	TC19523	67.05	TC79523	76.10
.3680	U	1-3/8	3	TC19621	74.40	TC79621	83.45
.3750	3/8	1-3/8	3	TC19524	66.50	TC79524	75.55
.3770	V	1-3/8	3	TC19622	74.40	TC79622	84.95
.3860	W	1-3/8	3	TC19623	82.25	TC79623	92.80
.3906	25/64	1-3/8	3	TC19525	82.65	TC79525	90.05
.3970	X	1-3/8	3	TC19624	90.95	TC79624	101.50
.4040	Y	1-3/8	3	TC19625	95.40	TC79625	105.95
.4063	13/32	1-3/8	3	TC19526	78.70	TC79526	89.25
.4130	Z	1-3/8	3	TC19626	99.75	TC79626	110.30
.4219	27/64	1-3/8	3	TC19527	99.75	TC79527	110.30
.4375	7/16	1-3/8	3	TC19528	97.75	TC79528	108.30
.4688	15/32	1-3/8	3	TC19530	108.25	TC79530	120.55
.5000	1/2	1-3/8	3	TC19532	117.30	TC79532	139.75

Drills

Carbide

Cobalt

HSS

For technical information, see 223

DRILLS - CARBIDE

3 Flute - 150° Point



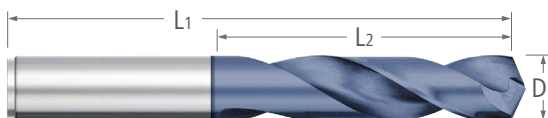
- 150° point angle aids in elimination of exit burrs
- 3 flute geometry for simplified exit through angled surfaces
- AlTiN coating offers increased wear and heat resistance
- Solid carbide
- Precision manufactured in the USA

DRILL DIAMETER		FLUTE LENGTH	OAL	UNCOATED		AlTiN COATED		
dec. equiv.	size			TOOL #	PRICE	TOOL #	PRICE	
$D1^{+0.0000''}_{-0.0005''}$		L2	L1					
.1250	1/8	1-1/4	2-1/4	TC20275	24.40	TC20375	29.10	NEW
.1406	9/64	1-3/8	2-1/2	TC20276	28.30	TC20376	33.60	NEW
.1563	5/32	1-3/8	2-1/2	TC20277	27.70	TC20377	33.00	NEW
.1719	11/64	1-5/8	2-3/4	TC20278	31.40	TC20378	36.70	NEW
.1875	3/16	1-5/8	2-3/4	TC20279	30.60	TC20379	35.90	NEW
.2031	13/64	1-3/4	3	TC20280	33.40	TC20380	39.75	NEW
.2188	7/32	1-3/4	3	TC20281	39.10	TC20381	45.45	NEW
.2344	15/64	2	3-1/4	TC20282	43.70	TC20382	50.50	NEW
.2500	1/4	2	3-1/4	TC20283	46.00	TC20383	52.80	NEW
.2656	17/64	2-1/8	3-1/2	TC20284	49.10	TC20384	57.25	NEW
.2813	9/32	2-1/8	3-1/2	TC20285	60.00	TC20385	68.15	NEW
.3125	5/16	2-3/8	3-3/4	TC20287	72.40	TC20387	80.55	NEW
.3438	11/32	2-1/2	4	TC20289	83.00	TC20389	92.70	NEW
.3750	3/8	2-3/4	4-1/4	TC20291	93.90	TC20391	104.40	NEW
.4063	13/32	2-7/8	4-1/2	TC20293	106.90	TC20393	119.05	NEW
.4375	7/16	2-7/8	4-1/2	TC20295	116.20	TC20395	128.35	NEW
.5000	1/2	3	4-3/4	TC20299	139.90	TC20399	154.05	NEW

For technical information, see 223

DRILLS - COBALT

Stub Length - 135° Split Point



- Stub length for increased rigidity
- Optimized for drilling stainless steels, nickel-based alloys, and titanium alloys
- 135° split point, type "J" (diameters <.0625" are not split)
- Gold Oxide finish extends tool life, improves lubricity, and reduces grinding stresses
- AlTiN coating offers increased wear and heat resistance
- M42 cobalt (identification ring on shank)
- Precision manufactured in the USA

DRILL DIAMETER dec. equiv. size		FLUTE LENGTH	OAL	PACKAGE QTY.	GOLD OXIDE FINISH		AlTiN COATED	
D1		L2	L1		TOOL #	PRICE	TOOL #	PRICE
.0400	#60	1/2	1-3/8	12	CD32660	2.30	CD60360	3.90
.0410	#59	1/2	1-3/8	12	CD32659	2.30	CD60359	3.90
.0420	#58	1/2	1-3/8	12	CD32658	2.30	CD60358	6.75
.0430	#57	1/2	1-3/8	12	CD32657	2.20	CD60357	3.70
.0465	#56	1/2	1-3/8	12	CD32656	2.20	CD60356	3.70
.0520	#55	5/8	1-5/8	12	CD32655	2.20	CD60355	3.70
.0550	#54	5/8	1-5/8	12	CD32654	2.20	CD60354	3.70
.0595	#53	5/8	1-5/8	12	CD32653	2.20	CD60353	3.70
.0625	1/16	5/8	1-5/8	12	CD32504	1.85	CD60204	3.25
.0635	#52	11/16	1-11/16	12	CD32652	1.90	CD60352	3.45
.0670	#51	11/16	1-11/16	12	CD32651	1.90	CD60351	3.45
.0700	#50	11/16	1-11/16	12	CD32650	1.90	CD60350	3.45
.0730	#49	11/16	1-11/16	12	CD32649	1.90	CD60349	3.45
.0760	#48	11/16	1-11/16	12	CD32648	1.90	CD60348	3.45
.0781	5/64	11/16	1-11/16	12	CD32505	1.85	CD60205	3.25
.0785	#47	11/16	1-11/16	12	CD32647	1.90	CD60347	3.45
.0810	#46	3/4	1-3/4	12	CD32646	1.90	CD60346	3.45
.0820	#45	3/4	1-3/4	12	CD32645	1.90	CD60345	3.45
.0860	#44	3/4	1-3/4	12	CD32644	1.90	CD60344	3.45
.0890	#43	3/4	1-3/4	12	CD32643	1.90	CD60343	3.45
.0935	#42	3/4	1-3/4	12	CD32642	1.90	CD60342	3.45
.0938	3/32	3/4	1-3/4	12	CD32506	1.85	CD60206	3.25
.0960	#41	13/16	1-13/16	12	CD32641	1.90	CD60341	3.45
.0980	#40	13/16	1-13/16	12	CD32640	1.95	CD60340	3.45
.0995	#39	13/16	1-13/16	12	CD32639	1.95	CD60339	3.45
.1015	#38	13/16	1-13/16	12	CD32638	1.95	CD60338	3.45
.1040	#37	13/16	1-13/16	12	CD32637	2.25	CD60337	3.80
.1065	#36	13/16	1-13/16	12	CD32636	2.25	CD60336	3.80
.1094	7/64	13/16	1-13/16	12	CD32507	2.05	CD60207	3.65
.1100	#35	7/8	1-7/8	12	CD32635	2.25	CD60335	3.80
.1110	#34	7/8	1-7/8	12	CD32634	2.25	CD60334	3.80
.1130	#33	7/8	1-7/8	12	CD32633	2.25	CD60333	3.80
.1160	#32	7/8	1-7/8	12	CD32632	2.30	CD60332	3.90
.1200	#31	7/8	1-7/8	12	CD32631	2.30	CD60331	3.90
.1250	1/8	7/8	1-7/8	12	CD32508	2.40	CD60208	4.15

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For technical information, see 224 - 225

DRILLS - COBALT

Stub Length - 135° Split Point (Cont.)

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DRILL DIAMETER dec. equiv. size		FLUTE LENGTH	OAL	PACKAGE QTY.	GOLD OXIDE FINISH		AITIN COATED	
D ₁		L ₂	L ₁		TOOL #	PRICE	TOOL #	PRICE
.1285	#30	15/16	1-15/16	12	CD32630	2.30	CD60330	3.90
.1360	#29	15/16	1-15/16	12	CD32629	2.40	CD60329	4.15
.1405	#28	15/16	1-15/16	12	CD32628	2.40	CD60328	4.15
.1406	9/64	15/16	1-15/16	12	CD32509	2.40	CD60209	4.15
.1440	#27	1	2-1/16	12	CD32627	2.60	CD60327	4.55
.1470	#26	1	2-1/16	12	CD32626	2.60	CD60326	4.55
.1495	#25	1	2-1/16	12	CD32625	2.60	CD60325	4.55
.1520	#24	1	2-1/16	12	CD32624	2.75	CD60324	4.85
.1540	#23	1	2-1/16	12	CD32623	2.75	CD60323	4.85
.1563	5/32	1	2-1/16	12	CD32510	2.60	CD60210	4.55
.1570	#22	1-1/16	2-1/8	12	CD32622	2.75	CD60322	4.85
.1590	#21	1-1/16	2-1/8	12	CD32621	2.75	CD60321	4.85
.1610	#20	1-1/16	2-1/8	12	CD32620	2.75	CD60320	4.85
.1660	#19	1-1/16	2-1/8	12	CD32619	2.75	CD60319	4.85
.1695	#18	1-1/16	2-1/8	12	CD32618	2.95	CD60318	5.15
.1719	11/64	1-1/16	2-1/8	12	CD32511	2.95	CD60211	5.15
.1730	#17	1-1/8	2-3/16	12	CD32617	3.35	CD60317	6.05
.1770	#16	1-1/8	2-3/16	12	CD32616	3.45	CD60316	6.25
.1800	#15	1-1/8	2-3/16	12	CD32615	3.45	CD60315	6.30
.1820	#14	1-1/8	2-3/16	12	CD32614	3.45	CD60314	6.30
.1850	#13	1-1/8	2-3/16	12	CD32613	3.45	CD60313	6.30
.1875	3/16	1-1/8	2-3/16	12	CD32512	3.35	CD60212	6.05
.1890	#12	1-3/16	2-1/4	12	CD32612	3.50	CD60312	6.35
.1910	#11	1-3/16	2-1/4	12	CD32611	3.50	CD60311	6.35
.1935	#10	1-3/16	2-1/4	12	CD32610	3.70	CD60310	6.60
.1960	#9	1-3/16	2-1/4	12	CD32609	3.70	CD60309	6.60
.1990	#8	1-3/16	2-1/4	12	CD32608	3.70	CD60308	6.60
.2010	#7	1-3/16	2-1/4	12	CD32607	3.70	CD60307	6.60
.2031	13/64	1-3/16	2-1/4	12	CD32513	3.90	CD60213	6.90
.2040	#6	1-1/4	2-3/8	12	CD32606	4.60	CD60306	8.40
.2055	#5	1-1/4	2-3/8	12	CD32605	4.60	CD60305	8.40
.2090	#4	1-1/4	2-3/8	12	CD32604	4.60	CD60304	8.40
.2130	#3	1-1/4	2-3/8	12	CD32603	5.15	CD60303	9.35
.2188	7/32	1-1/4	2-3/8	12	CD32514	4.20	CD60214	7.65
.2210	#2	1-5/16	2-7/16	12	CD32602	5.15	CD60302	9.35
.2280	#1	1-5/16	2-7/16	12	CD32601	5.15	CD60301	9.35
.2340	A	1-5/16	2-7/16	12	CD32701	5.40	CD60401	9.75
.2344	15/64	1-5/16	2-7/16	12	CD32515	4.45	CD60215	8.20
.2380	B	1-3/8	2-1/2	12	CD32702	5.65	CD60402	10.20
.2420	C	1-3/8	2-1/2	12	CD32703	5.65	CD60403	10.20
.2460	D	1-3/8	2-1/2	12	CD32704	5.65	CD60404	10.20
.2500	1/4	1-3/8	2-1/2	12	CD32516	4.65	CD60216	8.50
.2500	E	1-3/8	2-1/2	12	CD32705	5.20	CD60405	9.40
.2570	F	1-7/16	2-5/8	6	CD32706	5.95	CD60406	10.90
.2610	G	1-7/16	2-5/8	6	CD32707	5.95	CD60407	10.90
.2656	17/64	1-7/16	2-5/8	6	CD32517	5.30	CD60217	9.75

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For technical information, see 224 - 225

DRILLS - COBALT

Stub Length - 135° Split Point (Cont.)

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DRILL DIAMETER dec. equiv. size		FLUTE LENGTH	OAL	PACKAGE QTY.	GOLD OXIDE FINISH		AITIN COATED	
D ₁		L ₂	L ₁		TOOL #	PRICE	TOOL #	PRICE
.2660	H	1-1/2	2-11/16	6	CD32708	6.30	CD60408	11.60
.2720	I	1-1/2	2-11/16	6	CD32709	6.30	CD60409	11.60
.2770	J	1-1/2	2-11/16	6	CD32710	6.30	CD60410	11.60
.2810	K	1-1/2	2-11/16	6	CD32711	6.30	CD60411	11.60
.2813	9/32	1-1/2	2-11/16	6	CD32518	5.75	CD60218	10.55
.2900	L	1-9/16	2-3/4	6	CD32712	7.50	CD60412	13.00
.2950	M	1-9/16	2-3/4	6	CD32713	7.50	CD60413	13.00
.2969	19/64	1-9/16	2-3/4	6	CD32519	6.70	CD60219	12.20
.3020	N	1-5/8	2-13/16	6	CD32714	8.20	CD60414	13.75
.3125	5/16	1-5/8	2-13/16	6	CD32520	7.20	CD60220	12.70
.3160	O	1-11/16	2-15/16	6	CD32715	8.95	CD60415	15.45
.3230	P	1-11/16	2-15/16	6	CD32716	8.95	CD60416	15.45
.3281	21/64	1-11/16	2-15/16	6	CD32521	8.00	CD60221	14.50
.3320	Q	1-11/16	3	6	CD32717	9.80	CD60417	17.70
.3390	R	1-11/16	3	6	CD32718	9.80	CD60418	17.70
.3438	11/32	1-11/16	3	6	CD32522	8.55	CD60222	15.05
.3480	S	1-3/4	3-1/16	6	CD32719	12.10	CD60419	22.05
.3580	T	1-3/4	3-1/16	6	CD32720	12.10	CD60420	22.05
.3594	23/64	1-3/4	3-1/16	6	CD32523	9.95	CD60223	16.95
.3680	U	1-13/16	3-1/8	6	CD32721	12.10	CD60421	22.05
.3750	3/8	1-13/16	3-1/8	6	CD32524	9.95	CD60224	16.95
.3770	V	1-7/8	3-1/4	6	CD32722	13.35	CD60422	24.45
.3860	W	1-7/8	3-1/4	6	CD32723	13.35	CD60423	24.45
.3906	25/64	1-7/8	3-1/4	6	CD32525	11.35	CD60225	19.45
.3970	X	1-15/16	3-5/16	6	CD32724	13.35	CD60424	24.45
.4040	Y	1-15/16	3-5/16	6	CD32725	13.35	CD60425	24.45
.4063	13/32	1-15/16	3-5/16	6	CD32526	11.65	CD60226	21.35
.4130	Z	2	3-3/8	6	CD32726	15.40	CD60426	26.90
.4219	27/64	2	3-3/8	6	CD32527	12.95	CD60227	23.60
.4375	7/16	1-1/16	3-7/16	6	CD32528	13.25	CD60228	24.25
.4531	29/64	2-1/8	3-9/16	6	CD32529	16.05	CD60229	29.15
.4688	15/32	2-1/8	3-5/8	6	CD32530	16.05	CD60230	29.15
.4844	31/64	2-3/16	3-11/16	6	CD32531	16.05	CD60231	29.15
.5000	1/2	2-1/4	3-3/4	6	CD32532	16.05	CD60232	29.15

Drills
Carbide
Cobalt
HSS

For technical information, see 224 - 225

DRILLS - COBALT

Jobber Length - 135° Split Point



- Jobber length for deeper drilling applications
- Optimized for drilling stainless steels, nickel-based alloys, and titanium alloys
- 135° split point, type "J" (diameters <.0625" are not split)
- Gold Oxide finish extends tool life, improves lubricity, and reduces grinding stresses
- AlTiN coating offers increased wear and heat resistance
- M42 cobalt (identification ring on shank)
- Precision manufactured in the USA

DRILL DIAMETER dec. equiv. size		FLUTE LENGTH	OAL	PACKAGE QTY.	GOLD OXIDE FINISH		AlTiN COATED	
D1		L2	L1		TOOL #	PRICE	TOOL #	PRICE
.0400	#60	11/16	1-5/8	12	CD50260	2.60	CD60860	4.55
.0410	#59	11/16	1-5/8	12	CD50259	2.60	CD60859	4.55
.0420	#58	11/16	1-5/8	12	CD50258	2.60	CD60858	4.55
.0430	#57	3/4	1-3/4	12	CD50257	2.60	CD60857	4.55
.0465	#56	3/4	1-3/4	12	CD50256	2.60	CD60856	4.55
.0520	#55	7/8	1-7/8	12	CD50255	2.40	CD60855	4.10
.0550	#54	7/8	1-7/8	12	CD50254	2.40	CD60854	4.10
.0595	#53	7/8	1-7/8	12	CD50253	2.40	CD60853	4.10
.0625	1/16	7/8	1-7/8	12	CD50004	2.20	CD60704	3.70
.0635	#52	7/8	1-7/8	12	CD50252	2.20	CD60852	3.80
.0670	#51	1	2	12	CD50251	2.20	CD60851	3.80
.0700	#50	1	2	12	CD50250	2.20	CD60850	3.80
.0730	#49	1	2	12	CD50249	2.20	CD60849	3.80
.0760	#48	1	2	12	CD50248	2.20	CD60848	3.80
.0781	5/64	1	2	12	CD50005	2.20	CD60705	3.70
.0785	#47	1	2	12	CD50247	2.20	CD60847	3.80
.0810	#46	1-1/8	2-1/8	12	CD50246	2.20	CD60846	3.80
.0820	#45	1-1/8	2-1/8	12	CD50245	2.20	CD60845	3.80
.0860	#44	1-1/8	2-1/8	12	CD50244	2.20	CD60844	3.80
.0890	#43	1-1/4	2-1/4	12	CD50243	2.20	CD60843	3.80
.0935	#42	1-1/4	2-1/4	12	CD50242	2.20	CD60842	3.80
.0938	3/32	1-1/4	2-1/4	12	CD50006	2.20	CD60706	3.70
.0960	#41	1-3/8	2-3/8	12	CD50241	2.20	CD60841	3.80
.0980	#40	1-3/8	2-3/8	12	CD50240	2.25	CD60840	3.80
.0995	#39	1-3/8	2-3/8	12	CD50239	2.25	CD60839	3.80
.1015	#38	1-7/16	2-1/2	12	CD50238	2.25	CD60838	3.80
.1040	#37	1-7/16	2-1/2	12	CD50237	2.35	CD60837	4.00
.1065	#36	1-7/16	2-1/2	12	CD50236	2.35	CD60836	4.00
.1094	7/64	1-1/2	2-5/8	12	CD50007	2.30	CD60707	3.85
.1100	#35	1-1/2	2-5/8	12	CD50235	2.40	CD60835	4.05
.1110	#34	1-1/2	2-5/8	12	CD50234	2.40	CD60834	4.05
.1130	#33	1-1/2	2-5/8	12	CD50233	2.40	CD60833	4.05
.1160	#32	1-5/8	2-3/4	12	CD50232	2.45	CD60832	4.20
.1200	#31	1-5/8	2-3/4	12	CD50231	2.45	CD60831	4.30
.1250	1/8	1-5/8	2-3/4	12	CD50008	2.70	CD60708	4.70
.1285	#30	1-5/8	2-3/4	12	CD50230	2.55	CD60830	4.35

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For technical information, see 224 - 225

DRILLS - COBALT

Jobber Length - 135° Split Point (Cont.)

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DRILL DIAMETER dec. equiv. size		FLUTE LENGTH	OAL	PACKAGE QTY.	GOLD OXIDE FINISH		AlTiN COATED	
D ₁		L ₂	L ₁		TOOL #	PRICE	TOOL #	PRICE
.1360	#29	1-3/4	2-7/8	12	CD50229	2.65	CD60829	4.60
.1405	#28	1-3/4	2-7/8	12	CD50228	2.70	CD60828	4.75
.1406	9/64	1-3/4	2-7/8	12	CD50009	2.70	CD60709	4.70
.1440	#27	1-7/8	3	12	CD50227	2.85	CD60827	5.10
.1470	#26	1-7/8	3	12	CD50226	2.85	CD60826	5.10
.1495	#25	1-7/8	3	12	CD50225	2.95	CD60825	5.15
.1520	#24	2	3-1/8	12	CD50224	3.15	CD60824	5.60
.1540	#23	2	3-1/8	12	CD50223	3.15	CD60823	5.60
.1563	5/32	2	3-1/8	12	CD50010	3.00	CD60710	5.25
.1570	#22	2	3-1/8	12	CD50222	3.15	CD60822	5.60
.1590	#21	2-1/8	3-1/4	12	CD50221	3.15	CD60821	5.60
.1610	#20	2-1/8	3-1/4	12	CD50220	3.15	CD60820	5.65
.1660	#19	2-1/8	3-1/4	12	CD50219	3.15	CD60819	5.65
.1695	#18	2-1/8	3-1/4	12	CD50218	3.25	CD60818	5.80
.1719	11/64	2-1/8	3-1/4	12	CD50011	3.15	CD60711	5.55
.1730	#17	2-3/16	3-3/8	12	CD50217	3.50	CD60817	6.35
.1770	#16	2-3/16	3-3/8	12	CD50216	3.65	CD60816	6.50
.1800	#15	2-3/16	3-3/8	12	CD50215	4.00	CD60815	7.15
.1820	#14	2-3/16	3-3/8	12	CD50214	4.00	CD60814	7.15
.1850	#13	2-5/16	3-1/2	12	CD50213	4.00	CD60813	7.15
.1875	3/16	2-5/16	3-1/2	12	CD50012	3.45	CD60712	6.25
.1890	#12	2-5/16	3-1/2	12	CD50212	4.05	CD60812	7.25
.1910	#11	2-5/16	3-1/2	12	CD50211	4.05	CD60811	7.25
.1935	#10	2-7/16	3-5/8	12	CD50210	4.05	CD60810	7.25
.1960	#9	2-7/16	3-5/8	12	CD50209	4.05	CD60809	7.25
.1990	#8	2-7/16	3-5/8	12	CD50208	4.05	CD60808	7.25
.2010	#7	2-7/16	3-5/8	12	CD50207	4.05	CD60807	7.25
.2031	13/64	2-7/16	3-5/8	12	CD50013	4.15	CD60713	7.55
.2040	#6	2-1/2	3-3/4	12	CD50206	5.15	CD60806	9.35
.2055	#5	2-1/2	3-3/4	12	CD50205	5.15	CD60805	9.35
.2090	#4	2-1/2	3-3/4	12	CD50204	5.15	CD60804	9.35
.2130	#3	2-1/2	3-3/4	12	CD50203	5.15	CD60803	9.35
.2188	7/32	2-1/2	3-3/4	12	CD50014	4.55	CD60714	8.20
.2210	#2	2-5/8	3-7/8	12	CD50202	5.50	CD60802	10.00
.2280	#1	2-5/8	3-7/8	12	CD50201	5.50	CD60801	10.00
.2340	A	2-5/8	3-7/8	12	CD50301	5.45	CD60901	9.90
.2344	15/64	2-5/8	3-7/8	12	CD50015	4.75	CD60715	8.70
.2380	B	2-3/4	4	12	CD50302	6.25	CD60902	11.15
.2420	C	2-3/4	4	12	CD50303	6.25	CD60903	11.15
.2460	D	2-3/4	4	12	CD50304	7.05	CD60904	11.95
.2500	1/4	2-3/4	4	12	CD50016	5.15	CD60716	9.35
.2500	E	2-3/4	4	12	CD50305	5.15	CD60905	9.35
.2570	F	2-7/8	4-1/8	6	CD50306	6.25	CD60906	11.40
.2610	G	2-7/8	4-1/8	6	CD50307	6.25	CD60907	11.40
.2656	17/64	2-7/8	4-1/8	6	CD50017	5.80	CD60717	10.60
.2660	H	2-7/8	4-1/8	6	CD50308	7.05	CD60908	12.85

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For technical information, see 224 - 225

DRILLS - COBALT**Jobber Length - 135° Split Point (Cont.)**

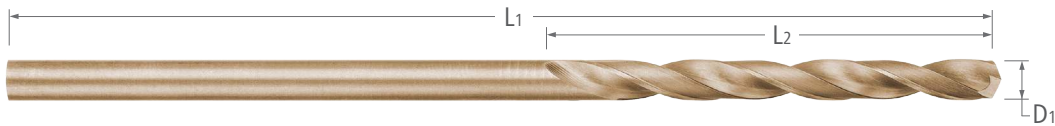
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DRILL DIAMETER dec. equiv. size		FLUTE LENGTH	OAL	PACKAGE QTY.	GOLD OXIDE FINISH		AlTiN COATED	
D ₁		L ₂	L ₁		TOOL #	PRICE	TOOL #	PRICE
.2720	I	2-7/8	4-1/8	6	CD50309	7.05	CD60909	12.85
.2770	J	2-7/8	4-1/8	6	CD50310	7.05	CD60910	12.85
.2810	K	2-15/16	4-1/4	6	CD50311	7.05	CD60911	12.85
.2813	9/32	2-15/16	4-1/4	6	CD50018	6.05	CD60718	11.05
.2900	L	2-15/16	4-1/4	6	CD50312	8.05	CD60912	14.35
.2950	M	3-1/16	4-3/8	6	CD50313	8.45	CD60913	14.75
.2969	19/64	3-1/16	4-3/8	6	CD50019	7.40	CD60719	13.55
.3020	N	3-1/16	4-3/8	6	CD50314	8.45	CD60914	14.75
.3125	5/16	3-3/16	4-1/2	6	CD50020	8.00	CD60720	14.30
.3160	O	3-3/16	4-1/2	6	CD50315	9.40	CD60915	16.95
.3230	P	3-5/16	4-5/8	6	CD50316	10.00	CD60916	17.55
.3281	21/64	3-5/16	4-5/8	6	CD50021	8.75	CD60721	15.10
.3320	Q	3-7/16	4-3/4	6	CD50317	10.30	CD60917	17.85
.3390	R	3-7/16	4-3/4	6	CD50318	10.30	CD60918	17.80
.3438	11/32	3-7/16	4-3/4	6	CD50022	9.65	CD60722	17.20
.3480	S	3-1/2	4-7/8	6	CD50319	12.70	CD60919	21.90
.3580	T	3-1/2	4-7/8	6	CD50320	12.70	CD60920	23.05
.3594	23/64	3-1/2	4-7/8	6	CD50023	11.05	CD60723	18.60
.3680	U	3-5/8	5	6	CD50321	12.70	CD60921	23.05
.3750	3/8	3-5/8	5	6	CD50024	11.05	CD60724	18.60
.3770	V	3-5/8	5	6	CD50322	13.95	CD60922	25.40
.3860	W	3-3/4	5-1/8	6	CD50323	13.95	CD60923	25.40
.3906	25/64	3-3/4	5-1/8	6	CD50025	12.55	CD60725	22.00
.3970	X	3-3/4	5-1/8	6	CD50324	13.95	CD60924	25.40
.4040	Y	3-7/8	5-1/4	6	CD50325	14.80	CD60925	26.95
.4063	13/32	3-7/8	5-1/4	6	CD50026	13.00	CD60726	22.45
.4130	Z	3-7/8	5-1/4	6	CD50326	16.05	CD60926	29.30
.4219	27/64	3-15/16	5-3/8	6	CD50027	14.40	CD60727	26.25
.4375	7/16	4-1/16	5-1/2	6	CD50028	14.75	CD60728	26.90
.4531	29/64	4-3/16	5-5/8	6	CD50029	17.60	CD60729	32.20
.4688	15/32	4-5/16	5-3/4	6	CD50030	18.10	CD60730	32.85
.4844	31/64	4-3/8	5-7/8	6	CD50031	18.20	CD60731	33.00
.5000	1/2	4-1/2	6	6	CD50032	18.20	CD60732	32.30

For technical information, see 224 - 225

DRILLS - COBALT

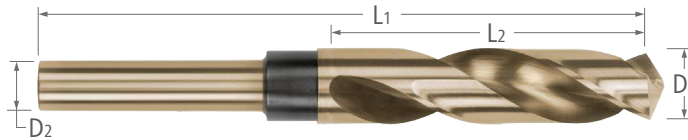
Aircraft Extension Drills - 135° Split Point



- 135° split point, type "J"
- M42 cobalt
- Offered in 6" and 12" overall lengths
- Gold Oxide finish extends tool life, improves lubricity, and reduces grinding stresses
- Precision manufactured in the USA

DRILL DIAMETER dec. equiv. size		FLUTE LENGTH	OAL	PACKAGE QTY.	GOLD OXIDE FINISH	
D1		L2	L1		TOOL #	PRICE
.0938	3/32	1-1/4	6	6	CD67706	8.45
.0980	#40	1-5/8	6	6	CD67840	7.15
.0980	#40	1-3/8	12	6	CD68940	25.65
.1094	7/64	1-1/2	6	6	CD67707	9.55
.1250	1/8	1-5/8	6	6	CD67708	7.80
.1250	1/8	1-5/8	12	6	CD68808	24.00
.1285	#30	1-5/8	6	6	CD67830	7.80
.1285	#30	1-5/8	12	6	CD68930	23.25
.1360	#29	1-3/4	6	6	CD67829	11.45
.1360	#29	1-3/4	12	6	CD68929	25.65
.1406	9/64	1-3/4	6	6	CD67709	10.60
.1406	9/64	1-3/4	12	6	CD68809	26.35
.1563	5/32	2	6	6	CD67710	10.60
.1563	5/32	2	12	6	CD68810	24.20
.1590	#21	2-1/8	6	6	CD67821	10.35
.1590	#21	2-1/8	12	6	CD68921	24.70
.1610	#20	2-1/8	6	6	CD67820	10.35
.1610	#20	2-1/8	12	6	CD68920	24.60
.1719	11/64	2-1/8	6	6	CD67711	11.70
.1719	11/64	2-1/8	12	6	CD68811	26.20
.1875	3/16	2-5/16	6	6	CD67712	9.95
.1875	3/16	2-5/16	12	6	CD68812	25.50
.1910	#11	2-5/16	6	6	CD67811	10.95
.1910	#11	2-5/16	12	6	CD68911	26.65
.1935	#10	2-7/16	6	6	CD67810	11.35
.1935	#10	2-7/16	12	6	CD68910	27.70
.2031	13/64	2-7/16	6	6	CD67713	14.60
.2031	13/64	2-7/16	12	6	CD68813	33.35
.2188	7/32	2-1/2	6	6	CD67714	14.85
.2188	7/32	2-1/2	12	6	CD68814	30.20
.2210	#2	2-5/8	6	6	CD67802	16.60
.2280	#1	2-5/8	6	6	CD67801	16.60
.2280	#1	2-5/8	12	6	CD68901	35.80
.2344	15/64	2-5/8	6	6	CD67715	15.90
.2344	15/64	2-5/8	12	6	CD68815	32.00
.2500	1/4	2-3/4	6	6	CD67716	15.50
.2500	1/4	2-3/4	12	6	CD68816	29.50

For technical information, see 224 - 225

DRILLS - COBALT**Silver & Deming - 135° Split Point**

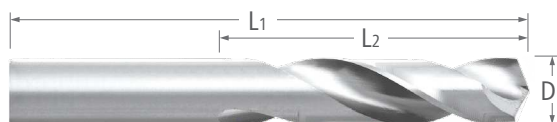
- 3" flute length
- 135° split point
- 1/2" shank
- Gold Oxide finish extends tool life, improves lubricity, and reduces grinding stresses
- M42 cobalt
- Precision manufactured in the USA

DRILL DIAMETER dec. equiv. size		FLUTE LENGTH	OAL	SHANK DIA.	GOLD OXIDE FINISH	
D1		L2	L1	D2	TOOL #	PRICE
.5156	33/64	3	6	1/2	SD93633	44.60
.5313	17/32	3	6	1/2	SD93634	44.60
.5469	35/64	3	6	1/2	SD93635	53.65
.5625	9/16	3	6	1/2	SD93636	53.65
.5781	37/64	3	6	1/2	SD93637	55.85
.5938	19/32	3	6	1/2	SD93638	55.85
.6094	39/64	3	6	1/2	SD93639	57.25
.6250	5/8	3	6	1/2	SD93640	57.25
.6406	41/64	3	6	1/2	SD93641	59.80
.6563	21/32	3	6	1/2	SD93642	59.80
.6719	43/64	3	6	1/2	SD93643	61.35
.6875	11/16	3	6	1/2	SD93644	61.35
.7031	45/64	3	6	1/2	SD93645	64.65
.7188	23/32	3	6	1/2	SD93646	64.65
.7344	47/64	3	6	1/2	SD93647	67.15
.7500	3/4	3	6	1/2	SD93648	67.15
.7656	49/64	3	6	1/2	SD93649	70.50
.7813	25/32	3	6	1/2	SD93650	70.50
.7969	51/64	3	6	1/2	SD93651	72.05
.8125	13/16	3	6	1/2	SD93652	72.05
.8281	53/64	3	6	1/2	SD93653	77.85
.8438	27/32	3	6	1/2	SD93654	77.85
.8594	55/64	3	6	1/2	SD93655	77.85
.8750	7/8	3	6	1/2	SD93656	77.85
.8906	57/64	3	6	1/2	SD93657	81.25
.9063	29/32	3	6	1/2	SD93658	81.25
.9219	59/64	3	6	1/2	SD93659	84.35
.9375	15/16	3	6	1/2	SD93660	84.35
.9531	61/64	3	6	1/2	SD93661	88.95
.9688	31/32	3	6	1/2	SD93662	88.95
.9844	63/64	3	6	1/2	SD93663	100.95
1.0000	1	3	6	1/2	SD93664	100.95

For technical information, see 224 - 225

DRILLS - HIGH SPEED STEEL

Stub Length - 135° Split Point



- Stub length for increased rigidity
- 135° split point, type "C" (diameters < .0625" not split)
- Bright finish improves performance in plastics and other non-ferrous materials
- Black Oxide finish increases wear resistance and adds lubricity to improve chip flow
- High speed steel
- Precision manufactured in the USA

	DRILL DIAMETER		FLUTE LENGTH	OAL	PACKAGE QTY.	BRIGHT FINISH		BLACK OXIDE FINISH	
	dec. equiv.	size				TOOL #	PRICE	TOOL #	PRICE
	D1		L2	L1					
NEW	.0400	#60	1/2	1-3/8	12	CD32388	1.55	CD30260	1.55
NEW	.0410	#59	1/2	1-3/8	12	CD32387	1.55	CD30259	1.55
NEW	.0420	#58	1/2	1-3/8	12	CD32386	1.55	CD30258	1.55
NEW	.0430	#57	1/2	1-3/8	12	CD32385	1.55	CD30257	1.55
NEW	.0465	#56	1/2	1-3/8	12	CD32384	1.55	CD30256	1.55
NEW	.0520	#55	5/8	1-5/8	12	CD32383	1.55	CD30255	1.55
NEW	.0550	#54	5/8	1-5/8	12	CD32382	1.55	CD30254	1.55
NEW	.0595	#53	5/8	1-5/8	12	CD32381	1.55	CD30253	1.55
NEW	.0625	1/16	5/8	1-5/8	12	CD32300	1.40	CD30004	1.40
NEW	.0635	#52	11/16	1-11/16	12	CD32380	1.55	CD30252	1.55
NEW	.0670	#51	11/16	1-11/16	12	CD32379	1.55	CD30251	1.55
NEW	.0700	#50	11/16	1-11/16	12	CD32378	1.55	CD30250	1.55
NEW	.0730	#49	11/16	1-11/16	12	CD32377	1.55	CD30249	1.55
NEW	.0760	#48	11/16	1-11/16	12	CD32376	1.55	CD30248	1.55
NEW	.0781	5/64	11/16	1-11/16	12	CD32301	1.45	CD30005	1.45
NEW	.0785	#47	11/16	1-11/16	12	CD32375	1.55	CD30247	1.55
NEW	.0810	#46	3/4	1-3/4	12	CD32374	1.55	CD30246	1.55
NEW	.0820	#45	3/4	1-3/4	12	CD32373	1.55	CD30245	1.55
NEW	.0860	#44	3/4	1-3/4	12	CD32372	1.55	CD30244	1.55
NEW	.0890	#43	3/4	1-3/4	12	CD32371	1.55	CD30243	1.55
NEW	.0935	#42	3/4	1-3/4	12	CD32370	1.55	CD30242	1.55
NEW	.0938	3/32	3/4	1-3/4	12	CD32302	1.45	CD30006	1.45
NEW	.0960	#41	13/16	1-13/16	12	CD32369	1.55	CD30241	1.55
NEW	.0980	#40	13/16	1-13/16	12	CD32368	1.55	CD30240	1.55
NEW	.0995	#39	13/16	1-13/16	12	CD32367	1.55	CD30239	1.55
NEW	.1015	#38	13/16	1-13/16	12	CD32366	1.55	CD30238	1.55
NEW	.1040	#37	13/16	1-13/16	12	CD32365	1.55	CD30237	1.55
NEW	.1065	#36	13/16	1-13/16	12	CD32364	1.55	CD30236	1.55
NEW	.1094	7/64	13/16	1-13/16	12	CD32303	1.45	CD30007	1.45
NEW	.1100	#35	7/8	1-7/8	12	CD32363	1.55	CD30235	1.55
NEW	.1110	#34	7/8	1-7/8	12	CD32362	1.55	CD30234	1.55
NEW	.1130	#33	7/8	1-7/8	12	CD32361	1.55	CD30233	1.55
NEW	.1160	#32	7/8	1-7/8	12	CD32360	1.55	CD30232	1.55
NEW	.1200	#31	7/8	1-7/8	12	CD32359	1.55	CD30231	1.55
NEW	.1250	1/8	7/8	1-7/8	12	CD32304	1.45	CD30008	1.45
NEW	.1285	#30	15/16	1-15/16	12	CD32358	1.55	CD30230	1.55

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For technical information, see 224 - 225

DRILLS - HIGH SPEED STEEL

Stub Length - 135° Split Point (Cont.)

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DRILL DIAMETER dec. equiv. size		FLUTE LENGTH	OAL	PACKAGE QTY.	BRIGHT FINISH		BLACK OXIDE FINISH		
D ₁		L ₂	L ₁		TOOL #	PRICE	TOOL #	PRICE	
.1360	#29	15/16	1-15/16	12	CD32357	1.95	CD30229	1.95	NEW
.1405	#28	15/16	1-15/16	12	CD32356	1.95	CD30228	1.95	NEW
.1406	9/64	15/16	1-15/16	12	CD32305	1.45	CD30009	1.45	NEW
.1440	#27	1	2-1/16	12	CD32355	1.95	CD30227	1.95	NEW
.1470	#26	1	2-1/16	12	CD32354	1.95	CD30226	1.95	NEW
.1495	#25	1	2-1/16	12	CD32353	1.95	CD30225	1.95	NEW
.1520	#24	1	2-1/16	12	CD32352	1.95	CD30224	1.95	NEW
.1540	#23	1	2-1/16	12	CD32351	1.95	CD30223	1.95	NEW
.1563	5/32	1	2-1/16	12	CD32306	1.55	CD30010	1.55	NEW
.1570	#22	1-1/16	2-1/8	12	CD32350	1.95	CD30222	1.95	NEW
.1590	#21	1-1/16	2-1/8	12	CD32349	2.00	CD30221	2.00	NEW
.1610	#20	1-1/16	2-1/8	12	CD32348	2.00	CD30220	2.00	NEW
.1660	#19	1-1/16	2-1/8	12	CD32347	2.00	CD30219	2.00	NEW
.1695	#18	1-1/16	2-1/8	12	CD32346	2.00	CD30218	2.00	NEW
.1719	11/64	1-1/16	2-1/8	12	CD32307	1.55	CD30011	1.55	NEW
.1730	#17	1-1/8	2-3/16	12	CD32345	2.10	CD30217	2.10	NEW
.1770	#16	1-1/8	2-3/16	12	CD32344	2.10	CD30216	2.10	NEW
.1800	#15	1-1/8	2-3/16	12	CD32343	2.10	CD30215	2.10	NEW
.1820	#14	1-1/8	2-3/16	12	CD32342	2.10	CD30214	2.10	NEW
.1850	#13	1-1/8	2-3/16	12	CD32341	2.10	CD30213	2.10	NEW
.1875	3/16	1-1/8	2-3/16	12	CD32308	1.75	CD30012	1.75	NEW
.1890	#12	1-3/16	2-1/4	12	CD32340	2.10	CD30212	2.10	NEW
.1910	#11	1-3/16	2-1/4	12	CD32339	2.10	CD30211	2.10	NEW
.1935	#10	1-3/16	2-1/4	12	CD32338	2.10	CD30210	2.10	NEW
.1960	#9	1-3/16	2-1/4	12	CD32337	2.10	CD30209	2.10	NEW
.1990	#8	1-3/16	2-1/4	12	CD32336	2.10	CD30208	2.10	NEW
.2010	#7	1-3/16	2-1/4	12	CD32335	2.10	CD30207	2.10	NEW
.2031	13/64	1-3/16	2-1/4	12	CD32309	1.80	CD30013	1.80	NEW
.2040	#6	1-1/4	2-3/8	12	CD32334	2.35	CD30206	2.35	NEW
.2055	#5	1-1/4	2-3/8	12	CD32333	2.35	CD30205	2.35	NEW
.2090	#4	1-1/4	2-3/8	12	CD32332	2.35	CD30204	2.35	NEW
.2130	#3	1-1/4	2-3/8	12	CD32331	2.35	CD30203	2.35	NEW
.2188	7/32	1-1/4	2-3/8	12	CD32310	2.05	CD30014	2.05	NEW
.2210	#2	1-5/16	2-7/16	12	CD32330	2.30	CD30202	2.30	NEW
.2280	#1	1-5/16	2-7/16	12	CD32329	2.30	CD30201	2.30	NEW
.2340	A	1-5/16	2-7/16	12	CD32389	2.75	CD30301	2.75	NEW
.2344	15/64	1-5/16	2-7/16	12	CD32311	2.30	CD30015	2.30	NEW
.2380	B	1-3/8	2-1/2	12	CD32390	2.85	CD30302	2.85	NEW
.2420	C	1-3/8	2-1/2	12	CD32391	2.85	CD30303	2.85	NEW
.2460	D	1-3/8	2-1/2	12	CD32392	2.90	CD30304	2.90	NEW
.2500	1/4	1-3/8	2-1/2	12	CD32312	2.50	CD30016	2.50	NEW
.2500	E	1-3/8	2-1/2	12	CD32393	2.90	CD30305	2.90	NEW
.2570	F	1-7/16	2-5/8	6	CD32394	3.65	CD30306	3.65	NEW
.2610	G	1-7/16	2-5/8	6	CD32395	3.85	CD30307	3.85	NEW
.2656	17/64	1-7/16	2-5/8	6	CD32313	2.55	CD30017	2.55	NEW
.2660	H	1-1/2	2-11/16	6	CD32396	3.95	CD30308	3.95	NEW

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For technical information, see 224 - 225

DRILLS - HIGH SPEED STEEL

Stub Length - 135° Split Point (Cont.)

continued from previous page

	DRILL DIAMETER		FLUTE LENGTH	OAL	PACKAGE QTY.	BRIGHT FINISH		BLACK OXIDE FINISH	
	dec. equiv.	size				TOOL #	PRICE	TOOL #	PRICE
	D ₁		L ₂	L ₁					
NEW	.2720	I	1-1/2	2-11/16	6	CD32397	4.00	CD30309	4.00
NEW	.2770	J	1-1/2	2-11/16	6	CD32398	4.05	CD30310	4.05
NEW	.2810	K	1-1/2	2-11/16	6	CD32399	4.10	CD30311	4.10
NEW	.2813	9/32	1-1/2	2-11/16	6	CD32314	2.75	CD30018	2.75
NEW	.2900	L	1-9/16	2-3/4	6	CD32400	4.25	CD30312	4.25
NEW	.2950	M	1-9/16	2-3/4	6	CD32401	4.45	CD30313	4.45
NEW	.2969	19/64	1-9/16	2-3/4	6	CD32315	2.95	CD30019	2.95
NEW	.3020	N	1-5/8	2-13/16	6	CD32402	4.60	CD30314	4.60
NEW	.3125	5/16	1-5/8	2-13/16	6	CD32316	3.10	CD30020	3.10
NEW	.3160	O	1-11/16	2-15/16	6	CD32403	5.20	CD30315	5.20
NEW	.3230	P	1-11/16	2-15/16	6	CD32404	5.30	CD30316	5.30
NEW	.3281	21/64	1-11/16	2-15/16	6	CD32317	3.40	CD30021	3.40
NEW	.3320	Q	1-11/16	3	6	CD32405	5.55	CD30317	5.55
NEW	.3390	R	1-11/16	3	6	CD32406	5.65	CD30318	5.65
NEW	.3438	11/32	1-11/16	3	6	CD32318	3.70	CD30022	3.70
NEW	.3480	S	1-3/4	3-1/16	6	CD32407	5.95	CD30319	5.95
NEW	.3580	T	1-3/4	3-1/16	6	CD32408	6.05	CD30320	6.05
NEW	.3594	23/64	1-3/4	3-1/16	6	CD32319	3.90	CD30023	3.90
NEW	.3680	U	1-13/16	3-1/8	6	CD32409	6.55	CD30321	6.55
NEW	.3750	3/8	1-13/16	3-1/8	6	CD32320	4.25	CD30024	4.25
NEW	.3770	V	1-7/8	3-1/4	6	CD32410	6.95	CD30322	6.95
NEW	.3860	W	1-7/8	3-1/4	6	CD32411	7.20	CD30323	7.20
NEW	.3906	25/64	1-7/8	3-1/4	6	CD32321	4.45	CD30025	4.45
NEW	.3970	X	1-15/16	3-5/16	6	CD32412	7.65	CD30324	7.65
NEW	.4040	Y	1-15/16	3-5/16	6	CD32413	7.80	CD30325	7.80
NEW	.4063	13/32	1-15/16	3-5/16	6	CD32322	4.85	CD30026	4.85
NEW	.4130	Z	2	3-3/8	6	CD32414	8.10	CD30326	8.10
NEW	.4219	27/64	2	3-3/8	6	CD32323	5.15	CD30027	5.15
NEW	.4375	7/16	1-1/16	3-7/16	6	CD32324	5.60	CD30028	5.60
NEW	.4531	29/64	2-1/8	3-9/16	6	CD32325	6.00	CD30029	6.00
NEW	.4688	15/32	2-1/8	3-5/8	6	CD32326	6.60	CD30030	6.60
NEW	.4844	31/64	2-3/16	3-11/16	6	CD32327	6.80	CD30031	6.80
NEW	.5000	1/2	2-1/4	3-3/4	6	CD32328	7.15	CD30032	7.15

Drills
Carbide
Cobalt
HSS

For technical information, see 224 - 225

DRILLS - HIGH SPEED STEEL

Jobber Length - 135° Split Point



- Jobber length for deeper drilling applications
- 135° split point, type "B" (diameters < .0625" not split)
- Black Oxide and Black & Gold Oxide finishes available for increased wear resistance and added lubricity for improved chip flow
- High speed steel
- Precision manufactured in the USA

DRILL DIAMETER dec. equiv. size		FLUTE LENGTH	OAL	PACKAGE QTY.	BLACK OXIDE FINISH		BLACK & GOLD OXIDE FINISH	
D1		L2	L1		TOOL #	PRICE	TOOL #	PRICE
.0400	#60	11/16	1-5/8	12	CD44260	1.60	CD44760	1.85
.0410	#59	11/16	1-5/8	12	CD44259	1.60	CD44759	1.85
.0420	#58	11/16	1-5/8	12	CD44258	1.60	CD44758	1.85
.0430	#57	3/4	1-3/4	12	CD44257	1.60	CD44757	1.85
.0465	#56	3/4	1-3/4	12	CD44256	1.60	CD44756	1.85
.0520	#55	7/8	1-7/8	12	CD44255	1.60	CD44755	1.85
.0550	#54	7/8	1-7/8	12	CD44254	1.60	CD44754	1.80
.0595	#53	7/8	1-7/8	12	CD44253	1.60	CD44753	1.85
.0625	1/16	7/8	1-7/8	12	CD44004	1.25	CD44504	1.40
.0635	#52	7/8	1-7/8	12	CD44252	1.60	CD44752	1.85
.0670	#51	1	2	12	CD44251	1.60	CD44751	1.90
.0700	#50	1	2	12	CD44250	1.60	CD44750	1.90
.0730	#49	1	2	12	CD44249	1.60	CD44749	1.90
.0760	#48	1	2	12	CD44248	1.60	CD44748	1.90
.0781	5/64	1	2	12	CD44005	1.25	CD44505	1.40
.0785	#47	1	2	12	CD44247	1.60	CD44747	1.90
.0810	#46	1-1/8	2-1/8	12	CD44246	1.60	CD44746	1.95
.0820	#45	1-1/8	2-1/8	12	CD44245	1.60	CD44745	1.95
.0860	#44	1-1/8	2-1/8	12	CD44244	1.60	CD44744	1.95
.0890	#43	1-1/4	2-1/4	12	CD44243	1.60	CD44743	1.95
.0935	#42	1-1/4	2-1/4	12	CD44242	1.60	CD44742	1.95
.0938	3/32	1-1/4	2-1/4	12	CD44006	1.25	CD44506	1.40
.0960	#41	1-3/8	2-3/8	12	CD44241	1.60	CD44741	1.95
.0980	#40	1-3/8	2-3/8	12	CD44240	1.65	CD44740	2.00
.0995	#39	1-3/8	2-3/8	12	CD44239	1.65	CD44739	2.00
.1015	#38	1-7/16	2-1/2	12	CD44238	1.65	CD44738	1.90
.1040	#37	1-7/16	2-1/2	12	CD44237	1.65	CD44737	2.00
.1065	#36	1-7/16	2-1/2	12	CD44236	1.65	CD44736	2.00
.1094	7/64	1-1/2	2-5/8	12	CD44007	1.25	CD44507	1.45
.1100	#35	1-1/2	2-5/8	12	CD44235	1.65	CD44735	2.00
.1110	#34	1-1/2	2-5/8	12	CD44234	1.65	CD44734	2.00
.1130	#33	1-1/2	2-5/8	12	CD44233	1.65	CD44733	2.00
.1160	#32	1-5/8	2-3/4	12	CD44232	1.65	CD44732	2.00
.1200	#31	1-5/8	2-3/4	12	CD44231	1.65	CD44731	2.00
.1250	1/8	1-5/8	2-3/4	12	CD44008	1.25	CD44508	1.60
.1285	#30	1-5/8	2-3/4	12	CD44230	1.55	CD44730	2.00

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For technical information, see 224 - 225

DRILLS - HIGH SPEED STEEL

Jobber Length - 135° Split Point (Cont.)

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DRILL DIAMETER dec. equiv. size		FLUTE LENGTH	OAL	PACKAGE QTY.	BLACK OXIDE FINISH		BLACK & GOLD OXIDE FINISH	
D ₁		L ₂	L ₁		TOOL #	PRICE	TOOL #	PRICE
.1360	#29	1-3/4	2-7/8	12	CD44229	1.55	CD44729	2.20
.1405	#28	1-3/4	2-7/8	12	CD44228	1.85	CD44728	2.30
.1406	9/64	1-3/4	2-7/8	12	CD44009	1.35	CD44509	1.60
.1440	#27	1-7/8	3	12	CD44227	1.85	CD44727	2.30
.1470	#26	1-7/8	3	12	CD44226	1.85	CD44726	2.35
.1495	#25	1-7/8	3	12	CD44225	1.85	CD44725	2.35
.1520	#24	2	3-1/8	12	CD44224	1.85	CD44724	2.35
.1540	#23	2	3-1/8	12	CD44223	1.85	CD44723	2.35
.1563	5/32	2	3-1/8	12	CD44010	1.55	CD44510	1.95
.1570	#22	2	3-1/8	12	CD44222	1.85	CD44722	2.40
.1590	#21	2-1/8	3-1/4	12	CD44221	1.85	CD44721	2.40
.1610	#20	2-1/8	3-1/4	12	CD44220	2.00	CD44720	2.40
.1660	#19	2-1/8	3-1/4	12	CD44219	2.00	CD44719	2.40
.1695	#18	2-1/8	3-1/4	12	CD44218	2.10	CD44718	2.40
.1719	11/64	2-1/8	3-1/4	12	CD44011	1.65	CD44511	2.00
.1730	#17	2-3/16	3-3/8	12	CD44217	2.10	CD44717	2.65
.1770	#16	2-3/16	3-3/8	12	CD44216	2.10	CD44716	2.65
.1800	#15	2-3/16	3-3/8	12	CD44215	2.10	CD44715	2.65
.1820	#14	2-3/16	3-3/8	12	CD44214	2.10	CD44714	2.65
.1850	#13	2-5/16	3-1/2	12	CD44213	2.10	CD44713	2.65
.1875	3/16	2-5/16	3-1/2	12	CD44012	1.80	CD44512	2.20
.1890	#12	2-5/16	3-1/2	12	CD44212	1.85	CD44712	2.75
.1910	#11	2-5/16	3-1/2	12	CD44211	1.85	CD44711	2.75
.1935	#10	2-7/16	3-5/8	12	CD44210	1.85	CD44710	2.95
.1960	#9	2-7/16	3-5/8	12	CD44209	2.10	CD44709	3.00
.1990	#8	2-7/16	3-5/8	12	CD44208	2.10	CD44708	3.00
.2010	#7	2-7/16	3-5/8	12	CD44207	2.05	CD44707	3.00
.2031	13/64	2-7/16	3-5/8	12	CD44013	2.00	CD44513	2.35
.2040	#6	2-1/2	3-3/4	12	CD44206	2.15	CD44706	3.35
.2055	#5	2-1/2	3-3/4	12	CD44205	2.15	CD44705	3.35
.2090	#4	2-1/2	3-3/4	12	CD44204	2.15	CD44704	3.35
.2130	#3	2-1/2	3-3/4	12	CD44203	2.15	CD44703	3.35
.2188	7/32	2-1/2	3-3/4	12	CD44014	2.15	CD44514	2.60
.2210	#2	2-5/8	3-7/8	12	CD44202	2.30	CD44702	3.60
.2280	#1	2-5/8	3-7/8	12	CD44201	2.30	CD44701	3.60
.2340	A	2-5/8	3-7/8	12	CD44301	2.60	CD44801	3.85
.2344	15/64	2-5/8	3-7/8	12	CD44015	2.30	CD44515	2.80
.2380	B	2-3/4	4	12	CD44302	2.60	CD44802	3.85
.2420	C	2-3/4	4	12	CD44303	2.60	CD44803	3.85
.2460	D	2-3/4	4	12	CD44304	2.60	CD44804	3.75
.2500	1/4	2-3/4	4	12	CD44016	2.45	CD44516	2.95
.2500	E	2-3/4	4	12	CD44305	2.60	CD44805	3.30
.2570	F	2-7/8	4-1/8	6	CD44306	3.25	CD44806	4.35
.2610	G	2-7/8	4-1/8	6	CD44307	3.25	CD44807	4.45
.2656	17/64	2-7/8	4-1/8	6	CD44017	3.30	CD44517	3.85
.2660	H	2-7/8	4-1/8	6	CD44308	3.25	CD44808	4.55

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For technical information, see 224 - 225

DRILLS - HIGH SPEED STEEL

Jobber Length - 135° Split Point (Cont.)

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DRILL DIAMETER dec. equiv. size		FLUTE LENGTH	OAL	PACKAGE QTY.	BLACK OXIDE FINISH		BLACK & GOLD OXIDE FINISH	
D ₁		L ₂	L ₁		TOOL #	PRICE	TOOL #	PRICE
.2720	I	2-7/8	4-1/8	6	CD44309	3.25	CD44809	4.55
.2770	J	2-7/8	4-1/8	6	CD44310	3.90	CD44810	5.10
.2810	K	2-15/16	4-1/4	6	CD44311	3.90	CD44811	5.30
.2813	9/32	2-15/16	4-1/4	6	CD44018	3.55	CD44518	4.15
.2900	L	2-15/16	4-1/4	6	CD44312	3.90	CD44812	5.15
.2950	M	3-1/16	4-3/8	6	CD44313	4.75	CD44813	5.95
.2969	19/64	3-1/16	4-3/8	6	CD44019	3.90	CD44519	4.55
.3020	N	3-1/16	4-3/8	6	CD44314	4.75	CD44814	5.95
.3125	5/16	3-3/16	4-1/2	6	CD44020	4.00	CD44520	4.75
.3160	O	3-3/16	4-1/2	6	CD44315	4.75	CD44815	6.00
.3230	P	3-5/16	4-5/8	6	CD44316	5.40	CD44816	6.75
.3281	21/64	3-5/16	4-5/8	6	CD44021	4.50	CD44521	5.20
.3320	Q	3-7/16	4-3/4	6	CD44317	5.40	CD44817	6.95
.3390	R	3-7/16	4-3/4	6	CD44318	5.40	CD44818	6.95
.3438	11/32	3-7/16	4-3/4	6	CD44022	4.75	CD44522	5.60
.3480	S	3-1/2	4-7/8	6	CD44319	6.15	CD44819	7.70
.3580	T	3-1/2	4-7/8	6	CD44320	6.15	CD44820	8.10
.3594	23/64	3-1/2	4-7/8	6	CD44023	5.05	CD44523	6.00
.3680	U	3-5/8	5	6	CD44321	6.55	CD44821	8.10
.3750	3/8	3-5/8	5	6	CD44024	5.50	CD44524	6.35
.3770	V	3-5/8	5	6	CD44322	6.55	CD44822	8.25
.3860	W	3-3/4	5-1/8	6	CD44323	7.45	CD44823	10.10
.3906	25/64	3-3/4	5-1/8	6	CD44025	6.00	CD44525	6.90
.3970	X	3-3/4	5-1/8	6	CD44324	7.45	CD44824	11.90
.4040	Y	3-7/8	5-1/4	6	CD44325	8.10	CD44825	12.05
.4063	13/32	3-7/8	5-1/4	6	CD44026	6.55	CD44526	7.60
.4130	Z	3-7/8	5-1/4	6	CD44326	8.10	CD44826	12.35
.4219	27/64	3-15/16	5-3/8	6	CD44027	6.95	CD44527	8.05
.4375	7/16	4-1/16	5-1/2	6	CD44028	7.55	CD44528	8.70
.4531	29/64	4-3/16	5-5/8	6	CD44029	8.10	CD44529	9.25
.4688	15/32	4-5/16	5-3/4	6	CD44030	8.75	CD44530	10.05
.4844	31/64	4-3/8	5-7/8	6	CD44031	9.25	CD44531	10.60
.5000	1/2	4-1/2	6	6	CD44032	9.75	CD44532	11.05



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For technical information, see 224 - 225

DRILLS - HIGH SPEED STEEL

Jobber Length - 118° Point - Black Oxide Finish



- Jobber length for deeper drilling applications
- 118° point
- Black Oxide finish increases wear resistance and adds lubricity to improve chip flow
- High speed steel
- Precision manufactured in the USA

DRILL DIAMETER			FLUTE LENGTH	OAL	PACKAGE QTY.	BLACK OXIDE FINISH	
dec. equiv.	size	metric					
D1			L2	L1		TOOL #	PRICE
.0394		1 mm	17 mm	41 mm	12	CD42100	1.55
.0400	#60		11/16	1-5/8	12	CD40260	1.40
.0410	#59		11/16	1-5/8	12	CD40259	1.40
.0413		1.05 mm	17 mm	41 mm	12	CD42105	1.55
.0420	#58		11/16	1-5/8	12	CD40258	1.40
.0430	#57		3/4	1-3/4	12	CD40257	1.40
.0433		1.1 mm	19 mm	44 mm	12	CD42110	1.60
.0453		1.15 mm	19 mm	44 mm	12	CD42115	1.65
.0465	#56		3/4	1-3/4	12	CD40256	1.30
.0472		1.2 mm	22 mm	48 mm	12	CD42120	1.60
.0492		1.25 mm	22 mm	48 mm	12	CD42125	1.65
.0512		1.3 mm	22 mm	48 mm	12	CD42130	1.60
.0520	#55		7/8	1-7/8	12	CD40255	1.30
.0531		1.35 mm	22 mm	48 mm	12	CD42135	1.70
.0550	#54		7/8	1-7/8	12	CD40254	1.30
.0551		1.4 mm	22 mm	48 mm	12	CD42140	1.60
.0591		1.5 mm	22 mm	48 mm	12	CD42150	1.60
.0595	#53		7/8	1-7/8	12	CD40253	1.20
.0625	1/16		7/8	1-7/8	12	CD40004	1.25
.0630		1.6 mm	22 mm	48 mm	12	CD42160	1.60
.0635	#52		7/8	1-7/8	12	CD40252	1.20
.0669		1.7 mm	25 mm	51 mm	12	CD42170	1.65
.0670	#51		1	2	12	CD40251	1.20
.0700	#50		1	2	12	CD40250	1.20
.0709		1.8 mm	25 mm	51 mm	12	CD42180	1.65
.0730	#49		1	2	12	CD40249	1.20
.0748		1.9 mm	25 mm	51 mm	12	CD42190	1.65
.0760	#48		1	2	12	CD40248	1.20
.0781	5/64		1	2	12	CD40005	1.25
.0785	#47		1	2	12	CD40247	1.20
.0787		2 mm	25 mm	51 mm	12	CD42200	1.65
.0810	#46		1-1/8	2-1/8	12	CD40246	1.20
.0820	#45		1-1/8	2-1/8	12	CD40245	1.20
.0860	#44		1-1/8	2-1/8	12	CD40244	1.15
.0890	#43		1-1/4	2-1/4	12	CD40243	1.15
.0935	#42		1-1/4	2-1/4	12	CD40242	1.15

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For technical information, see 224 - 225

DRILLS - HIGH SPEED STEEL

Jobber Length - 118° Point - Black Oxide Finish (Cont.)

continued from previous page

DRILL DIAMETER			FLUTE LENGTH	OAL	PACKAGE QTY.	BLACK OXIDE FINISH	
dec. equiv.	size	metric				TOOL #	PRICE
D ₁			L ₂	L ₁			
.0938	3/32		1-1/4	2-1/4	12	CD40006	1.25
.0960	#41		1-3/8	2-3/8	12	CD40241	1.15
.0980	#40		1-3/8	2-3/8	12	CD40240	1.15
.0984		2.5 mm	35 mm	60 mm	12	CD42250	1.70
.0995	#39		1-3/8	2-3/8	12	CD40239	1.15
.1015	#38		1-7/16	2-1/2	12	CD40238	1.15
.1040	#37		1-7/16	2-1/2	12	CD40237	1.15
.1065	#36		1-7/16	2-1/2	12	CD40236	1.15
.1094	7/64		1-1/2	2-5/8	12	CD40007	1.25
.1100	#35		1-1/2	2-5/8	12	CD40235	1.15
.1110	#34		1-1/2	2-5/8	12	CD40234	1.15
.1130	#33		1-1/2	2-5/8	12	CD40233	1.15
.1160	#32		1-5/8	2-3/4	12	CD40232	1.15
.1181		3 mm	41 mm	70 mm	12	CD42300	1.75
.1200	#31		1-5/8	2-3/4	12	CD40231	1.15
.1250	1/8		1-5/8	2-3/4	12	CD40008	1.25
.1285	#30		1-5/8	2-3/4	12	CD40230	1.20
.1360	#29		1-3/4	2-7/8	12	CD40229	1.20
.1378		3.5 mm	45 mm	73 mm	12	CD42350	1.85
.1405	#28		1-3/4	2-7/8	12	CD40228	1.20
.1406	9/64		1-3/4	2-7/8	12	CD40009	1.30
.1440	#27		1-7/8	3	12	CD40227	1.30
.1470	#26		1-7/8	3	12	CD40226	1.30
.1495	#25		1-7/8	3	12	CD40225	1.30
.1520	#24		2	3-1/8	12	CD40224	1.45
.1540	#23		2	3-1/8	12	CD40223	1.45
.1563	5/32		2	3-1/8	12	CD40010	1.35
.1570	#22		2	3-1/8	12	CD40222	1.45
.1575		4 mm	54 mm	83 mm	12	CD42400	1.95
.1590	#21		2-1/8	3-1/4	12	CD40221	1.50
.1610	#20		2-1/8	3-1/4	12	CD40220	1.50
.1660	#19		2-1/8	3-1/4	12	CD40219	1.65
.1695	#18		2-1/8	3-1/4	12	CD40218	1.65
.1719	11/64		2-1/8	3-1/4	12	CD40011	1.45
.1730	#17		2-3/16	3-3/8	12	CD40217	1.65
.1770	#16		2-3/16	3-3/8	12	CD40216	1.70
.1772		4.5 mm	56 mm	86 mm	12	CD42450	2.15
.1800	#15		2-3/16	3-3/8	12	CD40215	1.70
.1820	#14		2-3/16	3-3/8	12	CD40214	1.70
.1850	#13		2-5/16	3-1/2	12	CD40213	1.85
.1875	3/16		2-5/16	3-1/2	12	CD40012	1.55
.1890	#12		2-5/16	3-1/2	12	CD40212	1.85
.1910	#11		2-5/16	3-1/2	12	CD40211	1.85
.1935	#10		2-7/16	3-5/8	12	CD40210	1.85
.1960	#9		2-7/16	3-5/8	12	CD40209	1.95
.1969		5 mm	62 mm	92 mm	12	CD42500	2.35

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DRILLS - HIGH SPEED STEEL

Jobber Length - 118° Point - Black Oxide Finish (Cont.)

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DRILL DIAMETER			FLUTE LENGTH	OAL	PACKAGE QTY.	BLACK OXIDE FINISH	
dec. equiv.	size	metric				TOOL #	PRICE
	D ₁		L ₂	L ₁			
.1990	#8		2-7/16	3-5/8	12	CD40208	2.00
.2010	#7		2-7/16	3-5/8	12	CD40207	2.00
.2031	13/64		2-7/16	3-5/8	12	CD40013	1.70
.2040	#6		2-1/2	3-3/4	12	CD40206	2.05
.2055	#5		2-1/2	3-3/4	12	CD40205	2.05
.2090	#4		2-1/2	3-3/4	12	CD40204	2.10
.2130	#3		2-1/2	3-3/4	12	CD40203	2.10
.2165		5.5 mm	64 mm	95 mm	12	CD42550	2.65
.2188	7/32		2-1/2	3-3/4	12	CD40014	1.90
.2210	#2		2-5/8	3-7/8	12	CD40202	2.25
.2280	#1		2-5/8	3-7/8	12	CD40201	2.25
.2340	A		2-5/8	3-7/8	12	CD40301	2.10
.2344	15/64		2-5/8	3-7/8	12	CD40015	2.10
.2362		6 mm	70 mm	102 mm	12	CD42600	2.85
.2380	B		2-3/4	4	12	CD40302	2.10
.2420	C		2-3/4	4	12	CD40303	2.10
.2460	D		2-3/4	4	12	CD40304	2.20
.2500	1/4		2-3/4	4	12	CD40016	2.10
.2500	E		2-3/4	4	12	CD40305	2.20
.2559		6.5 mm	73 mm	105 mm	6	CD42650	3.60
.2570	F		2-7/8	4-1/8	6	CD40306	2.95
.2610	G		2-7/8	4-1/8	6	CD40307	2.85
.2656	17/64		2-7/8	4-1/8	6	CD40017	2.95
.2660	H		2-7/8	4-1/8	6	CD40308	2.90
.2720	I		2-7/8	4-1/8	6	CD40309	2.95
.2756		7 mm	73 mm	105 mm	6	CD42700	3.75
.2770	J		2-7/8	4-1/8	6	CD40310	3.05
.2810	K		2-15/16	4-1/4	6	CD40311	3.10
.2813	9/32		2-15/16	4-1/4	6	CD40018	3.10
.2900	L		2-15/16	4-1/4	6	CD40312	3.20
.2950	M		3-1/16	4-3/8	6	CD40313	3.45
.2953		7.5 mm	78 mm	111 mm	6	CD42750	4.40
.2969	19/64		3-1/16	4-3/8	6	CD40019	3.40
.3020	N		3-1/16	4-3/8	6	CD40314	3.55
.3125	5/16		3-3/16	4-1/2	6	CD40020	3.55
.3150		8 mm	81 mm	114 mm	6	CD42800	4.80
.3160	O		3-3/16	4-1/2	6	CD40315	3.80
.3230	P		3-5/16	4-5/8	6	CD40316	4.10
.3281	21/64		3-5/16	4-5/8	6	CD40021	3.90
.3320	Q		3-7/16	4-3/4	6	CD40317	4.25
.3346		8.5 mm	87 mm	121 mm	6	CD42850	5.50
.3390	R		3-7/16	4-3/4	6	CD40318	4.40
.3438	11/32		3-7/16	4-3/4	6	CD40022	4.20
.3480	S		3-1/2	4-7/8	6	CD40319	4.60
.3543		9 mm	89 mm	124 mm	6	CD42900	6.25
.3580	T		3-1/2	4-7/8	6	CD40320	4.85

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For technical information, see 224 - 225

DRILLS - HIGH SPEED STEEL**Jobber Length - 118° Point - Black Oxide Finish (Cont.)**

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DRILL DIAMETER			FLUTE LENGTH	OAL	PACKAGE QTY.	BLACK OXIDE FINISH	
dec. equiv.	size	metric				TOOL #	PRICE
D ₁			L ₂	L ₁			
.3594	23/64		3-1/2	4-7/8	6	CD40023	4.60
.3680	U		3-5/8	5	6	CD40321	5.20
.3740		9.5 mm	92 mm	127 mm	6	CD42950	6.55
.3750	3/8		3-5/8	5	6	CD40024	4.85
.3770	V		3-5/8	5	6	CD40322	5.45
.3860	W		3-3/4	5-1/8	6	CD40323	5.75
.3906	25/64		3-3/4	5-1/8	6	CD40025	5.20
.3937		10 mm	95 mm	130 mm	6	CD43100	8.05
.3970	X		3-3/4	5-1/8	6	CD40324	6.05
.4040	Y		3-7/8	5-1/4	6	CD40325	6.40
.4063	13/32		3-7/8	5-1/4	6	CD40026	5.70
.4130	Z		3-7/8	5-1/4	6	CD40326	6.55
.4134		10.5 mm	98 mm	133 mm	6	CD43105	8.05
.4219	27/64		3-15/16	5-3/8	6	CD40027	6.05
.4331		11 mm	103 mm	140 mm	6	CD43110	8.20
.4375	7/16		4-1/16	5-1/2	6	CD40028	6.60
.4528		11.5 mm	106 mm	143 mm	6	CD43115	9.25
.4531	29/64		4-3/16	5-5/8	6	CD40029	7.05
.4688	15/32		4-5/16	5-3/4	6	CD40030	7.70
.4724		12 mm	111 mm	149 mm	6	CD43120	10.20
.4844	31/64		4-3/8	5-7/8	6	CD40031	8.10
.4921		12.5 mm	114 mm	152 mm	6	CD43125	10.45
.5000	1/2		4-1/2	6	6	CD40032	8.45
.5118		13 mm	114 mm	152 mm	6	CD43130	17.25
.5156	33/64		4-13/16	6-5/8	1	CD40033	20.00
.5313	17/32		4-13/16	6-5/8	1	CD40034	20.95
.5469	35/64		4-13/16	6-5/8	1	CD40035	22.70
.5625	9/16		4-13/16	6-5/8	1	CD40036	23.75
.5781	37/64		4-13/16	6-5/8	1	CD40037	23.95
.5938	19/32		5-3/16	7-1/8	1	CD40038	24.50
.6094	39/64		5-3/16	7-1/8	1	CD40039	26.90
.6250	5/8		5-3/16	7-1/8	1	CD40040	26.25
.6406	41/64		5-3/16	7-1/8	1	CD40041	28.75
.6563	21/32		5-3/16	7-1/8	1	CD40042	27.85
.6719	43/64		5-5/8	7-5/8	1	CD40043	32.65
.6875	11/16		5-5/8	7-5/8	1	CD40044	32.10

For technical information, see 224 - 225

DRILLS - HIGH SPEED STEEL

Jobber Length - 118° Point - Bright Finish & TiN Coated



- Jobber length for deeper drilling applications
- 118° point
- Bright finish improves performance in plastics and other non-ferrous materials
- TiN coating provides improved performance in a wide variety of materials, and generally used in applications with lower cutting speeds
- High speed steel
- Precision manufactured in the USA

DRILL DIAMETER dec. equiv. size		FLUTE LENGTH	OAL	PACKAGE QTY.	BRIGHT FINISH		TiN COATED	
D1		L2	L1		TOOL #	PRICE	TOOL #	PRICE
.0400	#60	11/16	1-5/8	12	CD40860	1.40	CD47760	3.10
.0410	#59	11/16	1-5/8	12	CD40859	1.40	CD47759	3.10
.0420	#58	11/16	1-5/8	12	CD40858	1.40	CD47758	3.10
.0430	#57	3/4	1-3/4	12	CD40857	1.40	CD47757	3.10
.0465	#56	3/4	1-3/4	12	CD40856	1.30	CD47756	3.10
.0520	#55	7/8	1-7/8	12	CD40855	1.30	CD47755	3.10
.0550	#54	7/8	1-7/8	12	CD40854	1.30	CD47754	3.00
.0595	#53	7/8	1-7/8	12	CD40853	1.20	CD47753	3.10
.0625	1/16	7/8	1-7/8	12	CD40604	1.25	CD47504	3.15
.0635	#52	7/8	1-7/8	12	CD40852	1.20	CD47752	3.10
.0670	#51	1	2	12	CD40851	1.20	CD47751	3.10
.0700	#50	1	2	12	CD40850	1.20	CD47750	3.10
.0730	#49	1	2	12	CD40849	1.20	CD47749	3.10
.0760	#48	1	2	12	CD40848	1.20	CD47748	3.10
.0781	5/64	1	2	12	CD40605	1.25	CD47505	3.15
.0785	#47	1	2	12	CD40847	1.20	CD47747	3.10
.0810	#46	1-1/8	2-1/8	12	CD40846	1.20	CD47746	3.20
.0820	#45	1-1/8	2-1/8	12	CD40845	1.20	CD47745	3.20
.0860	#44	1-1/8	2-1/8	12	CD40844	1.15	CD47744	3.10
.0890	#43	1-1/4	2-1/4	12	CD40843	1.15	CD47743	3.10
.0935	#42	1-1/4	2-1/4	12	CD40842	1.15	CD47742	3.10
.0938	3/32	1-1/4	2-1/4	12	CD40606	1.25	CD47506	3.10
.0960	#41	1-3/8	2-3/8	12	CD40841	1.15	CD47741	3.00
.0980	#40	1-3/8	2-3/8	12	CD40840	1.15	CD47740	3.10
.0995	#39	1-3/8	2-3/8	12	CD40839	1.15	CD47739	3.10
.1015	#38	1-7/16	2-1/2	12	CD40838	1.15	CD47738	3.10
.1040	#37	1-7/16	2-1/2	12	CD40837	1.15	CD47737	3.10
.1065	#36	1-7/16	2-1/2	12	CD40836	1.15	CD47736	3.10
.1094	7/64	1-1/2	2-5/8	12	CD40607	1.25	CD47507	3.25
.1100	#35	1-1/2	2-5/8	12	CD40835	1.15	CD47735	3.15
.1110	#34	1-1/2	2-5/8	12	CD40834	1.15	CD47734	3.15
.1130	#33	1-1/2	2-5/8	12	CD40833	1.15	CD47733	3.15
.1160	#32	1-5/8	2-3/4	12	CD40832	1.15	CD47732	3.15
.1200	#31	1-5/8	2-3/4	12	CD40831	1.15	CD47731	3.15
.1250	1/8	1-5/8	2-3/4	12	CD40608	1.25	CD47508	3.25
.1285	#30	1-5/8	2-3/4	12	CD40830	1.20	CD47730	3.15

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DRILLS - HIGH SPEED STEEL**Jobber Length - 118° Point - Bright Finish & TiN Coated (Cont.)**

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DRILL DIAMETER dec. equiv. size		FLUTE LENGTH	OAL	PACKAGE QTY.	BRIGHT FINISH		TiN COATED	
D ₁		L ₂	L ₁		TOOL #	PRICE	TOOL #	PRICE
.1360	#29	1-3/4	2-7/8	12	CD40829	1.20	CD47729	3.75
.1405	#28	1-3/4	2-7/8	12	CD40828	1.20	CD47728	3.75
.1406	9/64	1-3/4	2-7/8	12	CD40609	1.30	CD47509	3.30
.1440	#27	1-7/8	3	12	CD40827	1.30	CD47727	3.85
.1470	#26	1-7/8	3	12	CD40826	1.30	CD47726	3.85
.1495	#25	1-7/8	3	12	CD40825	1.30	CD47725	3.85
.1520	#24	2	3-1/8	12	CD40824	1.45	CD47724	3.90
.1540	#23	2	3-1/8	12	CD40823	1.45	CD47723	3.90
.1563	5/32	2	3-1/8	12	CD40610	1.35	CD47510	3.65
.1570	#22	2	3-1/8	12	CD40822	1.45	CD47722	4.00
.1590	#21	2-1/8	3-1/4	12	CD40821	1.50	CD47721	4.00
.1610	#20	2-1/8	3-1/4	12	CD40820	1.50	CD47720	4.05
.1660	#19	2-1/8	3-1/4	12	CD40819	1.65	CD47719	4.05
.1695	#18	2-1/8	3-1/4	12	CD40818	1.65	CD47718	4.05
.1719	11/64	2-1/8	3-1/4	12	CD40611	1.45	CD47511	3.70
.1730	#17	2-3/16	3-3/8	12	CD40817	1.65	CD47717	4.50
.1770	#16	2-3/16	3-3/8	12	CD40816	1.70	CD47716	4.50
.1800	#15	2-3/16	3-3/8	12	CD40815	1.70	CD47715	4.50
.1820	#14	2-3/16	3-3/8	12	CD40814	1.70	CD47714	4.50
.1850	#13	2-5/16	3-1/2	12	CD40813	1.80	CD47713	5.65
.1875	3/16	2-5/16	3-1/2	12	CD40612	1.55	CD47512	3.85
.1890	#12	2-5/16	3-1/2	12	CD40812	1.80	CD47712	4.55
.1910	#11	2-5/16	3-1/2	12	CD40811	1.80	CD47711	5.30
.1935	#10	2-7/16	3-5/8	12	CD40810	1.80	CD47710	5.60
.1960	#9	2-7/16	3-5/8	12	CD40809	1.95	CD47709	5.60
.1990	#8	2-7/16	3-5/8	12	CD40808	2.00	CD47708	5.60
.2010	#7	2-7/16	3-5/8	12	CD40807	2.00	CD47707	5.60
.2031	13/64	2-7/16	3-5/8	12	CD40613	1.70	CD47513	5.55
.2040	#6	2-1/2	3-3/4	12	CD40806	2.05	CD47706	5.90
.2055	#5	2-1/2	3-3/4	12	CD40805	2.05	CD47705	5.90
.2090	#4	2-1/2	3-3/4	12	CD40804	2.10	CD47704	5.90
.2130	#3	2-1/2	3-3/4	12	CD40803	2.10	CD47703	5.90
.2188	7/32	2-1/2	3-3/4	12	CD40614	1.85	CD47514	5.65
.2210	#2	2-5/8	3-7/8	12	CD40802	2.25	CD47702	6.20
.2280	#1	2-5/8	3-7/8	12	CD40801	2.25	CD47701	6.20
.2340	A	2-5/8	3-7/8	12	CD40901	2.10	CD47601	6.20
.2344	15/64	2-5/8	3-7/8	12	CD40615	2.10	CD47515	5.90
.2380	B	2-3/4	4	12	CD40902	2.10	CD47602	6.35
.2420	C	2-3/4	4	12	CD40903	2.10	CD47603	6.35
.2460	D	2-3/4	4	12	CD40904	2.20	CD47604	6.35
.2500	1/4	2-3/4	4	12	CD40616	2.10	CD47516	6.05
.2500	E	2-3/4	4	12	CD40905	2.20	CD47605	6.05
.2570	F	2-7/8	4-1/8	6	CD40906	2.95	CD47606	9.60
.2610	G	2-7/8	4-1/8	6	CD40907	2.85	CD47607	9.60
.2656	17/64	2-7/8	4-1/8	6	CD40617	2.95	CD47517	8.60

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DRILLS - HIGH SPEED STEEL

Jobber Length - 118° Point - Bright Finish & TiN Coated (Cont.)

