

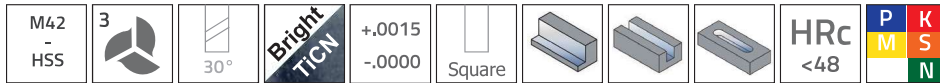
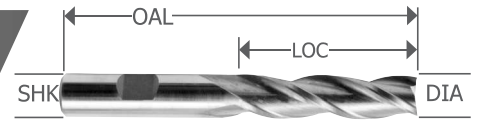
Cobalt HSS & HSS End Mills - Speed & Feed Recommendations

Applications in Various Materials

MATERIAL	HEAT-RESISTANT COBALT BASE ALLOYS, HIGH TENSILE STEELS (50-55 C)		HEAT-RESISTANT AUSTENITIC ALLOYS, HIGH TENSILE STEELS (46-50 C)		HEAT-RESISTANT NICKEL BASE ALLOYS, HIGH STRENGTH STAINLESS STEELS, HIGH STRENGTH TITANIUM ALLOYS		HIGH STRENGTH STAINLESS STEELS, HIGH TENSILE STEELS (40-60 C) MEDIUM STRENGTH TITANIUM ALLOYS		HEAT RESISTANT FERRITIC BASE ALLOYS MEDIUM STRENGTH STAINLESS STEELS UNALLOYED TITANIUM TOOL STEELS (30-40 C)		MACHINE STEEL, HARD BRASS AND BRONZE, ELECTROLYTIC COPPER MILD STEEL FORGINGS (20-30 C)		CAST IRON, MILD STEEL, HALF-HARD BRASS AND BRONZE		BRASS, BRONZE, ALLOYED ALUMINUM, ABRASIVE PLASTICS		ALUMINUM, PLASTICS, WOOD	
	SPEED 5-10 SFM	FEED	SPEED 10-15 SFM	FEED	SPEED 15-20 SFM	FEED	SPEED 20-40 SFM	FEED	SPEED 40-60 SFM	FEED	SPEED 60-80 SFM	FEED	SPEED 80-100 SFM	FEED	SPEED 100-200 SFM	FEED	SPEED 200-600 SFM	FEED
DIA. OF END MILLS	RPM	CHIP LOAD PER TOOTH	RPM	CHIP LOAD PER TOOTH	RPM	CHIP LOAD PER TOOTH	RPM	CHIP LOAD PER TOOTH	RPM	CHIP LOAD PER TOOTH	RPM	CHIP LOAD PER TOOTH	RPM	CHIP LOAD PER TOOTH	RPM	CHIP LOAD PER TOOTH	RPM	CHIP LOAD PER TOOTH
1/16	-	-	-	-	-	-	1222-2444	.0002-.0005	2444-3667	.0002-.005	3667-4888	.0002-.0005	4888-6111	.0002-.0005	6111-12222	.0002-.0005	12222 UP	.0002-.0005
3/32	-	-	-	-	611-815	.0002-.0005	815-1629	.0002-.0005	1629-2750	.0002-.005	2750-3259	.0002-.0005	3259-4073	.0002-.0005	4073-8146	.0002-.0005	8146 UP	.0002-.0005
1/8	-	-	-	-	456-611	.0002-.0005	611-1222	.0002-.0005	1222-1833	.0002-.005	1833-2440	.0002-.001	2440-3056	.0002-.001	3056-6112	.0002-.001	6112 UP	.0002-.001
3/16	-	-	204-306	.0002-.0005	306-407	.0002-.0005	407-815	.0002-.0005	815-1222	.0002-.005	1222-1625	.0002-.001	1625-2037	.0002-.001	2037-4074	.0002-.001	4074-12222	.0002-.001
1/4	76-153	.0002-.001	153-230	.0002-.001	229-306	.0002-.001	306-611	.0002-.001	611-917	.0002-.001	917-1222	.0005-.002	1222-1528	.0005-.002	1528-3056	.0005-.002	3056-9168	.0005-.002
