HIGH SPEED STEEL & COBALT
Flat Ends

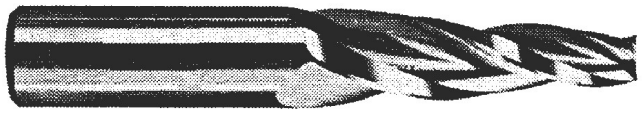
A

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 (847) 677-8770



A HIGH SPEED STEEL & COBALT
Flat Ends

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

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HIGH SPEED STEEL & COBALT
Flat Ends

A

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

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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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for Cobalt TIN Coated, add the suffix “CO-TIN”
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A HIGH SPEED STEEL & COBALT
Flat Ends

Taper Per Side	Tool No.	Tip Dia.	Flt. Lgth	Shk Dia.	OAL	Large Dia.	
4 DEG	N-004	1/16	1	3/8	2 7/8	0.20236	3 Flute
	N-006	1/16	1 1/2	3/8	3 1/4	0.27229	3 Flute
	N-103	3/32	3/4	3/8	2 5/8	0.19865	3 Flute
	N-104	3/32	1	3/8	2 7/8	0.23361	3 Flute
	N-203	1/8	3/4	3/8	2 5/8	0.22990	3 Flute
	N-204	1/8	1	3/8	2 7/8	0.26486	3 Flute
	N-206	1/8	1 1/2	3/8	3 1/4	0.33479	3 Flute
	N-208	1/8	2	1/2	3 7/8	0.40472	3 Flute
	N-210	1/8	2 1/2	1/2	4 1/2	0.47465	3 Flute
	N-303	3/16	3/4	3/8	2 5/8	0.29240	3 Flute
	N-305	3/16	1 1/4	3/8	3 1/8	0.36233	3 Flute
	N-310	3/16	2 1/2	1/2	4 1/2	0.53715	3 Flute
	N-313	3/16	3 1/4	5/8	5 1/2	0.64205	3 Flute
	N-316	3/16	4	3/4	6 1/2	0.74694	3 Flute
	N-403	1/4	3/4	3/8	2 1/2	0.35490	3 Flute
	N-405	1/4	1 1/4	1/2	3 1/4	0.42483	3 Flute
	N-409	1/4	2 1/4	5/8	4 3/8	0.56469	3 Flute
	N-413	1/4	3 1/4	3/4	5 1/2	0.70455	3 Flute
	N-416	1/4	4	3/4	6 1/2	0.80944	3 Flute
	N-605	3/8	1 1/4	1/2	3 1/4	0.54983	3 Flute
	N-609	3/8	2 1/4	5/8	4 3/8	0.68969	3 Flute
	N-613	3/8	3 1/4	3/4	5 1/2	0.82955	3 Flute
	N-616	3/8	4	3/4	6 1/2	0.93444	3 Flute
	N-805	1/2	1 1/4	1/2	3 1/4	0.67483	3 Flute
	N-809	1/2	2 1/4	3/4	4 1/2	0.81469	3 Flute
	N-813	1/2	3 1/4	3/4	5 5/8	0.95455	3 Flute
	N-816	1/2	4	1	6 1/2	1.05944	3 Flute
	N-820	1/2	5	1	7 1/2	1.19930	3 Flute

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for TIN Coated, add the suffix “TIN”
for Cobalt, add the suffix “CO”
for Cobalt TIN Coated, add the suffix “CO-TIN”
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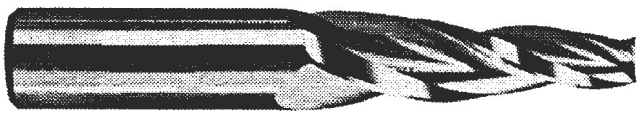
Taper Per Side	Tool No.	Tip Dia.	Flt. Lgth	Shk Dia.	OAL	Large Dia.	
5 DEG	O-0002	1/32	1/2	3/16	2 5/8	0.11874	2 Flute
	O-0003	1/32	3/4	3/16	2 5/8	0.16249	2 Flute
	O-002	1/16	1/2	3/8	2 5/8	0.14999	3 Flute
	O-003	1/16	3/4	3/8	2 5/8	0.19374	3 Flute
	O-004	1/16	1	3/8	2 7/8	0.23748	3 Flute
	O-005	1/16	1 1/4	3/8	3 1/8	0.28123	3 Flute
	O-006	1/16	1 1/2	3/8	3 1/4	0.32497	3 Flute
	O-056	.070	1 1/2	3/8	3 1/4	0.33247	3 Flute
	O-102	3/32	1/2	3/8	2 5/8	0.18124	3 Flute
	O-103	3/32	3/4	3/8	2 5/8	0.22499	3 Flute
	O-104	3/32	1	3/8	2 7/8	0.26873	3 Flute
	O-105	3/32	1 1/4	3/8	3 1/8	0.31248	3 Flute
	O-106	3/32	1 1/2	3/8	3 1/4	0.35622	3 Flute
	O-108	3/32	2	1/2	4	0.44371	3 Flute
	O-108A	3/32	2	3/8	3 7/8	0.44371	3 Flute
	O-110	3/32	2 1/2	1/2	4 1/2	0.53120	3 Flute
	O-114	3/32	3 1/2	3/4	5 7/8	0.66244	3 Flute
	O-154	7/64	1	3/8	2 7/8	0.28436	3 Flute
	O-155	7/64	1 1/4	3/8	3 1/8	0.32810	3 Flute
	O-156	7/64	1 1/2	3/8	3 5/16	0.37185	3 Flute
	O-158	7/64	2	1/2	4	0.45934	3 Flute
	O-203	1/8	3/4	3/8	2 5/8	0.25000	3 Flute
	O-204	1/8	1	3/8	2 7/8	0.29998	3 Flute
	O-205	1/8	1 1/4	3/8	3 1/8	0.34373	3 Flute
	O-206	1/8	1 1/2	3/8	3 1/4	0.37500	3 Flute
	O-208	1/8	2	1/2	4	0.47496	3 Flute
	O-208A	1/8	2	3/8	4	0.47496	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