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DRILL DIAMETER dec. equiv. size		FLUTE LENGTH	OAL	PACKAGE QTY.	BRIGHT FINISH		TiN COATED	
D ₁		L ₂	L ₁		TOOL #	PRICE	TOOL #	PRICE
.2660	H	2-7/8	4-1/8	6	CD40908	2.90	CD47608	9.60
.2720	I	2-7/8	4-1/8	6	CD40909	2.95	CD47609	9.60
.2770	J	2-7/8	4-1/8	6	CD40910	3.05	CD47610	9.65
.2810	K	2-15/16	4-1/4	6	CD40911	3.10	CD47611	10.35
.2813	9/32	2-15/16	4-1/4	6	CD40618	3.10	CD47518	9.10
.2900	L	2-15/16	4-1/4	6	CD40912	3.20	CD47612	10.35
.2950	M	3-1/16	4-3/8	6	CD40913	3.40	CD47613	10.50
.2969	19/64	3-1/16	4-3/8	6	CD40619	3.35	CD47519	9.35
.3020	N	3-1/16	4-3/8	6	CD40914	3.55	CD47614	10.70
.3125	5/16	3-3/16	4-1/2	6	CD40620	3.55	CD47520	9.50
.3160	O	3-3/16	4-1/2	6	CD40915	3.80	CD47615	11.00
.3230	P	3-5/16	4-5/8	6	CD40916	4.05	CD47616	11.25
.3281	21/64	3-5/16	4-5/8	6	CD40621	3.90	CD47521	11.10
.3320	Q	3-7/16	4-3/4	6	CD40917	4.25	CD47617	11.40
.3390	R	3-7/16	4-3/4	6	CD40918	4.35	CD47618	11.50
.3438	11/32	3-7/16	4-3/4	6	CD40622	4.15	CD47522	11.35
.3480	S	3-1/2	4-7/8	6	CD40919	4.55	CD47619	14.45
.3580	T	3-1/2	4-7/8	6	CD40920	4.75	CD47620	15.15
.3594	23/64	3-1/2	4-7/8	6	CD40623	4.55	CD47523	12.80
.3680	U	3-5/8	5	6	CD40921	5.20	CD47621	15.15
.3750	3/8	3-5/8	5	6	CD40624	4.75	CD47524	12.95
.3770	V	3-5/8	5	6	CD40922	5.35	CD47622	15.35
.3860	W	3-3/4	5-1/8	6	CD40923	5.65	CD47623	17.75
.3906	25/64	3-3/4	5-1/8	6	CD40625	5.20	CD47525	16.00
.3970	X	3-3/4	5-1/8	6	CD40924	6.05	CD47624	19.15
.4040	Y	3-7/8	5-1/4	6	CD40925	6.30	CD47625	20.35
.4063	13/32	3-7/8	5-1/4	6	CD40626	5.65	CD47526	16.35
.4130	Z	3-7/8	5-1/4	6	CD40926	6.55	CD47626	20.60
.4219	27/64	3-15/16	5-3/8	6	CD40627	6.00	CD47527	17.00
.4375	7/16	4-1/16	5-1/2	6	CD40628	6.60	CD47528	17.35
.4531	29/64	4-3/16	5-5/8	6	CD40629	7.00	CD47529	19.00
.4688	15/32	4-5/16	5-3/4	6	CD40630	7.60	CD47530	19.60
.4844	31/64	4-3/8	5-7/8	6	CD40631	8.05	CD47531	19.75
.5000	1/2	4-1/2	6	6	CD40632	8.40	CD47532	20.15

Drills
Carbide
Cobalt
HSS

For technical information, see 224 - 225

DRILLS - HIGH SPEED STEEL

Aircraft Extension Drills - 135° Split Point



- 135° Split Point, Type "B"
- Black Oxide finish increases wear resistance and adds lubricity to improve chip flow
- Offered in 6" and 12" overall lengths
- High speed steel
- Precision manufactured in the USA

DRILL DIAMETER dec. equiv. size		FLUTE LENGTH	OAL	PACKAGE QTY.	BLACK OXIDE FINISH	
D ₁		L ₂	L ₁		TOOL #	PRICE
.0938	3/32	1-1/4	6	6	CD67506	4.70
.0980	#40	1-5/8	6	6	CD67640	4.30
.0980	#40	1-3/8	12	6	CD68140	15.05
.1094	7/64	1-1/2	6	6	CD67507	4.70
.1250	1/8	1-5/8	6	6	CD67508	4.65
.1250	1/8	1-5/8	12	6	CD68008	13.40
.1285	#30	1-5/8	6	6	CD67630	5.20
.1285	#30	1-5/8	12	6	CD68130	15.05
.1360	#29	1-3/4	6	6	CD67629	6.75
.1360	#29	1-3/4	12	6	CD68129	15.95
.1406	9/64	1-3/4	6	6	CD67509	5.50
.1406	9/64	1-3/4	12	6	CD68009	13.50
.1563	5/32	2	6	6	CD67510	6.10
.1563	5/32	2	12	6	CD68010	13.50
.1590	#21	2-1/8	6	6	CD67621	6.35
.1590	#21	2-1/8	12	6	CD68121	15.05
.1610	#20	2-1/8	6	6	CD67620	6.05
.1610	#20	2-1/8	12	6	CD68120	15.30
.1719	11/64	2-1/8	6	6	CD67511	6.75
.1719	11/64	2-1/8	12	6	CD68011	15.30
.1875	3/16	2-5/16	6	6	CD67512	6.70
.1875	3/16	2-5/16	12	6	CD68012	15.15
.1910	#11	2-5/16	6	6	CD67611	7.30
.1910	#11	2-5/16	12	6	CD68111	17.00
.1935	#10	2-7/16	6	6	CD67610	7.30
.1935	#10	2-7/16	12	6	CD68110	16.85
.2031	13/64	2-7/16	6	6	CD67513	8.15
.2031	13/64	2-7/16	12	6	CD68013	17.30
.2188	7/32	2-1/2	6	6	CD67514	8.15
.2188	7/32	2-1/2	12	6	CD68014	17.15
.2210	#2	2-5/8	6	6	CD67602	9.40
.2280	#1	2-5/8	6	6	CD67601	9.40
.2280	#1	2-5/8	12	6	CD68101	20.95
.2344	15/64	2-5/8	6	6	CD67515	9.05
.2344	15/64	2-5/8	12	6	CD68015	19.25
.2500	1/4	2-3/4	6	6	CD67516	8.10
.2500	1/4	2-3/4	12	6	CD68016	20.95

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For technical information, see 224 - 225

DRILLS - HIGH SPEED STEEL

Aircraft Extension Drills - 135° Split Point (Cont.)

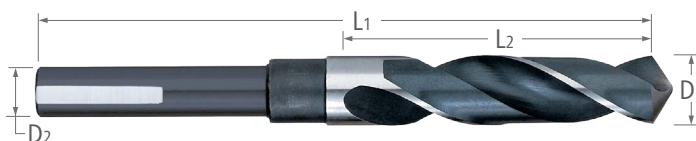
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DRILL DIAMETER		FLUTE LENGTH	OAL	PACKAGE QTY.	BLACK OXIDE FINISH	
dec. equiv.	size					
D ₁		L ₂	L ₁		TOOL #	PRICE
.2656	17/64	2-7/8	6	1	CD67517	20.45
.2656	17/64	2-7/8	12	1	CD68017	24.40
.2813	9/32	2-15/16	6	1	CD67518	21.15
.2813	9/32	2-15/16	12	1	CD68018	24.05
.2969	19/64	3-1/16	6	1	CD67519	25.00
.2969	19/64	3-1/16	12	1	CD68019	26.95
.3125	5/16	3-3/16	6	1	CD67520	27.00
.3125	5/16	3-3/16	12	1	CD68020	29.70
.3281	21/64	3-5/16	6	1	CD67521	29.10
.3281	21/64	3-5/16	12	1	CD68021	32.20
.3438	11/32	3-7/16	6	1	CD67522	29.10
.3438	11/32	3-7/16	12	1	CD68022	31.90
.3594	23/64	3-1/2	6	1	CD67523	32.40
.3594	23/64	3-1/2	12	1	CD68023	35.95
.3750	3/8	3-5/8	6	1	CD67524	33.10
.3750	3/8	3-5/8	12	1	CD68024	36.45
.3906	25/64	3-3/4	12	1	CD68025	40.45
.4063	13/32	3-7/8	12	1	CD68026	39.15
.4219	27/64	3-15/16	12	1	CD68027	43.15
.4375	7/16	4-1/16	12	1	CD68028	43.05
.4531	29/64	4-3/16	12	1	CD68029	48.60
.4688	15/32	4-5/16	12	1	CD68030	50.35
.4844	31/64	4-3/8	12	1	CD68031	52.20
.5000	1/2	4-1/2	12	1	CD68032	51.90

Drills | Carbide | Cobalt | HSS

DRILLS - HIGH SPEED STEEL

Silver & Deming - 118° Point - 3 Flats



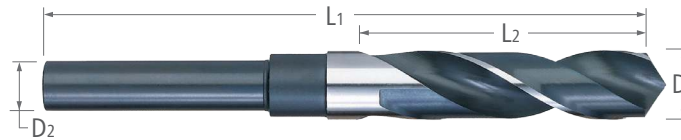
- 3" flute length
- 118° point
- 1/2" shank
- 3 flats on shank to prevent spinning in a 3 Jaw Chuck
- Bright finish on cut edge for better chip evacuation; Black Oxide finish holds cutting oil for better abrasion resistance.
- High speed steel
- Precision manufactured in the USA

DRILL DIAMETER dec. equiv. size		FLUTE LENGTH	OAL	SHAK DIA.	BRIGHT & BLACK OXIDE FINISH	
D1		L2	L1	D2	TOOL #	PRICE
.5156	33/64	3	6	1/2	SD92533	21.05
.5313	17/32	3	6	1/2	SD92534	21.05
.5469	35/64	3	6	1/2	SD92535	22.40
.5625	9/16	3	6	1/2	SD92536	22.40
.5781	37/64	3	6	1/2	SD92537	24.05
.5938	19/32	3	6	1/2	SD92538	24.05
.6094	39/64	3	6	1/2	SD92539	25.20
.6250	5/8	3	6	1/2	SD92540	25.20
.6406	41/64	3	6	1/2	SD92541	26.90
.6563	21/32	3	6	1/2	SD92542	26.90
.6719	43/64	3	6	1/2	SD92543	27.95
.6875	11/16	3	6	1/2	SD92544	27.95
.7031	45/64	3	6	1/2	SD92545	28.30
.7188	23/32	3	6	1/2	SD92546	28.30
.7344	47/64	3	6	1/2	SD92547	30.85
.7500	3/4	3	6	1/2	SD92548	30.85
.7656	49/64	3	6	1/2	SD92549	32.90
.7813	25/32	3	6	1/2	SD92550	32.90
.7969	51/64	3	6	1/2	SD92551	36.05
.8125	13/16	3	6	1/2	SD92552	36.05
.8281	53/64	3	6	1/2	SD92553	37.60
.8438	27/32	3	6	1/2	SD92554	37.60
.8594	55/64	3	6	1/2	SD92555	40.10
.8750	7/8	3	6	1/2	SD92556	40.10
.8906	57/64	3	6	1/2	SD92557	41.60
.9063	29/32	3	6	1/2	SD92558	41.60
.9219	59/64	3	6	1/2	SD92559	42.60
.9375	15/16	3	6	1/2	SD92560	42.60
.9531	61/64	3	6	1/2	SD92561	44.55
.9688	31/32	3	6	1/2	SD92562	44.55
.9844	63/64	3	6	1/2	SD92563	48.85
1.0000	1	3	6	1/2	SD92564	48.85

For technical information, see 224 - 225

DRILLS - HIGH SPEED STEEL

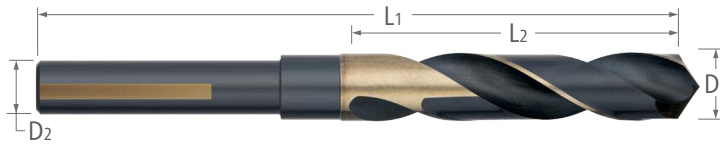
Silver & Deming - 118° Point



- 3" flute length
- 118° point
- 1/2" shank
- Bright finish on cut edge for better chip evacuation; Black Oxide finish holds cutting oil for better abrasion resistance and lubricity.
- High speed steel
- Precision manufactured in the USA

DRILL DIAMETER dec. equiv. size		FLUTE LENGTH	OAL	SHANK DIA.	BRIGHT & BLACK OXIDE FINISH	
D ₁		L ₂	L ₁	D ₂	TOOL #	PRICE
.5156	33/64	3	6	1/2	SD91433	20.85
.5313	17/32	3	6	1/2	SD91434	20.85
.5469	35/64	3	6	1/2	SD91435	22.05
.5625	9/16	3	6	1/2	SD91436	22.05
.5781	37/64	3	6	1/2	SD91437	23.65
.5938	19/32	3	6	1/2	SD91438	23.65
.6094	39/64	3	6	1/2	SD91439	25.00
.6250	5/8	3	6	1/2	SD91440	25.00
.6406	41/64	3	6	1/2	SD91441	26.05
.6563	21/32	3	6	1/2	SD91442	26.05
.6719	43/64	3	6	1/2	SD91443	27.80
.6875	11/16	3	6	1/2	SD91444	27.80
.7031	45/64	3	6	1/2	SD91445	27.80
.7188	23/32	3	6	1/2	SD91446	27.80
.7344	47/64	3	6	1/2	SD91447	30.35
.7500	3/4	3	6	1/2	SD91448	30.45
.7656	49/64	3	6	1/2	SD91449	32.25
.7813	25/32	3	6	1/2	SD91450	32.25
.7969	51/64	3	6	1/2	SD91451	33.90
.8125	13/16	3	6	1/2	SD91452	33.90
.8281	53/64	3	6	1/2	SD91453	35.40
.8438	27/32	3	6	1/2	SD91454	35.40
.8594	55/64	3	6	1/2	SD91455	36.60
.8750	7/8	3	6	1/2	SD91456	36.60
.8906	57/64	3	6	1/2	SD91457	37.90
.9063	29/32	3	6	1/2	SD91458	37.90
.9219	59/64	3	6	1/2	SD91459	41.25
.9375	15/16	3	6	1/2	SD91460	41.25
.9531	61/64	3	6	1/2	SD91461	43.25
.9688	31/32	3	6	1/2	SD91462	43.25
.9844	63/64	3	6	1/2	SD91463	48.20
1.0000	1	3	6	1/2	SD91464	48.20
1.0313	1-1/32	3	6	1/2	SD91466	64.70
1.0625	1-1/16	3	6	1/2	SD91468	64.70
1.0938	1-3/32	3	6	1/2	SD91470	68.95
1.1250	1-1/8	3	6	1/2	SD91472	74.05
1.1563	1-5/32	3	6	1/2	SD91474	74.05
1.1875	1-3/16	3	6	1/2	SD91476	81.60
1.2188	1-7/32	3	6	1/2	SD91478	90.75
1.2500	1-1/4	3	6	1/2	SD91480	90.75
1.3125	1-5/16	3	6	1/2	SD91484	95.50
1.3750	1-3/8	3	6	1/2	SD91488	110.00
1.4375	1-7/16	3	6	1/2	SD91492	120.95
1.5000	1-1/2	3	6	1/2	SD91496	132.90

For technical information, see 224 - 225

DRILLS - HIGH SPEED STEEL**Silver & Deming - 118° Split Point - 3 Flats - Black & Gold Oxide Finish**

- 3" flute length
- 118° split point
- 1/2" shank
- 3 flats on shank to prevent spinning in a 3 Jaw Chuck
- Black & Gold Oxide finish minimizes friction and improves lubricity
- High speed steel
- Precision manufactured in the USA

DRILL DIAMETER dec. equiv. size		FLUTE LENGTH	OAL	SHANK DIA.	BLACK & GOLD OXIDE FINISH	
D1		L2	L1	D2	TOOL #	PRICE
.5156	33/64	3	6	1/2	SD94733	24.70
.5313	17/32	3	6	1/2	SD94734	24.70
.5469	35/64	3	6	1/2	SD94735	26.15
.5625	9/16	3	6	1/2	SD94736	26.15
.5781	37/64	3	6	1/2	SD94737	27.75
.5938	19/32	3	6	1/2	SD94738	27.75
.6094	39/64	3	6	1/2	SD94739	28.85
.6250	5/8	3	6	1/2	SD94740	28.85
.6406	41/64	3	6	1/2	SD94741	30.60
.6563	21/32	3	6	1/2	SD94742	30.60
.6719	43/64	3	6	1/2	SD94743	31.95
.6875	11/16	3	6	1/2	SD94744	31.95
.7031	45/64	3	6	1/2	SD94745	33.25
.7188	23/32	3	6	1/2	SD94746	33.25
.7344	47/64	3	6	1/2	SD94747	34.75
.7500	3/4	3	6	1/2	SD94748	34.75
.7656	49/64	3	6	1/2	SD94749	36.60
.7813	25/32	3	6	1/2	SD94750	36.60
.7969	51/64	3	6	1/2	SD94751	38.95
.8125	13/16	3	6	1/2	SD94752	38.95
.8281	53/64	3	6	1/2	SD94753	40.70
.8438	27/32	3	6	1/2	SD94754	40.70
.8594	55/64	3	6	1/2	SD94755	41.75
.8750	7/8	3	6	1/2	SD94756	41.75
.8906	57/64	3	6	1/2	SD94757	43.60
.9063	29/32	3	6	1/2	SD94758	43.60
.9219	59/64	3	6	1/2	SD94759	46.85
.9375	15/16	3	6	1/2	SD94760	46.85
.9531	61/64	3	6	1/2	SD94761	50.50
.9688	31/32	3	6	1/2	SD94762	50.50
.9844	63/64	3	6	1/2	SD94763	53.00
1.0000	1	3	6	1/2	SD94764	53.00

For technical information, see 224 - 225

DRILLS - HIGH SPEED STEEL

Taper Length - 118° Point



- Taper length for drilling applications at extreme depths
- 118° point
- Black Oxide finish increases wear resistance and adds lubricity to improve chip flow
- High speed steel
- Precision manufactured in the USA

DRILL DIAMETER dec. equiv. size		FLUTE LENGTH	OAL	PACKAGE QTY.	BLACK OXIDE FINISH	
D ₁		L ₂	L ₁		TOOL #	PRICE
.0469	3/64	1-1/8	2-1/4	12	CD52503	7.45
.0625	1/16	1-3/4	3	12	CD52504	7.45
.0781	5/64	2	3-3/4	12	CD52505	7.45
.0938	3/32	2-1/4	4-1/4	12	CD52506	6.90
.0980	#40	2-1/2	4-5/8	12	CD52740	7.65
.0995	#39	2-1/2	4-5/8	12	CD52739	7.65
.1015	#38	2-1/2	4-5/8	12	CD52738	8.75
.1040	#37	2-1/2	4-5/8	12	CD52737	8.75
.1065	#36	2-1/2	4-5/8	12	CD52736	8.75
.1094	7/64	2-1/2	4-5/8	12	CD52507	7.20
.1100	#35	2-3/4	5-1/8	12	CD52735	11.65
.1110	#34	2-3/4	5-1/8	12	CD52734	11.65
.1130	#33	2-3/4	5-1/8	12	CD52733	11.70
.1160	#32	2-3/4	5-1/8	12	CD52732	11.65
.1200	#31	2-3/4	5-1/8	12	CD52731	11.70
.1250	1/8	2-3/4	5-1/8	12	CD52508	7.45
.1285	#30	3	5-3/8	12	CD52730	11.90
.1360	#29	3	5-3/8	12	CD52729	11.90
.1405	#28	3	5-3/8	12	CD52728	11.90
.1406	9/64	3	5-3/8	12	CD52509	10.00
.1440	#27	3	5-3/8	12	CD52727	11.90
.1470	#26	3	5-3/8	12	CD52726	11.90
.1495	#25	3	5-3/8	12	CD52725	11.90
.1520	#24	3	5-3/8	12	CD52724	11.90
.1540	#23	3	5-3/8	12	CD52723	11.90
.1563	5/32	3	5-3/8	12	CD52510	10.10
.1570	#22	3-3/8	5-3/4	12	CD52722	11.90
.1590	#21	3-3/8	5-3/4	12	CD52721	11.90
.1610	#20	3-3/8	5-3/4	12	CD52720	11.90
.1660	#19	3-3/8	5-3/4	12	CD52719	11.90
.1695	#18	3-3/8	5-3/4	12	CD52718	11.90
.1719	11/64	3-3/8	5-3/4	12	CD52511	10.60
.1730	#17	3-3/8	5-3/4	12	CD52717	11.90
.1770	#16	3-3/8	5-3/4	12	CD52716	11.90
.1800	#15	3-3/8	5-3/4	12	CD52715	11.90
.1820	#14	3-3/8	5-3/4	12	CD52714	11.90
.1850	#13	3-3/8	5-3/4	12	CD52713	11.90

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For technical information, see 224 - 225

DRILLS - HIGH SPEED STEEL

Taper Length - 118° Point (Cont.)

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DRILL DIAMETER dec. equiv. size		FLUTE LENGTH	OAL	PACKAGE QTY.	BLACK OXIDE FINISH	
D ₁		L ₂	L ₁		TOOL #	PRICE
.1875	3/16	3-3/8	5-3/4	12	CD52512	9.80
.1890	#12	3-5/8	6	12	CD52712	13.15
.1910	#11	3-5/8	6	12	CD52711	13.15
.1935	#10	3-5/8	6	12	CD52710	13.15
.1960	#9	3-5/8	6	12	CD52709	13.15
.1990	#8	3-5/8	6	12	CD52708	13.15
.2010	#7	3-5/8	6	12	CD52707	13.15
.2031	13/64	3-5/8	6	12	CD52513	12.05
.2040	#6	3-5/8	6	12	CD52706	13.15
.2055	#5	3-5/8	6	12	CD52705	13.15
.2090	#4	3-5/8	6	12	CD52704	13.15
.2130	#3	3-5/8	6	12	CD52703	13.15
.2188	7/32	3-5/8	6	12	CD52514	12.90
.2210	#2	3-3/4	6-1/8	12	CD52702	13.60
.2280	#1	3-3/4	6-1/8	12	CD52701	13.60
.2344	15/64	3-3/4	6-1/8	12	CD52515	12.90
.2500	1/4	3-3/4	6-1/8	12	CD52516	11.15
.2656	17/64	3-7/8	6-1/4	6	CD52517	13.50
.2813	9/32	3-7/8	6-1/4	6	CD52518	13.50
.2969	19/64	4	6-3/8	6	CD52519	14.75
.3125	5/16	4	6-3/8	6	CD52520	14.75
.3281	21/64	4-1/8	6-1/2	6	CD52521	14.75
.3438	11/32	4-1/8	6-1/2	6	CD52522	14.75
.3594	23/64	4-1/4	6-3/4	6	CD52523	17.40
.3750	3/8	4-1/4	6-3/4	6	CD52524	17.40
.3906	25/64	4-3/8	6-3/4	6	CD52525	19.80
.4063	13/32	4-3/8	7	6	CD52526	19.80
.4219	27/64	4-5/8	7-1/4	6	CD52527	21.05
.4375	7/16	4-5/8	7-1/4	6	CD52528	21.05
.4531	29/64	4-3/4	7-1/2	6	CD52529	23.90
.4688	15/32	4-3/4	7-1/2	6	CD52530	23.90
.4844	31/64	4-3/4	7-3/4	6	CD52531	25.30
.5000	1/2	4-3/4	7-3/4	6	CD52532	25.30
.5156	33/64	4-3/4	8	1	CD52533	33.45
.5313	17/32	4-3/4	8	1	CD52534	33.45
.5469	35/64	4-7/8	8-1/4	1	CD52535	35.30
.5625	9/16	4-7/8	8-1/4	1	CD52536	35.30
.5781	37/64	4-7/8	8-3/4	1	CD52537	41.30
.5938	19/32	4-7/8	8-3/4	1	CD52538	41.30
.6094	39/64	4-7/8	8-3/4	1	CD52539	42.60
.6250	5/8	4-7/8	8-3/4	1	CD52540	42.60
.6406	41/64	5-1/8	9	1	CD52541	48.75
.6563	21/32	5-1/8	9	1	CD52542	48.75
.6719	43/64	5-3/8	9-1/4	1	CD52543	57.35
.6875	11/16	5-3/8	9-1/4	1	CD52544	57.35
.7031	45/64	5-5/8	9-1/2	1	CD52545	59.95

continued on next page

For technical information, see 224 - 225

DRILLS - HIGH SPEED STEEL

Taper Length - 118° Point (Cont.)

continued from previous page

DRILL DIAMETER		FLUTE LENGTH	OAL	PACKAGE QTY.	BLACK OXIDE FINISH	
dec. equiv.	size					
D ₁		L ₂	L ₁		TOOL #	PRICE
.7188	23/32	5-5/8	9-1/2	1	CD52546	59.95
.7344	47/64	5-7/8	9-3/4	1	CD52547	64.50
.7500	3/4	5-7/8	9-3/4	1	CD52548	64.50
.7656	49/64	6	9-7/8	1	CD52549	70.25
.7813	25/32	6	9-7/8	1	CD52550	70.25
.7969	51/64	6-1/8	10	1	CD52551	75.80
.8125	13/16	6-1/8	10	1	CD52552	75.80
.8281	53/64	6-1/8	10	1	CD52553	79.90
.8438	27/32	6-1/8	10	1	CD52554	79.90
.8594	55/64	6-1/8	10	1	CD52555	83.40
.8750	7/8	6-1/8	10	1	CD52556	83.40
.8906	57/64	6-1/8	10	1	CD52557	86.95
.9063	29/32	6-1/8	10	1	CD52558	87.35
.9219	59/64	6-1/8	10-3/4	1	CD52559	94.55
.9375	15/16	6-1/8	10-3/4	1	CD52560	94.95
.9531	61/64	6-3/8	11	1	CD52561	104.35
.9688	31/32	6-3/8	11	1	CD52562	104.35
.9844	63/64	6-3/8	11	1	CD52563	108.70
1.0000	1	6-3/8	11	1	CD52564	108.70
1.0625	1-1/16	6-5/8	11-1/4	1	CD52568	135.40
1.1250	1-1/8	7-1/8	11-3/4	1	CD52572	149.95
1.1875	1-3/16	7-3/8	12	1	CD52576	175.75
1.2500	1-1/4	7-7/8	12-1/2	1	CD52580	188.25
1.3125	1-5/16	8-5/8	14-1/4	1	CD52584	224.65
1.3750	1-3/8	8-7/8	14-1/2	1	CD52588	240.90

Drills
Carbide
Cobalt
HSS

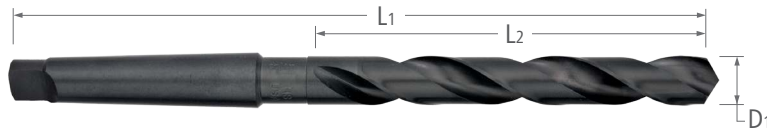


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DRILLS - HIGH SPEED STEEL

Taper Shank - 118° Point



- Morse taper shank
- 118° point
- Black Oxide finish increases wear resistance and adds lubricity to improve chip flow
- High speed steel
- Precision manufactured in the USA

DRILL DIAMETER dec. equiv. size		MORSE TAPER	FLUTE LENGTH	OAL	BLACK OXIDE FINISH	
D1			L2	L1	TOOL #	PRICE
.1875	3/16	1	2-1/2	5-3/4	CD55012	26.25
.2031	13/64	1	2-3/4	6	CD55013	26.25
.2188	7/32	1	2-3/4	6	CD55014	26.25
.2344	15/64	1	2-7/8	6-1/8	CD55015	26.25
.2500	1/4	1	2-7/8	6-1/8	CD55016	26.25
.2656	17/64	1	3	6-1/4	CD55017	26.25
.2813	9/32	1	3	6-1/4	CD55018	26.25
.2969	19/64	1	3-1/8	6-3/8	CD55019	27.85
.3125	5/16	1	3-1/8	6-3/8	CD55020	29.25
.3281	21/64	1	3-1/4	6-1/2	CD55021	29.25
.3438	11/32	1	3-1/4	6-1/2	CD55022	29.25
.3594	23/64	1	3-1/2	6-3/4	CD55023	29.90
.3750	3/8	1	3-1/2	6-3/4	CD55024	30.00
.3906	25/64	1	3-5/8	7	CD55025	35.70
.4063	13/32	1	3-5/8	7	CD55026	35.70
.4219	27/64	1	3-7/8	7-1/4	CD55027	38.40
.4375	7/16	1	3-7/8	7-1/4	CD55028	38.40
.4531	29/64	1	4-1/8	7-1/2	CD55029	38.25
.4688	15/32	1	4-1/8	7-1/2	CD55030	38.40
.4844	31/64	2	4-3/8	8-1/4	CD55031	42.00
.5000	1/2	2	4-3/8	8-1/4	CD55032	39.30
.5156	33/64	2	4-5/8	8-1/2	CD55033	45.10
.5313	17/32	2	4-5/8	8-1/2	CD55034	46.60
.5469	35/64	2	4-7/8	8-3/4	CD55035	49.35
.5625	9/16	2	4-7/8	8-3/4	CD55036	48.05
.5781	37/64	2	4-7/8	8-3/4	CD55037	52.25
.5938	19/32	2	4-7/8	8-3/4	CD55038	51.65
.6094	39/64	2	4-7/8	8-3/4	CD55039	54.35
.6250	5/8	2	4-7/8	8-3/4	CD55040	52.20
.6406	41/64	2	5-1/8	9	CD55041	60.05
.6563	21/32	2	5-1/8	9	CD55042	58.85
.6719	43/64	2	5-3/8	9-1/4	CD55043	64.50
.6875	11/16	2	5-3/8	9-1/4	CD55044	60.95
.7031	45/64	2	5-5/8	9-1/2	CD55045	67.25
.7188	23/32	2	5-5/8	9-1/2	CD55046	64.95
.7344	47/64	2	5-7/8	9-3/4	CD55047	71.70
.7500	3/4	2	5-7/8	9-3/4	CD55048	71.10
.7656	49/64	2	6	9-7/8	CD55049	86.10
.7813	25/32	2	6	9-7/8	CD55050	85.15

Taper shank drills sold individually.

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For technical information, see 224 - 225

DRILLS - HIGH SPEED STEEL

Taper Shank - 118° Point (Cont.)

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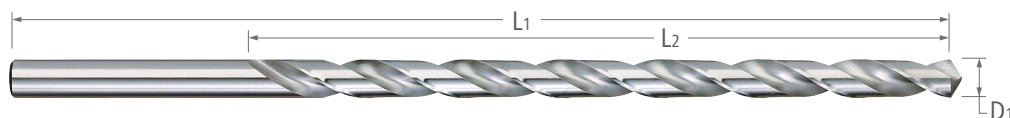
DRILL DIAMETER dec. equiv. size		MORSE TAPER	FLUTE LENGTH	OAL	BLACK OXIDE FINISH	
D ₁			L ₂	L ₁	TOOL #	PRICE
.7969	51/64	3	6-1/8	10-3/4	CD55051	93.80
.8125	13/16	3	6-1/8	10-3/4	CD55052	88.10
.8281	53/64	3	6-1/8	10-3/4	CD55053	98.10
.8438	27/32	3	6-1/8	10-3/4	CD55054	95.00
.8594	55/64	3	6-1/8	10-3/4	CD55055	107.70
.8750	7/8	3	6-1/8	10-3/4	CD55056	98.35
.8906	57/64	3	6-1/8	10-3/4	CD55057	103.35
.9063	29/32	3	6-1/8	10-3/4	CD55058	103.35
.9219	59/64	3	6-1/8	10-3/4	CD55059	104.80
.9375	15/16	3	6-1/8	10-3/4	CD55060	98.25
.9531	61/64	3	6-3/8	11	CD55061	107.65
.9688	31/32	3	6-3/8	11	CD55062	106.95
.9844	63/64	3	6-3/8	11	CD55063	114.20
1.0000	1	3	6-3/8	11	CD55064	108.70
1.0156	1-1/64	3	6-1/2	11-1/8	CD55065	127.00
1.0313	1-1/32	3	6-1/2	11-1/8	CD55066	125.45
1.0469	1-3/64	3	6-5/8	11-1/4	CD55067	131.45
1.0625	1-1/16	3	6-5/8	11-1/4	CD55068	125.45
1.0781	1-5/64	4	6-7/8	12-1/2	CD55069	149.35
1.0938	1-3/32	4	6-7/8	12-1/2	CD55070	150.05
1.1094	1-7/64	4	7-1/8	12-3/4	CD55071	155.30
1.1250	1-1/8	4	7-1/8	12-3/4	CD55072	155.30
1.1406	1-9/64	4	7-1/4	12-7/8	CD55073	167.30
1.1563	1-5/32	4	7-1/4	12-7/8	CD55074	161.30
1.1719	1-11/64	4	7-3/8	13	CD55075	167.30
1.1875	1-3/16	4	7-3/8	13	CD55076	167.30
1.2031	1-13/64	4	7-1/2	13-1/8	CD55077	179.20
1.2188	1-7/32	4	7-1/2	13-1/8	CD55078	179.20
1.2500	1-1/4	4	7-7/8	13-1/2	CD55080	187.60
1.3125	1-5/16	4	8-5/8	14-1/4	CD55084	231.70
1.3750	1-3/8	4	8-7/8	14-1/2	CD55088	246.15
1.4375	1-7/16	4	9-1/8	14-3/4	CD55092	270.05
1.5000	1-1/2	4	9-3/8	15	CD55096	283.20
1.5625	1-9/16	5	9-5/8	16-5/8	CD55102	345.35
1.6250	1-5/8	5	10	17	CD55106	372.85
1.6875	1-11/16	5	10-1/8	17-1/8	CD55110	411.10
1.7500	1-3/4	5	10-1/8	17-1/8	CD55114	437.35
1.8125	1-13/16	5	10-1/8	17-1/8	CD55118	469.60
1.8750	1-7/8	5	10-3/8	17-3/8	CD55122	489.90
1.9375	1-15/16	5	10-3/8	17-3/8	CD55126	528.20
2.0000	2	5	10-3/8	17-3/8	CD55130	547.30

Taper shank drills sold individually.

Drills
Carbide
Cobalt
HSS

DRILLS - HIGH SPEED STEEL

Extra Long - 118° Point



- Extra long length design for deep drilling applications
- Offered in 8" and 12" overall lengths
- Bright finish improves performance in plastics and other non-ferrous materials
- High speed steel
- Precision manufactured in the USA

DRILL DIAMETER dec. equiv. size		FLUTE LENGTH	OAL	BRIGHT FINISH	
D1		L2	L1	TOOL #	PRICE
.1250	1/8	5-1/2	8	CD66600	27.25
.1250	1/8	9	12	CD68608	29.55
.1406	9/64	5-1/2	8	CD66601	29.20
.1406	9/64	9	12	CD68609	42.55
.1563	5/32	5-1/2	8	CD66602	29.55
.1563	5/32	9	12	CD68610	38.70
.1719	11/64	5-1/2	8	CD66603	29.55
.1719	11/64	9	12	CD68611	33.00
.1875	3/16	5-1/2	8	CD66604	29.55
.1875	3/16	9	12	CD68612	33.15
.2031	13/64	5-1/2	8	CD66605	30.25
.2031	13/64	9	12	CD68613	40.00
.2188	7/32	5-1/2	8	CD66606	30.40
.2188	7/32	9	12	CD68614	35.80
.2344	15/64	5-1/2	8	CD66607	30.80
.2344	15/64	9	12	CD68615	35.80
.2500	1/4	5-1/2	8	CD66608	30.80
.2500	1/4	9	12	CD68616	37.00
.2656	17/64	5-1/2	8	CD66609	31.55
.2656	17/64	9	12	CD68617	38.30
.2813	9/32	5-1/2	8	CD66610	32.55
.2813	9/32	9	12	CD68618	38.30
.2969	19/64	9	12	CD68619	39.90
.3125	5/16	5-1/2	8	CD66612	34.60
.3125	5/16	9	12	CD68620	39.90
.3281	21/64	9	12	CD68621	42.55
.3438	11/32	5-1/2	8	CD66614	39.55
.3438	11/32	9	12	CD68622	42.55
.3594	23/64	9	12	CD68623	42.55
.3750	3/8	5-1/2	8	CD66616	37.50
.3750	3/8	9	12	CD68624	39.40
.3906	25/64	9	12	CD68625	59.35
.4063	13/32	5-1/2	8	CD66618	43.00

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DRILLS - HIGH SPEED STEEL

Extra Long - 118° Point (Cont.)

continued from previous page

	DRILL DIAMETER		FLUTE LENGTH	OAL	BRIGHT FINISH	
	dec. equiv.	size			TOOL #	PRICE
	D ₁		L ₂	L ₁		
	.4063	13/32	9	12	CD68626	59.35
NEW	.4219	27/64	5-1/2	8	CD66619	47.80
	.4219	27/64	9	12	CD68627	59.35
NEW	.4375	7/16	5-1/2	8	CD66620	48.00
	.4375	7/16	9	12	CD68628	50.65
	.4531	29/64	9	12	CD68629	61.95
	.4688	15/32	9	12	CD68630	55.75
	.4844	31/64	9	12	CD68631	57.05
NEW	.5000	1/2	5-1/2	8	CD66624	54.75
	.5000	1/2	9	12	CD68632	57.30
	.5313	17/32	9	12	CD68634	72.60
	.5625	9/16	9	12	CD68636	72.60
	.5938	19/32	9	12	CD68638	90.75
	.6250	5/8	9	12	CD68640	88.15
	.6875	11/16	9	12	CD68644	92.90
	.7500	3/4	9	12	CD68648	105.15

Drills

Carbide

Cobalt

HSS

DRILLS - HIGH SPEED STEEL

Mechanics Length -135° Split Point



- 3 flats on shank for added tool holding security in 3 Jaw Chucks
- Black & Gold Oxide finish minimizes friction and improves lubricity
- High speed steel
- 135° split point
- Precision manufactured in the USA

DRILL DIAMETER dec. equiv. size		FLUTE LENGTH	OAL	PACKAGE QTY.	BLACK & GOLD OXIDE FINISH	
D ₁		L ₂	L ₁		TOOL #	PRICE
.0625	1/16	7/8	1-7/8	12	CD45504	1.60
.0781	5/64	1	2	12	CD45505	1.70
.0938	3/32	1-1/4	2-1/4	12	CD45506	1.70
.1094	7/64	1-5/16	2-3/8	12	CD45507	1.75
.1250	1/8	1-7/16	2-1/2	12	CD45508	1.80
.1406	9/64	1-9/16	2-5/8	12	CD45509	1.85
.1563	5/32	1-11/16	2-3/4	12	CD45510	2.20
.1719	11/64	1-13/16	2-7/8	12	CD45511	2.25
.1875	3/16	1-7/8	3	12	CD45512	2.50
.2031	13/64	1-15/16	3-1/8	12	CD45513	2.75
.2188	7/32	2	3-1/4	12	CD45514	3.00
.2344	15/64	2-1/16	3-3/8	12	CD45515	3.20
.2500	1/4	2	3-1/2	12	CD45516	3.35
.2656	17/64	2-1/8	3-5/8	6	CD45517	4.15
.2813	9/32	2-1/4	3-3/4	6	CD45518	4.15
.2969	19/64	2-3/8	3-7/8	6	CD45519	4.90
.3125	5/16	2-1/2	4	6	CD45520	5.25
.3281	21/64	2-9/16	4-1/16	6	CD45521	5.60
.3438	11/32	2-5/8	4-1/8	6	CD45522	6.10
.3594	23/64	2-11/16	4-3/16	6	CD45523	6.45
.3750	3/8	2-11/16	4-1/4	6	CD45524	6.90
.3906	25/64	2-3/4	4-5/16	6	CD45525	7.35
.4063	13/32	2-13/16	4-3/8	6	CD45526	7.85
.4219	27/64	2-7/8	4-7/16	6	CD45527	8.90
.4375	7/16	2-15/16	4-1/2	6	CD45528	9.35
.4531	29/64	3	4-5/8	6	CD45529	10.20
.4688	15/32	3-1/8	4-3/4	6	CD45530	11.00
.4844	31/64	3-1/4	4-7/8	6	CD45531	11.20
.5000	1/2	3-3/8	5	6	CD45532	11.55

Sizes 3/16" through 1/2" include 3 Flats. Sizes 27/64" and larger include 3/8" reduced flatted shanks.

SCREW EXTRACTORS



- High speed steel
- Precision manufactured in the USA

SIZE	FOR SCREW & BOLT SIZES	PIPE SIZE	PACKAGE QUANTITY	UNCOATED	
				TOOL #	PRICE
1	3/16 - 1/4	-	1	CD53101	5.10
2	1/4 - 5/16	-	1	CD53102	5.40
3	5/16 - 7/16	-	1	CD53103	6.50
4	7/16 - 9/16	1/8	1	CD53104	6.95
5	9/16 - 3/4	1/4	1	CD53105	8.70
6	3/4-1	3/8	1	CD53106	19.10
7	1 - 1-3/8	1/2	1	CD53107	30.80
SET	SIZES 1-5	-	1	CD53113	32.70



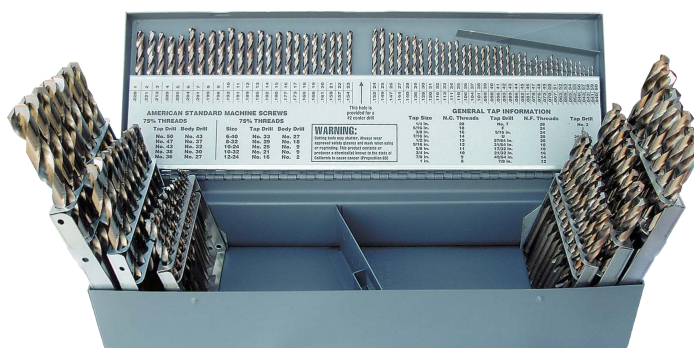
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DRILL SETS - COBALT

Jobber Drill Sets

- Comprehensive drill set featuring tools with jobber length geometry, ideal for deeper drilling applications
- M42 cobalt
- Precision manufactured in the USA



DESCRIPTION	GOLD OXIDE FINISH	
	TOOL #	PRICE
13PC • 1/16" - 1/4" by 64ths • Heavy Duty • 135° SP/PT	MS99151	42.30
15PC • 1/16" - 1/2" by 32nds • Heavy Duty • 135° SP/PT	MS99153	125.25
21PC • 1/16" - 3/8" by 64ths • Heavy Duty • 135° SP/PT	MS99155	136.35
26PC • A - Z • Heavy Duty • 135° SP/PT	MS99157	239.25
29PC • 1/16" - 1/2" by 64ths • Heavy Duty • 135° SP/PT	MS99159	239.25
60PC • #1 - #60 • Heavy Duty • 135° SP/PT	MS99161	177.45
115PC • 1/16" - 1/2" by 64ths • #1 - #60 • A - Z • H.D. • 135° SP/PT	MS99163	749.05

DRILL SETS - COBALT

Screw Machine Drill Set

- Comprehensive cobalt drill set featuring tools with screw machine length geometry for extra strength
- M42 cobalt
- Precision manufactured in the USA



DESCRIPTION	GOLD OXIDE FINISH	
	TOOL #	PRICE
115PC • 1/16" - 1/2" by 64ths • #1 - #60 • A - Z • H.D. • 135° SP/PT	MS99165	621.10

For technical information, see 224 - 225

DRILL SETS - HIGH SPEED STEEL

Jobber Drill Sets

- Comprehensive drill set featuring tools with jobber length geometry, ideal for deeper drilling applications
- High speed steel
- Precision manufactured in the USA



DESCRIPTION	BRIGHT FINISH		BLACK OXIDE FINISH		TIN COATED	
	TOOL #	PRICE	TOOL #	PRICE	TOOL #	PRICE
13PC • 1/16" - 1/4" by 64ths • 118° Point	MS99011	28.75	MS99010	28.75		
15PC • 1/16" - 1/2" by 32nds • 118° Point	MS99016	79.35	MS99014	79.35		
15PC • 1/16" - 1/2" by 32nds • Heavy Duty • 135° SP/PT			MS99017	87.40		
21PC • 1/16" - 3/8" by 64ths • 118° Point	MS99020	67.30	MS99018	67.30		
25PC • 1.0mm - 13.0mm by 0.5mm • 118° Point			MS99050	153.55		
26PC • A - Z • 118° Point	MS99024	112.75	MS99022	112.75		
29PC • 1/16" - 1/2" by 64ths • 118° Point	MS99028	113.85	MS99026	113.85		
29PC • 1/16" - 1/2" by 64ths • Heavy Duty • 135° SP/PT			MS99032	135.75		
29PC • 1/16" - 1/2" by 64ths • 118° Point					MS99036	316.35
60PC • #1 - #60 • 118° Point	MS99040	98.90	MS99038	98.90		
115PC • 1/16" - 1/2" by 64ths • #1 - #60 • A - Z • 118° Point	MS99044	319.75	MS99042	319.75		

For technical information, see 224 - 225

DRILL SETS - HIGH SPEED STEEL

Jobber Drill Sets - Black & Gold Oxide Finish

- Comprehensive set of drills with Black & Gold finish for minimized friction and improved lubricity.
- High speed steel
- Precision manufactured in the USA



DESCRIPTION	BLACK & GOLD OXIDE FINISH	
	TOOL #	PRICE
13PC • 1/16" - 1/4" by 64ths • Heavy Duty • 135° SP/PT • Black & Gold Oxide	MS99012	35.65
15PC • 1/16" - 1/2" by 32nds • Heavy Duty • 135° SP/PT • Black & Gold Oxide	MS99015	102.95
21PC • 1/16" - 3/8" by 64ths • Heavy Duty • 135° SP/PT • Black & Gold Oxide	MS99021	100.65
29PC • 1/16" - 1/2" by 64ths • Heavy Duty • 135° SP/PT • Black & Gold Oxide	MS99030	164.50
29PC • 1/16" - 1/2" by 64ths • H.D. • 135° SP/PT • Black & Gold Oxide • Plastic Case	MS99431	164.50
115PC • 1/16" - 1/2" by 64ths • #1 - #60 • A - Z • Heavy Duty • 135° SP/PT • Black & Gold Oxide	MS99046	488.85

Sizes below 1/16" are not split point.

DRILL SETS - HIGH SPEED STEEL

Mechanics Length Sets

- Comprehensive drill set featuring tools with mechanics length geometry for added tool holding security in 3 Jaw Chucks
- High speed steel
- Precision manufactured in the USA



DESCRIPTION	BLACK & GOLD OXIDE FINISH	
	TOOL #	PRICE
15PC • 1/16" - 1/2" by 32ths • Black & Gold • Heavy Duty • 135° SP/PT • Metal Case	MS99425	96.60
29PC • 1/16" - 1/2" by 64ths • Black & Gold • Heavy Duty • 135° SP/PT • Metal Case	MS99405	178.90
29PC • 1/16" - 1/2" by 64ths • Black & Gold • Heavy Duty • 135° SP/PT • Plastic Case	MS99442	178.90

Mechanics Length sizes 3/16" to 1/2" include 3 flats.
 Sizes 27/64" and up include 3/8" reduced flat shanks.

For technical information, see 224 - 225

DRILL SETS - HIGH SPEED STEEL

Silver & Deming Sets



- Comprehensive Silver & Deming drill set featuring tools with a 1/2" shank diameter
- High speed steel
- Precision manufactured in the USA

DESCRIPTION	UNCOATED		BLACK & GOLD OXIDE FINISH	
	TOOL #	PRICE	TOOL #	PRICE
8PC • HSS • 9/16" - 1" by 16ths • 118° Point • Plastic Case	MS99302	286.45		
8PC • HSS • 9/16" - 1" by 16ths • 118° Split Point • Plastic Case			MS99313	343.95
8PC • 9/16" - 1" by 16ths • M42 cobalt • 135° Split Point • Plastic Case	MS99310	569.35		
33PC • HSS • 1/2" - 1" by 64ths • 118° Point • Metal Stand	MS99304	1179.05		

DRILL SETS - HIGH SPEED STEEL

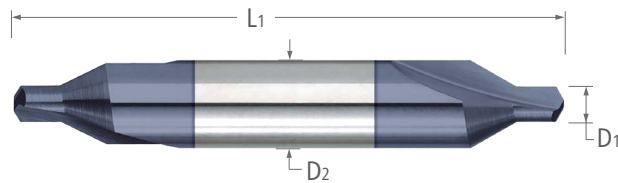
Tap & Drill Sets



- 18 piece tap & drill set
- High speed steel
- Precision manufactured in the USA

DESCRIPTION	TOOL #	PRICE
18PC • (6-32, #36), (8-32, #29), (10-24, #25), (10-32, #21), (1/4-20, #7) (5/16-18,"F"), (3/8-16, 5/16"), (7/16-14,"U"), (1/2-13, 27/64) • Metal Case	MS99201	146.65

COMBINED DRILL & COUNTERSINKS - CARBIDE

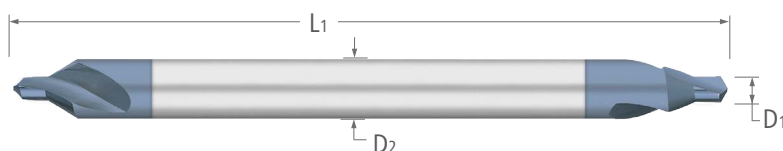


- 60° included angle
- Double-ended
- AlTiN coating offers increased wear and heat resistance
- Solid carbide
- Precision manufactured in the USA

SIZE	DRILL DIA.	BODY DIA.	OAL	PACKAGE QTY.	UNCOATED		AlTiN COATED	
	D ₁	D ₂	L ₁		TOOL #	PRICE	TOOL #	PRICE
00	.025	1/8	1-1/2	1	CS30020	20.70	CS36020	25.10
0	1/32	1/8	1-1/2	1	CS30010	19.85	CS36010	24.35
1	3/64	1/8	1-1/2	1	CS30001	18.05	CS36001	22.50
2	5/64	3/16	2	1	CS30002	26.85	CS36002	31.90
3	7/64	1/4	2	1	CS30003	30.15	CS36003	36.20
4	1/8	5/16	2-1/2	1	CS30004	39.10	CS36004	46.80
5	3/16	7/16	2-3/4	1	CS30005	61.70	CS36005	73.50
6	7/32	1/2	3	1	CS30006	77.20	CS36006	91.55

COMBINED DRILL & COUNTERSINKS - CARBIDE

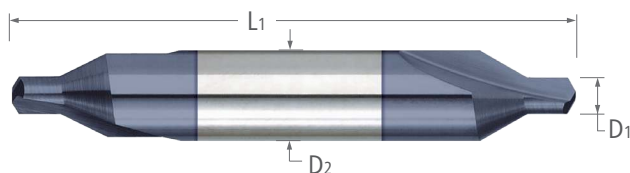
Long Length



- 60° included angle
- Long length design
- Double-ended
- AlTiN coating offers increased wear and heat resistance
- Solid carbide
- Precision manufactured in the USA

	SIZE	DRILL DIA.	BODY DIA.	OAL	PACKAGE QTY.	UNCOATED		AlTiN COATED	
		D ₁	D ₂	L ₁		TOOL #	PRICE	TOOL #	PRICE
NEW	1 x 4	3/64	1/8	4	1	CS95464	77.30	CS95474	84.85
NEW	2 x 4	5/64	3/16	4	1	CS95465	82.00	CS95475	90.50
NEW	3 x 4	7/64	1/4	4	1	CS95466	86.20	CS95476	96.35
NEW	3 x 6	7/64	1/4	6	1	CS95467	94.60	CS95477	106.45
NEW	4 x 4	1/8	5/16	4	1	CS95468	129.90	CS95478	142.15
NEW	4 x 5	1/8	5/16	5	1	CS95469	141.20	CS95479	154.35
NEW	4 x 6	1/8	5/16	6	1	CS95470	146.00	CS95480	160.20
NEW	5 x 5	3/16	7/16	5	1	CS95471	194.10	CS95481	212.30
NEW	5 x 6	3/16	7/16	6	1	CS95472	198.90	CS95482	218.60
NEW	6 x 6	7/32	1/2	6	1	CS95473	201.20	CS95483	224.20

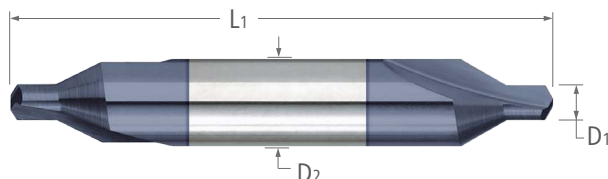
COMBINED DRILL & COUNTERSINKS - M42 COBALT



- 60° included angle
- Double-ended
- AlTiN coating offers increased wear and heat resistance
- M42 cobalt
- Precision manufactured in the USA

SIZE	DRILL DIA.	BODY DIA.	OAL	PACKAGE QTY.	UNCOATED		AlTiN COATED	
	D ₁	D ₂	L ₁		TOOL #	PRICE	TOOL #	PRICE
1	3/64	1/8	1-1/4	6	CS20001	19.15	CS37001	23.70
2	5/64	3/16	1-7/8	6	CS20002	20.70	CS37002	25.85
3	7/64	1/4	2	6	CS20003	21.45	CS37003	27.55
4	1/8	5/16	2-1/8	6	CS20004	22.45	CS37004	30.20

COMBINED DRILL & COUNTERSINKS - HIGH SPEED STEEL



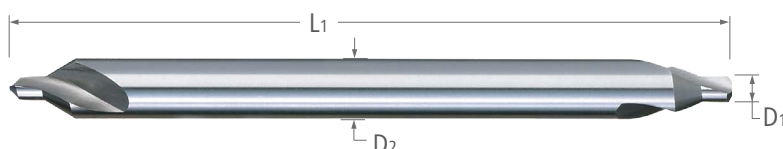
- 60° included angle
- Double-ended
- AlTiN coating offers increased wear and heat resistance
- High speed steel
- Precision manufactured in the USA

SIZE	DRILL DIA.	BODY DIA.	OAL	PACKAGE QTY.	UNCOATED		AlTiN COATED	
	D ₁	D ₂	L ₁		TOOL #	PRICE	TOOL #	PRICE
00000	.010	1/8	1-1/4	6	CS00050	11.35	CS35050	15.40
0000	.015	1/8	1-1/4	6	CS00040	10.35	CS35040	14.80
000	.020	1/8	1-1/4	6	CS00030	9.85	CS35030	14.15
00	.025	1/8	1-1/4	6	CS00020	9.85	CS35020	13.45
0	1/32	1/8	1-1/4	6	CS10010	10.35	CS35010	13.45
1	3/64	1/8	1-1/4	6	CS10001	6.25	CS35001	10.20
2	5/64	3/16	1-7/8	6	CS10002	6.50	CS35002	10.45
3	7/64	1/4	2	6	CS10003	6.85	CS35003	13.10
4	1/8	5/16	2-1/8	6	CS10004	7.05	CS35004	14.65
5	3/16	7/16	2-3/4	1	CS10005	11.20	CS35005	19.40
6	7/32	1/2	3	1	CS10006	16.70	CS35006	29.95
7	1/4	5/8	3-1/4	1	CS10007	29.05	CS35007	44.40
8	5/16	3/4	3-1/2	1	CS10008	40.65	CS35008	69.25

For technical information, see 225

COMBINED DRILL & COUNTERSINKS - HIGH SPEED STEEL

Long Length



- 60° included angle
- Long length design
- Double-ended
- High speed steel
- Precision manufactured in the USA

SIZE	DRILL DIA.	BODY DIA.	OAL	PACKAGE QTY.	UNCOATED	
	D ₁	D ₂	L ₁		TOOL #	PRICE
1 x 3	3/64	1/8	3	1	CS50013	15.60
1 x 4	3/64	1/8	4	1	CS50014	16.45
1 x 5	3/64	1/8	5	1	CS50015	22.80
1 x 6	3/64	1/8	6	1	CS50016	29.90
2 x 3	5/64	3/16	3	1	CS50023	15.85
2 x 4	5/64	3/16	4	1	CS50024	17.85
2 x 5	5/64	3/16	5	1	CS50025	23.05
2 x 6	5/64	3/16	6	1	CS50026	29.85
3 x 3	7/64	1/4	3	1	CS50033	16.65
3 x 4	7/64	1/4	4	1	CS50034	18.85
3 x 5	7/64	1/4	5	1	CS50035	24.95
3 x 6	7/64	1/4	6	1	CS50036	30.10
4 x 4	1/8	5/16	4	1	CS50044	20.90
4 x 5	1/8	5/16	5	1	CS50045	26.80
4 x 6	1/8	5/16	6	1	CS50046	31.00
4-1/2 x 4	9/64	3/8	4	1	CS50040	23.55
4-1/2 x 5	9/64	3/8	5	1	CS50050	34.35
4-1/2 x 6	9/64	3/8	6	1	CS50060	38.15
5 x 4	3/16	7/16	4	1	CS50054	27.40
5 x 5	3/16	7/16	5	1	CS50055	31.95
5 x 6	3/16	7/16	6	1	CS50056	35.85
6 x 5	7/32	1/2	5	1	CS50065	34.15
6 x 6	7/32	1/2	6	1	CS50066	41.30
7 x 6	1/4	5/8	6	1	CS50076	77.20
8 x 6	5/16	3/4	6	1	CS50086	93.40

COUNTERSINKS - CARBIDE

Single Flute



- 60°, 82°, 90°, and 100° included angle options
- Single flute design
- Solid carbide head brazed onto a steel shank
- Precision manufactured in the USA

INCLUDED ANGLE	SIZE	SHANK DIAMETER	OVERALL LENGTH	UNCOATED	
A	D1	D2	L1	TOOL #	PRICE
60°	1/8*	1/8	1-1/2	CS31008	16.05
	3/16*	3/16	2	CS31012	17.15
	1/4*	1/4	2	CS31016	19.50
	3/8	1/4	2-5/8	CS31024	35.30
	1/2	1/4	2-5/8	CS31032	43.55
	5/8	3/8	2-3/4	CS31040	63.90
	3/4	3/8	2-3/4	CS31048	90.40
	1	1/2	3	CS31064	133.25
82°	1/8*	1/8	1-1/2	CS31108	16.05
	3/16*	3/16	2	CS31112	17.15
	1/4*	1/4	2	CS31116	19.50
	3/8	1/4	2-5/8	CS31124	35.30
	1/2	1/4	2-5/8	CS31132	43.55
	5/8	3/8	2-3/4	CS31140	63.90
	3/4	3/8	2-3/4	CS31148	90.40
	1	1/2	3	CS31164	133.25
90°	1/8*	1/8	1-1/2	CS31208	16.05
	3/16*	3/16	2	CS31212	17.15
	1/4*	1/4	2	CS31216	19.50
	3/8	1/4	2-5/8	CS31224	35.30
	1/2	1/4	2-5/8	CS31232	43.55
	5/8	3/8	2-3/4	CS31240	63.90
	3/4	3/8	2-3/4	CS31248	90.40
	1	1/2	3	CS31264	133.25
100°	1/8*	1/8	1-1/2	CS31308	16.05
	3/16*	3/16	2	CS31312	17.15
	1/4*	1/4	2	CS31316	19.50
	3/8	1/4	2-5/8	CS31324	35.30
	1/2	1/4	2-5/8	CS31332	43.55
	5/8	3/8	2-3/4	CS31340	63.90
	3/4	3/8	2-3/4	CS31348	90.40
	1	1/2	3	CS31364	133.25

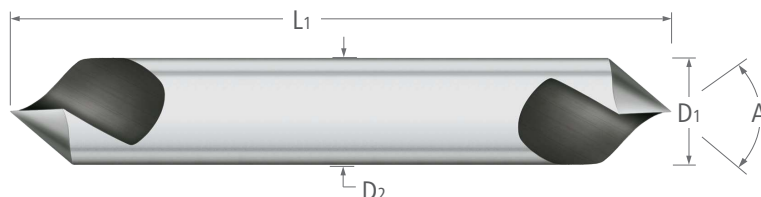
*One solid carbide piece

For technical information, see 226

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COUNTERSINKS - CARBIDE

Single Flute - Double-Ended



- Designed for countersinking, chamfering, and deburring holes
- 60°, 82°, 90°, 100° and 120° included angle options
- Double-ended
- Solid carbide
- Precision manufactured in the USA

INCLUDED ANGLE	SIZE	SHANK DIAMETER	OVERALL LENGTH	UNCOATED	
A	D1	D2	L1	TOOL #	PRICE
60°	1/8	1/8	1-1/2	CS36050	39.15
	3/16	3/16	2	CS36051	50.35
	1/4	1/4	2	CS36052	63.45
	5/16	5/16	2-1/2	CS36053	102.00
	3/8	3/8	2-1/2	CS36054	120.85
	1/2	1/2	3	CS36055	170.35
	5/8	5/8	3-1/2	CS36056	226.10
	3/4	3/4	4	CS36057	322.70
82°	1/8	1/8	1-1/2	CS36060	39.15
	3/16	3/16	2	CS36061	50.35
	1/4	1/4	2	CS36062	63.45
	5/16	5/16	2-1/2	CS36063	102.00
	3/8	3/8	2-1/2	CS36064	120.85
	1/2	1/2	3	CS36065	170.35
	5/8	5/8	3-1/2	CS36066	226.10
	3/4	3/4	4	CS36067	322.70
90°	1/8	1/8	1-1/2	CS36070	39.15
	3/16	3/16	2	CS36071	50.35
	1/4	1/4	2	CS36072	63.45
	5/16	5/16	2-1/2	CS36073	102.00
	3/8	3/8	2-1/2	CS36074	120.85
	1/2	1/2	3	CS36075	170.35
	5/8	5/8	3-1/2	CS36076	226.10
	3/4	3/4	4	CS36077	322.70
100°	1/8	1/8	1-1/2	CS36080	39.15
	3/16	3/16	2	CS36081	50.35
	1/4	1/4	2	CS36082	63.45
	5/16	5/16	2-1/2	CS36083	102.00
	3/8	3/8	2-1/2	CS36084	120.85
	1/2	1/2	3	CS36085	170.35
	5/8	5/8	3-1/2	CS36086	226.10
	3/4	3/4	4	CS36087	322.70
120°	1/8	1/8	1-1/2	CS36090	39.15
	3/16	3/16	2	CS36091	50.35
	1/4	1/4	2	CS36092	63.45
	5/16	5/16	2-1/2	CS36093	102.00
	3/8	3/8	2-1/2	CS36094	120.85
	1/2	1/2	3	CS36095	170.35
	5/8	5/8	3-1/2	CS36096	226.10
	3/4	3/4	4	CS36097	322.70

For technical information, see 226

Trust in Titan USA

COUNTERSINKS - CARBIDE

3 Flute



- 60°, 82°, 90°, and 100° included angle options
- Solid carbide head brazed onto a steel shank
- Precision manufactured in the USA

INCLUDED ANGLE	SIZE	SHANK DIAMETER	OVERALL LENGTH	UNCOATED	
A	D1	D2	L1	TOOL #	PRICE
60°	1/8*	1/8	1-1/2	CS33108	16.05
	3/16*	3/16	2	CS33112	17.15
	1/4*	1/4	2	CS33116	19.50
	3/8	1/4	2-5/8	CS33124	35.30
	1/2	1/4	2-5/8	CS33132	43.55
	5/8	3/8	2-3/4	CS33140	63.90
	3/4	3/8	2-3/4	CS33148	90.40
	1	1/2	3	CS33164	133.25
82°	1/8*	1/8	1-1/2	CS33208	16.05
	3/16*	3/16	2	CS33212	17.15
	1/4*	1/4	2	CS33216	19.50
	3/8	1/4	2-5/8	CS33224	35.30
	1/2	1/4	2-5/8	CS33232	43.55
	5/8	3/8	2-3/4	CS33240	63.90
	3/4	3/8	2-3/4	CS33248	90.40
	1	1/2	3	CS33264	133.25
90°	1/8*	1/8	1-1/2	CS33308	16.05
	3/16*	3/16	2	CS33312	17.15
	1/4*	1/4	2	CS33316	19.50
	3/8	1/4	2-5/8	CS33324	35.30
	1/2	1/4	2-5/8	CS33332	43.55
	5/8	3/8	2-3/4	CS33340	63.90
	3/4	3/8	2-3/4	CS33348	90.40
	1	1/2	3	CS33364	133.25
100°	1/8*	1/8	1-1/2	CS33408	16.05
	3/16*	3/16	2	CS33412	17.15
	1/4*	1/4	2	CS33416	19.50
	3/8	1/4	2-5/8	CS33424	35.30
	1/2	1/4	2-5/8	CS33432	43.55
	5/8	3/8	2-3/4	CS33440	63.90
	3/4	3/8	2-3/4	CS33448	90.40
	1	1/2	3	CS33464	133.25

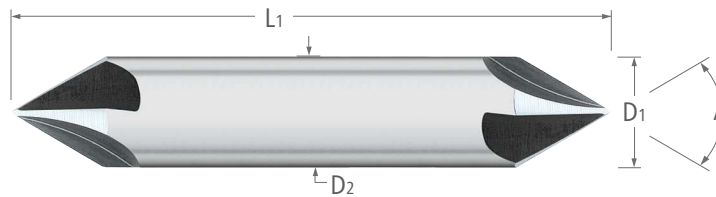
*One solid carbide piece

For technical information, see 226

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COUNTERSINKS - CARBIDE

4 Flute - Double-Ended



- Designed for countersinking, chamfering, and deburring holes
- 60°, 82°, 90°, 100°, 120° included angle options
- Double-ended
- 4 flute design allows for higher feed rates over single flute design
- Solid carbide
- Precision manufactured in the USA

INCLUDED ANGLE	SIZE	SHANK DIAMETER	OVERALL LENGTH	UNCOATED	
A	D1	D2	L1	TOOL #	PRICE
60°	1/8	1/8	1-1/2	CS36100	39.15
	3/16	3/16	2	CS36101	50.35
	1/4	1/4	2	CS36102	63.45
	5/16	5/16	2-1/2	CS36103	102.00
	3/8	3/8	2-1/2	CS36104	120.85
	1/2	1/2	3	CS36105	170.35
	5/8	5/8	3-1/2	CS36106	226.10
	3/4	3/4	4	CS36107	322.70
82°	1/8	1/8	1-1/2	CS36110	39.15
	3/16	3/16	2	CS36111	50.35
	1/4	1/4	2	CS36112	63.45
	5/16	5/16	2-1/2	CS36113	102.00
	3/8	3/8	2-1/2	CS36114	120.85
	1/2	1/2	3	CS36115	170.35
	5/8	5/8	3-1/2	CS36116	226.10
	3/4	3/4	4	CS36117	322.70
90°	1/8	1/8	1-1/2	CS36120	39.15
	3/16	3/16	2	CS36121	50.35
	1/4	1/4	2	CS36122	63.45
	5/16	5/16	2-1/2	CS36123	102.00
	3/8	3/8	2-1/2	CS36124	120.85
	1/2	1/2	3	CS36125	170.35
	5/8	5/8	3-1/2	CS36126	226.10
	3/4	3/4	4	CS36127	322.70
100°	1/8	1/8	1-1/2	CS36130	39.15
	3/16	3/16	2	CS36131	50.35
	1/4	1/4	2	CS36132	63.45
	5/16	5/16	2-1/2	CS36133	102.00
	3/8	3/8	2-1/2	CS36134	120.85
	1/2	1/2	3	CS36135	170.35
	5/8	5/8	3-1/2	CS36136	226.10
	3/4	3/4	4	CS36137	322.70
120°	1/8	1/8	1-1/2	CS36140	39.15
	3/16	3/16	2	CS36141	50.35
	1/4	1/4	2	CS36142	63.45
	5/16	5/16	2-1/2	CS36143	102.00
	3/8	3/8	2-1/2	CS36144	120.85
	1/2	1/2	3	CS36145	170.35
	5/8	5/8	3-1/2	CS36146	226.10
	3/4	3/4	4	CS36147	322.70

For technical information, see 226

COUNTERSINKS - CARBIDE

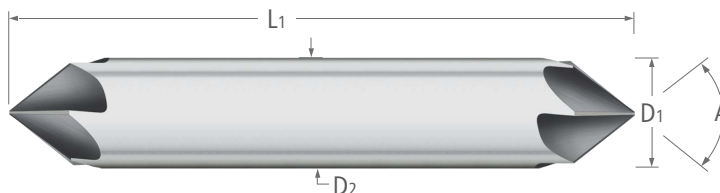
6 Flute



- 6 Flute chatterless design for improved finish
- Solid carbide head brazed onto a steel shank
- Precision manufactured in the USA
- 60°, 82°, 90°, and 100° included angle options

INCLUDED ANGLE	SIZE	SHANK DIAMETER	OVERALL LENGTH	UNCOATED	
A	D1	D2	L1	TOOL #	PRICE
60°	1/8*	1/8	1-1/2	CS36608	16.05
	3/16*	3/16	2	CS36612	17.15
	1/4*	1/4	2	CS36616	19.50
	3/8	1/4	2-5/8	CS36624	35.30
	1/2	1/4	2-5/8	CS36632	43.55
	5/8	3/8	2-3/4	CS36640	63.90
	3/4	3/8	2-3/4	CS36648	90.40
	1	1/2	3	CS36664	133.25
82°	1/8*	1/8	1-1/2	CS36708	16.05
	3/16*	3/16	2	CS36712	17.15
	1/4*	1/4	2	CS36716	19.50
	3/8	1/4	2-5/8	CS36724	35.30
	1/2	1/4	2-5/8	CS36732	43.55
	5/8	3/8	2-3/4	CS36740	63.90
	3/4	3/8	2-3/4	CS36748	90.40
	1	1/2	3	CS36764	133.25
90°	1/8*	1/8	1-1/2	CS36808	16.05
	3/16*	3/16	2	CS36812	17.15
	1/4*	1/4	2	CS36816	19.50
	3/8	1/4	2-5/8	CS36824	35.30
	1/2	1/4	2-5/8	CS36832	43.55
	5/8	3/8	2-3/4	CS36840	63.90
	3/4	3/8	2-3/4	CS36848	90.40
	1	1/2	3	CS36864	133.25
100°	1/8*	1/8	1-1/2	CS36908	16.05
	3/16*	3/16	2	CS36912	17.15
	1/4*	1/4	2	CS36916	19.50
	3/8	1/4	2-5/8	CS36924	35.30
	1/2	1/4	2-5/8	CS36932	43.55
	5/8	3/8	2-3/4	CS36940	63.90
	3/4	3/8	2-3/4	CS36948	90.40
	1	1/2	3	CS36964	133.25

*One solid carbide piece

COUNTERSINKS - CARBIDE**6 Flute - Double-Ended**

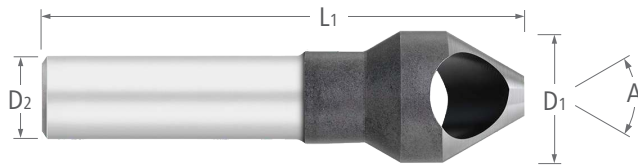
- Designed for countersinking, chamfering, and deburring holes
- 60°, 82°, 90°, 100°, and 120° included angle options
- Double-ended
- 6 flute design allows for higher feed rates over 4 flute design
- Solid carbide
- Precision manufactured in the USA

INCLUDED ANGLE	SIZE	SHANK DIAMETER	OVERALL LENGTH	UNCOATED	
A	D1	D2	L1	TOOL #	PRICE
60°	1/8	1/8	1-1/2	CS36150	39.15
	3/16	3/16	2	CS36151	50.35
	1/4	1/4	2	CS36152	63.45
	5/16	5/16	2-1/2	CS36153	102.00
	3/8	3/8	2-1/2	CS36154	120.85
	1/2	1/2	3	CS36155	170.35
	5/8	5/8	3-1/2	CS36156	226.10
	3/4	3/4	4	CS36157	322.70
82°	1/8	1/8	1-1/2	CS36160	39.15
	3/16	3/16	2	CS36161	50.35
	1/4	1/4	2	CS36162	63.45
	5/16	5/16	2-1/2	CS36163	102.00
	3/8	3/8	2-1/2	CS36164	120.85
	1/2	1/2	3	CS36165	170.35
	5/8	5/8	3-1/2	CS36166	226.10
	3/4	3/4	4	CS36167	322.70
90°	1/8	1/8	1-1/2	CS36170	39.15
	3/16	3/16	2	CS36171	50.35
	1/4	1/4	2	CS36172	63.45
	5/16	5/16	2-1/2	CS36173	102.00
	3/8	3/8	2-1/2	CS36174	120.85
	1/2	1/2	3	CS36175	170.35
	5/8	5/8	3-1/2	CS36176	226.10
	3/4	3/4	4	CS36177	322.70
100°	1/8	1/8	1-1/2	CS36180	39.15
	3/16	3/16	2	CS36181	50.35
	1/4	1/4	2	CS36182	63.45
	5/16	5/16	2-1/2	CS36183	102.00
	3/8	3/8	2-1/2	CS36184	120.85
	1/2	1/2	3	CS36185	170.35
	5/8	5/8	3-1/2	CS36186	226.10
	3/4	3/4	4	CS36187	322.70
120°	1/8	1/8	1-1/2	CS36190	39.15
	3/16	3/16	2	CS36191	50.35
	1/4	1/4	2	CS36192	63.45
	5/16	5/16	2-1/2	CS36193	102.00
	3/8	3/8	2-1/2	CS36194	120.85
	1/2	1/2	3	CS36195	170.35
	5/8	5/8	3-1/2	CS36196	226.10
	3/4	3/4	4	CS36197	322.70

For technical information, see 226

COUNTERSINKS - COBALT

Zero Flute



Double-Ended



- Designed with a radially-relieved single edge for fast removal without chatter
- 60°, 82°, 90° included angle options
- M42 cobalt
- Precision manufactured in the USA

INCLUDED ANGLE	SIZE	SHANK DIAMETER	OVERALL LENGTH	END	UNCOATED	
A	D ₁	D ₂	L ₁		TOOL #	PRICE
60°	1/4	1/4	1-1/2	DE	CD31500	21.45
	7/16	1/4	2-1/32	SE	CD31501	28.30
	9/16	1/4	2	SE	CD31502	36.05
	13/16	1/2	2-5/8	SE	CD31503	65.20
	1-1/8	1/2	2-7/8	SE	CD31504	107.05
82°	1/4	1/4	1-1/2	DE	CD31505	21.45
	7/16	1/4	2-1/32	SE	CD31506	28.30
	9/16	1/4	2	SE	CD31507	36.05
	13/16	1/2	2-5/8	SE	CD31508	65.20
	1-1/8	1/2	2-7/8	SE	CD31509	107.05
90°	1/4	1/4	1-1/2	DE	CD31510	21.45
	7/16	1/4	2-1/32	SE	CD31511	28.30
	9/16	1/4	2	SE	CD31512	36.05
	13/16	1/2	2-5/8	SE	CD31513	65.20
	1-1/8	1/2	2-7/8	SE	CD31514	107.05

For technical information, see 226

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COUNTERSINKS - HIGH SPEED STEEL

Single Flute



- 60°, 82°, and 90° included angle options
- Single flute design
- High speed steel
- Precision manufactured in the USA

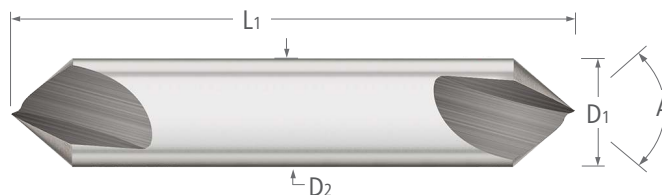
INCLUDED ANGLE	SIZE	SHANK DIAMETER	OVERALL LENGTH	UNCOATED	
A	D1	D2	L1	TOOL #	PRICE
60°	1/4	3/16	1-7/16	CD50501	17.55
	3/8	1/4	1-21/32	CD50502	20.05
	1/2	1/4	1-13/32	CD50503	25.65
	3/4	1/2	1-27/32	CD50504	35.25
	1	1/2	2-13/16	CD50505	54.90
82°	1/4	3/16	1-7/16	CD51014	17.55
	3/8	1/4	1-21/32	CD51015	20.05
	1/2	1/4	1-13/32	CD51016	25.65
	3/4	1/2	1-27/32	CD51017	35.25
	1	1/2	2-13/16	CD51018	54.90
90°	1/4	3/16	1-7/16	CD51523	17.55
	3/8	1/4	1-21/32	CD51524	20.05
	1/2	1/4	1-13/32	CD51525	25.65
	3/4	1/2	1-27/32	CD51526	35.25
	1	1/2	2-13/16	CD51527	54.90

For technical information, see 226

Trust in Titan USA

COUNTERSINKS - HIGH SPEED STEEL

Single Flute - Double-Ended



- Designed for countersinking, and deburring holes
- 60°, 82°, 90°, 100°, 120° included angle options
- High speed steel
- Precision manufactured in the USA

INCLUDED ANGLE	SIZE	SHANK DIAMETER	OVERALL LENGTH	UNCOATED	
A	D1	D2	L1	TOOL #	PRICE
60°	1/8	1/8	1-1/2	CD51025	16.40
	3/16	3/16	2	CD51026	17.75
	1/4	1/4	2	CD51027	18.25
	5/16	5/16	2-1/2	CD51028	20.80
	3/8	3/8	2-1/2	CD51029	23.25
	1/2	1/2	3	CD51030	29.05
	5/8	5/8	3-1/2	CD51031	42.00
	3/4	3/4	4	CD51032	60.10
82°	1/8	1/8	1-1/2	CD51033	16.40
	3/16	3/16	2	CD51034	17.75
	1/4	1/4	2	CD51035	18.25
	5/16	5/16	2-1/2	CD51036	20.80
	3/8	3/8	2-1/2	CD51037	23.25
	1/2	1/2	3	CD51038	29.05
	5/8	5/8	3-1/2	CD51039	42.00
	3/4	3/4	4	CD51040	60.10
90°	1/8	1/8	1-1/2	CD51041	16.40
	3/16	3/16	2	CD51042	17.75
	1/4	1/4	2	CD51043	18.25
	5/16	5/16	2-1/2	CD51044	20.80
	3/8	3/8	2-1/2	CD51045	23.25
	1/2	1/2	3	CD51046	29.05
	5/8	5/8	3-1/2	CD51047	42.00
	3/4	3/4	4	CD51048	60.10
100°	1/8	1/8	1-1/2	CD51049	16.40
	3/16	3/16	2	CD51050	17.75
	1/4	1/4	2	CD51051	18.25
	5/16	5/16	2-1/2	CD51052	20.80
	3/8	3/8	2-1/2	CD51053	23.25
	1/2	1/2	3	CD51054	29.05
	5/8	5/8	3-1/2	CD51055	42.00
	3/4	3/4	4	CD51056	60.10
120°	1/8	1/8	1-1/2	CD51057	16.40
	3/16	3/16	2	CD51058	17.75
	1/4	1/4	2	CD51059	18.25
	5/16	5/16	2-1/2	CD51060	20.80
	3/8	3/8	2-1/2	CD51061	23.25
	1/2	1/2	3	CD51062	29.05
	5/8	5/8	3-1/2	CD51063	42.00
	3/4	3/4	4	CD51064	60.10

For technical information, see 226

COUNTERSINKS - HIGH SPEED STEEL

4 Flute



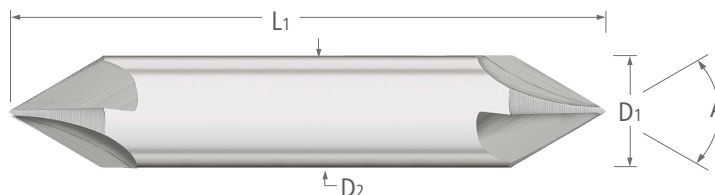
- 60° and 82° included angle options
- High speed steel
- Precision manufactured in the USA

INCLUDED ANGLE	SIZE	SHANK DIAMETER	OVERALL LENGTH	UNCOATED	
A	D1	D2	L1	TOOL #	PRICE
60°	1/2	1/2	3-7/8	CD52032	56.05
	5/8	1/2	4	CD52040	63.10
	3/4	1/2	4-1/8	CD52048	80.55
	7/8	1/2	4-1/4	CD52056	94.60
	1	1/2	4-3/8	CD52064	98.30
82°	1/2	1/2	3-7/8	CD52232	56.05
	5/8	1/2	4	CD52240	63.10
	3/4	1/2	4-1/8	CD52248	80.55
	7/8	1/2	4-1/4	CD52256	94.60
	1	1/2	4-3/8	CD52264	98.30

For technical information, see 226

COUNTERSINKS - HIGH SPEED STEEL

4 Flute - Double-Ended



- Designed for countersinking, and deburring holes
- 60°, 82°, 90°, 100°, 120° included angle options
- 4 flute design allows for higher feed rates over single flute design
- High speed steel
- Precision manufactured in the USA

INCLUDED ANGLE	SIZE	SHANK DIAMETER	OVERALL LENGTH	UNCOATED	
A	D1	D2	L1	TOOL #	PRICE
60°	1/8	1/8	1-1/2	CD51065	11.55
	3/16	3/16	2	CD51066	11.80
	1/4	1/4	2	CD51067	12.20
	5/16	5/16	2-1/2	CD51068	14.25
	3/8	3/8	2-1/2	CD51069	15.85
	1/2	1/2	3	CD51070	19.85
	5/8	5/8	3-1/2	CD51071	28.80
	3/4	3/4	4	CD51072	38.75
82°	1/8	1/8	1-1/2	CD51073	11.55
	3/16	3/16	2	CD51074	11.80
	1/4	1/4	2	CD51075	12.20
	5/16	5/16	2-1/2	CD51076	14.25
	3/8	3/8	2-1/2	CD51077	15.85
	1/2	1/2	3	CD51078	19.85
	5/8	5/8	3-1/2	CD51079	28.80
	3/4	3/4	4	CD51080	38.75
90°	1/8	1/8	1-1/2	CD51081	11.55
	3/16	3/16	2	CD51082	11.80
	1/4	1/4	2	CD51083	12.20
	5/16	5/16	2-1/2	CD51084	14.25
	3/8	3/8	2-1/2	CD51085	15.85
	1/2	1/2	3	CD51086	19.85
	5/8	5/8	3-1/2	CD51087	28.80
	3/4	3/4	4	CD51088	38.75
100°	1/8	1/8	1-1/2	CD51089	11.55
	3/16	3/16	2	CD51090	11.80
	1/4	1/4	2	CD51091	12.20
	5/16	5/16	2-1/2	CD51092	14.25
	3/8	3/8	2-1/2	CD51093	15.85
	1/2	1/2	3	CD51094	19.85
	5/8	5/8	3-1/2	CD51095	28.80
	3/4	3/4	4	CD51096	38.75
120°	1/8	1/8	1-1/2	CD51097	11.55
	3/16	3/16	2	CD51098	11.80
	1/4	1/4	2	CD51099	12.20
	5/16	5/16	2-1/2	CD51100	14.25
	3/8	3/8	2-1/2	CD51101	15.85
	1/2	1/2	3	CD51102	19.85
	5/8	5/8	3-1/2	CD51103	28.80
	3/4	3/4	4	CD51104	38.75

For technical information, see 226

DRILLS - CARBIDE

Technical Information

General Purpose Carbide Drills

Material Guide		Rc	SFM		Feed Per Tooth				
			25° Helix	15° Helix Straight Flute	1/16" - 1/8"	1/8" - 1/4"	1/4" - 3/8"	3/8" - 1/2"	1/2" - 5/8"
COBALT BASE ALLOYS	Stellite, HS - 21, Haynes 25/188, X - 40, L - 605	under 32 over 32	100 - 150 80 - 110	100 - 150 80 - 110	.0004 - .0010 .0004 - .0010	.0008 - .0020 .0005 - .0010	.0015 - .0025 .0010 - .0015	.0020 - .0040 .0010 - .0020	.0025 - .0050 .0015 - .0030
NICKEL BASE ALLOYS	Inconel - 625/718, Waspalloy, Rene, Hastelloy	under 32 over 32	100 - 150 90 - 125	125 - 175 90 - 125	.0005 - .0015 .0004 - .0010	.0010 - .0015 .0008 - .0015	.0015 - .0025 .0010 - .0015	.0020 - .0040 .0015 - .0030	.0025 - .0050 .0020 - .0040
IRON BASE ALLOYS	Incoloy 800 - 802, Multimet N - 155, Timkin 16 - 25 - 6, Carpeneter 22 - b3	under 32 over 32	100 - 150 90 - 125	125 - 175 90 - 125	.0010 - .0015 .0008 - .0015	.0010 - .0020 .0010 - .0020	.0015 - .0035 .0015 - .0025	.0020 - .0020 .0020 - .0040	.0030 - .0060 .0025 - .0050
MONEL	Monel - 65% Nickel		100 - 150	100 - 150	.0004 - .0010	.0008 - .0015	.0010 - .0015	.0015 - .0030	.0020 - .0040
TITANIUM ALLOYS	Commercially Pure, 6AL - 4V, Astm 1/2/3, 6AL - 25N - 4Zr - 2Mo - Si		150 - 200	150 - 200	.0008 - .0015	.0010 - .0020	.0015 - .0030	.0020 - .0040	.0025 - .0050
STAINLESS STEEL (PRECIPITATION)	13/8, 15/5, 17 - 4	under 32 over 32	125 - 175 80 - 125	150 - 200 100 - 150	.0005 - .0015 .0004 - .0010	.0010 - .0020 .0008 - .0015	.0015 - .0035 .0010 - .0015	.0020 - .0040 .0015 - .0030	.0025 - .0050 .0020 - .0040
STAINLESS STEEL (AUSTENITIC)	200 Series, 302, 303, 304, 304L, 316, 316L	under 32 over 32	100 - 175 100 - 125	150 - 200 125 - 150	.0005 - .0015 .0004 - .0010	.0010 - .0020 .0008 - .0015	.0015 - .0035 .0010 - .0015	.0020 - .0040 .0015 - .0030	.0025 - .0050 .0020 - .0040
STAINLESS STEEL (MARTENSITIC)	403, 410, 416, 440	under 32 over 32	100 - 150 80 - 125	125 - 175 100 - 140	.0005 - .0015 .0004 - .0010	.0010 - .0020 .0008 - .0015	.0015 - .0035 .0010 - .0015	.0020 - .0040 .0015 - .0030	.0025 - .0050 .0020 - .0040
HIGH STRENGTH TOOL STEELS	4140, 4340, 6150, 5210, A2, D2 P20, H11, H13, S2, 01	under 32 over 32	100 - 175 80 - 130	125 - 175 80 - 130	.0005 - .0015 .0004 - .0010	.0010 - .0020 .0010 - .0020	.0015 - .0025 .0010 - .0020	.0015 - .0030 .0015 - .0030	.0020 - .0040 .0020 - .0040
MEDIUM ALLOY STEELS	200, 250, 300	under 32 over 32	125 - 175 100 - 150	125 - 175 100 - 150	.0010 - .0015 .0005 - .0010	.0015 - .0025 .0010 - .0020	.0020 - .0030 .0010 - .0025	.0020 - .0040 .0015 - .0030	.0025 - .0050 .0020 - .0040
CARBON STEELS	1000's, 1100's, 1300's	under 32 over 32	125 - 175 100 - 125	150 - 200 100 - 175	.0010 - .0015 .0005 - .0010	.0015 - .0025 .0010 - .0020	.0020 - .0030 .0010 - .0025	.0020 - .0040 .0015 - .0035	.0025 - .0050 .0020 - .0040
DUCTILE	Ductile Cast Irons		125 - 200	150 - 250	.0010 - .0020	.0010 - .0030	.0015 - .0035	.0025 - .0040	.0030 - .0050
CAST IRONS	Gray Cast Irons		100 - 200	150 - 250	.0010 - .0020	.0010 - .0030	.0015 - .0035	.0025 - .0040	.0030 - .0050
ALUMINUM	2014, 2024, 6061 - (T1 - T6), 7075, Die Cast, Extruded		150 - 250		.0010 - .0020	.0015 - .0040	.0020 - .0050	.0030 - .0060	.0035 - .0070
MAGNESIUM			200 - 300		.0010 - .0020	.0010 - .0030	.0015 - .0035	.0025 - .0040	.0030 - .0050
COPPER, COPPER ALLOYS			150 - 250		.0010 - .0020	.0010 - .0030	.0015 - .0035	.0025 - .0040	.0030 - .0050
BRASS, BRONZE	Brass, Alum/Bronze, Low Silicon Bronze		150 - 300 125 - 200		.0010 - .0020 .0008 - .0015	.0010 - .0030 .0010 - .0020	.0015 - .0035 .0015 - .0030	.0025 - .0040 .0020 - .0040	.0030 - .0050 .0025 - .0050

DRILLS - HIGH SPEED STEEL & M42 COBALT

Element & Dimensional Drill Tolerances

Diameter at Point

Size (Inclusive)	Tolerance
OVER #81 TO 1/8	+0.0000 TO -0.0005
OVER 1/8 TO 1/4	+0.0000 TO -0.0007
OVER 1/4 TO 1/2	+0.0000 TO -0.0010
OVER 1/2 TO 1	+0.0000 TO -0.0012
OVER 1 TO 2	+0.0000 TO -0.0015
OVER 2 TO 3-1/2	+0.0000 TO -0.0020

Shank Diameter

Size (Inclusive)	Tolerance
OVER #81 TO 1/8	-.000 TO -.0025
OVER 1/8 TO 1/4	-.0005 TO -.0030
OVER 1/4 TO 1/2	-.0005 TO -.0045
OVER 1/2 TO 2	-.0005 TO -.0030

Back Taper

Size (Inclusive)	Tolerance Per Inch
OVER #81 TO 1/8	.0000 TO .0008
OVER 1/8 TO 1/4	.0002 TO .0008
OVER 1/4 TO 1/2	.0002 TO .0009
OVER 1/2 TO 1	.0003 TO .0011
OVER 1 TO 3-1/2	.0004 TO .0015

Flute Length

Size (Inclusive)	Tolerance
OVER #81 TO 1/8	+1/8 TO -1/16
OVER 1/8 TO 1/2	+1/8 TO -1/8
OVER 1/2 TO 1	+1/4 TO -1/8
OVER 1 TO 2	+1/4 TO -1/4
OVER 2 TO 3-1/2	+3/8 TO -3/8

Overall Length

Size (Inclusive)	Tolerance
OVER #81 TO 1/8	+1/8 TO -1/16
OVER 1/8 TO 1/2	+1/8 TO -1/8
OVER 1/2 TO 1	+1/4 TO -1/8
OVER 1 TO 2	+1/4 TO -1/4
OVER 2 TO 3-1/2	+3/8 TO -3/8

Included Point Angle

Size (Inclusive)	Included Angle	Tolerance
1/16 TO 1/2	118°	±5°
OVER 1/2 TO 1-1/2	118°	±3°
OVER 1-1/2 TO 3-1/2	118°	±2°

Lip Height

Size (Inclusive)	TIV (Total Indicator Variation)
1/16 TO 1/8	.0020
OVER 1/8 TO 1/4	.0030
OVER 1/4 TO 1/2	.0040
OVER 1/2 TO 1	.0050
OVER 1 TO 3-1/2	.0060

NOTE: 95% of drills in any one lot to fall within tolerances above.