5/16	61-122	.0002-.001	122-183	.0002-.001	183-244	.0002-.001	244-489	.0002-.001	489-733	.0002-.001	733-978	.0005-.002	978-1222	.0005-.002	1222-2444	.0005-.002	2444-7332	.0005-.002
3/8	51-102	.0002-.001	102-153	.0002-.001	153-203	.0002-.001	203-407	.0005-.002	406-611	.0005-.002	611-815	.001-.003	815-1019	.001-.003	1019-2038	.0005-.003	2038-6114	.0005-.002
7/16	44-88	.0005-.001	88-132	.0005-.001	131-175	.0005-.002	175-349	.0005-.002	349-524	.0005-.002	524-698	.001-.003	698-873	.001-.003	873-1746	.0005-.003	1746-5238	.0005-.002
1/2	38-76	.0005-.001	76-115	.0005-.001	115-153	.0005-.002	153-306	.0005-.003	306-458	.001-.003	458-611	.001-.003	611-764	.001-.003	764-1528	.0005-.003	1528-4584	.0005-.002
9/16	34-68	.0005-.002	68-104	.0005-.002	104-136	.0005-.002	136-272	.0005-.003	272-412	.001-.003	412-543	.001-.004	543-678	.001-.004	678-1356	.0005-.004	1356-4071	.0005-.003
5/8	31-61	.0005-.002	61-92	.0005-.002	92-122	.0005-.002	122-244	.001-.004	244-367	.001-.004	367-489	.001-.004	489-611	.001-.004	611-1222	.0005-.004	1222-3666	.0005-.003
11/16	28-56	.0005-.002	56-84	.0005-.002	84-111	.0005-.002	111-222	.001-.004	222-337	.001-.004	337-444	.001-.004	444-555	.001-.004	555-1110	.0005-.004	1110-3330	.0005-.003
3/4	26-51	.0005-.002	51-76	.0005-.002	76-102	.001-.004	102-203	.001-.004	203-306	.001-.004	306-407	.001-.004	407-509	.002-.006	509-1018	.001-.006	1018-3054	.001-.004
13/16	24-47	.001-.003	47-71	.001-.003	71-94	.001-.004	94-189	.001-.004	189-284	.001-.004	284-379	.002-.006	379-469	.002-.006	469-938	.001-.006	938-2814	.001-.004
7/8	22-44	.001-.003	44-65	.001-.003	65-87	.001-.004	87-175	.001-.004	175-262	.002-.006	262-349	.002-.006	349-436	.002-.006	436-872	.001-.006	872-2616	.001-.004
15/16	20-40	.001-.003	40-62	.001-.003	62-81	.001-.004	81-163	.001-.004	163-246	.002-.006	246-326	.002-.006	326-407	.002-.006	407-814	.001-.006	514-2442	.001-.004
1	19-38	.001-.003	38-58	.001-.003	58-76	.001-.004	76-153	.002-.006	153-229	.002-.006	229-306	.002-.006	306-382	.002-.006	382-764	.002 UP	764-2292	.002 UP
1 1/8	34	.0015-.004	34-51	.0015-.004	51-68	.0015-.005	68-136	.002-.006	136-204	.002-.006	204-272	.002-.006	272-340	.003 UP	340-680	.002 UP	680-2040	.002 UP
