

# HIGH SPEED STEEL & COBALT

## Flat Ends



Taper Per Side	Tool No.	Tip Dia.	Flt. Lgth	Shk Dia.	OAL	Large Dia.	
1/2 DEG	KK-102	3/32	1/2	3/8	2 1/2	0.10248	3 Flute
	KK-103	3/32	3/4	3/8	2 5/8	0.10684	3 Flute
	KK-105	3/32	1 1/4	3/8	3 1/8	0.11556	3 Flute
	KK-201	1/8	1/4	3/8	2 1/2	0.12936	3 Flute
	KK-202	1/8	1/2	3/8	2 1/2	0.13373	3 Flute
	KK-203	1/8	3/4	3/8	2 1/2	0.13809	3 Flute
	KK-204	1/8	1	3/8	2 7/8	0.14245	3 Flute
	KK-205	1/8	1 1/4	3/8	3 1/8	0.14681	3 Flute
	KK-206	1/8	1 1/2	3/8	3 1/4	0.15118	3 Flute
	KK-303	3/16	3/4	3/8	2 1/2	0.20059	3 Flute
	KK-305	3/16	1 1/4	3/8	3 1/8	0.20931	3 Flute
	KK-307	3/16	1 3/4	3/8	3 7/8	0.21804	3 Flute
	KK-309	3/16	2 1/4	3/8	4 1/2	0.22676	3 Flute
	KK-313	3/16	3 1/4	3/8	5 1/2	0.24421	3 Flute
	KK-403	1/4	3/4	3/8	2 1/2	0.26309	3 Flute
	KK-405	1/4	1 1/4	3/8	3	0.27181	3 Flute
	KK-409	1/4	2 1/4	1/2	4 1/4	0.28926	3 Flute
	KK-409A	1/4	2 1/4	3/8	4 1/4	0.28926	3 Flute
	KK-413	1/4	3 1/4	1/2	5 1/2	0.30671	3 Flute
	KK-605	3/8	1 1/4	1/2	3 1/8	0.39681	3 Flute
	KK-609	3/8	2 1/4	1/2	4 1/4	0.41426	3 Flute
	KK-613	3/8	3 1/4	1/2	5 1/2	0.43171	3 Flute
	KK-805	1/2	1 1/4	1/2	3 1/4	0.52181	3 Flute
	KK-809	1/2	2 1/4	1/2	4 1/4	0.53926	3 Flute
	KK-813	1/2	3 1/4	1/2	5 1/2	0.55671	3 Flute
	KK-1009	5/8	2 1/4	5/8	4 1/2	0.66426	3 Flute
	KK-1013	5/8	3 1/4	5/8	5 1/2	0.68171	3 Flute
	KK-1017	5/8	4 1/4	5/8	6 1/2	0.69916	3 Flute
	KK-1209	3/4	2 1/4	3/4	4 3/4	0.78926	3 Flute
	KK-1213	3/4	3 1/4	3/4	5 3/4	0.80671	3 Flute
	KK-1217	3/4	4 1/4	3/4	6 3/4	0.82416	3 Flute
	KK-1221	3/4	5 1/4	3/4	7 3/4	0.84161	3 Flute
KK-1624	1	6	1	8 1/2	1.10470	4 Flute	

Taper Per Side	Tool No.	Tip Dia.	Flt. Lgth	Shk Dia.	OAL	Large Dia.	
1 DEG	K-102	3/32	1/2	3/8	2 1/2	0.11120	3 Flute
	K-103	3/32	3/4	3/8	2 1/2	0.11993	3 Flute
	K-105	3/32	1 1/4	3/8	3 1/8	0.13738	3 Flute
	K-201	1/8	1/4	3/8	2 1/2	0.13373	3 Flute
	K-202	1/8	1/2	3/8	2 1/2	0.14245	3 Flute
	K-203	1/8	3/4	3/8	2 1/2	0.15118	3 Flute
	K-204	1/8	1	3/8	2 7/8	0.15990	3 Flute
	K-205	1/8	1 1/4	3/8	3 1/8	0.16863	3 Flute
	K-206	1/8	1 1/2	3/8	3 1/4	0.17735	3 Flute
	K-208	1/8	2	3/8	4	0.19480	3 Flute
	K-303	3/16	3/4	3/8	2 1/2	0.21368	3 Flute
	K-305	3/16	1 1/4	3/8	3 1/8	0.23113	3 Flute
	K-308	3/16	2	3/8	3 7/8	0.25730	3 Flute
	K-309	3/16	2 1/4	3/8	4 1/4	0.26603	3 Flute
	K-310	3/16	2 1/2	3/8	4 1/2	0.27475	3 Flute
	K-313	3/16	3 1/4	3/8	5 1/2	0.30093	3 Flute
	K-403	1/4	3/4	3/8	2 1/2	0.27618	3 Flute
	K-405	1/4	1 1/4	3/8	3	0.29363	3 Flute
	K-406	1/4	1 1/2	3/8	3 1/4	0.30235	3 Flute
	K-409	1/4	2 1/4	1/2	4 1/4	0.32853	3 Flute
	K-413	1/4	3 1/4	1/2	5 1/2	0.36343	3 Flute
	K-605	3/8	1 1/4	1/2	3 1/4	0.41863	3 Flute
	K-609	3/8	2 1/4	1/2	4 1/4	0.45353	3 Flute
	K-613	3/8	3 1/4	1/2	5 1/4	0.48843	3 Flute
	K-805	1/2	1 1/4	1/2	3 1/4	0.54363	3 Flute
	K-809	1/2	2 1/4	1/2	4 1/4	0.57853	3 Flute
	K-813	1/2	3 1/4	5/8	5 3/8	0.61343	3 Flute
	K-813A	1/2	3 1/4	1/2	5 3/8	0.61343	3 Flute
	K-1009	5/8	2 1/4	5/8	4 1/2	0.70353	3 Flute
	K-1013	5/8	3 1/4	5/8	5 1/2	0.73843	3 Flute
	K-1017	5/8	4 1/4	5/8	6 1/2	0.77333	3 Flute
	K-1209	3/4	2 1/4	3/4	4 3/4	0.82853	3 Flute
K-1213	3/4	3 1/4	3/4	5 3/4	0.86343	3 Flute	
K-1217	3/4	4 1/4	3/4	6 3/4	0.89833	3 Flute	
K-1221	3/4	5 1/4	3/4	7 3/4	0.93323	3 Flute	
K-1624	1	6	1	8 1/2	1.20940	4 Flute	

TO ORDER COBALT OR COATINGS,  
 Add a suffix to the part number given above.  
 for TIN Coated, add the suffix "TIN"  
 for Cobalt, add the suffix "CO"  
 for Cobalt TIN Coated, add the suffix "CO-TIN"  
 If no suffix is given High Speed Steel will ship.