Suggested Method of Measurement:

- Rotate the drill in a vee block against a back end stop.
- Measure the cutting lip height variation on a comparator, or with an indicator set at allocation approximately
- 75% of the distance from the center to the periphery of the drill.

Centrality of Web

Size (Inclusive)	TIV (Total Indicator Variation)
1/16 TO 1/8	.0030
OVER 1/8 TO 1/4	.0040
OVER 1/4 TO 1/2	.0050
OVER 1/2 TO 1	.0070
OVER 1 TO 2	.0100

NOTE: 95% of drills in any one lot to fall within tolerances above.

Suggested Method of Measurement :

- Rotate the drill in a close fitting bushing.
- Record the difference in indicator readings of the web at the point as the drill is indexed 180°.

Flute Spacing

Size (Inclusive)	Tolerance (TIV)	Actual Deviation
1/16 TO 1/8	.0030	.0015
OVER 1/8 TO 1/4	.0060	.0030
OVER 1/4 TO 1/2	.0100	.0050
OVER 1/2 TO 1	.0140	.0070
OVER 1 TO 2	.0260	.0130

NOTE: 95% of drills in any one lot to fall within tolerances above.

Suggested Method of Measurement:

- Place the drill in a vee block against a back end stop, and rotate it against a radial finger stop.
- Take an indicator reading at the leading edge of the margin on the opposite flute.
- Repeat for the other flute and note the difference between the two readings.
- The deviation in flute spacing is equal to one-half the difference between the two readings.

DRILLS - HIGH SPEED STEEL & M42 COBALT

Technical Information

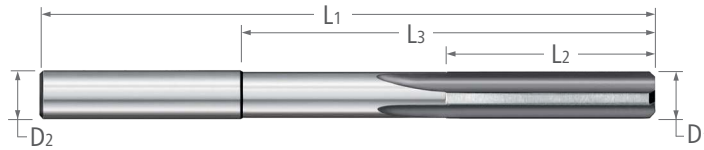
General Purpose Cobalt and HSS Drills										
Material Guide		Rc	GP	HD	Cobalt	Suggested Inch Per Revolution				
						UP TO 1/8"	1/8" - 1/4"	1/4" - 3/8"	3/8" - 1/2"	1/2" - 3/4"
NICKEL BASE ALLOYS	Inconel - 625/718, Waspalloy, Rene, Hastelloy	< 32	10 - 20	20 - 23	20 - 23	.0010 - .0020	.0020 - .0040	.0040 - .0080	.0080 - .0160	.0160 - .0240
TITANIUM ALLOYS	Commercially Pure, 6AL - 4V, Astm 1/2/3, 6Al - 25N - 4Zr - 2Mo - Si		20 - 75	35 - 90	35 - 90	.0010 - .0020	.0020 - .0040	.0040 - .0080	.0080 - .0160	.0160 - .0240
STAINLESS STEEL (PRECIPITATION)	13/8, 15/5, 17 - 4	< 32	20	30	30	.0010 - .0020	.0020 - .0040	.0040 - .0080	.0080 - .0160	.0160 - .0240
STAINLESS STEEL (AUSTENITIC)	200 Series, 302, 303, 304, 304L, 316, 316L	< 32	26	36	36	.0010 - .0020	.0020 - .0040	.0040 - .0080	.0080 - .0160	.0160 - .0240
STAINLESS STEEL (MARTENSITIC)	403, 410, 416, 440	< 32	50	70	72	.0010 - .0020	.0020 - .0040	.0040 - .0080	.0080 - .0160	.0160 - .0240
HIGH STRENGTH TOOL STEELS	4140, 4340, 6150, 5210, A2, D2 P20, H11, H13, S2, O1	< 32	30 - 65	33 - 75	33 - 75	.0010 - .0020	.0020 - .0040	.0040 - .0080	.0080 - .0160	.0160 - .0240
MEDIUM ALLOY STEELS	200, 250, 300	< 32	115	115	115	.0010 - .0020	.0020 - .0040	.0040 - .0080	.0080 - .0160	.0160 - .0240
CARBON STEELS	1000's, 1100's, 1300's	< 32	95	95	95	.0010 - .0020	.0020 - .0040	.0040 - .0080	.0080 - .0160	.0160 - .0240
DUCTILE	Ductile Cast Irons		45	55	55	.0010 - .0020	.0020 - .0040	.0040 - .0080	.0080 - .0160	.0160 - .0240
CAST IRONS	Gray Cast Irons		80 - 100	90 - 115	90 - 115	.0010 - .0020	.0020 - .0040	.0040 - .0080	.0080 - .0160	.0160 - .0240
HIGH SILICON ALUMINUM	A380, A390		60 - 80	80 - 95	80 - 95	.0010 - .0020	.0020 - .0040	.0040 - .0080	.0080 - .0160	.0160 - .0240
ALUMINUM ALLOYS	2014, 2024, 6061, 7075		90 - 98	95 - 100	95 - 100	.0010 - .0020	.0020 - .0040	.0040 - .0080	.0080 - .0160	.0160 - .0240
MAGNESIUM			90 - 115	90 - 130	90 - 130	.0010 - .0020	.0020 - .0040	.0040 - .0080	.0080 - .0160	.0160 - .0240
COPPER, COPPER ALLOYS			108	125	125	.0010 - .0020	.0020 - .0040	.0040 - .0080	.0080 - .0160	.0160 - .0240
BRASS, BRONZE	Brass, Alum/Bronze, Low Silicon Bronze		90 - 115	90 - 130	90 - 130	.0010 - .0020	.0020 - .0040	.0040 - .0080	.0080 - .0160	.0160 - .0240
COMPOSITES	G-10 Fiberglass, Graphite, Graphite/Epoxy, Plastics		100 - 125	125 - 175	125 - 175	.0010 - .0020	.0020 - .0040	.0040 - .0080	.0080 - .0160	.0160 - .0240

COUNTERSINKS - CARBIDE & HIGH SPEED STEEL

Technical Information

Countersinks Carbide and HSS			
Material Guide	SFM		Feed Per Tooth (FPT)
	HSS	Carbide	
INCONEL ALLOY HASTELLOY WROUGHT	15 - 20	25 - 35	.0010 - .0020
HASTELLOY (CAST)	5 - 7	7 - 15	.0010 - .0020
MAGNESIUM MAGNESIUM ALLOY	125 - 250	250 - 400	.0010 - .0020
HIGH NICKEL STEEL	30 - 50	50 - 75	.0010 - .0020
STAINLESS STEEL (FREE MACHINING)	30 - 80	80 - 125	.0010 - .0020
STAINLESS STEEL (WORK HARDENING)	15 - 50	50 - 75	.0010 - .0020
STEEL - MILD	70 - 100	80 - 170	.0010 - .0020
STEEL - TOOL	50 - 60	60 - 100	.0010 - .0020
STEEL - FORGINGS	40 - 50	50 - 80	.0010 - .0020
STEEL - ALLOYS 300 - 400 BRINELL	20 - 30	30 - 50	.0010 - .0020
STEEL - HIGH TENSILE 35 - 45 RC	25 - 40	35 - 60	.0010 - .0020
STEEL - HIGH TENSILE 45 - 50 RC	15 - 25	25 - 40	.0010 - .0020
STEEL - HIGH TENSILE 50 - 55 RC	7 - 15	15 - 20	.0010 - .0020
IRON - CAST SOFT	75 - 125	125 - 225	.0010 - .0020
IRON - CAST MEDIUM HARD	50 - 100	100 - 175	.0010 - .0020
IRON MALLEABLE	80 - 90	90 - 150	.0010 - .0020
ALUMINUM ALUMINUM ALLOYS	150 - 250	300 - 500	.0010 - .0020
BRASS/BRONZE	75 - 125	150 - 250	.0010 - .0020
PLASTIC BAKELITE	100 - 250	250 - 400	.0010 - .0020

REAMERS - CARBIDE



- Straight flute general purpose reamers for through and blind hole applications
- 45° chamfer angle
- 4 and 6 flute styles
- Solid carbide
- Precision manufactured in the USA

REAMER DIAMETER dec. equiv. size		FLUTE LENGTH	OVERALL REACH	AXIAL CHAMFER LENGTH	FLUTES	SHANK DIA.	OAL	UNCOATED	
D1 ^{+0.002"} -0.000"		L2	L3			D2	L1	TOOL #	PRICE
.0400	#60	1/4	0*	.007	4	.0350	1-1/2	TC87046	29.00
.0410	#59	1/4	0*	.007	4	.0360	1-1/2	TC87047	29.00
.0420	#58	3/8	0*	.010	4	.0370	1-1/2	TC87048	29.00
.0430	#57	3/8	0*	.010	4	.0380	1-1/2	TC87049	29.00
.0440		3/8	0*	.010	4	.0390	1-1/2	TC87050	28.95
.0450		3/8	0*	.010	4	.0400	1-1/2	TC87051	30.55
.0460		3/8	0*	.010	4	.0410	1-1/2	TC87052	30.55
.0465	#56	3/8	0*	.010	4	.0420	1-1/2	TC87053	29.00
.0469	3/64	3/8	0*	.010	4	.0420	1-1/2	TC87054	27.55
.0470		3/8	0*	.010	4	.0420	1-1/2	TC87055	30.55
.0480		3/8	0*	.010	4	.0430	1-1/2	TC87056	30.55
.0490		3/8	0*	.010	4	.0440	1-1/2	TC87057	30.55
.0500		3/8	0*	.010	4	.0450	1-1/2	TC87058	30.55
.0510		3/8	3/4	.010	4	.0510	1-1/2	TC87059	30.55
.0520	#55	3/8	3/4	.010	4	.0520	1-1/2	TC87060	29.00
.0530		3/8	3/4	.010	4	.0530	1-1/2	TC87061	30.55
.0540		3/8	3/4	.010	4	.0540	1-1/2	TC87062	30.55
.0550	#54	3/8	3/4	.010	4	.0550	1-1/2	TC87063	29.00
.0560		3/8	3/4	.010	4	.0560	1-1/2	TC87064	30.55
.0570		3/8	3/4	.010	4	.0570	1-1/2	TC87065	30.55
.0580		3/8	3/4	.010	4	.0580	1-1/2	TC87066	30.55
.0590		3/8	3/4	.010	4	.0590	1-1/2	TC87067	30.55
.0591	1.5 mm	10 mm	3/4	.010	4	.0591	38 mm	TC87068	30.55
.0595	#53	3/8	3/4	.010	4	.0595	1-1/2	TC87069	29.00
.0600		3/8	3/4	.010	4	.0600	1-1/2	TC87070	30.55
.0605		3/8	3/4	.010	4	.0605	1-1/2	TC87071	40.60
.0610		3/8	3/4	.010	4	.0610	1-1/2	TC87072	30.55
.0615		3/8	3/4	.010	4	.0615	1-1/2	TC87073	34.00
.0620		3/8	3/4	.010	4	.0620	1-1/2	TC87074	30.55
.0625	1/16	3/8	3/4	.010	4	.0625	1-1/2	TC87075	27.55
.0630		3/8	3/4	.010	4	.0630	1-1/2	TC87076	30.55
.0635	#52	3/8	3/4	.010	4	.0635	1-1/2	TC87077	29.00
.0640		3/8	3/4	.010	4	.0640	1-1/2	TC87078	30.55
.0645		3/8	3/4	.010	4	.0645	1-1/2	TC87079	40.60
.0650		3/8	3/4	.010	4	.0650	1-1/2	TC87080	30.55
.0660		1/2	7/8	.012	4	.0660	1-3/4	TC87081	30.55
.0670	#51	1/2	7/8	.012	4	.0670	1-3/4	TC87082	29.00
.0680		1/2	7/8	.012	4	.0680	1-3/4	TC87083	30.55

*When L3 value is 0, it is a full shank reduction

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REAMERS - CARBIDE

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REAMER DIAMETER dec. equiv. size	FLUTE LENGTH	OVERALL REACH	AXIAL CHAMFER LENGTH	FLUTES	SHANK DIA.	OAL	UNCOATED	
D1 ^{+0.002"} _{-0.000"}	L2	L3			D2	L1	TOOL #	PRICE
.0690	1/2	7/8	.012	4	.0690	1-3/4	TC87084	30.55
.0700 #50	1/2	7/8	.012	4	.0700	1-3/4	TC87085	29.00
.0710	1/2	7/8	.012	4	.0710	1-3/4	TC87086	30.55
.0720	1/2	7/8	.012	4	.0720	1-3/4	TC87087	30.55
.0730 #49	1/2	7/8	.012	4	.0730	1-3/4	TC87088	29.00
.0740	1/2	7/8	.012	4	.0740	1-3/4	TC87089	30.55
.0750	1/2	7/8	.012	4	.0750	1-3/4	TC87090	30.55
.0760 #48	1/2	7/8	.012	4	.0760	1-3/4	TC87091	29.00
.0770	1/2	7/8	.012	4	.0770	1-3/4	TC87092	30.55
.0780	1/2	7/8	.012	4	.0780	1-3/4	TC87093	30.55
.0781 5/64	1/2	7/8	.012	4	.0781	1-3/4	TC87094	27.55
.0785 #47	1/2	7/8	.012	4	.0785	1-3/4	TC87095	29.00
.0787 2 mm	13 mm	7/8	.012	4	.0787	44 mm	TC87096	30.55
.0790	1/2	7/8	.012	4	.0790	1-3/4	TC87097	30.55
.0800	1/2	7/8	.012	4	.0800	1-3/4	TC87098	30.55
.0810 #46	1/2	7/8	.012	4	.0810	1-3/4	TC87099	29.00
.0820 #45	1/2	7/8	.012	4	.0820	2	TC87100	29.00
.0830	1/2	7/8	.012	4	.0830	2	TC87101	30.55
.0840	1/2	7/8	.012	4	.0840	2	TC87102	30.55
.0850	1/2	7/8	.012	4	.0850	2	TC87103	30.55
.0860 #44	1/2	7/8	.012	4	.0860	2	TC87104	29.00
.0870	1/2	7/8	.012	4	.0870	2	TC87105	30.55
.0880	1/2	7/8	.012	4	.0880	2	TC87106	30.55
.0890 #43	1/2	7/8	.012	4	.0890	2	TC87107	29.00
.0900	1/2	7/8	.012	4	.0900	2	TC87108	30.55
.0910	1/2	7/8	.012	4	.0910	2	TC87109	30.55
.0915	1/2	7/8	.012	4	.0915	2	TC87110	40.25
.0920	1/2	7/8	.012	4	.0920	2	TC87111	30.55
.0925	1/2	7/8	.012	4	.0925	2	TC87112	34.00
.0930	1/2	7/8	.012	4	.0930	2	TC87113	30.55
.0935 #42	1/2	7/8	.012	4	.0935	2	TC87114	29.00
.0938 3/32	1/2	7/8	.012	4	.0938	2	TC87115	27.55
.0940	1/2	7/8	.012	4	.0940	2	TC87116	30.55
.0945	1/2	7/8	.012	4	.0945	2	TC87117	34.00
.0950	1/2	7/8	.012	4	.0950	2	TC87118	30.55
.0960 #41	1/2	7/8	.012	4	.0960	2	TC87119	29.00
.0970	5/8	1-1/8	.015	4	.0970	2-1/4	TC87120	30.55
.0980 #40	5/8	1-1/8	.015	4	.0980	2-1/4	TC87121	29.00
.0984 2.5 mm	16 mm	1-1/8	.015	4	.0984	57 mm	TC87122	30.55
.0990	5/8	1-1/8	.015	4	.0990	2-1/4	TC87123	30.55
.0995 #39	5/8	1-1/8	.015	4	.0995	2-1/4	TC87124	29.00
.1000	5/8	1-1/8	.015	4	.1000	2-1/4	TC87125	30.55
.1010	5/8	1-1/8	.015	4	.1010	2-1/4	TC87126	30.55
.1015 #38	5/8	1-1/8	.015	4	.1015	2-1/4	TC87127	29.00
.1020	5/8	1-1/8	.015	4	.1020	2-1/4	TC87128	30.55
.1030	5/8	1-1/8	.015	4	.1030	2-1/4	TC87129	30.55

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REAMER DIAMETER dec. equiv.	size	FLUTE LENGTH	OVERALL REACH	AXIAL CHAMFER LENGTH	FLUTES	SHANK DIA.	OAL	UNCOATED	
D1 ^{+0.002"} -0.000"		L2	L3			D2	L1	TOOL #	PRICE
.1040	#37	5/8	1-1/8	.015	4	.1040	2-1/4	TC87130	29.00
.1050		5/8	1-1/8	.015	4	.1050	2-1/4	TC87131	30.55
.1060		5/8	1-1/8	.015	4	.1060	2-1/4	TC87132	30.55
.1065	#36	5/8	1-1/8	.015	4	.1065	2-1/4	TC87133	29.00
.1070		5/8	1-1/8	.015	4	.1070	2-1/4	TC87134	30.55
.1080		5/8	1-1/8	.015	4	.1080	2-1/4	TC87135	30.55
.1090		5/8	1-1/8	.015	4	.1090	2-1/4	TC87136	31.85
.1094	7/64	5/8	1-1/8	.015	4	.1094	2-1/4	TC87137	27.55
.1100	#35	5/8	1-1/8	.015	4	.1100	2-1/4	TC87138	29.00
.1110	#34	5/8	1-1/8	.015	4	.1110	2-1/4	TC87139	29.00
.1120		5/8	1-1/8	.015	4	.1120	2-1/4	TC87140	30.55
.1130	#33	5/8	1-1/8	.015	4	.1130	2-1/4	TC87141	29.00
.1140		5/8	1-1/8	.015	4	.1140	2-1/4	TC87142	30.55
.1150		5/8	1-1/8	.015	4	.1150	2-1/4	TC87143	30.55
.1160	#32	5/8	1-1/8	.015	4	.1160	2-1/4	TC87144	30.60
.1170		5/8	1-1/8	.015	4	.1170	2-1/4	TC87145	32.50
.1180		5/8	1-1/8	.015	4	.1180	2-1/4	TC87146	32.50
.1181	3 mm	16 mm	1-1/8	.015	4	.1181	57 mm	TC87147	29.90
.1190		5/8	1-1/8	.015	4	.1190	2-1/4	TC87148	32.50
.1200	#31	5/8	1-1/8	.015	4	.1200	2-1/4	TC87149	30.60
.1210		5/8	1-1/8	.015	4	.1210	2-1/4	TC87150	32.50
.1220		5/8	1-1/8	.015	4	.1220	2-1/4	TC87151	32.50
.1230		5/8	1-1/8	.015	4	.1230	2-1/4	TC87152	32.50
.1235		5/8	1-1/8	.015	4	.1235	2-1/4	TC87153	43.00
.1240		5/8	1-1/8	.015	4	.1240	2-1/4	TC87154	32.50
.1245		5/8	1-1/8	.015	4	.1245	2-1/4	TC87155	35.75
.1250	1/8	5/8	1-1/8	.015	4	.1250	2-1/4	TC87156	29.35
.1255		5/8	1-1/8	.015	4	.1255	2-1/4	TC87157	35.75
.1260		5/8	1-1/8	.015	4	.1260	2-1/4	TC87158	32.50
.1265		5/8	1-1/8	.015	4	.1265	2-1/4	TC87159	43.00
.1270		5/8	1-1/8	.015	4	.1270	2-1/4	TC87160	32.50
.1275		5/8	1-1/8	.015	4	.1275	2-1/4	TC87161	43.00
.1280		5/8	1-1/8	.015	4	.1280	2-1/4	TC87162	32.50
.1285	#30	5/8	1-1/8	.015	4	.1285	2-1/4	TC87163	32.50
.1290		5/8	1-1/8	.015	4	.1290	2-1/4	TC87164	32.50
.1300		5/8	1-1/8	.015	4	.1300	2-1/4	TC87165	32.50
.1310		3/4	1-3/8	.017	4	.1310	2-1/2	TC87166	36.95
.1320		3/4	1-3/8	.017	4	.1320	2-1/2	TC87167	36.95
.1330		3/4	1-3/8	.017	4	.1330	2-1/2	TC87168	36.95
.1340		3/4	1-3/8	.017	4	.1340	2-1/2	TC87169	36.95
.1350		3/4	1-3/8	.017	4	.1350	2-1/2	TC87170	36.95
.1360	#29	3/4	1-3/8	.017	4	.1360	2-1/2	TC87171	34.75
.1370		3/4	1-3/8	.017	4	.1370	2-1/2	TC87172	36.95
.1378	3.5 mm	19 mm	1-3/8	.017	4	.1378	64 mm	TC87173	36.95
.1380		3/4	1-3/8	.017	4	.1380	2-1/2	TC87174	36.95
.1390		3/4	1-3/8	.017	4	.1390	2-1/2	TC87175	36.95

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REAMER DIAMETER dec. equiv. size	FLUTE LENGTH	OVERALL REACH	AXIAL CHAMFER LENGTH	FLUTES	SHANK DIA.	OAL	UNCOATED	
$D_1 \begin{smallmatrix} +.0002" \\ - .0000" \end{smallmatrix}$	L ₂	L ₃			D ₂	L ₁	TOOL #	PRICE
.1400	3/4	1-3/8	.017	4	.1400	2-1/2	TC87176	36.95
.1405 #28	3/4	1-3/8	.017	4	.1405	2-1/2	TC87177	34.75
.1406 9/64	3/4	1-3/8	.017	4	.1406	2-1/2	TC87178	33.25
.1410	3/4	1-3/8	.017	4	.1410	2-1/2	TC87179	36.95
.1420	3/4	1-3/8	.017	4	.1420	2-1/2	TC87180	36.95
.1430	3/4	1-3/8	.017	4	.1430	2-1/2	TC87181	36.95
.1440 #27	3/4	1-3/8	.017	4	.1440	2-1/2	TC87182	34.75
.1450	3/4	1-3/8	.017	4	.1450	2-1/2	TC87183	36.95
.1460	3/4	1-3/8	.017	4	.1460	2-1/2	TC87184	38.80
.1470 #26	3/4	1-3/8	.017	4	.1470	2-1/2	TC87185	36.25
.1480	3/4	1-3/8	.017	4	.1480	2-1/2	TC87186	38.80
.1490	3/4	1-3/8	.017	4	.1490	2-1/2	TC87187	38.80
.1495 #25	3/4	1-3/8	.017	4	.1495	2-1/2	TC87188	36.25
.1500	3/4	1-3/8	.017	4	.1500	2-1/2	TC87189	38.80
.1510	3/4	1-3/8	.017	4	.1510	2-1/2	TC87190	38.80
.1520 #24	3/4	1-3/8	.017	4	.1520	2-1/2	TC87191	36.25
.1530	3/4	1-3/8	.017	4	.1530	2-1/2	TC87192	38.80
.1540 #23	3/4	1-3/8	.017	4	.1540	2-1/2	TC87193	36.25
.1545	3/4	1-3/8	.017	4	.1545	2-1/2	TC87194	44.90
.1550	3/4	1-3/8	.017	4	.1550	2-1/2	TC87195	38.80
.1555	3/4	1-3/8	.017	4	.1555	2-1/2	TC87196	44.90
.1560	3/4	1-3/8	.017	4	.1560	2-1/2	TC87197	38.80
.1562 5/32	3/4	1-3/8	.017	4	.1562	2-1/2	TC87198	35.10
.1565	3/4	1-3/8	.017	4	.1565	2-1/2	TC87199	44.90
.1570 #22	3/4	1-3/8	.017	4	.1570	2-1/2	TC87200	36.25
.1575 4 mm	3/4	1-3/8	.022	4	.1575	2-1/2	TC87201	38.80
.1580	3/4	1-3/8	.022	4	.1580	2-1/2	TC87202	38.80
.1590 #21	3/4	1-3/8	.022	4	.1590	2-1/2	TC87203	36.25
.1600	3/4	1-3/8	.022	4	.1600	2-1/2	TC87204	38.80
.1610 #20	7/8	1-1/2	.022	4	.1610	2-3/4	TC87205	40.60
.1620	7/8	1-1/2	.022	4	.1620	2-3/4	TC87206	43.70
.1630	7/8	1-1/2	.022	4	.1630	2-3/4	TC87207	43.70
.1640	7/8	1-1/2	.022	4	.1640	2-3/4	TC87208	43.70
.1650	7/8	1-1/2	.022	4	.1650	2-3/4	TC87209	40.60
.1660 #19	7/8	1-1/2	.022	4	.1660	2-3/4	TC87210	40.60
.1670	7/8	1-1/2	.022	4	.1670	2-3/4	TC87211	43.70
.1680	7/8	1-1/2	.022	4	.1680	2-3/4	TC87212	43.70
.1690	7/8	1-1/2	.022	4	.1690	2-3/4	TC87213	43.55
.1695 #18	7/8	1-1/2	.022	4	.1695	2-3/4	TC87214	40.60
.1700	7/8	1-1/2	.022	4	.1700	2-3/4	TC87215	43.70
.1710	7/8	1-1/2	.022	4	.1710	2-3/4	TC87216	43.70
.1719 11/64	7/8	1-1/2	.022	4	.1719	2-3/4	TC87217	39.25
.1720	7/8	1-1/2	.022	4	.1720	2-3/4	TC87218	43.70
.1730 #17	7/8	1-1/2	.022	4	.1730	2-3/4	TC87219	40.60
.1740	7/8	1-1/2	.022	4	.1740	2-3/4	TC87220	43.70
.1750	7/8	1-1/2	.022	4	.1750	2-3/4	TC87221	43.70
.1760	7/8	1-1/2	.022	4	.1760	2-3/4	TC87222	43.70

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REAMER DIAMETER dec. equiv. size	FLUTE LENGTH	OVERALL REACH	AXIAL CHAMFER LENGTH	FLUTES	SHANK DIA.	OAL	UNCOATED	
D ₁ ^{+0.002"} _{-0.000"}	L ₂	L ₃			D ₂	L ₁	TOOL #	PRICE
.1770 #16	7/8	1-1/2	.022	4	.1770	2-3/4	TC87223	40.60
.1772 4.5 mm	22 mm	1-1/2	.022	4	.1772	70 mm	TC87224	45.35
.1780	7/8	1-1/2	.022	4	.1780	2-3/4	TC87225	43.70
.1790	7/8	1-1/2	.022	4	.1790	2-3/4	TC87226	43.70
.1800 #15	7/8	1-1/2	.022	4	.1800	2-3/4	TC87227	40.60
.1810	7/8	1-1/2	.022	4	.1810	2-3/4	TC87228	43.70
.1820 #14	7/8	1-1/2	.022	4	.1820	2-3/4	TC87229	40.60
.1830	7/8	1-1/2	.022	4	.1830	2-3/4	TC87230	43.70
.1840	7/8	1-1/2	.022	4	.1840	2-3/4	TC87231	43.70
.1850 #13	7/8	1-1/2	.022	4	.1850	2-3/4	TC87232	40.60
.1855	7/8	1-1/2	.022	4	.1855	2-3/4	TC87233	52.25
.1860	7/8	1-1/2	.022	4	.1860	2-3/4	TC87234	43.70
.1865	7/8	1-1/2	.022	4	.1865	2-3/4	TC87235	47.05
.1870	7/8	1-1/2	.022	4	.1870	2-3/4	TC87236	43.70
.1875 3/16	7/8	1-1/2	.022	4	.1875	2-3/4	TC87237	39.25
.1880	7/8	1-1/2	.022	4	.1880	2-3/4	TC87238	43.70
.1885	7/8	1-1/2	.022	4	.1885	2-3/4	TC87239	47.05
.1890 #12	7/8	1-1/2	.022	4	.1890	2-3/4	TC87240	40.60
.1900	7/8	1-1/2	.022	4	.1900	2-3/4	TC87241	43.70
.1910 #11	7/8	1-1/2	.022	4	.1910	2-3/4	TC87242	49.40
.1920	1	1-3/4	.025	4	.1920	3	TC87243	52.85
.1930	1	1-3/4	.025	4	.1930	3	TC87244	52.85
.1935 #10	1	1-3/4	.025	4	.1935	3	TC87245	49.40
.1940	1	1-3/4	.025	4	.1940	3	TC87246	52.85
.1950	1	1-3/4	.025	4	.1950	3	TC87247	52.85
.1960 #9	1	1-3/4	.025	4	.1960	3	TC87248	49.40
.1969 5 mm	25 mm	1-3/4	.025	4	.1969	76 mm	TC87249	52.85
.1970	1	1-3/4	.025	4	.1970	3	TC87250	52.85
.1980	1	1-3/4	.025	4	.1980	3	TC87251	52.85
.1990 #8	1	1-3/4	.025	4	.1990	3	TC87252	49.40
.2000	1	1-3/4	.025	4	.2000	3	TC87253	52.85
.2010 #7	1	1-3/4	.025	4	.2010	3	TC87254	49.40
.2020	1	1-3/4	.025	4	.2020	3	TC87255	52.85
.2030	1	1-3/4	.025	4	.2030	3	TC87256	52.85
.2031 13/64	1	1-3/4	.025	4	.2031	3	TC87257	47.65
.2040 #6	1	1-3/4	.025	4	.2040	3	TC87258	49.40
.2050	1	1-3/4	.025	4	.2050	3	TC87259	52.85
.2055 #5	1	1-3/4	.025	4	.2055	3	TC87260	49.40
.2060	1	1-3/4	.025	4	.2060	3	TC87261	52.85
.2070	1	1-3/4	.025	4	.2070	3	TC87262	52.85
.2080	1	1-3/4	.025	4	.2080	3	TC87263	52.85
.2090 #4	1	1-3/4	.025	4	.2090	3	TC87264	49.40
.2100	1	1-3/4	.025	4	.2100	3	TC87265	52.85
.2110	1	1-3/4	.025	4	.2110	3	TC87266	52.85
.2120	1	1-3/4	.025	4	.2120	3	TC87267	52.85
.2130 #3	1	1-3/4	.025	4	.2130	3	TC87268	49.40
.2140	1	1-3/4	.025	4	.2140	3	TC87269	52.85

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REAMER DIAMETER dec. equiv. size	FLUTE LENGTH	OVERALL REACH	AXIAL CHAMFER LENGTH	FLUTES	SHANK DIA.	OAL	UNCOATED	
D1 $^{+.0002"}_{-.0000"}$	L2	L3			D2	L1	TOOL #	PRICE
.2150	1	1-3/4	.025	4	.2150	3	TC87270	52.85
.2160	1	1-3/4	.025	4	.2160	3	TC87271	52.85
.2165 5.5 mm	25 mm	1-3/4	.025	4	.2165 76 mm	3	TC87272	55.95
.2170	1	1-3/4	.025	4	.2170	3	TC87273	52.85
.2180	1	1-3/4	.025	4	.2180	3	TC87274	52.85
.2188 7/32	1	1-3/4	.025	4	.2188	3	TC87275	47.65
.2190	1	1-3/4	.025	4	.2190	3	TC87276	52.85
.2200	1	1-3/4	.025	4	.2200	3	TC87277	52.85
.2210 #2	1	1-3/4	.025	4	.2210	3	TC87278	49.40
.2220	1	1-3/4	.025	4	.2220	3	TC87279	52.85
.2230	1	1-3/4	.025	4	.2230	3	TC87280	52.85
.2240	1	1-3/4	.025	4	.2240	3	TC87281	52.85
.2250	1	1-3/4	.025	4	.2250	3	TC87282	52.85
.2260	1	1-3/4	.025	4	.2260	3	TC87283	57.95
.2270	1	1-3/4	.025	4	.2270	3	TC87284	57.95
.2280 #1	1	1-3/4	.025	4	.2280	3	TC87285	54.30
.2290	1	1-3/4	.025	4	.2290	3	TC87286	54.10
.2300	1	1-3/4	.025	4	.2300	3	TC87287	57.95
.2310	1	1-3/4	.025	4	.2310	3	TC87288	57.95
.2320	1	1-3/4	.025	4	.2320	3	TC87289	57.95
.2330	1	1-3/4	.025	4	.2330	3	TC87290	57.95
.2340 A	1	1-3/4	.025	4	.2340	3	TC87291	57.95
.2344 15/64	1	1-3/4	.025	4	.2344	3	TC87292	52.10
.2350	1	1-3/4	.025	4	.2350	3	TC87293	57.95
.2360	1	1-3/4	.025	4	.2360	3	TC87294	57.95
.2362 6 mm	25 mm	1-3/4	.025	4	.2362 76 mm	3	TC87295	55.50
.2370	1	1-3/4	.025	4	.2370	3	TC87296	57.95
.2380 B	1	1-3/4	.025	4	.2380	3	TC87297	57.95
.2390	1	1-3/4	.025	4	.2390	3	TC87298	57.95
.2400	1	1-3/4	.025	4	.2400	3	TC87299	57.95
.2410	1	1-3/4	.025	4	.2410	3	TC87300	57.95
.2420 C	1	1-3/4	.025	4	.2420	3	TC87301	57.95
.2430	1	1-3/4	.025	4	.2430	3	TC87302	57.95
.2440	1	1-3/4	.025	4	.2440	3	TC87303	57.95
.2450	1	1-3/4	.025	4	.2450	3	TC87304	57.95
.2460 D	1	1-3/4	.025	4	.2460	3	TC87305	57.95
.2470	1	1-3/4	.025	4	.2470	3	TC87306	57.95
.2480	1	1-3/4	.025	4	.2480	3	TC87307	57.95
.2485	1	1-3/4	.025	4	.2485	3	TC87308	65.10
.2490	1	1-3/4	.025	4	.2490	3	TC87309	57.95
.2495	1	1-3/4	.025	4	.2495	3	TC87310	61.55
.2500 1/4	1	1-3/4	.025	4	.2500	3	TC87311	52.10
D1 $^{+.0003"}_{-.0000"}$	L2	L3			D2	L1	TOOL #	PRICE
.2505	1	1-3/4	.025	4	.2505	3	TC87312	61.55
.2510	1	1-3/4	.025	4	.2510	3	TC87313	57.95
.2515	1	1-3/4	.025	4	.2515	3	TC87314	72.45
.2520	1	1-3/4	.025	4	.2520	3	TC87315	57.95

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REAMER DIAMETER dec. equiv.	size	FLUTE LENGTH	OVERALL REACH	AXIAL CHAMFER LENGTH	FLUTES	SHANK DIA.	OAL	UNCOATED	
D1 ^{+0.003"} -0.000"		L2	L3			D2	L1	TOOL #	PRICE
.2530		1	1-3/4	.025	4	.2530	3	TC87316	57.95
.2540		1	1-3/4	.025	4	.2540	3	TC87317	57.95
.2550		1	1-3/4	.025	6	.2550	3	TC87318	57.95
.2559	6.5 mm	29 mm	47 mm	.030	6	6.5 mm	83 mm	TC87319	61.35
.2560		1-1/8	1-7/8	.030	6	.2560	3-1/4	TC87320	70.55
.2570	F	1-1/8	1-7/8	.030	6	.2570	3-1/4	TC87321	70.55
.2580		1-1/8	1-7/8	.030	6	.2580	3-1/4	TC87322	70.55
.2590		1-1/8	1-7/8	.030	6	.2590	3-1/4	TC87323	70.55
.2600		1-1/8	1-7/8	.030	6	.2600	3-1/4	TC87324	70.55
.2610	G	1-1/8	1-7/8	.030	6	.2610	3-1/4	TC87325	70.55
.2620		1-1/8	1-7/8	.030	6	.2620	3-1/4	TC87326	70.55
.2630		1-1/8	1-7/8	.030	6	.2630	3-1/4	TC87327	70.55
.2640		1-1/8	1-7/8	.030	6	.2640	3-1/4	TC87328	70.55
.2650		1-1/8	1-7/8	.030	6	.2650	3-1/4	TC87329	70.55
.2656	17/64	1-1/8	1-7/8	.030	6	.2656	3-1/4	TC87330	63.45
.2660	H	1-1/8	1-7/8	.030	6	.2660	3-1/4	TC87331	70.55
.2670		1-1/8	1-7/8	.030	6	.2670	3-1/4	TC87332	70.55
.2680		1-1/8	1-7/8	.030	6	.2680	3-1/4	TC87333	70.55
.2690		1-1/8	1-7/8	.030	6	.2690	3-1/4	TC87334	70.55
.2700		1-1/8	1-7/8	.030	6	.2700	3-1/4	TC87335	70.55
.2710		1-1/8	1-7/8	.030	6	.2710	3-1/4	TC87336	70.20
.2720	I	1-1/8	1-7/8	.030	6	.2720	3-1/4	TC87337	70.55
.2730		1-1/8	1-7/8	.030	6	.2730	3-1/4	TC87338	70.20
.2740		1-1/8	1-7/8	.030	6	.2740	3-1/4	TC87339	70.55
.2750		1-1/8	1-7/8	.030	6	.2750	3-1/4	TC87340	70.55
.2756	7 mm	29 mm	47 mm	.030	6	7 mm	83 mm	TC87341	76.95
.2760		1-1/8	1-7/8	.030	6	.2760	3-1/4	TC87342	70.55
.2770	J	1-1/8	1-7/8	.030	6	.2770	3-1/4	TC87343	70.55
.2780		1-1/8	1-7/8	.030	6	.2780	3-1/4	TC87344	70.55
.2790		1-1/8	1-7/8	.030	6	.2790	3-1/4	TC87345	70.55
.2800		1-1/8	1-7/8	.030	6	.2800	3-1/4	TC87346	70.55
.2810	K	1-1/8	1-7/8	.030	6	.2810	3-1/4	TC87347	70.55
.2812	9/32	1-1/8	1-7/8	.030	6	.2812	3-1/4	TC87348	63.45
.2820		1-1/8	1-7/8	.030	6	.2820	3-1/4	TC87349	70.55
.2830		1-1/8	1-7/8	.030	6	.2830	3-1/4	TC87350	70.55
.2840		1-1/8	1-7/8	.030	6	.2840	3-1/4	TC87351	70.55
.2850		1-1/8	1-7/8	.030	6	.2850	3-1/4	TC87352	70.55
.2860		1-1/8	1-7/8	.030	6	.2860	3-1/4	TC87353	70.55
.2870		1-1/8	1-7/8	.030	6	.2870	3-1/4	TC87354	70.55
.2880		1-1/8	1-7/8	.030	6	.2880	3-1/4	TC87355	70.20
.2890		1-1/8	1-7/8	.030	6	.2890	3-1/4	TC87356	70.20
.2900	L	1-1/8	1-7/8	.030	6	.2900	3-1/4	TC87357	70.55
.2910		1-1/8	1-7/8	.030	6	.2910	3-1/4	TC87358	70.20
.2920		1-1/8	1-7/8	.030	6	.2920	3-1/4	TC87359	70.20
.2930		1-1/8	1-7/8	.030	6	.2930	3-1/4	TC87360	70.55
.2940		1-1/8	1-7/8	.030	6	.2940	3-1/4	TC87361	70.55
.2950	M	1-1/8	1-7/8	.030	6	.2950	3-1/4	TC87362	70.20
.2953		1-1/8	1-7/8	.030	6	.2953	3-1/4	TC87363	76.65

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REAMER DIAMETER		FLUTE LENGTH	OVERALL REACH	AXIAL CHAMFER LENGTH	FLUTES	SHANK DIA.	OAL	UNCOATED	
dec. equiv.	size							TOOL #	PRICE
D1 ^{+0.0003"} -0.0000"		L2	L3			D2	L1		
.2960		1-1/8	1-7/8	.030	6	.2960	3-1/4	TC87364	70.20
.2969	19/64	1-1/8	1-7/8	.030	6	.2969	3-1/4	TC87365	70.55
.2970		1-1/8	1-7/8	.030	6	.2970	3-1/4	TC87366	70.20
.2980		1-1/8	1-7/8	.030	6	.2980	3-1/4	TC87367	70.55
.2990		1-1/8	1-7/8	.030	6	.2990	3-1/4	TC87368	70.20
.3000		1-1/8	1-7/8	.030	6	.3000	3-1/4	TC87369	70.55
.3010		1-1/8	1-7/8	.030	6	.3010	3-1/4	TC87370	70.55
.3020	N	1-1/8	1-7/8	.030	6	.3020	3-1/4	TC87371	70.55
.3030		1-1/8	1-7/8	.030	6	.3030	3-1/4	TC87372	70.20
.3040		1-1/8	1-7/8	.030	6	.3040	3-1/4	TC87373	70.20
.3050		1-1/8	1-7/8	.030	6	.3050	3-1/4	TC87374	70.55
.3060		1-1/8	1-7/8	.030	6	.3060	3-1/4	TC87375	70.20
.3070		1-1/8	1-7/8	.030	6	.3070	3-1/4	TC87376	70.55
.3080		1-1/8	1-7/8	.030	6	.3080	3-1/4	TC87377	70.20
.3090		1-1/8	1-7/8	.030	6	.3090	3-1/4	TC87378	70.20
.3100		1-1/8	1-7/8	.030	6	.3100	3-1/4	TC87379	70.55
.3110		1-1/8	1-7/8	.030	6	.3110	3-1/4	TC87380	70.55
.3115		1-1/8	1-7/8	.030	6	.3115	3-1/4	TC87381	80.55
.3120		1-1/8	1-7/8	.030	6	.3120	3-1/4	TC87382	70.55
.3125	5/16	1-1/8	1-7/8	.030	6	.3125	3-1/4	TC87383	70.55
.3130		1-1/8	1-7/8	.030	6	.3130	3-1/4	TC87384	70.55
.3135		1-1/8	1-7/8	.030	6	.3135	3-1/4	TC87385	80.55
.3140		1-1/8	1-7/8	.030	6	.3140	3-1/4	TC87386	70.55
.3150	8 mm	29 mm	50 mm	.030	6	8 mm	83 mm	TC87387	70.55
.3160	O	1-1/8	2	.030	6	.3160	3-1/4	TC87388	78.45
.3170		1-1/4	2-1/8	.030	6	.3170	3-1/2	TC87389	78.45
.3180		1-1/4	2-1/8	.035	6	.3180	3-1/2	TC87390	78.45
.3190		1-1/4	2-1/8	.035	6	.3190	3-1/2	TC87391	78.45
.3200		1-1/4	2-1/8	.035	6	.3200	3-1/2	TC87392	78.45
.3210		1-1/4	2-1/8	.035	6	.3210	3-1/2	TC87393	78.45
.3220		1-1/4	2-1/8	.035	6	.3220	3-1/2	TC87394	78.45
.3230	P	1-1/4	2-1/8	.035	6	.3230	3-1/2	TC87395	78.45
.3240		1-1/4	2-1/8	.035	6	.3240	3-1/2	TC87396	78.45
.3250		1-1/4	2-1/8	.035	6	.3250	3-1/2	TC87397	78.45
.3260		1-1/4	2-1/8	.035	6	.3260	3-1/2	TC87398	78.45
.3270		1-1/4	2-1/8	.035	6	.3270	3-1/2	TC87399	78.45
.3280		1-1/4	2-1/8	.035	6	.3280	3-1/2	TC87400	78.45
.3281	21/64	1-1/4	2-1/8	.035	6	.3281	3-1/2	TC87401	79.25
.3290		1-1/4	2-1/8	.035	6	.3290	3-1/2	TC87402	78.45
.3300		1-1/4	2-1/8	.035	6	.3300	3-1/2	TC87403	78.45
.3310		1-1/4	2-1/8	.035	6	.3310	3-1/2	TC87404	78.45
.3320	Q	1-1/4	2-1/8	.035	6	.3320	3-1/2	TC87405	78.45
.3330		1-1/4	2-1/8	.035	6	.3330	3-1/2	TC87406	78.45
.3340		1-1/4	2-1/8	.035	6	.3340	3-1/2	TC87407	78.45
.3346	8.5 mm	32 mm	54 mm	.035	6	8.5 mm	89 mm	TC87408	78.45
.3350		1-1/4	2-1/8	.035	6	.3350	3-1/2	TC87409	78.45
.3360		1-1/4	2-1/8	.035	6	.3360	3-1/2	TC87410	78.45
.3370		1-1/4	2-1/8	.035	6	.3370	3-1/2	TC87411	78.45

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REAMER DIAMETER		FLUTE LENGTH	OVERALL REACH	AXIAL CHAMFER LENGTH	FLUTES	SHANK DIA.	OAL	UNCOATED	
dec. equiv.	size								
D ₁ ^{+0.003"} _{-.0000"}		L ₂	L ₃			D ₂	L ₁	TOOL #	PRICE
.3380		1-1/4	2-1/8	.035	6	.3380	3-1/2	TC87412	78.45
.3390	R	1-1/4	2-1/8	.035	6	.3390	3-1/2	TC87413	79.35
.3400		1-1/4	2-1/8	.035	6	.3400	3-1/2	TC87414	78.45
.3410		1-1/4	2-1/8	.035	6	.3410	3-1/2	TC87415	78.45
.3420		1-1/4	2-1/8	.035	6	.3420	3-1/2	TC87416	78.45
.3430		1-1/4	2-1/8	.035	6	.3430	3-1/2	TC87417	78.45
.3438	11/32	1-1/4	2-1/8	.035	6	.3438	3-1/2	TC87418	79.70
.3440		1-1/4	2-1/8	.035	6	.3440	3-1/2	TC87419	78.45
.3450		1-1/4	2-1/8	.035	6	.3450	3-1/2	TC87420	78.45
.3460		1-1/4	2-1/8	.035	6	.3460	3-1/2	TC87421	78.45
.3470		1-1/4	2-1/8	.035	6	.3470	3-1/2	TC87422	78.45
.3480	S	1-1/4	2-1/8	.035	6	.3480	3-1/2	TC87423	78.45
.3490		1-1/4	2-1/8	.035	6	.3490	3-1/2	TC87424	78.45
.3500		1-1/4	2-1/8	.035	6	.3500	3-1/2	TC87425	78.45
.3510		1-1/4	2-1/8	.035	6	.3510	3-1/2	TC87426	85.60
.3520		1-1/4	2-1/8	.035	6	.3520	3-1/2	TC87427	85.60
.3530		1-1/4	2-1/8	.035	6	.3530	3-1/2	TC87428	85.60
.3540		1-1/4	2-1/8	.035	6	.3540	3-1/2	TC87429	85.60
.3543	9 mm	32 mm	54 mm	.035	6	9 mm	89 mm	TC87430	89.75
.3550		1-1/4	2-1/8	.035	6	.3550	3-1/2	TC87431	85.60
.3560		1-1/4	2-1/8	.035	6	.3560	3-1/2	TC87432	85.60
.3570		1-1/4	2-1/8	.035	6	.3570	3-1/2	TC87433	85.60
.3580	T	1-1/4	2-1/8	.035	6	.3580	3-1/2	TC87434	85.60
.3590		1-1/4	2-1/8	.035	6	.3590	3-1/2	TC87435	87.50
.3594	23/64	1-1/4	2-1/8	.035	6	.3594	3-1/2	TC87436	84.85
.3600		1-1/4	2-1/8	.035	6	.3600	3-1/2	TC87437	85.60
.3610		1-1/4	2-1/8	.035	6	.3610	3-1/2	TC87438	85.60
.3620		1-1/4	2-1/8	.035	6	.3620	3-1/2	TC87439	85.60
.3630		1-1/4	2-1/8	.035	6	.3630	3-1/2	TC87440	85.60
.3640		1-1/4	2-1/8	.035	6	.3640	3-1/2	TC87441	85.60
.3650		1-1/4	2-1/8	.035	6	.3650	3-1/2	TC87442	85.60
.3660		1-1/4	2-1/8	.035	6	.3660	3-1/2	TC87443	85.60
.3670		1-1/4	2-1/8	.035	6	.3670	3-1/2	TC87444	85.60
.3680	U	1-1/4	2-1/8	.035	6	.3680	3-1/2	TC87445	85.60
.3690		1-1/4	2-1/8	.035	6	.3690	3-1/2	TC87446	85.60
.3700		1-1/4	2-1/8	.035	6	.3700	3-1/2	TC87447	85.60
.3710		1-1/4	2-1/8	.035	6	.3710	3-1/2	TC87448	85.60
.3720		1-1/4	2-1/8	.035	6	.3720	3-1/2	TC87449	85.60
.3730		1-1/4	2-1/8	.035	6	.3730	3-1/2	TC87450	85.60
.3740	9.5 mm	32 mm	54 mm	.035	6	9.5 mm	89 mm	TC87451	85.60
.3745		1-1/4	2-1/8	.035	6	.3745	3-1/2	TC87452	103.90
.3750	3/8	1-1/4	2-1/8	.035	6	.3750	3-1/2	TC87453	84.85
.3755		1-1/4	2-1/8	.035	6	.3755	3-1/2	TC87454	103.90
.3760		1-1/4	2-1/8	.035	6	.3760	3-1/2	TC87455	108.00
.3765		1-1/4	2-1/8	.035	6	.3765	3-1/2	TC87456	112.80
.3770	V	1-1/4	2-1/8	.035	6	.3770	3-1/2	TC87457	108.00
.3780		1-1/4	2-1/8	.035	6	.3780	3-1/2	TC87458	108.00

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REAMER DIAMETER		FLUTE LENGTH	OVERALL REACH	AXIAL CHAMFER LENGTH	FLUTES	SHANK DIA.	OAL	UNCOATED	
dec. equiv.	size								
D1 $+0.003"$ $-0.000"$		L2	L3			D2	L1	TOOL #	PRICE
.3790		1-1/4	2-1/8	.035	6	.3790	3-1/2	TC87459	107.50
.3800		1-1/4	2-1/8	.035	6	.3800	3-1/2	TC87460	108.00
.3810		1-1/4	2-1/8	.035	6	.3810	3-1/2	TC87461	107.50
.3820		1-1/4	2-1/8	.035	6	.3820	3-1/2	TC87462	108.00
.3830		1-1/4	2-1/8	.035	6	.3830	3-1/2	TC87463	107.50
.3840		1-1/4	2-1/8	.035	6	.3840	3-1/2	TC87464	108.00
.3850		1-1/4	2-1/8	.035	6	.3850	3-1/2	TC87465	107.50
.3860	W	1-1/4	2-1/8	.035	6	.3860	3-1/2	TC87466	107.50
.3870		1-1/4	2-1/8	.035	6	.3870	3-1/2	TC87467	133.25
.3880		1-1/4	2-1/8	.035	6	.3880	3-1/2	TC87468	133.25
.3890		1-1/4	2-1/8	.035	6	.3890	3-1/2	TC87469	133.25
.3900		1-1/4	2-1/8	.035	6	.3900	3-1/2	TC87470	133.25
.3906	25/64	1-1/4	2-1/8	.035	6	.3906	3-1/2	TC87471	133.25
.3910		1-1/4	2-1/8	.035	6	.3910	3-1/2	TC87472	133.25
.3920		1-1/4	2-1/8	.035	6	.3920	3-1/2	TC87473	133.25
.3930		1-1/4	2-1/8	.035	6	.3930	3-1/2	TC87474	133.25
.3937	10 mm	32 mm	54 mm	.035	6	10 mm	89 mm	TC87475	101.55
.3940		1-1/4	2-1/8	.035	6	.3940	3-1/2	TC87476	133.25
.3950		1-1/4	2-1/8	.035	6	.3950	3-1/2	TC87477	133.25
.3960		1-1/4	2-1/8	.035	6	.3960	3-1/2	TC87478	133.25
.3970	X	1-1/4	2-1/8	.035	6	.3970	3-1/2	TC87479	133.25
.3980		1-1/4	2-1/8	.035	6	.3980	3-1/2	TC87480	133.25
.3990		1-1/4	2-1/8	.035	6	.3990	3-1/2	TC87481	133.25
.4000		1-1/4	2-1/8	.035	6	.4000	3-1/2	TC87482	133.25
.4010		1-1/4	2-1/8	.035	6	.4010	3-1/2	TC87483	133.25
.4020		1-1/4	2-1/8	.035	6	.4020	3-1/2	TC87484	133.25
.4030		1-1/4	2-1/8	.035	6	.4030	3-1/2	TC87485	133.25
.4040	Y	1-1/4	2-1/8	.035	6	.4040	3-1/2	TC87486	133.25
.4050		1-1/4	2-1/8	.035	6	.4050	3-1/2	TC87487	133.25
.4060		1-1/4	2-1/8	.035	6	.4060	3-1/2	TC87488	133.25
.4062	13/32	1-1/4	2-1/8	.035	6	.4062	3-1/2	TC87489	97.30
.4070		1-1/4	2-1/8	.035	6	.4070	3-1/2	TC87490	133.25
.4080		1-1/4	2-1/8	.035	6	.4080	3-1/2	TC87491	133.25
.4090		1-1/4	2-1/8	.035	6	.4090	3-1/2	TC87492	133.25
.4100		1-1/4	2-1/8	.035	6	.4100	3-1/2	TC87493	133.25
.4110		1-1/4	2-1/8	.035	6	.4110	3-1/2	TC87494	133.25
.4120		1-1/4	2-1/8	.035	6	.4120	3-1/2	TC87495	133.25
.4130	Z	1-1/4	2-1/8	.035	6	.4130	3-1/2	TC87496	133.25
.4134	10.5 mm	32 mm	54 mm	.035	6	10.5 mm	89 mm	TC87497	121.45
.4140		1-1/4	2-1/8	.035	6	.4140	3-1/2	TC87498	133.25
.4150		1-1/4	2-1/8	.035	6	.4150	3-1/2	TC87499	133.25
.4160		1-1/4	2-1/8	.035	6	.4160	3-1/2	TC87500	133.25
.4170		1-3/8	2-1/8	.045	6	.4170	4	TC87501	133.25
.4180		1-3/8	2-1/8	.045	6	.4180	4	TC87502	133.25
.4190		1-3/8	2-1/8	.045	6	.4190	4	TC87503	133.25
.4200		1-3/8	2-1/8	.045	6	.4200	4	TC87504	133.25
.4210		1-3/8	2-1/8	.045	6	.4210	4	TC87505	133.25

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REAMER DIAMETER dec. equiv. size		FLUTE LENGTH	OVERALL REACH	AXIAL CHAMFER LENGTH	FLUTES	SHANK DIA.	OAL	UNCOATED	
D ₁ ^{+0.003"} -0.0000"		L ₂	L ₃			D ₂	L ₁	TOOL #	PRICE
.4219	27/64	1-3/8	2-1/8	.045	6	.4219	4	TC87506	110.35
.4220		1-3/8	2-1/8	.045	6	.4220	4	TC87507	133.25
.4230		1-3/8	2-1/8	.045	6	.4230	4	TC87508	133.25
.4240		1-3/8	2-1/8	.045	6	.4240	4	TC87509	133.25
.4250		1-3/8	2-1/8	.045	6	.4250	4	TC87510	133.25
.4260		1-3/8	2-1/8	.045	6	.4260	4	TC87511	133.25
.4270		1-3/8	2-1/8	.045	6	.4270	4	TC87512	133.25
.4280		1-3/8	2-1/8	.045	6	.4280	4	TC87513	133.25
.4290		1-3/8	2-1/8	.045	6	.4290	4	TC87514	133.25
.4300		1-3/8	2-1/8	.045	6	.4300	4	TC87515	133.25
.4310		1-3/8	2-1/8	.045	6	.4310	4	TC87516	133.25
.4320		1-3/8	2-1/8	.045	6	.4320	4	TC87517	133.25
.4330		1-3/8	2-1/8	.045	6	.4330	4	TC87518	133.25
.4331	11 mm	35 mm	57 mm	.045	6	11 mm	102 mm	TC87519	121.45
.4340		1-3/8	2-1/4	.045	6	.4340	4	TC87520	133.25
.4350		1-3/8	2-1/4	.045	6	.4350	4	TC87521	133.25
.4360		1-3/8	2-1/4	.045	6	.4360	4	TC87522	133.25
.4365		1-3/8	2-1/4	.045	6	.4365	4	TC87523	133.25
.4370		1-3/8	2-1/4	.045	6	.4370	4	TC87524	133.25
.4375	7/16	1-3/8	2-1/4	.045	6	.4375	4	TC87525	110.35
.4380		1-3/8	2-1/4	.045	6	.4380	4	TC87526	133.25
.4385		1-3/8	2-1/4	.045	6	.4385	4	TC87527	159.35
.4390		1-3/8	2-1/4	.045	6	.4390	4	TC87528	133.25
.4400		1-3/8	2-1/4	.045	6	.4400	4	TC87529	133.25
.4410		1-3/8	2-1/4	.045	6	.4410	4	TC87530	152.00
.4420		1-3/8	2-1/4	.045	6	.4420	4	TC87531	152.00
.4430		1-3/8	2-1/4	.045	6	.4430	4	TC87532	152.00
.4440		1-3/8	2-1/4	.045	6	.4440	4	TC87533	151.35
.4450		1-3/8	2-1/4	.045	6	.4450	4	TC87534	152.00
.4460		1-3/8	2-1/4	.045	6	.4460	4	TC87535	151.35
.4470		1-3/8	2-1/4	.045	6	.4470	4	TC87536	151.35
.4480		1-3/8	2-1/4	.045	6	.4480	4	TC87537	151.35
.4490		1-3/8	2-1/4	.045	6	.4490	4	TC87538	151.35
.4500		1-3/8	2-1/4	.045	6	.4500	4	TC87539	151.35
.4510		1-3/8	2-1/4	.045	6	.4510	4	TC87540	151.35
.4520		1-3/8	2-1/4	.045	6	.4520	4	TC87541	151.35
.4528	11.5 mm	35 mm	57 mm	.045	6	11.5 mm	102 mm	TC87542	151.35
.4530		1-3/8	2-1/4	.045	6	.4530	4	TC87543	138.65
.4531	29/64	1-3/8	2-1/4	.045	6	.4531	4	TC87544	120.95
.4540		1-3/8	2-1/4	.045	6	.4540	4	TC87545	151.35
.4550		1-3/8	2-1/4	.045	6	.4550	4	TC87546	151.35
.4560		1-3/8	2-1/4	.045	6	.4560	4	TC87547	151.35
.4570		1-3/8	2-1/4	.045	6	.4570	4	TC87548	151.35
.4580		1-3/8	2-1/4	.045	6	.4580	4	TC87549	151.35
.4590		1-3/8	2-1/4	.045	6	.4590	4	TC87550	151.35
.4600		1-3/8	2-1/4	.045	6	.4600	4	TC87551	151.35
.4610		1-3/8	2-1/4	.045	6	.4610	4	TC87552	151.35

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REAMER DIAMETER		FLUTE LENGTH	OVERALL REACH	AXIAL CHAMFER LENGTH	FLUTES	SHANK DIA.	OAL	UNCOATED	
dec. equiv.	size							TOOL #	PRICE
D1 ^{+0.003"} _{-.0000"}		L2	L3			D2	L1		
.4620		1-3/8	2-1/4	.045	6	.4620	4	TC87553	151.35
.4630		1-3/8	2-1/4	.045	6	.4630	4	TC87554	151.35
.4640		1-3/8	2-1/4	.045	6	.4640	4	TC87555	151.35
.4650		1-3/8	2-1/4	.045	6	.4650	4	TC87556	151.35
.4660		1-3/8	2-1/4	.045	6	.4660	4	TC87557	151.35
.4670		1-3/8	2-1/4	.045	6	.4670	4	TC87558	151.35
.4680		1-3/8	2-1/4	.045	6	.4680	4	TC87559	152.00
.4688	15/32	1-3/8	2-1/4	.045	6	.4688	4	TC87560	120.95
.4690		1-3/8	2-1/4	.045	6	.4690	4	TC87561	159.45
.4700		1-3/8	2-1/4	.045	6	.4700	4	TC87562	159.45
.4710		1-3/8	2-1/4	.045	6	.4710	4	TC87563	159.45
.4720		1-3/8	2-1/4	.045	6	.4720	4	TC87564	160.25
.4724	12 mm	35 mm	57 mm	.045	6	12 mm	102 mm	TC87565	153.60
.4730		1-3/8	2-1/4	.045	6	.4730	4	TC87566	160.25
.4740		1-3/8	2-1/4	.045	6	.4740	4	TC87567	159.45
.4750		1-3/8	2-1/4	.045	6	.4750	4	TC87568	159.45
.4760		1-3/8	2-1/4	.045	6	.4760	4	TC87569	160.25
.4770		1-3/8	2-1/4	.045	6	.4770	4	TC87570	159.45
.4780		1-3/8	2-1/4	.045	6	.4780	4	TC87571	159.45
.4790		1-1/2	2-1/2	.045	6	.4790	4	TC87572	159.45
.4800		1-1/2	2-1/2	.045	6	.4800	4	TC87573	159.45
.4810		1-1/2	2-1/2	.045	6	.4810	4	TC87574	159.45
.4820		1-1/2	2-1/2	.045	6	.4820	4	TC87575	159.45
.4830		1-1/2	2-1/2	.045	6	.4830	4	TC87576	159.45
.4840		1-1/2	2-1/2	.045	6	.4840	4	TC87577	159.45
.4844	31/64	1-1/2	2-1/2	.045	6	.4844	4	TC87578	137.05
.4850		1-1/2	2-1/2	.045	6	.4850	4	TC87579	159.45
.4860		1-1/2	2-1/2	.045	6	.4860	4	TC87580	159.45
.4870		1-1/2	2-1/2	.045	6	.4870	4	TC87581	192.25
.4880		1-1/2	2-1/2	.045	6	.4880	4	TC87582	192.25
.4890		1-1/2	2-1/2	.045	6	.4890	4	TC87583	192.25
.4900		1-1/2	2-1/2	.045	6	.4900	4	TC87584	192.25
.4910		1-1/2	2-1/2	.045	6	.4910	4	TC87585	192.25
.4920		1-1/2	2-1/2	.045	6	.4920	4	TC87586	192.25
.4921	12.5 mm	38 mm	63 mm	.045	6	12.5 mm	102 mm	TC87587	192.25
.4930		1-1/2	2-1/2	.045	6	.4930	4	TC87588	192.25
.4940		1-1/2	2-1/2	.045	6	.4940	4	TC87589	192.25
.4950		1-1/2	2-1/2	.045	6	.4950	4	TC87590	192.25
.4960		1-1/2	2-1/2	.045	6	.4960	4	TC87591	192.25
.4970		1-1/2	2-1/2	.045	6	.4970	4	TC87592	192.25
.4980		1-1/2	2-1/2	.045	6	.4980	4	TC87593	192.25
.4990		1-1/2	2-1/2	.045	6	.4990	4	TC87594	192.25
.4995		1-1/2	2-1/2	.045	6	.4995	4	TC87595	192.25
.5000	1/2	1-1/2	2-1/2	.045	6	.5000	4	TC87596	137.75
.5005		1-1/2	2-1/2	.045	6	.5005	4	TC87597	192.25
.5010		1-1/2	2-1/2	.045	6	.5010	4	TC87598	192.25
.5020		1-1/2	2-1/2	.045	6	.5020	4	TC87599	192.25

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Quickturn Custom Diameter Reamer Program



- Uncommon reamer diameters are ground to order for your precise application need
- Additional dimensions will vary depending on diameter selected
- Call for current production lead times
- Pricing is based on quantity ordered, use chart for instant pricing model based on quantity
- Straight flute general purpose reamers for through and blind hole applications
- 45° chamfer angle
- 4 and 6 flute styles
- Solid carbide
- Precision manufactured in the USA

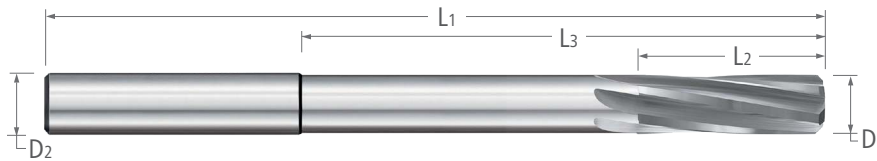
DIA. RANGE* D ₁	1 PIECE	2 PIECES	3 - 5 PIECES	6 - 11 PIECES	12 - 17 PIECES	18 - 23 PIECES	24 - 35 PIECES	36 - 49 PIECES	50 - 74 PIECES
.0401 - .0450	184.90	122.35	106.65	68.30	54.05	48.35	45.50	42.65	39.85
.0451 - .0500	184.90	122.35	106.65	68.30	54.05	48.35	45.50	42.65	39.85
.0501 - .0570	186.30	123.75	108.15	69.70	55.50	49.80	46.95	44.10	41.25
.0571 - .0650	184.90	122.35	106.65	68.30	54.05	48.35	45.50	42.65	39.85
.0651 - .0800	186.30	123.75	108.15	69.70	55.50	49.80	46.95	44.10	41.25
.0801 - .0950	187.75	125.20	109.50	71.10	56.85	51.20	48.35	45.50	42.65
.0951 - .1150	190.60	128.00	112.35	73.95	59.75	54.05	51.20	48.35	45.50
.1151 - .1300	192.00	129.45	113.80	75.40	61.15	55.50	52.65	49.80	46.95
.1301 - .1450	196.30	133.70	118.10	79.65	65.45	59.75	56.85	54.05	51.20
.1451 - .1600	200.55	138.00	122.35	83.95	69.70	64.05	61.15	58.35	55.50
.1601 - .1750	204.85	142.20	126.55	88.20	73.95	68.30	65.45	62.60	59.75
.1751 - .1950	210.55	147.95	132.25	93.90	79.65	73.95	71.10	68.30	65.45
.1951 - .2100	221.85	159.30	143.70	105.25	91.05	85.35	82.55	79.65	76.80
.2101 - .2250	226.15	163.60	147.95	109.50	95.30	89.60	86.75	83.95	81.00
.2251 - .2400	233.30	170.70	155.05	116.65	102.40	96.70	93.90	91.05	88.20
.2401 - .2550	238.95	176.35	160.75	122.35	108.15	102.40	99.55	96.70	93.90
.2551 - .2750	253.20	190.60	174.90	136.50	122.35	116.65	113.80	110.95	108.15
.2751 - .2950	254.55	192.00	176.35	138.00	123.75	118.10	115.20	112.35	109.50
.2951 - .3150	268.80	206.20	190.60	152.20	138.00	132.25	129.45	126.55	123.75
.3151 - .3350	288.75	226.15	210.55	172.05	157.95	152.20	149.35	146.50	143.70
.3351 - .3550	291.55	231.85	213.35	174.90	160.75	155.05	152.20	149.35	146.50
.3551 - .3800	297.25	237.50	219.05	180.65	166.45	160.75	157.95	155.05	152.20
.3801 - .4100	318.60	256.05	240.40	202.00	187.75	182.05	179.25	176.35	173.55
.4101 - .4400	330.00	267.40	251.70	213.35	199.15	193.50	190.60	187.75	184.90
.4401 - .4700	347.05	284.50	268.80	230.40	216.15	210.55	207.60	204.85	202.00
.4701 - .5050	375.45	312.95	297.25	258.90	244.65	238.95	236.10	233.30	230.40
.5051 - .5400	412.45	349.90	334.30	295.85	281.65	275.95	273.15	270.25	267.40
.5401 - .5800	469.35	406.75	391.15	352.75	338.55	332.80	330.00	327.10	324.30
.5801 - .6260	514.90	452.30	436.65	398.25	384.05	378.40	375.45	372.65	369.85
.6261 - .6600	583.15	520.60	504.90	466.50	452.30	446.60	443.80	440.95	438.05
.6601 - .7050	668.55	605.95	590.25	551.85	537.65	531.95	529.15	526.30	523.45
.7051 - .7550	725.35	662.80	647.15	608.80	594.55	588.85	586.00	583.15	580.30
.7551 - .7950	782.30	719.70	704.05	665.65	651.40	645.75	642.85	640.05	637.15
.7951 - .8450	839.20	776.60	760.95	722.50	708.35	702.65	699.80	696.95	694.15
.8451 - .9000	953.00	890.40	874.75	836.35	822.10	816.40	813.55	810.70	807.85
.9001 - .9600	1095.20	1032.60	1016.95	978.55	964.40	958.65	955.85	953.00	950.15
.9601 - 1.025	1209.00	1146.40	1130.75	1092.35	1078.10	1072.45	1069.60	1066.75	1063.85

*Diameter tolerance: +.0003/- .0000

For technical information, see page 295

REAMERS - CARBIDE

Right Hand Spiral



- Spiral flute geometry best suited for blind holes
- Reduced neck for through hole clearance
- Expand an existing hole to a precise size or create a perfect hole finish
- 45° chamfer angle naturally guides the reamer into the hole
- Solid carbide
- Precision manufactured in the USA

REAMER DIAMETER dec. equiv. size	FLUTE LENGTH	OVERALL REACH	AXIAL CHAMFER LENGTH	FLUTES	SHANK DIA.	OAL	UNCOATED	
D ₁ ^{+0.002"} _{-0.000"}	L ₂	L ₃			D ₂	L ₁	TOOL #	PRICE
.0469 3/64	3/8	0*	.010	4	.0404	1-1/2	TC86950	30.35
.0625 1/16	3/8	3/4	.010	4	.0625	1-1/2	TC86951	30.35
.0781 5/64	1/4	7/8	.012	4	.0781	1-3/4	TC86952	30.35
.0938 3/32	1/2	7/8	.012	4	.0938	2	TC86953	30.35
.1094 7/64	5/8	1-1/8	.015	4	.1094	2-1/4	TC86954	30.35
.1250 1/8	5/8	1-1/8	.015	4	.1250	2-1/4	TC86955	32.30
.1406 9/64	3/4	1-3/8	.017	4	.1406	2-1/2	TC86956	36.60
.1562 5/32	3/4	1-3/8	.017	4	.1563	2-1/2	TC86957	38.60
.1719 11/64	7/8	1-1/2	.022	4	.1719	2-3/4	TC86958	43.30
.1875 3/16	7/8	1-1/2	.022	4	.1875	2-3/4	TC86959	43.30
.2031 13/64	1	1-3/4	.025	4	.2031	3	TC86960	52.35
.2188 7/32	1	1-3/4	.025	4	.2188	3	TC86961	52.35
.2344 15/64	1	1-3/4	.025	4	.2344	3	TC86962	57.35
.2500 1/4	1	1-3/4	.025	4	.2500	3	TC86963	57.35
D ₁ ^{+0.0003"} _{-0.0000"}	L ₂	L ₃			D ₂	L ₁	TOOL #	PRICE
.2656 17/64	1-1/8	1-7/8	.030	6	.2656	3-1/4	TC86964	69.80
.2812 9/32	1-1/8	1-7/8	.030	6	.2813	3-1/4	TC86965	69.80
.3125 5/16	1-1/8	1-7/8	.030	6	.3125	3-1/4	TC86966	77.50
.3750 3/8	1-1/4	2-1/8	.035	6	.3750	3-1/2	TC86967	93.35
.4062 13/32	1-1/4	2-1/8	.035	6	.4063	3-1/2	TC86968	107.05
.4375 7/16	1-3/8	2-1/4	.045	6	.4375	4	TC86969	121.25
.5000 1/2	1-1/2	2-1/2	.045	6	.5000	4	TC86970	151.55

*When L3 Value is 0, it is a full shank reduction



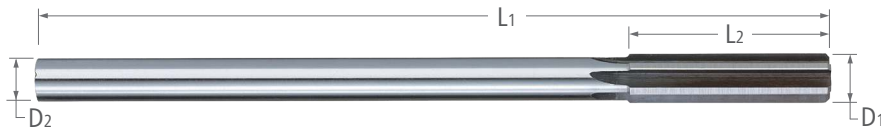
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For technical information, see page 295

REAMERS - COBALT

Chucking - Straight Flute



- Straight flute general purpose reamers for through and blind hole applications
- 45° chamfer angle
- Flute options from 2 to 8
- M42 cobalt
- Precision manufactured in the USA

REAMER DIAMETER dec. equiv. size		FLUTE LENGTH	FLUTES	SHANK DIA.	OAL	UNCOATED	
D1 ^{+0.0002"} -0.0000"		L2		D2	L1	TOOL #	PRICE
.0135	#80	3/8	2	.0135	3/4	TR96310	28.30
.0145	#79	3/8	2	.0145	3/4	TR96311	28.30
.0156	1/64	3/8	2	.0156	3/4	TR96312	28.30
.0160	#78	3/8	2	.0160	7/8	TR96313	28.30
.0180	#77	3/8	2	.0180	7/8	TR96314	28.30
.0200	#76	3/8	2	.0200	7/8	TR96315	28.30
.0210	#75	1/2	3	.0210	1	TR96316	28.30
.0225	#74	1/2	3	.0225	1	TR96317	28.30
.0240	#73	1/2	3	.0240	1-1/8	TR96318	28.30
.0250	#72	1/2	3	.0250	1-1/8	TR96319	28.30
.0260	#71	1/2	3	.0260	1-1/4	TR96320	28.30
.0280	#70	1/2	3	.0280	1-1/4	TR96321	28.30
.0292	#69	1/2	3	.0292	1-3/8	TR96322	28.30
.0310	#68	1/2	3	.0310	1-3/8	TR96323	28.30
.0313	1/32	1/2	3	.0312	1-3/8	TR96324	23.30
.0320	#67	1/2	3	.0320	1-3/8	TR96325	23.30
.0330	#66	1/2	3	.0330	1-3/8	TR96326	23.30
.0350	#65	1/2	3	.0350	1-1/2	TR96327	23.30
.0360	#64	1/2	3	.0360	1-1/2	TR96328	23.30
.0370	#63	1/2	3	.0370	1-1/2	TR96329	23.30
.0380	#62	1/2	3	.0380	1-1/2	TR96330	23.30
.0390	#61	1/2	3	.0390	1-1/2	TR96331	23.30
.0394	1.0 mm	1/2	4	.0394	2-1/2	TR96332	22.95
.0400	#60	1/2	4	.0390	2-1/2	TR96333	22.95
.0410	#59	1/2	4	.0390	2-1/2	TR96334	23.10
.0420	#58	1/2	4	.0390	2-1/2	TR96335	22.95
.0430	#57	1/2	4	.0390	2-1/2	TR96336	23.10
.0465	#56	1/2	4	.0455	2-1/2	TR96337	23.10
.0469	3/64	1/2	4	.0455	2-1/2	TR96338	22.95
.0520	#55	1/2	4	.0510	2-1/2	TR96339	23.10
.0550	#54	1/2	4	.0510	2-1/2	TR96340	23.10
.0591	1.5 mm	1/2	4	.0510	2-1/2	TR96341	23.10
.0595	#53	1/2	4	.0585	2-1/2	TR96342	23.10
.0625	1/16	1/2	4	.0585	2-1/2	TR96343	23.10
.0635	#52	1/2	4	.0585	2-1/2	TR96344	23.10
.0670	#51	3/4	4	.0660	3	TR96345	18.45
.0700	#50	3/4	4	.0660	3	TR96346	18.45
.0730	#49	3/4	4	.0660	3	TR96347	18.45
.0760	#48	3/4	4	.0720	3	TR96348	18.45
.0781	5/64	3/4	4	.0720	3	TR96349	18.45
.0785	#47	3/4	4	.0720	3	TR96350	18.45
.0787	2.0 mm	3/4	4	.0720	3	TR96351	18.45

For technical information, see page 295

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REAMERS - COBALT

Chucking - Straight Flute (Cont.)

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REAMER DIAMETER dec. equiv. size		FLUTE LENGTH	FLUTES	SHANK DIA.	OAL	UNCOATED	
D1 $^{+.0002"}_{-.0000"}$		L2		D2	L1	TOOL #	PRICE
.0810	#46	3/4	4	.0771	3	TR96352	18.45
.0820	#45	3/4	4	.0771	3	TR96353	18.45
.0860	#44	3/4	4	.0810	3	TR96354	18.45
.0890	#43	3/4	4	.0810	3	TR96355	18.45
.0935	#42	3/4	4	.0880	3	TR96356	18.45
.0938	3/32	3/4	4	.0880	3	TR96357	18.45
.0960	#41	7/8	4	.0928	3-1/2	TR96358	18.65
.0980	#40	7/8	4	.0928	3-1/2	TR96359	18.65
.0984	2.5 mm	7/8	4	.0928	3-1/2	TR96360	18.65
.0995	#39	7/8	4	.0928	3-1/2	TR96361	18.65
.1015	#38	7/8	4	.0950	3-1/2	TR96362	18.65
.1040	#37	7/8	4	.0950	3-1/2	TR96363	18.65
.1065	#36	7/8	4	.1030	3-1/2	TR96364	18.65
.1094	7/64	7/8	4	.1030	3-1/2	TR96365	19.35
.1100	#35	7/8	4	.1030	3-1/2	TR96366	19.35
.1110	#34	7/8	4	.1055	3-1/2	TR96367	19.35
.1130	#33	7/8	4	.1055	3-1/2	TR96368	19.35
.1160	#32	7/8	4	.1120	3-1/2	TR96369	19.35
.1181	3.0 mm	7/8	4	.1120	3-1/2	TR96370	19.35
.1200	#31	7/8	4	.1120	3-1/2	TR96371	19.35
.1240	O/U	7/8	4	.1190	3-1/2	TR96372	19.35
.1250	1/8	7/8	4	.1190	3-1/2	TR96373	17.30
.1260	O/U	7/8	4	.1190	3-1/2	TR96374	19.35
.1285	#30	7/8	4	.1190	3-1/2	TR96375	19.35
.1360	#29	1	4	.1275	4	TR96376	23.10
.1378	3.5 mm	1	4	.1350	4	TR96377	23.10
.1405	#28	1	4	.1350	4	TR96378	22.95
.1406	9/64	1	4	.1350	4	TR96379	23.10
.1440	#27	1	4	.1350	4	TR96380	23.10
.1470	#26	1	4	.1430	4	TR96381	23.10
.1495	#25	1	4	.1430	4	TR96382	23.10
.1520	#24	1	4	.1460	4	TR96383	23.10
.1540	#23	1	4	.1460	4	TR96384	23.10
.1563	5/32	1	4	.1510	4	TR96385	23.10
.1570	#22	1	6	.1510	4	TR96386	23.10
.1575	4.0 mm	1	6	.1510	4	TR96387	23.10
.1590	#21	1-1/8	6	.1530	4-1/2	TR96388	24.50
.1610	#20	1-1/8	6	.1530	4-1/2	TR96389	24.50
.1660	#19	1-1/8	6	.1595	4-1/2	TR96390	24.50
.1695	#18	1-1/8	6	.1595	4-1/2	TR96391	24.50
.1719	11/64	1-1/8	6	.1645	4-1/2	TR96392	24.50
.1730	#17	1-1/8	6	.1645	4-1/2	TR96393	24.50
.1770	#16	1-1/8	6	.1704	4-1/2	TR96394	24.50
.1772	4.5 mm	1-1/8	6	.1704	4-1/2	TR96395	24.50
.1800	#15	1-1/8	6	.1755	4-1/2	TR96396	24.50
.1820	#14	1-1/8	6	.1755	4-1/2	TR96397	24.50
.1850	#13	1-1/8	6	.1805	4-1/2	TR96398	24.50
.1865	O/U	1-1/8	6	.1805	4-1/2	TR96399	24.50
.1875	3/16	1-1/8	6	.1805	4-1/2	TR96400	23.60
.1885	O/U	1-1/8	6	.1805	4-1/2	TR96401	24.50

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REAMERS - COBALT

Chucking - Straight Flute (Cont.)

