

# 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 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																		
	DIA. OF END MILLS	SPEED 5-10 SFM	FEED	CHIP LOAD PER TOOTH	RPM	SPEED 10-15 SFM	FEED	CHIP LOAD PER TOOTH	RPM	SPEED 15-20 SFM	FEED	CHIP LOAD PER TOOTH	RPM	SPEED 20-40 SFM	FEED	CHIP LOAD PER TOOTH	RPM	SPEED 40-60 SFM	FEED	CHIP LOAD PER TOOTH	RPM	SPEED 60-80 SFM	FEED	CHIP LOAD PER TOOTH	RPM	SPEED 80-100 SFM	FEED	CHIP LOAD PER TOOTH	RPM	SPEED 100-200 SFM	FEED	CHIP LOAD PER TOOTH	RPM	SPEED 200-600 SFM	FEED	CHIP LOAD PER TOOTH	RPM			
1/16	-	-	-	-	-	-	-	-	-	-	-	-	-	1222-2444	.0002-.0005	.0002-.0005	1222-2444	2444-3667	.0002-.0005	.0002-.0005	2444-3667	3667-4888	.0002-.0005	.0002-.0005	3667-4888	4888-6111	.0002-.0005	.0002-.0005	4888-6111	6111-12222	.0002-.0005	.0002-.0005	6111-12222	12222 UP	.0002-.0005					
3/32	-	-	-	-	611-815	.0002-.0005	.0002-.0005	611-815	815-1629	.0002-.0005	.0002-.0005	.0002-.0005	815-1629	1629-2750	.0002-.0005	.0002-.0005	1629-2750	2750-3259	.0002-.0005	.0002-.0005	2750-3259	3259-4073	.0002-.0005	.0002-.0005	3259-4073	4073-8146	.0002-.0005	.0002-.0005	4073-8146	8146 UP	.0002-.0005									
1/8	-	-	-	-	456-611	.0002-.0005	.0002-.0005	456-611	611-1222	.0002-.0005	.0002-.0005	.0002-.0005	611-1222	1222-1833	.0002-.0005	.0002-.0005	1222-1833	1833-2440	.0002-.0005	.0002-.0005	1833-2440	2440-3056	.0002-.0005	.0002-.0005	2440-3056	3056-6112	.0002-.0005	.0002-.0005	3056-6112	6112 UP	.0002-.0005									
3/16	-	-	-	-	306-407	.0002-.0005	.0002-.0005	306-407	407-815	.0002-.0005	.0002-.0005	.0002-.0005	407-815	815-1222	.0002-.0005	.0002-.0005	815-1222	1222-1625	.0002-.0005	.0002-.0005	1222-1625	1625-2037	.0002-.0005	.0002-.0005	1625-2037	2037-4074	.0002-.0005	.0002-.0005	2037-4074	4074-12222	.0002-.0005	.0002-.0005	4074-12222	12222 UP	.0002-.0005					
1/4	76-153	.0002-.001	.0002-.001	.0002-.001	229-306	.0002-.001	.0002-.001	229-306	306-611	.0002-.001	.0002-.001	.0002-.001	306-611	611-917	.0002-.001	.0002-.001	611-917	917-1222	.0005-.002	.0005-.002	917-1222	1222-1528	.0005-.002	.0005-.002	1222-1528	1528-3056	.0005-.002	.0005-.002	1528-3056	3056-9168	.0005-.002	.0005-.002	3056-9168	9168 UP	.0005-.002					
5/16	61-122	.0002-.001	.0002-.001	.0002-.001	183-244	.0002-.001	.0002-.001	183-244	244-489	.0002-.001	.0002-.001	.0002-.001	244-489	489-733	.0002-.001	.0002-.001	489-733	733-978	.0005-.002	.0005-.002	733-978	978-1222	.0005-.002	.0005-.002	1222-2444	2444-7332	.0005-.002	.0005-.002	2444-7332	7332 UP	.0005-.002									
3/8	51-102	.0002-.001	.0002-.001	.0002-.001	153-203	.0002-.001	.0002-.001	153-203	203-407	.0005-.002	.0005-.002	.0005-.002	203-407	406-611	.0005-.002	.0005-.002	406-611	611-815	.001-.003	.001-.003	611-815	815-1019	.001-.003	.001-.003	1019-2038	2038-6114	.0005-.002	.0005-.002	2038-6114	6114 UP	.0005-.002									