HIGH SPEED STEEL & COBALT
Flat Ends

A

Taper Per Side	Tool No.	Tip Dia.	Flt. Lgth	Shk Dia.	OAL	Large Dia.	
5	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
6 DEG	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.	
7 DEG	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

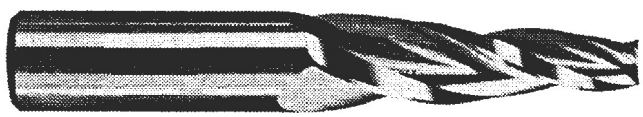


A HIGH SPEED STEEL & COBALT
Flat Ends

Taper Per Side	Tool No.	Tip Dia.	Flt. Lgth	Shk Dia.	OAL	Large Dia.	
8 DEG	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
10 DEG	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

Taper Per Side	Tool No.	Tip Dia.	Flt. Lgth	Shk Dia.	OAL	Large Dia.	
11 DEG	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
12 DEG	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
15 DEG	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

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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SOME ARE AVAILABLE WITH EXTENDED SHANKS.
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Flat Ends

A

Taper Per Side	Tool No.	Tip Dia.	Flt. Lgth	Shk Dia.	OAL	Large Dia.	
15 DEG	V-406	1/4	1 1/2	3/4	3 3/4	1.05385	3 Flute
	V-408	1/4	2	3/4	4 1/2	1.32180	3 Flute
	V-409	1/4	2 1/4	1	4 3/4	1.45578	4 Flute
	V-413	1/4	3 1/4	1 1/4	5 3/4	1.99168	4 Flute
	V-504	5/16	1	3/4	3 1/4	0.84840	3 Flute
	V-506	5/16	1 1/2	3/4	3 7/8	1.11635	3 Flute
	V-509	5/16	2 1/4	1	4 7/8	1.51828	4 Flute
	V-605	3/8	1 1/4	3/4	3 5/8	1.04488	3 Flute
	V-609	3/8	2 1/4	1 1/4	4 3/4	1.58080	4 Flute
	V-613	3/8	3 1/4	1 1/4	5 3/4	2.05418	4 Flute
	V-804	1/2	1	3/4	3 1/4	1.03590	3 Flute
	V-805	1/2	1 1/4	3/4	3 5/8	1.16988	3 Flute
	V-807	1/2	1 3/4	1	4 1/4	1.43783	4 Flute
	V-809	1/2	2 1/4	1 1/4	4 7/8	1.70578	4 Flute
	V-812	1/2	3	1 1/4	5 1/2	2.10770	4 Flute
	V-813	1/2	3 1/4	1 1/4	6	2.24168	4 Flute
20 DEG	W-002	1/16	1/2	3/8	2 1/2	0.42647	3 Flute
	W-103	3/32	3/4	1/2	2 3/4	0.63971	3 Flute
	W-202	1/8	1/2	3/8	2 1/2	0.48897	3 Flute
	W-204	1/8	1	1/2	3 1/8	0.85294	4 Flute
	W-204C	1/8	1	3/4	3 3/8	0.85294	3 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
	W-404	1/4	1	1/2	3 1/8	0.97794	4 Flute
	W-406	1/4	1 1/2	3/4	4	1.34191	4 Flute
	W-504	5/16	1	3/4	3 1/4	1.04044	4 Flute
	W-506	5/16	1 1/2	3/4	3 7/8	1.40441	4 Flute
	W-606	3/8	1 1/2	3/4	3 7/8	1.46691	4 Flute
	W-608	3/8	2	1	4 1/2	1.83088	4 Flute
	W-809	1/2	2 1/4	1 1/4	4 7/8	2.13787	4 Flute
22. 5 DEG	225-204	1/8	1	1/2	3 1/8	0.95350	4 Flute
25 DEG	X-103	3/32	3/4	1/2	3	0.79322	3 Flute
	X-202	1/8	1/2	1/2	2 1/2	0.59131	3 Flute
	X-204A	1/8	1	1/2	3 1/8	1.05762	3 Flute
	X-204B	1/8	1	5/8	3 1/8	1.05762	3 Flute
	X-204C	1/8	1	3/4	3 1/8	1.05762	3 Flute
	X-404	1/4	1	5/8	3 1/4	1.18262	4 Flute
	X-406	1/4	1 1/2	3/4	4 1/8	1.64893	4 Flute
	X-503	5/16	3/4	5/8	3	1.01197	4 Flute
	X-504	5/16	1	3/4	3 3/8	1.24512	4 Flute
	X-506	5/16	1 1/2	1	4 1/8	1.71143	4 Flute