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REAMER DIAMETER dec. equiv. size		FLUTE LENGTH	FLUTES	SHANK DIA.	OAL	UNCOATED	
D ₁ ^{+0.0002"} -0.0000"		L ₂		D ₂	L ₁	TOOL #	PRICE
.1890	#12	1-1/8	6	.1805	4-1/2	TR96402	24.50
.1910	#11	1-1/4	6	.1860	5	TR96403	29.55
.1935	#10	1-1/4	6	.1860	5	TR96404	29.55
.1960	#9	1-1/4	6	.1895	5	TR96405	29.55
.1969	5.0 mm	1-1/4	6	.1895	5	TR96406	29.55
.1990	#8	1-1/4	6	.1895	5	TR96407	29.55
.2010	#7	1-1/4	6	.1895	5	TR96408	29.55
.2031	13/64	1-1/4	6	.1945	5	TR96409	29.55
.2040	#6	1-1/4	6	.1945	5	TR96410	29.55
.2055	#5	1-1/4	6	.2016	5	TR96411	29.55
.2090	#4	1-1/4	6	.2016	5	TR96412	29.55
.2130	#3	1-1/4	6	.2075	5	TR96413	29.55
.2165	5.5 mm	1-1/4	6	.2075	5	TR96414	29.55
.2188	7/32	1-1/4	6	.2075	5	TR96415	29.55
.2210	#2	1-1/2	6	.2173	6	TR96416	30.45
.2280	#1	1-1/2	6	.2173	6	TR96417	30.45
.2340	A	1-1/2	6	.2265	6	TR96418	30.45
.2344	15/64	1-1/2	6	.2265	6	TR96419	30.45
.2362	6.0 mm	1-1/2	6	.2265	6	TR96420	30.65
.2380	B	1-1/2	6	.2329	6	TR96421	30.65
.2420	C	1-1/2	6	.2329	6	TR96422	30.65
.2460	D	1-1/2	6	.2329	6	TR96423	27.95
.2490	O/U	1-1/2	6	.2405	6	TR96424	27.50
.2500	1/4	1-1/2	6	.2405	6	TR96425	26.15
.2510	O/U	1-1/2	6	.2405	6	TR96426	27.55
.2559	6.5 mm	1-1/2	6	.2405	6	TR96427	30.65
.2570	F	1-1/2	6	.2485	6	TR96428	30.65
.2610	G	1-1/2	6	.2485	6	TR96429	30.65
.2656	17/64	1-1/2	6	.2485	6	TR96430	41.45
.2660	H	1-1/2	6	.2485	6	TR96431	41.45
.2720	I	1-1/2	6	.2485	6	TR96432	41.45
.2756	7.0 mm	1-1/2	6	.2485	6	TR96433	41.45
.2770	J	1-1/2	6	.2485	6	TR96434	41.45
.2810	K	1-1/2	6	.2485	6	TR96435	41.45
.2813	9/32	1-1/2	6	.2485	6	TR96436	39.40
.2900	L	1-1/2	6	.2792	6	TR96437	41.45
.2950	M	1-1/2	6	.2792	6	TR96438	41.45
.2953	7.5 mm	1-1/2	6	.2792	6	TR96439	41.45
.2969	19/64	1-1/2	6	.2792	6	TR96440	41.45
.3020	N	1-1/2	6	.2792	6	TR96441	41.45
.3115	O/U	1-1/2	6	.2792	6	TR96442	39.40
.3125	5/16	1-1/2	6	.2792	6	TR96443	37.35
.3135	O/U	1-1/2	6	.2792	6	TR96444	39.40
.3150	8.0 mm	1-1/2	6	.2792	6	TR96445	41.45
.3160	O	1-1/2	6	.2792	6	TR96446	41.45
.3230	P	1-1/2	6	.2792	6	TR96447	44.70
.3281	21/64	1-1/2	6	.2792	6	TR96448	44.70
.3320	Q	1-1/2	6	.2792	6	TR96449	44.70
.3346	8.5 mm	1-1/2	6	.2792	6	TR96450	44.70
.3390	R	1-1/2	6	.2792	6	TR96451	44.70
.3438	11/32	1-1/2	6	.2792	6	TR96452	44.70

For technical information, see page 295
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REAMERS - COBALT

Chucking - Straight Flute (Cont.)

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REAMER DIAMETER dec. equiv. size		FLUTE LENGTH	FLUTES	SHANK DIA.	OAL	UNCOATED	
D ₁ ^{+0.002"} -0.000"		L ₂		D ₂	L ₁	TOOL #	PRICE
.3480	S	1-3/4	6	.3105	6	TR96453	45.45
.3543	9.0 mm	1-3/4	6	.3105	7	TR96454	45.45
.3580	T	1-3/4	6	.3105	7	TR96455	45.45
.3594	23/64	1-3/4	6	.3105	7	TR96456	45.45
.3680	U	1-3/4	6	.3105	7	TR96457	45.45
.3740	9.5 mm - O/U	1-3/4	6	.3105	7	TR96458	43.10
.3750	3/8	1-3/4	6	.3105	7	TR96459	41.10
.3760	O/U	1-3/4	6	.3105	7	TR96460	43.10
.3770	V	1-3/4	6	.3105	7	TR96461	55.65
.3860	W	1-3/4	6	.3105	7	TR96462	55.65
.3906	25/64	1-3/4	6	.3105	7	TR96463	55.65
.3937	10.0 mm	1-3/4	6	.3105	7	TR96464	55.65
.3970	X	1-3/4	6	.3105	7	TR96465	55.65
.4040	Y	1-3/4	6	.3105	7	TR96466	55.65
.4063	13/32	1-3/4	6	.3105	7	TR96467	55.45
.4130	Z	1-3/4	6	.3730	7	TR96468	55.65
.4134	10.5 mm	1-3/4	6	.3730	7	TR96469	55.45
.4219	27/64	1-3/4	6	.3730	7	TR96470	55.65
.4331	11.0 mm	1-3/4	6	.3730	7	TR96471	55.65
.4365	O/U	1-3/4	6	.3730	7	TR96472	55.45
.4375	7/16	1-3/4	6	.3730	7	TR96473	55.65
.4385	O/U	1-3/4	6	.3730	7	TR96474	55.45
.4528	11.5 mm	1-3/4	6	.3730	7	TR96475	63.80
.4531	29/64	1-3/4	6	.3730	7	TR96476	63.55
.4688	15/32	1-3/4	6	.3730	7	TR96477	63.80
.4724	12.0 mm	2	6	.4355	8	TR96478	63.80
.4844	31/64	2	6	.4355	8	TR96479	63.55
.4921	12.5 mm	2	6	.4355	8	TR96480	63.55
.4990	O/U	2	6	.4355	8	TR96481	63.80
.5000	1/2	2	6	.4355	8	TR96482	63.80
D ₁ ^{+0.003"} -0.000"		L ₂		D ₂	L ₁	TOOL #	PRICE
.5010	O/U	2	6	.4355	8	TR96483	63.80
.5313	17/32	2	6	.4355	8	TR96484	71.60
.5625	9/16	2	8	.4355	8	TR96485	71.60
.5938	19/32	2	8	.4355	8	TR96486	71.60
D ₁ ^{+0.001"} _{+0.004"}		L ₂		D ₂	L ₁	TOOL #	PRICE
.6250	5/8	2-1/4	8	.5615	9	TR96487	83.55
.6563	21/32	2-1/4	8	.5615	9	TR96488	96.25
.6875	11/16	2-1/4	8	.5615	9	TR96489	95.95
.7188	23/32	2-1/4	8	.5615	9	TR96490	107.25
.7500	3/4	2-1/2	8	.6240	9	TR96491	107.20
.7813	25/32	2-1/2	8	.6240	9	TR96492	115.95
.8125	13/16	2-1/2	8	.6240	9	TR96493	115.30
.8438	27/32	2-1/2	8	.6240	9-1/2	TR96494	137.15
.8750	7/8	2-5/8	8	.7490	10	TR96495	140.45
.9063	29/32	2-5/8	8	.7490	10	TR96496	151.00
.9375	15/16	2-5/8	8	.7490	10	TR96497	150.45
.9688	31/32	2-5/8	8	.7490	10	TR96498	169.00
1.0000	1	2-3/4	8	.8740	10-1/2	TR96499	170.90

For technical information, see page 295

REAMERS - COBALT

Chucking - Straight Flute - Quickturn Custom Diameter Reamer Program



- Uncommon reamer diameters are ground to order for your precise application need
- Additional dimensions will vary depending on diameter selected
- Call for current production lead times
- Pricing is based on quantity ordered, use chart for instant pricing model based on quantity
- Straight flute general purpose reamers for through and blind hole applications
- 45° chamfer angle
- Flute options from 2 to 10
- M42 cobalt
- Precision manufactured in the USA

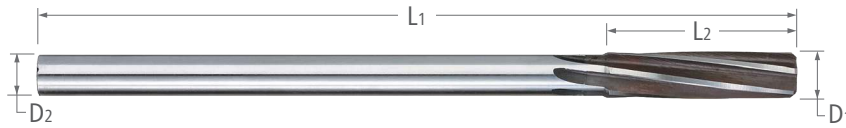
DIA. RANGE* D1	1 PIECE	2 PIECES	3 - 5 PIECES	6 - 7 PIECES	8 - 11 PIECES	12 - 17 PIECES	18 - 23 PIECES	24 - 35 PIECES	36 - 47 PIECES	48 - 59 PIECES	60 - 71 PIECES	72 - 95 PIECES	96+ PIECES
.0135 - .0195	221.80	117.25	86.90	56.70	49.15	41.55	36.55	33.95	31.45	30.25	29.45	28.45	28.35
.0196 - .0290	201.60	106.50	79.00	51.60	44.75	37.75	33.15	30.90	28.60	28.50	28.45	28.45	28.35
.0291 - .0390	183.35	96.90	71.85	46.85	40.60	36.30	30.15	28.10	26.05	25.05	24.40	23.90	23.40
.0391 - .0624	166.90	95.40	70.40	45.35	39.15	32.85	28.75	26.65	24.55	23.50	23.40	23.20	22.95
.0626 - .1093	168.05	93.30	68.30	43.25	37.00	30.75	26.55	24.50	22.40	21.40	21.30	21.20	21.00
.1095 - .1249	164.20	89.40	64.50	39.40	33.10	26.95	22.75	21.50	20.35	19.90	19.65	19.45	19.15
.1251 - .1405	171.60	96.85	71.55	46.85	40.60	34.40	30.15	28.10	26.05	25.05	24.40	23.90	23.40
.1407 - .1561	170.20	95.40	70.40	45.35	39.15	32.85	28.75	26.65	24.55	23.50	23.20	23.15	22.90
.1563 - .1718	171.80	96.90	71.90	46.95	40.70	34.45	30.30	28.20	26.10	25.10	24.85	24.65	24.50
.1720 - .1874	170.50	95.80	70.70	45.80	40.60	33.25	29.05	27.05	24.85	24.85	24.70	24.55	24.50
.1876 - .2030	177.55	102.70	77.70	52.65	46.45	40.15	36.05	33.90	31.85	30.85	30.15	29.80	29.65
.2032 - .2187	176.80	102.05	77.05	51.95	45.80	39.55	35.35	34.25	33.10	32.80	32.60	32.25	31.80
.2189 - .2343	176.80	102.05	77.05	51.95	45.80	39.55	35.35	34.25	33.10	32.80	32.60	32.25	31.80
.2345 - .2499	173.75	99.10	74.10	49.15	42.85	36.65	32.50	32.25	32.05	31.80	31.45	30.95	30.50
.2501 - .2968	189.20	114.50	89.35	64.50	58.15	51.90	47.65	45.70	43.55	42.50	42.25	41.60	41.50
.2970 - .3124	184.45	109.65	84.60	59.60	53.30	47.05	42.95	42.70	42.45	42.25	41.90	41.80	41.55
.3126 - .3437	191.60	116.70	91.75	66.70	60.45	54.20	50.05	48.00	45.85	45.70	45.35	45.00	44.75
.3439 - .3593	191.90	117.20	92.10	67.10	60.90	54.65	50.50	48.40	46.35	46.00	45.80	45.70	45.35
.3595 - .3749	187.50	112.75	87.70	62.70	56.45	50.15	46.00	45.90	45.80	45.60	45.55	45.50	45.30
.3751 - .3905	204.85	130.10	105.05	80.05	73.75	67.55	63.20	61.20	59.20	58.15	57.50	57.15	56.60
.3907 - .4218	207.45	132.75	107.60	82.70	76.40	70.20	66.00	63.95	61.90	60.90	60.10	59.70	59.20
.4220 - .4374	203.35	128.60	103.55	78.60	72.35	66.10	61.90	59.85	57.70	56.70	56.15	55.65	55.15
.4376 - .4843	213.25	138.50	113.55	88.50	82.20	76.00	71.90	69.75	67.70	66.60	66.00	65.60	65.00
.4845 - .4999	207.90	133.00	108.10	83.00	76.80	70.55	66.45	65.30	64.10	63.95	63.75	63.65	63.55
.5001 - .5311	219.35	143.50	118.75	91.75	89.15	86.75	84.40	82.00	79.65	77.30	74.90	72.55	70.25
.5313 - .5624	221.00	145.90	122.05	94.65	91.85	89.15	86.50	83.80	81.15	78.50	75.85	73.15	70.50
.5626 - .5937	225.15	149.70	125.10	97.55	94.45	91.50	88.55	93.10	82.65	79.65	76.75	73.70	70.70
.5939 - .6249	232.30	157.20	133.30	105.65	102.85	100.25	97.60	95.00	92.35	89.60	87.05	84.40	81.80
.6251 - .6874	239.70	164.30	141.65	113.85	111.30	108.90	106.45	104.05	101.60	99.20	97.70	94.30	91.95
.6876 - .7187	246.95	171.40	147.30	119.40	117.35	115.40	113.30	111.40	109.55	107.60	105.65	105.05	104.85
.7189 - .7499	255.70	180.95	158.45	130.40	127.30	124.30	121.35	118.35	115.40	112.35	109.40	106.40	103.40
.7501 - .8124	269.20	193.90	170.40	143.20	134.25	131.35	128.50	125.65	122.80	119.85	116.95	114.05	111.25
.8126 - .8437	282.75	208.20	183.60	158.25	150.75	148.20	145.70	143.20	140.70	138.20	135.65	133.25	130.70
.8439 - .8749	297.40	222.05	197.80	171.20	161.20	157.85	154.50	151.20	147.80	144.50	141.10	137.85	134.50
.8751 - .9374	309.35	233.60	209.70	181.75	171.60	168.20	164.85	161.50	158.15	154.80	151.40	149.90	148.35
.9376 - .9687	325.15	247.95	224.25	197.00	192.90	189.25	185.35	181.55	177.65	173.75	169.90	168.00	166.20
.9689 - .9999	336.50	261.20	238.05	211.40	206.10	200.90	195.75	190.65	185.45	180.40	175.20	170.10	164.90
1.0001 - 1.0624	362.05	286.65	262.20	235.00	229.25	223.40	217.60	211.85	206.10	200.25	194.45	188.65	182.90
1.0626 - 1.1249	387.80	312.75	288.75	262.20	254.60	247.25	239.85	232.50	225.05	217.75	210.40	203.00	195.65
1.1251 - 1.1874	412.85	336.50	314.60	285.40	278.80	272.35	265.90	259.40	252.95	246.40	239.90	233.45	226.90
1.1876 - 1.2499	439.05	365.10	341.50	313.05	304.65	296.70	288.75	280.95	273.05	265.20	257.25	249.35	241.55
1.2501 - 1.3749	465.40	388.65	363.40	337.55	332.40	278.40	322.15	317.10	312.00	306.85	301.75	301.40	300.70
1.3751 - 1.4999	491.20	415.65	392.15	364.80	361.20	357.80	354.45	352.25	350.05	349.30	348.75	347.95	347.20

*Diameter tolerances: 0-1/2" (+.0002"/-.0000"); 1/2"-5/8" (+.0003"/-.0000"); and 5/8" up to 1-1/2" (+.0001"/+.0004")

For technical information, see page 295

REAMERS - COBALT

Chucking - Right Hand Spiral



- General purpose reamers featuring a 45° chamfer angle
- 4 and 6 flute styles
- Spiral flutes for increased chip evacuation in blind hole applications
- M42 cobalt
- Precision manufactured in the USA

REAMER DIAMETER dec. equiv. size		FLUTE LENGTH	FLUTES	SHANK DIA.	OAL	UNCOATED	
D1 ^{+0.0002"} -0.0000"		L2		D2	L1	TOOL #	PRICE
.0394	1.0 mm	1/2	4	.0394	2-1/2	TR96726	26.95
.0400	#60	1/2	4	.0390	2-1/2	TR96727	26.95
.0410	#59	1/2	4	.0390	2-1/2	TR96728	26.95
.0420	#58	1/2	4	.0390	2-1/2	TR96729	27.15
.0430	#57	1/2	4	.0390	2-1/2	TR96730	27.15
.0465	#56	1/2	4	.0455	2-1/2	TR96731	26.95
.0469	3/64	1/2	4	.0455	2-1/2	TR96732	26.95
.0520	#55	1/2	4	.0510	2-1/2	TR96733	27.15
.0550	#54	1/2	4	.0510	2-1/2	TR96734	26.95
.0591	1.5 mm	1/2	4	.0510	2-1/2	TR96735	26.95
.0595	#53	1/2	4	.0585	2-1/2	TR96736	26.95
.0625	1/16	1/2	4	.0585	2-1/2	TR96737	27.15
.0635	#52	1/2	4	.0585	2-1/2	TR96738	27.15
.0670	#51	3/4	4	.0660	3	TR96739	21.80
.0700	#50	3/4	4	.0660	3	TR96740	21.80
.0730	#49	3/4	4	.0660	3	TR96741	21.80
.0760	#48	3/4	4	.0720	3	TR96742	21.80
.0781	5/64	3/4	4	.0720	3	TR96743	21.80
.0785	#47	3/4	4	.0720	3	TR96744	21.80
.0787	2.0 mm	3/4	4	.0720	3	TR96745	21.70
.0810	#46	3/4	4	.0771	3	TR96746	21.70
.0820	#45	3/4	4	.0771	3	TR96747	21.80
.0860	#44	3/4	4	.0810	3	TR96748	21.80
.0890	#43	3/4	4	.0810	3	TR96749	21.80
.0935	#42	3/4	4	.0880	3	TR96750	21.80
.0938	3/32	3/4	4	.0880	3	TR96751	21.80
.0960	#41	7/8	4	.0928	3-1/2	TR96752	21.95
.0980	#40	7/8	4	.0928	3-1/2	TR96753	21.90
.0984	2.5 mm	7/8	4	.0928	3-1/2	TR96754	21.90
.0995	#39	7/8	4	.0928	3-1/2	TR96755	21.95
.1015	#38	7/8	4	.0950	3-1/2	TR96756	21.90
.1040	#37	7/8	4	.0950	3-1/2	TR96757	21.90
.1065	#36	7/8	4	.1030	3-1/2	TR96758	21.90
.1094	7/64	7/8	4	.1030	3-1/2	TR96759	22.65
.1100	#35	7/8	4	.1030	3-1/2	TR96760	22.75
.1110	#34	7/8	4	.1055	3-1/2	TR96761	22.75
.1130	#33	7/8	4	.1055	3-1/2	TR96762	22.75
.1160	#32	7/8	4	.1120	3-1/2	TR96763	22.65

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For technical information, see page 295

REAMERS - COBALT

Chucking - Right Hand Spiral (Cont.)

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REAMER DIAMETER dec. equiv. size		FLUTE LENGTH	FLUTES	SHANK DIA.	OAL	UNCOATED	
$D_1 \begin{smallmatrix} +.0002" \\ -.0000" \end{smallmatrix}$		L ₂		D ₂	L ₁	TOOL #	PRICE
.1181	3.0 mm	7/8	4	.1120	3-1/2	TR96764	22.65
.1200	#31	7/8	4	.1120	3-1/2	TR96765	22.75
.1240	O/U	7/8	4	.1190	3-1/2	TR96766	22.75
.1250	1/8	7/8	4	.1190	3-1/2	TR96767	20.30
.1260	O/U	7/8	4	.1190	3-1/2	TR96768	22.75
.1285	#30	7/8	4	.1190	3-1/2	TR96769	22.75
.1360	#29	1	4	.1275	4	TR96770	26.95
.1378	3.5 mm	1	4	.1350	4	TR96771	26.95
.1405	#28	1	4	.1350	4	TR96772	26.95
.1406	9/64	1	4	.1350	4	TR96773	26.95
.1440	#27	1	4	.1350	4	TR96774	26.95
.1470	#26	1	4	.1430	4	TR96775	26.95
.1495	#25	1	4	.1430	4	TR96776	26.95
.1520	#24	1	4	.1460	4	TR96777	26.95
.1540	#23	1	4	.1460	4	TR96778	26.95
.1563	5/32	1	4	.1510	4	TR96779	26.95
.1570	#22	1	6	.1510	4	TR96780	26.95
.1575	4.0 mm	1	6	.1510	4	TR96781	26.95
.1590	#21	1-1/8	6	.1530	4-1/2	TR96782	28.90
.1610	#20	1-1/8	6	.1530	4-1/2	TR96783	28.90
.1660	#19	1-1/8	6	.1595	4-1/2	TR96784	28.90
.1695	#18	1-1/8	6	.1595	4-1/2	TR96785	28.90
.1719	11/64	1-1/8	6	.1645	4-1/2	TR96786	28.90
.1730	#17	1-1/8	6	.1645	4-1/2	TR96787	28.90
.1770	#16	1-1/8	6	.1704	4-1/2	TR96788	28.90
.1772	4.5 mm	1-1/8	6	.1704	4-1/2	TR96789	28.90
.1800	#15	1-1/8	6	.1755	4-1/2	TR96790	29.00
.1820	#14	1-1/8	6	.1755	4-1/2	TR96791	28.90
.1850	#13	1-1/8	6	.1805	4-1/2	TR96792	28.90
.1865	O/U	1-1/8	6	.1805	4-1/2	TR96793	29.00
.1875	3/16	1-1/8	6	.1805	4-1/2	TR96794	27.50
.1885	O/U	1-1/8	6	.1805	4-1/2	TR96795	29.00
.1890	#12	1-1/8	6	.1805	4-1/2	TR96796	29.00
.1910	#11	1-1/4	6	.1860	5	TR96797	32.30
.1935	#10	1-1/4	6	.1860	5	TR96798	32.30
.1960	#9	1-1/4	6	.1895	5	TR96799	32.30
.1969	5.0 mm	1-1/4	6	.1895	5	TR96800	32.30
.1990	#8	1-1/4	6	.1895	5	TR96801	32.30
.2010	#7	1-1/4	6	.1895	5	TR96802	32.30
.2031	13/64	1-1/4	6	.1945	5	TR96803	32.30
.2040	#6	1-1/4	6	.1945	5	TR96804	32.30
.2055	#5	1-1/4	6	.2016	5	TR96805	32.30
.2090	#4	1-1/4	6	.2016	5	TR96806	32.30
.2130	#3	1-1/4	6	.2075	5	TR96807	32.30
.2165	5.5 mm	1-1/4	6	.2075	5	TR96808	32.30
.2188	7/32	1-1/4	6	.2075	5	TR96809	32.30
.2210	#2	1-1/2	6	.2173	6	TR96810	33.20

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For technical information, see page 295

REAMERS - COBALT

Chucking - Right Hand Spiral (Cont.)

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REAMER DIAMETER dec. equiv. size		FLUTE LENGTH	FLUTES	SHANK DIA.	OAL	UNCOATED	
$D_1 \begin{smallmatrix} +.0002" \\ -.0000" \end{smallmatrix}$		L ₂		D ₂	L ₁	TOOL #	PRICE
.2280	#1	1-1/2	6	.2173	6	TR96811	33.20
.2340	A	1-1/2	6	.2265	6	TR96812	33.30
.2344	15/64	1-1/2	6	.2265	6	TR96813	33.30
.2362	6.0 mm	1-1/2	6	.2265	6	TR96814	34.90
.2380	B	1-1/2	6	.2329	6	TR96815	34.90
.2420	C	1-1/2	6	.2329	6	TR96816	34.90
.2460	D	1-1/2	6	.2329	6	TR96817	31.75
.2490	O/U	1-1/2	6	.2405	6	TR96818	37.45
.2500	1/4	1-1/2	6	.2405	6	TR96819	29.70
.2510	O/U	1-1/2	6	.2405	6	TR96820	37.45
.2559	6.5 mm	1-1/2	6	.2405	6	TR96821	34.90
.2570	F	1-1/2	6	.2485	6	TR96822	34.90
.2610	G	1-1/2	6	.2485	6	TR96823	34.90
.2656	17/64	1-1/2	6	.2485	6	TR96824	43.30
.2660	H	1-1/2	6	.2485	6	TR96825	43.15
.2720	I	1-1/2	6	.2485	6	TR96826	43.30
.2756	7.0 mm	1-1/2	6	.2485	6	TR96827	43.15
.2770	J	1-1/2	6	.2485	6	TR96828	43.30
.2810	K	1-1/2	6	.2485	6	TR96829	43.15
.2813	9/32	1-1/2	6	.2485	6	TR96830	41.05
.2900	L	1-1/2	6	.2792	6	TR96831	43.15
.2950	M	1-1/2	6	.2792	6	TR96832	43.15
.2953	7.5 mm	1-1/2	6	.2792	6	TR96833	43.30
.2969	19/64	1-1/2	6	.2792	6	TR96834	43.15
.3020	N	1-1/2	6	.2792	6	TR96835	43.15
.3115	O/U	1-1/2	6	.2792	6	TR96836	41.05
.3125	5/16	1-1/2	6	.2792	6	TR96837	39.10
.3135	O/U	1-1/2	6	.2792	6	TR96838	41.05
.3150	8.0 mm	1-1/2	6	.2792	6	TR96839	43.30
.3160	O	1-1/2	6	.2792	6	TR96840	43.15
.3230	P	1-1/2	6	.2792	6	TR96841	46.80
.3281	21/64	1-1/2	6	.2792	6	TR96842	46.80
.3320	Q	1-1/2	6	.2792	6	TR96843	46.45
.3346	8.5 mm	1-1/2	6	.2792	6	TR96844	46.45
.3390	R	1-1/2	6	.2792	6	TR96845	46.45
.3438	11/32	1-1/2	6	.2792	6	TR96846	46.45
.3480	S	1-3/4	6	.3105	6	TR96847	47.15
.3543	9.0 mm	1-3/4	6	.3105	7	TR96848	47.15
.3580	T	1-3/4	6	.3105	7	TR96849	47.15
.3594	23/64	1-3/4	6	.3105	7	TR96850	47.35
.3680	U	1-3/4	6	.3105	7	TR96851	47.15
.3740	9.5 mm-O/U	1-3/4	6	.3105	7	TR96852	44.75
.3750	3/8	1-3/4	6	.3105	7	TR96853	42.60
.3760	O/U	1-3/4	6	.3105	7	TR96854	44.75
.3770	V	1-3/4	6	.3105	7	TR96855	59.60
.3860	W	1-3/4	6	.3105	7	TR96856	59.35

continued on next page

For technical information, see page 295

REAMERS - COBALT

Chucking - Right Hand Spiral (Cont.)

continued from previous page

REAMER DIAMETER dec. equiv. size		FLUTE LENGTH	FLUTES	SHANK DIA.	OAL	UNCOATED	
D1 ^{+0.0002"} -0.0000"		L2		D2	L1	TOOL #	PRICE
.3906	25/64	1-3/4	6	.3105	7	TR96857	59.60
.3937	10.0 mm	1-3/4	6	.3105	7	TR96858	59.60
.3970	X	1-3/4	6	.3105	7	TR96859	59.35
.4040	Y	1-3/4	6	.3105	7	TR96860	59.60
.4063	13/32	1-3/4	6	.3105	7	TR96861	59.35
.4130	Z	1-3/4	6	.3730	7	TR96862	59.60
.4134	10.5 mm	1-3/4	6	.3730	7	TR96863	59.60
.4219	27/64	1-3/4	6	.3730	7	TR96864	59.60
.4331	11.0 mm	1-3/4	6	.3730	7	TR96865	59.60
.4365	O/U	1-3/4	6	.3730	7	TR96866	59.35
.4375	7/16	1-3/4	6	.3730	7	TR96867	56.70
.4385	O/U	1-3/4	6	.3730	7	TR96868	59.35
.4528	11.5 mm	1-3/4	6	.3730	7	TR96869	68.05
.4531	29/64	1-3/4	6	.3730	7	TR96870	68.05
.4688	15/32	1-3/4	6	.3730	7	TR96871	68.05
.4724	12.0 mm	2	6	.4355	8	TR96872	68.05
.4844	31/64	2	6	.4355	8	TR96873	68.05
.4921	12.5 mm	2	6	.4355	8	TR96874	68.05
.4990	O/U	2	6	.4355	8	TR96875	68.05
.5000	1/2	2	6	.4355	8	TR96876	64.95

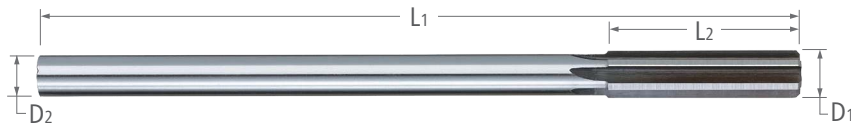
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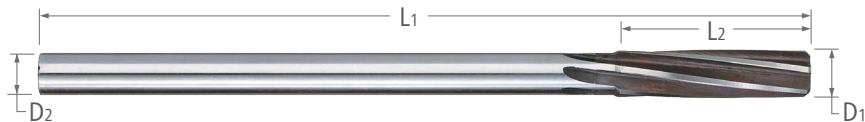
For technical information, see page 295

Trust in Titan USA

REAMERS - COBALT**Dowel Pin - Straight Flute**

- General purpose reamers featuring a 45° chamfer angle
- Straight flutes for through and blind hole applications
- 4 and 6 flute styles
- M42 cobalt
- Precision manufactured in the USA

REAMER DIA.	FLUTE LENGTH	FLUTES	SHANK DIA.	OVERALL LENGTH	UNCOATED	
$D_1^{+.0000" \atop -.0002"}$	L ₂		D ₂	L ₁	TOOL #	PRICE
.1230	7/8	4	.1190	3-1/2	TR96508	19.40
.1247	7/8	4	.1190	3-1/2	TR96509	18.55
.1855	1-1/8	6	.1805	4-1/2	TR96510	23.45
.1870	1-1/8	6	.1805	4-1/2	TR96511	23.45
.2480	1-1/2	6	.2405	6	TR96512	26.20
.2495	1-1/2	6	.2405	6	TR96513	26.20
.3105	1-1/2	6	.2792	6	TR96514	37.55
.3120	1-1/2	6	.2792	6	TR96515	37.70
.3730	1-3/4	6	.3105	7	TR96516	41.10
.3745	1-3/4	6	.3105	7	TR96517	41.10
.4355	1-3/4	6	.3730	7	TR96518	52.75
.4370	1-3/4	6	.3730	7	TR96519	52.75
.4980	2	6	.4355	8	TR96520	60.50
.4995	2	6	.4355	8	TR96521	60.50

REAMERS - COBALT**Dowel Pin - Right Hand Spiral**

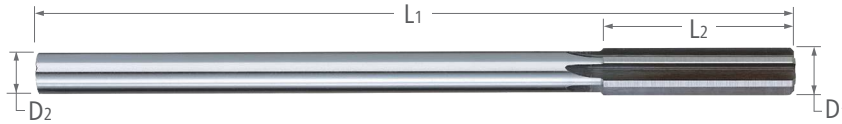
- General purpose reamers featuring a 45° chamfer angle
- Spiral flutes for increased chip evacuation in blind hole applications
- 4 and 6 flute styles
- M42 cobalt
- Precision manufactured in the USA

REAMER DIA.	FLUTE LENGTH	FLUTES	SHANK DIA.	OVERALL LENGTH	UNCOATED	
$D_1^{+.0002" \atop -.0000"}$	L ₂		D ₂	L ₁	TOOL #	PRICE
.1230	7/8	4	.1190	3-1/2	TR96970	21.50
.1247	7/8	4	.1190	3-1/2	TR96971	21.50
.1855	1-1/8	6	.1805	4-1/2	TR96972	28.55
.1870	1-1/8	6	.1805	4-1/2	TR96973	28.80
.2480	1-1/2	6	.2405	6	TR96974	30.05
.2495	1-1/2	6	.2405	6	TR96975	30.05
.3105	1-1/2	6	.2792	6	TR96976	39.65
.3120	1-1/2	6	.2792	6	TR96977	38.95
.3730	1-3/4	6	.3105	7	TR96978	42.60
.3745	1-3/4	6	.3105	7	TR96979	42.60
.4355	1-3/4	6	.3730	7	TR96980	58.55
.4370	1-3/4	6	.3730	7	TR96981	58.55
.4980	2	6	.4355	8	TR96982	64.85
.4995	2	6	.4355	8	TR96983	66.90

For technical information, see page 295

REAMERS - HIGH SPEED STEEL

Chucking - Straight Flute



- Straight flute general purpose reamers for through and blind hole applications
- 45° chamfer angle
- Flute options from 2 to 12
- High speed steel
- Precision manufactured in the USA

REAMER DIAMETER dec. equiv. size		FLUTE LENGTH	FLUTES	SHANK DIA.	OAL	UNCOATED	
D1 $^{+.0002}_{-.0000}$ "		L2		D2	L1	TOOL #	PRICE
.0135	#80	3/8	2	.0135	3/4	TR96001	25.35
.0140		3/8	2	.0135	3/4	TR94007	31.70
.0145	#79	3/8	2	.0145	3/4	TR96002	25.35
.0150		3/8	2	.0156	3/4	TR94008	31.60
.0155		3/8	2	.0156	3/4	TR94009	31.60
.0156	1/64	3/8	2	.0156	3/4	TR96003	25.45
.0160	#78	3/8	2	.0160	7/8	TR96004	25.45
.0165		3/8	2	.0180	7/8	TR94010	31.60
.0170		3/8	2	.0180	7/8	TR94011	31.60
.0175		3/8	2	.0180	7/8	TR94012	31.60
.0180	#77	3/8	2	.0180	7/8	TR96005	25.35
.0185		3/8	2	.0200	7/8	TR94013	31.70
.0190		3/8	2	.0200	7/8	TR94014	31.70
.0195		3/8	2	.0200	7/8	TR94015	31.60
.0200	#76	3/8	2	.0200	7/8	TR96006	25.45
.0205		1/2	3	.0210	1	TR94016	28.70
.0210	#75	1/2	3	.0210	1	TR96007	25.35
.0215		1/2	3	.0225	1	TR94017	28.70
.0220		1/2	3	.0225	1	TR94018	28.70
.0225	#74	1/2	3	.0225	1	TR96008	25.45
.0230		1/2	3	.0240	1-1/8	TR94019	28.70
.0235		1/2	3	.0240	1-1/8	TR94020	28.70
.0240	#73	1/2	3	.0240	1-1/8	TR96009	25.45
.0245		1/2	3	.0250	1-1/8	TR94021	28.70
.0250	#72	1/2	3	.0250	1-1/8	TR96010	25.45
.0255		1/2	3	.0260	1-1/4	TR94022	28.70
.0260	#71	1/2	3	.0260	1-1/4	TR96011	25.45
.0265		1/2	3	.0280	1-1/4	TR94023	28.70
.0270		1/2	3	.0280	1-1/4	TR94024	28.70
.0275		1/2	3	.0280	1-1/4	TR94025	28.70
.0280	#70	1/2	3	.0280	1-1/4	TR96012	25.35
.0285		1/2	3	.0292	1-3/8	TR94026	28.70
.0290		1/2	3	.0292	1-3/8	TR94027	28.70
.0292	#69	1/2	3	.0292	1-3/8	TR96013	25.35
.0295		1/2	3	.0310	1-3/8	TR94028	26.15
.0300		1/2	3	.0310	1-3/8	TR94029	26.15
.0305		1/2	3	.0310	1-3/8	TR94030	26.15
.0310	#68	1/2	3	.0310	1-3/8	TR96014	25.45
.0312	1/32	1/2	3	.0312	1-3/8	TR96015	20.05
.0315		1/2	3	.0320	1-3/8	TR94031	26.15
.0320	#67	1/2	3	.0320	1-3/8	TR96016	21.35
.0325		1/2	3	.0330	1-3/8	TR94032	26.15

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For technical information, see page 295

REAMERS - HIGH SPEED STEEL

Chucking - Straight Flute (Cont.)

continued from previous page

REAMER DIAMETER dec. equiv. size		FLUTE LENGTH	FLUTES	SHANK DIA.	OAL	UNCOATED	
D1 ^{+0.0002"} -0.0000"		L2		D2	L1	TOOL #	PRICE
.0330	#66	1/2	3	.0330	1-3/8	TR96017	21.35
.0335		1/2	3	.0350	1-1/2	TR94033	26.15
.0340		1/2	3	.0350	1-1/2	TR94034	26.15
.0345		1/2	3	.0350	1-1/2	TR94035	26.15
.0350	#65	1/2	3	.0350	1-1/2	TR96018	21.35
.0355		1/2	3	.0360	1-1/2	TR94036	26.15
.0360	#64	1/2	3	.0360	1-1/2	TR96019	21.35
.0365		1/2	3	.0370	1-1/2	TR94037	26.15
.0370	#63	1/2	3	.0370	1-1/2	TR96020	21.35
.0375		1/2	3	.0380	1-1/2	TR94038	26.15
.0380	#62	1/2	3	.0380	1-1/2	TR96021	21.35
.0385		1/2	3	.0390	1-1/2	TR94039	26.15
.0390	#61	1/2	3	.0390	1-1/2	TR96022	21.35
.0394	1.0 mm	1/2	4	.0394	2-1/2	TR96023	21.35
.0395		1/2	4	.0390	2-1/2	TR94040	24.85
.0400	#60	1/2	4	.0390	2-1/2	TR96024	21.35
.0405		1/2	4	.0390	2-1/2	TR94041	25.00
.0410	#59	1/2	4	.0390	2-1/2	TR96025	21.35
.0415		1/2	4	.0390	2-1/2	TR94042	24.85
.0420	#58	1/2	4	.0390	2-1/2	TR96026	21.35
.0425		1/2	4	.0390	2-1/2	TR94043	25.00
.0430	#57	1/2	4	.0390	2-1/2	TR96027	21.35
.0435		1/2	4	.0455	2-1/2	TR94044	24.85
.0440		1/2	4	.0455	2-1/2	TR94045	25.00
.0445		1/2	4	.0455	2-1/2	TR94046	24.85
.0450		1/2	4	.0455	2-1/2	TR94047	25.00
.0455		1/2	4	.0455	2-1/2	TR94048	25.00
.0460		1/2	4	.0455	2-1/2	TR94049	25.00
.0465	#56	1/2	4	.0455	2-1/2	TR96028	21.35
.0469	3/64	1/2	4	.0455	2-1/2	TR96029	21.35
.0470		1/2	4	.0510	2-1/2	TR94050	25.00
.0475		1/2	4	.0510	2-1/2	TR94051	25.00
.0480		1/2	4	.0510	2-1/2	TR94052	25.00
.0485		1/2	4	.0510	2-1/2	TR94053	25.00
.0490		1/2	4	.0510	2-1/2	TR94054	25.00
.0495		1/2	4	.0510	2-1/2	TR94055	25.00
.0500		1/2	4	.0510	2-1/2	TR94056	25.00
.0505		1/2	4	.0510	2-1/2	TR94057	25.00
.0510		1/2	4	.0510	2-1/2	TR94058	25.00
.0515		1/2	4	.0510	2-1/2	TR94059	25.00
.0520	#55	1/2	4	.0510	2-1/2	TR96030	21.35
.0525		1/2	4	.0510	2-1/2	TR94060	25.00
.0530		1/2	4	.0510	2-1/2	TR94061	25.00
.0535		1/2	4	.0510	2-1/2	TR94062	25.00
.0540		1/2	4	.0510	2-1/2	TR94063	25.00
.0545		1/2	4	.0510	2-1/2	TR94064	25.00
.0550	#54	1/2	4	.0510	2-1/2	TR96031	21.35
.0555		1/2	4	.0510	2-1/2	TR94065	25.00
.0560		1/2	4	.0510	2-1/2	TR94066	25.00
.0565		1/2	4	.0510	2-1/2	TR94067	25.00

For technical information, see page 295

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REAMERS - HIGH SPEED STEEL

Chucking - Straight Flute (Cont.)

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REAMER DIAMETER dec. equiv.	size	FLUTE LENGTH	FLUTES	SHANK DIA.	OAL	UNCOATED	
D1 $^{+.0002''}_{-.0000''}$		L2		D2	L1	TOOL #	PRICE
.0570		1/2	4	.0510	2-1/2	TR94068	24.85
.0575		1/2	4	.0510	2-1/2	TR94069	25.00
.0580		1/2	4	.0510	2-1/2	TR94070	25.00
.0585		1/2	4	.0510	2-1/2	TR94071	25.00
.0590		1/2	4	.0510	2-1/2	TR94072	25.00
.0591	1.5 mm	1/2	4	.0510	2-1/2	TR96032	21.35
.0595	#53	1/2	4	.0585	2-1/2	TR96033	21.35
.0600		1/2	4	.0585	2-1/2	TR94073	25.00
.0605		1/2	4	.0585	2-1/2	TR94074	25.00
.0610		1/2	4	.0585	2-1/2	TR94075	25.00
.0615		1/2	4	.0585	2-1/2	TR94076	25.00
.0620		1/2	4	.0585	2-1/2	TR94077	25.00
.0625	1/16	1/2	4	.0585	2-1/2	TR96034	19.10
.0630		1/2	4	.0585	2-1/2	TR94078	22.40
.0635	#52	1/2	4	.0585	2-1/2	TR96035	19.10
.0640		3/4	4	.0660	3	TR94079	22.40
.0645		3/4	4	.0660	3	TR94080	22.40
.0650		3/4	4	.0660	3	TR94081	22.40
.0655		3/4	4	.0660	3	TR94082	22.40
.0660		3/4	4	.0660	3	TR94083	22.40
.0665		3/4	4	.0660	3	TR94084	22.40
.0670	#51	3/4	4	.0660	3	TR96036	17.20
.0675		3/4	4	.0660	3	TR94085	22.40
.0680		3/4	4	.0660	3	TR94086	22.40
.0685		3/4	4	.0660	3	TR94087	22.40
.0690		3/4	4	.0660	3	TR94088	22.40
.0695		3/4	4	.0660	3	TR94089	22.40
.0700	#50	3/4	4	.0660	3	TR96037	17.20
.0705		3/4	4	.0660	3	TR94090	22.40
.0710		3/4	4	.0660	3	TR94091	22.40
.0715		3/4	4	.0660	3	TR94092	22.40
.0720		3/4	4	.0660	3	TR94093	22.40
.0725		3/4	4	.0660	3	TR94094	22.40
.0730	#49	3/4	4	.0660	3	TR96038	17.20
.0735		3/4	4	.0720	3	TR94095	22.40
.0740		3/4	4	.0720	3	TR94096	22.40
.0745		3/4	4	.0720	3	TR94097	22.35
.0750		3/4	4	.0720	3	TR94098	22.40
.0755		3/4	4	.0720	3	TR94099	22.40
.0760	#48	3/4	4	.0720	3	TR96039	17.20
.0765		3/4	4	.0720	3	TR94100	22.40
.0770		3/4	4	.0720	3	TR94101	22.40
.0775		3/4	4	.0720	3	TR94102	22.40
.0780		3/4	4	.0720	3	TR94103	22.40
.0781	5/64	3/4	4	.0720	3	TR96040	17.20
.0785	#47	3/4	4	.0720	3	TR96041	17.20
.0787	2.0 mm	3/4	4	.0720	3	TR96042	17.20
.0790		3/4	4	.0771	3	TR94104	22.40
.0795		3/4	4	.0771	3	TR94105	22.40

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For technical information, see page 295

REAMERS - HIGH SPEED STEEL

Chucking - Straight Flute (Cont.)

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REAMER DIAMETER dec. equiv.	size	FLUTE LENGTH	FLUTES	SHANK DIA.	OAL	UNCOATED	
D ₁ ^{+0.002"} -0.000"		L ₂		D ₂	L ₁	TOOL #	PRICE
.0800		3/4	4	.0771	3	TR94106	22.40
.0805		3/4	4	.0771	3	TR94107	22.40
.0810	#46	3/4	4	.0771	3	TR96043	17.20
.0815		3/4	4	.0771	3	TR94108	22.40
.0820	#45	3/4	4	.0771	3	TR96044	17.20
.0825		3/4	4	.0810	3	TR94109	22.35
.0830		3/4	4	.0810	3	TR94110	22.40
.0835		3/4	4	.0810	3	TR94111	22.40
.0840		3/4	4	.0810	3	TR94112	22.40
.0845		3/4	4	.0810	3	TR94113	22.40
.0850		3/4	4	.0810	3	TR94114	22.40
.0855		3/4	4	.0810	3	TR94115	22.40
.0860	#44	3/4	4	.0810	3	TR96045	17.20
.0865		3/4	4	.0810	3	TR94116	22.40
.0870		3/4	4	.0810	3	TR94117	22.40
.0875		3/4	4	.0810	3	TR94118	22.35
.0880		3/4	4	.0810	3	TR94119	22.40
.0885		3/4	4	.0810	3	TR94120	22.40
.0890	#43	3/4	4	.0810	3	TR96046	17.20
.0895		3/4	4	.0880	3	TR94121	22.40
.0900		3/4	4	.0880	3	TR94122	22.40
.0905		3/4	4	.0880	3	TR94123	22.40
.0910		3/4	4	.0880	3	TR94124	22.40
.0915		3/4	4	.0880	3	TR94125	22.40
.0920		3/4	4	.0880	3	TR94126	22.40
.0925		3/4	4	.0880	3	TR94127	22.40
.0930		3/4	4	.0880	3	TR94128	22.40
.0935	#42	3/4	4	.0880	3	TR96047	17.20
.0938	3/32	3/4	4	.0880	3	TR96048	15.45
.0940		7/8	4	.0928	3-1/2	TR94129	22.40
.0945		7/8	4	.0928	3-1/2	TR94130	22.40
.0950		7/8	4	.0928	3-1/2	TR94131	22.40
.0955		7/8	4	.0928	3-1/2	TR94132	22.40
.0960	#41	7/8	4	.0928	3-1/2	TR96049	17.35
.0965		7/8	4	.0928	3-1/2	TR94133	22.40
.0970		7/8	4	.0928	3-1/2	TR94134	22.40
.0975		7/8	4	.0928	3-1/2	TR94135	22.40
.0980	#40	7/8	4	.0928	3-1/2	TR96050	17.35
.0984	2.5 mm	7/8	4	.0928	3-1/2	TR96051	17.35
.0985		7/8	4	.0928	3-1/2	TR94136	22.40
.0990		7/8	4	.0928	3-1/2	TR94137	22.40
.0995	#39	7/8	4	.0928	3-1/2	TR96052	17.35
.1000		7/8	4	.0950	3-1/2	TR94138	22.40
.1005		7/8	4	.0950	3-1/2	TR94139	22.40
.1010		7/8	4	.0950	3-1/2	TR94140	22.40
.1015	#38	7/8	4	.0950	3-1/2	TR96053	17.35
.1020		7/8	4	.0950	3-1/2	TR94141	22.40
.1025		7/8	4	.0950	3-1/2	TR94142	22.40
.1030		7/8	4	.0950	3-1/2	TR94143	22.40

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REAMER DIAMETER dec. equiv.	size	FLUTE LENGTH	FLUTES	SHANK DIA.	OAL	UNCOATED	
$D_1 \begin{smallmatrix} +.0002" \\ - .0000" \end{smallmatrix}$		L ₂		D ₂	L ₁	TOOL #	PRICE
.1035		7/8	4	.0950	3-1/2	TR94144	22.40
.1040	#37	7/8	4	.0950	3-1/2	TR96054	17.35
.1045		7/8	4	.1030	3-1/2	TR94145	22.40
.1050		7/8	4	.1030	3-1/2	TR94146	22.40
.1055		7/8	4	.1030	3-1/2	TR94147	22.35
.1060		7/8	4	.1030	3-1/2	TR94148	22.40
.1065	#36	7/8	4	.1030	3-1/2	TR96055	17.35
.1070		7/8	4	.1030	3-1/2	TR94149	22.40
.1075		7/8	4	.1030	3-1/2	TR94150	22.35
.1080		7/8	4	.1030	3-1/2	TR94151	22.40
.1085		7/8	4	.1030	3-1/2	TR94152	22.40
.1090		7/8	4	.1030	3-1/2	TR94153	22.40
.1094	7/64	7/8	4	.1030	3-1/2	TR96056	17.75
.1095		7/8	4	.1030	3-1/2	TR94154	19.35
.1100	#35	7/8	4	.1030	3-1/2	TR96057	17.75
.1105		7/8	4	.1055	3-1/2	TR94155	19.30
.1110	#34	7/8	4	.1055	3-1/2	TR96058	17.75
.1115		7/8	4	.1055	3-1/2	TR94156	19.30
.1120		7/8	4	.1055	3-1/2	TR94157	19.35
.1125		7/8	4	.1055	3-1/2	TR94158	19.30
.1130	#33	7/8	4	.1055	3-1/2	TR96059	17.75
.1135		7/8	4	.1120	3-1/2	TR94159	19.35
.1140		7/8	4	.1120	3-1/2	TR94160	19.35
.1145		7/8	4	.1120	3-1/2	TR94161	19.35
.1150		7/8	4	.1120	3-1/2	TR94162	19.35
.1155		7/8	4	.1120	3-1/2	TR94163	19.35
.1160	#32	7/8	4	.1120	3-1/2	TR96060	17.75
.1165		7/8	4	.1120	3-1/2	TR94164	19.35
.1170		7/8	4	.1120	3-1/2	TR94165	19.35
.1175		7/8	4	.1120	3-1/2	TR94166	19.35
.1180		7/8	4	.1120	3-1/2	TR94167	19.35
.1181	3.0 mm	7/8	4	.1120	3-1/2	TR96061	17.75
.1185		7/8	4	.1120	3-1/2	TR94168	19.35
.1190		7/8	4	.1120	3-1/2	TR94169	19.35
.1195		7/8	4	.1120	3-1/2	TR94170	19.35
.1200	#31	7/8	4	.1120	3-1/2	TR96062	17.75
.1205		7/8	4	.1190	3-1/2	TR94171	19.35
.1210		7/8	4	.1190	3-1/2	TR94172	19.35
.1215		7/8	4	.1190	3-1/2	TR94173	19.35
.1220		7/8	4	.1190	3-1/2	TR94174	19.35
.1225		7/8	4	.1190	3-1/2	TR94175	19.35
.1230		7/8	4	.1190	3-1/2	TR94176	19.35
.1235		7/8	4	.1190	3-1/2	TR94177	19.35
.1240	O/U	7/8	4	.1190	3-1/2	TR96063	17.75
.1245		7/8	4	.1190	3-1/2	TR94178	19.35
.1247		7/8	4	.1190	3-1/2	TR94179	19.35
.1250	1/8	7/8	4	.1190	3-1/2	TR96064	16.10
.1255		7/8	4	.1190	3-1/2	TR94180	26.15
.1260	O/U	7/8	4	.1190	3-1/2	TR96065	17.75

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REAMER DIAMETER dec. equiv.	FLUTE LENGTH	FLUTES	SHANK DIA.	OAL	UNCOATED	
D ₁ ^{+0.002"} -0.000"	L ₂		D ₂	L ₁	TOOL #	PRICE
.1265	7/8	4	.1190	3-1/2	TR94181	26.15
.1270	7/8	4	.1190	3-1/2	TR94182	26.15
.1275	7/8	4	.1190	3-1/2	TR94183	26.15
.1280	7/8	4	.1190	3-1/2	TR94184	26.15
.1285 #30	7/8	4	.1190	3-1/2	TR96066	17.75
.1290	1	4	.1275	4	TR94185	26.15
.1295	1	4	.1275	4	TR94186	26.15
.1300	1	4	.1275	4	TR94187	26.15
.1305	1	4	.1275	4	TR94188	26.15
.1310	1	4	.1275	4	TR94189	26.15
.1315	1	4	.1275	4	TR94190	26.15
.1320	1	4	.1275	4	TR94191	26.15
.1325	1	4	.1275	4	TR94192	26.15
.1330	1	4	.1275	4	TR94193	26.15
.1335	1	4	.1275	4	TR94194	26.15
.1340	1	4	.1275	4	TR94195	26.15
.1345	1	4	.1275	4	TR94196	26.15
.1350	1	4	.1275	4	TR94197	26.15
.1355	1	4	.1275	4	TR94198	26.15
.1360 #29	1	4	.1275	4	TR96067	21.35
.1365	1	4	.1350	4	TR94199	26.15
.1370	1	4	.1350	4	TR94200	26.15
.1375	1	4	.1350	4	TR94201	26.15
.1378 3.5 mm	1	4	.1350	4	TR96068	21.35
.1380	1	4	.1350	4	TR94202	26.15
.1385	1	4	.1350	4	TR94203	26.15
.1390	1	4	.1350	4	TR94204	26.15
.1395	1	4	.1350	4	TR94205	26.15
.1400	1	4	.1350	4	TR94206	26.15
.1405 #28	1	4	.1350	4	TR96069	21.35
.1406 9/64	1	4	.1350	4	TR96070	21.35
.1410	1	4	.1350	4	TR94207	25.00
.1415	1	4	.1350	4	TR94208	25.00
.1420	1	4	.1350	4	TR94209	25.00
.1425	1	4	.1350	4	TR94210	25.00
.1430	1	4	.1350	4	TR94211	25.00
.1435	1	4	.1350	4	TR94212	25.00
.1440 #27	1	4	.1350	4	TR96071	21.35
.1445	1	4	.1430	4	TR94213	24.85
.1450	1	4	.1430	4	TR94214	25.00
.1455	1	4	.1430	4	TR94215	25.00
.1460	1	4	.1430	4	TR94216	25.00
.1465	1	4	.1430	4	TR94217	24.85
.1470 #26	1	4	.1430	4	TR96072	21.35
.1475	1	4	.1430	4	TR94218	24.85
.1480	1	4	.1430	4	TR94219	25.00
.1485	1	4	.1430	4	TR94220	24.85
.1490	1	4	.1430	4	TR94221	25.00
.1495 #25	1	4	.1430	4	TR96073	21.35

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REAMERS - HIGH SPEED STEEL

Chucking - Straight Flute (Cont.)

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REAMER DIAMETER dec. equiv.	size	FLUTE LENGTH	FLUTES	SHANK DIA.	OAL	UNCOATED	
$D_1 \begin{smallmatrix} +.0002" \\ - .0000" \end{smallmatrix}$		L ₂		D ₂	L ₁	TOOL #	PRICE
.1500		1	4	.1460	4	TR94222	25.00
.1505		1	4	.1460	4	TR94223	24.85
.1510		1	4	.1460	4	TR94224	25.00
.1515		1	4	.1460	4	TR94225	25.00
.1520	#24	1	4	.1460	4	TR96074	21.35
.1525		1	4	.1460	4	TR94226	24.85
.1530		1	4	.1460	4	TR94227	25.00
.1535		1	4	.1460	4	TR94228	24.85
.1540	#23	1	4	.1460	4	TR96075	21.35
.1545		1	4	.1510	4	TR94229	25.00
.1550		1	4	.1510	4	TR94230	25.00
.1555		1	4	.1510	4	TR94231	25.00
.1560		1	4	.1510	4	TR94232	25.00
.1562	5/32	1	4	.1510	4	TR96076	21.35
.1565		1	6	.1510	4	TR94233	26.15
.1570	#22	1	6	.1510	4	TR96077	21.35
.1575	4.0 mm	1	6	.1510	4	TR96078	21.35
.1580		1-1/8	6	.1530	4-1/2	TR94234	26.15
.1585		1-1/8	6	.1530	4-1/2	TR94235	26.15
.1590	#21	1-1/8	6	.1530	4-1/2	TR96079	22.80
.1595		1-1/8	6	.1530	4-1/2	TR94236	26.15
.1600		1-1/8	6	.1530	4-1/2	TR94237	26.15
.1605		1-1/8	6	.1530	4-1/2	TR94238	26.15
.1610	#20	1-1/8	6	.1530	4-1/2	TR96080	22.80
.1615		1-1/8	6	.1595	4-1/2	TR94239	26.15
.1620		1-1/8	6	.1595	4-1/2	TR94240	26.15
.1625		1-1/8	6	.1595	4-1/2	TR94241	26.15
.1630		1-1/8	6	.1595	4-1/2	TR94242	26.15
.1635		1-1/8	6	.1595	4-1/2	TR94243	26.15
.1640		1-1/8	6	.1595	4-1/2	TR94244	26.15
.1645		1-1/8	6	.1595	4-1/2	TR94245	26.15
.1650		1-1/8	6	.1595	4-1/2	TR94246	26.15
.1655		1-1/8	6	.1595	4-1/2	TR94247	26.15
.1660	#19	1-1/8	6	.1595	4-1/2	TR96081	22.80
.1665		1-1/8	6	.1595	4-1/2	TR94248	26.15
.1670		1-1/8	6	.1595	4-1/2	TR94249	26.15
.1675		1-1/8	6	.1595	4-1/2	TR94250	26.15
.1680		1-1/8	6	.1595	4-1/2	TR94251	26.15
.1685		1-1/8	6	.1595	4-1/2	TR94252	26.15
.1690		1-1/8	6	.1595	4-1/2	TR94253	26.15
.1695	#18	1-1/8	6	.1595	4-1/2	TR96082	22.80
.1700		1-1/8	6	.1645	4-1/2	TR94254	26.15
.1705		1-1/8	6	.1645	4-1/2	TR94255	26.15
.1710		1-1/8	6	.1645	4-1/2	TR94256	26.15
.1715		1-1/8	6	.1645	4-1/2	TR94257	26.15
.1719	11/64	1-1/8	6	.1645	4-1/2	TR96083	22.80
.1720		1-1/8	6	.1645	4-1/2	TR94258	24.65
.1725		1-1/8	6	.1645	4-1/2	TR94259	24.65
.1730	#17	1-1/8	6	.1645	4-1/2	TR96084	22.80

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REAMER DIAMETER dec. equiv. size		FLUTE LENGTH	FLUTES	SHANK DIA.	OAL	UNCOATED	
D ₁ ^{+0.002"} -0.000"		L ₂		D ₂	L ₁	TOOL #	PRICE
.1735		1-1/8	6	.1704	4-1/2	TR94260	24.65
.1740		1-1/8	6	.1704	4-1/2	TR94261	24.65
.1745		1-1/8	6	.1704	4-1/2	TR94262	24.65
.1750		1-1/8	6	.1704	4-1/2	TR94263	24.65
.1755		1-1/8	6	.1704	4-1/2	TR94264	24.65
.1760		1-1/8	6	.1704	4-1/2	TR94265	24.65
.1765		1-1/8	6	.1704	4-1/2	TR94266	24.55
.1770	#16	1-1/8	6	.1704	4-1/2	TR96085	22.80
.1772	4.5 mm	1-1/8	6	.1704	4-1/2	TR96086	22.80
.1775		1-1/8	6	.1755	4-1/2	TR94267	24.65
.1780		1-1/8	6	.1755	4-1/2	TR94268	24.65
.1785		1-1/8	6	.1755	4-1/2	TR94269	24.55
.1790		1-1/8	6	.1755	4-1/2	TR94270	24.65
.1795		1-1/8	6	.1755	4-1/2	TR94271	24.65
.1800	#15	1-1/8	6	.1755	4-1/2	TR96087	22.80
.1805		1-1/8	6	.1755	4-1/2	TR94272	24.65
.1810		1-1/8	6	.1755	4-1/2	TR94273	24.65
.1815		1-1/8	6	.1755	4-1/2	TR94274	24.65
.1820	#14	1-1/8	6	.1755	4-1/2	TR96088	22.80
.1825		1-1/8	6	.1805	4-1/2	TR94275	24.55
.1830		1-1/8	6	.1805	4-1/2	TR94276	24.65
.1835		1-1/8	6	.1805	4-1/2	TR94277	24.55
.1840		1-1/8	6	.1805	4-1/2	TR94278	24.65
.1845		1-1/8	6	.1805	4-1/2	TR94279	24.65
.1850	#13	1-1/8	6	.1805	4-1/2	TR96089	22.80
.1855		1-1/8	6	.1805	4-1/2	TR94280	24.65
.1860		1-1/8	6	.1805	4-1/2	TR94281	24.65
.1865	O/U	1-1/8	6	.1805	4-1/2	TR96090	22.80
.1870		1-1/8	6	.1805	4-1/2	TR94282	24.65
.1875	3/16	1-1/8	6	.1805	4-1/2	TR96091	20.55
.1880		1-1/8	6	.1805	4-1/2	TR94283	31.00
.1885	O/U	1-1/8	6	.1805	4-1/2	TR96092	22.80
.1890	#12	1-1/8	6	.1805	4-1/2	TR96093	22.80
.1895		1-1/4	6	.1860	5	TR94284	31.00
.1900		1-1/4	6	.1860	5	TR94285	31.00
.1905		1-1/4	6	.1860	5	TR94286	31.00
.1910	#11	1-1/4	6	.1860	5	TR96094	25.35
.1915		1-1/4	6	.1860	5	TR94287	31.00
.1920		1-1/4	6	.1860	5	TR94288	31.00
.1925		1-1/4	6	.1860	5	TR94289	31.00
.1930		1-1/4	6	.1860	5	TR94290	31.00
.1935	#10	1-1/4	6	.1860	5	TR96095	25.35
.1940		1-1/4	6	.1895	5	TR94291	31.00
.1945		1-1/4	6	.1895	5	TR94292	31.00
.1950		1-1/4	6	.1895	5	TR94293	31.00
.1955		1-1/4	6	.1895	5	TR94294	31.00
.1960	#9	1-1/4	6	.1895	5	TR96096	25.35
.1965		1-1/4	6	.1895	5	TR94295	31.00
.1969	5.0 mm	1-1/4	6	.1895	5	TR96097	25.35

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Chucking - Straight Flute (Cont.)

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REAMER DIAMETER dec. equiv.	FLUTE LENGTH	FLUTES	SHANK DIA.	OAL	UNCOATED	
D ₁ ^{+0.0002"} -0.0000"	L ₂		D ₂	L ₁	TOOL #	PRICE
.1970	1-1/4	6	.1895	5	TR94296	31.00
.1975	1-1/4	6	.1895	5	TR94297	31.00
.1980	1-1/4	6	.1895	5	TR94298	31.00
.1985	1-1/4	6	.1895	5	TR94299	31.00
.1990	1-1/4	6	.1895	5	TR96098	25.35
.1995	1-1/4	6	.1945	5	TR94300	31.00
.2000	1-1/4	6	.1945	5	TR94301	31.00
.2005	1-1/4	6	.1945	5	TR94302	31.00
.2010	1-1/4	6	.1895	5	TR96099	25.35
.2015	1-1/4	6	.1945	5	TR94303	31.00
.2020	1-1/4	6	.1945	5	TR94304	31.00
.2025	1-1/4	6	.1945	5	TR94305	31.00
.2030	1-1/4	6	.1945	5	TR94306	31.00
.2031	13/64	6	.1945	5	TR96100	25.35
.2035	1-1/4	6	.1945	5	TR94307	30.20
.2040	1-1/4	6	.1945	5	TR96101	25.35
.2045	1-1/4	6	.2016	5	TR94308	30.20
.2050	1-1/4	6	.2016	5	TR94309	30.20
.2055	1-1/4	6	.2016	5	TR96102	25.35
.2060	1-1/4	6	.2016	5	TR94310	30.20
.2065	1-1/4	6	.2016	5	TR94311	30.20
.2070	1-1/4	6	.2016	5	TR94312	30.20
.2075	1-1/4	6	.2016	5	TR94313	30.20
.2080	1-1/4	6	.2016	5	TR94314	30.20
.2085	1-1/4	6	.2016	5	TR94315	30.20
.2090	1-1/4	6	.2016	5	TR96103	25.35
.2095	1-1/4	6	.2075	5	TR94316	30.20
.2100	1-1/4	6	.2075	5	TR94317	30.20
.2105	1-1/4	6	.2075	5	TR94318	30.20
.2110	1-1/4	6	.2075	5	TR94319	30.20
.2115	1-1/4	6	.2075	5	TR94320	30.20
.2120	1-1/4	6	.2075	5	TR94321	30.20
.2125	1-1/4	6	.2075	5	TR94322	30.20
.2130	1-1/4	6	.2075	5	TR96104	25.35
.2135	1-1/4	6	.2075	5	TR94323	30.20
.2140	1-1/4	6	.2075	5	TR94324	30.20
.2145	1-1/4	6	.2075	5	TR94325	30.20
.2150	1-1/4	6	.2075	5	TR94326	30.20
.2155	1-1/4	6	.2075	5	TR94327	30.20
.2160	1-1/4	6	.2075	5	TR94328	30.20
.2165	1-1/4	6	.2075	5	TR96105	25.35
.2170	1-1/4	6	.2075	5	TR94329	30.20
.2175	1-1/4	6	.2075	5	TR94330	30.20
.2180	1-1/4	6	.2075	5	TR94331	30.20
.2185	1-1/4	6	.2075	5	TR94332	30.20
.2188	1-1/4	6	.2075	5	TR96106	25.35
.2190	1-1/2	6	.2173	6	TR94333	30.80
.2195	1-1/2	6	.2173	6	TR94334	30.65
.2200	1-1/2	6	.2173	6	TR94335	30.80

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REAMERS - HIGH SPEED STEEL

Chucking - Straight Flute (Cont.)

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REAMER DIAMETER dec. equiv. size		FLUTE LENGTH	FLUTES	SHANK DIA.	OAL	UNCOATED	
D ₁ ^{+0.002"} -0.000"		L ₂		D ₂	L ₁	TOOL #	PRICE
.2205	#2	1-1/2	6	.2173	6	TR94336	30.80
.2210		1-1/2	6	.2173	6	TR96107	26.25
.2215		1-1/2	6	.2173	6	TR94337	30.80
.2220		1-1/2	6	.2173	6	TR94338	30.80
.2225		1-1/2	6	.2173	6	TR94339	30.65
.2230	#1	1-1/2	6	.2173	6	TR94340	30.80
.2235		1-1/2	6	.2173	6	TR94341	30.65
.2240		1-1/2	6	.2173	6	TR94342	30.80
.2245		1-1/2	6	.2173	6	TR94343	30.65
.2250		1-1/2	6	.2173	6	TR94344	30.80
.2255		1-1/2	6	.2173	6	TR94345	30.65
.2260		1-1/2	6	.2173	6	TR94346	30.80
.2265		1-1/2	6	.2173	6	TR94347	30.65
.2270		1-1/2	6	.2173	6	TR94348	30.80
.2275		1-1/2	6	.2173	6	TR94349	30.80
.2280		1-1/2	6	.2173	6	TR96108	26.25
.2285		1-1/2	6	.2265	6	TR94350	30.65
.2290		1-1/2	6	.2265	6	TR94351	30.80
.2295		1-1/2	6	.2265	6	TR94352	30.80
.2300		1-1/2	6	.2265	6	TR94353	30.80
.2305		1-1/2	6	.2265	6	TR94354	30.65
.2310		1-1/2	6	.2265	6	TR94355	30.65
.2315		1-1/2	6	.2265	6	TR94356	30.65
.2320		1-1/2	6	.2265	6	TR94357	30.80
.2325		1-1/2	6	.2265	6	TR94358	30.65
.2330		1-1/2	6	.2265	6	TR94359	30.80
.2335		1-1/2	6	.2265	6	TR94360	30.65
.2340	A	1-1/2	6	.2265	6	TR96109	26.25
.2344		1-1/2	6	.2265	6	TR96110	26.25
.2345	15/64	1-1/2	6	.2265	6	TR94361	27.70
.2350		1-1/2	6	.2265	6	TR94362	27.80
.2355	6.0 mm	1-1/2	6	.2265	6	TR94363	27.80
.2360		1-1/2	6	.2265	6	TR94364	27.80
.2362		1-1/2	6	.2265	6	TR96111	27.55
.2365		1-1/2	6	.2329	6	TR94365	27.80
.2370		1-1/2	6	.2329	6	TR94366	27.80
.2375		1-1/2	6	.2329	6	TR94367	27.80
.2380		1-1/2	6	.2329	6	TR96112	27.55
.2385		1-1/2	6	.2329	6	TR94368	27.80
.2390		1-1/2	6	.2329	6	TR94369	27.80
.2395		1-1/2	6	.2329	6	TR94370	27.80
.2400	C	1-1/2	6	.2329	6	TR94371	27.80
.2405		1-1/2	6	.2329	6	TR94372	27.80
.2410		1-1/2	6	.2329	6	TR94373	27.80
.2415		1-1/2	6	.2329	6	TR94374	27.70
.2420		1-1/2	6	.2329	6	TR96113	27.55
.2425		1-1/2	6	.2329	6	TR94375	27.80
.2430		1-1/2	6	.2329	6	TR94376	27.80
.2435		1-1/2	6	.2329	6	TR94377	27.70

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REAMERS - HIGH SPEED STEEL

Chucking - Straight Flute (Cont.)

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REAMER DIAMETER dec. equiv. size	FLUTE LENGTH	FLUTES	SHANK DIA.	OAL	UNCOATED	
D ₁ ^{+0.0002"} -0.0000"	L ₂		D ₂	L ₁	TOOL #	PRICE
.2440	1-1/2	6	.2329	6	TR94378	27.80
.2445	1-1/2	6	.2329	6	TR94379	27.80
.2450	1-1/2	6	.2329	6	TR94380	27.80
.2455	1-1/2	6	.2329	6	TR94381	27.70
.2460	1-1/2	6	.2329	6	TR96114	27.55
.2465	1-1/2	6	.2405	6	TR94382	27.80
.2470	1-1/2	6	.2405	6	TR94383	27.80
.2475	1-1/2	6	.2405	6	TR94384	27.80
.2480	1-1/2	6	.2405	6	TR94385	27.80
.2485	1-1/2	6	.2405	6	TR94386	27.80
.2490	1-1/2	6	.2405	6	TR96115	25.90
.2495	1-1/2	6	.2405	6	TR94387	27.80
.2500	1-1/2	6	.2405	6	TR96116	24.60
.2505	1-1/2	6	.2405	6	TR94388	35.30
.2510	1-1/2	6	.2405	6	TR96117	25.90
.2515	1-1/2	6	.2405	6	TR94389	35.30
.2520	1-1/2	6	.2405	6	TR94390	35.30
.2525	1-1/2	6	.2405	6	TR94391	35.30
.2530	1-1/2	6	.2405	6	TR94392	35.30
.2535	1-1/2	6	.2405	6	TR94393	35.30
.2540	1-1/2	6	.2405	6	TR94394	35.30
.2545	1-1/2	6	.2405	6	TR94395	35.30
.2550	1-1/2	6	.2405	6	TR94396	35.30
.2555	1-1/2	6	.2405	6	TR94397	35.30
.2559	1-1/2	6	.2405	6	TR96118	27.55
.2560	1-1/2	6	.2485	6	TR94398	35.30
.2565	1-1/2	6	.2485	6	TR94399	35.30
.2570	1-1/2	6	.2485	6	TR96119	27.55
.2575	1-1/2	6	.2485	6	TR94400	35.30
.2580	1-1/2	6	.2485	6	TR94401	35.30
.2585	1-1/2	6	.2485	6	TR94402	35.30
.2590	1-1/2	6	.2485	6	TR94403	35.30
.2595	1-1/2	6	.2485	6	TR94404	35.30
.2600	1-1/2	6	.2485	6	TR94405	35.30
.2605	1-1/2	6	.2485	6	TR94406	35.30
.2610	1-1/2	6	.2485	6	TR96120	27.55
.2615	1-1/2	6	.2485	6	TR94407	35.30
.2620	1-1/2	6	.2485	6	TR94408	35.30
.2625	1-1/2	6	.2485	6	TR94409	35.30
.2630	1-1/2	6	.2485	6	TR94410	35.30
.2635	1-1/2	6	.2485	6	TR94411	35.30
.2640	1-1/2	6	.2485	6	TR94412	35.30
.2645	1-1/2	6	.2485	6	TR94413	35.30
.2650	1-1/2	6	.2485	6	TR94414	35.30
.2655	1-1/2	6	.2485	6	TR94415	35.30
.2656	1-1/2	6	.2485	6	TR96121	30.60
.2660	1-1/2	6	.2485	6	TR96122	30.60
.2665	1-1/2	6	.2485	6	TR94416	35.30
.2670	1-1/2	6	.2485	6	TR94417	35.30

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REAMERS - HIGH SPEED STEEL

Chucking - Straight Flute (Cont.)

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REAMER DIAMETER dec. equiv. size		FLUTE LENGTH	FLUTES	SHANK DIA.	OAL	UNCOATED	
D ₁ ^{+0.002"} -0.000"		L ₂		D ₂	L ₁	TOOL #	PRICE
.2675		1-1/2	6	.2485	6	TR94418	35.30
.2680		1-1/2	6	.2485	6	TR94419	35.30
.2685		1-1/2	6	.2485	6	TR94420	35.30
.2690		1-1/2	6	.2485	6	TR94421	35.30
.2695		1-1/2	6	.2485	6	TR94422	35.30
.2700		1-1/2	6	.2485	6	TR94423	35.30
.2705		1-1/2	6	.2485	6	TR94424	35.30
.2710		1-1/2	6	.2485	6	TR94425	35.30
.2715		1-1/2	6	.2485	6	TR94426	35.30
.2720	I	1-1/2	6	.2485	6	TR96123	30.60
.2725		1-1/2	6	.2485	6	TR94427	35.30
.2730		1-1/2	6	.2485	6	TR94428	35.30
.2735		1-1/2	6	.2485	6	TR94429	35.30
.2740		1-1/2	6	.2485	6	TR94430	35.30
.2745		1-1/2	6	.2485	6	TR94431	35.30
.2750		1-1/2	6	.2485	6	TR94432	35.30
.2755		1-1/2	6	.2485	6	TR94433	35.30
.2756	7.0 mm	1-1/2	6	.2485	6	TR96124	30.60
.2760		1-1/2	6	.2485	6	TR94434	35.30
.2765		1-1/2	6	.2485	6	TR94435	35.30
.2770	J	1-1/2	6	.2485	6	TR96125	30.60
.2775		1-1/2	6	.2485	6	TR94436	35.30
.2780		1-1/2	6	.2485	6	TR94437	35.30
.2785		1-1/2	6	.2485	6	TR94438	35.30
.2790		1-1/2	6	.2485	6	TR94439	35.30
.2795		1-1/2	6	.2485	6	TR94440	35.30
.2800		1-1/2	6	.2485	6	TR94441	35.30
.2805		1-1/2	6	.2485	6	TR94442	35.30
.2810	K	1-1/2	6	.2485	6	TR96126	30.60
.2812	9/32	1-1/2	6	.2485	6	TR96127	29.05
.2815		1-1/2	6	.2792	6	TR94443	35.30
.2820		1-1/2	6	.2792	6	TR94444	35.30
.2825		1-1/2	6	.2792	6	TR94445	35.30
.2830		1-1/2	6	.2792	6	TR94446	35.30
.2835		1-1/2	6	.2792	6	TR94447	35.30
.2840		1-1/2	6	.2792	6	TR94448	35.30
.2845		1-1/2	6	.2792	6	TR94449	35.30
.2850		1-1/2	6	.2792	6	TR94450	35.30
.2855		1-1/2	6	.2792	6	TR94451	35.30
.2860		1-1/2	6	.2792	6	TR94452	35.30
.2865		1-1/2	6	.2792	6	TR94453	35.30
.2870		1-1/2	6	.2792	6	TR94454	35.30
.2875		1-1/2	6	.2792	6	TR94455	35.30
.2880		1-1/2	6	.2792	6	TR94456	35.30
.2885		1-1/2	6	.2792	6	TR94457	35.30
.2890		1-1/2	6	.2792	6	TR94458	35.30
.2895		1-1/2	6	.2792	6	TR94459	35.30
.2900	L	1-1/2	6	.2792	6	TR96128	30.60
.2905		1-1/2	6	.2792	6	TR94460	35.30

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REAMERS - HIGH SPEED STEEL

Chucking - Straight Flute (Cont.)

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REAMER DIAMETER dec. equiv.	size	FLUTE LENGTH	FLUTES	SHANK DIA.	OAL	UNCOATED	
$D_1 \begin{smallmatrix} +.0002'' \\ -.0000'' \end{smallmatrix}$		L ₂		D ₂	L ₁	TOOL #	PRICE
.2910		1-1/2	6	.2792	6	TR94461	35.30
.2915		1-1/2	6	.2792	6	TR94462	35.30
.2920		1-1/2	6	.2792	6	TR94463	35.30
.2925		1-1/2	6	.2792	6	TR94464	35.30
.2930		1-1/2	6	.2792	6	TR94465	35.30
.2935		1-1/2	6	.2792	6	TR94466	35.30
.2940		1-1/2	6	.2792	6	TR94467	35.30
.2945		1-1/2	6	.2792	6	TR94468	35.30
.2950	M	1-1/2	6	.2792	6	TR96129	30.60
.2953	7.5 mm	1-1/2	6	.2792	6	TR96130	30.60
.2955		1-1/2	6	.2792	6	TR94469	35.30
.2960		1-1/2	6	.2792	6	TR94470	35.30
.2965		1-1/2	6	.2792	6	TR94471	35.30
.2969	19/64	1-1/2	6	.2792	6	TR96131	30.60
.2970		1-1/2	6	.2792	6	TR94472	31.60
.2975		1-1/2	6	.2792	6	TR94473	31.60
.2980		1-1/2	6	.2792	6	TR94474	31.60
.2985		1-1/2	6	.2792	6	TR94475	31.60
.2990		1-1/2	6	.2792	6	TR94476	31.60
.2995		1-1/2	6	.2792	6	TR94477	31.60
.3000		1-1/2	6	.2792	6	TR94478	31.60
.3005		1-1/2	6	.2792	6	TR94479	31.60
.3010		1-1/2	6	.2792	6	TR94480	31.60
.3015		1-1/2	6	.2792	6	TR94481	31.60
.3020	N	1-1/2	6	.2792	6	TR96132	30.60
.3025		1-1/2	6	.2792	6	TR94482	31.60
.3030		1-1/2	6	.2792	6	TR94483	31.60
.3035		1-1/2	6	.2792	6	TR94484	31.60
.3040		1-1/2	6	.2792	6	TR94485	31.60
.3045		1-1/2	6	.2792	6	TR94486	31.60
.3050		1-1/2	6	.2792	6	TR94487	31.60
.3055		1-1/2	6	.2792	6	TR94488	31.60
.3060		1-1/2	6	.2792	6	TR94489	31.60
.3065		1-1/2	6	.2792	6	TR94490	31.60
.3070		1-1/2	6	.2792	6	TR94491	31.60
.3075		1-1/2	6	.2792	6	TR94492	31.60
.3080		1-1/2	6	.2792	6	TR94493	31.60
.3085		1-1/2	6	.2792	6	TR94494	31.60
.3090		1-1/2	6	.2792	6	TR94495	31.60
.3095		1-1/2	6	.2792	6	TR94496	31.60
.3100		1-1/2	6	.2792	6	TR94497	31.60
.3105		1-1/2	6	.2792	6	TR94498	31.60
.3110		1-1/2	6	.2792	6	TR94499	31.60
.3115	O/U	1-1/2	6	.2792	6	TR96133	29.05
.3120		1-1/2	6	.2792	6	TR94500	31.60
.3125	5/16	1-1/2	6	.2792	6	TR96134	27.65
.3130		1-1/2	6	.2792	6	TR94501	37.40
.3135	O/U	1-1/2	6	.2792	6	TR96135	29.05
.3140		1-1/2	6	.2792	6	TR94502	37.40

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REAMERS - HIGH SPEED STEEL

Chucking - Straight Flute (Cont.)

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REAMER DIAMETER dec. equiv. size		FLUTE LENGTH	FLUTES	SHANK DIA.	OAL	UNCOATED	
$D_1 \begin{smallmatrix} +.0002'' \\ -.0000'' \end{smallmatrix}$		L ₂		D ₂	L ₁	TOOL #	PRICE
.3145	8.0 mm	1-1/2	6	.2792	6	TR94503	37.40
.3150		1-1/2	6	.2792	6	TR96136	30.60
.3155		1-1/2	6	.2792	6	TR94504	37.40
.3160		1-1/2	6	.2792	6	TR96137	30.60
.3165	O	1-1/2	6	.2792	6	TR94505	37.40
.3170		1-1/2	6	.2792	6	TR94506	37.40
.3175		1-1/2	6	.2792	6	TR94507	37.40
.3180		1-1/2	6	.2792	6	TR94508	37.40
.3185		1-1/2	6	.2792	6	TR94509	37.40
.3190		1-1/2	6	.2792	6	TR94510	37.40
.3195		1-1/2	6	.2792	6	TR94511	37.25
.3200		1-1/2	6	.2792	6	TR94512	37.40
.3205		1-1/2	6	.2792	6	TR94513	37.25
.3210		1-1/2	6	.2792	6	TR94514	37.40
.3215		1-1/2	6	.2792	6	TR94515	37.25
.3220		1-1/2	6	.2792	6	TR94516	37.40
.3225	P	1-1/2	6	.2792	6	TR94517	37.40
.3230		1-1/2	6	.2792	6	TR96138	32.80
.3235		1-1/2	6	.2792	6	TR94518	37.25
.3240		1-1/2	6	.2792	6	TR94519	37.25
.3245		1-1/2	6	.2792	6	TR94520	37.25
.3250		1-1/2	6	.2792	6	TR94521	37.40
.3255		1-1/2	6	.2792	6	TR94522	37.25
.3260		1-1/2	6	.2792	6	TR94523	37.40
.3265		1-1/2	6	.2792	6	TR94524	37.40
.3270		1-1/2	6	.2792	6	TR94525	37.25
.3275		1-1/2	6	.2792	6	TR94526	37.25
.3280		1-1/2	6	.2792	6	TR94527	37.40
.3281	21/64	1-1/2	6	.2792	6	TR96139	32.80
.3285		1-1/2	6	.2792	6	TR94528	37.25
.3290		1-1/2	6	.2792	6	TR94529	37.40
.3295		1-1/2	6	.2792	6	TR94530	37.25
.3300		1-1/2	6	.2792	6	TR94531	37.25
.3305		1-1/2	6	.2792	6	TR94532	37.25
.3310		1-1/2	6	.2792	6	TR94533	37.25
.3315		1-1/2	6	.2792	6	TR94534	37.40
.3320	Q	1-1/2	6	.2792	6	TR96140	32.80
.3325		1-1/2	6	.2792	6	TR94535	37.25
.3330		1-1/2	6	.2792	6	TR94536	37.40
.3335		1-1/2	6	.2792	6	TR94537	37.25
.3340		1-1/2	6	.2792	6	TR94538	37.40
.3345		1-1/2	6	.2792	6	TR94539	37.40
.3346		1-1/2	6	.2792	6	TR96141	32.80
.3350		1-1/2	6	.2792	6	TR94540	37.40
.3355	8.5 mm	1-1/2	6	.2792	6	TR94541	37.40
.3360		1-1/2	6	.2792	6	TR94542	37.40
.3365		1-1/2	6	.2792	6	TR94543	37.25
.3370		1-1/2	6	.2792	6	TR94544	37.40
.3375		1-1/2	6	.2792	6	TR94545	37.25

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Chucking - Straight Flute (Cont.)