1 1/4	31	.0015-.004	31-46	.0015-.004	46-61	.0015-.005	61-122	.002-.006	122-183	.002-.006	183-244	.003 UP	244-306	.003 UP	306-612	.002 UP	612-1836	.002 UP
1 3/8	28	.0015-.004	28-42	.0015-.004	42-55	.0015-.005	55-111	.002-.006	111-167	.003 UP	167-222	.003 UP	222-278	.003 UP	278-556	.002 UP	556-1668	.002 UP
1 1/2	26	.0015-.004	26-38	.0015-.004	38-51	.002 UP	51-102	.003 UP	102-153	.003 UP	153-204	.003 UP	204-255	.003 UP	255-510	.003 UP	510-1530	.002 UP
1 5/8	24	.002 UP	35	.002 UP	35-47	.002 UP	47-94	.003 UP	94-141	.003 UP	141-188	.003 UP	188-235	.003 UP	235-470	.003 UP	470-1410	.002 UP
1 3/4	22	.002 UP	32	.002 UP	32-43	.002 UP	43-87	.003 UP	87-131	.003 UP	131-175	.003 UP	175-218	.003 UP	218-436	.003 UP	436-1308	.002 UP
1 7/8	20	.002 UP	30	.002 UP	30-40	.003 UP	40-81	.003 UP	81-122	.003 UP	122-163	.003 UP	163-204	.003 UP	204-408	.003 UP	408-1224	.003 UP
2	19	.002 UP	29	.003 UP	29-38	.003 UP	38-76	.003 UP	76-115	.003 UP	115-153	.003 UP	153-191	.003 UP	191-382	.003 UP	382-1146	.003 UP
2 1/8	18	.003 UP	28	.003 UP	36	.003 UP	36-72	.003 UP	72-108	.003 UP	108-144	.003 UP	144-179	.003 UP	179-358	.003 UP	358-1074	.003 UP
2 1/4	17	.003 UP	26	.003 UP	34	.003 UP	34-68	.003 UP	68-102	.003 UP	103-136	.003 UP	136-170	.003 UP	170-340	.003 UP	340-1020	.003 UP
2 3/8	16	.003 UP	25	.003 UP	32	.003 UP	32-64	.003 UP	64-97	.003 UP	97-128	.003 UP	128-161	.003 UP	161-322	.003 UP	322-966	.003 UP
2 1/2	15	.003 UP	23	.003 UP	30	.003 UP	30-61	.003 UP	61-92	.003 UP	92-122	.003 UP	122-153	.003 UP	153-306	.003 UP	306-918	.003 UP
2 5/8	15	.003 UP	22	.003 UP	29	.003 UP	29-58	.003 UP	58-88	.003 UP	88-116	.003 UP	116-145	.003 UP	145-290	.003 UP	290-870	.003 UP
2 3/4	14	.003 UP	21	.003 UP	28	.003 UP	28-56	.003 UP	56-83	.003 UP	83-111	.003 UP	111-139	.003 UP	139-278	.003 UP	278-834	.003 UP
2 7/8	14	.003 UP	20	.003 UP	27	.003 UP	27-53	.003 UP	53-80	.003 UP	80-106	.003 UP	106-132	.003 UP	132-264	.003 UP	264-792	.003 UP
3	13	.003 UP	19	.003 UP	26	.003 UP	26-51	.003 UP	51-76	.003 UP	76-102	.003 UP	102-127	.003 UP	127-154	.003 UP	254-762	.003 UP

