



RAW MATERIALS

PREMIUM CARBIDE GRADES AND TABLES

The raw material that is used to manufacture your tool is just as important as the design of the tool itself. By using inferior materials, the tool life will be significantly decreased.

We will never try to profit by using sub-par materials. We put 100% into every tool and the results speak for themselves.

RESOURCE

We offer a variety of carbide for you to purchase directly from us, which is yet another way we strive to be your preferred go to resource. We would be happy to discuss your purchase and help you determine the grade of carbide needed.

VALUE

We offer only the highest quality carbide available on the market today. We won't waste your time with inferior materials. We understand the value of quality and performance, and use these grades to manufacture our own high performance cutting tools.



(888) 531.8500 | info@conicaltool.com | www.conicalendmills.com

PREMIUM CARBIDE SELECTION CHARTS

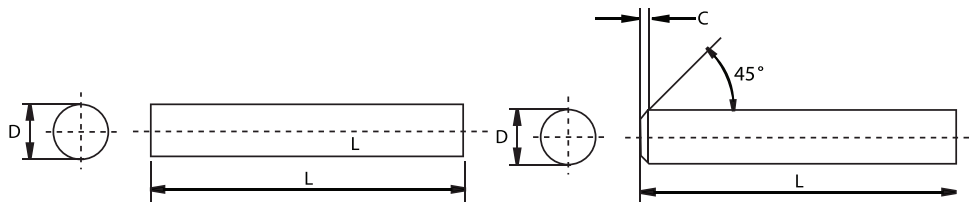
PRECISION GROUND ROD, CUT TO LENGTH

INCH SIZES 1/16" TO 1-1/4" DIAMETER, H6 TOLERANCE

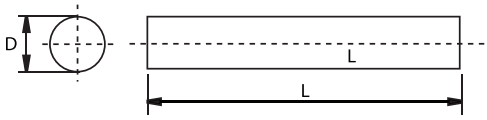
FRACTIONAL SIZE D x L	DIMENSIONS (INCHES)			DESCRIPTION	SUBMICRON / 10% COBALT		COMPLEMENTARY GRADES W/ CHAMFER		
	D	L	C		W/ CHAMFER	W/O CHAMFER	ULTRAFINE / 8% CO	SUBMICRON / 6% CO	ULTRAFINE / 12% CO
1/16 x 1-1/2	0.0625	1.5000		0.0625 x 1.5000		505058			
5/64 x 1-3/4	0.0781	1.7500		0.0781 x 1.7500		505068			
3/32 x 2	0.0937	2.0000		0.0937 x 2.0000		505069			
3/32 x 3	0.0937	3.0000		0.0937 x 3.0000		505039			
3/32 x 4	0.0937	4.0000		0.0937 x 4.0000		505040			
7/64 x 2-1/4	0.1093	2.2500		0.1093 x 2.2500		505070			
1/8 x 1-1/2	0.1250	1.5000	0.015	0.1250 x 1.5000	505115	505000	503095		
1/8 x 2	0.1250	2.0000	0.015	0.1250 x 2.0000	505109	505001	503096	505305	505511
1/8 x 2-1/4	0.1250	2.2500	0.015	0.1250 x 2.2500	503075	505087			
1/8 x 2-1/2	0.1250	2.5000	0.015	0.1250 x 2.5000	505101	505002			505541
1/8 x 3	0.1250	3.0000	0.015	0.1250 x 3.0000	505154	505004			505514
1/8 x 4	0.1250	4.0000	0.015	0.1250 x 4.0000	505111	505005			
1/8 x 6	0.1250	6.0000		0.1250 x 6.0000		505010			
9/64 x 2-1/2	0.1406	2.5000		0.1406 x 2.5000		505071			
9/64 x 3	0.1406	3.0000		0.1406 x 3.0000		503009			
5/32 x 2	0.1562	2.0000		0.1562 x 2.0000		503008			
5/32 x 2-1/2	0.1562	2.5000		0.1562 x 2.5000		505146			
5/32 x 3	0.1562	3.0000		0.1562 x 3.0000		505011			
5/32 x 3-1/2	0.1562	3.5000		0.1562 x 3.5000		505033			
5/32 x 4	0.1562	4.0000		0.1562 x 4.0000		505021			
11/64 x 2-3/4	0.1718	2.7500		0.1718 x 2.7500		505072			
11/64 x 6-1/2	0.1718	6.5000		0.1718 x 6.5000		505220			