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REAMER DIAMETER dec. equiv.	size	FLUTE LENGTH	FLUTES	SHANK DIA.	OAL	UNCOATED	
D ₁ ^{+0.002"} -0.000"		L ₂		D ₂	L ₁	TOOL #	PRICE
.3380		1-1/2	6	.2792	6	TR94546	37.25
.3385		1-1/2	6	.2792	6	TR94547	37.25
.3390	R	1-1/2	6	.2792	6	TR96142	32.80
.3395		1-1/2	6	.2792	6	TR94548	37.25
.3400		1-1/2	6	.2792	6	TR94549	37.40
.3405		1-1/2	6	.2792	6	TR94550	37.25
.3410		1-1/2	6	.2792	6	TR94551	37.40
.3415		1-1/2	6	.2792	6	TR94552	37.25
.3420		1-1/2	6	.2792	6	TR94553	37.40
.3425		1-1/2	6	.2792	6	TR94554	37.40
.3430		1-1/2	6	.2792	6	TR94555	37.40
.3435		1-1/2	6	.2792	6	TR94556	37.40
.3438	11/32	1-1/2	6	.2792	6	TR96143	32.80
.3440		1-3/4	6	.3105	7	TR94557	37.70
.3445		1-3/4	6	.3105	7	TR94558	37.70
.3450		1-3/4	6	.3105	7	TR94559	37.70
.3455		1-3/4	6	.3105	7	TR94560	37.70
.3460		1-3/4	6	.3105	7	TR94561	37.70
.3465		1-3/4	6	.3105	7	TR94562	37.70
.3470		1-3/4	6	.3105	7	TR94563	37.70
.3475		1-3/4	6	.3105	7	TR94564	37.70
.3480	S	1-3/4	6	.3105	6	TR96144	33.30
.3485		1-3/4	6	.3105	7	TR94565	37.70
.3490		1-3/4	6	.3105	7	TR94566	37.70
.3495		1-3/4	6	.3105	7	TR94567	37.70
.3500		1-3/4	6	.3105	7	TR94568	37.70
.3505		1-3/4	6	.3105	7	TR94569	37.70
.3510		1-3/4	6	.3105	7	TR94570	37.70
.3515		1-3/4	6	.3105	7	TR94571	37.70
.3520		1-3/4	6	.3105	7	TR94572	37.70
.3525		1-3/4	6	.3105	7	TR94573	37.70
.3530		1-3/4	6	.3105	7	TR94574	37.70
.3535		1-3/4	6	.3105	7	TR94575	37.70
.3540		1-3/4	6	.3105	7	TR94576	37.70
.3543	9.0 mm	1-3/4	6	.3105	7	TR96145	33.30
.3545		1-3/4	6	.3105	7	TR94577	37.70
.3550		1-3/4	6	.3105	7	TR94578	37.70
.3555		1-3/4	6	.3105	7	TR94579	37.70
.3560		1-3/4	6	.3105	7	TR94580	37.70
.3565		1-3/4	6	.3105	7	TR94581	37.70
.3570		1-3/4	6	.3105	7	TR94582	37.70
.3575		1-3/4	6	.3105	7	TR94583	37.70
.3580	T	1-3/4	6	.3105	7	TR96146	33.30
.3585		1-3/4	6	.3105	7	TR94584	37.70
.3590		1-3/4	6	.3105	7	TR94585	37.70
.3594	23/64	1-3/4	6	.3105	7	TR96147	33.30
.3595		1-3/4	6	.3105	7	TR94586	33.80
.3600		1-3/4	6	.3105	7	TR94587	33.80
.3605		1-3/4	6	.3105	7	TR94588	33.80

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Chucking - Straight Flute (Cont.)

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REAMER DIAMETER dec. equiv. size		FLUTE LENGTH	FLUTES	SHANK DIA.	OAL	UNCOATED	
D1 $\begin{smallmatrix} +.0002" \\ -.0000" \end{smallmatrix}$		L2		D2	L1	TOOL #	PRICE
.3610		1-3/4	6	.3105	7	TR94589	33.80
.3615		1-3/4	6	.3105	7	TR94590	33.80
.3620		1-3/4	6	.3105	7	TR94591	33.80
.3625		1-3/4	6	.3105	7	TR94592	33.80
.3630		1-3/4	6	.3105	7	TR94593	33.80
.3635		1-3/4	6	.3105	7	TR94594	33.80
.3640		1-3/4	6	.3105	7	TR94595	33.80
.3645		1-3/4	6	.3105	7	TR94596	33.80
.3650		1-3/4	6	.3105	7	TR94597	33.80
.3655		1-3/4	6	.3105	7	TR94598	33.80
.3660		1-3/4	6	.3105	7	TR94599	33.80
.3665		1-3/4	6	.3105	7	TR94600	33.80
.3670		1-3/4	6	.3105	7	TR94601	33.80
.3675		1-3/4	6	.3105	7	TR94602	33.80
.3680	U	1-3/4	6	.3105	7	TR96148	33.30
.3685		1-3/4	6	.3105	7	TR94603	33.80
.3690		1-3/4	6	.3105	7	TR94604	33.80
.3695		1-3/4	6	.3105	7	TR94605	33.80
.3700		1-3/4	6	.3105	7	TR94606	33.80
.3705		1-3/4	6	.3105	7	TR94607	33.80
.3710		1-3/4	6	.3105	7	TR94608	33.80
.3715		1-3/4	6	.3105	7	TR94609	33.80
.3720		1-3/4	6	.3105	7	TR94610	33.80
.3725		1-3/4	6	.3105	7	TR94611	33.80
.3730		1-3/4	6	.3105	7	TR94612	33.80
.3735		1-3/4	6	.3105	7	TR94613	33.80
.3740	9.5 mm - O/U	1-3/4	6	.3105	7	TR96149	31.45
.3745		1-3/4	6	.3105	7	TR94614	33.80
.3750	3/8	1-3/4	6	.3105	7	TR96150	29.85
.3755		1-3/4	6	.3105	7	TR94615	40.70
.3760	O/U	1-3/4	6	.3105	7	TR96151	31.45
.3765		1-3/4	6	.3105	7	TR94616	40.70
.3770	V	1-3/4	6	.3105	7	TR96152	36.15
.3775		1-3/4	6	.3105	7	TR94617	40.70
.3780		1-3/4	6	.3105	7	TR94618	40.70
.3785		1-3/4	6	.3105	7	TR94619	40.70
.3790		1-3/4	6	.3105	7	TR94620	40.70
.3795		1-3/4	6	.3105	7	TR94621	40.70
.3800		1-3/4	6	.3105	7	TR94622	40.70
.3805		1-3/4	6	.3105	7	TR94623	40.70
.3810		1-3/4	6	.3105	7	TR94624	40.70
.3815		1-3/4	6	.3105	7	TR94625	40.70
.3820		1-3/4	6	.3105	7	TR94626	40.70
.3825		1-3/4	6	.3105	7	TR94627	40.70
.3830		1-3/4	6	.3105	7	TR94628	40.70
.3835		1-3/4	6	.3105	7	TR94629	40.70
.3840		1-3/4	6	.3105	7	TR94630	40.70
.3845		1-3/4	6	.3105	7	TR94631	40.70
.3850		1-3/4	6	.3105	7	TR94632	40.70

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Chucking - Straight Flute (Cont.)

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REAMER DIAMETER dec. equiv.	size	FLUTE LENGTH	FLUTES	SHANK DIA.	OAL	UNCOATED	
$D_1 \begin{smallmatrix} +.0002" \\ - .0000" \end{smallmatrix}$		L ₂		D ₂	L ₁	TOOL #	PRICE
.3855		1-3/4	6	.3105	7	TR94633	40.70
.3860	W	1-3/4	6	.3105	7	TR96153	36.15
.3865		1-3/4	6	.3105	7	TR94634	40.70
.3870		1-3/4	6	.3105	7	TR94635	40.70
.3875		1-3/4	6	.3105	7	TR94636	40.70
.3880		1-3/4	6	.3105	7	TR94637	40.70
.3885		1-3/4	6	.3105	7	TR94638	40.70
.3890		1-3/4	6	.3105	7	TR94639	40.70
.3895		1-3/4	6	.3105	7	TR94640	40.70
.3900		1-3/4	6	.3105	7	TR94641	40.70
.3905		1-3/4	6	.3105	7	TR94642	40.70
.3906	25/64	1-3/4	6	.3105	7	TR96154	36.15
.3910		1-3/4	6	.3105	7	TR94643	42.00
.3915		1-3/4	6	.3105	7	TR94644	42.00
.3920		1-3/4	6	.3105	7	TR94645	42.00
.3925		1-3/4	6	.3105	7	TR94646	42.00
.3930		1-3/4	6	.3105	7	TR94647	42.00
.3935		1-3/4	6	.3105	7	TR94648	42.00
.3937	10.0 mm	1-3/4	6	.3105	7	TR96155	36.15
.3940		1-3/4	6	.3105	7	TR94649	42.00
.3945		1-3/4	6	.3105	7	TR94650	42.00
.3950		1-3/4	6	.3105	7	TR94651	42.00
.3955		1-3/4	6	.3105	7	TR94652	41.80
.3960		1-3/4	6	.3105	7	TR94653	42.00
.3965		1-3/4	6	.3105	7	TR94654	41.80
.3970	X	1-3/4	6	.3105	7	TR96156	36.15
.3975		1-3/4	6	.3105	7	TR94655	41.80
.3980		1-3/4	6	.3105	7	TR94656	42.00
.3985		1-3/4	6	.3105	7	TR94657	41.80
.3990		1-3/4	6	.3105	7	TR94658	42.00
.3995		1-3/4	6	.3105	7	TR94659	41.80
.4000		1-3/4	6	.3105	7	TR94660	42.00
.4005		1-3/4	6	.3105	7	TR94661	41.80
.4010		1-3/4	6	.3105	7	TR94662	42.00
.4015		1-3/4	6	.3105	7	TR94663	41.80
.4020		1-3/4	6	.3105	7	TR94664	42.00
.4025		1-3/4	6	.3105	7	TR94665	41.80
.4030		1-3/4	6	.3105	7	TR94666	41.80
.4035		1-3/4	6	.3105	7	TR94667	41.80
.4040	Y	1-3/4	6	.3105	7	TR96157	37.50
.4045		1-3/4	6	.3105	7	TR94668	41.80
.4050		1-3/4	6	.3105	7	TR94669	42.00
.4055		1-3/4	6	.3105	7	TR94670	41.80
.4060		1-3/4	6	.3105	7	TR94671	42.00
.4062	13/32	1-3/4	6	.3105	7	TR96158	37.50
.4065		1-3/4	6	.3730	7	TR94672	42.00
.4070		1-3/4	6	.3730	7	TR94673	42.00
.4075		1-3/4	6	.3730	7	TR94674	42.00
.4080		1-3/4	6	.3730	7	TR94675	42.00

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Chucking - Straight Flute (Cont.)

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REAMER DIAMETER dec. equiv.	size	FLUTE LENGTH	FLUTES	SHANK DIA.	OAL	UNCOATED	
D ₁ ^{+0.002"} -0.000"		L ₂		D ₂	L ₁	TOOL #	PRICE
.4085		1-3/4	6	.3730	7	TR94676	42.00
.4090		1-3/4	6	.3730	7	TR94677	41.80
.4095		1-3/4	6	.3730	7	TR94678	41.80
.4100		1-3/4	6	.3730	7	TR94679	41.80
.4105		1-3/4	6	.3730	7	TR94680	41.80
.4110		1-3/4	6	.3730	7	TR94681	41.80
.4115		1-3/4	6	.3730	7	TR94682	41.80
.4120		1-3/4	6	.3730	7	TR94683	41.80
.4125		1-3/4	6	.3730	7	TR94684	42.00
.4130	Z	1-3/4	6	.3730	7	TR96159	37.50
.4134	10.5 mm	1-3/4	6	.3730	7	TR96160	37.65
.4135		1-3/4	6	.3730	7	TR94685	41.80
.4140		1-3/4	6	.3730	7	TR94686	41.80
.4145		1-3/4	6	.3730	7	TR94687	41.80
.4150		1-3/4	6	.3730	7	TR94688	42.00
.4155		1-3/4	6	.3730	7	TR94689	41.80
.4160		1-3/4	6	.3730	7	TR94690	42.00
.4165		1-3/4	6	.3730	7	TR94691	41.80
.4170		1-3/4	6	.3730	7	TR94692	42.00
.4175		1-3/4	6	.3730	7	TR94693	41.80
.4180		1-3/4	6	.3730	7	TR94694	42.00
.4185		1-3/4	6	.3730	7	TR94695	41.80
.4190		1-3/4	6	.3730	7	TR94696	41.80
.4195		1-3/4	6	.3730	7	TR94697	41.80
.4200		1-3/4	6	.3730	7	TR94698	42.00
.4205		1-3/4	6	.3730	7	TR94699	41.80
.4210		1-3/4	6	.3730	7	TR94700	41.80
.4215		1-3/4	6	.3730	7	TR94701	41.80
.4219	27/64	1-3/4	6	.3730	7	TR96161	37.50
.4220		1-3/4	6	.3730	7	TR94702	39.35
.4225		1-3/4	6	.3730	7	TR94703	39.20
.4230		1-3/4	6	.3730	7	TR94704	39.35
.4235		1-3/4	6	.3730	7	TR94705	39.20
.4240		1-3/4	6	.3730	7	TR94706	39.35
.4245		1-3/4	6	.3730	7	TR94707	39.20
.4250		1-3/4	6	.3730	7	TR94708	39.35
.4255		1-3/4	6	.3730	7	TR94709	39.20
.4260		1-3/4	6	.3730	7	TR94710	39.20
.4265		1-3/4	6	.3730	7	TR94711	39.20
.4270		1-3/4	6	.3730	7	TR94712	39.20
.4275		1-3/4	6	.3730	7	TR94713	39.20
.4280		1-3/4	6	.3730	7	TR94714	39.35
.4285		1-3/4	6	.3730	7	TR94715	39.20
.4290		1-3/4	6	.3730	7	TR94716	39.20
.4295		1-3/4	6	.3730	7	TR94717	39.20
.4300		1-3/4	6	.3730	7	TR94718	39.35
.4305		1-3/4	6	.3730	7	TR94719	39.20
.4310		1-3/4	6	.3730	7	TR94720	39.35
.4315		1-3/4	6	.3730	7	TR94721	39.20

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Chucking - Straight Flute (Cont.)

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REAMER DIAMETER dec. equiv.	size	FLUTE LENGTH	FLUTES	SHANK DIA.	OAL	UNCOATED	
$D_1 \begin{smallmatrix} +.0002" \\ -.0000" \end{smallmatrix}$		L ₂		D ₂	L ₁	TOOL #	PRICE
.4320		1-3/4	6	.3730	7	TR94722	39.35
.4325		1-3/4	6	.3730	7	TR94723	39.35
.4330		1-3/4	6	.3730	7	TR94724	39.35
.4331	11.0 mm	1-3/4	6	.3730	7	TR96162	37.50
.4335		1-3/4	6	.3730	7	TR94725	39.35
.4340		1-3/4	6	.3730	7	TR94726	39.35
.4345		1-3/4	6	.3730	7	TR94727	39.20
.4350		1-3/4	6	.3730	7	TR94728	39.35
.4355		1-3/4	6	.3730	7	TR94729	39.35
.4360		1-3/4	6	.3730	7	TR94730	39.35
.4365	O/U	1-3/4	6	.3730	7	TR96163	35.45
.4370		1-3/4	6	.3730	7	TR94731	39.35
.4375	7/16	1-3/4	6	.3730	7	TR96164	35.45
.4380		1-3/4	6	.3730	7	TR94732	44.60
.4385	O/U	1-3/4	6	.3730	7	TR96165	35.45
.4390		1-3/4	6	.3730	7	TR94733	44.60
.4395		1-3/4	6	.3730	7	TR94734	44.45
.4400		1-3/4	6	.3730	7	TR94735	44.60
.4405		1-3/4	6	.3730	7	TR94736	44.45
.4410		1-3/4	6	.3730	7	TR94737	44.60
.4415		1-3/4	6	.3730	7	TR94738	44.60
.4420		1-3/4	6	.3730	7	TR94739	44.60
.4425		1-3/4	6	.3730	7	TR94740	44.60
.4430		1-3/4	6	.3730	7	TR94741	44.60
.4435		1-3/4	6	.3730	7	TR94742	44.45
.4440		1-3/4	6	.3730	7	TR94743	44.60
.4445		1-3/4	6	.3730	7	TR94744	44.45
.4450		1-3/4	6	.3730	7	TR94745	44.60
.4455		1-3/4	6	.3730	7	TR94746	44.45
.4460		1-3/4	6	.3730	7	TR94747	44.45
.4465		1-3/4	6	.3730	7	TR94748	44.45
.4470		1-3/4	6	.3730	7	TR94749	44.45
.4475		1-3/4	6	.3730	7	TR94750	44.45
.4480		1-3/4	6	.3730	7	TR94751	44.60
.4485		1-3/4	6	.3730	7	TR94752	44.45
.4490		1-3/4	6	.3730	7	TR94753	44.45
.4495		1-3/4	6	.3730	7	TR94754	44.45
.4500		1-3/4	6	.3730	7	TR94755	44.60
.4505		1-3/4	6	.3730	7	TR94756	44.45
.4510		1-3/4	6	.3730	7	TR94757	44.45
.4515		1-3/4	6	.3730	7	TR94758	44.45
.4520		1-3/4	6	.3730	7	TR94759	44.60
.4525		1-3/4	6	.3730	7	TR94760	44.45
.4528	11.5 mm	1-3/4	6	.3730	7	TR96166	40.65
.4530		1-3/4	6	.3730	7	TR94761	44.45
.4531	29/64	1-3/4	6	.3730	7	TR96167	40.65
.4535		1-3/4	6	.3730	7	TR94762	44.45
.4540		1-3/4	6	.3730	7	TR94763	44.60
.4545		1-3/4	6	.3730	7	TR94764	44.45

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Chucking - Straight Flute (Cont.)

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REAMER DIAMETER dec. equiv.	FLUTE LENGTH	FLUTES	SHANK DIA.	OAL	UNCOATED	
D ₁ ^{+0.002"} -0.000"	L ₂		D ₂	L ₁	TOOL #	PRICE
.4550	1-3/4	6	.3730	7	TR94765	44.60
.4555	1-3/4	6	.3730	7	TR94766	44.45
.4560	1-3/4	6	.3730	7	TR94767	44.60
.4565	1-3/4	6	.3730	7	TR94768	44.45
.4570	1-3/4	6	.3730	7	TR94769	44.45
.4575	1-3/4	6	.3730	7	TR94770	44.45
.4580	1-3/4	6	.3730	7	TR94771	44.45
.4585	1-3/4	6	.3730	7	TR94772	44.45
.4590	1-3/4	6	.3730	7	TR94773	44.45
.4595	1-3/4	6	.3730	7	TR94774	44.45
.4600	1-3/4	6	.3730	7	TR94775	44.45
.4605	1-3/4	6	.3730	7	TR94776	44.45
.4610	1-3/4	6	.3730	7	TR94777	44.45
.4615	1-3/4	6	.3730	7	TR94778	44.45
.4620	1-3/4	6	.3730	7	TR94779	44.45
.4625	1-3/4	6	.3730	7	TR94780	44.45
.4630	1-3/4	6	.3730	7	TR94781	44.45
.4635	1-3/4	6	.3730	7	TR94782	44.45
.4640	1-3/4	6	.3730	7	TR94783	44.45
.4645	1-3/4	6	.3730	7	TR94784	44.45
.4650	1-3/4	6	.3730	7	TR94785	44.45
.4655	1-3/4	6	.3730	7	TR94786	44.45
.4660	1-3/4	6	.3730	7	TR94787	44.45
.4665	1-3/4	6	.3730	7	TR94788	44.45
.4670	1-3/4	6	.3730	7	TR94789	44.45
.4675	1-3/4	6	.3730	7	TR94790	44.45
.4680	1-3/4	6	.3730	7	TR94791	44.60
.4685	1-3/4	6	.3730	7	TR94792	44.45
.4688	15/32	6	.3730	7	TR96168	40.65
.4690	2	6	.4355	8	TR94793	44.60
.4695	2	6	.4355	8	TR94794	44.45
.4700	2	6	.4355	8	TR94795	44.60
.4705	2	6	.4355	8	TR94796	44.45
.4710	2	6	.4355	8	TR94797	44.60
.4715	2	6	.4355	8	TR94798	44.60
.4720	2	6	.4355	8	TR94799	44.60
.4724	12.0 mm	6	.4355	8	TR96169	40.65
.4725	2	6	.4355	8	TR94800	44.60
.4730	2	6	.4355	8	TR94801	44.60
.4735	2	6	.4355	8	TR94802	44.60
.4740	2	6	.4355	8	TR94803	44.60
.4745	2	6	.4355	8	TR94804	44.60
.4750	2	6	.4355	8	TR94805	44.60
.4755	2	6	.4355	8	TR94806	44.60
.4760	2	6	.4355	8	TR94807	44.60
.4765	2	6	.4355	8	TR94808	44.60
.4770	2	6	.4355	8	TR94809	44.45
.4775	2	6	.4355	8	TR94810	44.45
.4780	2	6	.4355	8	TR94811	44.45

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REAMERS - HIGH SPEED STEEL

Chucking - Straight Flute (Cont.)

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REAMER DIAMETER dec. equiv. size	FLUTE LENGTH	FLUTES	SHANK DIA.	OAL	UNCOATED	
D ₁ ^{+0.002"} -0.000"	L ₂		D ₂	L ₁	TOOL #	PRICE
.4785	2	6	.4355	8	TR94812	44.45
.4790	2	6	.4355	8	TR94813	44.45
.4795	2	6	.4355	8	TR94814	44.45
.4800	2	6	.4355	8	TR94815	44.45
.4805	2	6	.4355	8	TR94816	44.45
.4810	2	6	.4355	8	TR94817	44.45
.4815	2	6	.4355	8	TR94818	44.45
.4820	2	6	.4355	8	TR94819	44.60
.4825	2	6	.4355	8	TR94820	44.45
.4830	2	6	.4355	8	TR94821	44.60
.4835	2	6	.4355	8	TR94822	44.60
.4840	2	6	.4355	8	TR94823	44.45
.4844	2	6	.4355	8	TR96170	40.65
.4845	2	6	.4355	8	TR94824	41.80
.4850	2	6	.4355	8	TR94825	42.00
.4855	2	6	.4355	8	TR94826	41.80
.4860	2	6	.4355	8	TR94827	41.80
.4865	2	6	.4355	8	TR94828	41.80
.4870	2	6	.4355	8	TR94829	41.80
.4875	2	6	.4355	8	TR94830	41.80
.4880	2	6	.4355	8	TR94831	41.80
.4885	2	6	.4355	8	TR94832	41.80
.4890	2	6	.4355	8	TR94833	42.00
.4895	2	6	.4355	8	TR94834	41.80
.4900	2	6	.4355	8	TR94835	41.80
.4905	2	6	.4355	8	TR94836	41.80
.4910	2	6	.4355	8	TR94837	41.80
.4915	2	6	.4355	8	TR94838	41.80
.4920	2	6	.4355	8	TR94839	41.80
.4921	2	6	.4355	8	TR96171	40.65
.4925	2	6	.4355	8	TR94840	41.80
.4930	2	6	.4355	8	TR94841	41.80
.4935	2	6	.4355	8	TR94842	41.80
.4940	2	6	.4355	8	TR94843	41.80
.4945	2	6	.4355	8	TR94844	41.80
.4950	2	6	.4355	8	TR94845	42.00
.4955	2	6	.4355	8	TR94846	41.80
.4960	2	6	.4355	8	TR94847	42.00
.4965	2	6	.4355	8	TR94848	41.80
.4970	2	6	.4355	8	TR94849	42.00
.4975	2	6	.4355	8	TR94850	41.80
.4980	2	6	.4355	8	TR94851	42.00
.4985	2	6	.4355	8	TR94852	42.00
.4990	2	6	.4355	8	TR96172	38.60
.4995	2	6	.4355	8	TR94853	42.00
.5000	2	6	.4355	8	TR96173	38.60

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REAMERS - HIGH SPEED STEEL

Chucking - Straight Flute (Cont.)

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REAMER DIAMETER dec. equiv.	size	FLUTE LENGTH	FLUTES	SHANK DIA.	OAL	UNCOATED	
D ₁ ^{+0.003"} -0.000"		L ₂		D ₂	L ₁	TOOL #	PRICE
.5005		2	6	.4355	8	TR94854	56.20
.5010	O/U	2	6	.4355	8	TR96174	38.60
.5015		2	6	.4355	8	TR94855	56.20
.5020		2	6	.4355	8	TR94856	56.20
.5025		2	6	.4355	8	TR94857	56.20
.5030		2	6	.4355	8	TR94858	56.20
.5035		2	6	.4355	8	TR94859	56.20
.5040		2	6	.4355	8	TR94860	56.20
.5045		2	6	.4355	8	TR94861	56.20
.5050		2	6	.4355	8	TR94862	56.20
.5060		2	6	.4355	8	TR94863	56.20
.5070		2	6	.4355	8	TR94864	56.20
.5080		2	6	.4355	8	TR94865	56.20
.5090		2	6	.4355	8	TR94866	56.20
.5100		2	6	.4355	8	TR94867	56.20
.5118	13.0 mm	2	6	.4355	8	TR96175	50.45
.5156	33/64	2	6	.4355	8	TR96176	50.45
.5312	17/32	2	6	.4355	8	TR96177	47.95
.5315	13.5 mm	2	6	.4355	8	TR96178	50.45
.5469	35/64	2	8	.4355	8	TR96179	50.45
.5512	14.0 mm	2	8	.4355	8	TR96180	50.45
.5600		2	8	.4355	8	TR94868	55.00
.5605		2	8	.4355	8	TR94869	55.00
.5610		2	8	.4355	8	TR94870	55.00
.5615	O/U	2	8	.4355	8	TR96181	50.45
.5620		2	8	.4355	8	TR94871	55.00
.5625	9/16	2	8	.4355	8	TR96182	47.95
.5630		2	8	.4355	8	TR94872	63.20
.5635	O/U	2	8	.4355	8	TR96183	50.45
.5640		2	8	.4355	8	TR94873	63.20
.5645		2	8	.4355	8	TR94874	63.20
.5650		2	8	.4355	8	TR94875	63.20
.5655		2	8	.4355	8	TR94876	63.20
.5709	14.5 mm	2	8	.4355	8	TR96184	50.45
.5781	37/64	2	8	.4355	8	TR96185	50.45
.5906	15.0 mm	2	8	.4355	8	TR96186	50.45
.5938	19/32	2	8	.4355	8	TR96187	47.95
.6094	39/64	2-1/4	8	.5615	9	TR96188	59.05
.6102	15.5 mm	2-1/4	8	.5615	9	TR96189	59.05
.6220		2-1/4	8	.5615	9	TR94877	63.50
.6225		2-1/4	8	.5615	9	TR94878	63.50
.6230		2-1/4	8	.5615	9	TR94879	63.80
.6235		2-1/4	8	.5615	9	TR94880	63.80
.6240	O/U	2-1/4	8	.5615	9	TR96190	59.05
.6245		2-1/4	8	.5615	9	TR94881	63.80
.6250	5/8	2-1/4	8	.5615	9	TR96191	56.20

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Chucking - Straight Flute (Cont.)

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REAMER DIAMETER dec. equiv.	size	FLUTE LENGTH	FLUTES	SHANK DIA.	OAL	UNCOATED	
D ₁ ^{+0.001"} _{+0.004"}		L ₂		D ₂	L ₁	TOOL #	PRICE
.6255		2-1/4	8	.5615	9	TR94882	70.90
.6260	O/U	2-1/4	8	.5615	9	TR96192	60.80
.6265		2-1/4	8	.5615	9	TR94883	70.90
.6270		2-1/4	8	.5615	9	TR94884	70.90
.6275		2-1/4	8	.5615	9	TR94885	70.90
.6280		2-1/4	8	.5615	9	TR94886	70.90
.6299	16.0 mm	2-1/4	8	.5615	9	TR96193	60.80
.6300		2-1/4	8	.5615	9	TR94949	70.90
.6406	41/64	2-1/4	8	.5615	9	TR96194	60.75
.6496	16.5 mm	2-1/4	8	.5615	9	TR96195	63.40
.6562	21/32	2-1/4	8	.5615	9	TR96196	65.15
.6693	17.0 mm	2-1/4	8	.5615	9	TR96197	68.40
.6719	43/64	2-1/4	8	.5615	9	TR96198	68.40
.6845		2-1/4	8	.5615	9	TR94887	70.90
.6850		2-1/4	8	.5615	9	TR94888	70.90
.6855		2-1/4	8	.5615	9	TR94889	70.90
.6860		2-1/4	8	.5615	9	TR94890	70.90
.6865	O/U	2-1/4	8	.5615	9	TR96199	68.35
.6870		2-1/4	8	.5615	9	TR94891	70.90
.6875	11/16	2-1/4	8	.5615	9	TR96200	65.35
.6880		2-1/4	8	.5615	9	TR94892	78.15
.6885	O/U	2-1/4	8	.5615	9	TR96201	73.50
.6890	17.5 mm	2-1/4	8	.5615	9	TR96202	73.50
.6895		2-1/4	8	.5615	9	TR94893	78.15
.6900		2-1/4	8	.5615	9	TR94894	78.15
.6905		2-1/4	8	.5615	9	TR94895	78.15
.7031	45/64	2-1/4	8	.5615	9	TR96203	73.40
.7087	18.0 mm	2-1/4	8	.5615	9	TR96204	73.40
.7188	23/32	2-1/4	8	.5615	9	TR96205	73.00
.7283	18.5 mm	2-1/2	8	.6240	9-1/2	TR96206	76.15
.7344	47/64	2-1/2	8	.6240	9-1/2	TR96207	84.95
.7470		2-1/2	8	.6240	9-1/2	TR94896	83.10
.7475		2-1/2	8	.6240	9-1/2	TR94897	83.45
.7480	19.0 mm	2-1/2	8	.6240	9-1/2	TR96208	84.85
.7485		2-1/2	8	.6240	9-1/2	TR94898	83.45
.7490	O/U	2-1/2	8	.6240	9-1/2	TR96209	84.85
.7495		2-1/2	8	.6240	9-1/2	TR94899	83.45
.7500	3/4	2-1/2	8	.6240	9-1/2	TR96210	72.85
.7505		2-1/2	8	.6240	9-1/2	TR94900	90.15
.7510	O/U	2-1/2	8	.6240	9-1/2	TR96211	81.20
.7515		2-1/2	8	.6240	9-1/2	TR94901	90.15
.7520		2-1/2	8	.6240	9-1/2	TR94902	90.15
.7525		2-1/2	8	.6240	9-1/2	TR94903	90.15
.7530		2-1/2	8	.6240	9-1/2	TR94904	90.15
.7540		2-1/2	8	.6240	9-1/2	TR94905	90.15
.7550		2-1/2	8	.6240	9-1/2	TR94906	90.15
.7656	49/64	2-1/2	8	.6240	9-1/2	TR96212	81.10
.7677	19.5 mm	2-1/2	8	.6240	9-1/2	TR96213	81.10
.7812	25/32	2-1/2	8	.6240	9-1/2	TR96214	79.00
.7874	20.0 mm	2-1/2	8	.6240	9-1/2	TR96215	86.80

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Chucking - Straight Flute (Cont.)

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REAMER DIAMETER dec. equiv. size		FLUTE LENGTH	FLUTES	SHANK DIA.	OAL	UNCOATED	
D ₁ ^{+0.001"} _{+0.004"}		L ₂		D ₂	L ₁	TOOL #	PRICE
.7969	51/64	2-1/2	8	.6240	9-1/2	TR96216	86.80
.8071	20.5 mm	2-1/2	8	.6240	9-1/2	TR96217	86.75
.8095		2-1/2	8	.6240	9-1/2	TR94907	90.15
.8100		2-1/2	8	.6240	9-1/2	TR94908	90.15
.8105		2-1/2	8	.6240	9-1/2	TR94909	90.15
.8110		2-1/2	8	.6240	9-1/2	TR94910	90.15
.8115	O/U	2-1/2	8	.6240	9-1/2	TR96218	86.75
.8120		2-1/2	8	.6240	9-1/2	TR94911	90.15
.8125	13/16	2-1/2	8	.6240	9-1/2	TR96219	78.80
.8130		2-1/2	8	.6240	9-1/2	TR94912	99.30
.8135	O/U	2-1/2	8	.6240	9-1/2	TR96220	86.75
.8140		2-1/2	8	.6240	9-1/2	TR94913	99.70
.8145		2-1/2	8	.6240	9-1/2	TR94914	99.30
.8150		2-1/2	8	.6240	9-1/2	TR94915	99.30
.8155		2-1/2	8	.6240	9-1/2	TR94916	99.30
.8268	21.0 mm	2-1/2	8	.6240	9-1/2	TR96221	87.10
.8281	53/64	2-1/2	8	.6240	9-1/2	TR96222	86.70
.8438	27/32	2-1/2	8	.6240	9-1/2	TR96223	92.95
.8465	21.5 mm	2-5/8	8	.7490	10	TR96224	101.20
.8594	55/64	2-5/8	8	.7490	10	TR96225	101.20
.8661	22.0 mm	2-5/8	8	.7490	10	TR96226	101.65
.8720		2-5/8	8	.6240	10	TR94917	101.90
.8725		2-5/8	8	.6240	10	TR94918	101.90
.8730		2-5/8	8	.6240	10	TR94919	101.90
.8735		2-5/8	8	.6240	10	TR94920	101.90
.8740	O/U	2-5/8	8	.7490	10	TR96227	101.10
.8745		2-5/8	8	.7490	10	TR94921	102.35
.8750	7/8	2-5/8	8	.7490	10	TR96228	94.95
.8755		2-5/8	8	.7490	10	TR94922	111.50
.8760	O/U	2-5/8	8	.7490	10	TR96229	103.45
.8765		2-5/8	8	.7490	10	TR94923	111.50
.8770		2-5/8	8	.7490	10	TR94924	111.50
.8775		2-5/8	8	.7490	10	TR94925	111.00
.8780		2-5/8	8	.7490	10	TR94926	111.50
.8858	22.5 mm	2-5/8	8	.7490	10	TR96230	103.20
.8906	57/64	2-5/8	8	.7490	10	TR96231	103.20
.9055	23.0 mm	2-5/8	8	.7490	10	TR96232	103.20
.9062	29/32	2-5/8	8	.7490	10	TR96233	102.80
.9219	59/64	2-5/8	8	.7490	10	TR96234	110.65
.9252	23.5 mm	2-5/8	8	.7490	10	TR96235	110.65
.9340		2-5/8	8	.7490	10	TR94927	111.00
.9345		2-5/8	8	.7490	10	TR94928	111.00
.9350		2-5/8	8	.7490	10	TR94929	111.00
.9355		2-5/8	8	.7490	10	TR94930	111.00
.9360		2-5/8	8	.7490	10	TR94931	111.00
.9365	O/U	2-5/8	8	.7490	10	TR96236	110.50
.9370		2-5/8	8	.7490	10	TR94932	111.00
.9375	15/16	2-5/8	8	.7490	10	TR96237	102.60
.9380		2-5/8	8	.7490	10	TR94933	121.85

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REAMER DIAMETER dec. equiv. size		FLUTE LENGTH	FLUTES	SHANK DIA.	OAL	UNCOATED	
D ₁ ^{+0.001"} _{+0.004"}		L ₂		D ₂	L ₁	TOOL #	PRICE
.9385	O/U	2-5/8	8	.7490	10	TR96238	110.50
.9390		2-5/8	8	.7490	10	TR94934	121.85
.9395		2-5/8	8	.7490	10	TR94935	121.85
.9400		2-5/8	8	.7490	10	TR94936	121.85
.9405		2-5/8	8	.7490	10	TR94937	121.85
.9449	24.0 mm	2-5/8	8	.7490	10	TR96239	110.50
.9531	61/64	2-5/8	8	.7490	10	TR96240	110.50
.9646	24.5 mm	2-5/8	8	.7490	10	TR96241	110.35
.9688	31/32	2-5/8	8	.7490	10	TR96242	120.25
.9843	25.0 mm	2-3/4	8	.8740	10-1/2	TR96243	117.05
.9844	63/64	2-3/4	8	.8740	10-1/2	TR96244	117.05
.9970		2-3/4	8	.8740	10-1/2	TR94938	124.15
.9975		2-3/4	8	.8740	10-1/2	TR94939	124.15
.9980		2-3/4	8	.8740	10-1/2	TR94940	124.80
.9985		2-3/4	8	.8740	10-1/2	TR94941	124.15
.9990	O/U	2-3/4	8	.8740	10-1/2	TR96245	117.05
.9995		2-3/4	8	.8740	10-1/2	TR94942	124.15
1.0000	1	2-3/4	8	.8740	10-1/2	TR96246	116.05
1.0005		2-3/4	8	.8740	10-1/2	TR94943	172.50
1.001	O/U	2-3/4	8	.8740	10-1/2	TR96247	124.30
1.0015		2-3/4	8	.8740	10-1/2	TR94944	172.50
1.0020		2-3/4	8	.8740	10-1/2	TR94945	172.50
1.0025		2-3/4	8	.8740	10-1/2	TR94946	172.50
1.0030		2-3/4	8	.8740	10-1/2	TR94947	172.50
1.0312	1-1/32	2-3/4	8	.8740	10-1/2	TR96248	162.30
1.0625	1-1/16	2-3/4	8	.8740	10-1/2	TR96249	127.90
1.0938	1-3/32	2-7/8	8	.8740	11	TR96250	169.25
1.1250	1-1/8	2-7/8	8	.8740	11	TR96251	135.65
1.1562	1-5/32	2-7/8	10	.9990	11	TR96252	192.75
1.1875	1-3/16	2-7/8	10	.9990	11	TR96253	159.60
1.2188	1-7/32	3	10	.9990	11-1/2	TR96254	201.90
1.2500	1-1/4	3	10	.9990	11-1/2	TR96255	168.90
1.2812	1-9/32	3	10	.9990	11-1/2	TR96256	230.20
1.3125	1-5/16	3	10	.9990	11-1/2	TR96257	196.40
1.3438	1-11/32	3-1/4	10	.9990	12	TR96258	238.30
1.3750	1-3/8	3-1/4	10	.9990	12	TR96259	206.90
1.4062	1-13/32	3-1/4	10	1.2490	12	TR96260	253.80
1.4375	1-7/16	3-1/4	10	1.2490	12	TR96261	220.35
1.4688	1-15/32	3-1/2	10	1.2490	12-1/2	TR96262	270.70
1.5000	1-1/2	3-1/2	10	1.2490	12-1/2	TR96263	238.00
D ₁ ^{+0.002"} _{+0.006"}		L ₂		D ₂	L ₁	TOOL #	PRICE
1.5625	1-9/16	3-1/2	12	1.2490	13	TR96910	340.35
1.6250	1-5/8	3-1/2	12	1.2490	13	TR96911	340.35
1.6875	1-11/16	4	12	1.2490	13-1/2	TR96912	390.75
1.7500	1-3/4	4	12	1.2490	13-1/2	TR96913	425.60
1.8125	1-13/16	4	12	1.4990	14	TR96914	489.90
1.8750	1-7/8	4	12	1.4990	14	TR96915	450.15
1.9375	1-15/16	4	12	1.4990	14	TR96916	527.85
2.0000	2	4	12	1.4990	14	TR96917	574.45

For technical information, see page 295

REAMERS - HIGH SPEED STEEL

Chucking - Straight Flute - Quickturn Custom Diameter Reamer Program



- Uncommon reamer diameters are ground to order for your precise application need
- Additional dimensions will vary depending on diameter selected
- Call for current production lead times
- Pricing is based on quantity ordered, use chart for instant pricing model based on quantity
- Straight flute general purpose reamers for through and blind hole applications
- 45° chamfer angle
- Flute options from 2 to 12
- High speed steel
- Precision manufactured in the USA

DIA. RANGE* D ₁	1 PIECE	2 PIECES	3 - 5 PIECES	6 - 7 PIECES	8 - 11 PIECES	12 - 17 PIECES	18 - 23 PIECES	24 - 35 PIECES	36 - 47 PIECES	48 - 59 PIECES	60 - 71 PIECES	72 - 95 PIECES	96+ PIECES
.0135 - .0195	152.10	99.40	74.05	48.85	44.15	37.50	33.90	31.60	30.75	28.20	27.35	27.00	26.35
.0196 - .0290	138.30	90.35	67.35	44.45	40.10	35.20	30.85	28.75	26.65	25.60	25.45	25.45	25.35
.0291 - .0390	125.70	82.00	61.20	40.40	36.45	31.95	28.10	26.15	24.20	23.25	22.60	22.30	21.75
.0391 - .0624	113.65	75.65	61.20	38.90	35.05	30.40	26.70	24.85	22.95	21.50	21.20	21.10	21.00
.0626 - .1093	119.60	76.55	59.05	36.80	32.30	26.70	24.20	22.30	20.40	19.30	18.75	18.45	17.85
.1095 - .1249	118.05	74.95	55.55	32.15	28.25	25.80	21.20	19.30	19.05	18.65	18.35	18.00	17.90
.1251 - .1405	125.70	82.00	55.35	40.40	38.00	31.95	28.10	26.15	24.20	23.25	22.70	22.30	21.50
.1407 - .1561	123.80	80.65	61.25	39.10	35.05	30.65	26.70	24.85	23.50	22.95	22.40	21.90	21.30
.1563 - .1718	125.70	78.45	60.95	40.40	36.55	31.95	28.10	26.15	24.20	23.80	23.50	23.25	22.80
.1720 - .1874	120.60	75.25	60.90	37.60	33.75	30.20	26.55	24.55	24.25	23.95	23.60	23.00	22.70
.1876 - .2030	129.10	86.00	67.45	45.15	41.35	36.75	32.85	30.95	28.85	27.35	27.00	26.55	26.35
.2032 - .2187	129.10	86.00	66.80	45.90	40.65	35.95	32.05	30.20	28.25	26.55	26.25	25.85	25.75
.2189 - .2343	129.60	86.65	67.30	45.05	41.15	36.55	32.65	30.70	28.80	27.60	27.25	27.05	26.70
.2345 - .2499	129.60	86.65	64.10	41.75	37.90	33.45	29.65	27.65	25.60	25.50	25.20	24.85	24.75
.2501 - .2968	134.55	91.55	72.10	49.80	46.00	41.10	37.25	35.30	33.30	31.55	31.25	30.95	30.65
.2970 - .3124	130.85	87.75	68.35	46.00	42.15	37.50	33.55	31.60	31.50	31.20	31.05	30.80	30.65
.3126 - .3437	137.45	93.70	74.20	48.00	46.60	43.00	39.25	37.25	35.15	33.60	33.30	33.05	32.75
.3439 - .3593	137.25	94.25	74.80	52.45	48.55	45.60	39.25	37.75	35.85	34.15	33.75	33.50	33.30
.3595 - .3749	133.35	90.15	70.75	48.35	44.45	39.75	35.95	33.80	33.65	33.60	33.40	33.25	33.15
.3751 - .3905	139.55	96.55	77.20	54.75	50.90	46.65	42.65	40.70	38.85	36.80	36.55	36.30	35.95
.3907 - .4218	141.30	98.20	78.70	56.40	52.60	47.55	43.65	41.75	39.80	38.05	37.70	37.50	37.40
.4220 - .4374	138.65	95.60	76.05	53.85	50.05	45.05	41.10	39.20	38.85	38.70	38.55	37.75	37.35
.4376 - .4843	145.05	101.90	82.50	60.20	56.35	51.10	45.35	44.45	43.45	42.10	41.75	41.35	40.90
.4845 - .4999	141.60	98.60	79.15	56.75	52.95	47.70	41.85	41.75	41.45	41.30	40.90	40.80	40.65
.5001 - .5311	205.55	127.70	101.75	75.70	69.30	62.75	58.50	56.20	54.05	53.05	52.30	51.95	51.45
.5313 - .5624	204.35	126.45	100.55	74.50	68.10	61.55	57.30	55.00	52.85	51.80	51.10	50.65	50.45
.5626 - .5937	212.50	134.50	108.55	82.50	77.55	69.60	67.30	63.20	60.90	59.90	59.20	58.80	58.15
.5939 - .6249	212.75	134.80	108.75	82.75	76.35	69.90	65.50	63.50	61.10	60.15	59.40	59.05	58.80
.6251 - .6874	220.30	142.40	116.45	90.40	83.95	80.55	73.10	70.90	68.80	67.70	67.05	66.65	66.40
.6876 - .7187	227.50	149.60	123.60	97.30	90.90	84.60	80.30	78.15	76.05	74.95	74.20	73.65	73.25
.7189 - .7499	230.35	152.45	126.60	100.50	94.15	87.55	83.15	83.10	83.00	82.95	82.55	82.40	82.15
.7501 - .8124	239.45	161.55	135.70	109.60	103.15	96.65	92.35	90.15	88.05	86.95	86.30	85.75	85.20
.8126 - .8437	248.60	170.65	144.80	118.75	112.25	105.85	101.45	99.30	97.20	96.00	95.35	94.90	94.40
.8439 - .8749	250.90	173.00	146.95	120.95	114.55	108.00	103.60	101.85	100.90	98.20	97.50	97.05	95.30
.8751 - .9374	260.35	182.35	156.45	130.40	123.95	117.60	113.10	111.00	108.85	108.55	108.40	108.15	107.95
.9376 - .9687	271.15	192.05	167.25	141.30	134.85	128.35	123.95	121.85	119.75	118.65	117.85	117.65	116.95
.9689 - .9999	273.35	195.45	169.55	143.45	137.10	130.55	126.30	124.20	121.90	120.90	120.15	119.75	119.20
1.0001 - 1.0624	293.40	219.15	211.40	203.65	195.85	188.05	180.25	172.45	164.70	163.70	159.95	158.65	157.30
1.0626 - 1.1249	309.85	236.00	227.50	218.90	210.35	201.75	193.30	184.80	176.25	167.75	166.95	166.10	165.15
1.1251 - 1.1874	330.85	258.10	249.20	240.80	232.25	223.80	215.55	206.85	199.95	189.90	181.35	172.95	164.45
1.1876 - 1.2499	349.25	275.45	266.20	257.05	247.90	238.70	229.55	220.30	211.15	202.05	192.85	183.65	174.50
1.2501 - 1.3749	397.35	320.00	310.00	300.20	290.50	279.25	271.00	261.25	251.45	241.70	239.15	236.70	234.65
1.3751 - 1.4999	439.50	364.70	353.80	342.90	332.05	321.15	310.25	299.35	288.55	277.60	274.65	270.60	266.00

*Diameter tolerances: 0-1/2" (+.0002"/-.0000"); 1/2"-5/8" (+.0003"/-.0000"); and 5/8" up to 1-1/2" (+.0001"/+.0004")

For technical information, see page 295

REAMERS - HIGH SPEED STEEL

Chucking - Right Hand Spiral



- General purpose reamers featuring a 45° chamfer angle
- Flute options from 4 to 12
- Spiral flutes for increased chip evacuation in blind hole applications
- High speed steel
- Precision manufactured in the USA

REAMER DIAMETER dec. equiv. size		FLUTE LENGTH	FLUTES	SHANK DIA.	OAL	UNCOATED	
$D_1 \begin{smallmatrix} +.0002" \\ -.0000" \end{smallmatrix}$		L2		D2	L1	TOOL #	PRICE
.0394	1.0 mm	1/2	4	.0394	2-1/2	TR96550	24.45
.0400	#60	1/2	4	.0390	2-1/2	TR96551	24.45
.0410	#59	1/2	4	.0390	2-1/2	TR96552	24.45
.0420	#58	1/2	4	.0390	2-1/2	TR96553	24.45
.0430	#57	1/2	4	.0390	2-1/2	TR96554	24.45
.0465	#56	1/2	4	.0455	2-1/2	TR96555	24.45
.0469	3/64	1/2	4	.0455	2-1/2	TR96556	24.45
.0520	#55	1/2	4	.0510	2-1/2	TR96557	24.45
.0550	#54	1/2	4	.0510	2-1/2	TR96558	24.45
.0591	1.5 mm	1/2	4	.0510	2-1/2	TR96559	24.45
.0595	#53	1/2	4	.0585	2-1/2	TR96560	24.45
.0625	1/16	1/2	4	.0585	2-1/2	TR96561	24.45
.0635	#52	1/2	4	.0585	2-1/2	TR96562	24.45
.0670	#51	3/4	4	.0660	3	TR96563	19.70
.0700	#50	3/4	4	.0660	3	TR96564	19.65
.0730	#49	3/4	4	.0660	3	TR96565	19.70
.0760	#48	3/4	4	.0720	3	TR96566	19.65
.0781	5/64	3/4	4	.0720	3	TR96567	19.70
.0785	#47	3/4	4	.0720	3	TR96568	19.65
.0787	2.0 mm	3/4	4	.0720	3	TR96569	19.70
.0810	#46	3/4	4	.0771	3	TR96570	19.65
.0820	#45	3/4	4	.0771	3	TR96571	19.65
.0860	#44	3/4	4	.0810	3	TR96572	19.65
.0890	#43	3/4	4	.0810	3	TR96573	19.70
.0935	#42	3/4	4	.0880	3	TR96574	19.65
.0938	3/32	3/4	4	.0880	3	TR96575	19.55
.0960	#41	7/8	4	.0928	3-1/2	TR96576	19.75
.0980	#40	7/8	4	.0928	3-1/2	TR96577	19.75
.0984	2.5 mm	7/8	4	.0928	3-1/2	TR96578	19.75
.0995	#39	7/8	4	.0928	3-1/2	TR96579	19.75
.1015	#38	7/8	4	.0950	3-1/2	TR96580	19.75
.1040	#37	7/8	4	.0950	3-1/2	TR96581	19.75
.1065	#36	7/8	4	.1030	3-1/2	TR96582	19.75
.1094	7/64	7/8	4	.1030	3-1/2	TR96583	20.55
.1100	#35	7/8	4	.1030	3-1/2	TR96584	20.45
.1110	#34	7/8	4	.1055	3-1/2	TR96585	20.45
.1130	#33	7/8	4	.1055	3-1/2	TR96586	20.45
.1160	#32	7/8	4	.1120	3-1/2	TR96587	20.55
.1181	3.0 mm	7/8	4	.1120	3-1/2	TR96588	20.55
.1200	#31	7/8	4	.1120	3-1/2	TR96589	20.55

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For technical information, see page 295

REAMERS - HIGH SPEED STEEL

Chucking - Right Hand Spiral (Cont.)

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REAMER DIAMETER dec. equiv. size		FLUTE LENGTH	FLUTES	SHANK DIA.	OAL	UNCOATED	
$D_1 \begin{smallmatrix} +.0002" \\ -.0000" \end{smallmatrix}$		L ₂		D ₂	L ₁	TOOL #	PRICE
.1240	O/U	7/8	4	.1190	3-1/2	TR96590	20.55
.1250	1/8	7/8	4	.1190	3-1/2	TR96591	18.40
.1260	O/U	7/8	4	.1190	3-1/2	TR96592	20.55
.1285	#30	7/8	4	.1190	3-1/2	TR96593	20.55
.1360	#29	1	4	.1275	4	TR96594	24.45
.1378	3.5 mm	1	4	.1350	4	TR96595	24.45
.1405	#28	1	4	.1350	4	TR96596	24.45
.1406	9/64	1	4	.1350	4	TR96597	24.45
.1440	#27	1	4	.1350	4	TR96598	24.45
.1470	#26	1	4	.1430	4	TR96599	24.45
.1495	#25	1	4	.1430	4	TR96600	24.45
.1520	#24	1	4	.1460	4	TR96601	25.40
.1540	#23	1	4	.1460	4	TR96602	25.40
.1563	5/32	1	4	.1510	4	TR96603	25.50
.1570	#22	1	6	.1510	4	TR96604	25.40
.1575	4.0 mm	1	6	.1510	4	TR96605	25.50
.1590	#21	1-1/8	6	.1530	4-1/2	TR96606	26.10
.1610	#20	1-1/8	6	.1530	4-1/2	TR96607	26.10
.1660	#19	1-1/8	6	.1595	4-1/2	TR96608	26.10
.1695	#18	1-1/8	6	.1595	4-1/2	TR96609	26.10
.1719	11/64	1-1/8	6	.1645	4-1/2	TR96610	26.10
.1730	#17	1-1/8	6	.1645	4-1/2	TR96611	26.10
.1770	#16	1-1/8	6	.1704	4-1/2	TR96612	26.10
.1772	4.5 mm	1-1/8	6	.1704	4-1/2	TR96613	26.10
.1800	#15	1-1/8	6	.1755	4-1/2	TR96614	26.10
.1820	#14	1-1/8	6	.1755	4-1/2	TR96615	26.10
.1850	#13	1-1/8	6	.1805	4-1/2	TR96616	26.10
.1865	O/U	1-1/8	6	.1805	4-1/2	TR96617	26.10
.1875	3/16	1-1/8	6	.1805	4-1/2	TR96618	24.75
.1885	O/U	1-1/8	6	.1805	4-1/2	TR96619	26.10
.1890	#12	1-1/8	6	.1805	4-1/2	TR96620	26.10
.1910	#11	1-1/4	6	.1860	5	TR96621	29.25
.1935	#10	1-1/4	6	.1860	5	TR96622	29.25
.1960	#9	1-1/4	6	.1895	5	TR96623	29.25
.1969	5.0 mm	1-1/4	6	.1895	5	TR96624	29.25
.1990	#8	1-1/4	6	.1895	5	TR96625	29.25
.2010	#7	1-1/4	6	.1895	5	TR96626	29.25
.2031	13/64	1-1/4	6	.1945	5	TR96627	29.25
.2040	#6	1-1/4	6	.1945	5	TR96628	29.25
.2055	#5	1-1/4	6	.2016	5	TR96629	29.25
.2090	#4	1-1/4	6	.2016	5	TR96630	29.25
.2130	#3	1-1/4	6	.2075	5	TR96631	29.25
.2165	5.5 mm	1-1/4	6	.2075	5	TR96632	29.25
.2188	7/32	1-1/4	6	.2075	5	TR96633	29.25
.2210	#2	1-1/2	6	.2173	6	TR96634	30.05
.2280	#1	1-1/2	6	.2173	6	TR96635	30.05
.2340	A	1-1/2	6	.2265	6	TR96636	30.05
.2344	15/64	1-1/2	6	.2265	6	TR96637	30.05
.2362	6.0 mm	1-1/2	6	.2265	6	TR96638	30.35
.2380	B	1-1/2	6	.2329	6	TR96639	30.35

For technical information, see page 295

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REAMERS - HIGH SPEED STEEL

Chucking - Right Hand Spiral (Cont.)

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REAMER DIAMETER dec. equiv. size		FLUTE LENGTH	FLUTES	SHANK DIA.	OAL	UNCOATED	
D ₁ ^{+0.0002"} _{-0.0000"}		L ₂		D ₂	L ₁	TOOL #	PRICE
.2420	C	1-1/2	6	.2329	6	TR96640	30.25
.2460	D	1-1/2	6	.2329	6	TR96641	30.35
.2490	O/U	1-1/2	6	.2405	6	TR96642	32.40
.2500	1/4	1-1/2	6	.2405	6	TR96643	27.05
.2510	O/U	1-1/2	6	.2405	6	TR96644	32.40
.2559	6.5 mm	1-1/2	6	.2405	6	TR96645	30.25
.2570	F	1-1/2	6	.2485	6	TR96646	30.35
.2610	G	1-1/2	6	.2485	6	TR96647	30.25
.2656	17/64	1-1/2	6	.2485	6	TR96648	33.70
.2660	H	1-1/2	6	.2485	6	TR96649	33.70
.2720	I	1-1/2	6	.2485	6	TR96650	33.70
.2756	7.0 mm	1-1/2	6	.2485	6	TR96651	33.70
.2770	J	1-1/2	6	.2485	6	TR96652	33.70
.2810	K	1-1/2	6	.2485	6	TR96653	33.70
.2813	9/32	1-1/2	6	.2485	6	TR96654	31.95
.2900	L	1-1/2	6	.2792	6	TR96655	33.70
.2950	M	1-1/2	6	.2792	6	TR96656	33.70
.2953	7.5 mm	1-1/2	6	.2792	6	TR96657	33.70
.2969	19/64	1-1/2	6	.2792	6	TR96658	33.70
.3020	N	1-1/2	6	.2792	6	TR96659	33.70
.3115	O/U	1-1/2	6	.2792	6	TR96660	31.95
.3125	5/16	1-1/2	6	.2792	6	TR96661	30.45
.3135	O/U	1-1/2	6	.2792	6	TR96662	31.95
.3150	8.0 mm	1-1/2	6	.2792	6	TR96663	33.70
.3160	O	1-1/2	6	.2792	6	TR96664	33.70
.3230	P	1-1/2	6	.2792	6	TR96665	36.00
.3281	21/64	1-1/2	6	.2792	6	TR96666	36.00
.3320	Q	1-1/2	6	.2792	6	TR96667	36.00
.3346	8.5 mm	1-1/2	6	.2792	6	TR96668	36.00
.3390	R	1-1/2	6	.2792	6	TR96669	36.00
.3438	11/32	1-1/2	6	.2792	6	TR96670	36.00
.3480	S	1-3/4	6	.3105	6	TR96671	36.45
.3543	9.0 mm	1-3/4	6	.3105	7	TR96672	36.45
.3580	T	1-3/4	6	.3105	7	TR96673	36.45
.3594	23/64	1-3/4	6	.3105	7	TR96674	36.60
.3680	U	1-3/4	6	.3105	7	TR96675	36.45
.3740	9.5 mm-O/U	1-3/4	6	.3105	7	TR96676	34.60
.3750	3/8	1-3/4	6	.3105	7	TR96677	32.80
.3760	O/U	1-3/4	6	.3105	7	TR96678	34.60
.3770	V	1-3/4	6	.3105	7	TR96679	39.55
.3860	W	1-3/4	6	.3105	7	TR96680	39.55
.3906	25/64	1-3/4	6	.3105	7	TR96681	39.55
.3937	10.0 mm	1-3/4	6	.3105	7	TR96682	39.55
.3970	X	1-3/4	6	.3105	7	TR96683	39.55
.4040	Y	1-3/4	6	.3105	7	TR96684	41.05
.4063	13/32	1-3/4	6	.3105	7	TR96685	41.05
.4130	Z	1-3/4	6	.3730	7	TR96686	41.05
.4134	10.5 mm	1-3/4	6	.3730	7	TR96687	41.05
.4219	27/64	1-3/4	6	.3730	7	TR96688	41.25
.4331	11.0 mm	1-3/4	6	.3730	7	TR96689	41.05

For technical information, see page 295

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REAMERS - HIGH SPEED STEEL

Chucking - Right Hand Spiral (Cont.)

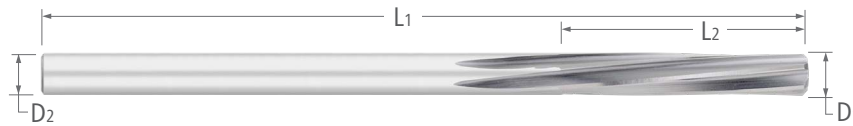
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REAMER DIAMETER dec. equiv. size		FLUTE LENGTH	FLUTES	SHANK DIA.	OAL	UNCOATED	
$D_1 \begin{smallmatrix} +.0002'' \\ -.0000'' \end{smallmatrix}$		L ₂		D ₂	L ₁	TOOL #	PRICE
.4365	O/U	1-3/4	6	.3730	7	TR96690	41.25
.4375	7/16	1-3/4	6	.3730	7	TR96691	39.20
.4385	O/U	1-3/4	6	.3730	7	TR96692	41.05
.4528	11.5 mm	1-3/4	6	.3730	7	TR96693	44.75
.4531	29/64	1-3/4	6	.3730	7	TR96694	44.95
.4688	15/32	1-3/4	6	.3730	7	TR96695	44.95
.4724	12.0 mm	2	6	.4355	8	TR96696	44.75
.4844	31/64	2	6	.4355	8	TR96697	44.75
.4921	12.5 mm	2	6	.4355	8	TR96698	44.75
.4990	O/U	2	6	.4355	8	TR96699	44.95
.5000	1/2	2	6	.4355	8	TR96700	42.45
$D_1 \begin{smallmatrix} +.0003'' \\ -.0000'' \end{smallmatrix}$		L ₂		D ₂	L ₁	TOOL #	PRICE
.5010	O/U	2	6	.4355	8	TR96701	44.95
.5313	17/32	2	6	.4355	8	TR96702	52.80
.5625	9/16	2	8	.4355	8	TR96703	52.80
.5938	19/32	2	8	.4355	8	TR96704	52.80
.6250	5/8	2-1/4	8	.5615	9	TR96705	61.90
$D_1 \begin{smallmatrix} +.0001'' \\ -.0004'' \end{smallmatrix}$		L ₂		D ₂	L ₁	TOOL #	PRICE
.6562	21/32	2-1/4	8	.5615	9	TR96706	66.75
.6875	11/16	2-1/4	8	.5615	9	TR96707	71.75
.7188	23/32	2-1/4	8	.5615	9	TR96708	84.05
.7500	3/4	2-1/2	8	.6240	9-1/2	TR96709	79.85
.7812	25/32	2-1/2	8	.6240	9-1/2	TR96710	86.55
.8125	13/16	2-1/2	8	.6240	9-1/2	TR96711	86.45
.8438	27/32	2-1/2	8	.6240	9-1/2	TR96712	107.45
.8750	7/8	2-5/8	8	.7490	10	TR96713	102.05
.9062	29/32	2-5/8	8	.7490	10	TR96714	118.35
.9375	15/16	2-5/8	8	.7490	10	TR96715	112.65
.9688	31/32	2-5/8	8	.7490	10	TR96716	126.25
1.0000	1	2-3/4	8	.8740	10-1/2	TR96717	127.85
1.0625	1-1/16	2-3/4	8	.8740	10-1/2	TR96718	141.05
1.1250	1-1/8	2-7/8	8	.8740	11	TR96719	149.60
1.1875	1-3/16	2-7/8	10	.9990	11	TR96720	175.15
1.2500	1-1/4	3	10	.9990	11-1/2	TR96721	185.30
1.3125	1-5/16	3	10	.9990	11-1/2	TR96722	216.60
1.3750	1-3/8	3-1/4	10	.9990	12	TR96723	227.15
1.4375	1-7/16	3-1/4	10	1.2490	12	TR96724	243.05
1.5000	1-1/2	3-1/2	10	1.2490	12-1/2	TR96725	261.25
$D_1 \begin{smallmatrix} +.0002'' \\ -.0006'' \end{smallmatrix}$		L ₂		D ₂	L ₁	TOOL #	PRICE
1.5625	1-9/16	3-1/2	12	1.2490	13	TR96900	372.50
1.6250	1-5/8	3-1/2	12	1.2490	13	TR96901	374.40
1.6875	1-11/16	4	12	1.2490	13-1/2	TR96902	426.35
1.7500	1-3/4	4	12	1.2490	13-1/2	TR96903	429.90
1.8125	1-13/16	4	12	1.4990	14	TR96904	495.10
1.8750	1-7/8	4	12	1.4990	14	TR96905	495.10
1.9375	1-15/16	4	12	1.4990	14	TR96906	579.65
2.0000	2	4	12	1.4990	14	TR96907	579.65

For technical information, see page 295

REAMERS - HIGH SPEED STEEL

Chucking - Left Hand Spiral



- Flute options from 4 to 12
- Optimized for use in through holes as chips are pushed ahead of the tool and into the hole
- High speed steel
- Precision manufactured in the USA

REAMER DIAMETER dec. equiv. size		FLUTE LENGTH	FLUTES	SHANK DIA.	OAL	UNCOATED	
D1 + .0002" - .0000"		L2		D2	L1	TOOL #	PRICE
.0394	1.0 mm	1/2	4	.0394	2-1/2	TR97010	24.45
.0400	#60	1/2	4	.0390	2-1/2	TR97011	24.45
.0410	#59	1/2	4	.0390	2-1/2	TR97012	24.45
.0420	#58	1/2	4	.0390	2-1/2	TR97013	24.45
.0430	#57	1/2	4	.0390	2-1/2	TR97014	24.45
.0465	#56	1/2	4	.0455	2-1/2	TR97015	24.45
.0469	3/64	1/2	4	.0455	2-1/2	TR97016	24.45
.0520	#55	1/2	4	.0510	2-1/2	TR97017	24.45
.0550	#54	1/2	4	.0510	2-1/2	TR97018	24.45
.0591	1.5 mm	1/2	4	.0510	2-1/2	TR97019	24.45
.0595	#53	1/2	4	.0585	2-1/2	TR97020	24.45
.0625	1/16	1/2	4	.0585	2-1/2	TR97021	24.45
.0635	#52	1/2	4	.0585	2-1/2	TR97022	24.45
.0670	#51	3/4	4	.0660	3	TR97023	19.70
.0700	#50	3/4	4	.0660	3	TR97024	19.65
.0730	#49	3/4	4	.0660	3	TR97025	19.70
.0760	#48	3/4	4	.0720	3	TR97026	19.65
.0781	5/64	3/4	4	.0720	3	TR97027	19.70
.0785	#47	3/4	4	.0720	3	TR97028	19.65
.0787	2.0 mm	3/4	4	.0720	3	TR97029	19.70
.0810	#46	3/4	4	.0771	3	TR97030	19.65
.0820	#45	3/4	4	.0771	3	TR97031	19.65
.0860	#44	3/4	4	.0810	3	TR97032	19.65
.0890	#43	3/4	4	.0810	3	TR97033	19.70
.0935	#42	3/4	4	.0880	3	TR97034	19.65
.0938	3/32	3/4	4	.0880	3	TR97035	19.55
.0960	#41	7/8	4	.0928	3-1/2	TR97036	19.75
.0980	#40	7/8	4	.0928	3-1/2	TR97037	19.75
.0984	2.5 mm	7/8	4	.0928	3-1/2	TR97038	19.75
.0995	#39	7/8	4	.0928	3-1/2	TR97039	19.75
.1015	#38	7/8	4	.0950	3-1/2	TR97040	19.75
.1040	#37	7/8	4	.0950	3-1/2	TR97041	19.75
.1065	#36	7/8	4	.1030	3-1/2	TR97042	19.75
.1094	7/64	7/8	4	.1030	3-1/2	TR97043	20.55
.1100	#35	7/8	4	.1030	3-1/2	TR97044	20.45
.1110	#34	7/8	4	.1055	3-1/2	TR97045	20.45

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For technical information, see page 295

REAMERS - HIGH SPEED STEEL

Chucking - Left Hand Spiral (Cont.)

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REAMER DIAMETER dec. equiv. size		FLUTE LENGTH	FLUTES	SHANK DIA.	OAL	UNCOATED	
$D_1 \begin{smallmatrix} +.0002" \\ -.0000" \end{smallmatrix}$		L ₂		D ₂	L ₁	TOOL #	PRICE
.1130	#33	7/8	4	.1055	3-1/2	TR97046	20.45
.1160	#32	7/8	4	.1120	3-1/2	TR97047	20.55
.1181	3.0 mm	7/8	4	.1120	3-1/2	TR97048	20.55
.1200	#31	7/8	4	.1120	3-1/2	TR97049	20.55
.1240	O/U	7/8	4	.1190	3-1/2	TR97050	20.55
.1250	1/8	7/8	4	.1190	3-1/2	TR97051	18.40
.1260	O/U	7/8	4	.1190	3-1/2	TR97052	20.55
.1285	#30	7/8	4	.1190	3-1/2	TR97053	20.55
.1360	#29	1	4	.1275	4	TR97054	24.45
.1378	3.5 mm	1	4	.1350	4	TR97055	24.45
.1405	#28	1	4	.1350	4	TR97056	24.45
.1406	9/64	1	4	.1350	4	TR97057	24.45
.1440	#27	1	4	.1350	4	TR97058	24.45
.1470	#26	1	4	.1430	4	TR97059	24.45
.1495	#25	1	4	.1430	4	TR97060	24.45
.1520	#24	1	4	.1460	4	TR97061	25.40
.1540	#23	1	4	.1460	4	TR97062	25.40
.1562	5/32	1	4	.1510	4	TR97063	25.50
.1570	#22	1	6	.1510	4	TR97064	25.40
.1575	4.0 mm	1	6	.1510	4	TR97065	25.50
.1590	#21	1-1/8	6	.1530	4-1/2	TR97066	26.10
.1610	#20	1-1/8	6	.1530	4-1/2	TR97067	26.10
.1660	#19	1-1/8	6	.1595	4-1/2	TR97068	26.10
.1695	#18	1-1/8	6	.1595	4-1/2	TR97069	26.10
.1719	11/64	1-1/8	6	.1645	4-1/2	TR97070	26.10
.1730	#17	1-1/8	6	.1645	4-1/2	TR97071	26.10
.1770	#16	1-1/8	6	.1704	4-1/2	TR97072	26.10
.1772	4.5 mm	1-1/8	6	.1704	4-1/2	TR97073	26.10
.1800	#15	1-1/8	6	.1755	4-1/2	TR97074	26.10
.1820	#14	1-1/8	6	.1755	4-1/2	TR97075	26.10
.1850	#13	1-1/8	6	.1805	4-1/2	TR97076	26.10
.1865	O/U	1-1/8	6	.1805	4-1/2	TR97077	26.10
.1875	3/16	1-1/8	6	.1805	4-1/2	TR97078	24.75
.1885	O/U	1-1/8	6	.1805	4-1/2	TR97079	26.10
.1890	#12	1-1/8	6	.1805	4-1/2	TR97080	26.10
.1910	#11	1-1/4	6	.1860	5	TR97081	29.25
.1935	#10	1-1/4	6	.1860	5	TR97082	29.25
.1960	#9	1-1/4	6	.1895	5	TR97083	29.25
.1969	5.0 mm	1-1/4	6	.1895	5	TR97084	29.25
.1990	#8	1-1/4	6	.1895	5	TR97085	29.25
.2010	#7	1-1/4	6	.1895	5	TR97086	29.25
.2031	13/64	1-1/4	6	.1945	5	TR97087	29.25
.2040	#6	1-1/4	6	.1945	5	TR97088	29.25
.2055	#5	1-1/4	6	.2016	5	TR97089	29.25
.2090	#4	1-1/4	6	.2016	5	TR97090	29.25
.2130	#3	1-1/4	6	.2075	5	TR97091	29.25
.2165	5.5 mm	1-1/4	6	.2075	5	TR97092	29.25
.2188	7/32	1-1/4	6	.2075	5	TR97093	29.25

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For technical information, see page 295

REAMERS - HIGH SPEED STEEL

Chucking - Left Hand Spiral (Cont.)

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REAMER DIAMETER dec. equiv. size		FLUTE LENGTH	FLUTES	SHANK DIA.	OAL	UNCOATED	
D ₁ ^{+0.0002"} -0.0000"		L ₂		D ₂	L ₁	TOOL #	PRICE
.2210	#2	1-1/2	6	.2173	6	TR97094	30.05
.2280	#1	1-1/2	6	.2173	6	TR97095	30.05
.2340	A	1-1/2	6	.2265	6	TR97096	30.05
.2344	15/64	1-1/2	6	.2265	6	TR97097	30.05
.2362	6.0 mm	1-1/2	6	.2265	6	TR97098	30.35
.2380	B	1-1/2	6	.2329	6	TR97099	30.35
.2420	C	1-1/2	6	.2329	6	TR97100	30.25
.2460	D	1-1/2	6	.2329	6	TR97101	30.35
.2490	O/U	1-1/2	6	.2405	6	TR97102	32.40
.2500	1/4	1-1/2	6	.2405	6	TR97103	27.05
.2510	O/U	1-1/2	6	.2405	6	TR97104	32.40
.2559	6.5 mm	1-1/2	6	.2405	6	TR97105	30.25
.2570	F	1-1/2	6	.2485	6	TR97106	30.35
.2610	G	1-1/2	6	.2485	6	TR97107	30.25
.2656	17/64	1-1/2	6	.2485	6	TR97108	33.70
.2660	H	1-1/2	6	.2485	6	TR97109	33.70
.2720	I	1-1/2	6	.2485	6	TR97110	33.70
.2756	7.0 mm	1-1/2	6	.2485	6	TR97111	33.70
.2770	J	1-1/2	6	.2485	6	TR97112	33.70
.2810	K	1-1/2	6	.2485	6	TR97113	33.70
.2813	9/32	1-1/2	6	.2485	6	TR97114	31.95
.2900	L	1-1/2	6	.2792	6	TR97115	33.70
.2950	M	1-1/2	6	.2792	6	TR97116	33.70
.2953	7.5 mm	1-1/2	6	.2792	6	TR97117	33.70
.2969	19/64	1-1/2	6	.2792	6	TR97118	33.70
.3020	N	1-1/2	6	.2792	6	TR97119	33.70
.3115	O/U	1-1/2	6	.2792	6	TR97120	31.95
.3125	5/16	1-1/2	6	.2792	6	TR97121	30.45
.3135	O/U	1-1/2	6	.2792	6	TR97122	31.95
.3150	8.0 mm	1-1/2	6	.2792	6	TR97123	33.70
.3160	O	1-1/2	6	.2792	6	TR97124	33.70
.3230	P	1-1/2	6	.2792	6	TR97125	36.00
.3281	21/64	1-1/2	6	.2792	6	TR97126	36.00
.3320	Q	1-1/2	6	.2792	6	TR97127	36.00
.3346	8.5 mm	1-1/2	6	.2792	6	TR97128	36.00
.3390	R	1-1/2	6	.2792	6	TR97129	36.00
.3438	11/32	1-1/2	6	.2792	6	TR97130	36.00
.3480	S	1-3/4	6	.3105	6	TR97131	36.45
.3543	9.0 mm	1-3/4	6	.3105	7	TR97132	36.45
.3580	T	1-3/4	6	.3105	7	TR97133	36.45
.3594	23/64	1-3/4	6	.3105	7	TR97134	36.60
.3680	U	1-3/4	6	.3105	7	TR97135	36.45
.3740	9.5 mm-O/U	1-3/4	6	.3105	7	TR97136	34.60
.3750	3/8	1-3/4	6	.3105	7	TR97137	32.80
.3760	O/U	1-3/4	6	.3105	7	TR97138	34.60
.3770	V	1-3/4	6	.3105	7	TR97139	39.55
.3860	W	1-3/4	6	.3105	7	TR97140	39.55
.3906	25/64	1-3/4	6	.3105	7	TR97141	39.55

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For technical information, see page 295

REAMERS - HIGH SPEED STEEL

Chucking - Left Hand Spiral (Cont.)

