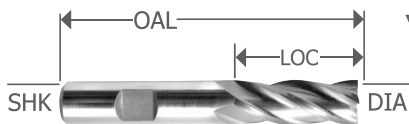


# Cobalt HSS & HSS End Mills - Speed & Feed Recommendations

## 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		SPEED		SPEED		SPEED		SPEED		SPEED		SPEED		SPEED		SPEED	
	5-10 SFM	FEED	10-15 SFM	FEED	15-20 SFM	FEED	20-40 SFM	FEED	40-60 SFM	FEED	60-80 SFM	FEED	80-100 SFM	FEED	100-200 SFM	FEED	200-600 SFM	FEED
DIA. OF END MILLS	CHIP LOAD		CHIP LOAD		CHIP LOAD		CHIP LOAD		CHIP LOAD		CHIP LOAD		CHIP LOAD		CHIP LOAD		CHIP LOAD	
	RPM	PER TOOTH	RPM	PER TOOTH	RPM	PER TOOTH	RPM	PER TOOTH	RPM	PER TOOTH	RPM	PER TOOTH	RPM	PER TOOTH	RPM	PER TOOTH	RPM	PER TOOTH
1/16	-	-	-	-	-	-	1222-2444	.0002-.0005	2444-3667	.0002-.0005	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-.0005	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-.0005	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-.0005	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	814-2442	.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



## MULTI FLUTE • CENTER CUTTING END MILLS

HSSCo M42	4	30°	Bright TiCN	+0.0015 -0.0000	Square				HRC <48	<table border="1"><tr><td>P</td><td>K</td></tr><tr><td>M</td><td>S</td></tr><tr><td>N</td><td>N</td></tr></table>	P	K	M	S	N	N
P	K															
M	S															
N	N															