ALL SIZES ARE AVAILABLE  
 SOME ARE AVAILABLE WITH EXTENDED SHANKS.  
 CALL FOR AVAILABILITY 1-888-531-0430



**A**

# HIGH SPEED STEEL & COBALT

## Flat Ends

Taper Per Side	Tool No.	Tip Dia.	Flt. Lgth	Shk Dia.	OAL	Large Dia.	Flute	Taper Per Side	Tool No.	Tip Dia.	Flt. Lgth	Shk Dia.	OAL	Large Dia.	Flute
<b>1 1/2 DEG</b>	KX-102	3/32	1/2	3/8	2 1/2	0.11993	3 Flute	<b>2 DEG</b>	L-002	1/16	1/2	3/8	2 5/8	0.09742	3 Flute
	KX-103	3/32	3/4	3/8	2 1/2	0.13302	3 Flute		L-004	1/16	1	3/8	2 7/8	0.13234	3 Flute
	KX-104	3/32	1	3/8	2 7/8	0.14611	3 Flute		L-102	3/32	1/2	3/8	2 1/2	0.12867	3 Flute
	KX-105	3/32	1 1/4	3/8	3 1/8	0.15920	3 Flute		L-103	3/32	3/4	3/8	2 1/2	0.14613	3 Flute
	KX-106	3/32	1 1/2	3/8	3 1/4	0.17229	3 Flute		L-105	3/32	1 1/4	3/8	3 1/8	0.18105	3 Flute
	KX-110	3/32	2 1/2	3/8	4 1/2	0.22465	3 Flute		L-202	1/8	1/2	3/8	2 1/2	0.15992	3 Flute
	KX-154	7/64	1	3/8	2 7/8	0.16174	3 Flute		L-203	1/8	3/4	3/8	2 1/2	0.17738	3 Flute
	KX-155	7/64	1 1/4	3/8	3 1/8	0.17483	3 Flute		L-204	1/8	1	3/8	2 7/8	0.19484	3 Flute
	KX-156	7/64	1 1/2	3/8	3 1/4	0.18792	3 Flute		L-205	1/8	1 1/4	3/8	3 1/8	0.21230	3 Flute
	KX-202	1/8	1/2	3/8	2 1/2	0.15118	3 Flute		L-206	1/8	1 1/2	3/8	3 1/4	0.22976	3 Flute
	KX-203	1/8	3/4	3/8	2 1/2	0.16427	3 Flute		L-208	1/8	2	3/8	3 7/8	0.26468	3 Flute
	KX-204	1/8	1	3/8	2 7/8	0.17736	3 Flute		L-210	1/8	2 1/2	1/2	4 1/2	0.29960	3 Flute
	KX-205	1/8	1 1/4	3/8	3 1/8	0.19045	3 Flute		L-210A	1/8	2 1/2	3/8	4 1/2	0.29960	3 Flute
	KX-206	1/8	1 1/2	3/8	3 1/4	0.20354	3 Flute		L-303	3/16	3/4	3/8	2 1/2	0.23988	3 Flute
	KX-208	1/8	2	3/8	3 7/8	0.22972	3 Flute		L-305	3/16	1 1/4	3/8	3 1/8	0.27480	3 Flute
	KX-209	1/8	2 1/4	3/8	4 1/4	0.24281	3 Flute		L-309	3/16	2 1/4	1/2	4 1/4	0.34464	3 Flute
	KX-212	1/8	3	3/8	5	0.28208	3 Flute		L-313	3/16	3 1/4	1/2	5 1/2	0.41448	3 Flute
	KX-254	5/32	1	3/8	2 7/8	0.20861	3 Flute		L-403	1/4	3/4	3/8	2 1/2	0.30238	3 Flute
	KX-255	5/32	1 1/4	3/8	3 1/8	0.22170	3 Flute		L-405	1/4	1 1/4	3/8	3 1/8	0.33730	3 Flute
	KX-256	5/32	1 1/2	3/8	3 1/4	0.23479	3 Flute		L-409	1/4	2 1/4	1/2	4 3/8	0.40714	3 Flute
	KX-258	5/32	2	3/8	3 7/8	0.26097	3 Flute		L-413	1/4	3 1/4	1/2	5 1/4	0.47698	3 Flute
	KX-303	3/16	3/4	3/8	2 1/2	0.22677	3 Flute		L-505	5/16	1 1/4	1/2	3 1/4	0.39980	3 Flute
	KX-305	3/16	1 1/4	3/8	3 1/8	0.25295	3 Flute		L-605	3/8	1 1/4	1/2	3 1/4	0.46230	3 Flute
	KX-309	3/16	2 1/4	3/8	4	0.30531	3 Flute		L-609	3/8	2 1/4	1/2	4 1/4	0.53214	3 Flute
	KX-313	3/16	3 1/4	3/8	5 1/2	0.35767	3 Flute		L-613	3/8	3 1/4	1/2	5 1/2	0.60198	3 Flute
	KX-403	1/4	3/4	3/8	2 1/2	0.28927	3 Flute		L-613B	3/8	3 1/4	5/8	5 1/2	0.60198	3 Flute
	KX-405	1/4	1 1/4	3/8	3	0.31545	3 Flute		L-805	1/2	1 1/4	1/2	3 1/4	0.58730	3 Flute
	KX-409	1/4	2 1/4	1/2	4 1/4	0.36781	3 Flute		L-809	1/2	2 1/4	5/8	4 3/8	0.65714	3 Flute
	KX-413	1/4	3 1/4	1/2	5 1/2	0.42017	3 Flute		L-809A	1/2	2 1/4	1/2	4 3/8	0.65714	3 Flute
	KX-605	3/8	1 1/4	1/2	3 1/8	0.44045	3 Flute		L-813	1/2	3 1/4	3/4	5 1/2	0.72698	3 Flute
	KX-609	3/8	2 1/4	1/2	4 1/4	0.49281	3 Flute		L-813B	1/2	3 1/4	5/8	5 1/2	0.72698	3 Flute
	KX-613	3/8	3 1/4	1/2	5 1/2	0.54517	3 Flute		L-1009	5/8	2 1/4	3/4	4 1/2	0.78214	3 Flute
	KX-805	1/2	1 1/4	1/2	3 1/4	0.56545	3 Flute		L-1013	5/8	3 1/4	3/4	5 1/2	0.85198	3 Flute
	KX-809	1/2	2 1/4	5/8	4 1/2	0.61781	3 Flute		L-1017	5/8	4 1/4	3/4	6 1/2	0.92182	3 Flute
	KX-813	1/2	3 1/4	5/8	5 1/2	0.67017	3 Flute		L-1209	3/4	2 1/4	3/4	4 1/2	0.90714	3 Flute
	KX-1009	5/8	2 1/4	3/4	4 1/2	0.74281	3 Flute		L-1213	3/4	3 1/4	3/4	5 3/4	0.97698	3 Flute
KX-1013	5/8	3 1/4	3/4	5 1/2	0.79517	3 Flute	L-1221	3/4	5 1/4	1	7 3/4	1.11666	3 Flute		
KX-1017	5/8	4 1/4	3/4	6 1/2	0.84753	3 Flute	L-1624	1	6	1 1/4	8 1/2	1.41904	4 Flute		
KX-1209	3/4	2 1/4	3/4	4 3/4	0.86781	3 Flute									
KX-1221	3/4	5 1/4	1	7 3/4	1.02489	3 Flute									
KX-1624	1	6	1 1/4	8 1/2	1.31416	4 Flute									