Taper Per Side	Tool No.	Tip Dia.	Flt. Lgth	Shk Dia.	OAL	Large Dia.	
25 DEG	X-603	3/8	3/4	5/8	3	1.07447	4 Flute
	X-604	3/8	1	3/4	3 1/4	1.30762	4 Flute
	X-606	3/8	1 1/2	1	4 1/8	1.77393	4 Flute
	X-805	1/2	1 1/4	1	3 3/4	1.66578	4 Flute
30 DEG	Z-002	1/16	1/2	1/2	2 1/2	0.63985	3 Flute
	Z-103	3/32	3/4	1/2	3	0.95978	3 Flute
	Z-202	1/8	1/2	1/2	2 5/8	0.70235	4 Flute
	Z-204	1/8	1	1/2	3 1/8	1.27970	4 Flute
	Z-404	1/4	1	3/4	3 3/8	1.40470	4 Flute
	Z-406	1/4	1 1/2	1	4 1/8	1.98205	4 Flute
	Z-605	3/8	1 1/4	1	3 7/8	1.81838	4 Flute
	Z-606	3/8	1 1/2	1	4 1/4	2.10705	4 Flute
	Z-805	1/2	1 1/4	1	3 3/4	1.94338	4 Flute
	Z-806	1/2	1 1/2	1	4 1/4	2.23205	4 Flute
35 DEG	35-203A	1/8	3/4	5/8	3	1.17532	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
40 DEG	40-202	1/8	1/2	1/2	2 5/8	0.96410	4 Flute
	40-203	1/8	3/4	5/8	3 1/4	1.38370	4 Flute
	40-204	1/8	1	1	3 5/8	1.80320	4 Flute
	40-404	1/4	1	1	3 5/8	1.92820	4 Flute
41 DEG	41-203	1/8	3/4	5/8	3 1/4	1.42900	4 Flute
45 DEG	45-2015	1/8	5/16	1/2	2 1/2	0.75000	4 Flute
	45-202	1/8	1/2	1/2	2 5/8	1.12500	4 Flute
	45-203	1/8	3/4	5/8	3 1/4	1.62500	4 Flute
	45-203ST	1/8	3/4	5/8	3 1/4	1.62500	4 Straight
	45-204	1/8	1	1	3 3/4	2.12500	4 Flute
	45-303	3/16	3/4	3/4	3 1/4	1.67850	4 Flute
	45-304	3/16	1	1	4	2.17850	4 Flute
	45-305	3/16	1 1/4	1 1/4	4 1/4	2.68750	4 Flute
	45-403	1/4	3/4	3/4	3 1/4	1.75000	4 Flute
	45-404	1/4	1	1	4	2.25000	4 Flute
	45-405	1/4	1 1/4	1 1/4	4 1/4	2.75000	4 Flute
	45-406	1/4	1 1/2	1 1/4	4 1/2	3.25000	4 Flute
	45-603	3/8	3/4	3/4	3 1/4	1.87500	4 Flute
	45-604	3/8	1	1	4	2.37500	4 Flute
	45-605	3/8	1 1/4	1 1/4	4 1/4	2.87500	6 Flute
	45-606	3/8	1 1/2	1 1/4	4 1/2	3.37500	6 Flute
	45-803	1/2	3/4	3/4	3 1/4	2.00000	4 Flute
	45-804	1/2	1	1	4	2.50000	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