3/16 x 1-1/2	0.1875	1.5000		0.1875 x 1.5000		505012			
3/16 x 2	0.1875	2.0000	0.015	0.1875 x 2.0000	505123	505013			505515
3/16 x 2-1/2	0.1875	2.5000	0.015	0.1875 x 2.5000	503182	505014		505396	505517
3/16 x 2-3/4	0.1875	2.7500	0.015	0.1875 x 2.7500	505141				
3/16 x 3	0.1875	3.0000	0.015	0.1875 x 3.0000	503183	505016			505165
3/16 x 4	0.1875	4.0000		0.1875 x 4.0000		505076			
3/16 x 6	0.1875	6.0000		0.1875 x 6.0000		505015			
13/64 x 3	0.2031	3.0000		0.2031 x 3.0000		505149			
7/32 x 2-1/2	0.2187	2.5000		0.2187 x 2.5000		505405			
7/32 x 3	0.2187	3.0000		0.2187 x 3.0000		505150			
15/64 x 3-1/4	0.2343	3.2500		0.2343 x 3.2500		505094			
1/4 x 1-1/2	0.2500	1.5000	0.015	0.2500 x 1.5000	505103	505003			
1/4 x 2	0.2500	2.0000	0.015	0.2500 x 2.0000	505107	505007		505307	505507
1/4 x 2-1/2	0.2500	2.5000	0.015	0.2500 x 2.5000	505124	505009	503185	505324	505524
1/4 x 3	0.2500	3.0000	0.015	0.2500 x 3.0000	505125	50517	503186	505325	505519
1/4 x 3-1/4	0.2500	3.2500	0.015	0.2500 x 3.2500	505197				
1/4 x 3-1/2	0.2500	3.5000	0.015	0.2500 x 3.5000	502024	505098		505326	
1/4 x 4	0.2500	4.0000	0.015	0.2500 x 4.0000	505163	505075	503187	505350	505549
1/4 x 6	0.2500	6.0000	0.015	0.2500 x 6.0000	505212	505073	503189	505352	
1/4 x 6-1/2	0.2500	6.5000		0.2500 x 6.5000		505221			
17/64 x 3-1/2	0.2656	3.5000		0.2656 x 3.5000		505097			
9/32 x 3-1/2	0.2812	3.5000		0.2812 x 3.5000		505152			
19/64 x 3-3/4	0.2968	3.7500		0.2968 x 3.7500		505037			
5/16 x 1-1/4	0.3125	1.2500		0.3125 x 1.2500		505027			
5/16 x 2	0.3125	2.0000	0.015	0.3125 x 2.0000	505126	505077			505526
5/16 x 2-1/2	0.3125	2.5000	0.015	0.3125 x 2.5000	505127	505018	503190	505353	505520
5/16 x 2-3/4	0.3125	2.7500		0.3125 x 2.7500		505026			
5/16 x 3	0.3125	3.0000	0.015	0.3125 x 3.0000	505142	505019	503191	505354	505521
5/16 x 3-3/4	0.3125	3.7500		0.3125 x 3.7500		505085			
5/16 x 4	0.3125	4.0000	0.015	0.3125 x 4.0000	505117	505054	503192	505355	505522
5/16 x 6	0.3125	6.0000	0.015	0.3125 x 6.0000	505178	505078	503193	505356	
21/64 x 4	0.3281	4.0000		0.3281 x 4.0000		505048			
11/32 x 4	0.3437	4.0000		0.3437 x 4.0000		505049			
23/64 x 4-1/4	0.3593	4.2500		0.3593 x 4.2500		505043			
3/8 x 2	0.3750	2.0000	0.015	0.3750 x 2.0000	505128	505025			505525
3/8 x 2-1/2	0.3750	2.5000	0.015	0.3750 x 2.5000	505129	505020	503194	505357	505529
3/8 x 3	0.3750	3.0000	0.015	0.3750 x 3.0000	505130	505023	503195	505330	505523

TOLERANCES (INCH)

SIZES INCH	D,H6	L
1/16 to 7/64	+0, -.00024	+ 1/16, -0
1/8 to 3/16	+0, -.00031	
1/4 to 3/8	+0, -.00035	
7/16 to 5/8	+0, -.00043	
3/4 to 1	+0, -.00051	
1-1/4	+0, -.00063	