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## Flat Ends



Taper Per Side	Tool No.	Tip Dia.	Flt. Lgth	Shk Dia.	OAL	Large Dia.	
3 DEG	M-002	1/16	1/2	3/8	2 5/8	0.11491	3 Flute
	M-003	1/16	3/4	3/8	2 3/4	0.14112	3 Flute
	M-004	1/16	1	3/8	2 7/8	0.16732	3 Flute
	M-005	1/16	1 1/4	3/8	3 1/8	0.19353	3 Flute
	M-006	1/16	1 1/2	3/8	3 1/4	0.21973	3 Flute
	M-103	3/32	3/4	3/8	2 1/2	0.17237	3 Flute
	M-104	3/32	1	3/8	2 7/8	0.19857	3 Flute
	M-105	3/32	1 1/4	3/8	3 1/8	0.22478	3 Flute
	M-106	3/32	1 1/2	3/8	3 1/4	0.25098	3 Flute
	M-108	3/32	2	3/8	3 3/4	0.30339	3 Flute
	M-110	3/32	2 1/2	1/2	4 1/2	0.35580	3 Flute
	M-154	7/64	1	3/8	2 7/8	0.21420	3 Flute
	M-155	7/64	1 1/4	3/8	3 1/8	0.24040	3 Flute
	M-156	7/64	1 1/2	3/8	3 1/4	0.26661	3 Flute
	M-158	7/64	2	3/8	3 3/4	0.31902	3 Flute
	M-203	1/8	3/4	3/8	2 5/8	0.20362	3 Flute
	M-204	1/8	1	3/8	2 7/8	0.22982	3 Flute
	M-205	1/8	1 1/4	3/8	3 1/8	0.25603	3 Flute
	M-206	1/8	1 1/2	3/8	3 1/4	0.28223	3 Flute
	M-208	1/8	2	3/8	3 3/4	0.33464	3 Flute
	M-210	1/8	2 1/2	1/2	4 1/2	0.38705	3 Flute
	M-210A	1/8	2 1/2	3/8	4 1/2	0.38705	3 Flute
	M-212	1/8	3	1/2	5	0.43946	3 Flute
	M-216	1/8	4	1/2	6 1/2	0.54428	3 Flute
	M-2525	5/32	5/8	3/8	2 1/2	0.22176	3 Flute
	M-253	5/32	3/4	3/8	2 1/2	0.23487	3 Flute
	M-254	5/32	1	3/8	2 7/8	0.26107	3 Flute
	M-255	5/32	1 1/4	3/8	3 1/8	0.28728	3 Flute
	M-256	5/32	1 1/2	3/8	3 1/4	0.31348	3 Flute
	M-258	5/32	2	3/8	3 7/8	0.36589	3 Flute
	M-303	3/16	3/4	3/8	2 5/8	0.26612	3 Flute
	M-304	3/16	1	3/8	2 7/8	0.29232	3 Flute
M-305	3/16	1 1/4	3/8	3 1/8	0.31853	3 Flute	
M-306	3/16	1 1/2	3/8	3 1/8	0.34473	3 Flute	
M-308	3/16	2	1/2	4	0.39714	3 Flute	
M-310	3/16	2 1/2	1/2	4 1/2	0.44955	3 Flute	
M-312	3/16	3	1/2	5	0.50196	3 Flute	
M-313	3/16	3 1/4	1/2	5 1/2	0.52817	3 Flute	
M-316	3/16	4	5/8	6 1/8	0.60678	3 Flute	
M-320	3/16	5	3/4	7 1/4	0.71160	3 Flute	
M-322	3/16	5 1/2	3/4	7 3/4	0.76401	3 Flute	