7/16	44-88	.0005-.001	.0005-.001	.0005-.001	131-175	.0005-.002	.0005-.002	131-175	175-348	.0005-.002	.0005-.002	.0005-.002	175-348	348-524	.0005-.002	.0005-.002	348-524	524-698	.001-.003	.001-.003	524-698	698-873	.001-.003	.001-.003	873-1746	1746-5238	.0005-.002	.0005-.002	5238 UP	.0005-.002										
1/2	38-76	.0005-.001	.0005-.001	.0005-.001	115-153	.0005-.002	.0005-.002	115-153	153-306	.0005-.003	.0005-.003	.0005-.003	153-306	306-458	.001-.003	.001-.003	306-458	458-611	.001-.003	.001-.003	458-611	611-764	.001-.003	.001-.003	764-1528	1528-4684	.0005-.002	.0005-.002	1528-4684	4684 UP	.0005-.002									
9/16	34-88	.0005-.002	.0005-.002	.0005-.002	104-136	.0005-.002	.0005-.002	104-136	136-272	.0005-.003	.0005-.003	.0005-.003	136-272	272-412	.001-.003	.001-.003	272-412	412-543	.001-.004	.001-.004	412-543	543-678	.001-.004	.001-.004	678-1356	1356-4071	.0005-.003	.0005-.003	1356-4071	4071 UP	.0005-.003									
5/8	31-61	.0005-.002	.0005-.002	.0005-.002	92-122	.0005-.002	.0005-.002	92-122	122-244	.001-.004	.001-.004	.001-.004	122-244	244-367	.001-.004	.001-.004	244-367	367-444	.001-.004	.001-.004	367-444	444-555	.001-.004	.001-.004	555-1110	1110-3330	.0005-.003	.0005-.003	1110-3330	3330 UP	.0005-.003									
1 1/16	28-56	.0005-.002	.0005-.002	.0005-.002	84-111	.0005-.002	.0005-.002	84-111	111-222	.001-.004	.001-.004	.001-.004	111-222	222-337	.001-.004	.001-.004	222-337	337-444	.001-.004	.001-.004	337-444	444-555	.001-.004	.001-.004	555-1110	1110-3330	.0005-.003	.0005-.003	1110-3330	3330 UP	.0005-.003									
3/4	26-51	.0005-.002	.0005-.002	.0005-.002	76-102	.001-.004	.001-.004	76-102	102-203	.001-.004	.001-.004	.001-.004	102-203	203-306	.001-.004	.001-.004	203-306	306-407	.001-.004	.001-.004	306-407	407-509	.002-.006	.002-.006	509-1018	1018-3054	.001-.004	.001-.004	1018-3054	3054 UP	.001-.004									
1 1/4	24-47	.001-.003	.001-.003	.001-.003	71-94	.001-.004	.001-.004	71-94	94-189	.001-.004	.001-.004	.001-.004	94-189	189-284	.001-.004	.001-.004	189-284	284-379	.002-.006	.002-.006	284-379	379-469	.002-.006	.002-.006	469-938	938-2814	.001-.004	.001-.004	938-2814	2814 UP	.001-.004									
7/8	22-44	.001-.003	.001-.003	.001-.003	65-87	.001-.004	.001-.004	65-87	87-175	.001-.004	.001-.004	.001-.004	87-175	175-262	.002-.006	.002-.006	175-262	262-349	.002-.006	.002-.006	262-349	349-436	.002-.006	.002-.006	436-872	872-2616	.001-.004	.001-.004	872-2616	2616 UP	.001-.004									