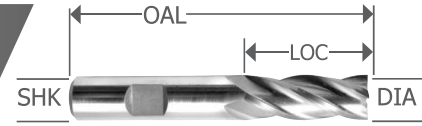
### SERIES: CC

DIA	SHK	LOC	OAL	FLUTE	LENGTH	MAT	TOOL	BRIGHT EDP	TICN EDP
1/8	3/8	3/16	2-1/8	4	stub	M42	CCS-1204	11434	41434
1/8	3/8	3/8	2-5/16	4	std	M42	CC-1204	11432	41432
1/8	3/8	1/2	2-3/8	4	med	M42	CC-1204-M	12972	42972
1/8	3/8	3/4	2-5/8	4	long	M42	CC-1204-L	12974	42974
9/64	3/8	7/16	2-5/16	4	std	M42	CC-1204-1/2	11369	41369
5/32	3/8	3/16	2-1/8	4	stub	M42	CCS-1205	11438	41438
5/32	3/8	7/16	2-5/16	4	std	M42	CC-1205	11436	41436
5/32	3/8	5/8	2-1/2	4	med	M42	CC-1205-M	12976	42976
5/32	3/8	3/4	2-5/8	4	long	M42	CC-1205-L	12978	42978
11/64	3/8	1/2	2-3/8	4	std	M42	CC-1205-1/2	11389	41389
3/16	3/8	3/16	2-1/16	4	stub	M42	CCS-1206	11442	41442
3/16	3/8	1/2	2-3/8	4	std	M42	CC-1206	11440	41440
3/16	3/8	5/8	2-1/2	4	med	M42	CC-1206-M	12980	42980
3/16	3/8	3/4	2-5/8	4	long	M42	CC-1206-L	11582	41582
3/16	3/8	1-1/4	3-1/8	4	xl	M42	CC-1206-E	12962	42962
3/16	3/8	1-3/4	3-9/16	4	xxl	M42	CC-1206-EE	11273	41273
13/64	3/8	1/2	2-3/8	4	std	M42	CC-1206-1/2	11365	41365
7/32	3/8	1/4	2-3/16	4	stub	M42	CCS-1207	11446	41446
7/32	3/8	1/2	2-3/8	4	std	M42	CC-1207	11444	41444
7/32	3/8	7/8	2-3/4	4	med	M42	CC-1207-M	12982	42982
7/32	3/8	1-1/4	3-1/8	4	long	M42	CC-1207-L	11584	41584
7/32	3/8	1-1/2	3-5/16	4	xl	M42	CC-1207-E	12964	42964
7/32	3/8	1-3/4	3-9/16	4	xxl	M42	CC-1207-EE	11339	41339
15/64	3/8	5/8	2-7/16	4	std	M42	CC-1207-1/2	11337	41337
1/4	3/8	1/4	2-1/8	4	stub	M42	CCS-1208	11450	41450
1/4	3/8	5/8	2-7/16	4	std	M42	CC-1208	11448	41448
1/4	3/8	7/8	2-11/16	4	med	M42	CC-1208-M	11588	41588
1/4	3/8	1-1/4	3-1/16	4	long	M42	CC-1208-L	11586	41586
1/4	3/8	1-3/4	3-9/16	4	xl	M42	CC-1208-E	11536	41536
1/4	3/8	2-1/4	4-1/8	4	xxl	M42	CC-1208-EE	11538	41538
17/64	3/8	11/16	2-1/2	4	std	M42	CC-1208-1/2	11207	41207
9/32	3/8	5/16	2-1/8	4	stub	M42	CCS-1209	11454	41454
9/32	3/8	11/16	2-1/2	4	std	M42	CC-1209	11452	41452
9/32	3/8	1	2-3/4	4	med	M42	CC-1209-M	12984	42984
9/32	3/8	1-3/8	3-1/8	4	long	M42	CC-1209-L	11590	41590
9/32	3/8	1-3/4	3-1/2	4	xl	M42	CC-1209-E	12966	42966
19/64	3/8	3/4	2-1/2	4	std	M42	CC-1209-1/2	11390	41390
5/16	3/8	5/16	2-1/16	4	stub	M42	CCS-1210	11458	41458
5/16	3/8	3/4	2-1/2	4	std	M42	CC-1210	11456	41456
5/16	3/8	1	2-3/4	4	med	M42	CC-1210-M	12986	42986
5/16	3/8	1-3/8	3-1/8	4	long	M42	CC-1210-L	11592	41592
5/16	3/8	2	3-3/4	4	xl	M42	CC-1210-E	11540	41540
21/64	3/8	3/4	2-1/2	4	std	M42	CC-1210-1/2	11367	41367
11/32	3/8	3/8	2-1/8	4	stub	M42	CCS-1211	11462	41462
11/32	3/8	3/4	2-1/2	4	std	M42	CC-1211	11460	41460
11/32	3/8	1	2-3/4	4	med	M42	CC-1211-M	12988	42988
11/32	3/8	1-1/2	3-1/4	4	long	M42	CC-1211-L	11594	41594
11/32	3/8	2-1/2	4-1/4	4	xl	M42	CC-1211-E	12968	42968
23/64	3/8	3/4	2-1/2	4	std	M42	CC-1211-1/2	11340	41340
3/8	3/8	3/8	2-1/8	4	stub	M42	CCS-1212	11466	41466
3/8	3/8	3/4	2-1/2	4	std	M42	CC-1212	11464	41464
3/8	3/8	1	2-3/4	4	med	M42	CC-1212-M	12990	42990
3/8	3/8	1-1/2	3-1/4	4	long	M42	CC-1212-L	11596	41596
3/8	3/8	2-1/2	4-1/4	4	xl	M42	CC-1212-E	11542	41542