Taper Per Side	Tool No.	Tip Dia.	Flt. Lgth	Shk Dia.	OAL	Large Dia.	
3 DEG	M-403	1/4	3/4	3/8	2 1/2	0.32862	3 Flute
	M-404	1/4	1	3/8	2 3/4	0.35482	3 Flute
	M-405	1/4	1 1/4	3/8	3 1/8	0.37500	3 Flute
	M-406	1/4	1 1/2	3/8	3 1/4	0.40723	3 Flute
	M-409	1/4	2 1/4	1/2	4 1/4	0.48585	3 Flute
	M-410	1/4	2 1/2	1/2	4 1/2	0.51205	3 Flute
	M-413	1/4	3 1/4	1/2	5 1/2	0.59067	3 Flute
	M-413A	1/4	3 1/4	5/8	5 1/2	0.59067	3 Flute
	M-416	1/4	4	3/4	6 1/4	0.66928	3 Flute
	M-416A	1/4	4	5/8	6 1/4	0.66928	3 Flute
	M-420	1/4	5	3/4	7 3/8	0.77410	3 Flute
	M-504	5/16	1	1/2	3 1/8	0.41732	3 Flute
	M-507	5/16	1 3/4	1/2	3 7/8	0.49594	3 Flute
	M-605	3/8	1 1/4	1/2	3 1/4	0.50000	3 Flute
	M-609	3/8	2 1/4	5/8	4 3/8	0.61085	3 Flute
	M-609A	3/8	2 1/4	1/2	4 3/8	0.61085	3 Flute
	M-613	3/8	3 1/4	5/8	5 3/8	0.71567	3 Flute
	M-613A	3/8	3 1/4	3/4	5 3/8	0.71567	3 Flute
	M-616	3/8	4	3/4	6 1/2	0.79428	3 Flute
	M-620	3/8	5	3/4	7 1/2	0.89910	3 Flute
	M-624	3/8	6	1	8 1/2	1.00392	3 Flute
	M-805	1/2	1 1/4	1/2	3 1/4	0.63103	3 Flute
	M-809	1/2	2 1/4	3/4	4 1/2	0.73585	3 Flute
	M-809A	1/2	2 1/4	1/2	4 1/8	0.73585	3 Flute
	M-809B	1/2	2 1/4	5/8	4 1/4	0.73585	3 Flute
	M-813	1/2	3 1/4	3/4	5 1/2	0.84067	3 Flute
	M-816	1/2	4	3/4	6 3/8	0.91928	3 Flute
	M-820	1/2	5	1	7 1/2	1.02410	3 Flute
	M-824	1/2	6	1	8 1/2	1.12892	3 Flute
	M-1009	5/8	2 1/4	3/4	4 1/2	0.86085	3 Flute
	M-1013	5/8	3 1/4	3/4	5 1/2	0.96567	3 Flute
	M-1016	5/8	4	1	6 1/2	1.04428	3 Flute
M-1020	5/8	5	1	7 1/2	1.14910	3 Flute	
M-1209	3/4	2 1/4	1	4 3/4	0.98585	3 Flute	
M-1213	3/4	3 1/4	1	5 3/4	1.09067	3 Flute	
M-1216	3/4	4	1	6 1/2	1.16928	4 Flute	
M-1220	3/4	5	1	7 1/2	1.27410	4 Flute	
M-1224	3/4	6	1 1/4	8 1/2	1.37892	4 Flute	
M-1624	1	6	1 1/4	8 1/2	1.62892	4 Flute	

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## Flat Ends

Taper Per Side	Tool No.	Tip Dia.	Flt. Lgth	Shk Dia.	OAL	Large Dia.	Flute	Taper Per Side	Tool No.	Tip Dia.	Flt. Lgth	Shk Dia.	OAL	Large Dia.	Flute
<b>4 DEG</b>	N-004	1/16	1	3/8	2 7/8	0.20236	3 Flute	<b>5 DEG</b>	O-0002	1/32	1/2	3/16	2 5/8	0.11874	2 Flute
	N-006	1/16	1 1/2	3/8	3 1/4	0.27229	3 Flute		O-0003	1/32	3/4	3/16	2 5/8	0.16249	2 Flute
	N-103	3/32	3/4	3/8	2 5/8	0.19865	3 Flute		O-002	1/16	1/2	3/8	2 5/8	0.14999	3 Flute
	N-104	3/32	1	3/8	2 7/8	0.23361	3 Flute		O-003	1/16	3/4	3/8	2 5/8	0.19374	3 Flute
	N-203	1/8	3/4	3/8	2 5/8	0.22990	3 Flute		O-004	1/16	1	3/8	2 7/8	0.23748	3 Flute
	N-204	1/8	1	3/8	2 7/8	0.26486	3 Flute		O-005	1/16	1 1/4	3/8	3 1/8	0.28123	3 Flute
	N-206	1/8	1 1/2	3/8	3 1/4	0.33479	3 Flute		O-006	1/16	1 1/2	3/8	3 1/4	0.32497	3 Flute
	N-208	1/8	2	1/2	3 7/8	0.40472	3 Flute		O-056	.070	1 1/2	3/8	3 1/4	0.33247	3 Flute
	N-210	1/8	2 1/2	1/2	4 1/2	0.47465	3 Flute		O-102	3/32	1/2	3/8	2 5/8	0.18124	3 Flute
	N-303	3/16	3/4	3/8	2 5/8	0.29240	3 Flute		O-103	3/32	3/4	3/8	2 5/8	0.22499	3 Flute
	N-305	3/16	1 1/4	3/8	3 1/8	0.36233	3 Flute		O-104	3/32	1	3/8	2 7/8	0.26873	3 Flute
	N-310	3/16	2 1/2	1/2	4 1/2	0.53715	3 Flute		O-105	3/32	1 1/4	3/8	3 1/8	0.31248	3 Flute
	N-313	3/16	3 1/4	5/8	5 1/2	0.64205	3 Flute		O-106	3/32	1 1/2	3/8	3 1/4	0.35622	3 Flute
	N-316	3/16	4	3/4	6 1/2	0.74694	3 Flute		O-108	3/32	2	1/2	4	0.44371	3 Flute
	N-403	1/4	3/4	3/8	2 1/2	0.35490	3 Flute		O-108A	3/32	2	3/8	3 7/8	0.44371	3 Flute
	N-405	1/4	1 1/4	1/2	3 1/4	0.42483	3 Flute		O-110	3/32	2 1/2	1/2	4 1/2	0.53120	3 Flute
	N-409	1/4	2 1/4	5/8	4 3/8	0.56469	3 Flute		O-114	3/32	3 1/2	3/4	5 7/8	0.66244	3 Flute
	N-413	1/4	3 1/4	3/4	5 1/2	0.70455	3 Flute		O-154	7/64	1	3/8	2 7/8	0.28436	3 Flute
	N-416	1/4	4	3/4	6 1/2	0.80944	3 Flute		O-155	7/64	1 1/4	3/8	3 1/8	0.32810	3 Flute
	N-605	3/8	1 1/4	1/2	3 1/4	0.54983	3 Flute		O-156	7/64	1 1/2	3/8	3 5/16	0.37185	3 Flute
	N-609	3/8	2 1/4	5/8	4 3/8	0.68969	3 Flute		O-158	7/64	2	1/2	4	0.45934	3 Flute
	N-613	3/8	3 1/4	3/4	5 1/2	0.82955	3 Flute		O-203	1/8	3/4	3/8	2 5/8	0.25000	3 Flute
	N-616	3/8	4	3/4	6 1/2	0.93444	3 Flute		O-204	1/8	1	3/8	2 7/8	0.29998	3 Flute
	N-805	1/2	1 1/4	1/2	3 1/4	0.67483	3 Flute		O-205	1/8	1 1/4	3/8	3 1/8	0.34373	3 Flute
N-809	1/2	2 1/4	3/4	4 1/2	0.81469	3 Flute	O-206	1/8	1 1/2	3/8	3 1/4	0.37500	3 Flute		
N-813	1/2	3 1/4	3/4	5 5/8	0.95455	3 Flute	O-208	1/8	2	1/2	4	0.47496	3 Flute		
N-816	1/2	4	1	6 1/2	1.05944	3 Flute	O-208A	1/8	2	3/8	4	0.47496	3 Flute		
N-820	1/2	5	1	7 1/2	1.19930	3 Flute	O-210	1/8	2 1/2	5/8	4 1/2	0.56245	3 Flute		
								O-210A	1/8	2 1/2	1/2	4 1/2	0.56245	3 Flute	
								O-212	1/8	3	3/4	5 1/2	0.64994	3 Flute	
								O-212A	1/8	3	1/2	5 1/2	0.64994	3 Flute	
								O-254	5/32	1	3/8	2 7/8	0.33123	3 Flute	
								O-255	5/32	1 1/4	3/8	3 1/8	0.37498	3 Flute	
								O-256	5/32	1 1/2	1/2	3 5/8	0.41872	3 Flute	
								O-258	5/32	2	1/2	4	0.50000	3 Flute	
								O-303	3/16	3/4	3/8	2 9/16	0.31874	3 Flute	
								O-304	3/16	1	3/8	3	0.36248	3 Flute	
								O-305	3/16	1 1/4	1/2	3 3/8	0.40623	3 Flute	
								O-305S	7/32	1 1/4	1/2	3 3/8	0.43748	3 Flute	
								O-306	3/16	1 1/2	1/2	3 1/2	0.44997	3 Flute	
								O-308	3/16	2	1/2	4 1/8	0.53746	3 Flute	
								O-310	3/16	2 1/2	5/8	4 5/8	0.62495	3 Flute	
								O-310A	3/16	2 1/2	1/2	4 1/2	0.62495	3 Flute	
								O-312	3/16	3	3/4	5 1/4	0.71244	3 Flute	
								O-312A	3/16	3	1/2	5 1/4	0.71244	3 Flute	
								O-313	3/16	3 1/4	3/4	5 1/2	0.75619	3 Flute	