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REAMER DIAMETER dec. equiv. size		FLUTE LENGTH	FLUTES	SHANK DIA.	OAL	UNCOATED	
$D_1 \begin{smallmatrix} +.0002" \\ -.0000" \end{smallmatrix}$		L ₂		D ₂	L ₁	TOOL #	PRICE
.3937	10.0 mm	1-3/4	6	.3105	7	TR97142	39.55
.3970	X	1-3/4	6	.3105	7	TR97143	39.55
.4040	Y	1-3/4	6	.3105	7	TR97144	41.05
.4063	13/32	1-3/4	6	.3105	7	TR97145	41.05
.4130	Z	1-3/4	6	.3730	7	TR97146	41.05
.4134	10.5 mm	1-3/4	6	.3730	7	TR97147	41.05
.4219	27/64	1-3/4	6	.3730	7	TR97148	41.25
.4331	11.0 mm	1-3/4	6	.3730	7	TR97149	41.05
.4365	O/U	1-3/4	6	.3730	7	TR97150	41.25
.4375	7/16	1-3/4	6	.3730	7	TR97151	39.20
.4385	O/U	1-3/4	6	.3730	7	TR97152	41.05
.4528	11.5 mm	1-3/4	6	.3730	7	TR97153	44.75
.4531	29/64	1-3/4	6	.3730	7	TR97154	44.95
.4688	15/32	1-3/4	6	.3730	7	TR97155	44.95
.4724	12.0 mm	2	6	.4355	8	TR97156	44.75
.4844	31/64	2	6	.4355	8	TR97157	44.75
.4921	12.5 mm	2	6	.4355	8	TR97158	44.75
.4990	O/U	2	6	.4355	8	TR97159	44.95
.5000	1/2	2	6	.4355	8	TR97160	42.45

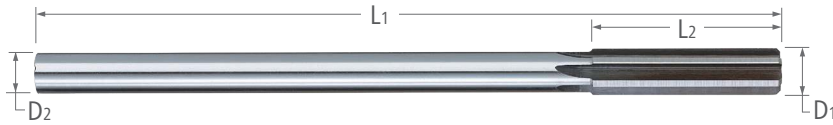
$D_1 \begin{smallmatrix} +.0003" \\ -.0000" \end{smallmatrix}$		L ₂		D ₂	L ₁	TOOL #	PRICE
.5010	O/U	2	6	.4355	8	TR97161	44.95
.5313	17/32	2	6	.4355	8	TR97162	52.80
.5625	9/16	2	8	.4355	8	TR97163	52.80
.5938	19/32	2	8	.4355	8	TR97164	52.80
.6250	5/8	2-1/4	8	.5615	9	TR97165	61.90

$D_1 \begin{smallmatrix} +.0001" \\ -.0004" \end{smallmatrix}$		L ₂		D ₂	L ₁	TOOL #	PRICE
.6562	21/32	2-1/4	8	.5615	9	TR97166	66.75
.6875	11/16	2-1/4	8	.5615	9	TR97167	71.75
.7188	23/32	2-1/4	8	.5615	9	TR97168	84.05
.7500	3/4	2-1/2	8	.6240	9-1/2	TR97169	79.85
.7812	25/32	2-1/2	8	.6240	9-1/2	TR97170	86.55
.8125	13/16	2-1/2	8	.6240	9-1/2	TR97171	86.45
.8438	27/32	2-1/2	8	.6240	9-1/2	TR97172	107.45
.8750	7/8	2-5/8	8	.7490	10	TR97173	102.05
.9062	29/32	2-5/8	8	.7490	10	TR97174	118.35
.9375	15/16	2-5/8	8	.7490	10	TR97175	112.65
.9688	31/32	2-5/8	8	.7490	10	TR97176	126.25
1.0000	1	2-3/4	8	.8740	10-1/2	TR97177	127.85
1.0625	1-1/16	2-3/4	8	.8740	10-1/2	TR97178	141.05
1.1250	1-1/8	2-7/8	8	.8740	11	TR97179	149.60
1.1875	1-3/16	2-7/8	10	.9990	11	TR97180	175.15
1.2500	1-1/4	3	10	.9990	11-1/2	TR97181	185.30
1.3125	1-5/16	3	10	.9990	11-1/2	TR97182	216.60
1.3750	1-3/8	3-1/4	10	.9990	12	TR97183	227.15
1.4375	1-7/16	3-1/4	10	1.2490	12	TR97184	243.05
1.5000	1-1/2	3-1/2	12	1.2490	12-1/2	TR97185	261.25

For technical information, see page 295

REAMERS - HIGH SPEED STEEL

Dowel Pin - Straight Flute

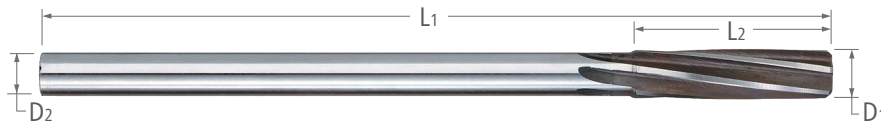


- General purpose reamers featuring a 45° chamfer angle
- Straight flutes for through and blind hole applications
- 4 and 6 flute styles
- High speed steel
- Precision manufactured in the USA

REAMER DIA.	FLUTE LENGTH	FLUTES	SHANK DIA.	OAL	UNCOATED	
$D_1 \begin{smallmatrix} +.0000" \\ -.0002" \end{smallmatrix}$	L2		D2	L1	TOOL #	PRICE
.1230	7/8	4	.1190	3-1/2	TR96264	17.75
.1247	7/8	4	.1190	3-1/2	TR96265	17.75
.1855	1-1/8	6	.1805	4-1/2	TR96266	22.70
.1870	1-1/8	6	.1805	4-1/2	TR96267	22.70
.2480	1-1/2	6	.2405	6	TR96268	24.75
.2495	1-1/2	6	.2405	6	TR96269	24.75
.3105	1-1/2	6	.2792	6	TR96270	29.05
.3120	1-1/2	6	.2792	6	TR96271	29.05
.3730	1-3/4	6	.3105	7	TR96272	31.55
.3745	1-3/4	6	.3105	7	TR96273	31.55
.4355	1-3/4	6	.3730	7	TR96274	35.45
.4370	1-3/4	6	.3730	7	TR96275	35.45
.4980	2	6	.4355	8	TR96276	38.60
.4995	2	6	.4355	8	TR96277	38.60

REAMERS - HIGH SPEED STEEL

Dowel Pin - Right Hand Spiral



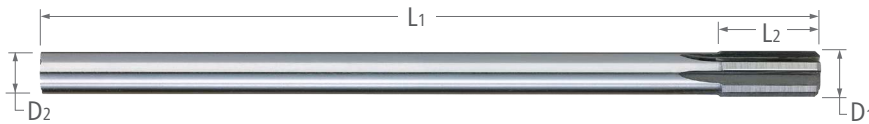
- General purpose reamers featuring a 45° chamfer angle
- Spiral flutes for increased chip evacuation in blind hole applications
- 4 and 6 flute styles
- High speed steel
- Precision manufactured in the USA

REAMER DIA.	FLUTE LENGTH	FLUTES	SHANK DIA.	OAL	UNCOATED	
$D_1 \begin{smallmatrix} +.0002" \\ -.0000" \end{smallmatrix}$	L2		D2	L1	TOOL #	PRICE
.1230	7/8	4	.1190	3-1/2	TR96950	20.45
.1247	7/8	4	.1190	3-1/2	TR96951	20.45
.1855	1-1/8	6	.1805	4-1/2	TR96952	26.10
.1870	1-1/8	6	.1805	4-1/2	TR96953	26.10
.2480	1-1/2	6	.2405	6	TR96954	27.30
.2495	1-1/2	6	.2405	6	TR96955	27.30
.3105	1-1/2	6	.2792	6	TR96956	32.05
.3120	1-1/2	6	.2792	6	TR96957	32.20
.3730	1-3/4	6	.3105	7	TR96958	34.60
.3745	1-3/4	6	.3105	7	TR96959	34.60
.4355	1-3/4	6	.3730	7	TR96960	41.05
.4370	1-3/4	6	.3730	7	TR96961	41.05
.4980	2	6	.4355	8	TR96962	44.70
.4995	2	6	.4355	8	TR96963	44.70

For technical information, see page 295

REAMERS - HIGH SPEED STEEL

Expansion - Straight Flute



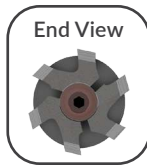
- General purpose reamers featuring a 45° chamfer angle
- Expansion style for resharpening to original size
- 6 and 8 flute styles
- Straight flutes for through and blind hole applications
- High speed steel
- Precision manufactured in the USA

REAMER DIAMETER dec. equiv. size		FLUTE LENGTH	FLUTES	SHANK DIA.	OAL	UNCOATED	
$D_1 \begin{smallmatrix} +.0002" \\ -.0000" \end{smallmatrix}$		L2		D2	L1	TOOL #	PRICE
.3750	3/8	3/4	6	5/16	7	TR97201	107.90
.4063	13/32	3/4	6	5/16	7	TR97202	120.50
.4375	7/16	7/8	6	3/8	7	TR97203	114.95
.4688	15/32	7/8	6	27/64	8	TR97204	125.05
.5000	1/2	1	6	7/16	8	TR97205	121.55
.5313	17/32	1	6	7/16	8	TR97206	135.30
.5625	9/16	1-1/8	6	7/16	8	TR97207	131.95
.5938	19/32	1-1/8	6	7/16	8	TR97208	133.90
.6250	5/8	1-1/4	6	9/16	9	TR97209	137.80
.6563	21/32	1-1/4	6	9/16	9	TR97210	147.10
.6875	11/16	1-1/4	6	9/16	9	TR97211	155.45
.7188	23/32	1-1/4	6	9/16	9	TR97212	165.65
.7500	3/4	1-3/8	6	5/8	9-1/2	TR97213	163.90
.7813	25/32	1-3/8	8	5/8	9-1/2	TR97214	172.65
.8125	13/16	1-3/8	8	5/8	9-1/2	TR97215	188.05
.8438	27/32	1-3/8	8	5/8	9-1/2	TR97216	188.80
.8750	7/8	1-1/2	8	3/4	10	TR97217	192.20
.9063	29/32	1-1/2	8	3/4	10	TR97218	212.45
.9375	15/16	1-1/2	8	3/4	10	TR97219	222.35
.9688	31/32	1-1/2	8	3/4	10	TR97220	232.45
1.0000	1	1-5/8	8	7/8	10-1/2	TR97221	233.45
1.0313	1-1/32	1-5/8	8	7/8	10-1/2	TR97222	340.90
1.0625	1-1/16	1-5/8	8	7/8	10-1/2	TR97223	270.75
1.0938	1-3/32	1-5/8	8	7/8	10-1/2	TR97224	270.25
1.1250	1-1/8	1-3/4	8	7/8	11	TR97225	282.30
1.1563	1-5/32	1-3/4	8	7/8	11	TR97226	300.30
1.1875	1-3/16	1-3/4	8	1	11	TR97227	297.05
1.2188	1-7/32	1-3/4	8	1	11	TR97228	323.30
1.2500	1-1/4	1-7/8	8	1	11-1/2	TR97229	319.95
1.3125	1-5/16	1-7/8	8	1	11-1/2	TR97230	332.10
1.3750	1-3/8	2	8	1	12	TR97231	342.60
1.4375	1-7/16	2	8	1-1/4	12	TR97232	373.40
1.5000	1-1/2	2-1/8	8	1-1/4	12-1/2	TR97233	370.80

For technical information, see page 295

REAMERS - HIGH SPEED STEEL

Expansion - Straight Flute - Taper Shank



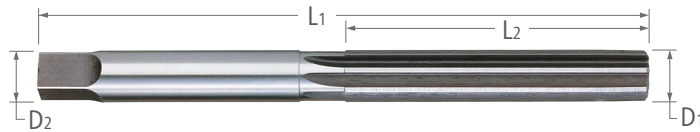
- General purpose reamers featuring a 45° chamfer angle
- Expansion tapered shank for Morse Taper Holders
- Expansion style for resharpening to original size
- 6 and 8 flute styles
- Straight flutes for through and blind hole applications
- High speed steel
- Precision manufactured in the USA

REAMER DIAMETER dec. equiv. size		FLUTE LENGTH	FLUTES	MORSE TAPER	OAL	UNCOATED	
$D_1 \begin{smallmatrix} +.0002" \\ -.0000" \end{smallmatrix}$		L ₂			L ₁	TOOL #	PRICE
.3750	3/8	3/4	6	1	7	TR97250	128.40
.4063	13/32	3/4	6	1	7	TR97251	141.95
.4375	7/16	7/8	6	1	7	TR97252	135.85
.4688	15/32	7/8	6	1	8	TR97253	139.15
.5000	1/2	1	6	1	8	TR97254	135.40
.5313	17/32	1	6	1	8	TR97255	140.75
.5625	9/16	1-1/8	6	1	8	TR97256	142.95
.5938	19/32	1-1/8	6	1	8	TR97257	155.55
.6250	5/8	1-1/4	6	2	9	TR97258	154.05
.6563	21/32	1-1/4	6	2	9	TR97259	169.75
.6875	11/16	1-1/4	6	2	9	TR97260	170.80
.7188	23/32	1-1/4	6	2	9	TR97261	182.10
.7500	3/4	1-3/8	6	2	9-1/2	TR97262	178.75
.7813	25/32	1-3/8	8	2	9-1/2	TR97263	187.00
.8125	13/16	1-3/8	8	2	9-1/2	TR97264	189.70
.8438	27/32	1-3/8	8	2	9-1/2	TR97265	210.65
.8750	7/8	1-1/2	8	2	10	TR97266	208.55
.9063	29/32	1-1/2	8	2	10	TR97267	230.35
.9375	15/16	1-1/2	8	3	10	TR97268	236.05
.9688	31/32	1-1/2	8	3	10	TR97269	245.95
1.0000	1.0000	1-5/8	8	3	10-1/2	TR97270	247.80
1.0313	1-1/32	1-5/8	8	3	10-1/2	TR97271	257.30
1.0625	1-1/16	1-5/8	8	3	10-1/2	TR97272	269.55
1.0938	1-3/32	1-5/8	8	3	10-1/2	TR97273	295.55
1.1250	1-1/8	1-3/4	8	3	11	TR97274	291.25
1.1563	1-5/32	1-3/4	8	3	11	TR97275	318.25
1.1875	1-3/16	1-3/4	8	3	11	TR97276	330.85
1.2188	1-7/32	1-3/4	8	3	11	TR97277	343.75
1.2500	1-1/4	1-7/8	8	4	11-1/2	TR97278	343.90
1.3125	1-5/16	1-7/8	8	4	11-1/2	TR97279	373.20
1.3750	1-3/8	2	8	4	12	TR97280	370.20
1.4375	1-7/16	2	8	4	12	TR97281	391.65
1.5000	1-1/2	2-1/8	8	4	12-1/2	TR97282	404.90

For technical information, see page 295

REAMERS - HIGH SPEED STEEL

Hand Reamers - Straight Flute



- General purpose reamers featuring a 45° chamfer angle
- Straight flutes for through and blind hole applications
- High speed steel
- Precision manufactured in the USA
- Flute options from 4 to 10

REAMER DIAMETER dec. equiv. size		FLUTE LENGTH	FLUTES	SHANK DIA.	OAL	UNCOATED	
D1 ^{+0.002"} -0.000"		L2		D2	L1	TOOL #	PRICE
.0625	1/16	1	4	.0625	2	TR97606	50.65
.0781	5/64	1	4	.0781	2	TR97607	50.45
.0938	3/32	1-1/4	4	.0938	2-1/2	TR97608	50.45
.1094	7/64	1-1/4	4	.1094	2-1/2	TR97609	50.45
.1250	1/8	1-1/2	4	.1250	3	TR97610	47.50
.1406	9/64	1-5/8	4	.1406	3-1/4	TR97611	47.50
.1563	5/32	1-5/8	4	.1562	3-1/4	TR97612	51.30
.1719	11/64	1-3/4	6	.1719	3-1/2	TR97613	51.30
.1875	3/16	1-3/4	6	.1875	3-1/2	TR97614	50.65
.2031	13/64	1-7/8	6	.2031	3-3/4	TR97615	50.45
.2188	7/32	1-7/8	6	.2188	3-3/4	TR97616	55.50
.2344	15/64	2	6	.2344	4	TR97617	55.50
.2500	1/4	2	6	.2500	4	TR97618	55.40
.2656	17/64	2-1/8	6	.2656	4-1/4	TR97619	55.50
.2813	9/32	2-1/8	6	.2812	4-1/4	TR97620	59.75
.2969	19/64	2-1/4	6	.2969	4-1/2	TR97621	59.75
.3125	5/16	2-1/4	6	.3125	4-1/2	TR97622	58.35
.3438	11/32	2-3/8	6	.3438	4-3/4	TR97623	67.75
.3750	3/8	2-1/2	6	.3750	5	TR97624	66.10
.4063	13/32	2-5/8	6	.4062	5-1/4	TR97625	76.75
.4375	7/16	2-3/4	6	.4375	5-1/2	TR97626	75.25
.4688	15/32	2-7/8	6	.4688	5-3/4	TR97627	83.20
.5000	1/2	3	6	.5000	6	TR97628	80.30
D1 ^{+0.003"} -0.000"		L2		D2	L1	TOOL #	PRICE
.5313	17/32	3-1/8	8	.5312	6-1/4	TR97629	86.45
.5625	9/16	3-1/4	8	.5625	6-1/2	TR97630	92.40
.5938	19/32	3-3/8	8	.5938	6-3/4	TR97631	102.75
.6250	5/8	3-1/2	8	.6250	7	TR97632	100.10
D1 ^{+0.001"} -0.004"		L2		D2	L1	TOOL #	PRICE
.6562	21/32	3-11/16	8	.6562	7-3/8	TR97633	113.70
.6875	11/16	3-7/8	8	.6875	7-3/4	TR97634	111.00
.7188	23/32	4-1/16	8	.7188	8-1/8	TR97635	121.45
.7500	3/4	4-3/16	8	.7500	8-3/8	TR97636	116.70
.7812	25/32	4-3/8	8	.7812	8-3/4	TR97637	128.00
.8125	13/16	4-9/16	8	.8125	9-1/8	TR97638	116.70

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For technical information, see page 295

REAMERS - HIGH SPEED STEEL

Hand Reamers - Straight Flute (Cont.)

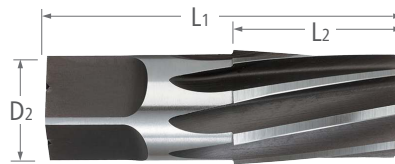
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REAMER DIAMETER dec. equiv. size		FLUTE LENGTH	FLUTES	SHANK DIA.	OAL	UNCOATED	
$D_1^{+.0001" \atop +.0004"}$		L ₂		D ₂	L ₁	TOOL #	PRICE
.8438	27/32	4-11/16	8	.8438	9-3/8	TR97639	140.20
.8750	7/8	4-7/8	8	.8750	9-3/4	TR97640	141.40
.9062	29/32	5	8	.9062	10	TR97641	156.25
.9375	15/16	5-1/8	8	.9375	10-1/4	TR97642	141.50
.9688	31/32	5-5/16	8	.9688	10-5/8	TR97643	172.00
1.0000	1	5-7/16	8	1.0000	10-7/8	TR97644	171.35
1.1250	1-1/8	5-13/16	8	1.1250	11-5/8	TR97645	223.90
1.2500	1-1/4	6-1/8	8	1.2500	12-1/4	TR97646	274.95
1.3750	1-3/8	6-5/16	10	1.3750	12-5/8	TR97647	324.95
1.5000	1-1/2	6-1/2	10	1.5000	13	TR97648	383.50

 Reamers
 Carbide
 Cobalt
 HSS

REAMERS - HIGH SPEED STEEL

Taper Pipe



- General purpose reamers featuring a 45° chamfer angle
- 6 to 12 flute options
- Spiral flutes for increased chip evacuation in blind hole applications
- High speed steel
- Precision manufactured in the USA

SIZE	DIAMETER SMALL END	DIAMETER LARGE END	FLUTE LENGTH	FLUTES	SIZE OF SQUARE	SHANK DIAMETER	OVERALL LENGTH	UNCOATED	
			L ₂			D ₂	L ₁	TOOL #	PRICE
1/16	.2320	.2750	3/4	6	.2350	.3125	2-1/8	TR97649	65.85
1/8	.3160	.3620	3/4	6	.3280	.4375	2-1/8	TR97650	61.40
1/4	.4060	.4720	1-1/16	6	.4210	.5625	2-7/16	TR97651	70.30
3/8	.5400	.6060	1-1/16	6	.5310	.7000	2-9/16	TR97652	79.95
1/2	.6650	.7510	1-3/8	6	.5150	.6875	3-1/8	TR97653	100.55
3/4	.8760	.9620	1-3/8	8	.6790	.9063	3-1/4	TR97654	139.40
1	1.1030	1.2120	1-3/4	8	.8430	1.1250	3-3/4	TR97655	206.15
1-1/4	1.4440	1.5530	1-3/4	10	.9840	1.3125	4	TR97656	345.55
1-1/2	1.6840	1.7930	1-3/4	12	1.1250	1.5000	4-1/4	TR97657	436.85
2	2.1590	2.2680	1-3/4	12	1.4060	1.8750	4-1/2	TR97658	586.35

For technical information, see page 295

REAMERS - HIGH SPEED STEEL

Taper Pin



- General purpose reamers featuring a 45° chamfer angle
- Helical flutes increase shearing action for superior finish
- Straight flutes for through and blind hole applications
- Flute options from 4 to 10
- Spiral flutes for increased chip evacuation in blind hole applications
- High speed steel
- Precision manufactured in the USA

SIZE	DIAMETER SMALL END	DIAMETER LARGE END	FLUTE LENGTH	OAL	FLUTES	STRAIGHT FLUTE		LEFT HAND SPIRAL RIGHT HAND CUT		LEFT HAND HELICAL RIGHT HAND CUT	
			L ₂	L ₁		TOOL #	PRICE	TOOL #	PRICE	TOOL #	PRICE
7/0	.0497	.0666	13/16	1-13/16	4	TR97525	52.70	TR97567	54.90	TR97546	48.90
6/0	.0611	.0806	15/16	1-15/16	4	TR97526	52.70	TR97568	54.70	TR97547	46.00
5/0	.0719	.0966	1-3/16	2-3/16	4	TR97527	48.00	TR97569	52.70	TR97548	47.75
4/0	.0869	.1142	1-5/16	2-5/16	4	TR97528	48.00	TR97570	52.70	TR97549	47.75
3/0	.1029	.1302	1-5/16	2-5/16	4	TR97529	48.00	TR97571	52.70	TR97550	43.40
2/0	.1137	.1462	1-9/16	2-9/16	4	TR97530	42.90	TR97572	46.20	TR97551	43.85
0	.1287	.1638	1-11/16	2-15/16	4	TR97531	41.45	TR97573	43.95	TR97552	44.65
1	.1447	.1798	1-11/16	2-15/16	6	TR97532	40.00	TR97574	44.65	TR97553	45.40
2	.1605	.2008	1-15/16	3-3/16	6	TR97533	40.00	TR97575	44.65	TR97554	51.30
3	.1813	.2294	2-15/16	3-11/16	6	TR97534	40.00	TR97576	44.65	TR97555	53.05
4	.2071	.2604	2-9/16	4-1/16	6	TR97535	44.80	TR97577	48.95	TR97556	59.75
5	.2409	.2994	2-13/16	4-5/16	6	TR97536	48.20	TR97578	51.90	TR97557	65.30
6	.2773	.3540	3-11/16	5-7/16	6	TR97537	58.20	TR97579	64.25	TR97558	76.65
7	.3297	.4220	4-7/16	6-5/16	6	TR97538	74.60	TR97580	80.95	TR97559	94.70
8	.3971	.5050	5-3/16	7-3/16	6	TR97539	96.75	TR97581	105.85	TR97560	111.05
9	.4805	.6066	6-1/16	8-5/16	6	TR97540	116.55	TR97582	126.25	TR97561	122.00
10	.5799	.7216	6-13/16	9-5/16	6	TR97541	127.95	TR97583	140.00	TR97562	154.95
11	.7060	.8780	8-1/4	11-1/4	8	TR97542	135.70	TR97584	149.40	TR97563	171.65
12	.8420	1.0500	10	13-7/8	8	TR97543	211.00	TR97585	231.00	TR97564	254.20
13	1.0090	1.2590	12	16	10	TR97544	407.40	TR97586	450.20	TR97565	696.25
14	1.2500	1.5420	14	18-1/4	10	TR97545	652.60	TR97587	727.80	TR97566	795.30

Straight Flute



Left Hand Spiral, Right Hand Cut



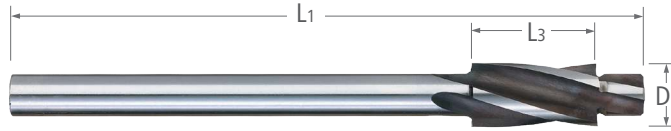
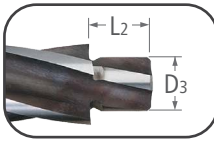
Left Hand Helical, Right Hand Cut



For technical information, see page 295

REAMERS - HIGH SPEED STEEL

Capscrew Counterbores



- General purpose reamers featuring a 45° chamfer angle
- Capscrew counterbore style
- Unique style allowing capscrews to sit flush with the surface of a part
- Built in pilot to maintain alignment in existing hole
- High speed steel
- Precision manufactured in the USA

SIZE	PILOT LENGTH	PILOT SIZE	FLUTE SIZE	BODY LENGTH	OAL	UNCOATED	
	L ₂	D ₃	D ₁	L ₃	L ₁	TOOL #	PRICE
4	1/8	.112	.183	9/16	3-7/8	TR97470	32.45
	1/8	.127	.199	9/16	3-7/8	TR97484	31.15
	1/8	.143	.215	9/16	3-7/8	TR97501	31.25
5	5/32	.125	.205	5/8	4-1/8	TR97471	32.40
	5/32	.140	.221	5/8	4-1/8	TR97485	32.35
	5/32	.156	.237	5/8	4-1/8	TR97502	31.25
6	3/16	.138	.227	3/4	4-5/8	TR97472	32.90
	3/16	.153	.243	3/4	4-5/8	TR97486	32.90
	3/16	.169	.259	3/4	4-5/8	TR97503	32.90
8	7/32	.164	.270	3/4	5	TR97473	35.30
	7/32	.179	.286	3/4	5	TR97487	35.30
	7/32	.195	.302	3/4	5	TR97504	35.30
10	1/4	.190	.312	7/8	5-1/4	TR97474	36.00
	1/4	.205	.328	7/8	5-1/4	TR97488	36.00
	1/4	.218	.344	7/8	5-1/4	TR97505	36.00
1 1/4	9/32	.250	.380	1	5-5/8	TR97475	38.10
	9/32	.265	.396	1	5-5/8	TR97489	38.10
	9/32	.281	.412	1	5-5/8	TR97506	38.10
5/16	5/16	.313	.474	1	6-1/8	TR97476	47.55
	5/16	.328	.489	1	6-1/8	TR97490	47.55
	5/16	.343	.504	1	6-1/8	TR97507	47.55
3/8	3/8	.375	.569	1-1/4	6-1/2	TR97477	51.90
	3/8	.390	.585	1-1/4	6-1/2	TR97491	51.90
	3/8	.406	.601	1-1/4	6-1/2	TR97508	51.90
7/16	7/16	.437	.661	1-1/4	7	TR97478	62.15
	7/16	.452	.676	1-1/4	7	TR97492	62.15
	7/16	.468	.691	1-1/4	7	TR97509	62.15
1/2	1/2	.500	.755	1-1/2	7-1/2	TR97479	73.45
	1/2	.515	.771	1-1/2	7-1/2	TR97493	73.05
	1/2	.531	.787	1-1/2	7-1/2	TR97510	73.05
5/8	5/8	.625	.943	1-1/2	7-5/8	TR97480	119.35
	5/8	.640	.959	1-1/2	7-5/8	TR97494	125.30
	5/8	.656	.975	1-1/2	7-5/8	TR97511	119.30
3/4	3/4	.750	1.131	1-5/8	7-3/4	TR97481	138.05
	3/4	.765	1.147	1-5/8	7-3/4	TR97495	137.90
	3/4	.781	1.163	1-5/8	7-3/4	TR97512	137.85
7/8	7/8	.875	1.320	1-7/8	8	TR97482	167.20
	7/8	.891	1.336	1-7/8	8	TR97496	175.30
	7/8	.906	1.352	1-7/8	8	TR97513	166.80
1	1	1.000	1.508	2	8-1/2	TR97483	221.75
	1	1.015	1.524	2	8-1/2	TR97497	221.75
	1	1.031	1.540	2	8-1/2	TR97514	210.90

For technical information, see page 295

REAMERS - HIGH SPEED STEEL

Taper Shank Bridge Reamers



- Heavy duty tools designed for enlarging and aligning holes
- Taper shank style
- Left hand spiral, right hand cut to push chips forward
- Black Oxide finish increases wear resistance and adds lubricity to improve chip flow
- High speed steel
- Precision manufactured in the USA

REAMER DIAMETER dec. equiv.	REAMER DIAMETER size	FLUTE LENGTH	SMALL DIAMETER	FLUTES	MORSE TAPER	OVERALL LENGTH	BLACK OXIDE FINISH	
D1 $^{+.0005}$ $_{-.0000}$ "		L2				L1	TOOL #	PRICE
.4375	7/16	5-1/8	.3050	5	2	9	TR98974	80.75
.5000	1/2	5-1/8	.3125	5	2	9	TR98976	88.65
.5625	9/16	5-1/8	.3430	5	2	9	TR97589	85.35
.6250	5/8	6-1/8	.3750	5	2	10	TR98978	93.65
.6875	11/16	7-1/8	.3906	5	3	11-3/4	TR97590	98.65
.7500	3/4	7-3/8	.5000	5	3	12	TR97591	135.40
.8125	13/16	7-3/8	.5000	5	3	12	TR97592	135.05
.8750	7/8	7-3/8	.5625	5	3	12	TR98980	147.25
.9375	15/16	7-3/8	.6250	5	3	12	TR97593	156.80
1.0000	1	7-3/8	.6875	5	3	12	TR98982	170.30
1.0625	1-1/16	7-3/8	.7500	5	3	12	TR97594	176.15
1.1250	1-1/8	7-3/8	.8125	5	3	12	TR98984	215.65
1.1875	1-3/16	7-3/8	.8750	5	3	12	TR98986	277.30
1.2500	1-1/4	7-3/8	.9375	5	4	13	TR98988	316.00
1.3125	1-5/16	7-3/8	1.0000	5	4	13	TR98990	373.95



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REAMERS - HIGH SPEED STEEL

Flatted Shank Construction Reamers



- Construction flatted shank style
- Black and gold oxide finish minimizes friction and improves lubricity
- High speed steel
- Precision manufactured in the USA

REAMER DIAMETER dec. equiv.	size	FLUTE LENGTH	FLUTES	SHANK DIAMETER	OVERALL LENGTH	BLACK & GOLD OXIDE	
$D_1 \begin{smallmatrix} +.0005" \\ -.0000" \end{smallmatrix}$		L2			L1	TOOL #	PRICE
.3750	3/8	2-1/2	5	3/8	4-5/8	TR97595	53.75
.4375	7/16	3-1/4	5	7/16	5-3/8	TR97596	58.05
.5000	1/2	3-3/4	5	1/2	5-7/8	TR97597	64.20
.5625	9/16	3-3/4	5	1/2	5-7/8	TR97598	66.90
.6250	5/8	4-1/4	5	1/2	6-3/8	TR97599	74.75
.6875	11/16	4-1/4	5	1/2	6-3/8	TR97600	89.30
.7500	3/4	4-1/2	5	1/2	6-7/8	TR97601	94.35
.8125	13/16	4-1/2	5	1/2	6-7/8	TR97602	94.35
.8750	7/8	4-1/2	5	1/2	6-7/8	TR97603	106.50
.9375	15/16	4-1/2	5	1/2	6-7/8	TR97604	106.50
1.0000	1	4-1/2	5	1/2	6-7/8	TR97605	121.65
1.0625	1-1/16	4-1/2	5	1/2	6-7/8	TR97660	143.10

REAMERS - HIGH SPEED STEEL

Magnetic Hex Shank Safety Reamers



- Heavy duty tools designed for enlarging and aligning holes
- Safety magnet hex shank style
- Back and gold oxide finish minimizes friction and improves lubricity
- High speed steel
- Precision manufactured in the USA

REAMER DIAMETER dec. equiv.	size	FLUTE LENGTH	FLUTES	HEX SHANK DIAMETER	OVERALL LENGTH	BLACK & GOLD OXIDE	
$D_1 \begin{smallmatrix} +.0005" \\ -.0000" \end{smallmatrix}$		L2			L1	TOOL #	PRICE
.5625	9/16	4	5	1-1/16	5-1/2	TR99050	113.40
.6875	11/16	4-1/2	5	1-1/16	6-3/8	TR99052	137.80
.8125	13/16	5	5	1-1/4	7	TR99054	164.00
.9375	15/16	5	5	1-7/16	7	TR99056	185.30
1.0625	1-1/16	5	5	1-5/8	7	TR99058	245.45
1.1875	1-3/16	5	5	1-13/16	7	TR99060	316.15
1.3125	1-5/16	5	5	2	7-7/8	TR99062	377.75

REAMERS - SETS

Cobalt

- General purpose reamer set
- M42 cobalt

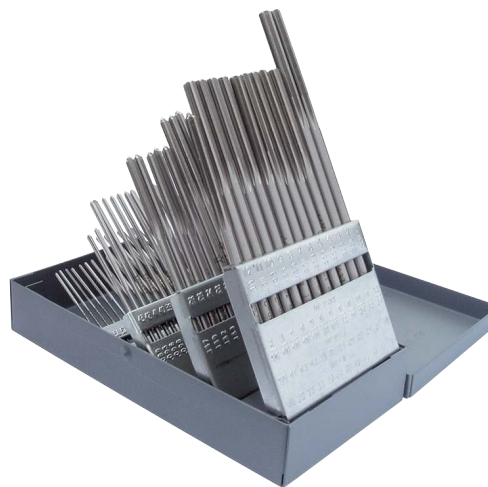


DESCRIPTION	FLUTE STYLE	UNCOATED	
		TOOL #	PRICE
14PC • Dowel Pin • .1230 - .4995 • M42 cobalt	Straight	TR96280	592.15
14PC • O/U • .1240 - .5010 • M42 cobalt	Straight	TR96294	565.80
26PC • A-Z • M42 cobalt	Straight	TR96291	1121.00
29PC • 1/16" - 1/2" by 64ths • M42 cobalt	Straight	TR96284	1140.05
60PC • #1 - #60 • M42 cobalt	Straight	TR96287	1401.90

REAMERS - SETS

High Speed Steel

- General purpose reamer set
- High speed steel



DESCRIPTION	FLUTE STYLE	UNCOATED	
		TOOL #	PRICE
10PC • #4 - 1/2" • Standard • Ctr Bore Set • HSS	RH Spiral	TR96307	448.00
10PC • #4 - 1/2" • 1/64" OS • Ctr Bore Set • HSS	RH Spiral	TR96308	448.00
10PC • #4 - 1/2" • 1/32" OS • Ctr Bore Set • HSS	RH Spiral	TR96309	448.00
14PC • Dowel Pin • .1230 - .4995 • HSS	Straight	TR96279	528.50
14PC • O/U • .1240 - .5010 • HSS	Straight	TR96293	457.85
20PC • #61 - #80 • HSS	Straight	TR96305	534.10
26PC • A-Z • HSS	Straight	TR96290	813.00
29PC • 1/16" - 1/2" by 64ths • HSS	Straight	TR96283	878.55
60PC • #1 - #60 • HSS	Straight	TR96286	1309.65

For technical information, see page 295

REAMERS - CARBIDE

Technical Information

Carbide Reamers		
Material Guide	SFM	Feed (IPR)
INCONEL	20 - 60	.0010 - .0050
RENE	20 - 60	.0020 - .0060
TITANIUM	30 - 90	.0020 - .0080
WASPOLOY	20 - 60	.0020 - .0060
STAINLESS STEEL - 300 SERIES	20 - 80	.0040 - .0080
STAINLESS STEEL - 400 SERIES	30 - 120	.0050 - .0100
MAGNESIUM	100 - 250	.0050 - .0150
MONEL	40 - 120	.0040 - .0120
STEEL - CAST & FORGED	40 - 100	.0030 - .0100
STEEL - HEAT TREATED (35-40 RC)	40 - 70	.0040 - .0080
STEEL - HEAT TREATED (40-45 RC)	30 - 50	.0020 - .0060
STEEL - HEAT TREATED (45+ RC)	15 - 40	.0010 - .0040
STEEL - MEDIUM CARBON	50 - 100	.0050 - .0100
MOLD STEEL	40 - 120	.0040 - .0060
TOOL STEEL	30 - 90	.0040 - .0060
CAST IRON - SOFT	80 - 200	.0060 - .0150
CAST IRON - MEDIUM	60 - 150	.0060 - .0120
CAST IRON - HARD	40 - 90	.0040 - .0100
ALUMINUM / ALUMINUM ALLOYS	100 - 250	.0050 - .0150
ALUMINUM - HIGH SILICON	80 - 200	.0030 - .0120
BRASS	100 - 250	.0050 - .0150
BRONZE	90 - 175	.0030 - .0120
COPPER / COPPER ALLOYS	90 - 220	.0050 - .0150
EPOXY FIBER	100 - 250	.0050 - .0150
PLASTIC	100 - 300	.0050 - .0150
RESIN - FIBER GLASS	100 - 300	.0050 - .0150
MASONITE	60 - 150	.0050 - .0150
PHENOLIC	60 - 100	.0050 - .0150

REAMERS - COBALT & HIGH SPEED STEEL

Technical Information

Cobalt & High Speed Steel Reamers			
Material Guide	Hardness	SFM	IPR
STEEL - ALL TYPES	60 + Rc	8 - 12	-
	50 + Rc	-	.0020 - .0040
	30 - 50 Rc	-	.0040 - .0080
	50 - 60 Rc	15 - 30	-
	40 - 50 Rc	20 - 40	-
	30 - 40 Rc	35 - 65	-
	Less than 30 Rc	60 - 90	-
CAST IRON & MALLEABLE	-	50 - 85	.0050 - .0120
ALUMINUM, BRASS, BRONZE, COPPER	-	90 - 175	.0050 - .0120
FIBER, PLASTIC, HARD RUBBER, ETC.	-	90 - 175	.0050 - .0120

Recommended Stock Removal		
Material Guide	Reamer Diameter	Removal (In)
STEEL - ALL TYPES	Up to 1/16" incl.	.0030 - .0050
	Over 1/16" to 1/8" incl.	.0040 - .0080
	Over 1/8" to 1/4" incl.	.0060 - .0120
	Over 1/4" to 3/8" incl.	.0080 - .0140
	Over 3/8" to 1/2" incl.	.0100 - .0150
	Over 1/2" to 3/4" incl.	.0120 - .0180

Recommended Lubricants		
Material Guide	Hardness	Lubricants
STEEL - ALL TYPES	Steel harder than 50 Rc	Light Oil
	Steel softer than 50 Rc	Light Oil for good finished or Soluble Oil and Water
CAST IRON & MALLEABLE IRON	-	Soluble Oil and Water
NON-FERROUS MATERIALS	-	Soluble Oil and Water

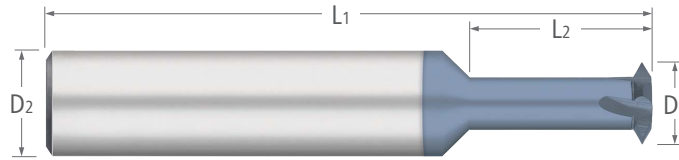
Workpiece hardness and machinability must be considered when setting machine speed. The feed rate plays an important part in the life expectancy of a tool and the hole finish which one is looking to attain. Improper feed rate can cause excessive tool wear as well as an inadequate hole finish.

To eliminate chatter, slow cutting speed and increase feed appropriately. Stock removal roughing operations should not exceed 2 to 4 percent of tool diameter in most case. Stock removal recommendations on finishing operations .002" to .004".

For best results with brass, cast iron, and some plastics, use a Left-Hand Spiral-Fluted reamer with negative shear action. This type of reamer helps prevent chips from working back into the flutes and scoring the hole. In all reaming operations, use constant-flow coolants. Soluble oil is effective for most metals; however, sulfur-based oils are recommended for stainless and certain alloy steels, lard oil and kerosene improve the finish on aluminum.

THREAD MILLS - SINGLE-FORM UN Threads

Single-Form

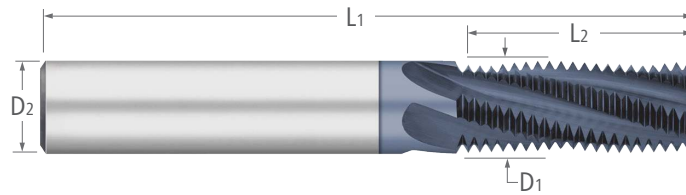


- Single thread form can mill multiple pitches
- Cuts internal and external UN threads
- Mills right and left hand threads
- AlTiN coating offers increased wear and heat resistance
- Solid carbide
- Precision manufactured in the USA

MIN. INTERNAL THREAD	THREAD RANGE	CUTTER DIA.	NECK DIA.	LENGTH OF CUT	FLUTES	SHANK DIA.	OAL	UNCOATED		AlTiN COATED	
		$D_1^{+.000^+}_{-.002^+}$		L ₂		D ₂	L ₁	TOOL #	PRICE	TOOL #	PRICE
#2	56-80	.064	.038	5/32	3	1/8	1-1/2	TC82000	69.85	TC82021	74.25
#3	48-72	.072	.040	5/32	3	1/8	1-1/2	TC82001	69.85	TC82022	74.25
#4	40-64	.080	.045	1/8	3	1/8	2	TC82002	73.30	TC82023	77.70
#4	40-64	.080	.045	1/4	3	1/8	2	TC82003	73.30	TC82024	77.70
#6	32-64	.098	.050	1/4	4	1/8	2	TC82004	70.95	TC82025	75.35
#6	32-64	.098	.050	3/8	4	1/8	2	TC82005	73.70	TC82026	78.10
#8	32-56	.120	.070	5/16	4	1/8	2	TC82006	70.95	TC82027	75.35
#8	32-56	.120	.070	1/2	4	1/8	2	TC82007	73.70	TC82028	78.10
#10	24-56	.138	.075	3/8	4	3/16	2	TC82008	68.35	TC82029	73.30
#10	24-56	.138	.075	5/8	4	3/16	2	TC82009	71.55	TC82030	76.50
#12	24-56	.160	.095	5/8	4	3/16	2	TC82010	71.55	TC82031	76.50
1/4	18-56	.180	.115	1/2	4	3/16	2	TC82011	74.40	TC82032	79.35
1/4	18-56	.180	.115	3/4	4	3/16	2	TC82012	75.90	TC82033	80.85
5/16	16-48	.240	.160	1/2	4	1/4	2-1/2	TC82013	87.40	TC82034	93.75
5/16	16-48	.240	.160	3/4	4	1/4	2-1/2	TC82014	91.60	TC82035	97.90
3/8	14-40	.300	.218	3/4	4	3/8	2-1/2	TC82015	108.65	TC82036	117.70
3/8	14-40	.300	.218	1	4	3/8	2-1/2	TC82016	113.85	TC82037	122.90
1/2	12-32	.388	.250	3/4	4	1/2	3	TC82017	133.60	TC82038	145.90
1/2	12-32	.388	.250	1-1/4	4	1/2	3	TC82018	136.65	TC82039	149.05
3/4	10-32	.495	.340	1	6	1/2	3	TC82019	182.95	TC82040	195.25
3/4	10-32	.495	.340	1-3/8	6	1/2	3	TC82020	186.05	TC82041	198.35

For technical information, see 301

THREAD MILLS - MULTI-FORM UN Threads



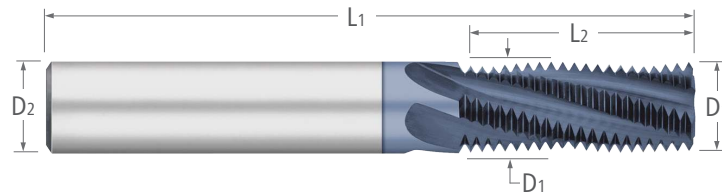
- Cuts internal and external UN threads
- Mills right hand and left hand threads
- AlTiN coating offers increased wear and heat resistance
- Solid carbide
- Precision manufactured in the USA

THREAD SIZE	CUTTER DIAMETER	THREAD LENGTH	FLUTES	SHANK DIAMETER	OAL	UNCOATED		AlTiN COATED	
	$D_1^{+.000" \atop -.002"}$	L ₂		D ₂	L ₁	TOOL #	PRICE	TOOL #	PRICE
2-56	.065	.125	3	1/8	2	TC83950	102.10	TC83995	106.50
4-40	.085	.180	3	1/8	2	TC83952	102.10	TC83998	106.50
6-32	.100	.218	3	1/8	2	TC83901	109.75	TC84001	114.15
8-32	.115	.250	3	1/8	2	TC83903	109.75	TC84003	114.15
8-36	.115	.250	3	1/8	2	TC83905	109.75	TC84005	114.15
10-24	.120	.312	3	3/16	2	TC83907	109.25	TC84007	114.20
10-32	.120	.312	3	3/16	2	TC83909	109.25	TC84009	114.20
1/4-20	.180	.500	3	3/16	2-1/2	TC83911	123.90	TC84011	129.20
1/4-28	.180	.500	3	3/16	2-1/2	TC83913	123.90	TC84013	129.20
5/16-18	.240	.625	3	1/4	2-1/2	TC83915	146.35	TC84015	152.70
5/16-24	.240	.625	3	1/4	2-1/2	TC83917	146.35	TC84017	152.70
3/8-16	.290	.750	4	5/16	3	TC83919	174.35	TC84019	181.95
3/8-24	.290	.750	4	5/16	3	TC83921	174.35	TC84021	181.95
7/16-14	.340	.875	4	3/8	3	TC83923	187.25	TC84023	196.30
7/16-20	.340	.875	4	3/8	3	TC83925	187.25	TC84025	196.30
1/2-13	.350	.875	4	3/8	3-1/2	TC83927	186.50	TC84027	196.20
1/2-20	.350	.875	4	3/8	3-1/2	TC83929	186.50	TC84029	196.20
9/16-12	.370	.875	4	1/2	3-1/2	TC83931	183.00	TC84031	196.20
9/16-18	.370	.875	4	1/2	3-1/2	TC83933	183.00	TC84033	196.20
5/8-11	.470	1.250	5	1/2	3-1/2	TC83935	232.15	TC84035	245.35
5/8-18	.470	1.250	5	1/2	3-1/2	TC83937	232.15	TC84037	245.35
3/4-10	.495	1.250	5	1/2	3-1/2	TC83939	232.15	TC84039	245.35
3/4-16	.495	1.250	5	1/2	3-1/2	TC83941	232.15	TC84041	245.35
7/8-9	.620	1.250	5	5/8	3-1/2	TC83943	291.70	TC84043	306.95
7/8-14	.620	1.250	5	5/8	3-1/2	TC83945	291.70	TC84045	306.95
1-8	.620	1.375	5	3/4	4	TC83947	288.85	TC84047	307.05
1-12	.620	1.375	5	3/4	4	TC83949	288.85	TC84049	307.05

For technical information, see 301

THREAD MILLS - MULTI-FORM

UN Threads - Coolant Through

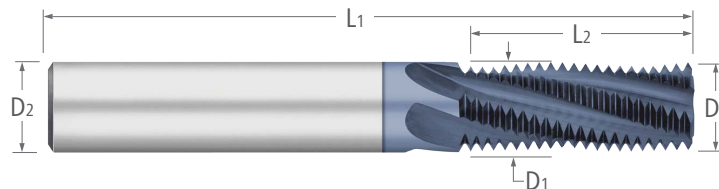


- Cuts internal and external UN threads
- Mills right hand and left hand threads
- Coolant through design for maximum chip ejection in blind holes
- AlTiN coating offers increased wear and heat resistance
- Solid carbide
- Precision manufactured in the USA

THREAD SIZE	CUTTER DIA.	THREAD LENGTH	FLUTES	SHANK DIA.	OAL	UNCOATED		AlTiN COATED	
	$D_1^{+.000" \atop -.002"}$	L2		D2	L1	TOOL #	PRICE	TOOL #	PRICE
10-32	.120	.312	3	3/16	2	TC84710	127.50	TC84810	132.45
1/4-20	.180	.500	3	3/16	2-1/2	TC84712	135.30	TC84812	140.60
1/4-28	.180	.500	3	3/16	2-1/2	TC84714	135.30	TC84814	137.90
5/16-18	.240	.625	3	1/4	2-1/2	TC84716	166.85	TC84816	173.20
5/16-24	.240	.625	3	1/4	2-1/2	TC84718	167.60	TC84818	173.95
3/8-16	.290	.750	4	5/16	3	TC84720	207.85	TC84820	215.45
3/8-24	.290	.750	4	5/16	3	TC84722	207.85	TC84822	215.45
7/16-14	.340	.875	4	3/8	3	TC84724	240.65	TC84824	249.70
7/16-20	.340	.875	4	3/8	3	TC84726	241.85	TC84826	250.90
1/2-13	.350	.875	4	3/8	3-1/2	TC84728	249.35	TC84828	259.05
1/2-20	.350	.875	4	3/8	3-1/2	TC84730	249.35	TC84830	259.05
3/4-10	.495	1.250	4	1/2	3-1/2	TC84740	319.10	TC84840	332.30
3/4-16	.495	1.250	4	1/2	3-1/2	TC84742	319.10	TC84842	332.30

THREAD MILLS - MULTI-FORM

NPT Pipe Threads



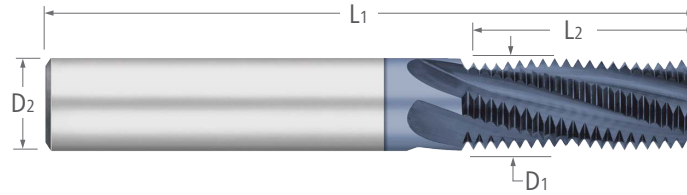
- Cuts internal and external National Pipe Taper (N.P.T.) threads
- Mills right hand and left hand threads
- AlTiN coating offers increased wear and heat resistance
- Solid carbide
- Precision manufactured in the USA

THREAD SIZE	CUTTER DIA.	THREAD LENGTH	FLUTES	SHANK DIA.	OAL	UNCOATED		AlTiN COATED	
	$D_1^{+.000" \atop -.002"}$	L2		D2	L1	TOOL #	PRICE	TOOL #	PRICE
1/16-27	.245	.437	3	1/4	2-1/2	TC84100	146.35	TC84200	152.70
1/8-27	.310	.437	4	5/16	2-1/2	TC84102	145.15	TC84202	152.75
1/4-18	.370	.625	4	3/8	3	TC84104	165.00	TC84204	174.05
3/8-18	.370	.625	4	3/8	3	TC84106	165.00	TC84206	174.05
1/2-14	.495	.875	4	1/2	3-1/2	TC84108	232.15	TC84208	245.35
3/4-14	.495	.875	4	1/2	3-1/2	TC84110	232.15	TC84210	245.35
1-11-1/2	.620	1.125	5	3/4	4	TC84112	288.85	TC84212	307.05

For technical information, see 301

THREAD MILLS - MULTI-FORM

NPTF Pipe Threads



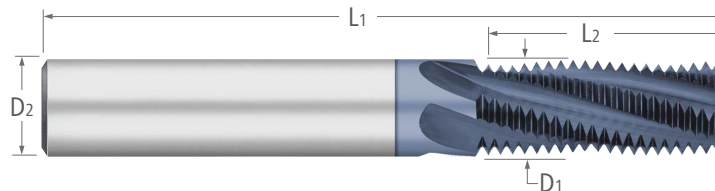
- Cuts internal and external National Pipe Taper for Fuels (N.P.T.F.) threads
- Mills right hand and left hand threads
- Solid carbide
- AlTiN coating offers increased wear and heat resistance
- Precision manufactured in the USA

THREAD SIZE	CUTTER DIA.	THREAD LENGTH	FLUTES	SHANK DIA.	OAL	UNCOATED		AlTiN COATED	
	$D_1^{+.000''}_{-.002''}$	L_2		D_2	L_1	TOOL #	PRICE	TOOL #	PRICE
1/16-27	.245	.437	3	1/4	2-1/2	TC84301	146.35	TC84401	152.70
1/8-27	.310	.437	4	5/16	2-1/2	TC84303	145.15	TC84403	152.75
1/4-18	.370	.625	4	3/8	3	TC84305	165.00	TC84405	174.05
3/8-18	.370	.625	4	3/8	3	TC84307	165.00	TC84407	174.05
1/2-14	.495	.875	4	1/2	3-1/2	TC84309	232.15	TC84409	244.00
3/4-14	.495	.875	4	1/2	3-1/2	TC84311	232.15	TC84411	245.35
1-11-1/2	.620	1.125	5	3/4	4	TC84313	288.85	TC84413	307.05

Multi-Form

THREAD MILLS - MULTI-FORM

NPS Pipe Threads



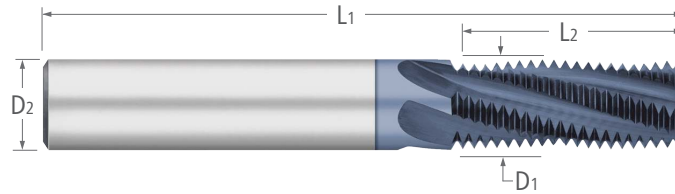
- Cuts internal and external National Pipe Straight (N.P.S.) threads
- Mills right and left hand threads
- Solid carbide
- Single thread form can mill multiple pitches
- AlTiN coating offers increased wear and heat resistance
- Precision manufactured in the USA

THREAD SIZE	CUTTER DIA.	THREAD LENGTH	FLUTES	SHANK DIA.	OAL	AlTiN COATED	
	$D_1^{+.000''}_{-.002''}$	L_2		D_2	L_1	TOOL #	PRICE
NEW 1/16-27	.245	.437	3	1/4	2-1/2	TC83100	133.25
NEW 1/8-27	.240	.570	3	1/4	2-1/2	TC83101	145.85
NEW 1/4-18	.430	.737	4	7/16	3	TC83102	194.55
NEW 3/8-18	.430	.737	4	7/16	3	TC83103	194.55
NEW 1/2-14	.620	1.150	5	5/8	3-1/2	TC83104	288.35
NEW 3/4-14	.620	1.150	5	5/8	3-1/2	TC83105	288.35
NEW 1-11-1/2	.745	1.365	5	3/4	4	TC83106	342.90

For technical information, see 301

THREAD MILLS - MULTI-FORM

Metric Threads



- Cuts internal and external Metric threads
- Mills right hand and left hand threads
- AlTiN coating offers increased wear and heat resistance
- Solid carbide
- Precision manufactured in the USA

Multi-Form

THREAD SIZE	CUTTER DIA.	THREAD LENGTH	FLUTES	SHANK DIA.	OAL	UNCOATED		AlTiN COATED	
	$D_1^{+.0000}_{-.0020}$	L ₂		D ₂	L ₁	TOOL #	PRICE	TOOL #	PRICE
M4 x 0.70	.115	.250	3	1/8	2	TC84520	112.75	TC84620	117.15
M4.5 x 0.75	.120	.250	3	1/8	2	TC84522	112.10	TC84622	116.50
M5 x 0.80	.120	.312	3	3/16	2	TC84524	112.10	TC84624	117.05
M6 x 1.00	.170	.500	3	3/16	2-1/2	TC84526	123.05	TC84626	128.35
M8 x 0.75	.235	.625	3	1/4	2-1/2	TC84528	146.35	TC84628	152.70
M8 x 1.00	.235	.625	3	1/4	2-1/2	TC84530	146.35	TC84630	152.70
M8 x 1.25	.235	.625	3	1/4	2-1/2	TC84532	146.35	TC84632	152.70
M10 x 1.25	.300	.750	4	5/16	3	TC84534	173.50	TC84634	181.10
M10 x 1.50	.300	.750	4	5/16	3	TC84536	174.35	TC84636	181.95
M12 x 1.00	.360	.875	4	3/8	3-1/2	TC84538	187.35	TC84638	197.05
M12 x 1.25	.360	.875	4	3/8	3-1/2	TC84540	187.35	TC84640	197.05
M12 x 1.75	.360	.875	4	3/8	3-1/2	TC84542	187.35	TC84642	197.05
M14 x 1.50	.360	.875	4	3/8	3-1/2	TC84544	187.35	TC84644	197.05
M16 x 2.00	.470	1.250	5	1/2	3-1/2	TC84546	232.15	TC84646	245.35
M18 x 2.50	.470	1.250	5	1/2	3-1/2	TC84548	232.15	TC84648	245.35
M20 x 3.00	.470	1.250	5	5/8	3-1/2	TC84550	228.85	TC84650	244.10

For technical information, see 301

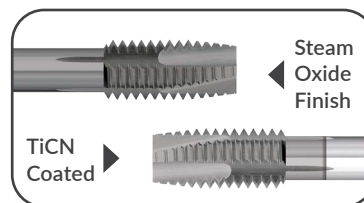
THREAD MILLS - CARBIDE

Technical Information

General Purpose Carbide Multi Form Thread Mills												
Material Guide		Rc	SFM	Feed Per Tooth								
				1/16	1/8	3/16	1/4	5/16	3/8	1/2	5/8	3/4
COBALT BASE ALLOYS	Stellite, HS-21, Haynes 25/188, X-40, L-605	under 32 over 32	50 - 90	.00015 .00025	.0002 .0005	.0003 .0005	.0004 .0006	.0006 .0009	.0008 .0015	.0010 .0020	.0014 .0028	.0018 .0030
NICKEL BASE ALLOYS	Inconel-625/718, Waspalloy, Rene, Hastelloy	under 32 over 32	60 - 100	.0002 .0003	.0003 .0006	.0005 .0010	.0008 .0015	.0010 .0020	.0015 .0025	.0015 .0025	.0020 .0030	.0025 .0040
IRON BASE ALLOYS	Incoloy 800-802, Multimet N-155, Timkin 16-25-6, Carpeneter 22-b3	under 32 over 32	50 - 90	.00015 .00025	.0002 .0005	.0003 .0005	.0004 .0006	.0006 .0009	.0008 .0015	.0010 .0020	.0014 .0028	.0018 .0030
TITANIUM ALLOYS	Commercially Pure, 6AL-4V, Astm 1/2/3, 6Al-25N-4Zr-2Mo-Si		80 - 150	.0002 .0005	.0003 .0006	.0005 .0010	.0008 .0015	.0010 .0020	.0015 .0025	.0015 .0025	.0025 .0035	.0030 .0040
STAINLESS STEEL (PRECIPITATION)	13/8, 15/5, 17-4, AM-350/355	under 32 over 32	100 - 250	.00015 .00025	.00025 .00055	.0005 .0010	.0008 .0015	.0010 .0020	.0015 .0025	.0020 .0030	.0030 .0040	.0035 .0050
STAINLESS STEEL (AUSTENITIC)	200 Series, 302, 303, 304, 316	under 32 over 32	100 - 250	.00015 .00025	.00025 .00055	.0005 .0010	.0008 .0015	.0010 .0020	.0015 .0025	.0020 .0030	.0030 .0040	.0035 .0050
STAINLESS STEEL (MARTENSITIC)	403, 410, 416, 440	under 32 over 32	150 - 250	.0002 .0003	.0004 .0008	.0005 .0010	.0010 .0015	.0015 .0020	.0015 .0030	.0020 .0035	.0030 .0040	.0030 .0040
HIGH STRENGTH TOOL STEELS	4140, 4340, 6150, 5210, A2, D2 P20, H11, H13, S2, O1	under 32 over 32	250 - 400	.00015 .0003	.0003 .0006	.0005 .0010	.0008 .0015	.0010 .0020	.0015 .0025	.0020 .0030	.0030 .0040	.0035 .0050
MEDIUM ALLOY STEELS	200, 250, 300	under 32 over 32	300 - 450	.0002 .0004	.0005 .0010	.0010 .0015	.0015 .0025	.0020 .0030	.0030 .0045	.0035 .0055	.0050 .0070	.0060 .0080
CARBON STEELS	A36, 12L14, 12L15, 1005, 1018, 1020, 1108-1119, 1213-1215, 1513-1518, 4012, 5015, 9310	under 32 over 32	350 - 500	.0002 .0004	.0005 .0010	.0010 .0015	.0015 .0025	.0020 .0030	.0030 .0045	.0035 .0055	.0050 .0070	.0060 .0080
DUCTILE	Ductile Cast Irons		200 - 300	.00025 .00035	.0003 .0006	.0005 .0010	.0008 .0015	.0010 .0020	.0015 .0025	.0020 .0030	.0030 .0040	.0030 .0050
CAST IRONS	Gray Cast Irons		250 - 350	.00025 .00035	.0004 .0008	.0005 .0010	.0008 .0015	.0010 .0020	.0015 .0025	.0020 .0030	.0030 .0040	.0030 .0050
MALLEABLE	A220, A436, A439, A602		200 - 300	.00025 .00035	.0003 .0006	.0005 .0010	.0008 .0015	.0010 .0020	.0015 .0025	.0020 .0030	.0030 .0040	.0030 .0050
ALUMINUM	2014, 2024, 6061-(T1-T6), 7075, Die Cast, Extruded		800 - 1400	.0002 .0004	.0005 .0010	.0010 .0015	.0015 .0025	.0020 .0030	.0030 .0045	.0035 .0055	.0050 .0070	.0060 .0100
HIGH SILICON			475 - 750	.00015 .00022	.00035 .0004	.00075 .0008	.0010 .0020	.0015 .0025	.0018 .0028	.0023 .0030	.0028 .0031	.0035 .0050
MAGNESIUM			800 - 1400	.0003 .0005	.0005 .0010	.0010 .0015	.0015 .0025	.0020 .0030	.0030 .0045	.0035 .0055	.0050 .0070	.0060 .0100
COPPER, COPPER ALLOYS			450 - 1000	.00025 .00035	.0003 .0006	.0005 .0010	.0008 .0015	.0010 .0020	.0015 .0025	.0020 .0030	.0030 .0040	.0035 .0050
BRASS, BRONZE	Brass, Alum/Bronze, Low Silicon Bronze		550 - 800	.0002 .0005	.0005 .0010	.0010 .0015	.0015 .0025	.0020 .0030	.0030 .0045	.0035 .0055	.0050 .0070	.0060 .0100
COMPOSITES	G-10 Fiberglass, Graphite, Graphite/Epoxy, Plastics		800 - 1400	.0003 .0005	.0005 .0010	.0010 .0015	.0015 .0025	.0020 .0030	.0030 .0045	.0035 .0055	.0050 .0070	.0060 .0100

HIGH PERFORMANCE TAPS

Spiral Point - ANSI Threads



- Best used for through hole tapping applications
- Optimized for steel, steel alloys, stainless steels, and a variety of other steels up to 32 Rc
- Taps are on blanks that meet ANSI specifications
- Steam Oxide finish provides decreased galling and increased lubricity in low carbon steels and gummy materials
- TiCN coating adds enhanced performance when AlTiN cannot be used
- AlTiN coating offers increased wear and heat resistance
- Premium powdered metal
- Precision manufactured in the USA

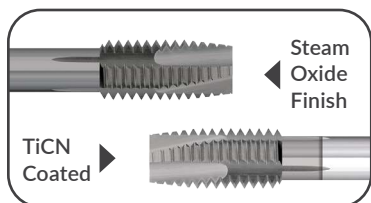
SIZE	H LIMIT	FLUTES	UNCOATED		STEAM OXIDE		TiCN COATED		AlTiN COATED	
			TOOL #	PRICE	TOOL #	PRICE	TOOL #	PRICE	TOOL #	PRICE
2-56	H2	2	TT97003	22.70	TT96903	23.40	TT97903	26.50	TT97103	27.05
4-40	H2	2	TT97015	17.50	TT96915	18.90	TT97915	25.30	TT97115	25.30
6-32	H3	2	TT97024	17.50	TT96924	18.90	TT97924	25.30	TT97124	25.30
8-32	H3	3	TT97030	17.50	TT96930	18.90	TT97930	25.30	TT97130	25.30
10-24	H3	3	TT97036	17.50	TT96936	19.20	TT97936	25.30	TT97136	25.30
10-32	H3	3	TT97040	17.50	TT96940	19.20	TT97940	25.30	TT97140	25.30
1/4-20	H3	3	TT97044	19.25	TT96944	21.15	TT97944	27.65	TT97144	27.65
1/4-20	H5	3	TT97048	19.25	TT96948	21.15	TT97948	27.65	TT97148	27.65
1/4-28	H3	3	TT97051	19.25	TT96951	21.15	TT97951	27.65	TT97151	27.65
1/4-28	H4	3	TT97054	19.15	TT96954	21.15	TT97954	24.95	TT97154	27.65
5/16-18	H3	3	TT97057	21.05	TT96957	23.25	TT97957	30.25	TT97157	31.90
5/16-18	H5	3	TT97060	21.05	TT96960	23.25	TT97960	30.25	TT97160	31.90
5/16-24	H3	3	TT97063	21.05	TT96963	23.25	TT97963	27.85	TT97163	31.90
5/16-24	H4	3	TT97066	20.95	TT96966	23.25	TT97966	27.85	TT97166	30.25
3/8-16	H3	3	TT97069	25.00	TT96969	27.55	TT97969	35.95	TT97169	35.95
3/8-16	H5	3	TT97071	25.00	TT96971	27.55	TT97971	35.95	TT97171	35.95
3/8-24	H3	3	TT97073	25.00	TT96973	27.55	TT97973	35.95	TT97173	35.95
3/8-24	H4	3	TT97075	24.90	TT96975	27.55	TT97975	35.95	TT97175	34.95
7/16-14	H3	3	TT97076	31.85	TT96976	34.45	TT97976	39.30	TT97176	41.15
7/16-14	H5	3	TT97078	32.00	TT96978	35.05	TT97978	46.05	TT97178	41.25
7/16-20	H3	3	TT97079	31.85	TT96979	34.90	TT97979	46.05	TT97179	41.15
7/16-20	H5	3	TT97081	31.85	TT96981	34.90	TT97981	46.05	TT97181	41.15
1/2-13	H3	3	TT97083	38.05	TT96983	41.25	TT97983	55.00	TT97183	55.00
1/2-13	H5	3	TT97085	38.05	TT96985	41.25	TT97985	45.45	TT97185	55.00
1/2-20	H3	3	TT97087	38.05	TT96987	41.25	TT97987	55.00	TT97187	55.00
1/2-20	H5	3	TT97089	38.05	TT96989	41.25	TT97989	55.00	TT97189	55.00
5/8-11	H3	4	TT97091	72.50	TT96991	78.35	TT97991	104.75	TT97191	104.75
5/8-11	H6	4	TT97093	72.50	TT96993	76.30	TT97993	104.75	TT97193	104.75
5/8-18	H3	4	TT97094	72.80	TT96994	76.60	TT97994	82.85	TT97194	85.35
5/8-18	H5	4	TT97095	72.50	TT96995	76.30	TT97995	82.55	TT97195	85.10
3/4-10	H3	4	TT97099	93.75	TT96999	99.00	TT97999	106.30	TT97199	135.40
3/4-10	H6	4	TT97096	93.75	TT96996	99.00	TT97996	106.30	TT97196	135.40
3/4-16	H3	4	TT97097	93.75	TT96997	99.00	TT97997	106.30	TT97197	109.45
3/4-16	H5	4	TT97098	94.20	TT96998	99.45	TT97998	106.70	TT97198	109.85

All taps sold individually
 Sizes 3/8" and smaller have male center

For technical information, see pages 344

HIGH PERFORMANCE TAPS

Spiral Point - Metric Threads



- Best used for through hole tapping applications
- Optimized for steel, steel alloys, stainless steels, and a variety of other steels up to 32 Rc
- Taps are on blanks that meet ANSI specifications
- Steam Oxide finish provides decreased galling and increased lubricity in low carbon steels and gummy materials
- TiCN coating adds enhanced performance when AlTiN cannot be used
- AlTiN coating offers increased wear and heat resistance
- Premium powdered metal
- Precision manufactured in the USA

SIZE	D LIMIT	FLUTES	UNCOATED		STEAM OXIDE		TiCN COATED		AlTiN COATED	
			TOOL #	PRICE	TOOL #	PRICE	TOOL #	PRICE	TOOL #	PRICE
M2.5 x 0.45	D3	2	TT98208	20.00	TT98301	21.45	TT98955	28.00	TT98418	28.00
M3 x 0.5	D3	2	TT98210	20.00	TT98303	21.45	TT98961	28.00	TT98420	28.00
M3.5 x 0.6	D3	3	TT98221	19.90	TT98317	20.65	TT98979	28.00	TT98431	28.00
M3.5 x 0.6	D4	3	TT98222	19.90	TT98318	21.45	TT98962	23.70	TT98432	24.65
M4 x 0.7	D3	3	TT98224	20.00	TT98321	21.55	TT98981	28.00	TT98433	28.00
M4 x 0.7	D4	3	TT98211	20.00	TT98304	21.55	TT98963	23.95	TT98421	28.00
M5 x 0.8	D3	3	TT98226	19.90	TT98323	21.55	TT98983	28.00	TT98435	28.00
M5 x 0.8	D4	3	TT98212	20.00	TT98305	21.65	TT98965	26.10	TT98422	28.00
M6 x 1.0	D3	3	TT98228	21.85	TT98325	23.90	TT98985	30.75	TT98437	30.75
M6 x 1.0	D5	3	TT98213	21.85	TT98306	23.90	TT98967	30.75	TT98423	30.75
M8 x 1.25	D3	3	TT98230	23.75	TT98327	26.15	TT98987	33.50	TT98439	33.50
M8 x 1.25	D5	3	TT98214	23.75	TT98308	26.15	TT98969	33.50	TT98424	33.50
M10 x 1.5	D3	3	TT98232	28.20	TT98329	30.85	TT98989	39.40	TT98441	39.40
M10 x 1.5	D6	3	TT98215	28.20	TT98310	31.00	TT98971	39.40	TT98425	39.40
M12 x 1.75	D3	3	TT98234	43.25	TT98331	46.70	TT98991	60.75	TT98443	60.75
M12 x 1.75	D6	3	TT98216	43.25	TT98312	46.70	TT98973	60.75	TT98426	60.75
M14 x 2.0	D3	3	TT98236	65.95	TT98333	69.35	TT98993	74.55	TT98445	76.70
M14 x 2.0	D7	3	TT98218	65.95	TT98314	69.35	TT98975	74.55	TT98428	83.55
M16 x 2.0	D3	3	TT98238	77.45	TT98335	81.25	TT98995	87.50	TT98447	90.05
M16 x 2.0	D7	3	TT98220	77.45	TT98316	83.65	TT98977	87.50	TT98430	98.10

All taps sold individually
 Sizes 3/8" and smaller have male center



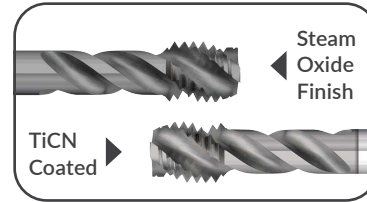
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HIGH PERFORMANCE TAPS

Spiral Flute Semi-Bottoming - ANSI Threads

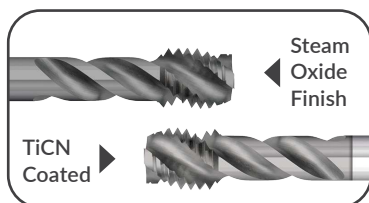


- Best used for blind hole tapping applications
- Features a 2 – 2½ thread chamfer
- Semi-bottoming 45° helix
- Optimized for steel, steel alloys, stainless steels, and a variety of other steels up to 32 Rc
- Taps are on blanks that meet ANSI specifications
- Steam Oxide finish provides decreased galling and increased lubricity in low carbon steels and gummy materials
- TiCN coating adds enhanced performance when AlTiN cannot be used
- AlTiN coating offers increased wear and heat resistance
- High vanadium powdered metal
- Precision manufactured in the USA

SIZE	H LIMIT	FLUTES	UNCOATED		STEAM OXIDE		TiCN COATED		AlTiN COATED	
			TOOL #	PRICE	TOOL #	PRICE	TOOL #	PRICE	TOOL #	PRICE
2-56	H2	2	TT97203	27.35	TT97503	29.25	TT97603	31.15	TT97303	39.10
4-40	H2	3	TT97207	27.35	TT97507	29.25	TT97607	39.10	TT97307	39.10
6-32	H3	3	TT97215	27.35	TT97515	29.25	TT97615	39.10	TT97315	39.10
8-32	H3	3	TT97223	27.35	TT97523	29.25	TT97623	39.10	TT97323	39.10
10-24	H3	3	TT97227	27.35	TT97527	29.35	TT97627	32.20	TT97327	39.10
10-32	H3	3	TT97231	27.35	TT97531	29.35	TT97631	39.10	TT97331	39.10
1/4-20	H3	3	TT97237	28.05	TT97537	30.15	TT97637	40.35	TT97337	40.35
1/4-20	H5	3	TT97239	28.05	TT97539	30.15	TT97639	40.35	TT97339	40.35
1/4-28	H3	3	TT97241	28.05	TT97541	30.15	TT97641	40.35	TT97341	40.35
1/4-28	H4	3	TT97243	28.05	TT97543	30.15	TT97643	32.55	TT97343	40.35
5/16-18	H3	3	TT97245	30.85	TT97545	33.15	TT97645	44.15	TT97345	44.15
5/16-18	H5	3	TT97247	30.85	TT97547	33.15	TT97647	44.15	TT97347	44.15
5/16-24	H3	3	TT97249	30.75	TT97549	33.05	TT97649	44.15	TT97349	44.15
5/16-24	H4	3	TT97251	30.75	TT97551	33.05	TT97651	44.15	TT97351	39.35
3/8-16	H3	3	TT97253	36.35	TT97553	39.10	TT97653	52.35	TT97353	52.35
3/8-16	H5	3	TT97255	36.35	TT97555	39.10	TT97655	52.35	TT97355	52.35
3/8-24	H3	3	TT97257	36.35	TT97557	39.10	TT97657	44.40	TT97357	52.35
3/8-24	H4	3	TT97259	36.35	TT97559	39.00	TT97659	52.35	TT97359	52.35
7/16-14	H3	3	TT97261	46.25	TT97561	49.50	TT97661	53.65	TT97361	66.20
7/16-14	H5	3	TT97263	46.25	TT97563	49.50	TT97663	53.65	TT97363	55.50
7/16-20	H3	3	TT97265	46.25	TT97565	49.30	TT97665	66.20	TT97365	55.50
7/16-20	H5	3	TT97267	46.25	TT97567	49.50	TT97667	66.20	TT97367	55.50
1/2-13	H3	3	TT97269	54.60	TT97569	58.70	TT97669	78.55	TT97369	78.55
1/2-13	H5	3	TT97271	54.60	TT97571	58.70	TT97671	78.55	TT97371	78.55
1/2-20	H3	3	TT97273	54.60	TT97573	57.65	TT97673	78.55	TT97373	63.85
1/2-20	H5	3	TT97275	54.60	TT97575	58.70	TT97675	78.55	TT97375	78.55
5/8-11	H3	3	TT97277	104.80	TT97577	108.55	TT97677	150.00	TT97377	150.00
5/8-11	H6	3	TT97279	104.30	TT97579	112.15	TT97679	150.00	TT97379	116.85
5/8-18	H3	3	TT97281	104.80	TT97581	108.55	TT97681	114.80	TT97381	117.35
5/8-18	H5	3	TT97283	104.30	TT97583	112.15	TT97683	110.10	TT97383	116.85
3/4-10	H3	4	TT97285	121.90	TT97585	131.05	TT97685	134.40	TT97385	175.35
3/4-10	H6	4	TT97287	122.50	TT97587	131.05	TT97687	175.35	TT97387	142.20
3/4-16	H3	4	TT97289	121.90	TT97589	127.15	TT97689	134.40	TT97389	137.55
3/4-16	H5	4	TT97291	121.90	TT97591	131.05	TT97691	134.40	TT97391	137.55

All taps sold individually
 Sizes 3/8" and smaller have male center

For technical information, see pages 344



HIGH PERFORMANCE TAPS

Spiral Flute Semi-Bottoming - Metric Threads



- Best used for blind hole tapping applications
- Features a 2 – 2½ thread chamfer
- Semi-bottoming 45° helix
- Optimized for steel, steel alloys, stainless steels, and a variety of other steels up to 32 Rc
- Taps are on blanks that meet ANSI specifications
- Steam Oxide finish provides decreased galling and increased lubricity in low carbon steels and gummy materials
- TiCN coating adds enhanced performance when AlTiN cannot be used
- AlTiN coating offers increased wear and heat resistance
- High vanadium powdered metal
- Precision manufactured in the USA

SIZE	H LIMIT	FLUTES	UNCOATED		STEAM OXIDE		TiCN COATED		AlTiN COATED	
			TOOL #	PRICE	TOOL #	PRICE	TOOL #	PRICE	TOOL #	PRICE
M2.5 x 0.45	D3	2	TT98508	31.05	TT98601	31.80	TT98845	42.60	TT98715	42.60
M3 x 0.5	D3	2	TT98510	31.05	TT98603	33.20	TT98851	42.60	TT98720	42.60
M3.5 x 0.6	D3	3	TT98521	30.90	TT98617	31.65	TT98869	34.70	TT98731	35.65
M3.5 x 0.6	D4	3	TT98522	30.90	TT98618	31.65	TT98852	34.70	TT98732	35.65
M4 x 0.7	D3	3	TT98523	31.05	TT98619	33.20	TT98871	42.60	TT98733	42.60
M4 x 0.7	D4	3	TT98511	31.05	TT98604	33.20	TT98853	42.60	TT98721	42.60
M5 x 0.8	D3	3	TT98525	31.05	TT98621	33.20	TT98873	42.60	TT98735	42.60
M5 x 0.8	D4	3	TT98512	31.05	TT98605	33.20	TT98855	35.90	TT98722	42.60
M6 x 1.0	D3	3	TT98527	31.80	TT98623	34.20	TT98875	44.15	TT98737	44.15
M6 x 1.0	D5	3	TT98513	31.80	TT98606	34.20	TT98857	44.15	TT98723	44.15
M8 x 1.25	D3	3	TT98529	35.10	TT98625	37.55	TT98877	48.90	TT98739	48.90
M8 x 1.25	D5	3	TT98514	35.10	TT98608	37.55	TT98859	41.95	TT98724	48.90
M10 x 1.5	D3	3	TT98531	41.30	TT98627	44.40	TT98879	57.60	TT98741	57.60
M10 x 1.5	D6	3	TT98515	41.30	TT98610	44.40	TT98861	57.60	TT98725	51.30
M12 x 1.75	D3	3	TT98533	61.95	TT98629	66.60	TT98881	86.75	TT98743	71.20
M12 x 1.75	D6	3	TT98516	61.95	TT98612	65.00	TT98863	69.35	TT98726	86.75
M14 x 2.0	D3	3	TT98535	87.80	TT98631	91.25	TT98883	96.40	TT98745	98.55
M14 x 2.0	D7	3	TT98518	87.80	TT98614	94.45	TT98865	96.40	TT98728	98.55
M16 x 2.0	D3	3	TT98537	103.25	TT98633	110.45	TT98885	113.25	TT98747	115.80
M16 x 2.0	D7	3	TT98520	102.75	TT98616	106.55	TT98867	112.80	TT98730	129.70

All taps sold individually
 Sizes 3/8" and smaller have male center

GENERAL PURPOSE TAPS - HIGH SPEED STEEL

Hand Taps



- For optimal results, use a Taper Tap for an initial pass, prior to using a Plug or Bottom Tap to finish the thread
- Taps are on blanks that meet ANSI specifications
- High speed steel
- Precision manufactured in the USA

SIZE	H LIMIT	FLUTES	TAPER	PLUG	BOTTOM	PRICE
0-80*	H1	2	TT90000	TT90001	TT90002	12.05
0-80	H2	2		TT90005	TT90006	12.05
1-64	H1	2		TT90009	TT90010	11.20
1-72*	H1	2	TT90016	TT90017	TT90018	11.20
1-72	H2	2		TT90021	TT90022	11.20
2-56	H1	3	TT90028	TT90029	TT90030	10.30
2-56	H2	2		TT90033	TT90034	10.30
2-56*	H2	3	TT90036	TT90037	TT90038	9.60
2-64	H2	3	TT90044	TT90045	TT90046	10.30
3-48	H2	2		TT90053		8.40
3-48*	H2	3	TT90056	TT90057	TT90058	7.45
3-56	H2	3	TT90060	TT90061	TT90062	8.30
4-40	H1	2		TT90065		6.80
4-40	H1	3	TT90068	TT90069	TT90070	6.55
4-40	H2	2		TT90073	TT90074	6.55
4-40*	H2	3	TT90076	TT90077	TT90078	6.10
4-48	H2	3	TT90084	TT90085	TT90086	6.55
4-36	H2	3		TT90089		6.55
5-40	H1	3		TT90093	TT90094	6.55
5-40	H2	2		TT90097	TT90098	6.55
5-40*	H2	3	TT90100	TT90101	TT90102	6.10
5-44	H2	3	TT90108	TT90109	TT90110	6.55
6-32	H1	3	TT90116	TT90117	TT90118	5.80
6-32	H2	2		TT90121	TT90122	5.80
6-32*	H2	3	TT90124	TT90125	TT90126	4.90
6-32	H3	2		TT90129	TT90130	4.90
6-32	H3	3	TT90132	TT90133	TT90134	4.70
6-32	H7	3		TT90137	TT90138	5.80
6-40	H2	2		TT90145		5.80
6-40*	H2	3	TT90148	TT90149	TT90150	4.90
8-32	H1	3		TT90157	TT90158	5.80
8-32	H1	4	TT90160	TT90161	TT90162	5.80
8-32	H2	2		TT90165	TT90166	5.80
8-32	H2	3		TT90169	TT90170	5.80
8-32	H2	4	TT90172	TT90173	TT90174	4.90
8-32	H3	2		TT90177	TT90178	4.90
8-32	H3	3		TT90181	TT90182	4.90
8-32*	H3	4	TT90184	TT90185	TT90186	4.75
8-32	H7	3		TT90189	TT90190	5.80
8-36	H1	4		TT90197		5.80
8-36*	H2	4	TT90200	TT90201	TT90202	4.90
10-24	H1	3		TT90205		5.80
10-24	H1	4	TT90208	TT90209	TT90210	5.05
10-24	H2	2		TT90213	TT90214	5.80
10-24	H2	3		TT90217		5.80

* Most Popular Size When Multiple Options Are Available

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All taps sold individually

For technical information, see pages 345 - 349

GENERAL PURPOSE TAPS - HIGH SPEED STEEL

Hand Taps (Cont.)