sizes continued on next page

# GENERAL PURPOSE COBALT & HSS END MILLS

## MULTI FLUTE • CENTER CUTTING END MILL



### SERIES: CC

DIA	SHK	LOC	OAL	FLUTE	LENGTH	MAT	TOOL	BRIGHT EDP	TICN EDP
25/64	3/8	1	2-11/16	4	std	M42	CC-1212-1/2	11311	41311
13/32	3/8	1	2-11/16	4	std	M42	CC-1213	11174	41174
27/64	3/8	1	2-11/16	4	std	M42	CC-1213-1/2	11335	41335
7/16	3/8	9/16	2-1/4	4	stub	M42	CCS-1214	12956	42956
7/16	3/8	1	2-11/16	4	std	M42	CC-1214	11468	41468
7/16	3/8	1-3/4	3-3/4	4	long	M42	CC-1214-L	11338	41338
7/16	1/2	1-1/4	3-1/4	4	med	M42	CC-1614-M	12992	42992
7/16	1/2	1-3/4	3-3/4	4	long	M42	CC-1614-L	12994	42994
7/16	1/2	2-3/4	4-3/4	4	xl	M42	CC-1614-E	12970	42970
29/64	3/8	1	2-11/16	4	std	M42	CC-1214-1/2	14419	44419
15/32	3/8	1	2-11/16	4	std	M42	CC-1215	10310	40310
15/32	1/2	1-1/4	3-1/4	4	std	M42	CC-1615	11180	41180
31/64	1/2	1-1/4	3-1/4	4	std	M42	CC-1615-1/2	11363	41363
1/2	1/2	1/2	2-1/2	4	stub	M42	CCS-1616	12957	42957
1/2	3/8	1	2-11/16	4	std	M42	CC-1216	11470	41470
1/2	1/2	1-1/4	3-1/4	4	std	M42	CC-1616	11472	41472
1/2	1/2	1-1/4	3-1/4	6	std	M42	CC-1616-A	15050	45050
1/2	1/2	1-5/8	3-5/8	4	med	M42	CC-1616-M	12996	42996
1/2	1/2	2	4	4	long	M42	CC-1616-L	11598	41598
1/2	1/2	3	5	4	xl	M42	CC-1616-E	11544	41544
1/2	1/2	4	6	4	xxl	M42	CC-1616-EE	11344	41344
33/64	1/2	1-1/4	3-1/4	4	std	M42	CC-1616-1/2	12540	42540
17/32	1/2	1-3/8	3-3/8	4	std	M42	CC-1617	11184	41184
9/16	1/2	1-3/8	3-3/8	4	std	M42	CC-1618	11474	41474
9/16	1/2	2-1/2	4-1/2	4	long	M42	CC-1618-L	11392	41392
9/16	1/2	3-1/2	5-1/2	4	xl	M42	CC-1618-E	11346	41346
19/32	1/2	1-3/8	3-3/8	4	std	M42	CC-1619	11188	41188
5/8	5/8	5/8	2-3/4	4	stub	M42	CCS-2020	12958	42958
5/8	1/2	1-3/8	3-3/8	4	std	M42	CC-1620	11190	41190
5/8	5/8	1-5/8	3-3/4	4	std	M42	CC-2020	11476	41476
5/8	5/8	1-5/8	3-3/4	6	std	M42	CC-2020-A	15054	45054
5/8	5/8	2	4-1/8	4	med	M42	CC-2020-M	12998	42998
5/8	5/8	2-1/2	4-5/8	4	long	M42	CC-2020-L	11600	41600
5/8	5/8	4	6-1/8	4	xl	M42	CC-2020-E	11546	41546
5/8	5/8	5	7-1/8	4	xxl	M42	CC-2020-EE	11548	41548
41/64	5/8	1-5/8	3-3/4	4	std	M42	CC-2020-1/2	14411	44411
21/32	5/8	1-5/8	3-3/4	4	std	M42	CC-2021	14412	44412
11/16	1/2	1-5/8	3-5/8	4	std	M42	CC-1622	11355	41355
11/16	5/8	1-5/8	3-3/4	4	std	M42	CC-2022	11478	41478
23/32	3/4	1-5/8	3-7/8	4	std	M42	CC-2423	14409	44409
3/4	1/2	1-5/8	3-5/8	4	std	M42	CC-1624	11201	41201
3/4	1/2	3	5	4	std	M42	CC-1624-L	14410	44410
3/4	3/4	3/4	3	4	stub	M42	CCS-2424	12960	42960
3/4	5/8	1-5/8	3-3/4	4	std	M42	CC-2024	15058	45058
3/4	3/4	1-5/8	3-7/8	4	std	M42	CC-2424	11480	41480
3/4	3/4	1-5/8	3-7/8	6	std	M42	CC-2424-A	15062	45062
3/4	3/4	2-1/4	4-1/2	4	med	M42	CC-2424-M	13000	43000
3/4	3/4	3	5-1/4	4	long	M42	CC-2424-L	11602	41602
3/4	3/4	3	5-1/4	6	long	M42	CC-2424-LA	11383	41383
3/4	3/4	4	6-1/4	4	xl	M42	CC-2424-E	11550	41550
3/4	3/4	4	6-1/4	6	xl	M42	CC-2424-EA	10805	40805
3/4	3/4	6	8-1/4	4	xxl	M42	CC-2424-EE	11552	41552
49/64	3/4	1-7/8	4-1/8	4	std	M42	CC-2424-1/2	12541	42541
25/32	3/4	1-7/8	4-1/8	4	std	M42	CC-2425	14413	44413
13/16	3/4	1-7/8	4-1/8	4	std	M42	CC-2426	11482	41482