TO ORDER COBALT OR COATINGS,  
 Add a suffix to the part number given above.  
 for TIN Coated, add the suffix "TIN"  
 for Cobalt, add the suffix "CO"  
 for Cobalt TIN Coated, add the suffix "CO-TIN"  
 If no suffix is given High Speed Steel will ship.



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# HIGH SPEED STEEL & COBALT

## Flat Ends



Taper Per Side	Tool No.	Tip Dia.	Flt. Lgth	Shk Dia.	OAL	Large Dia.	
<b>5</b>	O-313A	3/16	3 1/4	1/2	5 1/2	0.75619	3 Flute
	O-316	3/16	4	3/4	6 1/4	0.88742	3 Flute
	O-320	3/16	5	1	7 1/2	1.06240	3 Flute
	O-324	3/16	6	1	8 1/2	1.23738	3 Flute
	O-403	1/4	3/4	3/8	2 1/2	0.38124	3 Flute
	O-404	1/4	1	1/2	3	0.42498	3 Flute
	O-405	1/4	1 1/4	1/2	3 1/4	0.46873	3 Flute
	O-406	1/4	1 1/2	1/2	3 1/2	0.51247	3 Flute
	O-409	1/4	2 1/4	5/8	4 3/8	0.64371	3 Flute
	O-409A	1/4	2 1/4	1/2	4 3/8	0.64371	3 Flute
	O-410	1/4	2 1/2	5/8	4 1/2	0.68745	3 Flute
	O-413	1/4	3 1/4	3/4	5 1/2	0.81869	3 Flute
	O-416	1/4	4	3/4	6 1/4	0.94992	3 Flute
	O-424	1/4	6	1	8 1/2	1.29988	3 Flute
	O-509	5/16	2 1/4	5/8	4 1/4	0.70621	3 Flute
	O-605	3/8	1 1/4	1/2	3 1/4	0.59373	3 Flute
	O-609	3/8	2 1/4	3/4	4 1/2	0.76871	3 Flute
	O-613	3/8	3 1/4	3/4	5 1/2	0.94369	3 Flute
	O-616	3/8	4	1	6 1/2	1.07492	3 Flute
	O-620	3/8	5	1 1/4	7 1/2	1.24990	3 Flute
	O-624	3/8	6	1 1/4	8 1/2	1.42488	3 Flute
	O-805	1/2	1 1/4	1/2	3 1/4	0.71873	3 Flute
	O-809	1/2	2 1/4	3/4	4 1/2	0.89371	3 Flute
	O-813	1/2	3 1/4	3/4	5 5/8	1.06869	3 Flute
	O-816	1/2	4	1	6 1/2	1.19992	3 Flute
	O-820	1/2	5	1 1/4	7 1/2	1.37490	3 Flute
	O-824	1/2	6	1 1/4	8 1/2	1.54988	3 Flute
	O-1009	5/8	2 1/4	3/4	4 1/2	1.01871	3 Flute
	O-1020	5/8	5	1 1/4	7 1/2	1.49990	4 Flute
	O-1209	3/4	2 1/4	3/4	4 3/4	1.14371	3 Flute
	O-1216	3/4	4	1 1/4	6 1/2	1.44992	4 Flute
	O-1220	3/4	5	1 1/4	7 1/2	1.62490	4 Flute
O-1224	3/4	6	1 1/4	8 1/2	1.79988	4 Flute	
O-1620	1	5	1 1/4	7 1/2	1.87490	4 Flute	
O-1624	1	6	2	9 1/2	2.04988	4 Flute	
<b>6 DEG</b>	P-004	1/16	1	3/8	2 7/8	0.27271	3 Flute
	P-104	3/32	1	3/8	2 7/8	0.30396	3 Flute
	P-204	1/8	1	3/8	2 7/8	0.33521	3 Flute
	P-206	1/8	1 1/2	3/8	3 1/4	0.44032	3 Flute
	P-305	3/16	1 1/4	1/2	3 1/4	0.45030	3 Flute
	P-306	3/16	1 1/2	1/2	3 1/4	0.50282	3 Flute
	P-406	1/4	1 1/2	5/8	3 1/4	0.56532	3 Flute
	P-605	3/8	1 1/4	5/8	3 1/4	0.63776	3 Flute
	P-805	1/2	1 1/4	3/4	3 1/4	0.76276	3 Flute