GENERAL PURPOSE COBALT & HSS END MILLS

3 FLUTE • CENTER CUTTING END MILL



SERIES: E

DIA	SHK	LOC	OAL	LENGTH	MAT	TOOL	BRIGHT EDP	TICN EDP
3/32	3/8	5/16	2-1/4	std	M42	E-1203	12022	42022
1/8	3/8	3/8	2-5/16	std	M42	E-1204	12024	42024
5/32	3/8	7/16	2-5/16	std	M42	E-1205	12026	42026
3/16	3/8	1/2	2-3/8	std	M42	E-1206	12028	42028
3/16	3/8	3/4	2-5/8	long	M42	E-1206-L	12266	42266
7/32	3/8	1/2	2-3/8	std	M42	E-1207	12030	42030
7/32	3/8	1-1/4	3-1/8	long	M42	E-1207-L	12268	42268
1/4	3/8	5/8	2-7/16	std	M42	E-1208	12032	42032
1/4	3/8	1-1/4	3-1/16	long	M42	E-1208-L	12270	42270
9/32	3/8	11/16	2-1/2	std	M42	E-1209	12034	42034
9/32	3/8	1-3/8	3-1/8	long	M42	E-1209-L	12272	42272
5/16	3/8	3/4	2-1/2	std	M42	E-1210	12036	42036
5/16	3/8	1-3/8	3-1/8	long	M42	E-1210-L	12274	42274
11/32	3/8	3/4	2-1/2	std	M42	E-1211	12038	42038
11/32	3/8	1-1/2	3-1/4	long	M42	E-1211-L	12276	42276
3/8	3/8	3/4	2-1/2	std	M42	E-1212	12040	42040
3/8	3/8	1-1/2	3-1/4	long	M42	E-1212-L	12278	42278
13/32	3/8	1	2-11/16	std	M42	E-1213	12042	42042
7/16	3/8	1	2-11/16	std	M42	E-1214	12044	42044
7/16	1/2	1-3/4	3-3/4	long	M42	E-1614-L	12280	42280
15/32	1/2	1-1/4	3-1/4	std	M42	E-1615	12048	42048
1/2	3/8	1	2-11/16	std	M42	E-1216	12046	42046
1/2	1/2	1-1/4	3-1/4	std	M42	E-1616	12050	42050
1/2	1/2	2	4	long	M42	E-1616-L	12282	42282
17/32	1/2	1-3/8	3-3/8	std	M42	E-1617	12052	42052
9/16	1/2	1-3/8	3-3/8	std	M42	E-1618	12054	42054
19/32	1/2	1-3/8	3-3/8	std	M42	E-1619	12056	42056
5/8	1/2	1-3/8	3-3/8	std	M42	E-1620	12058	42058
5/8	5/8	1-5/8	3-3/4	std	M42	E-2020	12084	42084
5/8	5/8	2-1/2	4-5/8	long	M42	E-2020-L	12284	42284
21/32	1/2	1-5/8	3-5/8	std	M42	E-1621	12060	42060
11/16	1/2	1-5/8	3-5/8	std	M42	E-1622	12062	42062
23/32	1/2	1-5/8	3-5/8	std	M42	E-1623	12064	42064
3/4	1/2	1-5/8	3-5/8	std	M42	E-1624	12066	42066
3/4	5/8	1-5/8	3-3/4	std	M42	E-2024	12086	42086
3/4	3/4	1-5/8	3-7/8	std	M42	E-2424	12096	42096
3/4	3/4	3	5-1/4	long	M42	E-2424-L	12286	42286
25/32	1/2	1-5/8	3-5/8	std	M42	E-1625	12068	42068
13/16	1/2	1-5/8	3-5/8	std	M42	E-1626	12070	42070
13/16	5/8	1-7/8	4	std	M42	E-2026	12088	42088
13/16	3/4	1-7/8	4-1/8	std	M42	E-2426	12098	42098
27/32	1/2	1-5/8	3-5/8	std	M42	E-1627	12072	42072
7/8	1/2	1-5/8	3-5/8	std	M42	E-1628	12074	42074
7/8	5/8	1-7/8	4	std	M42	E-2028	12090	42090
7/8	3/4	1-7/8	4-1/8	std	M42	E-2428	12100	42100
7/8	7/8	1-7/8	4-1/8	std	M42	E-2828	12116	42116
15/16	1/2	1-7/8	3-7/8	std	M42	E-1630	12078	42078
15/16	5/8	1-7/8	4	std	M42	E-2030	12092	42092
1	1/2	1-7/8	3-7/8	std	M42	E-1632	CALL	CALL
1	3/4	1-7/8	4-1/8	std	M42	E-2432	12104	42104
1	1	2	4-1/2	std	M42	E-3232	12122	42122
1	1	3	5-1/2	med	M42	E-3232-M	12292	42292
1	1	4	6-1/2	long	M42	E-3232-L	12294	42294

sizes continued on next page

GENERAL PURPOSE COBALT & HSS END MILLS

3 FLUTE • CENTER CUTTING END MILL

SERIES: E

DIA	SHK	LOC	OAL	LENGTH	MAT	TOOL	BRIGHT EDP	TICN EDP
1-1/16	3/4	2	4-1/4	std	M42	E-2434	12106	42106
1-1/16	1	2	4-1/2	std	M42	E-3234	CALL	CALL
1-1/8	3/4	2	4-1/4	std	M42	E-2436	12108	42108
1-1/8	1	2	4-1/2	std	M42	E-3236	12126	42126
1-3/16	3/4	2	4-1/4	std	M42	E-2438	12110	42110
1-3/16	1	2	4-1/2	std	M42	E-3238	12128	42128
1-1/4	3/4	2	4-1/4	std	M42	E-2440	12112	42112
1-1/4	1	2	4-1/2	std	M42	E-3240	12130	42130
1-1/4	1-1/4	4	6-1/2	long	M42	E-4040-L	12296	42296
1-5/16	1	2	4-1/2	std	HSS	E-3242	12132	42132
1-3/8	1	2	4-1/2	std	HSS	E-3244	12134	42134
1-1/2	1-1/4	2	4-1/2	std	HSS	E-4048	12144	42144
1-3/4	1-1/4	2	4-1/2	std	HSS	E-4056	11660	41660
2	1-1/4	2	4-1/2	std	HSS	E-4064	12150	42150