1 5/8	20-40	.001-.003	.001-.003	.001-.003	62-81	.001-.004	.001-.004	62-81	81-163	.001-.004	.001-.004	.001-.004	81-163	163-246	.002-.006	.002-.006	163-246	246-326	.002-.006	.002-.006	246-326	326-407	.002-.006	.002-.006	407-814	814-2442	.001-.004	.001-.004	814-2442	2442 UP	.001-.004									
1	19-38	.001-.003	.001-.003	.001-.003	58-76	.001-.004	.001-.004	58-76	76-153	.002-.006	.002-.006	.002-.006	76-153	153-229	.002-.006	.002-.006	153-229	229-306	.002-.006	.002-.006	229-306	306-382	.002-.006	.002-.006	382-764	764-2292	.002 UP	.002 UP	764-2292	2292 UP	.002 UP									
1 1/8	34	.0015-.004	.0015-.004	.0015-.004	51-68	.0015-.005	.0015-.005	51-68	68-136	.002-.006	.002-.006	.002-.006	68-136	136-204	.002-.006	.002-.006	136-204	204-272	.002-.006	.002-.006	204-272	272-340	.003 UP	.003 UP	340-680	680-2040	.002 UP	.002 UP	680-2040	2040 UP	.002 UP									
1 1/4	31	.0015-.004	.0015-.004	.0015-.004	46-61	.0015-.005	.0015-.005	46-61	61-122	.002-.006	.002-.006	.002-.006	61-122	122-183	.002-.006	.002-.006	122-183	183-244	.003 UP	.003 UP	183-244	244-306	.003 UP	.003 UP	306-612	612-1836	.002 UP	.002 UP	612-1836	1836 UP	.002 UP									
1 3/8	28	.0015-.004	.0015-.004	.0015-.004	42-55	.0015-.005	.0015-.005	42-55	55-111	.002-.006	.002-.006	.002-.006	55-111	111-167	.003 UP	.003 UP	111-167	167-222	.003 UP	.003 UP	167-222	222-278	.003 UP	.003 UP	278-556	556-1668	.002 UP	.002 UP	556-1668	1668 UP	.002 UP									
1 1/2	26	.0015-.004	.0015-.004	.0015-.004	38-51	.002 UP	.002 UP	38-51	51-102	.003 UP	.003 UP	.003 UP	51-102	102-153	.003 UP	.003 UP	102-153	153-204	.003 UP	.003 UP	153-204	204-255	.003 UP	.003 UP	255-510	510-1530	.002 UP	.002 UP	510-1530	1530 UP	.002 UP									
1 5/8	24	.002 UP	.002 UP	.002 UP	35	.002 UP	.002 UP	35	47-94	.003 UP	.003 UP	.003 UP	47-94	94-141	.003 UP	.003 UP	94-141	141-198	.003 UP	.003 UP	141-198	198-235	.003 UP	.003 UP	235-470	470-1410	.002 UP	.002 UP	470-1410	1410 UP	.002 UP									
1 3/4	22	.002 UP	.002 UP	.002 UP	32	.002 UP	.002 UP	32	43-87	.003 UP	.003 UP	.003 UP	43-87	87-131	.003 UP	.003 UP	87-131	131-175	.003 UP	.003 UP	131-175	175-218	.003 UP	.003 UP	218-436	436-1308	.002 UP	.002 UP	436-1308	1308 UP	.002 UP									
1 7/8	20	.002 UP	.002 UP	.002 UP	30	.003 UP	.003 UP	30	40-81	.003 UP	.003 UP	.003 UP	40-81	81-122	.003 UP	.003 UP	81-122	122-163	.003 UP	.003 UP	122-163	163-204	.003 UP	.003 UP	204-408	408-1224	.003 UP	.003 UP	408-1224	1224 UP	.003 UP									
2	19	.002 UP	.002 UP	.002 UP	29	.003 UP	.003 UP	29	38-76	.003 UP	.003 UP	.003 UP	38-76	76-115	.003 UP	.003 UP	76-115	115-153	.003 UP	.003 UP	115-153	153-191	.003 UP	.003 UP	191-382	382-1146	.003 UP	.003 UP	382-1146	1146 UP	.003 UP									
2 1/8	18	.003 UP	.003 UP	.003 UP	28	.003 UP	.003 UP	28	36-72	.003 UP	.003 UP	.003 UP	36-72	72-108	.003 UP																									