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SIZE	H LIMIT	FLUTES	TAPER	PLUG	BOTTOM	PRICE
10-24	H2	4	TT90220	TT90221	TT90222	5.05
10-24	H3	2		TT90225	TT90226	5.05
10-24	H3	3		TT90229	TT90230	5.05
10-24*	H3	4	TT90232	TT90233	TT90234	4.90
10-24	H7	3		TT90237	TT90238	5.80
10-24	H7	4		TT90241	TT90242	5.80
10-32	H1	2		TT90245	TT90246	5.80
10-32	H1	3		TT90249		5.80
10-32	H1	4	TT90252	TT90253	TT90254	5.05
10-32	H2	2		TT90257	TT90258	5.80
10-32	H2	3		TT90261	TT90262	5.80
10-32	H2	4	TT90264	TT90265	TT90266	5.05
10-32	H3	2		TT90269	TT90270	5.05
10-32	H3	3		TT90273	TT90274	5.05
10-32*	H3	4	TT90276	TT90277	TT90278	4.90
12-24	H3	4	TT90288	TT90289	TT90290	5.20
12-28	H3	4	TT90296	TT90297	TT90298	5.80
1/4-20	H1	3		TT90301		6.65
1/4-20	H1	4	TT90304	TT90305	TT90306	6.65
1/4-20	H2	3		TT90309		6.65
1/4-20	H2	4	TT90311	TT90312	TT90313	6.35
1/4-20	H3	2		TT90316	TT90317	6.65
1/4-20	H3	3		TT90320	TT90321	6.35
1/4-20*	H3	4	TT90323	TT90324	TT90325	5.30
1/4-20	H5	3		TT90328	TT90329	6.65
1/4-20	H5	4		TT90332	TT90333	6.35
1/4-28	H1	4		TT90336	TT90337	6.35
1/4-28	H2	4		TT90340	TT90341	6.65
1/4-28	H3	2		TT90344	TT90345	6.65
1/4-28	H3	3		TT90348	TT90349	6.65
1/4-28*	H3	4	TT90351	TT90352	TT90353	5.30
1/4-28	H4	4		TT90356	TT90357	6.65
5/16-18	H1	4	TT90359	TT90360	TT90361	7.30
5/16-18	H2	4	TT90363	TT90364	TT90365	7.30
5/16-18	H3	2		TT90368	TT90369	8.30
5/16-18	H3	3		TT90372	TT90373	7.30
5/16-18*	H3	4	TT90375	TT90376	TT90377	6.55
5/16-18	H5	3		TT90380	TT90381	8.30
5/16-18	H5	4		TT90384	TT90385	7.30
5/16-24	H1	4		TT90388	TT90389	7.30
5/16-24	H2	4		TT90392		7.30
5/16-24	H3	3		TT90396	TT90397	7.30
5/16-24*	H3	4	TT90399	TT90400	TT90401	6.55
5/16-24	H4	4		TT90404	TT90405	7.30
3/8-16	H1	3		TT90408		9.50
3/8-16	H2	4	TT90414	TT90415	TT90416	8.30
3/8-16	H3	3		TT90419	TT90420	8.30
3/8-16*	H3	4	TT90422	TT90423	TT90424	7.45
3/8-16	H5	3		TT90427	TT90428	9.50
3/8-16	H5	4		TT90431	TT90432	8.30
3/8-24	H3	3		TT90443	TT90444	9.50
3/8-24*	H3	4	TT90446	TT90447	TT90448	7.45
3/8-24	H4	4		TT90451	TT90452	8.30
7/16-14	H2	4		TT90459	TT90460	14.05

* Most Popular Size When Multiple Options Are Available

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For technical information, see pages 345 - 349

GENERAL PURPOSE TAPS - HIGH SPEED STEEL

Hand Taps (Cont.)

continued from previous page

SIZE	H LIMIT	FLUTES	TAPER	PLUG	BOTTOM	PRICE
7/16-14	H3	3		TT90463		14.05
7/16-14*	H3	4	TT90465	TT90466	TT90467	12.80
7/16-14	H5	4		TT90470	TT90471	14.05
7/16-20	H2	4		TT90478	TT90479	14.05
7/16-20	H3	3		TT90482		14.05
7/16-20*	H3	4	TT90484	TT90485	TT90486	12.80
7/16-20	H5	4		TT90489	TT90490	14.05
1/2-13	H1	4		TT90493	TT90494	16.25
1/2-13	H2	4		TT90497	TT90498	16.25
1/2-13	H3	3		TT90501	TT90502	16.25
1/2-13*	H3	4	TT90504	TT90505	TT90506	13.20
1/2-13	H5	4		TT90509	TT90510	16.60
1/2-20	H1	4	TT90512	TT90513	TT90514	16.25
1/2-20	H3	3		TT90521		16.25
1/2-20*	H3	4	TT90523	TT90524	TT90525	15.00
1/2-20	H5	4		TT90528	TT90529	16.25
9/16-12	H2	4		TT90532		24.20
9/16-12*	H3	4	TT90535	TT90536	TT90537	22.35
9/16-12	H5	4		TT90540	TT90541	24.20
9/16-18	H2	4		TT90544		24.20
9/16-18*	H3	4	TT90546	TT90547	TT90548	22.35
9/16-18	H5	4		TT90551	TT90552	24.20
5/8-11*	H3	4	TT90561	TT90562	TT90563	26.70
5/8-11	H5	4		TT90566	TT90567	30.65
5/8-18	H2	4		TT90574	TT90575	30.65
5/8-18*	H3	4	TT90577	TT90578	TT90579	26.70
11/16-11	H3	4	TT90585	TT90586	TT90587	33.15
11/16-16	H3	4	TT90589	TT90590	TT90591	33.15
3/4-10	H2	4		TT90597		40.30
3/4-10*	H3	4	TT90600	TT90601	TT90602	37.30
3/4-10	H5	4		TT90605	TT90606	40.30
3/4-16	H2	4		TT90612		40.30
3/4-16*	H3	4	TT90615	TT90616	TT90617	37.30
3/4-16	H5	4		TT90620	TT90621	40.30
7/8-9*	H4	4	TT90626	TT90627	TT90628	51.95
7/8-9	H6	4		TT90631		54.75
7/8-14	H2	4		TT90634		54.75
7/8-14*	H4	4	TT90636	TT90637	TT90638	51.95
7/8-14	H6	4		TT90641		54.75
1-8	H2	4		TT90644		71.50
1-8*	H4	4	TT90646	TT90647	TT90648	69.00
1-8	H6	4		TT90651		71.50
1-12	H4	4	TT90653	TT90654	TT90655	69.00
1-14	H2	4		TT90658		71.50
1-14*	H4	4	TT90660	TT90661	TT90662	69.00
1-14	H6	4	TT90664	TT90665	TT90666	71.50
1-1/8-7	H4	4	TT90668	TT90669	TT90670	111.70
1-1/8-12	H4	4	TT90672	TT90673	TT90674	118.30
1-1/4-7	H4	4	TT90676	TT90677	TT90678	146.70
1-1/4-12	H4	6	TT90680	TT90681	TT90682	149.20
1-3/8-6	H4	4	TT90684	TT90685	TT90686	185.15
1-3/8-12	H4	6	TT90688	TT90689	TT90690	186.45
1-1/2-6	H4	4	TT90692	TT90693	TT90694	213.75
1-1/2-12	H4	6	TT90696	TT90697	TT90698	216.65

* Most Popular Size When Multiple Options Are Available

For technical information, see pages 345 - 349

GENERAL PURPOSE TAPS - HIGH SPEED STEEL

Hand Taps - Steam Oxide Finish



- For optimal results, use a Taper Tap for an initial pass, prior to using a Plug or Bottom Tap to finish the thread
- Taps are on blanks that meet ANSI specifications
- Steam Oxide finish provides decreased galling and increased lubricity in low carbon steels and gummy materials
- High speed steel
- Precision manufactured in the USA

SIZE	H LIMIT	FLUTES	TAPER	PLUG	BOTTOM	PRICE
0-80	H1	2	TT90000S	TT90001S	TT90002S	12.85
2-56	H2	3	TT90036S	TT90037S	TT90038S	10.40
3-48	H2	3	TT90056S	TT90057S	TT90058S	8.25
4-40	H2	3	TT90076S	TT90077S	TT90078S	6.90
4-48	H2	3	TT90084S	TT90085S	TT90086S	7.35
5-40	H2	3	TT90100S	TT90101S	TT90102S	6.90
6-32	H2	3	TT90124S	TT90125S	TT90126S	5.70
6-40	H2	3	TT90148S	TT90149S	TT90150S	5.70
8-32	H3	4	TT90184S	TT90185S	TT90186S	5.60
8-36	H2	4	TT90200S	TT90201S	TT90202S	5.80
10-24	H3	4	TT90232S	TT90233S	TT90234S	5.80
10-32	H3	4	TT90276S	TT90277S	TT90278S	5.80
12-24	H3	4	TT90288S	TT90289S	TT90290S	6.10
12-28	H3	4	TT90296S	TT90297S	TT90298S	6.75
1/4-20	H3	4	TT90323S	TT90324S	TT90325S	6.25
1/4-28	H3	4	TT90351S	TT90352S	TT90353S	6.25
5/16-18	H3	4	TT90375S	TT90376S	TT90377S	7.65
5/16-24	H3	4	TT90399S	TT90400S	TT90401S	7.65
3/8-16	H3	4	TT90422S	TT90423S	TT90424S	8.65
3/8-24	H3	4	TT90446S	TT90447S	TT90448S	8.65
7/16-14	H3	4	TT90465S	TT90466S	TT90467S	14.90
7/16-20	H3	4	TT90484S	TT90485S	TT90486S	14.90
1/2-13	H3	4	TT90504S	TT90505S	TT90506S	15.50
1/2-20	H3	4	TT90523S	TT90524S	TT90525S	17.50
9/16-12	H3	4	TT90535S	TT90536S	TT90537S	25.95
9/16-18	H3	4	TT90546S	TT90547S	TT90548S	25.95
5/8-11	H3	4	TT90561S	TT90562S	TT90563S	30.65
5/8-18	H3	4	TT90577S	TT90578S	TT90579S	30.65
3/4-10	H3	4	TT90600S	TT90601S	TT90602S	42.80
3/4-16	H3	4	TT90615S	TT90616S	TT90617S	42.80
7/8-9	H4	4	TT90626S	TT90627S	TT90628S	58.35
7/8-14	H4	4	TT90636S	TT90637S	TT90638S	58.35
1-8	H4	4	TT90646S	TT90647S	TT90648S	77.70
1-12	H4	4	TT90653S	TT90654S	TT90655S	77.70
1-14	H4	4	TT90660S	TT90661S	TT90662S	77.70
1-1/8-7	H4	4	TT90668S	TT90669S	TT90670S	121.55
1-1/8-12	H4	4	TT90672S	TT90673S	TT90674S	128.15
1-1/4-7	H4	4	TT90676S	TT90677S	TT90678S	159.00
1-1/4-12	H4	6	TT90680S	TT90681S	TT90682S	161.50
1-3/8-6	H4	4	TT90684S	TT90685S	TT90686S	198.85
1-3/8-12	H4	6	TT90688S	TT90689S	TT90690S	200.15
1-1/2-6	H4	4	TT90692S	TT90693S	TT90694S	227.45
1-1/2-12	H4	6	TT90696S	TT90697S	TT90698S	232.95

* Most Popular Size When Multiple Options Are Available

All taps sold individually

For technical information, see pages 345 - 349

GENERAL PURPOSE TAPS - HIGH SPEED STEEL

Hand Taps - Nitride & Steam Oxide Finish



- Optimized for all types of gray, ductile, and malleable cast iron ferrous materials.
- Taps are on blanks that meet ANSI specifications
- Nitride & Steam Oxide finish provides increased surface hardness and retains liquid lubricant at cutting edge, preventing chip welding and reducing friction
- High speed steel
- Precision manufactured in the USA

SIZE	H LIMIT	FLUTES	PLUG	BOTTOM	PRICE
4-40	H2	3	TT90077NS	TT90078NS	7.10
6-32	H2	3	TT90125NS	TT90126NS	5.80
6-40	H2	3	TT90149NS	TT90150NS	5.80
8-32	H3	4	TT90185NS	TT90186NS	5.60
10-24	H3	4	TT90233NS	TT90234NS	5.80
10-32	H3	4	TT90277NS	TT90278NS	5.80
1/4-20	H3	4	TT90324NS	TT90325NS	6.25
1/4-28	H3	4	TT90352NS	TT90353NS	6.25
5/16-18	H3	4	TT90376NS	TT90377NS	7.65
3/8-16	H3	4	TT90423NS	TT90424NS	8.65
3/8-24	H3	4	TT90447NS	TT90448NS	8.65
7/16-14	H3	4	TT90466NS	TT90467NS	14.90
7/16-20	H3	4	TT90485NS	TT90486NS	14.55
1/2-13	H3	4	TT90505NS	TT90506NS	15.50
1/2-20	H3	4	TT90524NS	TT90525NS	17.50
9/16-12	H3	4	TT90536NS	TT90537NS	26.00
9/16-18	H3	4	TT90547NS	TT90548NS	26.00
5/8-11	H3	4	TT90562NS	TT90563NS	31.20
5/8-18	H3	4	TT90578NS	TT90579NS	31.20
3/4-10	H3	4	TT90601NS	TT90602NS	43.65
3/4-16	H3	4	TT90616NS	TT90617NS	43.65
7/8-9	H4	4	TT90627NS	TT90628NS	59.40
7/8-14	H4	4	TT90637NS	TT90638NS	59.40
1-8	H4	4	TT90647NS	TT90648NS	78.90
1-1/8-7	H4	4	TT90669NS	TT90670NS	122.60
1-1/4-7	H4	4	TT90677NS	TT90678NS	160.70
1-1/4-12	H4	6	TT90681NS	TT90682NS	163.25
1-1/2-6	H4	4	TT90693NS	TT90694NS	229.15
1-1/2-12	H4	6	TT90697NS	TT90698NS	232.95

All taps sold individually

GENERAL PURPOSE TAPS - HIGH SPEED STEEL

Hand Taps - TiN Coated



- For optimal results, use a Taper Tap for an initial pass, prior to using a Plug or Bottom Tap to finish the thread
- Taps are on blanks that meet ANSI specifications
- TiN coating provides improved performance in a wide variety of materials, and generally used in applications with lower cutting speeds
- High speed steel
- Precision manufactured in the USA

SIZE	H LIMIT	FLUTES	TAPER	PLUG	BOTTOM	PRICE
0 - 80	H1	2	TT75200	TT75201	TT75202	20.20
2 - 56	H2	3	TT75223	TT75224	TT75225	16.20
4 - 40	H2	3	TT75249	TT75250	TT75251	10.20
5 - 40	H2	3	TT75266	TT75267	TT75268	10.20
6 - 32	H3	3	TT75288	TT75289	TT75290	8.30
8 - 32	H3	4	TT75319	TT75320	TT75321	8.55
10 - 24	H3	4	TT75348	TT75349	TT75350	9.05
10 - 32	H3	4	TT75375	TT75376	TT75377	9.05
12 - 24	H3	4	TT75383	TT75384	TT75385	9.60
12 - 28	H3	4	TT75388	TT75389	TT75390	10.40
1/4 - 20	H3	4	TT75406	TT75407	TT75408	9.75
1/4 - 28	H3	4	TT75422	TT75423	TT75424	9.75
5/16 - 18	H3	4	TT75439	TT75440	TT75441	12.05
5/16 - 24	H3	4	TT75454	TT75455	TT75456	12.05
3/8 - 16	H3	4	TT75469	TT75470	TT75471	13.60
3/8 - 24	H3	4	TT75484	TT75485	TT75486	13.60
7/16 - 14	H3	4	TT75495	TT75496	TT75497	21.35
7/16 - 20	H3	4	TT75506	TT75507	TT75508	21.35
1/2 - 13	H3	4	TT75518	TT75519	TT75520	22.25
1/2 - 20	H3	4	TT75530	TT75531	TT75532	25.15
9/16 - 18	H3	4	TT75544	TT75545	TT75546	34.25
5/8 - 11	H3	4	TT75552	TT75553	TT75554	44.90
5/8 - 18	H3	4	TT75561	TT75562	TT75563	44.90
3/4 - 10	H3	4	TT75577	TT75578	TT75579	62.75
3/4 - 16	H3	4	TT75585	TT75586	TT75587	62.75
1 - 8	H4	4	TT75604	TT75605	TT75606	106.50

All taps sold individually

GENERAL PURPOSE TAPS - HIGH SPEED STEEL

Hand Taps - Metric - Uncoated



- For optimal results, use a Taper Tap for an initial pass, prior to using a Plug or Bottom Tap to finish the thread
- Taps are on blanks that meet ANSI specifications
- High speed steel
- Precision manufactured in the USA

SIZE	D LIMIT	FLUTES	TAPER	PLUG	BOTTOM	PRICE
M1.6 x 0.35	D3	2		TT93002		16.05
M2 x 0.4	D3	3	TT93007	TT93008	TT93009	16.05
M2.5 x 0.45	D3	3		TT93014		9.95
M3 x 0.5	D3	3	TT93016	TT93017	TT93018	8.25
M3.5 x 0.6	D4	3		TT93020		6.80
M4 x 0.7	D4	4	TT93022	TT93023	TT93024	6.80
M4.5 x 0.75	D4	4		TT93026		6.80
M5 x 0.8	D4	4	TT93028	TT93029	TT93030	6.80
M6 x 1.0	D5	4	TT93031	TT93032	TT93033	7.15
M7 x 1.0	D5	4	TT93037	TT93038	TT93039	7.15
M8 x 1.25	D5	4	TT93043	TT93044	TT93045	7.15
M10 x 1.25	D5	4	TT93046	TT93047	TT93048	14.75
M10 x 1.50	D6	4	TT93049	TT93050	TT93051	14.75
M12 x 1.25	D5	4	TT93052	TT93053	TT93054	17.40
M12 x 1.75	D6	4	TT93055	TT93056	TT93057	17.40
M14 x 1.5	D6	4	TT93058	TT93059	TT93060	25.85
M14 x 2.0	D7	4	TT93061	TT93062	TT93063	25.85
M16 x 1.5	D6	4	TT93064	TT93065	TT93066	31.45
M16 x 2.0	D7	4	TT93067	TT93068	TT93069	31.45
M18 x 1.5	D6	4	TT93070	TT93071	TT93072	42.60
M18 x 2.5	D7	4	TT93073	TT93074	TT93075	42.60
M20 x 2.5	D7	4	TT93076	TT93077	TT93078	54.80
M24 x 3.0	D8	4	TT93082	TT93083	TT93084	80.70
M27 x 3.0	D8	4	TT93085	TT93086	TT93087	139.40
M30 x 3.5	D9	4	TT93088	TT93089	TT93090	177.20
M33 x 3.5	D9	4	TT93091	TT93092	TT93093	177.60
M36 x 4.0	D9	4	TT93094	TT93095	TT93096	225.15

All taps sold individually

GENERAL PURPOSE TAPS - HIGH SPEED STEEL

Hand Taps - Metric - TiN Coated



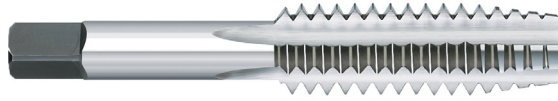
- For optimal results, use a Taper Tap for an initial pass, prior to using a Plug or Bottom Tap to finish the thread
- Taps are on blanks that meet ANSI specifications
- TiN coating provides improved performance in a wide variety of materials, and generally used in applications with lower cutting speeds
- High speed steel
- Precision manufactured in the USA

SIZE	D LIMIT	FLUTES	TAPER	PLUG	BOTTOM	PRICE
M1.6 x 0.35	D3	2		TT75700		27.05
M2 x 0.4	D3	3	TT75702	TT75704	TT75706	27.05
M2.5 x 0.45	D3	3		TT75708		16.60
M3 x 0.5	D3	3	TT75710	TT75712	TT75714	13.85
M3.5 x 0.6	D4	3		TT75716		11.45
M4 x 0.7	D4	4	TT75718	TT75720	TT75722	11.45
M4.5 x 0.75	D4	4		TT75724		11.45
M5 x 0.8	D4	4	TT75726	TT75728	TT75730	11.45
M6 x 1.0	D5	4	TT75732	TT75734	TT75736	12.75
M7 x 1.0	D5	4	TT75738	TT75740	TT75742	13.20
M8 x 1.25	D5	4	TT75744	TT75746	TT75748	13.20
M10 x 1.25	D5	4	TT75750	TT75752	TT75754	24.80
M10 x 1.50	D6	4	TT75756	TT75758	TT75760	24.80
M12 x 1.25	D5	4	TT75762	TT75764	TT75766	29.15
M12 x 1.75	D6	4	TT75768	TT75770	TT75772	29.15
M14 x 1.5	D6	4	TT75774	TT75776	TT75778	43.55
M14 x 2.0	D7	4	TT75780	TT75782	TT75784	43.55
M16 x 1.5	D6	4	TT75786	TT75788	TT75790	53.10
M16 x 2.0	D7	4	TT75792	TT75794	TT75796	53.10
M18 x 1.5	D6	4	TT75798	TT75800	TT75802	71.40
M18 x 2.5	D7	4	TT75804	TT75806	TT75808	71.40
M20 x 2.5	D7	4	TT75810	TT75812	TT75814	92.45
M24 x 3.0	D8	4	TT75816	TT75818	TT75820	98.00
M27 x 3.0	D8	4	TT75822	TT75824	TT75826	161.75
M30 x 3.5	D9	4	TT75828	TT75830	TT75832	203.65
M33 x 3.5	D9	4	TT75834	TT75836	TT75838	193.20
M36 x 4.0	D9	4	TT75840	TT75842	TT75844	253.85

All taps sold individually

GENERAL PURPOSE TAPS - HIGH SPEED STEEL

Hand Taps - 8 Pitch



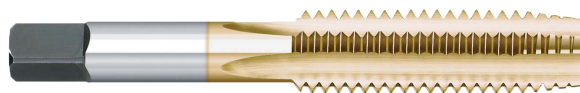
- Eight pitch large diameter taps are typically used in oil field, gas exploration and power plant maintenance
- Taps are on blanks that meet ANSI specifications
- High speed steel
- Precision manufactured in the USA

SIZE	H LIMIT	FLUTES	TAPER	PLUG	BOTTOM	PRICE
1-1/8-8	H5	4	TT90700	TT90701	TT90702	151.50
1-1/4-8	H5	4	TT90704	TT90705	TT90706	184.45
1-3/8-8	H5	4	TT90708	TT90709	TT90710	235.95
1-1/2-8	H5	4	TT90712	TT90713	TT90714	255.60
1-5/8-8	H6	6	TT90716	TT90717	TT90718	348.25
1-3/4-8	H6	6	TT90720	TT90721	TT90722	394.90
1-7/8-8	H6	6	TT90724	TT90725	TT90726	464.25
2"-8	H6	6	TT90728	TT90729	TT90730	489.80
2-1/4-8	H6	6	TT90732	TT90733	TT90734	657.55
2-1/2-8	H6	6	TT90736	TT90737	TT90738	892.45
2-5/8-8	H8	6	TT90740	TT90741	TT90742	962.70
2-3/4-8	H8	6	TT90744	TT90745	TT90746	1032.90
2-7/8-8	H8	6	TT90748	TT90749	TT90750	1126.80
3"-8	H8	6	TT90752	TT90753	TT90754	1243.95

All taps sold individually

GENERAL PURPOSE TAPS - HIGH SPEED STEEL

Hand Taps - Left Hand



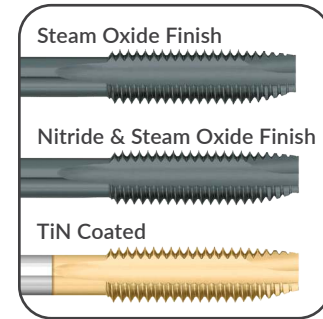
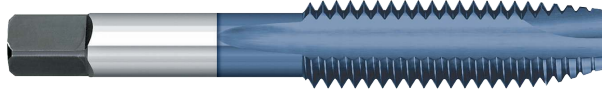
- Engineered to tap left hand threads
- For optimal results, use a Taper Tap for an initial pass prior to using a Plug or Bottom Tap to finish the thread
- Taps are on blanks that meet ANSI specifications
- TiN coating provides improved performance in a wide variety of materials, and generally used in applications with lower cutting speeds
- High speed steel
- Precision manufactured in the USA

SIZE	H LIMIT	FLUTES	UNCOATED				TiN COATED			
			TAPER	PLUG	BOTTOM	PRICE	TAPER	PLUG	BOTTOM	PRICE
6-32	H2	3	TT82920	TT82921	TT82922	19.70	TT82920TIN	TT82921TIN	TT82922TIN	21.85
8-32	H3	4	TT82923	TT82924	TT82925	22.65	TT82923TIN	TT82924TIN	TT82925TIN	24.95
10-24	H3	4	TT82926	TT82927	TT82928	28.10	TT82926TIN	TT82927TIN	TT82928TIN	30.85
10-32	H3	4	TT82929	TT82930	TT82931	28.10	TT82929TIN	TT82930TIN	TT82931TIN	30.85
1/4-20	H3	4	TT82932	TT82933	TT82934	30.25	TT82932TIN	TT82933TIN	TT82934TIN	33.65
1/4-28	H3	4	TT82935	TT82936	TT82937	30.25	TT82935TIN	TT82936TIN	TT82937TIN	33.65
5/16-18	H3	4	TT82938	TT82939	TT82940	37.30	TT82938TIN	TT82939TIN	TT82940TIN	43.90
5/16-24	H3	4	TT82941	TT82942	TT82943	37.30	TT82941TIN	TT82942TIN	TT82943TIN	43.90
3/8-16	H3	4	TT82944	TT82945	TT82946	38.65	TT82944TIN	TT82945TIN	TT82946TIN	46.35
3/8-24	H3	4	TT82947	TT82948	TT82949	38.65	TT82947TIN	TT82948TIN	TT82949TIN	46.35
7/16-14	H3	4	TT82950	TT82951	TT82952	48.20	TT82950TIN	TT82951TIN	TT82952TIN	52.40
7/16-20	H3	4	TT82953	TT82954	TT82955	48.20	TT82953TIN	TT82954TIN	TT82955TIN	52.40
1/2-13	H3	4	TT82956	TT82957	TT82958	50.20	TT82956TIN	TT82957TIN	TT82958TIN	54.40
1/2-20	H3	4	TT82959	TT82960	TT82961	56.85	TT82959TIN	TT82960TIN	TT82961TIN	61.05
5/8-11	H3	4	TT82962	TT82963	TT82964	75.90	TT82962TIN	TT82963TIN	TT82964TIN	81.60
5/8-18	H3	4	TT82965	TT82966	TT82967	75.90	TT82965TIN	TT82966TIN	TT82967TIN	81.60
3/4-10	H3	4	TT82968	TT82969	TT82970	106.25	TT82968TIN	TT82969TIN	TT82970TIN	113.35
3/4-16	H3	4	TT82971	TT82972	TT82973	106.25	TT82971TIN	TT82972TIN	TT82973TIN	113.35
7/8-9	H4	4	TT82974	TT82975	TT82976	148.00	TT82974TIN	TT82975TIN	TT82976TIN	156.45
7/8-14	H4	4	TT82977	TT82978	TT82979	148.00	TT82977TIN	TT82978TIN	TT82979TIN	156.45
1-8	H4	4	TT82980	TT82981	TT82982	163.90	TT82980TIN	TT82981TIN	TT82982TIN	174.95
1-14	H4	4	TT82983	TT82984	TT82985	163.90	TT82983TIN	TT82984TIN	TT82985TIN	174.95

All taps sold individually

GENERAL PURPOSE TAPS - HIGH SPEED STEEL

Spiral Point Plug Taps



- General purpose spiral point plug taps are best used for through hole applications
- Taps are on blanks that meet ANSI specifications
- AlTiN coating offers increased wear and heat resistance
- TiN coating provides improved performance in a wide variety of materials, and generally used in applications with lower cutting speeds
- Steam Oxide finish provides decreased galling and increased lubricity in low carbon steels and gummy materials
- Nitride & Steam Oxide finish provides increased surface hardness and acts as a lubricant and also retains liquid lubricant at cutting edge. Prevents chip welding and reduces friction
- High speed steel
- Precision manufactured in the USA

SIZE	H LIMIT	FLUTES	UNCOATED		STEAM OXIDE		NITRIDE & STEAM OXIDE		TiN COATED		AlTiN COATED	
			TOOL #	PRICE	TOOL #	PRICE	TOOL #	PRICE	TOOL #	PRICE	TOOL #	PRICE
0-80	H1	2	TT91000	14.80								
* 0-80	H2	2	TT91001	14.80	TT91001S	15.90			TT99401	20.50	TT98001	20.50
1-64	H1	2	TT91002	13.35								
* 1-64	H2	2	TT91003	13.40	TT91003S	14.20						
1-72	H1	2	TT91004	13.40								
* 1-72	H2	2	TT91005	13.40	TT91005S	14.20						
2-56	H1	2	TT91006	12.75								
* 2-56	H2	2	TT91007	11.40	TT91007S	12.20			TT99407	16.45	TT98002	16.45
2-64	H1	2	TT91008	12.75								
* 2-64	H2	2	TT91009	12.75	TT91009S	13.55						
3-48	H1	2	TT91010	9.15								
* 3-48	H2	2	TT91011	9.15	TT91011S	9.85						
3-56	H1	2	TT91012	11.20								
* 3-56	H2	2	TT91013	10.20	TT91013S	11.00						
4-40	H1	2	TT91014	8.30								
* 4-40	H2	2	TT91015	7.25	TT91015S	8.05	TT91015NS	8.25	TT99415	11.60	TT98003	12.30
4-48	H1	2	TT91016	8.50								
* 4-48	H2	2	TT91017	8.30	TT91017S	9.10	TT91017NS	9.30				
4-36	H2	2	TT91018	8.30	TT91018S	9.10	TT91018NS	9.30				
5-40	H1	2	TT91019	8.30								
* 5-40	H2	2	TT91020	7.25	TT91020S	8.05	TT91020NS	8.25	TT99420	11.60	TT98004	12.30
5-44	H2	2	TT91021	8.30	TT91021S	9.10	TT91021NS	9.30				
6-32	H1	2	TT91022	7.25								
6-32	H2	2	TT91023	6.25								
* 6-32	H3	2	TT91024	6.25	TT91024S	7.00	TT91024NS	7.20	TT99424	10.85	TT98005	11.25
6-32	H7	2	TT91025	6.90								
6-40	H1	2	TT91026	6.90								
6-40	H2	2	TT91027	6.90	TT91027S	7.70	TT91027NS	7.90				

* Most Popular Size When Multiple Options Are Available

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For technical information, see pages 345 - 349

GENERAL PURPOSE TAPS - HIGH SPEED STEEL

Spiral Point Plug Taps (Cont.)

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SIZE	H LIMIT	FLUTES	UNCOATED		STEAM OXIDE		NITRIDE & STEAM OXIDE		TiN COATED		AlTiN COATED	
			TOOL #	PRICE	TOOL #	PRICE	TOOL #	PRICE	TOOL #	PRICE	TOOL #	PRICE
8-32	H1	2	TT91028	6.90								
8-32	H2	2	TT91029	6.25								
* 8-32	H3	2	TT91030	6.25	TT91030S	6.85	TT91030NS	7.20	TT99430	10.85	TT98006	11.55
8-32	H7	2	TT91031	6.90								
8-36	H1	2	TT91032	6.90								
* 8-36	H2	2	TT91033	6.90	TT91033S	8.15	TT91033NS	8.20				
10-24	H1	2	TT91034	7.65								
10-24	H2	2	TT91035	6.90								
* 10-24	H3	2	TT91036	6.25	TT91036S	7.20	TT91036NS	7.20	TT99436	10.85	TT98007	11.85
10-24	H7	2	TT91037	7.65								
10-32	H1	2	TT91038	6.90								
10-32	H2	2	TT91039	6.25								
* 10-32	H3	2	TT91040	6.25	TT91040S	7.20	TT91040NS	7.20	TT99440	10.85	TT98008	11.85
10-32	H7	2	TT91041	7.65								
12-24	H1	2	TT91042	6.90								
* 12-24	H3	2	TT91043	6.90	TT91043S	8.20	TT91043NS	8.90	TT99443	11.80	TT98009	12.95
12-28	H3	2	TT91044	6.90					TT99444	11.80	TT98010	13.35
1/4-20	H1	2	TT91045	6.90								
1/4-20	H2	2	TT91046	6.90								
* 1/4-20	H3	2	TT91047	6.25	TT91047S	7.20	TT91047NS	7.20	TT99447	11.75	TT98011	11.85
1/4-20	H3	3	TT91048	7.65								
1/4-20	H5	2	TT91049	6.90								
1/4-20	H5	3	TT91050	7.65								
1/4-28	H1	2	TT91051	7.65								
1/4-28	H2	2	TT91052	6.90								
1/4-28	H2	3	TT91053	7.65								
* 1/4-28	H3	2	TT91054	6.25	TT91054S	7.20	TT91054NS	7.20	TT99454	11.75	TT98012	11.85
1/4-28	H4	2	TT91055	7.65								
1/4-28	H4	3	TT91056	7.65								
5/16-18	H1	2	TT91057	8.70								
5/16-18	H2	2	TT91058	7.65								
* 5/16-18	H3	2	TT91059	6.65	TT91059S	7.75	TT91059NS	7.75	TT99459	13.25	TT98013	13.70
5/16-18	H3	3	TT91060	8.70								
5/16-18	H5	2	TT91061	7.65								
5/16-18	H5	3	TT91062	8.70								
5/16-24	H1	2	TT91063	8.70								
5/16-24	H2	2	TT91064	8.70								
5/16-24	H2	3	TT91065	8.70								
* 5/16-24	H3	2	TT91066	7.75	TT91066S	8.30	TT91066NS	7.75	TT99466	13.70	TT98014	13.70
5/16-24	H4	2	TT91067	8.70								
5/16-24	H4	3	TT91068	8.70								
3/8-16	H1	3	TT91069	9.80								
3/8-16	H2	3	TT91070	9.25								
* 3/8-16	H3	3	TT91071	7.85	TT91071S	9.20	TT91071NS	9.20	TT99471	15.25	TT98015	15.25
3/8-16	H5	3	TT91072	9.90								
3/8-24	H1	3	TT91073	10.00								

* Most Popular Size When Multiple Options Are Available

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For technical information, see pages 345 - 349

GENERAL PURPOSE TAPS - HIGH SPEED STEEL

Spiral Point Plug Taps (Cont.)

continued from previous page

SIZE	H LIMIT	FLUTES	UNCOATED		STEAM OXIDE		NITRIDE & STEAM OXIDE		TiN COATED		AlTiN COATED	
			TOOL #	PRICE	TOOL #	PRICE	TOOL #	PRICE	TOOL #	PRICE	TOOL #	PRICE
3/8-24	H2	3	TT91074	10.00								
* 3/8-24	H3	3	TT91075	8.50	TT91075S	9.90	TT91075NS	9.90	TT99475	16.00	TT98016	16.00
3/8-24	H4	3	TT91076	10.00								
7/16-14	H2	3	TT91077	14.70								
* 7/16-14	H3	3	TT91078	13.40	TT91078S	15.70	TT91078NS	15.70	TT99478	23.10	TT98017	23.25
7/16-14	H5	3	TT91079	14.70								
7/16-20	H2	3	TT91080	14.65								
* 7/16-20	H3	3	TT91081	13.40	TT91081S	15.70	TT91081NS	16.90	TT99481	23.10	TT98018	23.25
7/16-20	H5	3	TT91082	14.70								
1/2-13	H1	3	TT91083	17.85								
1/2-13	H2	3	TT91084	17.85								
* 1/2-13	H3	3	TT91085	13.55	TT91085S	16.00	TT91085NS	16.00	TT99485	23.40	TT98019	23.45
1/2-13	H5	3	TT91086	16.15								
1/2-20	H1	3	TT91087	17.85								
1/2-20	H2	3	TT91088	17.85								
* 1/2-20	H3	3	TT91089	16.10	TT91089S	18.80	TT91089NS	19.60	TT99489	26.15	TT98020	26.15
1/2-20	H5	3	TT91090	17.85								
9/16-12	H3	3	TT91091	22.30	TT91091S	25.90	TT91091NS	26.25				
9/16-18	H3	3	TT91092	22.30	TT91092S	25.90	TT91092NS	26.25				
* 5/8-11	H3	3	TT91093	30.40	TT91093S	34.35	TT91093NS	34.85	TT99493	54.05	TT98021	54.05
5/8-11	H5	3	TT91094	30.40								
5/8-18	H3	3	TT91095	30.40	TT91095S	34.35	TT91095NS	34.85	TT99495	54.05	TT98022	54.05
* 3/4-10	H3	3	TT91096	43.05	TT91096S	48.55	TT91096NS	49.50	TT99496	70.55	TT98023	70.55
3/4-10	H5	3	TT91097	43.05								
3/4-16	H3	3	TT91098	43.05	TT91098S	48.55	TT91098NS	49.50	TT99498	70.55	TT98024	70.55

* Most Popular Size When Multiple Options Are Available

GENERAL PURPOSE TAPS - HIGH SPEED STEEL

Spiral Point Plug Taps - Metric



- General purpose spiral point plug taps
- Spiral point for through-hole applications
- Taps are on blanks that meet ANSI specifications
- TiN coating provides improved performance in a wide variety of materials, and generally used in applications with lower cutting speeds
- High speed steel
- Precision manufactured in the USA

SIZE	D LIMIT	FLUTES	UNCOATED		TiN COATED	
			TOOL #	PRICE	TOOL #	PRICE
M2 x 0.4	D3	2	TT93208	16.35	TT93208TiN	21.15
M2.5 x 0.45	D3	2	TT93214	11.70	TT93214TiN	15.40
M3 x 0.5	D3	2	TT93217	9.45	TT93217TiN	13.05
M3.5 x 0.6	D4	2	TT93220	8.15	TT93220TiN	11.45
M4 x 0.7	D4	2	TT93223	8.15	TT93223TiN	11.45
M4.5 x 0.75	D4	2	TT93226	8.15	TT93226TiN	11.45
M5 x 0.8	D4	2	TT93229	8.15	TT93229TiN	11.45
M6 x 1.0	D5	2	TT93232	8.15	TT93232TiN	11.45
M7 x 1.0	D5	2	TT93238	9.50	TT93238TiN	13.20
M8 x 1.25	D5	2	TT93244	9.50	TT93244TiN	13.20
M10 x 1.50	D6	3	TT93250	15.70	TT93250TiN	22.00
M12 x 1.75	D6	3	TT93256	19.70	TT93256TiN	26.80
M14 x 2.0	D7	3	TT93262	30.40	TT93262TiN	39.15
M16 x 2.0	D7	3	TT93268	34.45	TT93268TiN	44.35
M18 x 2.5	D7	3	TT93274	50.65	TT93274TiN	58.85
M20 x 2.5	D7	3	TT93277	66.85	TT93277TiN	86.10



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GENERAL PURPOSE TAPS - HIGH SPEED STEEL

Spiral Point Bottoming Taps



- General purpose spiral point bottoming taps
- Spiral point for through-hole applications
- Taps are on blanks that meet ANSI specifications
- TiN coating provides improved performance in a wide variety of materials, and generally used in applications with lower cutting speeds
- High speed steel
- Precision manufactured in the USA

SIZE	H LIMIT	FLUTES	UNCOATED		TIN COATED	
			TOOL #	PRICE	TOOL #	PRICE
0-80	H2	2	TT91201	27.40	TT92202	34.40
2-56	H2	2	TT91207	20.90	TT92209	26.35
3-48	H2	2	TT91211	16.80	TT92212	19.85
4-40	H2	2	TT91215	13.40	TT92216	17.05
5-40	H2	2	TT91220	13.40	TT92221	17.05
6-32	H2	2	TT91223	11.30	TT92224	14.90
6-32	H3	2	TT91224	11.30	TT92225	14.90
6-40	H2	2	TT91227	12.90	TT92228	16.50
8-32	H2	2	TT91229	11.30	TT92230	15.10
8-32	H3	2	TT91230	11.30	TT92231	15.10
10-24	H2	2	TT91235	12.90	TT92236	17.50
10-24	H3	2	TT91236	11.30	TT92237	15.55
10-32	H2	2	TT91239	11.30	TT92240	15.55
10-32	H3	2	TT91240	11.30	TT92241	15.55
12-24	H3	2	TT91243	12.95	TT92244	16.50
1/4-20	H3	2	TT91247	11.30	TT92248	15.55
1/4-28	H3	2	TT91254	11.30	TT92255	15.55
5/16-18	H3	2	TT91259	12.15	TT92260	16.75
5/16-24	H3	2	TT91266	12.15	TT92267	16.75

For technical information, see pages 345 - 349

GENERAL PURPOSE TAPS - HIGH SPEED STEEL

STI Taps - Hand Plug & Bottoming Taps



- Oversized to produce threads that accept coil wire screw thread inserts of the same size and pitch
- Taps are on blanks that meet ANSI specifications
- High speed steel
- Precision manufactured in the USA

SIZE	H LIMIT	FLUTES	PLUG	BOTTOM	PRICE
4-40	H1	3	TT78302	TT78303	16.00
5-40	H1	3	TT78304	TT78305	16.00
6-32	H2	3	TT78306	TT78307	16.25
6-40	H1	3	TT78308	TT78309	16.25
8-32	H2	3	TT78310	TT78311	16.55
10-24	H2	3	TT78312	TT78313	16.55
10-32	H2	3	TT78314	TT78315	17.15
12-24	H2	3	TT78316	TT78317	17.15
1/4-20	H2	3	TT78318	TT78319	17.30
1/4-28	H2	3	TT78320	TT78321	17.30
5/16-18	H3	4	TT78322	TT78323	18.70
5/16-24	H2	4	TT78324	TT78325	18.70
3/8-16	H3	4	TT78326	TT78327	20.25
3/8-24	H2	4	TT78328	TT78329	20.25
7/16-14	H3	4	TT78330	TT78331	27.90
7/16-20	H3	4	TT78332	TT78333	27.90
1/2-13	H3	4	TT78334	TT78335	31.40
1/2-20	H3	4	TT78336	TT78337	31.40

All taps sold individually

General Purpose Taps

GENERAL PURPOSE TAPS - HIGH SPEED STEEL

STI Taps - Spiral Point Plug



- Oversized to produce threads that accept coil wire screw thread inserts of the same size and pitch
- Spiral point for through-hole applications
- Taps are on blanks that meet ANSI specifications
- High speed steel
- Precision manufactured in the USA

SIZE	H LIMIT	FLUTES	UNCOATED	
			TOOL #	PRICE
4-40	H1	2	TT92315	17.90
5-40	H1	2	TT92320	17.90
6-32	H2	2	TT92324	17.95
6-40	H2	2	TT92327	17.95
8-32	H2	2	TT92330	18.10
10-24	H2	2	TT92336	18.45
10-32	H2	2	TT92340	18.75
12-24	H2	2	TT92343	18.75
1/4-20	H2	2	TT92347	18.75

SIZE	H LIMIT	FLUTES	UNCOATED	
			TOOL #	PRICE
1/4-28	H2	2	TT92354	19.20
5/16-18	H3	3	TT92360	24.30
5/16-24	H2	3	TT92368	24.45
3/8-16	H3	3	TT92371	29.85
3/8-24	H2	3	TT92375	30.20
7/16-14	H3	3	TT92378	32.75
7/16-20	H3	3	TT92381	32.65
1/2-13	H3	3	TT92385	36.30
1/2-20	H3	3	TT92389	36.30

For technical information, see pages 345 - 349

GENERAL PURPOSE TAPS - HIGH SPEED STEEL

Oversize Taps - Hand Plug



- Most commonly used when parts are to be plated after tapping
- Taps are on blanks that meet ANSI specifications
- High speed steel
- Precision manufactured in the USA

SIZE	H LIMIT	FLUTES	UNCOATED	
			TOOL #	PRICE
6-32	H11	3	TT90931	7.70
8-32	H11	4	TT90933	7.70
10-24	H11	4	TT90935	8.45
10-32	H11	4	TT90937	8.45
1/4-20	H11	4	TT90940	10.10
5/16-18	H11	4	TT90946	12.80
3/8-16	H11	4	TT90950	14.65
7/16-14	H11	4	TT90954	21.95
1/2-13	H11	4	TT90958	24.95
5/8-11	H11	4	TT90966	46.80

GENERAL PURPOSE TAPS - HIGH SPEED STEEL

Oversize Taps - Spiral Point Plug



- Most commonly used when parts are to be plated after tapping
- Spiral point for through-hole applications
- Taps are on blanks that meet ANSI specifications
- High speed steel
- Precision manufactured in the USA

SIZE	H LIMIT	FLUTES	UNCOATED	
			TOOL #	PRICE
6-32	H11	2	TT91732	9.25
8-32	H11	2	TT91734	9.25
10-24	H11	2	TT91736	10.10
10-32	H11	2	TT91738	10.10
1/4-20	H11	2	TT91749	11.50
5/16-18	H11	2	TT91761	13.20
3/8-16	H11	3	TT91772	14.90
7/16-14	H11	3	TT91779	22.45
1/2-13	H11	3	TT91786	27.30
5/8-11	H11	3	TT91794	46.80

For technical information, see pages 345 - 349

GENERAL PURPOSE TAPS - HIGH SPEED STEEL

Extension Taps - Spiral Point Plug



- Undersized, extended shank for increased clearance in deeper tapping applications
- Taps are on blanks that meet ANSI specifications
- AlTiN coating offers increased wear and heat resistance
- High speed steel
- Precision manufactured in the USA

SIZE	H LIMIT	NC/NF	THREAD LENGTH	FLUTES	SQUARE LENGTH	SQUARE	SHANK DIA.	OAL	UNCOATED		AlTiN COATED	
									TOOL #	PRICE	TOOL #	PRICE
6-32	H3	NC	11/16	2	3/16	.073	.097	6	TT94101	55.20	TT88901	61.10
8-32	H3	NC	3/4	2	1/4	.092	.123	6	TT94102	54.00	TT88902	59.95
10-24	H3	NC	7/8	2	1/4	.102	.136	6	TT94103	50.65	TT88903	57.35
10-32	H3	NF	7/8	2	1/4	.102	.136	6	TT94104	50.65	TT88904	57.35
1/4-20	H3	NC	1	2	5/16	.139	.185	6	TT94105	68.75	TT88905	75.45
1/4-28	H3	NF	1	2	5/16	.139	.185	6	TT94106	68.75	TT88906	75.45
5/16-18	H3	NC	1-1/8	2	3/8	.180	.240	6	TT94107	72.50	TT88907	80.50
5/16-24	H3	NF	1-1/8	2	3/8	.180	.240	6	TT94108	72.50	TT88908	80.50
3/8-16	H3	NC	1-1/4	3	7/16	.206	.275	6	TT94109	78.15	TT88909	94.50
3/8-24	H3	NF	1-1/4	3	7/16	.206	.275	6	TT94110	78.15	TT88910	87.75
7/16-14	H3	NC	1-7/16	3	13/32	.242	.323	6	TT94111	89.10	TT88911	95.90
7/16-20	H3	NF	1-7/16	3	13/32	.242	.323	6	TT94112	89.10	TT88912	95.90
1/2-13	H3	NC	1-21/32	3	7/16	.275	.367	6	TT94113	94.00	TT88913	105.55
1/2-20	H3	NF	1-21/32	3	7/16	.275	.367	6	TT94114	94.00	TT88914	100.80
5/8-11	H3	NC	1-13/16	3	9/16	.360	.480	6	TT94115	121.45	TT88915	146.90
5/8-18	H3	NF	1-13/16	3	9/16	.360	.480	6	TT94116	121.45	TT88916	137.00
3/4-10	H3	NC	2	3	11/16	.442	.590	6	TT94117	157.75	TT88917	175.80
3/4-16	H3	NF	2	3	11/16	.442	.590	6	TT94118	157.75	TT88918	175.80



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GENERAL PURPOSE TAPS - HIGH SPEED STEEL

Pulley Taps



- Extended shank length
- Taps are on blanks that meet ANSI specifications
- High speed steel
- Precision manufactured in the USA

SIZE	H LIMIT	FLUTES	OVERALL LENGTH	UNCOATED	
				TOOL #	PRICE
1/4-20	H3	4	6	TT92722	54.05
1/4-20	H3	4	8	TT92723	66.90
5/16-18	H3	4	6	TT92730	57.35
5/16-18	H3	4	8	TT92731	68.85
3/8-16	H3	4	6	TT92738	64.20
3/8-16	H3	4	8	TT92739	76.75
3/8-16	H3	4	10	TT92740	96.40
7/16-14	H3	4	6	TT92746	67.80
7/16-14	H3	4	8	TT92747	88.50
1/2-13	H3	4	6	TT92754	68.85
1/2-13	H3	4	8	TT92755	90.45
1/2-13	H3	4	10	TT92756	111.15
1/2-13	H3	4	12	TT92757	136.65
5/8-11	H3	4	6	TT92762	91.90
5/8-11	H3	4	8	TT92763	119.10
5/8-11	H3	4	10	TT92764	149.50
5/8-11	H3	4	12	TT92765	175.10
3/4-10	H3	4	10	TT92772	175.10
3/4-10	H3	4	12	TT92773	208.55

GENERAL PURPOSE TAPS - HIGH SPEED STEEL

Spiral Flute - Semi-Bottoming



- Optimized for relatively deep hole tapping in copper, brass, aluminum, and other soft ductile materials
- Slightly longer chamfer distributes cutting over greater number of teeth for increased production
- Can be used for plug or bottoming applications
- 52° helix
- Taps are on blanks that meet ANSI specifications
- ZrN coating offers increased speed rates and prolonged tool life
- High speed steel
- Precision manufactured in the USA

SIZE	H LIMIT	FLUTES	UNCOATED		ZrN COATED	
			TOOL #	PRICE	TOOL #	PRICE
3-48	H2	2	TT76101	25.00	TT89101	30.55
3-56	H2	2	TT76103	25.00	TT89103	30.55
4-40	H2	2	TT76105	20.70	TT89105	26.20
4-48	H2	2	TT76107	20.70	TT89107	26.20
5-40	H3	2	TT76109	20.70	TT89109	26.20
5-44	H3	2	TT76111	20.65	TT89111	24.55
6-32	H3	2	TT76113	16.70	TT89113	21.85
6-40	H3	2	TT76115	16.70	TT89115	22.25
8-32	H3	3	TT76117	16.70	TT89117	21.85
8-36	H3	3	TT76119	16.70	TT89119	21.85
10-24	H3	3	TT76121	16.70	TT89121	21.85
10-32	H3	3	TT76123	16.70	TT89123	21.85
12-24	H3	3	TT76125	18.10	TT89125	25.25
12-28	H3	3	TT76127	18.10	TT89127	25.25
1/4-20	H3	3	TT76129	18.10	TT89129	23.65
1/4-28	H3	3	TT76131	18.10	TT89131	26.65
5/16-18	H3	3	TT76133	22.50	TT89133	29.15
5/16-24	H3	3	TT76135	22.50	TT89135	30.55
3/8-16	H3	3	TT76137	25.95	TT89137	33.60
3/8-24	H3	3	TT76139	25.95	TT89139	37.65
7/16-14	H3	3	TT76141	38.85	TT89141	46.65
7/16-20	H3	3	TT76143	38.85	TT89143	46.65
1/2-13	H3	3	TT76145	46.45	TT89145	57.35
1/2-20	H3	3	TT76147	46.45	TT89147	57.35
9/16-12	H3	4	TT76149	77.50	TT89149	84.90
9/16-18	H3	4	TT76151	77.50	TT89151	84.90
5/8-11	H3	4	TT76153	101.70	TT89153	110.40
5/8-18	H3	4	TT76155	101.70	TT89155	110.40
3/4-10	H3	4	TT76157	130.15	TT89157	148.55
3/4-16	H3	4	TT76159	130.15	TT89159	141.00

GENERAL PURPOSE TAPS - HIGH SPEED STEEL

Spiral Flute - Semi-Bottoming - Metric

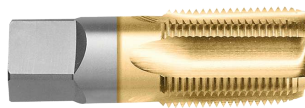


- Optimized for relatively deep hole tapping in copper, brass, aluminum, and other soft ductile materials
- Slightly longer chamfer distributes cutting over greater number of teeth for increased production
- Can be used for plug or bottoming applications
- 52° helix
- Taps are on blanks that meet ANSI specifications
- ZrN coating offers increased speed rates and prolonged tool life
- High speed steel
- Precision manufactured in the USA

SIZE	D LIMIT	FLUTES	UNCOATED		ZrN COATED	
			TOOL #	PRICE	TOOL #	PRICE
M3 x 0.5	D3	2	TT76349	21.20	TT89201	26.70
M3.5 x 0.6	D4	3	TT76351	17.15	TT89203	21.35
M4 x 0.7	D4	3	TT76353	17.15	TT89205	22.35
M4.5 x 0.75	D4	3	TT76355	17.15	TT89207	22.85
M5 x 0.8	D4	3	TT76357	17.15	TT89209	22.85
M6 x 1.0	D5	3	TT76359	18.75	TT89211	24.45
M8 x 1.25	D5	3	TT76361	23.20	TT89213	28.25
M10 x 1.5	D6	3	TT76363	40.05	TT89215	45.60
M12 x 1.75	D6	3	TT76365	47.95	TT89217	57.10

GENERAL PURPOSE TAPS - HIGH SPEED STEEL

Straight Pipe - NPS



- General purpose straight pipe taps
- Taps are on blanks that meet ANSI specifications
- TiN coating provides improved performance in a wide variety of materials, and generally used in applications with lower cutting speeds
- High speed steel
- Precision manufactured in the USA

SIZE	FLUTES	UNCOATED		TiN COATED	
		TOOL #	PRICE	TOOL #	PRICE
1/8-27	4	TT94201	37.75	TT94201TiN	52.60
1/4-18	4	TT94202	41.50	TT94202TiN	58.20
3/8-18	4	TT94203	54.65	TT94203TiN	63.00
1/2-14	4	TT94204	87.40	TT94204TiN	121.85
3/4-14	5	TT94205	121.65	TT94205TiN	170.45
1-11-1/2	5	TT94206	185.00	TT94206TiN	198.40

For technical information, see pages 345 - 349

GENERAL PURPOSE TAPS - HIGH SPEED STEEL

Taper Pipe - Extension Taper Pipe



- General purpose extension taper pipe NPT taps
- Taps are on blanks that meet ANSI specifications
- TiN coating provides improved performance in a wide variety of materials, and generally used in applications with lower cutting speeds
- High speed steel
- Precision manufactured in the USA

SIZE	FLUTES	OVERALL LENGTH	UNCOATED		TiN COATED	
			TOOL #	PRICE	TOOL #	PRICE
1/8-27	4	6	TT94221	70.75	TT94221TIN	98.60
1/4-18	4	6	TT94223	81.20	TT94223TIN	113.70
3/8-18	4	6	TT94225	110.30	TT94225TIN	153.85
1/2-14	4	6	TT94227	176.25	TT94227TIN	178.75



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GENERAL PURPOSE TAPS - HIGH SPEED STEEL

Taper Pipe - NPT



- General purpose NPT pipe taps
- Taps are on blanks that meet ANSI specifications
- Steam Oxide finish provides decreased galling and increased lubricity in low carbon steels and gummy materials
- TiN coating provides improved performance in a wide variety of materials, and generally used in applications with lower cutting speeds
- High speed steel
- Precision manufactured in the USA

SIZE	FLUTES	UNCOATED		STEAM OXIDE		TIN COATED	
		TOOL #	PRICE	TOOL #	PRICE	TOOL #	PRICE
1/16-27	4	TT93400	23.45	TT93400S	25.50	TT93400TIN	29.00
* 1/8-27	4	TT93401	23.45	TT93401S	25.50	TT93401TIN	29.00
1/8-27	4	TT93402	23.45	TT93402S	26.20	TT93402TIN	31.20
1/4-18	4	TT93406	26.05	TT93406S	29.60	TT93406TIN	34.50
3/8-18	4	TT93408	34.45	TT93408S	38.70	TT93408TIN	45.35
1/2-14	4	TT93410	54.45	TT93410S	59.70	TT93410TIN	67.80
3/4-14	5	TT93412	76.25	TT93412S	83.95	TT93412TIN	95.35
1-11-1/2	5	TT93414	116.35	TT93414S	126.00	TT93414TIN	139.00
1-1/4-11-1/2	5	TT93416	165.05	TT93416S	177.85	TT93416TIN	200.60
1-1/2-11-1/2	7	TT93418	222.45	TT93418S	238.10	TT93418TIN	252.10
2-11-1/2	7	TT93420	302.65	TT93420S	317.30	TT93420TIN	366.05

* Small Shank

GENERAL PURPOSE TAPS - HIGH SPEED STEEL

Taper Pipe - NPT Interrupted



- General purpose NPT interrupted pipe tap
- Interrupted threads reduce friction and allow for better lubrication
- Taps are on blanks that meet ANSI specifications
- Steam Oxide finish provides decreased galling and increased lubricity in low carbon steels and gummy materials
- TiN coating provides improved performance in a wide variety of materials, and generally used in applications with lower cutting speeds
- High speed steel
- Precision manufactured in the USA

SIZE	FLUTES	UNCOATED		STEAM OXIDE		TIN COATED	
		TOOL #	PRICE	TOOL #	PRICE	TOOL #	PRICE
* 1/8-27	5	TT93601	36.45	TT93601S	38.50	TT93601TIN	44.30
1/8-27	5	TT93602	36.45	TT93602S	39.20	TT93602TIN	44.30
1/4-18	5	TT93606	40.55	TT93606S	44.10	TT93606TIN	50.90
3/8-18	5	TT93608	51.00	TT93608S	55.25	TT93608TIN	63.40
1/2-14	5	TT93610	81.20	TT93610S	86.45	TT93610TIN	98.60
3/4-14	5	TT93612	118.65	TT93612S	126.35	TT93612TIN	143.55
1-11-1/2	5	TT93614	179.55	TT93614S	193.00	TT93614TIN	218.10
1-1/4-11-1/2	5	TT93616	255.40	TT93616S	268.20	TT93616TIN	271.70
1-1/2-11-1/2	7	TT93618	340.95	TT93618S	366.55	TT93618TIN	358.50
2-11-1/2	7	TT93620	460.80	TT93620S	495.35	TT93620TIN	478.35

* Small Shank

For technical information, see pages 345 - 349

GENERAL PURPOSE TAPS - HIGH SPEED STEEL

Taper Pipe - NPT Spiral Flute



- General purpose NPT pipe taps
- Taps are on blanks that meet ANSI specifications
- TiN coating provides improved performance in a wide variety of materials, and is generally used in applications with lower cutting speeds
- Used in ductile or stringy materials to aid chip ejection
- High speed steel
- Precision manufactured in the USA

	SIZE	FLUTES	UNCOATED		TiN COATED	
			TOOL #	PRICE	TOOL #	PRICE
NEW	1/8-27	4	TT93850	44.50	TT93950	49.00
NEW	1/4-18	4	TT93851	49.30	TT93951	55.50
NEW	3/8-18	4	TT93852	61.00	TT93952	68.30
NEW	1/2-14	4	TT93853	77.40	TT93953	85.30
NEW	3/4-14	5	TT93854	107.60	TT93954	119.00
NEW	1-11-1/2	5	TT93855	207.20	TT93955	220.60

GENERAL PURPOSE TAPS - HIGH SPEED STEEL

Taper Pipe - NPT For Cast Iron



- General purpose NPT pipe taps
- Taps are on blanks that meet ANSI specifications
- Low rake angle to support cutting face
- 2.5 thread chamfer to produce manageable chips
- Nitride/steam oxide surface treatment to resist abrasion
- High speed steel
- Precision manufactured in the USA

	SIZE	FLUTES	NITRIDE/STEAM OXIDE	
			TOOL #	PRICE
NEW	1/8-27	4	TT93880	27.40
NEW	1/4-18	4	TT93881	30.80
NEW	3/8-18	4	TT93882	40.30
NEW	1/2-14	4	TT93883	62.20
NEW	3/4-14	5	TT93884	87.35
NEW	1-11-1/2	5	TT93885	131.05
NEW	1-1/4-11-1/2	5	TT93886	185.15
NEW	1-1/2-11-1/2	7	TT93887	247.60
NEW	2-11-1/2	7	TT93888	366.90

For technical information, see pages 345 - 349

GENERAL PURPOSE TAPS - HIGH SPEED STEEL

Taper Pipe - NPTF Dryseal



- General purpose NPTF dryseal pipe taps
- Taps are on blanks that meet ANSI specifications
- TiN coating provides improved performance in a wide variety of materials, and generally used in applications with lower cutting speeds
- High speed steel
- Precision manufactured in the USA

SIZE	FLUTES	UNCOATED		TiN COATED	
		TOOL #	PRICE	TOOL #	PRICE
1/16-27	4	TT93800	25.85	TT93800TiN	36.20
* 1/8-27	4	TT93801	25.85	TT93801TiN	36.20
1/8-27	4	TT93802	25.85	TT93802TiN	36.20
1/4-18	4	TT93806	28.55	TT93806TiN	40.10
3/8-18	4	TT93808	37.65	TT93808TiN	52.70
1/2-14	4	TT93810	60.25	TT93810TiN	73.55
3/4-14	5	TT93812	84.20	TT93812TiN	103.40
1-11-1/2	5	TT93814	127.40	TT93814TiN	140.90
1-1/4-11-1/2	5	TT93816	181.60	TT93816TiN	197.90
1-1/2-11-1/2	7	TT93818	243.60	TT93818TiN	261.15
2-11-1/2	7	TT93820	331.30	TT93820TiN	348.85

* Small Shank

GENERAL PURPOSE TAPS - HIGH SPEED STEEL

Taper Pipe - NPTF Dryseal - Interrupted



- General purpose NPTF dryseal pipe taps
- Interrupted threads reduce friction and allow for better lubrication
- Taps are on blanks that meet ANSI specifications
- TiN coating provides improved performance in a wide variety of materials, and generally used in applications with lower cutting speeds
- High speed steel
- Precision manufactured in the USA

SIZE	FLUTES	UNCOATED		TiN COATED	
		TOOL #	PRICE	TOOL #	PRICE
* 1/8-27	5	TT94001	40.35	TT94001TiN	56.20
1/8-27	5	TT94002	40.35	TT94002TiN	48.05
1/4-18	5	TT94006	44.35	TT94006TiN	54.80
3/8-18	5	TT94008	56.35	TT94008TiN	68.80
1/2-14	5	TT94010	89.70	TT94010TiN	97.60
3/4-14	5	TT94012	130.60	TT94012TiN	141.95
1-11-1/2	5	TT94014	197.50	TT94014TiN	210.90
1-1/4-11-1/2	5	TT94016	279.60	TT94016TiN	295.90
1-1/2-11-1/2	7	TT94018	375.10	TT94018TiN	392.65
2-11-1/2	7	TT94020	506.85	TT94020TiN	524.40

* Small Shank

For technical information, see pages 345 - 349

GENERAL PURPOSE TAPS - HIGH SPEED STEEL

Thread Forming



- Thread forming taps have no flutes or cutting edges and provide chipless tapping
- Lube grooves for lubrication and venting in blind holes
- Taps are on blanks that meet ANSI specifications
- SINGLE THREAD - 1.5 Thread Chamfer for maximum thread length in blind holes due to its short chamfer
- BOTTOM - 2.5 Thread Chamfer for blind hole tapping
- PLUG - 4.0 Thread Chamfer for through hole tapping
- Uncoated is great for lead, stainless steels, carbon steels, aluminum and most other ductile materials producing stringy chips
- TiN coating provides improved performance in a wide variety of materials, and is generally used in applications with lower cutting speeds
- High speed steel
- Precision manufactured in the USA

SIZE	H LIMIT	LUBE GROOVES	UNCOATED				TiN COATED			
			1.5 ITEM	2.5 ITEM	4.0 ITEM	PRICE	1.5 ITEM	2.5 ITEM	4.0 ITEM	PRICE
0-80	H2	0	TT88301	TT82800		20.10	TT88401	TT92800		23.80
0-80	H3	0	TT88303	TT82802		20.10	TT88403	TT92802		23.80
1-64	H3	0		TT82804		20.10		TT92804		23.80
1-72	H3	0	TT88307	TT82806		20.10	TT88407	TT92806		23.80
2-56	H3	0	TT88309	TT82808		19.90	TT88409	TT92808		22.10
2-56	H4	0	TT88311	TT82810		19.90	TT88411	TT92810		22.10
2-64	H3	0		TT82814		19.90		TT92814		22.10
3-48	H3	0		TT82818		19.90		TT92818		22.10
3-56	H3	0		TT82820		19.90		TT92820		22.10
3-56	H5	0		TT82822		19.90		TT92822		22.10
4-40	H3	0	TT88321	TT82824	TT82823	17.95	TT88421	TT92824	TT92823	21.55
4-40	H5	0	TT88323	TT82826	TT82825	17.95	TT88423	TT92826	TT92825	21.55
4-48	H4	0		TT82828		17.95		TT92828		21.55
5-40	H4	0		TT82832	TT82831	17.95		TT92832	TT92831	21.55
5-44	H4	0		TT82836		17.95		TT92836		21.55
6-32	H3	1	TT88331	TT82840	TT82839	14.90	TT88431	TT92840	TT92839	18.55
6-32	H5	1	TT88333	TT82842	TT82841	14.90	TT88433	TT92842	TT92841	18.55
6-40	H4	1		TT82846	TT82845	14.90		TT92846	TT92845	18.55
8-32	H3	1	TT88337	TT82850	TT82849	14.90	TT88437	TT92850	TT92849	18.75
8-32	H5	1	TT88339	TT82852	TT82851	14.90	TT88439	TT92852	TT92851	18.75
8-32	H7	1		TT82854	TT82853	14.90		TT92854	TT92853	18.75
8-36	H4	1		TT82856	TT82855	14.90		TT92856	TT92855	18.75
10-24	H5	1		TT82858	TT82857	14.25		TT92858	TT92857	17.05
10-24	H7	1		TT82860	TT82859	14.25		TT92860	TT92859	17.05
10-32	H3	1	TT88347	TT82862	TT82861	14.25	TT88447	TT92862	TT92861	17.05
10-32	H5	1	TT88349	TT82864	TT82863	14.25	TT88449	TT92864	TT92863	17.05
12-24	H5	2		TT82866	TT82865	14.25		TT92866	TT92865	17.05
12-28	H4	2		TT82870	TT82869	14.25		TT92870	TT92869	17.05
1/4-20	H5	2	TT88355	TT82872	TT82871	15.15	TT88455	TT92872	TT92871	19.30
1/4-20	H8	2	TT88357	TT82874	TT82873	15.15	TT88457	TT92874	TT92873	19.30
1/4-28	H4	2	TT88359	TT82878	TT82877	15.15	TT88459	TT92878	TT92877	19.30
1/4-28	H6	2	TT88361	TT82880	TT82879	15.15	TT88461	TT92880	TT92879	19.30

Continued on next page

Plug tap sizes 3/8" and smaller have male centers

For technical information, see pages 350-351

GENERAL PURPOSE TAPS - HIGH SPEED STEEL

Thread Forming (Cont.)

continued from previous page

SIZE	H LIMIT	LUBE GROOVES	UNCOATED				TIN COATED			
			1.5 ITEM	2.5 ITEM	4.0 ITEM	PRICE	1.5 ITEM	2.5 ITEM	4.0 ITEM	PRICE
5/16-18	H8	2	TT88365	TT82884	TT82883	16.85	TT88465	TT92884	TT92883	21.40
5/16-18	H5	2		TT82882	TT82881	16.85		TT92882	TT92881	21.40
5/16-24	H5	2	TT88367	TT82886	TT82885	16.85	TT88467	TT92886	TT92885	21.40
5/16-24	H7	2	TT88369	TT82888	TT82887	16.85	TT88469	TT92888	TT92887	21.40
3/8-16	H6	2	TT88371	TT82890	TT82889	19.25	TT88471	TT92890	TT92889	24.45
3/8-16	H8	2	TT88373	TT82892	TT82891	19.25	TT88473	TT92892	TT92891	24.45
3/8-24	H5	2	TT88375	TT82894	TT82893	19.25	TT88475	TT92894	TT92893	24.45
3/8-24	H7	2	TT88377	TT82896	TT82895	19.25	TT88477	TT92896	TT92895	24.45
7/16-14	H7	4		TT82898	TT82897	29.30		TT92898	TT92897	36.40
7/16-14	H9	4		TT82902	TT82901	29.30		TT92902	TT92901	36.40
7/16-20	H5	4		TT82904	TT82903	29.30		TT92904	TT92903	36.40
7/16-20	H8	4		TT82906	TT82905	29.30		TT92906	TT92905	36.40
1/2-13	H7	6		TT82908	TT82907	32.80		TT92908	TT92907	39.90
1/2-13	H10	6		TT82910	TT82909	32.80		TT92910	TT92909	39.90
1/2-20	H5	6		TT82912	TT82911	32.80		TT92912	TT92911	39.90
1/2-20	H8	6		TT82914	TT82913	32.80		TT92914	TT92913	39.90

Plug tap sizes 3/8" and smaller have male centers



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For technical information, see pages 350-351

GENERAL PURPOSE TAPS - HIGH SPEED STEEL

Thread Forming - Metric



- Thread forming taps have no flutes or cutting edges and provide chipless tapping
- Taps are on blanks that meet ANSI specifications
- SINGLE THREAD - 1.5 Thread Chamfer for maximum thread length in blind holes due to its short chamfer
- BOTTOM - 2.5 Thread Chamfer for blind hole tapping
- PLUG - 4.0 Thread Chamfer for through hole tapping
- Lube grooves for lubrication and venting in blind holes
- Uncoated is great for lead, stainless steels, carbon steels, aluminum and most other ductile materials producing stringy chips
- TiN coating provides improved performance in a wide variety of materials, and is generally used in applications with lower cutting speeds
- High speed steel
- Precision manufactured in the USA

SIZE	D LIMIT	LUBE GROOVES	UNCOATED				TiN COATED			
			1.5 ITEM	2.5 ITEM	4.0 ITEM	PRICE	1.5 ITEM	2.5 ITEM	4.0 ITEM	PRICE
M1.6 x 0.35	D5	0		TT89690		16.60		TT89790		20.50
M1.7 x 0.35	D5	0		TT89692		16.60		TT89792		20.50
M2 x 0.4	D5	0	TT88380	TT89694		16.60	TT88580	TT89794		20.25
M2.5 x 0.45	D6	0	TT88382	TT89696		16.60	TT88582	TT89796		20.25
M3 x 0.5	D6	0	TT88384	TT89802		16.60	TT88584	TT79802		20.25
M3.5 x 0.6	D7	1	TT88386	TT89698	TT89697	14.95	TT88586	TT89798	TT89797	18.60
M4 x 0.7	D7	1	TT88388	TT89804	TT89803	14.95	TT88588	TT79804	TT79803	18.80
M5 x 0.8	D8	1	TT88390	TT89806	TT89805	14.95	TT88590	TT79806	TT79805	19.00
M6 x 1.0	D9	2	TT88392	TT89808	TT89807	15.85	TT88592	TT79808	TT79807	20.15
M8 x 1.25	D10	2	TT88394	TT89810	TT89809	18.05	TT88594	TT79810	TT79809	23.05
M10 x 1.5	D11	2	TT88396	TT89812	TT89811	20.40	TT88596	TT79812	TT79811	25.95
M12 x 1.75	D12	4	TT88398	TT89814	TT89813	35.05	TT88598	TT79814	TT79813	42.25

Plug taps M10 and smaller have male centers

DID YOU KNOW?



Thread Forming Taps have a tool life up to 20 times longer than cutting taps, as they do not have cutting edges to dull, and can run up to twice as fast as cutting taps.

Read More : **8 Machining Facts About Thread Forming Taps** on our technical blog, "In The Loupe"

harveyperformance.com/in-the-loupe/8-unique-facts-about-thread-forming-taps



GENERAL PURPOSE TAP SETS - HIGH SPEED STEEL

Hand Tap Sets

- Taps are on blanks that meet ANSI specifications
- TiN coating provides improved performance in a wide variety of materials, and is generally used in applications with lower cutting speeds
- High speed steel
- Precision manufactured in the USA



SIZE	H LIMIT	FLUTES	UNCOATED		TiN COATED	
			TOOL #	PRICE	TOOL #	PRICE
0-80	H1	2	TT90003	37.30	TT75203	61.25
1-72	H1	2	TT90019	33.90		
2-56	H1	3	TT90031	33.90		
* 2-56	H2	3	TT90039	28.85	TT75226	48.80
2-64	H2	3	TT90047	33.90		
3-48	H2	3	TT90059	23.15		
3-56	H2	3	TT90063	27.65		
4-40	H1	3	TT90071	19.75		
* 4-40	H2	3	TT90079	19.75	TT75252	30.10
4-48	H2	3	TT90087	19.75		
5-40	H2	3	TT90103	19.75	TT75269	30.10
5-44	H2	3	TT90111	19.75		
6-32	H1	3	TT90119	17.55		
* 6-32	H2	3	TT90127	16.35		
6-32	H3	3	TT90135	16.35	TT75291	23.35
6-40	H2	3	TT90151	16.35		
8-32	H1	4	TT90163	18.60		
8-32	H2	4	TT90175	16.35		
* 8-32	H3	4	TT90187	16.35	TT75322	24.25
8-36	H2	4	TT90203	16.35		
10-24	H1	4	TT90211	16.35		
10-24	H2	4	TT90223	16.35		
* 10-24	H3	4	TT90235	16.35	TT75351	25.05
10-32	H1	4	TT90255	16.35		
10-32	H2	4	TT90267	16.35		
* 10-32	H3	4	TT90279	16.35	TT75378	25.05
12-24	H3	4	TT90291	16.35	TT75386	26.55
12-28	H3	4	TT90299	17.55	TT75391	29.45
1/4-20	H1	4	TT90307	20.90		
1/4-20	H2	4	TT90314	20.90		
* 1/4-20	H3	4	TT90326	16.35	TT75409	27.15

* Most Popular Size When Multiple Options Are Available

Continued on next page

GENERAL PURPOSE TAP SETS - HIGH SPEED STEEL

Hand Tap Sets (Cont.)

continued from previous page

SIZE	H LIMIT	FLUTES	UNCOATED		TiN COATED	
1/4-28	H3	4	TT90354	16.35	TT75425	27.15
5/16-18	H2	4	TT90366	21.95		
* 5/16-18	H3	4	TT90378	19.75	TT75442	33.90
5/16-24	H3	4	TT90402	19.75	TT75457	33.90
3/8-16	H2	4	TT90417	25.45		
* 3/8-16	H3	4	TT90425	22.60	TT75472	38.40
3/8-24	H3	4	TT90449	22.60	TT75487	38.40
7/16-14	H3	4	TT90468	38.35	TT75498	64.90
7/16-20	H3	4	TT90487	38.35	TT75509	64.90
1/2-13	H3	4	TT90507	40.05	TT75521	67.70
1/2-20	H3	4	TT90526	45.20	TT75533	76.75
9/16-12	H3	4	TT90538	66.65		
9/16-18	H3	4	TT90549	66.65	TT75547	105.00
5/8-11	H3	4	TT90564	80.15	TT75555	138.15
5/8-18	H3	4	TT90580	80.15	TT75564	138.15
11/16-11	H3	4	TT90588	102.15		
11/16-16	H3	4	TT90592	102.15		
3/4-10	H3	4	TT90603	112.35	TT75580	193.85
3/4-16	H3	4	TT90618	112.35	TT75588	193.85
7/8-9	H4	4	TT90629	156.30		
7/8-14	H4	4	TT90639	156.30		
1-8	H4	4	TT90649	208.25	TT75607	330.40
1-12	H4	4	TT90656	208.25		
1-14	H4	4	TT90663	208.25		

* Most Popular Size When Multiple Options Are Available

General Purpose Tap Sets



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GENERAL PURPOSE TAP SETS - HIGH SPEED STEEL

Hand Tap Sets - Metric

- Taps are on blanks that meet ANSI specifications
- TiN coating provides improved performance in a wide variety of materials, and is generally used in applications with lower cutting speeds
- High speed steel
- Precision manufactured in the USA



SIZE	D LIMIT	FLUTES	UNCOATED		TiN COATED	
			TOOL #	PRICE	TOOL #	PRICE
M2 x 0.4	D3	3	TT93100	48.60	TT75846	82.60
M3 x 0.5	D3	3	TT93102	24.80	TT75848	41.45
M4 x 0.7	D4	4	TT93104	22.60	TT75850	34.05
M5 x 0.8	D4	4	TT93106	22.60	TT75852	34.05
M6 x 1.0	D5	4	TT93108	22.60	TT75854	36.55
M7 x 1.0	D5	4	TT93110	22.60	TT75856	37.45
M8 x 1.25	D5	4	TT93112	22.60	TT75858	37.45
M10 x 1.25	D5	4	TT93114	44.55	TT75860	75.65
M10 x 1.50	D6	4	TT93116	44.55	TT75862	75.65
M12 x 1.25	D5	4	TT93118	52.50	TT75864	89.05
M12 x 1.75	D6	4	TT93120	52.50	TT75866	89.05
M14 x 1.5	D6	4	TT93122	77.95	TT75868	134.15
M14 x 2.0	D7	4	TT93124	77.95	TT75870	134.15
M16 x 1.5	D6	4	TT93126	94.85	TT75872	163.75
M16 x 2.0	D7	4	TT93128	94.85	TT75874	163.75
M18 x 1.5	D6	4	TT93130	128.10	TT75876	221.00
M18 x 2.5	D7	4	TT93132	128.10	TT75878	221.00
M20 x 2.5	D7	4	TT93134	165.40	TT75880	286.55
M24 x 3.0	D8	4	TT93136	242.15	TT75882	419.90
M27 X 3.0	D8	4			TT75884	727.15
M30 X 3.5	D9	4			TT75886	929.15
M33 X 3.5	D9	4			TT75888	926.65
M36 X 4.0	D9	4			TT75890	1175.75

* Most Popular Size When Multiple Options Are Available

GENERAL PURPOSE TAP SETS - HIGH SPEED STEEL

Hand Tap Sets - Left Hand

- Engineered to tap left hand threads
- Taps are on blanks that meet ANSI specifications
- TiN coating provides improved performance in a wide variety of materials, and is generally used in applications with lower cutting speeds
- High speed steel
- Precision manufactured in the USA



SIZE	H LIMIT	FLUTES	UNCOATED		TiN COATED	
			TOOL #	PRICE	TOOL #	PRICE
6-32	H2	3	TT89950	27.65	TT89972	39.50
8-32	H3	4	TT89951	27.65	TT89973	39.50
10-24	H3	4	TT89952	27.65	TT89974	39.50
10-32	H3	4	TT89953	27.65	TT89975	39.50
1/4-20	H3	4	TT89954	27.65	TT89976	47.40
1/4-28	H3	4	TT89955	27.65	TT89977	47.40
5/16-18	H3	4	TT89956	33.90	TT89978	55.85
5/16-24	H3	4	TT89957	33.90	TT89979	55.85
3/8-16	H3	4	TT89958	39.50	TT89980	62.65
3/8-24	H3	4	TT89959	39.50	TT89981	62.65
7/16-14	H3	4	TT89960	66.65	TT89982	90.30
7/16-20	H3	4	TT89961	66.65	TT89983	90.30
1/2-13	H3	4	TT89962	66.65	TT89984	90.30
1/2-20	H3	4	TT89963	77.95	TT89985	100.45
5/8-11	H3	4	TT89964	141.10	TT89986	168.25
5/8-18	H3	4	TT89965	141.10	TT89987	168.25
3/4-10	H3	4	TT89966	197.60	TT89988	231.40
3/4-16	H3	4	TT89967	197.60	TT89989	231.40
7/8-9	H4	4	TT89968	269.85	TT89990	314.95
7/8-14	H4	4	TT89969	269.85	TT89991	314.95
1-8	H4	4	TT89970	333.00	TT89992	389.50
1-14	H4	4	TT89971	333.00	TT89993	389.50

For technical information, see pages 345-349

COMBINATION DRILL & TAPS



- Engineered to drill and tap in one operation for added versatility
- Taps are on blanks that meet ANSI specifications
- High speed steel
- Precision manufactured in the USA

SIZE	DRILL LENGTH	DRILL SIZE	THREAD LENGTH	FLUTES	SHANK DIA.	OAL	UNCOATED	
							TOOL #	PRICE
4-40	1/4	.0890	3/8	2	.141	1-7/8	TT70701	27.10
5-40	9/32	.1015	13/32	2	.141	1-15/16	TT70703	27.10
6-32	5/16	.1110	7/16	2	.141	2	TT70705	27.10
8-32	13/32	.1360	1/2	2	.168	2-5/32	TT70707	27.10
10-24	7/16	.1540	5/8	2	.194	2-13/32	TT70709	27.10
10-32	7/16	.1610	5/8	2	.194	2-13/32	TT70711	27.10
12-24	1/2	.1800	21/32	2	.220	2-13/32	TT70713	29.35
1/4-20	9/16	.2055	25/32	2	.255	2-9/16	TT70715	27.10
1/4-28	9/16	.2188	25/32	2	.255	2-9/16	TT70717	27.10
5/16-18	3/4	.2660	15/16	2	.318	2-29/32	TT70719	40.10
5/16-24	3/4	.2770	15/16	2	.318	2-29/32	TT70721	40.10
3/8-16	29/32	.3230	1-1/16	2	.381	3-15/32	TT70723	48.45
3/8-24	29/32	.3390	1-1/16	2	.381	3-15/32	TT70725	48.45
7/16-14	1-3/32	.3770	1-1/4	2	.323	3-27/32	TT70727	58.05
7/16-20	1-3/32	.3937	1-1/4	2	.323	3-27/32	TT70729	58.30
1/2-13	1-1/4	.4331	1-3/8	2	.367	4-3/16	TT70731	65.75
1/2-20	1-1/4	.4531	1-3/8	2	.367	4-3/16	TT70733	65.50

COMBINATION DRILL & TAPS

Metric



- Engineered to drill and tap in one operation for added versatility
- Taps are on blanks that meet ANSI specifications
- High speed steel
- Precision manufactured in the USA

SIZE	DRILL LENGTH	DRILL SIZE	THREAD LENGTH	FLUTES	SHANK DIA.	OAL	UNCOATED	
							TOOL #	PRICE
M4 x 0.7	13/32	.131	1/2	2	.168	2-5/32	TT70830	29.75
M5 x 0.8	7/16	.166	5/8	2	.194	2-13/32	TT70832	29.75
M6 x 1.0	9/16	.198	25/32	2	.255	2-17/32	TT70834	29.75
M8 x 1.25	3/4	.267	15/16	2	.318	2-29/32	TT70836	54.15
M10 x 1.50	29/32	.336	1-1/16	2	.381	3-15/32	TT70838	61.55
M12 x 1.75	1-1/4	.405	1-3/8	2	.367	4-3/16	TT70840	61.55

GENERAL PURPOSE DIES - CARBON STEEL

Hexagon Rethreading Die

- Hexagon style dies engineered to rethread worn or ineffective threads
- Carbon steel
- Precision manufactured in the USA



SIZE	ACROSS FLATS	THICKNESS	UNCOATED	
			TOOL #	PRICE
1/4-20	19/32	1/4	TE80529	17.00
1/4-28	19/32	1/4	TE80532	17.00
5/16-18	11/16	5/16	TE80537	19.90
5/16-24	11/16	5/16	TE80540	19.90
3/8-16	25/32	3/8	TE80544	22.00
3/8-24	25/32	3/8	TE80547	22.00
7/16-14	7/8	7/16	TE80550	27.00
7/16-20	7/8	7/16	TE80553	27.00
1/2-13	1-1/16	1/2	TE80555	29.70
1/2-20	1-1/16	1/2	TE80557	29.70
9/16-12	1-1/16	1/2	TE80559	31.90
9/16-18	1-1/16	1/2	TE80561	31.90
5/8-11	1-1/4	5/8	TE80563	33.35
5/8-18	1-1/4	5/8	TE80566	33.35
11/16-11	1-7/16	3/4	TE80568	36.80
11/16-16	1-7/16	3/4	TE80569	36.80
3/4-10	1-7/16	3/4	TE80571	41.20
3/4-16	1-7/16	3/4	TE80573	41.20
7/8-9	1-5/8	7/8	TE80575	44.70
7/8-14	1-5/8	7/8	TE80577	44.70
1-8	1-13/16	1	TE80579	50.15
1-12	1-13/16	1	TE80581	50.15
1-14	1-13/16	1	TE80583	50.15
1-1/8-7	2	1	TE80584	57.85
1-1/8-12	2	1	TE80585	57.85
1-1/4-7	2-3/16	1	TE80586	63.95
1-1/4-12	2-3/16	1	TE80587	63.95
1-3/8-6	2-3/8	1	TE80588	120.70
1-3/8-12	2-3/8	1	TE80589	120.70
1-1/2-6	2-9/16	1	TE80590	134.25
1-1/2-12	2-9/16	1	TE80591	134.25

GENERAL PURPOSE DIES - CARBON STEEL

Hexagon Rethreading Die - Metric

- Hexagon style dies engineered to rethread worn or ineffective threads
- Carbon steel
- Precision manufactured in the USA



SIZE	ACROSS FLATS	UNCOATED	
		TOOL #	PRICE
M3 x 0.5	1	TE80601	13.00
M4 x 0.7	1	TE80602	12.65
M5 x 0.8	1	TE80603	12.65
M6 x 1.0	1	TE80604	12.65
M7 x 1.0	1	TE80605	13.00
M8 x 1.25	1	TE80606	12.65
M10 x 1.25	1	TE80607	12.65
M10 x 1.50	1	TE80608	12.65
M12 x 1.25	1	TE80609	12.65
M12 x 1.75	1	TE80610	12.65
M14 x 1.50	1-7/16	TE80611	19.55
M14 x 2.0	1-7/16	TE80612	19.55
M16 x 1.50	1-7/16	TE80613	19.55
M16 x 2.0	1-7/16	TE80614	19.55
M18 x 1.50	1-7/16	TE80615	19.55
M18 x 2.50	1-7/16	TE80616	19.55
M20 x 2.5	1-13/16	TE80617	40.70
M24 x 3.0	1-13/16	TE80618	40.70



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GENERAL PURPOSE DIES - CARBON STEEL

Hexagon Rethreading Die - NPT

- Hexagon style dies engineered to rethread worn or ineffective NPT threads
- Carbon steel
- Precision manufactured in the USA



SIZE	ACROSS FLATS	THICKNESS	UNCOATED	
			TOOL #	PRICE
1/8 - 27 NPT	1-1/16	3/8	TE80701	23.55
1/4 - 18 NPT	1-1/4	5/8	TE80702	26.00
3/8 - 18 NPT	1-7/16	5/8	TE80703	35.95
1/2 - 14 NPT	1-5/8	3/4	TE80704	51.90
3/4 - 14 NPT	2	13/16	TE80705	64.55
1 - 11-1/2 NPT	2-3/8	1	TE80706	124.90

GENERAL PURPOSE DIES - CARBON STEEL

Adjustable Round Split Die

- Adjustable, round dies engineered to create male threads onto a part
- Carbon steel
- Precision manufactured in the USA



SIZE	OUTSIDE DIA.	UNCOATED	
		TOOL #	PRICE
6 - 32	1	TE80113	28.90
8 - 32	1	TE80116	28.90
10 - 24	1	TE80119	28.90
10 - 32	1	TE80121	28.90
1/4 - 20	1	TE80127	28.90
1/4 - 20	1-1/2	TE80128	47.35
1/4 - 28	1	TE80130	28.90
5/16 - 18	1	TE80135	28.90
5/16 - 18	1-1/2	TE80136	47.35
5/16 - 24	1	TE80138	28.90
5/16 - 24	1-1/2	TE80139	47.35

SIZE	OUTSIDE DIA.	UNCOATED	
		TOOL #	PRICE
3/8 - 16	1	TE80142	28.90
3/8 - 16	1-1/2	TE80143	47.35
3/8 - 24	1	TE80145	28.90
3/8 - 24	1-1/2	TE80146	47.35
7/16 - 14	1	TE80148	28.90
7/16 - 14	1-1/2	TE80149	47.35
7/16 - 20	1	TE80151	28.90
1/2 - 13	1-1/2	TE80154	47.35
1/2 - 20	1-1/2	TE80156	47.35
9/16 - 12	1-1/2	TE80158	47.35
9/16 - 18	1-1/2	TE80160	47.35
5/8 - 11	1-1/2	TE80162	47.35
5/8 - 18	1-1/2	TE80165	47.35

GENERAL PURPOSE DIES - HIGH SPEED STEEL

Adjustable Round Split Die

- Adjustable, round dies engineered to create male threads onto a part
- High speed steel
- Precision manufactured in the USA



SIZE	OUTSIDE DIA.	UNCOATED	
		TOOL #	PRICE
4-40	1	TE80810	54.40
5-40	13/16	TE80811	36.80
5-44	13/16	TE80812	36.80
6-32	13/16	TE80813	36.80
6-32	1	TE80814	44.70
6-40	13/16	TE80815	36.80
8-32	13/16	TE80816	36.80
8-32	1	TE80817	44.70
10-24	13/16	TE80818	36.80
10-24	1	TE80819	44.70
10-32	13/16	TE80820	36.80
10-32	1	TE80821	44.70
12-24	13/16	TE80822	36.80
12-24	1	TE80823	44.50
12-28	13/16	TE80824	36.80
1/4-20	13/16	TE80825	36.80
1/4-20	1	TE80826	44.70
1/4-20	1-1/2	TE80827	72.80
1/4-28	13/16	TE80828	36.80
1/4-28	1	TE80829	44.70
1/4-28	1-1/2	TE80830	72.80
5/16-18	13/16	TE80831	36.80
5/16-18	1	TE80832	44.70
5/16-18	1-1/2	TE80833	72.80
5/16-24	13/16	TE80834	36.80
5/16-24	1	TE80835	44.70

SIZE	OUTSIDE DIA.	UNCOATED	
		TOOL #	PRICE
5/16-24	1-1/2	TE80836	72.80
3/8-16	1	TE80837	44.70
3/8-16	1-1/2	TE80838	72.80
3/8-24	1	TE80839	44.70
3/8-24	1-1/2	TE80840	72.80
7/16-14	1	TE80841	44.50
7/16-14	1-1/2	TE80842	72.80
7/16-20	1	TE80843	44.70
7/16-20	1-1/2	TE80844	72.80
1/2-13	1	TE80845	44.70
1/2-13	1-1/2	TE80846	72.80
1/2-20	1	TE80847	44.70
1/2-20	1-1/2	TE80848	72.80
9/16-12	1-1/2	TE80849	72.80
9/16-18	1-1/2	TE80850	72.80
5/8-11	1-1/2	TE80851	72.80
5/8-11	2	TE80852	98.90
5/8-18	1-1/2	TE80853	72.80
5/8-18	2	TE80854	98.90
3/4-10	1-1/2	TE80855	72.80
3/4-10	2	TE80856	98.90
3/4-16	1-1/2	TE80857	72.80
3/4-16	2	TE80858	98.90
7/8-9	2	TE80859	98.90
7/8-14	2	TE80860	98.90

GENERAL PURPOSE DIES - DIE STOCKS



- Die stocks engineered for use with Titan USA Adjustable Round Split Dies
- Made in the USA

SIZE	UNCOATED	
	TOOL #	PRICE
1 OD	TE78909	33.10
1-1/2 OD	TE78910	54.50
2 OD	TE78911	95.55

GENERAL PURPOSE DIES - TAP HANDLES
T-Handle Tap Wrench



- T-handle tap wrenches for use with hand taps
- Made in the USA

SIZE	UNCOATED	
	TOOL #	PRICE
0 - 1/4	TE78701	10.65
1/4-1/2	TE78702	16.15

HIGH PERFORMANCE TAPS

Technical Information

General Purpose High Performance Taps					
Material Guide		Rc	Cutting Speed (fpm)		Cutting Fluid*
			Spiral Point	Spiral Flute	
NICKEL BASE ALLOYS	Inconel-625/718, Waspalloy, Rene, Hastelloy	25 - 42	10	10	CO
TITANIUM ALLOYS	Commercially Pure, 6AL-4V, Astm 1/2/3, 6Al-25N-4Zr-2Mo-Si	under 32 over 32	10 8	10 8	CO CO
STAINLESS STEEL (PRECIPITATION)	13/8, 15/5, 17-4, AM-350/355	35 - 42	10	10	CO
STAINLESS STEEL (AUSTENITIC)	200 Series, 302, 303, 304, 316	< 25	20	15	CO
STAINLESS STEEL (MARTENSITIC)	403, 410, 416, 440	25 - 32	15	12	CO
HIGH STRENGTH TOOL STEELS	4140, 4340, 6150, 5210, A2, D2 P20, H11, H13, S2, 01	35 - 42	10	10	CO
MEDIUM ALLOY STEELS	200, 250, 300	< 15	35	25	WS, CO
CARBON STEELS	A36, 12L14, 12L15, 1005, 1018, 1020, 1108-1119, 1213-1215, 1513-1518, 4012, 5015, 9310	< 10	55	40	WS, CO
CAST IRONS	Gray Cast Irons	< 25	20	15	WS
MALLEABLE	A220, A436, A439, A602	< 25	15	12	CO
ALUMINUM	2014, 2024, 6061-(T1-T6), 7075, Die Cast, Extruded		80	60	WS, CO
BRASS, BRONZE	Brass, Alum/Bronze, Low Silicon Bronze		60	45	WS

Your individual manufacturing conditions will greatly influence speeds.