Taper Per Side	Tool No.	Tip Dia.	Flt. Lgth	Shk Dia.	OAL	Large Dia.	
<b>7 DEG</b>	R-0004	1/32	1	3/8	2 3/4	0.27681	2 Flute
	R-003	1/16	3/4	3/8	2 5/8	0.24667	3 Flute
	R-004	1/16	1	3/8	2 7/8	0.30806	3 Flute
	R-006	1/16	1 1/2	1/2	3 1/4	0.43084	3 Flute
	R-0254	.070	1	3/8	2 7/8	0.31556	3 Flute
	R-054	5/64	1	3/8	2 7/8	0.32369	3 Flute
	R-103	3/32	3/4	3/8	2 1/2	0.27792	3 Flute
	R-104	3/32	1	3/8	2 3/4	0.33931	3 Flute
	R-105	3/32	1 1/4	1/2	3 1/8	0.40070	3 Flute
	R-106	3/32	1 1/2	1/2	3 1/2	0.46209	3 Flute
	R-203	1/8	3/4	3/8	2 9/16	0.30917	3 Flute
	R-204	1/8	1	3/8	2 3/4	0.37056	3 Flute
	R-206	1/8	1 1/2	1/2	3 1/2	0.49334	3 Flute
	R-208	1/8	2	5/8	3 7/8	0.61612	3 Flute
	R-212	1/8	3	3/4	5 1/4	0.86168	3 Flute
	R-305	3/16	1 1/4	1/2	3 1/4	0.49445	3 Flute
	R-312	3/16	3	3/4	5 3/8	0.92418	3 Flute
	R-403	1/4	3/4	1/2	2 1/2	0.43417	3 Flute
	R-405	1/4	1 1/4	1/2	3 1/4	0.55695	3 Flute
	R-409	1/4	2 1/4	3/4	4 1/2	0.80251	3 Flute
	R-413	1/4	3 1/4	1	5 3/4	1.04807	3 Flute
	R-416	1/4	4	1	6 1/2	1.23224	3 Flute
	R-513	5/16	3 1/4	1	5 3/4	1.11057	3 Flute
	R-605	3/8	1 1/4	5/8	3 1/4	0.68195	3 Flute
	R-609	3/8	2 1/4	3/4	4 1/2	0.92751	3 Flute
	R-613	3/8	3 1/4	1	5 5/8	1.17307	3 Flute
	R-616	3/8	4	1 1/4	6 1/2	1.35724	3 Flute
	R-624	3/8	6	1 1/4	8 1/2	1.84836	4 Flute
	R-805	1/2	1 1/4	3/4	3 1/2	0.80695	3 Flute
	R-805A	1/2	1 1/4	5/8	3 3/8	0.80695	3 Flute
	R-809	1/2	2 1/4	1	4 5/8	1.05251	3 Flute
	R-813	1/2	3 1/4	1 1/4	5 3/4	1.29807	4 Flute
R-816	1/2	4	1 1/4	6 1/2	1.48224	4 Flute	
R-824	1/2	6	1 1/4	8 1/2	1.97336	4 Flute	
R-1016	5/8	4	1 1/4	6 1/2	1.60724	4 Flute	
R-1020	5/8	5	1 1/4	7 1/2	1.85820	4 Flute	
R-1213	3/4	3 1/4	1 1/4	5 3/4	1.54807	4 Flute	
R-1216	3/4	4	1 1/4	6 1/2	1.73224	4 Flute	
R-1224	3/4	6	2	9 1/2	2.22336	4 Flute	
R-1624	1	6	2	9 1/2	2.47336	4 Flute	



