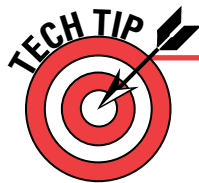


Style HD-4C • HSS, Double End, 4-Flute, Center Cutting (continued)
 formerly style 582

Cutting Diameter	Decimal Equiv.	Metric Equiv.	Shank Diameter		Length of Cut		Overall Length		No. of Flutes	Bright	Order Number	
			in	mm	in	mm	in	mm			TiN	TiCN
3/4	.7500	19.05	.750	19.05	1.625	41.28	5.625	142.88	4	C41223	C33091	C33132
25/32	.7812	19.84	.875	22.23	1.875	47.63	6.125	155.58	4	C33053	C33092	–
13/16	.8125	20.64	.875	22.23	1.875	47.63	6.125	155.58	4	C33054	C33093	C33134
27/32	.8438	21.43	.875	22.23	1.875	47.63	6.125	155.58	4	C33055	C33094	C33135
7/8	.8750	22.23	.875	22.23	1.875	47.63	6.125	155.58	4	C41227	C33095	C33136
29/32	.9062	23.02	1.000	25.40	1.875	47.63	6.375	161.93	4	C33056	C33096	C33137
15/16	.9375	23.81	1.000	25.40	1.875	47.63	6.375	161.93	4	C33057	C33097	–
31/32	.9688	24.61	1.000	25.40	1.875	47.63	6.375	161.93	4	C33058	C33098	–
1	1.0000	25.40	1.000	25.40	1.875	47.63	6.375	161.93	4	C41231	C33099	C33140



End Mill Finishes and Their Applications

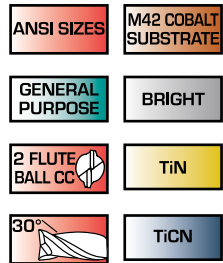
- Cleveland's cutting tools with TiN or TiCN coatings provide exceptional performance benefits. Coatings are matched with designs which are intended for aggressive material removal with significant increases in tool life and machining rates.
 - Coatings reduce heat and abrasion to increase tool life.
 - The increased lubricity of the coating surface reduces material adhesion and built-up edge, enabling even higher feed rates.
 - Coatings reduce the amount of torque required for machining to allow more efficient use of equipment.
 - Increase machining speeds to achieve optimum performance when using Cleveland coatings.
- Straw finish
 - bronze color
 - for general machining
 - operate at conventional cobalt speeds and heavier feed rates.
- TiN (titanium nitride) coating
 - gold color
 - intended for aggressive machining
 - increase machining speed 25% to 30% versus bright speeds
- TiCN (titanium carbonitride) coating
 - blue-gray color
 - for very aggressive machining of stainless steels and non-ferrous materials
 - extremely hard, wear resistant
 - increase machining speeds 35% to 50% versus bright speeds
- TiAlN (titanium aluminum nitride) coating
 - violet/blue-gray color
 - for aggressive machining of stainless steels, high alloy carbon steels, nickel-based high-temperature alloys, and titanium alloys
 - increase machining speeds 75% to 100% versus bright speeds.

General Application End Mills

Single End Finishers

Style HGC-2B • Cobalt, Single End, 2-Flute, Center Cutting, Ball Nose
formerly style 559

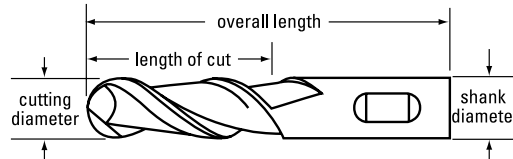
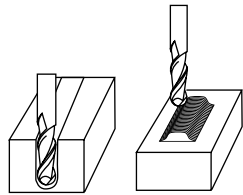
FEATURES



APPLICATIONS



High red hardness for high heat conditions.



Style HGC-2B Bright

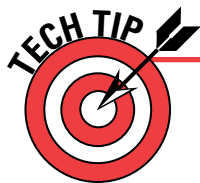


Style HGC-2B TiN-coated



Style HGC-2B TiCN-coated

Cutting Diameter	Decimal Equiv.	Metric Equiv.	Shank Diameter		Length of Cut		Overall Length		No. of Flutes	Order Number		
			in	mm	in	mm	in	mm		Bright	TiN	TiCN
1/8	.1250	3.18	.375	9.53	.375	9.53	2.313	58.74	2	C42643	C32737	C32749
3/16	.1875	4.76	.375	9.53	.500	12.70	2.375	60.33	2	C42645	C32738	C32750
1/4	.2500	6.35	.375	9.53	.625	15.88	2.438	61.91	2	C42648	C32739	C32751
5/16	.3125	7.94	.375	9.53	.750	19.05	2.500	63.50	2	C42650	C32740	C32752
3/8	.3750	9.53	.375	9.53	.750	19.05	2.500	63.50	2	C42653	C32741	C32753
1/2	.5000	12.70	.500	12.70	1.000	25.40	3.250	82.55	2	C42657	C32742	C32754
5/8	.6250	15.88	.625	15.88	1.375	34.93	3.250	82.55	2	C42660	C32743	C32755
3/4	.7500	19.05	.750	19.05	1.625	41.28	3.875	98.43	2	C42663	C32744	C32756
7/8	.8750	22.23	.875	22.23	2.000	50.80	4.250	107.95	2	C32736	C32745	C32757
1	1.0000	25.40	1.000	25.40	2.250	57.15	4.500	114.30	2	C42670	C32746	C32758
1-1/4	1.2500	31.75	1.250	31.75	2.500	63.50	4.500	114.30	2	C42674	C32747	C32759
1-1/2	1.5000	38.10	1.250	31.75	2.500	63.50	5.000	127.00	2	C42680	C32748	C32760



Two-Flute versus Multi-Flute End Mills

- Two-flute end mills
 - have greater chip ejection capacity
 - are ideal for slotting
- Multi-flute end mills
 - deliver a smoother finish
 - are better for peripheral cuts
 - have a heavy-duty cross section for better rigidity

DRILLING

HOLE FINISHING

THREADING

MILLING

OTHER TOOLS