*WS - Water Soluble

*CO - Cutting Oil

In most instances cutting fluid manufacturers recommend specific fluid for different materials.

GENERAL PURPOSE TAPS

Technical Information - Tolerances

Machine Screw Taps (NC & NF)

Size	OAL	Thread Length	Square Length	Shank Dia.	Square
#0 (.060)	1-5/8	5/16	3/16	.141	.110
#1 (.073)	1-11/16	3/8	3/16	.141	.110
#2 (.066)	1-3/4	7/16	3/16	.141	.110
#3 (.099)	1-13/16	1/2	3/16	.141	.110
#4 (.112)	1-7/8	9/16	3/16	.141	.110
#5 (.125)	1-15/16	5/8	3/16	.141	.110
#6 (.138)	2	11/16	3/16	.141	.110
#8 (.164)	2-1/8	3/4	1/4	.168	.131
#10 (.190)	2-3/8	7/8	1/4	.194	.152
#12 (.216)	2-3/8	15/16	9/32	.220	.165

Fractional Size Taps (NC & NF)

Size	OAL	Thread Length	Square Length	Shank Dia.	Square
1/4	2-1/2	1	5/16	.255	.191
5/16	2-23/32	1-1/8	3/8	.318	.238
3/8	2-15/16	1-1/4	7/16	.381	.286
7/16	3-5/32	1-7/16	13/32	.323	.242
1/2	3-3/8	1-21/32	7/16	.367	.275
9/16	3-19/32	1-21/32	1/2	.429	.322
5/8	3-13/16	1-13/16	9/16	.480	.360
11/16	4-1/32	1-13/16	5/8	.542	.406
3/4	4-1/4	2	11/16	.590	.442
7/8	4-11/16	2-7/32	3/4	.697	.523
1	5-1/8	2-1/2	13/16	.800	.600
1-1/8	5-7/16	2-9/16	7/8	.896	.672
1-1/4	5-3/4	2-9/16	1	1.021	.766
1-3/8	6-1/16	3	1-1/16	1.108	.831
1-1/2	6-3/8	3	1-1/8	1.233	.925

Pipe Taps - Straight & Taper

Size	OAL	Thread Length	Square Length	Shank Dia.	Square
1/16 - 27	2-1/8	11/16	3/8	.3125	.234
1/8 - 27	2-1/8	3/4	3/8	.3125(SS)	.234
1/8 - 27	2-1/8	3/4	3/8	.4375(LS)	.328
1/4 - 18	2-7/16	1-1/16	7/16	.5625	.421
3/8 - 18	2-9/16	1-1/16	1/2	.7000	.531
1/2 - 14	3-1/8	1-3/8	5/8	.6875	.515
3/4 - 14	3-1/4	1-3/8	11/16	.9063	.679
1 - 11-1/2	3-3/4	1-3/4	13/16	1.1250	.843
1-1/4 - 11-1/2	4	1-3/4	15/16	1.3125	.984
1-1/2 - 11-1/2	4-1/4	1-3/4	1	1.5000	1.125
2 - 11-1/2	4-1/2	1-3/4	1-1/8	1.8750	1.406

(SS) = Small Shank (LS) = Large Shank

Pulley Taps

Size	Thread Length	Square Length	Shank Dia.	Square	Neck Length	Ground Length
1/4	1	5/16	.255	.191	3/8	1-1/2
5/16	1-1/8	3/8	.318	.238	3/8	1-9/16
3/8	1-1/4	7/16	.381	.286	3/8	1-5/8
7/16	1-7/16	1/2	.444	.333	7/16	1-11/16
1/2	1-21/32	9/16	.507	.380	1/2	1-11/16
5/8	1-13/16	11/16	.633	.475	5/8	2
3/4	2	3/4	.759	.569	3/4	2-1/4

See page 311 for overall lengths available

Small Shank Extension Taps

Size	NC/NF	Thread Length	Square Length	Shank Dia.	Square
8 - 32	NC	3/4	1/4	.123	.092
10 - 24	NC	7/8	1/4	.136	.102
10 - 32	NF	7/8	1/4	.136	.102
1/4 - 20	NC	1	5/16	.185	.139
1/4 - 28	NF	1	5/16	.185	.139
5/16 - 18	NC	1-1/8	3/8	.240	.180
5/16 - 24	NF	1-1/8	3/8	.240	.180
3/8 - 16	NC	1-1/4	7/16	.275	.206
3/8 - 24	NF	1-1/4	7/16	.275	.206
7/16 - 14	NC	1-7/16	13/32	.323	.242
7/16 - 20	NF	1-7/16	13/32	.323	.242
1/2 - 13	NC	1-21/32	7/16	.367	.275
1/2 - 20	NF	1-21/32	7/16	.367	.275
5/8 - 11	NC	1-13/16	9/16	.480	.360
5/8 - 18	NF	1-13/16	9/16	.480	.360
3/4 - 10	NC	2	11/16	.590	.442
3/4 - 16	NF	2	11/16	.590	.442

Metric Taps

Size	Overall Length	Thread Length	Square Length	Shank Dia	Square	Inch Blank
M1.6 x 0.35	1-5/8	5/16	3/16	.141	.110	#0
M2 x 0.40	1-3/4	7/16	3/16	.141	.110	#2
M2.5 x 0.45	1-13/16	1/2	3/16	.141	.110	#3
M3 x 0.50	1-15/16	5/8	3/16	.141	.110	#5
M3.5 x 0.60	2	11/16	3/16	.141	.110	#6
M4 x 0.70	2-1/8	3/4	1/4	.168	.131	#8
M4.5 x 0.75	2-3/8	7/8	1/4	.194	.152	#10
M5 x 0.80	2-3/8	7/8	1/4	.194	.152	#10
M6 x 1	2-1/2	1	5/16	.255	.191	1/4
M6.3 x 1	2-1/2	1	5/16	.255	.191	1/4
M7 x 1	2-23/32	1-1/8	3/8	.318	.238	5/16
M8 x 1.25	2-23/32	1-1/8	3/8	.318	.238	5/16
M10 x 1.50	2-15/16	1-1/4	7/16	.381	.286	3/8
M12 x 1.75	3-3/8	1-21/32	7/16	.367	.275	1/2
M14 x 2	3-19/32	1-21/32	1/2	.429	.322	9/16
M16 x 2	3-13/16	1-13/16	9/16	.480	.360	5/8
M18 x 2.50	4-1/32	1-13/16	5/8	.542	.406	11/16
M20 x 2.50	4-15/32	2	11/16	.652	.489	13/16
M24 x 3	4-29/32	2-7/32	3/4	.760	.570	15/16
M30 x 3.50	5-7/16	2-9/16	1	1.021	.766	1-3/16
M36 x 4	6-1/16	3	1-1/8	1.233	.925	1-7/16

GENERAL PURPOSE TAPS

Technical Information

Tap Recommendations for Classes 2B & 3B Unified Inch Screw Threads							
Size	Threads Per Inch		Recommended Tap Limits		Internal Thread Pitch Diameter Limits		
	NC UC	NF UNF	Class 2B	Class 3B	Min. All Classes (Basic)	Max. Class 2B	Max Class 3B
0	–	80	H2	H1	.0519	.0542	.0536
1	64	–	H2	H1	.0629	.0655	.0648
	–	72	H2	H1	.0640	.0665	.0659
2	56	–	H2	H1	.0744	.0772	.0765
	–	64	H2	H1	.0759	.0786	.0779
3	48	–	H2	H1	.0855	.0885	.0877
	–	56	H2	H1	.0874	.0902	.0895
4	40	–	H2	H2	.0958	.0991	.0982
	–	48	H2	H1	.0985	.1016	.1008
5	40	–	H2	H2	.1088	.1121	.1113
	–	44	H2	H1	.1102	.1134	.1126
6	32	–	H3	H2	.1177	.1214	.1204
	–	40	H2	H1	.1218	.1252	.1243
8	32	–	H3	H2	.1437	.1475	.1465
	–	36	H2	H1	.1460	.1496	.1487
10	24	–	H3	H3	.1629	.1672	.1661
	–	32	H3	H2	.1697	.1736	.1726
12	24	–	H3	H3	.1889	.1933	.1922
	–	28	H3	H3	.1928	.1970	.1959
1/4	20	–	H5	H3	.2175	.2223	.2211
	–	28	H4	H3	.2268	.2311	.2300
5/16	18	–	H5	H3	.2764	.2817	.2803
	–	24	H4	H3	.2854	.2902	.2890
3/8	16	–	H5	H3	.3344	.3401	.3387
	–	24	H4	H3	.3479	.3528	.3516
7/16	14	–	H5	H3	.3911	.3972	.3957
	–	20	H5	H3	.4050	.4104	.4091
1/2	13	–	H5	H3	.4500	.4565	.4548
	–	20	H5	H3	.4675	.4731	.4717
9/16	12	–	H5	H3	.5084	.5152	.5135
	–	18	H5	H3	.5264	.5323	.5308
5/8	11	–	H5	H3	.5660	.5732	.5714
	–	18	H5	H3	.5889	.5949	.5934
3/4	10	–	H5	H5	.6850	.6927	.6907
	–	16	H5	H3	.7094	.7159	.7143
7/8	9	–	H6	H4	.8028	.8110	.8089
	–	14	H6	H4	.8286	.8356	.8339

The above recommended taps normally produce the Class of Thread indicated in average materials when used with reasonable care. However, if the tap specified does not give a satisfactory gage fit in the work, a choice of some other limit tap will be necessary.

GENERAL PURPOSE TAPS

Technical Information

Tap Recommendations for Classes 2B & 3B Unified Inch Screw Threads

Size	Threads Per Inch		Recommended Tap Limits		Internal Thread Pitch Diameter Limits		
	NC UC	NF UNF	Class 2B	Class 3B	Min. All Classes (Basic)	Max. Class 2B	Max Class 3B
1	8	-	H6	H4	.9188	.9276	.9254
	–	12	H6	H4	.9459	.9535	.9516
	NS	NS	H6	H4	.9536	.9609	.9590
1 1/8	7	-	H6	H4	1.0332	1.0416	.10393
	–	12	H6	H4	1.0709	1.0787	.10768
1 1/4	7	-	H6	H4	1.1572	1.1668	1.1644
	–	12	H6	H4	1.1959	1.2309	1.2019
1 3/8	6	-	H6	H4	1.2667	1.2771	1.2745
	–	12	H6	H4	1.3209	1.3291	1.3270
1 1/2	6	-	H6	H4	1.3917	1.4022	1.3996
	–	12	H6	H4	1.4459	1.4542	1.4522

Tap Recommendations for Class 6H Metric Screw Threads

Thread Size		Recommended Tap Limit	Internal Thread - Product Limits - Class 6H			
Nominal Dia. (mm)	Pitch (mm)	Limit Number	Pitch Diameter (mm)		Pitch Diameter (mm)	
			Min.	Max.	Min.	Max.
1.6	.35	D3	1.373	1.458	.05406	.05740
2	.4	D3	1.740	1.830	.06850	.07205
2.5	.45	D3	2.208	2.303	.08693	.09067
3	.5	D3	2.675	2.775	.10531	.10925
3.5	.6	D4	3.110	3.222	.12244	.12685
4	.7	D4	3.545	3.663	.13957	.14421
4.5	.75	D4	4.013	4.131	.15789	.16264
5	.8	D4	4.480	4.605	.17638	.18130
6	1	D5	5.350	5.500	.21063	.21654
7	1	D5	6.350	6.500	.25000	.25591
8	1.25	D5	7.188	7.348	.28299	.28929
10	1.5	D6	9.026	9.206	.35935	.36244
12	1.75	D6	10.863	11.063	.42758	.43555
14	2	D7	12.701	12.913	.50004	.50839
16	2	D7	14.701	14.913	.57878	.58713
20	2.5	D7	18.376	18.600	.72346	.73228
24	3	D8	22.051	22.316	.86815	.87858
30	3.5	D9	27.727	28.007	1.09161	1.10264
36	4	D9	33.402	33.702	1.31504	1.32685

GENERAL PURPOSE TAPS

Technical Information

Tap Hole Size							
Tap Size	Threads Per Inch NC UN	Threads Per Inch NF UN	75% Thread	65% Thread	Tap Drill Size (65% Thread)	Class of Fit	
						2B	3B
0	80	–	0.054	0.055	#54 or 1.4 mm	H3, H2	H2
1	64	–	0.066	0.067	#51 or 1.7 mm	H4, H3	H3, H2
	–	72	0.067	0.068	#51 or 1.75 mm	H4, H3	H3, H2
2	56	–	0.078	0.079	#47 or 2.0 mm	H4, H3	H3, H2
	–	64	0.079	0.080	2.0 mm	H4, H3	H3, H2
3	48	–	0.090	0.091	2.3 mm	H5, H4	H3, H2
	–	56	0.091	0.092	2.3 mm	H5, H4	H3, H2
4	40	–	0.100	0.101	#39	H5, H4	H4, H3
	–	48	0.103	0.104	#37	H5, H4	H4, H3
5	40	–	0.113	0.114	#33 or 2.9 mm	H5, H4	H4, H3
	–	44	0.114	0.115	#33 or 2.9 mm	H5, H4	H4, H3
6	32	–	0.124	0.125	3.1 mm	H6, H5	H4, H3
	–	40	0.126	0.127	1/8" or 3.2 mm	H5, H4	H4, H3
8	32	–	0.149	0.150	#25 or 3.8 mm	H6, H5	H4, H3
	–	36	0.151	0.152	#24	H5, H4	H4, H3
10	24	–	0.170	0.172	11/64"	H7, H6, H5	H5, H4
	–	32	0.175	0.176	#16 or .176"	H6, H5	H4, H3
12	24	–	0.196	0.198	#9 or 5.0 mm	H7, H6, H5	H5, H4
	–	28	0.199	0.201	#7 or 5.1 mm	H7, H6, H5	H4, H3
1/4	20	–	0.225	0.227	5.75 mm	H8, H7, H6	H5, H4
	–	28	0.233	0.235	A	H7, H6, H5	H5, H4
5/16	18	–	0.285	0.287	7.25 mm	H9, H8, H7	H6, H5
	–	24	0.292	0.294	.293"	H8, H7, H6	H5, H4
3/8	16	–	0.344	0.347	S or 11/32"	H9, H8, H7	H7, H6
	–	24	0.355	0.357	9.0 mm	H8, H7, H6	H6, H5
7/16	14	–	0.402	0.405	Y	H10, H9, H8	H7, H6
	–	20	0.414	0.416	Z or 10.5 mm	H9, H8, H7	H6, H5
1/2	13	–	0.462	0.466	.463"	H11, H10, H9	H8, H7, H6
	–	20	0.475	0.477	.476"	H9, H8, H7	H6, H5

Pre Tap Hole Size - Metric				
Tap Size	Pitch	75% Thread	65% Thread	Nearest Drill Size
M1.6	.350	.057	.058	1.45 mm
M1.7	.350	.061	.062	1.55 mm
M2	.400	.072	.073	1.85 mm
M2.5	.450	.091	.092	2.30 mm
M3	.500	.110	.111	#35
M3.5	.600	.128	.129	#30
M4	.700	.145	.146	3.70 mm
M5	.800	.183	.184	#14
M6	1.000	.218	.220	5.50 mm
M8	1.250	.291	.294	7.40 mm
M10	1.500	.365	.368	9.30 mm
M12	1.750	.439	.442	7/16"

HAND TAPS

Technical Information

Hand Taps		
Material Guide		SFM
NICKEL BASE ALLOYS	Inconel - 625/718, Waspalloy, Rene, Hastelloy	10
TITANIUM ALLOYS	Commercially Pure, 6AL - 4V, Astm 1/2/3, 6Al - 25N - 4Zr - 2Mo - Si	10
STAINLESS STEEL (PRECIPITATION)	13/8, 15/5, 17 - 4	15 - 25
STAINLESS STEEL (AUSTENTIC)	200 Series, 302, 303, 304, 304L, 316, 316L	10 - 20
STAINLESS STEEL (MARTENSITIC)	403, 410, 416, 440	15
HIGH STRENGTH TOOL STEELS	4140, 4340, 6150, 5210, A2, D2 P20, H11, H13, S2, O1	15 - 25
MEDIUM ALLOY STEELS	200, 250, 300	20 - 40
CARBON STEELS	1000's, 1100's, 1300's	30 - 50
DUCTILE	Ductile Cast Irons	50
CAST IRONS	Gray Cast Irons	30 - 60
ALUMINUM ALLOYS	2014, 2024, 6061, 7075	60 - 80
MAGNESIUM		50 - 70
COPPER, COPPER ALLOYS		60 - 80
BRASS, BRONZE	Brass, Alum/Bronze, Low Silicon Bronze	30 - 100
COMPOSITES	G-10 Fiberglass, Graphite, Graphite/ Epoxy, Plastics	50 - 70

THREAD FORMING TAPS

Technical Information

Pre Tap Hole Size				
Tap size	TPI	75% Thread	65% Thread	Nearest Drill Size
0	80	0.054	0.055	#54 or 1.4 mm
1	64	0.066	0.067	#51 or 1.7 mm
	72	0.067	0.068	#51 or 1.75 mm
2	56	0.078	0.079	#47 or 2.0 mm
	64	0.079	0.080	2.0 mm
3	48	0.090	0.091	2.3 mm
	56	0.091	0.092	2.3 mm
4	40	0.100	0.101	#39
	48	0.103	0.104	#37
5	40	0.113	0.114	#33 or 2.9 mm
	44	0.114	0.115	#33 or 2.9 mm
6	32	0.124	0.125	3.1 mm
	40	0.126	0.127	1/8" or 3.2 mm
8	32	0.149	0.150	#25 or 3.8 mm
	36	0.151	0.152	#24
10	24	0.170	0.172	11/64"
	32	0.175	0.176	#16 or .176"
12	24	0.196	0.198	#9 or 5.0 mm
	28	0.199	0.201	#7 or 5.1 mm
1/4	20	0.225	0.227	5.75 mm
	28	0.233	0.235	"A"
5/16	18	0.285	0.287	7.25 mm
	24	0.292	0.294	.293"
3/8	16	0.344	0.347	"S" or 11/32"
	24	0.355	0.357	9.0 mm
7/16	14	0.402	0.405	"Y"
	20	0.414	0.416	"Z" or 10.5 mm
1/2	13	0.462	0.466	.463"

Pre Tap Hole Size - Metric				
Tap size	Pitch	75% Thread	65% Thread	Nearest Drill Size
M1.6	0.35	0.057	0.058	1.45 mm
M1.7	0.35	0.061	0.062	1.55 mm
M2	0.4	0.072	0.073	1.85 mm
M2.5	0.45	0.091	0.092	2.30 mm
M3	0.5	0.110	0.111	#35
M3.5	0.6	0.128	0.129	#30
M4	0.7	0.145	0.146	3.70 mm
M5	0.8	0.183	0.184	#14
M6	1	0.218	0.220	5.50 mm
M8	1.25	0.291	0.294	7.40 mm
M10	1.5	0.365	0.368	9.30 mm
M12	1.75	0.439	0.442	7/16"

Where to Use Thread Forming Taps

Materials particularly well suited for thread forming include aluminum, brass, copper, lead, stainless steel, carbon steel, cast steel, leaded steel, and zinc. In general, any material which produces a stringy chip is a good candidate for cold forming threads. If the chips are powdery, the material may be too brittle. Forming taps generate threads without producing chips. The threads produced are much stronger than those created by cut taps because of the displacements of the grain of the metal in the workpiece. Cutting taps produce chips which may interfere with the tapping process.

Major Advantages to Thread Forming

Chipless Tapping – No chip removal problems in blind holes

Stronger Threads – The grain flow of formed threads follows the contour of the thread in steel and stainless steel, resulting in greater thread strength.

Better Thread Gaging – Forming taps create their own lead therefore the possibility of producing oversized threads is greatly reduced.

Stronger Taps – The absence for the need for flutes results in a stronger more solid tap.

Longer Tap Life – Forming taps last 3 to 20 times longer because they have no cutting edge to dull.

More Efficient Production – Longer tap life, less tap breakage and faster tapping speeds (up to 2X faster than cutting taps).

Ideal for Non-Lead Screw Tappers – The ability to form their own lead makes forming taps well suited or NC machines or other machines without lead screws.

THREAD FORMING TAPS

Technical Information

General Purpose Thread Forming Taps			
Material Guide		Rc	SFM
NICKEL BASE ALLOYS	Inconel-625/718, Waspalloy, Rene, Hastelloy	< 25	15
TITANIUM ALLOYS	Commercially Pure, 6AL-4V, Astm 1/2/3, 6Al-25N-4Zr-2Mo-Si	25 - 32	10
STAINLESS STEEL (AUSTENITIC)	200 Series, 302, 303, 304, 316	< 25	20
STAINLESS STEEL (MARTENSITIC)	403, 410, 416, 440	25 - 32	15
HIGH STRENGTH TOOL STEELS	4140, 4340, 6150, 5210, A2, D2 P20, H11, H13, S2, 01	35 - 42	10
MEDIUM ALLOY STEELS	200, 250, 300	< 15	35
CARBON STEELS	A36, 12L14, 12L15, 1005, 1018, 1020, 1108-1119, 1213-1215, 1513-1518, 4012, 5015, 9310	< 10	55
ALUMINUM	2014, 2024, 6061-(T1-T6), 7075, Die Cast, Extruded		80
BRASS, BRONZE	Brass, Alum/Bronze, Low Silicon Bronze		60

Calculating Tap Drill Sizes - Thread Forming Taps
Drill Size = Major Diameter - [(0.0068 X Desired % of Thread) ÷ Threads Per Inch]
Drill Size (mm) = Major Diameter - [(0.0068 X Desired % of Thread x Pitch (mm))]

Guidelines for Using Thread Forming Taps

Pre-tap Hole Size - Thread Forming Taps require a larger pre-tap hole size than a cutting tap.

Tapping with too small of a pre-tap hole size results in excessive tap wear, torque and possible tap breakage.

Lubrication - Thread Forming Taps require good lubrication. Cutting oils are generally preferred because of their lubricity compared to water soluble coolants.

BURS

Cylindrical - SA



- General purpose cylindrical style burs
- Single cut option provides optimal surface finish for most steels, stainless steels, high temp resistant light metals, and cast iron
- Double cut option provides increased operator control and a strong part finish for ferrous and non-ferrous metals
- Solid carbide head brazed onto a steel shank
- Precision manufactured in the USA

TOOL	SIZE	LOC	SHANK DIA.	OAL	SINGLE CUT		DOUBLE CUT	
	D ₁	L ₂	D ₂	L ₁	TOOL #	PRICE	TOOL #	PRICE
*SA-61	1/16	1/4	3/32	1-1/2	TB19264	6.90	TB19280	6.90
*SA-41	1/16	1/4	1/8	1-1/2	TB19301	6.50	TB19316	6.50
*SA-41L2	1/16	1/4	1/8	2	TB19265	9.60	TB19281	9.60
*SA-41L3	1/16	1/4	1/8	3	TB19266	10.70	TB19282	10.70
*SA-63	3/32	3/8	3/32	1-1/2	TB19267	6.90	TB19283	6.90
*SA-42	3/32	7/16	1/8	1-1/2	TB19302	6.50	TB19317	6.50
*SA-42L2	3/32	7/16	1/8	2	TB19268	9.60	TB19284	9.60
*SA-42L3	3/32	7/16	1/8	3	TB19269	10.70	TB19285	10.70
*SA-43	1/8	9/16	1/8	1-1/2	TB19303	6.50	TB19318	6.50
*SA-43L2	1/8	9/16	1/8	2	TB19270	9.60	TB19286	9.60
*SA-43L3	1/8	9/16	1/8	3	TB19271	10.70	TB19287	10.70
*SA-11	1/8	1/2	1/4	2	TB19307	12.70	TB19322	12.70
*SA-12	1/8	5/8	1/4	2	TB19272	12.75	TB19288	12.75
SA-52	5/32	1/2	1/8	2	TB19304	14.05	TB19319	14.05
*SA-13	5/32	5/8	1/4	2	TB19630	17.60	TB19652	17.60
SA-53	3/16	1/2	1/8	2	TB19305	14.05	TB19320	14.05
*SA-81	3/16	1/2	3/16	2	TB19273	15.45	TB19289	15.45
*SA-14	3/16	5/8	1/4	2	TB19308	15.20	TB19323	15.20
SA-51	1/4	1/2	1/8	2	TB19306	9.50	TB19321	9.50
*SA-1	1/4	5/8	1/4	2	TB19309	10.80	TB19324	10.80
SA-1L6	1/4	1/2	1/4	6-1/2	TB19562	21.90	TB19565	21.90
*SA-1L	1/4	1	1/4	2	TB19274	16.70	TB19290	16.70
SA-2	5/16	3/4	1/4	2-1/2	TB19310	19.90	TB19325	19.90
SA-3	3/8	3/4	1/4	2-1/2	TB19311	13.30	TB19326	13.30
SA-3L6	3/8	3/4	1/4	6-3/4	TB19563	30.75	TB19566	30.75
SA-3L	3/8	1	1/4	2-3/4	TB19275	20.55	TB19291	20.55
SA-3X	3/8	1-1/2	1/4	3-1/4	TB19276	29.10	TB19292	29.10
SA-4	7/16	1	1/4	2-3/4	TB19312	30.85	TB19327	30.85
SA-5	1/2	1	1/4	2-3/4	TB19313	21.30	TB19328	21.30
SA-5L6	1/2	1	1/4	7	TB19564	48.25	TB19567	48.25
SA-6	5/8	1	1/4	2-3/4	TB19314	30.65	TB19329	30.65
SA-15	3/4	1/2	1/4	2-1/4	TB19277	46.60	TB19293	46.60
SA-16	3/4	3/4	1/4	2-1/2	TB19278	46.60	TB19294	46.60
SA-7	3/4	1	1/4	2-3/4	TB19315	47.75	TB19330	47.75
SA-9	1	1	1/4	2-3/4	TB19632	75.40	TB19654	75.40

* One Solid Carbide Piece

For technical information, see page 367

BURS

Cylindrical - SA - For Aluminum



- Cylindrical style burs optimized for use in non-ferrous metals, aluminum alloys, and plastics
- Single cut style provides optimal surface finish
- Solid carbide head brazed onto a steel shank
- Precision manufactured in the USA

TOOL	SIZE	LENGTH OF CUT	SHANK DIA.	OAL	ALUMA CUT	
	D ₁	L ₂	D ₂	L ₁	TOOL #	PRICE
*SA-1NF	1/4	5/8	1/4	2	TB19592	15.55
SA-3NF	3/8	3/4	1/4	2-1/2	TB19593	21.85
SA-5NF	1/2	1	1/4	2-3/4	TB19594	36.35
SA-6NF	5/8	1	1/4	2-3/4	TB19595	54.00
SA-7NF	3/4	1	1/4	2-3/4	TB19596	70.95

* One Solid Carbide Piece

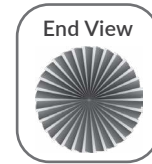


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BURS

Cylindrical End Cut - SB



- General purpose cylindrical end cut style burs
- Single cut option provides optimal surface finish for most steels, stainless steels, high temp resistant light metals, and cast iron
- Double cut option provides increased operator control and a strong part finish for ferrous and non-ferrous metals
- Solid carbide head brazed onto a steel shank
- Precision manufactured in the USA

TOOL	SIZE	LOC	SHANK DIA.	OAL	SINGLE CUT		DOUBLE CUT	
	D ₁				TOOL #	PRICE	TOOL #	PRICE
*SB-41	1/16	1/4	1/8	1-1/2	TB19331	8.70	TB19660	8.70
*SB-41L2	1/16	1/4	1/8	2	TB19815	10.45	TB19834	10.45
*SB-41L3	1/16	1/4	1/8	3	TB19816	11.70	TB19835	11.70
*SB-42	3/32	7/16	1/8	1-1/2	TB19332	6.95	TB19658	6.95
*SB-42L2	3/32	7/16	1/8	2	TB19817	10.45	TB19836	10.45
*SB-42L3	3/32	7/16	1/8	3	TB19818	11.70	TB19837	11.70
† SB-ECO	1/8	-	1/8	1-1/2	TB19819	5.15		
*SB-43	1/8	9/16	1/8	1-1/2	TB19333	6.35	TB19656	6.35
*SB-43L2	1/8	9/16	1/8	2	TB19820	10.45	TB19839	10.45
*SB-43L3	1/8	9/16	1/8	3	TB19821	11.70	TB19840	11.70
*SB-11	1/8	1/2	1/4	2	TB19336	16.50	TB19344	16.50
*SB-12	1/8	5/8	1/4	2	TB19822	14.05	TB19841	14.05
*SB-13	5/32	5/8	1/4	2	TB19634	19.80	TB19662	19.80
*SB-14	3/16	5/8	1/4	2	TB19337	16.55	TB19345	16.55
*SB-51	1/4	3/16	1/8	1-11/16	TB19334	9.60	TB19342	9.60
SB-51	1/4	1/2	1/8	2	TB19335	10.30	TB19343	10.30
*SB-1	1/4	5/8	1/4	2	TB19338	12.75	TB19346	12.75
*SB-1L	1/4	1	1/4	2	TB19823	18.40	TB19842	18.40
SB-2	5/16	3/4	1/4	2-1/2	TB19339	21.85	TB19347	21.85
SB-3	3/8	3/4	1/4	2-1/2	TB19340	15.25	TB19348	15.25
SB-3L	3/8	1	1/4	2-3/4	TB19824	22.55	TB19843	22.55
SB-3X	3/8	1-1/2	1/4	3-1/4	TB19825	29.80	TB19844	29.80
SB-4	7/16	1	1/4	2-3/4	TB19636	35.05	TB19349	35.05
SB-5	1/2	1	1/4	2-3/4	TB19341	23.35	TB19350	23.35
SB-6	5/8	1	1/4	2-3/4	TB19692	34.30	TB19351	34.30
SB-15	3/4	1/2	1/4	2-1/4	TB19826	51.15	TB19845	51.15
SB-16	3/4	3/4	1/4	2-1/2	TB19827	51.15	TB19846	51.15
SB-7	3/4	1	1/4	2-3/4	TB19638	52.60	TB19352	52.60
SB-9	1	1	1/4	2-3/4	TB19640	82.30	TB19664	82.30

* One Solid Carbide Piece † End Cut Only

Cylindrical End Cut - SB - For Aluminum



- General purpose cylindrical end cut style burs optimized for use in non-ferrous metals, aluminum alloys, and plastics
- Single cut style provides optimal surface finish
- Solid carbide head brazed onto a steel shank
- Precision manufactured in the USA

TOOL	SIZE	LENGTH OF CUT	SHANK DIA.	OAL	ALUMA CUT	
	D1				TOOL #	PRICE
SB-3NF	3/8	3/4	1/4	2-1/2	TB19852	24.60
SB-5NF	1/2	1	1/4	2-3/4	TB19853	37.75
SB-6NF	5/8	1	1/4	2-3/4	TB19854	52.10
SB-7NF	3/4	1	1/4	2-3/4	TB19855	76.35

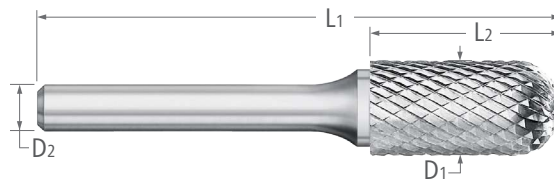


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BURS

Cylindrical Ball Nose - SC



- General purpose cylindrical ball nose style burs
- Single cut option provides optimal surface finish for most steels, stainless steels, high temp resistant light metals, and cast iron
- Double cut option provides increased operator control and a strong part finish for ferrous and non-ferrous metals
- Solid carbide head brazed onto a steel shank
- Precision manufactured in the USA

TOOL	SIZE	LOC	SHANK DIA. D ₂	OAL L ₁	SINGLE CUT		DOUBLE CUT	
	D ₁				TOOL #	PRICE	TOOL #	PRICE
*SC-61	3/32	3/8	3/32	1-1/2	TB19761	6.90	TB19772	6.90
*SC-41	3/32	7/16	1/8	1-1/2	TB19353	6.50	TB19367	6.50
*SC-42	1/8	9/16	1/8	1-1/2	TB19354	6.50	TB19368	6.50
*SC-42L2	1/8	9/16	1/8	2	TB19762	9.60	TB19773	9.60
*SC-42L3	1/8	9/16	1/8	3	TB19763	10.70	TB19774	10.70
*SC-11	1/8	1/2	1/4	2	TB19358	17.75	TB19372	17.75
*SC-12	1/8	5/8	1/4	2	TB19764	13.50	TB19775	13.50
SC-52	5/32	1/2	1/8	2	TB19355	14.05	TB19369	14.05
*SC-13	5/32	5/8	1/4	2	TB19642	20.25	TB19666	20.25
SC-53	3/16	1/2	1/8	2	TB19356	14.05	TB19370	14.05
*SC-81	3/16	1/2	3/16	2	TB19766	15.50	TB19777	15.50
*SC-14	3/16	5/8	1/4	2	TB19359	17.65	TB19373	17.65
SC-51	1/4	1/2	1/8	2	TB19357	9.60	TB19371	9.60
*SC-1	1/4	5/8	1/4	2	TB19360	12.90	TB19374	12.90
*SC-1L	1/4	1	1/4	2	TB19767	16.70	TB19778	16.70
SC-1L6	1/4	1/2	1/4	6-1/2	TB19568	25.35	TB19571	25.35
SC-2	5/16	3/4	1/4	2-1/2	TB19361	21.45	TB19375	21.45
SC-3	3/8	3/4	1/4	2-1/2	TB19362	15.45	TB19376	15.45
SC-3L	3/8	1	1/4	2-3/4	TB19768	22.45	TB19779	22.45
SC-3L6	3/8	3/4	1/4	6-3/4	TB19569	34.25	TB19572	34.25
SC-3X	3/8	1-1/2	1/4	3-1/4	TB19769	26.40	TB19788	26.40
SC-4	7/16	1	1/4	2-3/4	TB19363	33.95	TB19377	33.95
SC-5	1/2	1	1/4	2-3/4	TB19364	24.15	TB19378	24.15
SC-5L6	1/2	1	1/4	7	TB19570	54.10	TB19573	54.10
SC-6	5/8	1	1/4	2-3/4	TB19365	35.90	TB19379	35.90
SC-15	3/4	1/2	1/4	2-1/4	TB19770	50.05	TB19789	50.05
SC-16	3/4	3/4	1/4	2-1/2	TB19771	50.05	TB19792	50.05
SC-7	3/4	1	1/4	2-3/4	TB19366	51.45	TB19380	51.45
SC-9	1	1	1/4	2-3/4	TB19780	77.85	TB19782	77.85

* One Solid Carbide Piece

For technical information, see page 367

Cylindrical Ball Nose - SC - For Aluminum



- General purpose ball nose shape style burs optimized for use in non-ferrous metals, aluminum alloys, and plastics
- Single cut style provides optimal surface finish
- Solid carbide head brazed onto a steel shank
- Precision manufactured in the USA

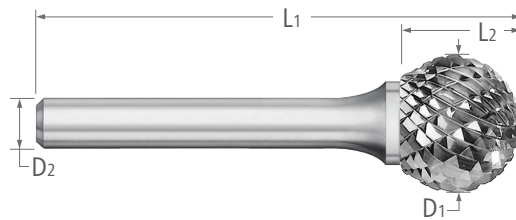
TOOL	SIZE	LENGTH OF CUT	SHANK DIA.	OAL	ALUMA CUT	
	D1		D2	L1	TOOL #	PRICE
*SC-1NF	1/4	5/8	1/4	2	TB19597	15.40
SC-3NF	3/8	3/4	1/4	2-1/2	TB19598	20.60
SC-5NF	1/2	1	1/4	2-3/4	TB19599	29.05
SC-7NF	3/4	1	1/4	2-3/4	TB19600	70.20

* One Solid Carbide Piece



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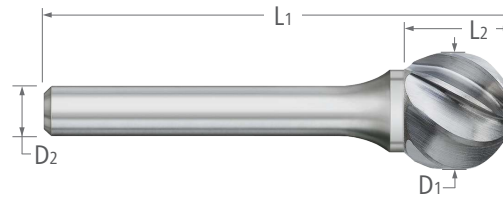
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BURS**Ball Shape - SD**

- General purpose cylindrical ball shape style burs
- Single cut option provides optimal surface finish for most steels, stainless steels, high temp resistant light metals, and cast iron
- Double cut option provides increased operator control and a strong part finish for ferrous and non-ferrous metals
- Solid carbide head brazed onto a steel shank
- Precision manufactured in the USA

TOOL	SIZE	LOC	SHANK DIA.	OAL	SINGLE CUT		DOUBLE CUT	
	D ₁	L ₂	D ₂	L ₁	TOOL #	PRICE	TOOL #	PRICE
*SD-40	1/16	1/16	1/8	1-1/2	TB19492	6.90	TB19136	6.90
*SD-61	3/32	3/32	3/32	1-1/2	TB19130	6.90	TB19137	6.90
*SD-41	3/32	3/32	1/8	1-1/2	TB19493	6.50	TB19506	6.50
*SD-42	1/8	1/8	1/8	1-1/2	TB19644	6.50	TB19507	6.50
*SD-42L2	1/8	1/8	1/8	2	TB19131	9.60	TB19138	9.60
SD-42L3	1/8	1/8	1/8	3	TB19132	10.70	TB19139	10.70
SD-11	1/8	1/8	1/4	2	TB19497	16.25	TB19510	16.25
*SD-52	5/32	5/32	1/8	1-21/32	TB19133	13.05	TB19140	13.05
*SD-53	3/16	3/16	1/8	1-11/16	TB19134	14.05	TB19508	14.05
SD-81	3/16	5/32	3/16	2	TB19135	15.50	TB19141	15.50
*SD-14	3/16	3/16	1/4	2	TB19498	16.25	TB19511	16.25
SD-51	1/4	1/4	1/8	1-3/4	TB19496	9.50	TB19509	9.50
SD-1	1/4	1/4	1/4	2	TB19499	12.35	TB19512	12.35
SD-1L6	1/4	1/4	1/4	6-1/4	TB19574	23.50	TB19577	23.50
SD-2	5/16	5/16	1/4	2-1/16	TB19500	17.45	TB19513	17.45
SD-3	3/8	3/8	1/4	2-1/8	TB19501	13.30	TB19514	13.30
SD-3L6	3/8	3/8	1/4	6-3/8	TB19575	28.15	TB19578	28.15
SD-4	7/16	7/16	1/4	2-3/16	TB19502	22.65	TB19515	22.65
SD-5	1/2	1/2	1/4	2-1/2	TB19503	18.00	TB19516	18.00
SD-5L6	1/2	1/2	1/4	6-1/2	TB19576	38.10	TB19579	38.10
SD-6	5/8	5/8	1/4	2-3/8	TB19504	28.25	TB19517	28.25
SD-7	3/4	3/4	1/4	2-1/2	TB19505	38.95	TB19518	38.95
SD-9	1	1	1/4	2-3/4	TB19646	82.30	TB19668	82.30

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BURS**Ball Shape - SD - For Aluminum**

- General purpose cylindrical ball shape style burs optimized for use in non-ferrous metals, aluminum alloys, and plastics
- Single cut style provides optimal surface finish
- Solid carbide head brazed onto a steel shank
- Precision manufactured in the USA

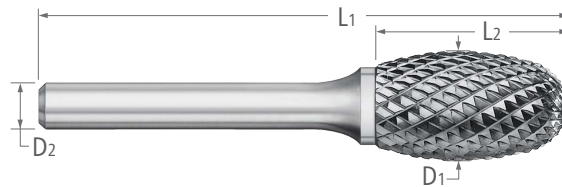
TOOL	SIZE	LENGTH OF CUT	SHANK DIA.	OAL	ALUMA CUT	
	D ₁	L ₂	D ₂	L ₁	TOOL #	PRICE
* SD-1NF	1/4	1/4	1/4	2	TB19613	15.20
SD-3NF	3/8	3/8	1/4	2-1/8	TB19614	19.15
SD-5NF	1/2	1/2	1/4	2-13/64	TB19615	31.25
SD-6NF	5/8	5/8	1/4	2-5/16	TB19616	47.20

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BURS**Egg Shape - SE**

- General purpose egg shape style burs
- Single cut option provides optimal surface finish for most steels, stainless steels, high temp resistant light metals, and cast iron
- Double cut option provides increased operator control and a strong part finish for ferrous and non-ferrous metals
- Solid carbide head brazed onto a steel shank
- Precision manufactured in the USA

TOOL	SIZE	LOC	SHANK DIA.	OAL	SINGLE CUT		DOUBLE CUT	
	D1	L2	D2	L1	TOOL #	PRICE	TOOL #	PRICE
*SE-61	3/32	1/8	3/32	1-1/2	TB19145	6.90	TB19153	6.90
*SE-41	1/8	7/32	1/8	1-1/2	TB19456	6.50	TB19464	6.50
*SE-41L2	1/8	7/32	1/8	2	TB19146	9.60	TB19154	9.60
*SE-41L3	1/8	7/32	1/8	3	TB19147	10.70	TB19155	10.70
SE-53	3/16	9/32	1/8	1-25/32	TB19457	14.05	TB19465	14.05
*SE-81	3/16	9/32	3/16	2	TB19148	15.50	TB19156	15.50
*SE-11	3/16	5/16	1/4	2	TB19149	13.90	TB19157	13.90
SE-51	1/4	3/8	1/8	1-7/8	TB19458	9.50	TB19466	9.50
*SE-1	1/4	3/8	1/4	2	TB19459	15.20	TB19467	15.20
SE-1L6	1/4	3/8	1/4	6-3/8	TB19150	20.55	TB19158	20.55
SE-3	3/8	5/8	1/4	2-3/8	TB19460	16.05	TB19468	16.05
SE-3L6	3/8	5/8	1/4	6-5/8	TB19151	23.10	TB19159	23.10
SE-5	1/2	7/8	1/4	2-5/8	TB19461	22.50	TB19469	22.50
SE-5L6	1/2	7/8	1/4	6-7/8	TB19152	34.45	TB19160	34.45
SE-6	5/8	1	1/4	2-3/4	TB19462	35.55	TB19470	35.55
SE-7	3/4	1	1/4	2-3/4	TB19463	49.45	TB19471	49.45

* One Solid Carbide Piece

BURS**Egg Shape - SE - For Aluminum**

- General purpose egg shape style burs optimized for use in non-ferrous metals, aluminum alloys, and plastics
- Single cut style provides optimal surface finish
- Solid carbide head brazed onto a steel shank
- Precision manufactured in the USA

TOOL	SIZE	LENGTH OF CUT	SHANK DIA.	OAL	ALUMA CUT	
	D1	L2	D2	L1	TOOL #	PRICE
SE-3NF	3/8	5/8	1/4	2-3/8	TB19606	21.30
SE-5NF	1/2	7/8	1/4	2-5/8	TB19607	36.85
SE-6NF	5/8	1	1/4	2-3/4	TB19608	52.25
SE-7NF	3/4	1	1/4	2-3/4	TB19609	74.85

For technical information, see page 367

BURS

Round Nose Tree - SF



- General purpose round nose tree style burs
- Single cut option provides optimal surface finish for most steels, stainless steels, high temp resistant light metals, and cast iron
- Double cut option provides increased operator control and a strong part finish for ferrous and non-ferrous metals
- Solid carbide head brazed onto a steel shank
- Precision manufactured in the USA

TOOL	SIZE	LOC	SHANK DIA.	OAL	SINGLE CUT		DOUBLE CUT	
	D ₁	L ₂	D ₂	L ₁	TOOL #	PRICE	TOOL #	PRICE
*SF-61	3/32	1/4	3/32	1-1/2	TB19161	6.90	TB19165	6.90
*SF-41	1/8	1/4	1/8	1-1/2	TB19381	6.50	TB19395	6.50
*SF-42	1/8	1/2	1/8	1-1/2	TB19382	6.50	TB19396	6.50
*SF-42L2	1/8	1/2	1/8	2	TB19162	9.60	TB19166	9.60
SF-42L3	1/8	1/2	1/8	3	TB19163	10.70	TB19167	10.70
*SF-53	3/16	1/2	1/8	2	TB19383	14.05	TB19397	14.05
*SF-81	3/16	1/2	3/16	2	TB19164	15.45	TB19168	15.45
SF-51	1/4	1/2	1/8	2	TB19384	9.50	TB19398	9.50
*SF-1	1/4	3/4	1/4	2	TB19385	13.85	TB19399	13.85
SF-1L6	1/4	1/2	1/4	6-1/2	TB19580	26.50	TB19583	26.50
SF-3	3/8	3/4	1/4	2-1/2	TB19386	15.45	TB19400	15.45
SF-3L6	3/8	3/4	1/4	6-3/4	TB19581	33.75	TB19584	33.75
SF-4	7/16	1	1/4	2-3/4	TB19387	32.45	TB19401	32.45
SF-13	1/2	3/4	1/4	2-1/2	TB19389	34.40	TB19402	34.40
SF-5	1/2	1	1/4	2-3/4	TB19390	23.30	TB19403	23.30
SF-5L6	1/2	1	1/4	7	TB19582	49.50	TB19585	49.50
SF-6	5/8	1	1/4	2-3/4	TB19391	35.55	TB19404	35.55
SF-7	3/4	1	1/4	2-3/4	TB19392	49.65	TB19405	49.65
SF-14	3/4	1-1/4	1/4	3	TB19393	90.80	TB19406	90.80
SF-15	3/4	1-1/2	1/4	3-1/4	TB19394	106.10	TB19407	106.10

* One Solid Carbide Piece

BURS

Round Nose Tree - SF - For Aluminum



- General purpose round nose tree style burs optimized for use in non-ferrous metals, aluminum alloys, and plastics
- Single cut style provides optimal surface finish
- Solid carbide head brazed onto a steel shank
- Precision manufactured in the USA

TOOL	SIZE	LENGTH OF CUT	SHANK DIA.	OAL	ALUMA CUT	
	D ₁	L ₂	D ₂	L ₁	TOOL #	PRICE
*SF-1NF	1/4	3/4	1/4	2	TB19601	15.60
SF-3NF	3/8	3/4	1/4	2-1/2	TB19602	20.80
SF-5NF	1/2	1	1/4	2-3/4	TB19603	36.50
SF-6NF	5/8	1	1/4	2-3/4	TB19604	55.70
SF-14NF	3/4	1-1/4	1/4	3	TB19605	67.75

* One Solid Carbide Piece

For technical information, see page 367

BURS**Pointed Tree - SG**

- General purpose pointed tree style burs
- Single cut option provides optimal surface finish for most steels, stainless steels, high temp resistant light metals, and cast iron
- Double cut option provides increased operator control and a strong part finish for ferrous and non-ferrous metals
- Solid carbide head brazed onto a steel shank
- Precision manufactured in the USA

TOOL	SIZE	LOC	SHANK DIA.	OAL	SINGLE CUT		DOUBLE CUT	
	D1	L2	D2	L1	TOOL #	PRICE	TOOL #	PRICE
*SG-61	3/32	1/4	3/32	1-1/2	TB19930	6.90	TB19938	6.90
*SG-41	1/8	1/4	1/8	1-1/2	TB19408	6.45	TB19421	6.45
*SG-42	1/8	5/16	1/8	1-1/2	TB19409	6.45	TB19422	6.45
*SG-43	1/8	3/8	1/8	1-1/2	TB19410	6.45	TB19423	6.45
*SG-44	1/8	1/2	1/8	1-1/2	TB19411	8.90	TB19424	8.90
*SG-44L2	1/8	1/2	1/8	2	TB19931	9.60	TB19939	9.60
*SG-44L3	1/8	1/2	1/8	3	TB19932	10.70	TB19940	10.70
SG-53	3/16	1/2	1/8	2	TB19412	14.05	TB19425	14.05
*SG-81	3/16	1/2	3/16	2	TB19933	15.45	TB19941	15.45
SG-51	1/4	1/2	1/8	2	TB19413	9.50	TB19426	9.50
*SG-1	1/4	5/8	1/4	2	TB19414	14.15	TB19427	14.15
SG-1L6	1/4	1/2	1/4	6-1/2	TB19934	19.45	TB19942	19.45
SG-2	5/16	3/4	1/4	2-1/2	TB19415	22.40	TB19428	22.40
SG-3	3/8	3/4	1/4	2-1/2	TB19416	15.85	TB19429	15.85
SG-3L6	3/8	3/4	1/4	6-3/4	TB19935	24.40	TB19943	24.40
SG-13	1/2	3/4	1/4	2-1/2	TB19417	34.00	TB19430	34.00
SG-5	1/2	1	1/4	2-3/4	TB19418	23.35	TB19431	23.35
SG-5L6	1/2	1	1/4	7	TB19936	31.85	TB19944	31.85
SG-6	5/8	1	1/4	2-3/4	TB19419	36.30	TB19432	36.30
SG-7	3/4	1	1/4	2-3/4	TB19420	48.50	TB19433	48.50
SG-15	3/4	1-1/2	1/4	3-1/4	TB19937	58.30	TB19945	58.30

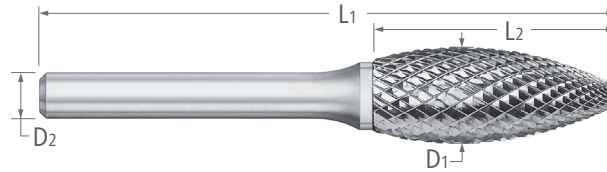
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BURS

Flame Shape - SH



- General purpose flame style burs
- Single cut option provides optimal surface finish for most steels, stainless steels, high temp resistant light metals, and cast iron
- Double cut option provides increased operator control and a strong part finish for ferrous and non-ferrous metals
- Solid carbide head brazed onto a steel shank
- Precision manufactured in the USA

TOOL	SIZE	LOC	SHANK DIA.	OAL	SINGLE CUT		DOUBLE CUT	
	D1				TOOL #	PRICE	TOOL #	PRICE
SH-41	1/8	1/4	1/8	1-1/2	TB19519	6.50	TB19525	6.50
SH-41L2	1/8	1/4	1/8	2	TB19950	9.60	TB19954	9.60
*SH-41L3	1/8	1/4	1/8	3	TB19951	10.70	TB19955	10.70
*SH-53	3/16	3/8	1/8	1-7/8	TB19520	14.05	TB19526	14.05
*SH-1	1/4	5/8	1/4	2	TB19810	15.05	TB19812	15.05
SH-2	5/16	3/4	1/4	2-1/2	TB19521	17.30	TB19527	17.30
*SH-2L6	5/16	3/4	1/4	6-3/4	TB19952	23.10	TB19956	23.10
SH-5	1/2	1-1/4	1/4	3	TB19522	33.75	TB19528	33.75
SH-5L6	1/2	1-1/4	1/4	7-1/4	TB19953	37.05	TB19957	37.05
SH-6	5/8	1-7/16	1/4	3-3/16	TB19523	79.05	TB19529	79.05
SH-7	3/4	1-5/8	1/4	3-3/8	TB19524	100.45	TB19530	100.45

* One Solid Carbide Piece

BURS

60° Included Angle - SJ

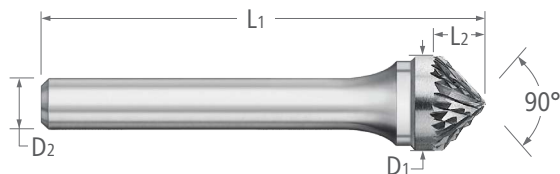


- General purpose burs featuring a 60° included angle
- Single cut option provides optimal surface finish for most steels, stainless steels, high temp resistant light metals, and cast iron
- Double cut option provides increased operator control and a strong part finish for ferrous and non-ferrous metals
- Solid carbide head brazed onto a steel shank
- Precision manufactured in the USA

TOOL	SIZE	LOC	SHANK DIA.	OAL	SINGLE CUT		DOUBLE CUT	
	D1				TOOL #	PRICE	TOOL #	PRICE
*SJ-42	1/8	3/32	1/8	1-1/2	TB19554	6.50	TB19558	6.50
*SJ-1	1/4	3/16	1/4	2	TB19555	12.35	TB19559	12.35
SJ-3	3/8	5/16	1/4	2-3/16	TB19556	15.25	TB19560	15.25
SJ-5	1/2	7/16	1/4	2-19/64	TB19557	20.90	TB19561	20.90
SJ-6	5/8	9/16	1/4	2-5/16	TB19960	25.20	TB19963	25.20
SJ-7	3/4	11/16	1/4	2-7/16	TB19961	33.05	TB19964	33.05
SJ-9	1	15/16	1/4	2-11/16	TB19962	66.50	TB19965	66.50

* One Solid Carbide Piece

For technical information, see page 367

BURS**90° Included Angle - SK**

- General purpose burs featuring a 90° included angle
- Single cut option provides optimal surface finish for most steels, stainless steels, high temp resistant light metals, and cast iron
- Double cut option provides increased operator control and a strong part finish for ferrous and non-ferrous metals
- Solid carbide head brazed onto a steel shank
- Precision manufactured in the USA

TOOL	SIZE	LOC	SHANK DIA.	OAL	SINGLE CUT		DOUBLE CUT	
	D ₁	L ₂	D ₂	L ₁	TOOL #	PRICE	TOOL #	PRICE
*SK-42	1/8	1/16	1/8	1-1/2	TB19546	6.50	TB19550	6.50
*SK-1	1/4	1/8	1/4	2	TB19547	12.35	TB19551	12.35
SK-3	3/8	3/16	1/4	2-1/16	TB19548	12.90	TB19552	12.90
SK-5	1/2	1/4	1/4	2-1/8	TB19549	20.25	TB19553	20.25
SK-6	5/8	5/16	1/4	2-3/16	TB19970	25.20	TB19972	25.20
SK-7	3/4	3/8	1/4	2-1/4	TB19694	40.95	TB19695	40.95
SK-9	1	1/2	1/4	2-1/4	TB19971	62.50	TB19973	62.50

* One Solid Carbide Piece

BURS**Included Angle with Radius End - SL**

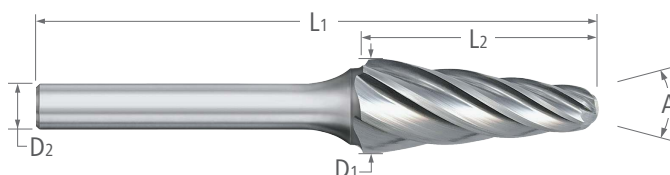
- General purpose burs featuring an include angle with a radius end
- Single cut option provides optimal surface finish for most steels, stainless steels, high temp resistant light metals, and cast iron
- Double cut option provides increased operator control and a strong part finish for ferrous and non-ferrous metals
- Solid carbide head brazed onto a steel shank
- Precision manufactured in the USA

INCLUDED ANGLE	TOOL	SIZE	LENGTH OF CUT	SHANK DIAMETER	OAL	SINGLE CUT		DOUBLE CUT	
A		D ₁	L ₂	D ₂	L ₁	TOOL #	PRICE	TOOL #	PRICE
8°	*SL-41	1/8	3/8	1/8	1-1/2	TB19472	6.45	TB19482	6.45
	*SL-42	1/8	1/2	1/8	1-1/2	TB19473	6.45	TB19483	6.45
	*SL-42L2	1/8	1/2	1/8	2	TB19980	9.60	TB19992	9.60
	*SL-42L3	1/8	1/2	1/8	3	TB19981	10.70	TB19993	10.70
14°	SL-53	3/16	1/2	1/8	2	TB19474	14.05	TB19484	14.05
	*SL-81	3/16	7/16	3/16	2	TB19982	15.45	TB19994	15.45
	*SL-1	1/4	5/8	1/4	2	TB19475	13.05	TB19485	13.05
	SL-1L6	1/4	5/8	1/4	6-5/8	TB19586	27.15	TB19589	27.15
	SL-2	5/16	7/8	1/4	2-3/4	TB19476	24.85	TB19486	24.85
	SL-3	3/8	1-1/16	1/4	2-15/16	TB19477	17.85	TB19487	17.85
	SL-3L6	3/8	1-1/16	1/4	7-1/16	TB19587	42.90	TB19590	42.90
	SL-4	1/2	1-1/4	1/4	3	TB19478	36.45	TB19488	36.45
	SL-4L6	1/2	1-1/4	1/4	7-1/4	TB19588	52.30	TB19591	52.30
	SL-6	5/8	1-5/16	1/4	3-3/16	TB19480	58.20	TB19490	58.20
	SL-7	3/4	1-1/2	1/4	3-3/8	TB19481	80.05	TB19491	80.05

For technical information, see page 367

BURS

Included Angle with Radius End - SL - For Aluminum

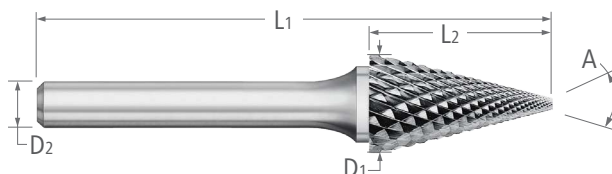


- General purpose burs for aluminum, featuring an included angle with a radius end
- Single cut style provides optimal surface finish
- Solid carbide head brazed onto a steel shank
- Precision manufactured in the USA

INCLUDED ANGLE	TOOL	SIZE	LENGTH OF CUT	SHANK DIAMETER	OAL	ALUMA CUT	
A		D1	L2	D2	L1	TOOL #	PRICE
14°	SL-3NF	3/8	1-1/16	1/4	2-15/16	TB19617	32.00
	SL-4NF	1/2	1-1/4	1/4	3	TB19610	36.60
	SL-5NF	5/8	1-3/16	1/4	3-5/16	TB19618	66.65
	SL-6NF	5/8	1-5/16	1/4	3-3/16	TB19611	73.70
	SL-7NF	3/4	1-1/2	1/4	3-3/8	TB19612	91.65

BURS

Pointed Cone - SM

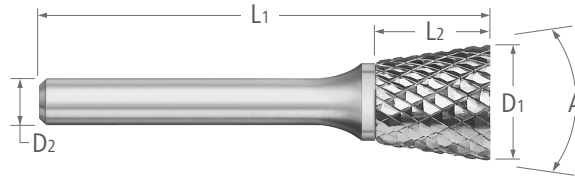


- General purpose pointed cone style burs
- Single cut option provides optimal surface finish for most steels, stainless steels, high temp resistant light metals, and cast iron
- Double cut option provides increased operator control and a strong part finish for ferrous and non-ferrous metals
- Solid carbide head brazed onto a steel shank
- Precision manufactured in the USA

TOOL	SIZE	LOC	INCL. ANGLE	SHANK DIA.	OAL	SINGLE CUT		DOUBLE CUT	
	D1	L2	A	D2	L1	TOOL #	PRICE	TOOL #	PRICE
*SM-61	3/32	1/4	10°	3/32	1-1/2	TB19061	6.90	TB19064	6.90
*SM-41	1/8	11/32	12°	1/8	1-1/2	TB19434	6.50	TB19445	6.50
*SM-42	1/8	7/16	14°	1/8	1-1/2	TB19435	6.50	TB19446	6.50
*SM-42L2	1/8	7/16	14°	1/8	2	TB19062	9.60	TB19065	9.60
*SM-42L3	1/8	7/16	14°	1/8	3	TB19063	10.70	TB19066	10.70
*SM-43	1/8	5/8	7°	1/8	1-1/2	TB19436	6.50	TB19447	6.50
SM-53	3/16	1/2	16°	1/8	2	TB19437	14.05	TB19448	14.05
SM-51	1/4	1/2	22°	1/8	2-1/8	TB19438	9.50	TB19449	9.50
*SM-1	1/4	1/2	22°	1/4	2	TB19439	12.20	TB19450	12.20
*SM-2	1/4	3/4	14°	1/4	2	TB19440	18.85	TB19451	18.85
*SM-3	1/4	1	10°	1/4	2	TB19441	13.55	TB19452	13.55
SM-4	3/8	5/8	28°	1/4	2-1/2	TB19442	18.15	TB19453	18.15
SM-5	1/2	7/8	28°	1/4	2-3/4	TB19443	25.45	TB19454	25.45
SM-6	5/8	1	31°	1/4	2-7/8	TB19444	57.30	TB19455	57.30

* One Solid Carbide Piece

For technical information, see page 367

BURS**Inverted Taper - SN**

- General purpose inverted taper style burs
- Single cut option provides optimal surface finish for most steels, stainless steels, high temp resistant light metals, and cast iron
- Double cut option provides increased operator control and a strong part finish for ferrous and non-ferrous metals
- Solid carbide head brazed onto a steel shank
- Precision manufactured in the USA

TOOL	SIZE	LOC	INCL. ANGLE	SHANK DIA.	OAL	SE CUT		DOUBLE CUT	
	D1					TOOL #	PRICE	TOOL #	PRICE
*SN-61	3/32	1/8	10°	3/32	1-1/2	TB19069	6.90	TB19075	6.90
*SN-41	3/32	1/8	10°	1/8	1-1/2	TB19531	6.50	TB19076	6.50
*SN-42	1/8	3/16	10°	1/8	1-1/2	TB19532	6.50	TB19537	6.50
SN-53	3/16	1/4	10°	1/8	1-3/4	TB19533	14.05	TB19538	14.05
*SN-81	3/16	1/4	10°	3/16	2	TB19070	15.50	TB19077	15.50
SN-51	1/4	1/4	10°	1/8	1-3/4	TB19534	9.50	TB19539	9.50
*SN-1	1/4	5/16	10°	1/4	2	TB19535	12.30	TB19540	12.30
SN-2	3/8	3/8	13°	1/4	2-1/8	TB19071	17.40	TB19078	17.40
SN-4	1/2	1/2	28°	1/4	2-1/4	TB19536	36.10	TB19541	36.10
SN-6	5/8	3/4	18°	1/4	2-1/2	TB19072	31.95	TB19079	31.95
SN-7	3/4	5/8	30°	1/4	2-3/8	TB19073	38.55	TB19080	38.55

* One Solid Carbide Piece

BURS SETS

- Multi-piece general purpose bur sets for ferrous and non-ferrous metals
- Double cut
- Provides increased operator control and a strong part finish
- Solid carbide head brazed onto a steel shank
- Precision manufactured in the USA



SET SIZES	# OF PCS. IN SET	DIAMETER	SHANK DIAMETER	CASE TYPE	TYPE	TOOL #	PRICE
SA-42, SA-43, SC-41, SC-42, SD-42, SE-41, SF-42, SG-42, SM-43	9 PCS	1/8	1/8	WOOD	DOUBLE CUT	TB19542	94.70
SA-1, SC-1, SD-3, SH-1, SF-3, SA-3, SC-3, SC-5, SF-5, SA-5	10 PCS	-	1/4	METAL	DOUBLE CUT	TB19850	178.35

For technical information, see page 367

DEBURRING

Technical Information

Carbide Burs - Speeds		
Cutting Dia	Suggested RPM	Maximum RPM
1/16	55,000 - 85,000	90,000
1/8	35,000 - 65,000	80,000
3/16	30,000 - 55,000	70,000
1/4	25,000 - 50,000	70,000
5/16	20,000 - 40,000	67,000
3/8	18,000 - 40,000	63,000
7/16	16,000 - 38,000	58,000
1/2	14,000 - 36,000	50,000
5/8	12,000 - 25,000	40,000
3/4	10,000 - 20,000	33,000
1	7,500 - 20,000	25,000

When using double cut: Reduce speeds by 25% approximately

For stainless steel material: Increase speeds by 50% approximately

Selection By Cut



Single Cut

Provides the best surface finish and largest contact patch on the work piece.

Demands greater operator skill since the single flute direction pulls the bur into the work piece.

Use In - Non-hardened steel <45 Rc, hardened steel >45Rc, stainless steel, non-ferrous light metals, hardened cast. iron >45Rc, High temp resistant metals



Double Cut

Most popular geometry as the dual flute direction reduces the contact patch on the work piece and therefore provides easier operator control while still maintaining a good surface finish.

Use In - Ferrous metals, Non-ferrous metals



Aluminum Cut

These burs employ a coarser flute which results in improved cutting performance for aluminum and aluminum alloys.

Use In - Non-ferrous metals, aluminum alloys, plastics

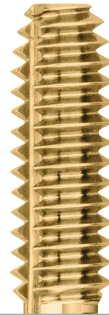
DECIMAL EQUIVALENTS & TAP DRILL SIZES

Drill Size	Decimal Inches	Drill Size	Decimal Inches	Tap Size	Drill Size	Decimal Inches	Tap Size	Drill Size	Decimal Inches	Tap Size	Drill Size	Decimal Inches	Tap Size
.97	.0059	.58	.0420		.27	.1440		H	.2660		17/32	.5312	5/8-11
.15mm	.0059	.57	.0430		.3.7mm	.1457		6.8mm	.2677		13.5mm	.5315	
.96	.0063	1.1mm	.0433		.26	.1470	3/16-24NS	6.9mm	.2717		35/64	.5469	
.16mm	.0063	1.15mm	.0453		.3.75mm	.1476	m4.5x0.75	I	.2720	5/16-24NF	14mm	.5512	m16x2
.95	.0067	.56	.0465		.25	.1495	#10-24	7mm	.2756	m8x1	9/16	.5625	3/8-18NPT
.17mm	.0067	3/64	.0469	#0-80	.3.8mm	.1496		J	.2770		14.5mm	.5709	m16x1.5
.94	.0071	1.2mm	.0472		.24	.1520		7.1mm	.2795		37/64	.5781	5/8-18NF
.18mm	.0071	1.25mm	.0492	m1.6x0.35	.3.9mm	.1535		K	.2810		15mm	.5906	
.93	.0075	1.3mm	.0512		.23	.1540		9/32	.2812	5/16-32NS	19/32	.5938	3/8-18 NPS PIPE
.19mm	.0075	.55	.0520		5/32	.1562		7.2mm	.2835		39/64	.6094	
.92	.0079	1.35mm	.0531		.22	.1570	3/16-32NS	7.25mm	.2854		15.5mm	.6102	m18x2.5
.2mm	.0079	.54	.0550		.4mm	.1575		7.3mm	.2874		5/8	.6250	11/16-16NS
.91	.0083	1.4mm	.0551		.21	.1590	#10-32	L	.2900		16mm	.6299	m18x2.0
.21mm	.0083	1.45mm	.0571	m1.8x0.35	.20	.1610		7.4mm	.2913		41/64	.6406	
.90	.0087	1.5mm	.0591		.4.1mm	.1614		M	.2950		16.5mm	.6496	
.22mm	.0087	.53	.0595	#1-64,72	.4.2mm	.1654	m5x0.8	7.5mm	.2953		21/32	.6562	3/4-10NC
.89	.0091	1.55mm	.0610		.19	.1660		19/64	.2969		17mm	.6693	
.23mm	.0091	1/16	.0625		.4.25mm	.1673		7.6mm	.2992		43/64	.6719	
.24mm	.0094	1.6mm	.0630	m2x0.4	.4.3mm	.1693		N	.3020		11/16	.6875	3/4-16NF
.88	.0095	.52	.0635		.18	.1695		7.7mm	.3031		17.5mm	.6890	m20x2.5
.25mm	.0098	1.65mm	.0650		11/64	.1719		7.75mm	.3051	m9x1.25	45/64	.7031	1/2-14NPT PIPE
.87	.0100	1.7mm	.0669		.17	.1730		7.8mm	.3071		18mm	.7087	m20x2.0
.26mm	.0102	.51	.0670	#2-56	.4.4mm	.1732		7.9mm	.3110		23/32	.7188	
.86	.0105	1.75mm	.0689	m2.2x0.45	.16	.1770	#12-24	5/16	.3125	3/8-16NC	18.5mm	.7283	m20x1.5
.27mm	.0106	.50	.0700	#2-64	.4.5mm	.1772		8mm	.3150		47/64	.7344	1/2-14NPS PIPE
.85	.0110	1.8mm	.0709		.15	.1800		O	.3160		19mm	.7480	
.28mm	.0110	1.85mm	.0728		.4.6mm	.1811		8.1mm	.3189		3/4	.7500	
.29mm	.0114	.49	.0730		.14	.1820	#12-28	8.2mm	.3228		49/64	.7656	7/8-9NC
.84	.0115	1.9mm	.0748	m2.3x.04	.13	.1850		P	.3230		19.5mm	.7677	m22x2.5
.3mm	.0118	.48	.0760		.4.7mm	.1850		8.25mm	.3248		25/32	.7812	
.83	.0120	1.95mm	.0768		.4.75mm	.1870		8.3mm	.3268		20mm	.7874	m22x2.0
.82	.0125	5/64	.0781		3/16	.1875		21/64	.3281		51/64	.7969	
.32mm	.0126	.47	.0785	#3-48	.4.8mm	.1890		8.4mm	.3307		20.5mm	.8071	m22x1.5
.81	.0130	.2mm	.0787		.12	.1890	7/32-32NS	Q	.3320	1/8-27NPT PIPE 3/8-24NF	13/16	.8125	7/8-14NF
.34mm	.0134	2.05mm	.0807	m2.5x0.45	.11	.1910		8.5mm	.3346	m10x1.5	21mm	.8268	m24x3
.80	.0135	.46	.0810		.4.9mm	.1929		8.6mm	.3386		53/64	.8281	
.35mm	.0138	.45	.0820	#3-56	.10	.1935		R	.3390		27/32	.8438	
.36mm	.0142	2.1mm	.0827		.9	.1960		8.7mm	.3425		21.5mm	.8465	
.79	.0145	2.15mm	.0846	m2.6x0.45	.5mm	.1969	m6x1	11/32	.3438		55/64	.8594	
.38mm	.0150	.44	.0860	#4-36	.8	.1990		8.75mm	.3445	m10x1.25	22mm	.8661	m24x2
1/64	.0156	2.2mm	.0866		.5.1mm	.2008		8.8mm	.3465		7/8	.8750	1-8NC
.4mm	.0157	2.25mm	.0886		.7	.2010	1/4-20	S	.3480	1/8-27NPS PIPE	22.25mm	.8760	
.78	.0160	.43	.0890	#4-40	13/64	.2031		8.9mm	.3504		22.5mm	.8858	m24x1.50
.42mm	.0165	2.3mm	.0906		.6	.2040		9mm	.3543	m10x1.00	57/64	.8906	
.44mm	.0173	2.35mm	.0925		.5.2mm	.2047		T	.3580		23mm	.9055	
.45mm	.0177	.42	.0935	#4-48	.5	.2055		9.1mm	.3583		29/32	.9062	3/4-14NPT PIPE
.77	.0180	3/32	.0938		.5.25mm	.2067	m6x0.75	23/64	.3594		59/64	.9219	
.46mm	.0181	2.4mm	.0945		.5.3mm	.2087		9.2mm	.3622		23.5mm	.9252	
.48mm	.0189	.41	.0960		.4	.2090	1/4-24	9.25mm	.3642		15/16	.9375	3/4-14 NPS 1-14 NF
.5mm	.0197	2.45mm	.0965		.5.4mm	.2126		9.3mm	.3661		24mm	.9449	m27x3
.76	.0200	.40	.0980		.3	.2130	1/4-28	U	.3680	7/16-14NC	61/64	.9531	
.75	.0210	2.5mm	.0984	m3x0.5	.5.5mm	.2165		9.4mm	.3701		24.5mm	.9646	
.55mm	.0217	.39	.0995		7/32	.2188		9.5mm	.3740	m11x1.50	31/32	.9688	
.74	.0225	.38	.1015	#5-40	.5.6mm	.2205		3/8	.3750		25mm	.9843	m27x2
.6mm	.0236	2.6mm	.1024		.2	.2210		V	.3770		63/64	.9844	1-1/8-7NC
.73	.0240	.37	.1040	#5-44	.5.7mm	.2244		9.6mm	.3780		1	1.0000	
.72	.0250	2.7mm	.1063		.5.75mm	.2264		9.7mm	.3819		25.5mm	1.0039	
.65mm	.0256	.36	.1065	#6-32	.1	.2280		9.75mm	.3839		1-1/64	1.0156	
.71	.0260	2.75mm	.1083		.5.8mm	.2283		9.8mm	.3858		26mm	1.0236	
.7mm	.0276	7/64	.1094		.5.9mm	.2323		W	.3860		1-1/32	1.0312	
.70	.0280	.35	.1100		A	.2340		9.9mm	.3898		26.5mm	1.0433	m30x3.5
.69	.0292	2.8mm	.1102		15/64	.2344		25/64	.3906	7/16-20	1-3/64	1.0469	1-1/8-12NF
.75mm	.0295	.34	.1110		.6mm	.2362	m7x1	10mm	.3937	m12x1.75	1-1/16	1.0625	
.68	.0310	.33	.1130	#6-40	B	.2380		X	.3970		27mm	1.0630	
1/32	.0312	2.9mm	.1142	m3.5x0.6	.6.1mm	.2402		Y	.4040		1-5/64	1.0781	
.8mm	.0315	.32	.1160		C	.2420	1/16-27 NPT PIPE	13/32	.4062		27.5mm	1.0827	
.67	.0320	.3mm	.1181		.6.2mm	.2441		Z	.4130		1-3/32	1.0938	
.66	.0330	.31	.1200		D	.2460		10.5mm	.4134	m12x1.25	28mm	1.1024	m30x2.0
.85mm	.0335	3.1mm	.1220		.6.25mm	.2461		27/64	.4219	1/2-13	1-7/64	1.1094	1-1/4-7NC
.65	.0350	1/8	.1250	5/32-32NS	.6.3mm	.2480		11mm	.4331		28.5mm	1.1220	
.9mm	.0354	3.2mm	.1260		E	.2500	1/16-27 NPS PIPE	7/16	.4375	1/4-18 NPT PIPE	1-1/8	1.1250	
.64	.0360	3.25mm	.1280		1/4	.2500		11.5mm	.4528		1-9/64	1.1406	
.63	.0370	.30	.1285	5/32-36NS	.6.4mm	.2520		29/64	.4531	1/4-18 1/2-20	29mm	1.1417	
.95mm	.0374	3.3mm	.1299	m4x0.70	.6.5mm	.2559		15/32	.4688		1-5/32	1.1562	1-11-1/2NPT PIPE
.62	.0380	3.4mm	.1339		F	.2570	5/16-18NC	12mm	.4724	m14x2	29.5mm	1.1614	
.61	.0390	.29	.1360	#8-32	.6.6mm	.2598		31/64	.4844	9/16-12	1-11/64	1.1719	1-1/4-12NF
1mm	.0394	3.5mm	.1378		G	.2610		12.5mm	.4921	m14x1.5			
.60	.0400	.28	.1405		.6.7mm	.2638		1/2	.5000				
.59	.0410	9/64	.1406		17/64	.2656		13mm	.5118	m14x1.25			
1.05mm	.0413	3.6mm	.1417		.6.75mm	.2657	m8x1.25	33/64	.5156	9/16-18			

COATINGS

Titan USA tools are coated in our state-of-the-art coating center, providing customers with uninterrupted production of the industry's highest quality PVD coatings. This allows us to maintain a robust level of inventory available to our valued customers.

PVD COATINGS



	AlCrO-MAX	AlTiN	TiCN	ZrN	TiN
Color	Gray/Charcoal	Gray/Blue	Gray/Silver	Light Gold	Gold/Yellow
Materials	Ferrous materials: high-temp alloys, stainless steels, alloy steels, cast iron, high temp. nickel base alloys, titanium alloys, and inconel	Ferrous materials: high-temp alloys, stainless steels, alloy steels, cast iron, high temp. nickel base alloys, titanium alloys, and inconel	Ferrous materials: stainless steels and a wide variety of other materials where AlTiN cannot be used	Non-Ferrous: aluminum, brass, bronze	Non-Ferrous
Application/ Benefits	• High-performance coating with a titanium top nano-layer for higher abrasion resistance • Max temperature: 950°C • Post-polish treatment to maximize chip evacuation at high speeds and feeds	• Excellent for milling, drilling, and tapping • Excellent high temperature resistance and hardness • Excellent in dry machining	• Used in milling, drilling, and tapping	• Higher hardness adds lubricity and abrasion resistance • Prevents edge build up in softer gummy alloys • Allows for higher speed and feed rates • Prolongs tool life	• General purpose coating used for milling, drilling, and tapping with lower cutting speeds

FINISHES



Black Oxide Finish

Acts as a solid lubricant and also retains liquid lubricant at cutting edges prevents chip welding, reduces friction and acts a thermal insulator.



Nitride/Steam Oxide Finish

Combines the advantages of the lubricity of oxide with the abrasion resistance of nitride.



Black & Gold Oxide Finish

Resists corrosion and breakage while increasing lubricity. This finish is not prone to chipping and flaking.



Gold Oxide Finish

Extends tool life, and improves lubricity, and reduces grinding stresses.

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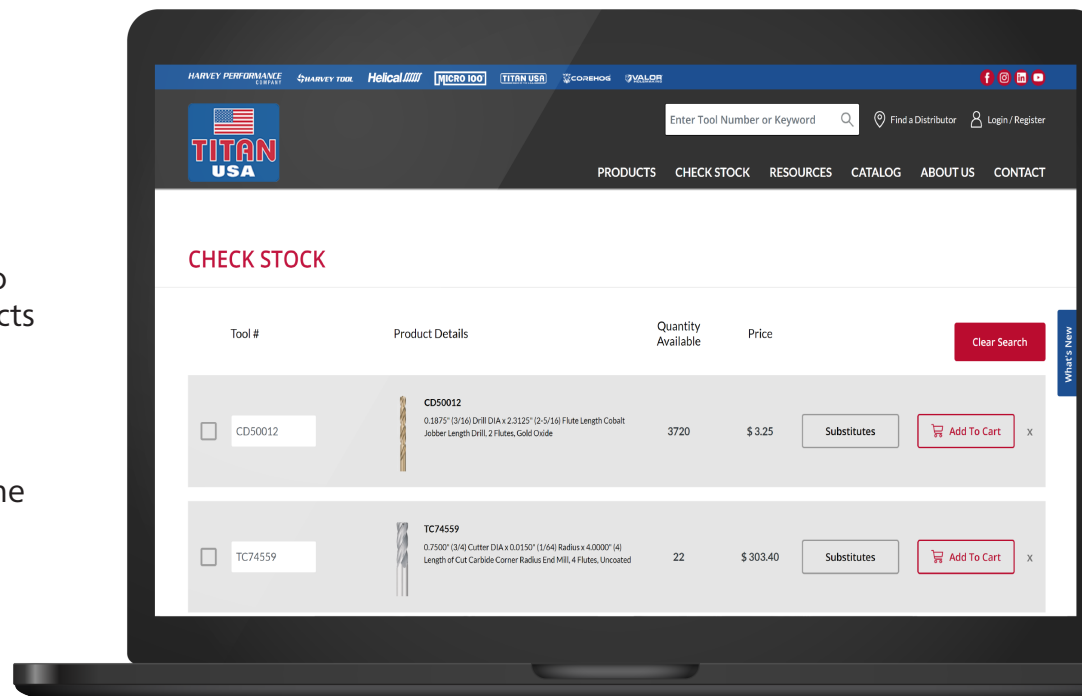
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Product Filtering to Quickly Sort Products



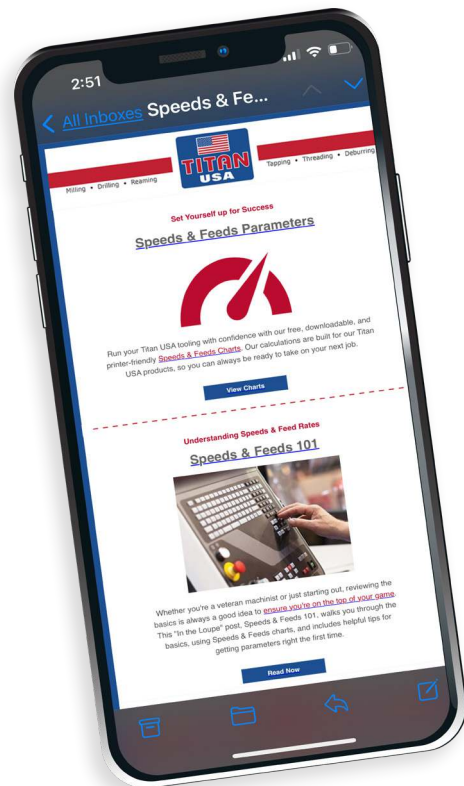
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New Tools for Spring 2024



General Purpose Taps
High Speed Steel
Taper Pipe - NPT
For Cast Iron [pg 329](#)



General Purpose Taps
High Speed Steel
Taper Pipe NPT
Spiral Flute [pg 329](#)



Drills - Carbide
3 Flute - 150° Point
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Spot Drills
Cobalt
[pg 158](#)



Combined Drill
& Countersinks
Carbide
Long Length
[pg 209](#)



Thread Mills
Multi-Form
NPS Pipe
Threads
[pg 299](#)



Specialty Profiling

Chamfer Mills
4 Flute
Pointed Tip
[pg 151](#)



Corner Rounding End Mills
2 Flute - Unflared
Double-Ended - Carbide [pg 152](#)



Corner Rounding
End Mills
3 Flute - Flared
Carbide Tipped
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