**A**

# HIGH SPEED STEEL & COBALT

## Flat Ends

Taper Per Side	Tool No.	Tip Dia.	Flt. Lgth	Shk Dia.	OAL	Large Dia.		
<b>8 DEG</b>	8-0002	1/32	1/2	3/8	2 5/8	0.17180	2 Flute	
	8-003	1/16	3/4	3/8	2 7/8	0.27330	3 Flute	
	8-004	1/16	1	3/8	2 7/8	0.34360	3 Flute	
	8-005	1/16	1 1/4	3/8	3 1/8	0.41390	3 Flute	
	8-006	1/16	1 1/2	3/8	3 1/2	0.48410	3 Flute	
	8-103	3/32	3/4	3/8	2 5/8	0.30456	3 Flute	
	8-104	3/32	1	3/8	2 7/8	0.37483	3 Flute	
	8-203	1/8	3/4	3/8	3	0.33581	3 Flute	
	8-204	1/8	1	3/8	3	0.40608	3 Flute	
	8-208	1/8	2	5/8	4	0.68716	3 Flute	
	8-403	1/4	3/4	1/2	2 7/8	0.46081	3 Flute	
	8-408	1/4	2	3/4	4 1/8	0.81216	3 Flute	
	8-603	3/8	3/4	1/2	2 3/4	0.58581	3 Flute	
	8-803	1/2	3/4	5/8	2 7/8	0.71081	3 Flute	
	<b>10 DEG</b>	T-0003	1/32	3/4	3/8	2 3/4	0.29575	2 Flute
		T-002	1/16	1/2	3/8	2 3/8	0.23883	3 Flute
		T-003	1/16	3/4	3/8	2 5/8	0.32700	3 Flute
		T-004	1/16	1	1/2	2 7/8	0.41516	3 Flute
T-102		3/32	1/2	3/8	2 3/8	0.27008	3 Flute	
T-103		3/32	3/4	3/8	2 7/8	0.35825	3 Flute	
T-106		3/32	1 1/2	1/2	3 1/2	0.62274	3 Flute	
T-203		1/8	3/4	3/8	2 5/8	0.38950	3 Flute	
T-205		1/8	1 1/4	1/2	3 1/4	0.56583	3 Flute	
T-206		1/8	1 1/2	1/2	3 1/2	0.65399	3 Flute	
T-254		5/32	1	1/2	3	0.50000	3 Flute	
T-258		5/32	2	3/4	4 1/4	0.86157	3 Flute	
T-305		3/16	1 1/4	1/2	3 3/8	0.62500	3 Flute	
T-309		3/16	2 1/4	3/4	4 1/2	0.98099	3 Flute	
T-403		1/4	3/4	1/2	2 3/4	0.51450	3 Flute	
T-405		1/4	1 1/4	1/2	3 1/4	0.69083	3 Flute	
T-409		1/4	2 1/4	3/4	4 1/2	1.04349	3 Flute	
T-409A		1/4	2 1/4	1/2	4 1/2	1.04349	3 Flute	
T-413	1/4	3 1/4	1	5 5/8	1.39615	4 Flute		
T-605	3/8	1 1/4	5/8	3 1/2	0.81583	3 Flute		
T-609	3/8	2 1/4	1	4 5/8	1.16849	3 Flute		
T-613	3/8	3 1/4	1 1/4	5 3/4	1.52115	4 Flute		
T-805	1/2	1 1/4	3/4	3 1/2	0.94083	3 Flute		
T-809	1/2	2 1/4	1	4 3/4	1.29349	3 Flute		
T-813	1/2	3 1/4	1 1/4	5 3/4	1.64615	4 Flute		
T-816	1/2	4	1 1/4	6 3/8	1.91064	4 Flute		
<b>11 DEG</b>	TK-0003	1/32	3/4	3/8	2 7/8	0.32282	2 Flute	
	TK-003	1/16	3/4	3/8	2 7/8	0.35407	3 Flute	
	TK-004	1/16	1	3/8	2 7/8	0.45126	3 Flute	
	TK-103	3/32	3/4	3/8	2 7/8	0.38532	3 Flute	
	TK-203	1/8	3/4	3/8	3	0.41657	3 Flute	
	<b>12 DEG</b>	TL-103	3/32	3/4	3/8	2 7/8	0.41258	3 Flute
		TL-204	1/8	1	1/2	3	0.55011	3 Flute
		TL-205	1/8	1 1/4	1/2	3 1/4	0.65639	3 Flute
		TL-403	1/4	3/4	1/2	2 7/8	0.56880	3 Flute
		TL-406	1/4	1 1/2	5/8	3 5/8	0.88765	3 Flute
		TL-409	1/4	2 1/4	1	4 3/4	1.20650	3 Flute
	<b>15 DEG</b>	V-0003	1/32	3/4	1/2	2 3/4	0.43318	2 Flute
		V-003	1/16	3/4	1/2	2 3/4	0.46443	3 Flute
		V-102	3/32	1/2	3/8	2 3/8	0.36170	3 Flute
		V-103	3/32	3/4	1/2	2 7/8	0.49568	3 Flute
		V-104	3/32	1	1/2	3	0.62965	3 Flute
		V-106	3/32	1 1/2	3/4	3 3/4	0.89760	3 Flute
		V-106A	3/32	1 1/2	1/2	3 3/4	0.89760	3 Flute
V-202		1/8	1/2	1/2	2 5/8	0.39295	3 Flute	
V-202A		1/8	1/2	3/8	2 5/8	0.39295	3 Flute	
V-203		1/8	3/4	1/2	2 7/8	0.52693	3 Flute	
V-204		1/8	1	1/2	3 1/8	0.66090	3 Flute	
V-205		1/8	1 1/4	5/8	3 1/2	0.79488	3 Flute	
V-205A	1/8	1 1/4	1/2	3 1/2	0.79488	3 Flute		
V-206A	1/8	1 1/2	1/2	3 5/8	0.92885	3 Flute		
V-304	3/16	1	1/2	3 1/8	0.72340	3 Flute		
V-305	3/16	1 1/4	3/4	3 1/2	0.85738	3 Flute		
V-305A	3/16	1 1/4	1/2	3 1/2	0.85738	3 Flute		
V-308	3/16	2	1	4 1/2	1.25930	3 Flute		
V-404	1/4	1	1/2	3 1/8	0.78590	3 Flute		
V-405	1/4	1 1/4	3/4	3 1/2	0.91988	3 Flute		
V-405A	1/4	1 1/4	1/2	3 1/2	0.91988	3 Flute		