sizes continued on next page

# GENERAL PURPOSE COBALT & HSS END MILLS

## MULTI FLUTE • CENTER CUTTING END MILL

### SERIES: CC

DIA	SHK	LOC	OAL	FLUTE	LENGTH	MAT	TOOL	BRIGHT EDP	TICN EDP
27/32	7/8	1-7/8	4-1/8	4	std	M42	CC-2827	12544	42544
7/8	1/2	1-5/8	3-5/8	4	std	M42	CC-1628	15854	45854
7/8	3/4	1-7/8	4-1/8	4	std	M42	CC-2428	15066	45066
7/8	7/8	1-7/8	4-1/8	4	std	M42	CC-2828	11484	41484
7/8	7/8	1-7/8	4-1/8	6	std	M42	CC-2828-A	15096	45096
7/8	7/8	3-1/2	5-3/4	4	long	M42	CC-2828-L	11604	41604
7/8	7/8	5	7-1/4	4	xl	M42	CC-2828-E	11554	41554
29/32	7/8	1-7/8	4-1/8	4	std	M42	CC-2829	14421	44421
15/16	3/4	1-7/8	4-1/8	4	std	M42	CC-2430	15068	45068
15/16	7/8	1-7/8	4-1/8	4	std	M42	CC-2830	11486	41486
1	5/8	1-7/8	4	4	std	M42	CC-2032	15060	45060
1	3/4	1-7/8	4-1/8	4	std	M42	CC-2432	15070	45070
1	1/2	1-7/8	3-7/8	4	std	M42	CC-1632	15856	45856
1	1	2	4-1/2	4	std	M42	CC-3232	11488	41488
1	1	2	4-1/2	6	std	M42	CC-3232-A	15098	45098
1	1	3	5-1/2	4	med	M42	CC-3232-M	11608	41608
1	1	4	6-1/2	4	long	M42	CC-3232-L	11606	41606
1	1	4	6-1/2	6	long	M42	CC-3232-LA	11385	41385
1	1	6	8-1/2	4	xl	M42	CC-3232-E	11556	41556
1	1	8	10-1/2	4	xxl	M42	CC-3232-EE	11558	41558
1-1/16	3/4	1-5/8	3-7/8	6	std	M42	CC-2434	15072	45072
1-1/8	3/4	1-5/8	3-7/8	6	std	M42	CC-2436	15074	45074
1-1/8	1	2	4-1/2	4	std	M42	CC-3236	11490	41490
1-3/16	3/4	1-5/8	3-7/8	6	std	M42	CC-2438	15076	45076
1-1/4	3/4	1-5/8	3-7/8	6	std	M42	CC-2440	15078	45078
1-1/4	1	2	4-1/2	6	std	M42	CC-3240	15102	45102
1-1/4	1-1/4	2	4-1/2	4	std	M42	CC-4040	11492	41492
1-1/4	1-1/4	2	4-1/2	6	std	M42	CC-4040-A	11662	41662
1-1/4	1-1/4	4	6-1/2	4	long	M42	CC-4040-L	11610	41610
1-1/4	1-1/4	4	6-1/2	6	long	M42	CC-4040-LA	11386	41386
1-1/4	1-1/4	6	8-1/2	4	xl	M42	CC-4040-E	11560	41560
1-1/4	1-1/4	6	8-1/2	6	xl	M42	CC-4040-EA	11230	41230
1-5/16	3/4	2	4-1/4	6	std	M42	CCP-2442	15080	45080
1-3/8	3/4	2	4-1/4	6	std	M42	CCP-2444	15082	45082
1-7/16	3/4	2	4-1/4	6	std	M42	CCP-2446	15084	45084
1-1/2	3/4	2	4-1/4	6	std	M42	CCP-2448	15086	45086
1-1/2	1	2	4-1/2	6	std	M42	CCP-3248	15106	45106
1-1/2	1	4	6-1/2	4	long	HSS	CC-3248-L	11271	41271
1-1/2	1-1/4	2	4-1/2	4	std	HSS	CC-4048	11494	41494
1-1/2	1-1/4	2	4-1/2	4	std	M42	CCP-4048	11664	41664
1-1/2	1-1/4	2	4-1/2	6	std	HSS	CC-4048-A	11269	41269
1-1/2	1-1/4	2	4-1/2	6	std	M42	CCP-4048-A	11666	41666
1-1/2	1-1/4	4	6-1/2	4	long	HSS	CC-4048-L	11612	41612
1-1/2	1-1/4	8	10-1/2	4	xl	M42	CCP-4048-E	11698	41698
1-5/8	3/4	2	4-1/4	6	std	M42	CCP-2452	15088	45088
1-5/8	1-1/4	2	4-1/2	6	std	M42	CCP-4052	11673	41673
1-3/4	3/4	2	4-1/4	6	std	M42	CCP-2456	15090	45090
1-3/4	1-1/4	2	4-1/2	6	std	M42	CCP-4056	15108	45108
1-7/8	3/4	2	4-1/4	6	std	M42	CCP-2460	15092	45092
2	3/4	2	4-1/4	6	std	M42	CCP-2464	15094	45094
2	1-1/4	2	4-1/2	4	std	M42	CCP-4064	11668	41668
2	1-1/4	2	4-1/2	6	std	M42	CCP-4064-A	11670	41670
2	1-1/4	4	6-1/2	4	long	M42	CCP-4064-L	11712	41712