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# HIGH SPEED STEEL & COBALT

## Flat Ends



Taper Per Side	Tool No.	Tip Dia.	Flt. Lgth	Shk Dia.	OAL	Large Dia.		Taper Per Side	Tool No.	Tip Dia.	Flt. Lgth	Shk Dia.	OAL	Large Dia.		
<b>15 DEG</b>	V-406	1/4	1 1/2	3/4	3 3/4	1.05385	3 Flute	<b>25 DEG</b>	X-603	3/8	3/4	5/8	3	1.07447	4 Flute	
	V-408	1/4	2	3/4	4 1/2	1.32180	3 Flute		X-604	3/8	1	3/4	3 1/4	1.30762	4 Flute	
	V-409	1/4	2 1/4	1	4 3/4	1.45578	4 Flute		X-606	3/8	1 1/2	1	4 1/8	1.77393	4 Flute	
	V-413	1/4	3 1/4	1 1/4	5 3/4	1.99168	4 Flute		X-805	1/2	1 1/4	1	3 3/4	1.66578	4 Flute	
	V-504	5/16	1	3/4	3 1/4	0.84840	3 Flute		<b>30 DEG</b>	Z-002	1/16	1/2	1/2	2 1/2	0.63985	3 Flute
	V-506	5/16	1 1/2	3/4	3 7/8	1.11635	3 Flute			Z-103	3/32	3/4	1/2	3	0.95978	3 Flute
	V-509	5/16	2 1/4	1	4 7/8	1.51828	4 Flute			Z-202	1/8	1/2	1/2	2 5/8	0.70235	4 Flute
	V-605	3/8	1 1/4	3/4	3 5/8	1.04488	3 Flute			Z-204	1/8	1	1/2	3 1/8	1.27970	4 Flute
	V-609	3/8	2 1/4	1 1/4	4 3/4	1.58080	4 Flute			Z-404	1/4	1	3/4	3 3/8	1.40470	4 Flute
	V-613	3/8	3 1/4	1 1/4	5 3/4	2.05418	4 Flute			Z-406	1/4	1 1/2	1	4 1/8	1.98205	4 Flute
	V-804	1/2	1	3/4	3 1/4	1.03590	3 Flute		Z-605	3/8	1 1/4	1	3 7/8	1.81838	4 Flute	
	V-805	1/2	1 1/4	3/4	3 5/8	1.16988	3 Flute		Z-606	3/8	1 1/2	1	4 1/4	2.10705	4 Flute	
	V-807	1/2	1 3/4	1	4 1/4	1.43783	4 Flute		Z-805	1/2	1 1/4	1	3 3/4	1.94338	4 Flute	
	V-809	1/2	2 1/4	1 1/4	4 7/8	1.70578	4 Flute		Z-806	1/2	1 1/2	1	4 1/4	2.23205	4 Flute	
	V-812	1/2	3	1 1/4	5 1/2	2.10770	4 Flute		<b>35 DEG</b>	35-203A	1/8	3/4	5/8	3	1.17532	4 Flute
V-813	1/2	3 1/4	1 1/4	6	2.24168	4 Flute	35-203B	1/8		3/4	1/2	3	1.17532	4 Flute		
							35-404	1/4		1	1	3 1/4	1.65042	4 Flute		
<b>20 DEG</b>	W-002	1/16	1/2	3/8	2 1/2	0.42647	3 Flute	<b>40 DEG</b>	40-202	1/8	1/2	1/2	2 5/8	0.96410	4 Flute	
	W-103	3/32	3/4	1/2	2 3/4	0.63971	3 Flute		40-203	1/8	3/4	5/8	3 1/4	1.38370	4 Flute	
	W-202	1/8	1/2	3/8	2 1/2	0.48897	3 Flute		40-204	1/8	1	1	3 5/8	1.80320	4 Flute	
	W-204	1/8	1	1/2	3 1/8	0.85294	4 Flute		40-404	1/4	1	1	3 5/8	1.92820	4 Flute	
	W-204C	1/8	1	3/4	3 3/8	0.85294	3 Flute	<b>41 DEG</b>	41-203	1/8	3/4	5/8	3 1/4	1.42900	4 Flute	
	W-304	3/16	1	1/2	3 1/8	0.91544	4 Flute									
	W-306	3/16	1 1/2	3/4	4	1.27941	4 Flute		<b>45 DEG</b>	45-2015	1/8	5/16	1/2	2 1/2	0.75000	4 Flute
	W-404	1/4	1	1/2	3 1/8	0.97794	4 Flute			45-202	1/8	1/2	1/2	2 5/8	1.12500	4 Flute
	W-406	1/4	1 1/2	3/4	4	1.34191	4 Flute			45-203	1/8	3/4	5/8	3 1/4	1.62500	4 Flute
	W-504	5/16	1	3/4	3 1/4	1.04044	4 Flute			45-203ST	1/8	3/4	5/8	3 1/4	1.62500	4 Straight
	W-506	5/16	1 1/2	3/4	3 7/8	1.40441	4 Flute			45-204	1/8	1	1	3 3/4	2.12500	4 Flute
	W-606	3/8	1 1/2	3/4	3 7/8	1.46691	4 Flute	45-303		3/16	3/4	3/4	3 1/4	1.67850	4 Flute	
	W-608	3/8	2	1	4 1/2	1.83088	4 Flute	45-304		3/16	1	1	4	2.17850	4 Flute	
	W-809	1/2	2 1/4	1 1/4	4 7/8	2.13787	4 Flute	45-305	3/16	1 1/4	1 1/4	4 1/4	2.68750	4 Flute		
	<b>22.5 DEG</b>	225-204	1/8	1	1/2	3 1/8	0.95350	4 Flute	45-403	1/4	3/4	3/4	3 1/4	1.75000	4 Flute	
<b>25 DEG</b>	X-103	3/32	3/4	1/2	3	0.79322	3 Flute	45-404	1/4	1	1	4	2.25000	4 Flute		
	X-202	1/8	1/2	1/2	2 1/2	0.59131	3 Flute	45-405	1/4	1 1/4	1 1/4	4 1/4	2.75000	4 Flute		
	X-204A	1/8	1	1/2	3 1/8	1.05762	3 Flute	45-406	1/4	1 1/2	1 1/4	4 1/2	3.25000	4 Flute		
	X-204B	1/8	1	5/8	3 1/8	1.05762	3 Flute	45-603	3/8	3/4	3/4	3 1/4	1.87500	4 Flute		
	X-204C	1/8	1	3/4	3 1/8	1.05762	3 Flute	45-604	3/8	1	1	4	2.37500	4 Flute		
	X-404	1/4	1	5/8	3 1/4	1.18262	4 Flute	45-605	3/8	1 1/4	1 1/4	4 1/4	2.87500	6 Flute		
	X-406	1/4	1 1/2	3/4	4 1/8	1.64893	4 Flute	45-606	3/8	1 1/2	1 1/4	4 1/2	3.37500	6 Flute		
	X-503	5/16	3/4	5/8	3	1.01197	4 Flute	45-803	1/2	3/4	3/4	3 1/4	2.00000	4 Flute		
	X-504	5/16	1	3/4	3 3/8	1.24512	4 Flute	45-804	1/2	1	1	4	2.50000	4 Flute		
	X-506	5/16	1 1/2	1	4 1/8	1.71143	4 Flute	45-805	1/2	1 1/4	1 1/4	4 1/4	3.00000	6 Flute		
								45-806	1/2	1 1/2	1 1/4	4 5/8	3.50000	6 Flute		