FRACTIONAL SIZE D x L	DIMENSIONS (INCHES)			DESCRIPTION	SUBMICRON / 10% COBALT		COMPLEMENTARY GRADES W/ CHAMFER		
	D	L	C		W/ CHAMFER	W/O CHAMFER	ULTRAFINE / 8% CO	SUBMICRON / 6% CO	ULTRAFINE / 12% CO
3/8 x 3-1/4	0.3750	3.2500		0.3750 x 3.2500		505227			
3/8 x 3-1/2	0.3750	3.5000	0.015	0.3750 x 3.5000	505143	505022		505329	
3/8 x 4	0.3750	4.0000	0.015	0.3750 x 4.0000	505144	505024	503196	505328	
3/8 x 4-1/4	0.3750	4.2500		0.3750 x 4.2500		505082			
3/8 x 4-1/2	0.3750	4.5000	0.015	0.3750 x 4.5000	505190				
3/8 x 5	0.3750	5.0000	0.015	0.3750 x 5.0000	505213		503197	505358	
3/8 x 6	0.3750	6.0000	0.015	0.3750 x 6.0000	505214	5037512	503198	505306	
25/64 x 4-1/2	0.3906	4.5000		0.3906 x 4.5000		505044			
13/32 x 4-1/2	0.4062	4.5000		0.4062 x 4.5000		503000			
27/64 x 4-1/2	0.4218	4.5000		0.4218 x 4.5000		503001			
7/16 x 2-1/2	0.4375	2.5000	0.031	0.4375 x 2.5000	505131				
7/16 x 2-3/4	0.4375	2.7500	0.031	0.4375 x 2.7500	505132	505066			505542
7/16 x 4	0.4375	4.0000	0.031	0.4375 x 4.0000	505177	505050			505543
7/16 x 4-1/4	0.4375	4.2500		0.4375 x 4.2500		505153			
7/16 x 6	0.4375	6.0000		0.4375 x 6.0000		505051			
29/64 x 4-3/4	0.4531	4.7500		0.4531 x 4.7500		503002			
15/32 x 4-3/4	0.4687	4.7500		0.4687 x 4.7500		503003			
31/64 x 4-3/4	0.4843	4.7500		0.4843 x 4.7500		503004			
1/2 x 10	0.5000	10.0000		0.5000 x 10.0000		505031			
1/2 x 2	0.5000	2.0000		0.5000 x 2.0000		505052			
1/2 x 2-1/2	0.5000	2.5000	0.031	0.5000 x 2.5000	505133	505053			505533
1/2 x 3	0.5000	3.0000	0.031	0.5000 x 3.0000	505134	505006	503199	505334	505506
1/2 x 3-1/2	0.5000	3.5000	0.031	0.5000 x 3.5000	505140	505074		505340	505513
1/2 x 4	0.5000	4.0000	0.031	0.5000 x 4.0000	505135	505038	503200	505335	505538
1/2 x 4-3/4	0.5000	4.7500		0.5000 x 4.7500		505083			
1/2 x 5	0.5000	5.0000	0.031	0.5000 x 5.0000	505138		503201	505383	
1/2 x 6	0.5000	6.0000	0.031	0.5000 x 6.0000	505136	505056	503215	505395	505209
1/2 x 7	0.5000	7.0000		0.5000 x 7.0000		505029			
1/2 x 8	0.5000	8.0000		0.5000 x 8.0000		505030			
9/16 x 3-1/2	0.5625	3.5000	0.031	0.5625 x 3.5000	505113	505057			
5/8 x 10	0.6250	10.0000		0.6250 x 10.0000		503020			
5/8 x 3	0.6250	3.0000	0.031	0.6250 x 3.0000	505100				505548
5/8 x 3-1/2	0.6250	3.5000	0.031	0.6250 x 3.5000	505102	503013	503202	505384	
5/8 x 4	0.6250	4.0000	0.031	0.6250 x 4.0000	505104	505046		505341	505528
5/8 x 5	0.6250	5.0000	0.031	0.6250 x 5.0000	505106				505530
5/8 x 6	0.6250	6.0000	0.031	0.6250 x 6.0000	505137	505065	503203	505385	505531
5/8 x 7	0.6250	7.0000		0.6250 x 7.0000		503018			
5/8 x 8	0.6250	8.0000		0.6250 x 8.0000		503019			
3/4 x 10	0.7500	10.0000		0.7500 x 10.0000		503006			
3/4 x 3	0.7500	3.0000	0.031	0.7500 x 3.0000	505108		503204	505386	505532
3/4 x 4	0.7500	4.0000	0.031	0.7500 x 4.0000	505110	505060	503205	505342	505534
3/4 x 5	0.7500	5.0000	0.031	0.7500 x 5.0000	505112	505061			505535
3/4 x 6	0.7500	6.0000	0.031	0.7500 x 6.0000	505114	505062	503206	505343	505536
3/4 x 7	0.7500	7.0000		0.7500 x 7.0000		505064			
3/4 x 8	0.7500	8.0000		0.7500 x 8.0000		503005			
7/8 x 4	0.8750	4.0000	0.031	0.8750 x 4.0000	503218	505063			
7/8 x 6	0.8750	6.0000		0.8750 x 6.0000		505067			
1 x 10	1.0000	10.0000		1.0000 x 10.0000		505096			
1 x 3	1.0000	3.0000	0.031	1.0000 x 3.0000	505116		503207	505387	505516
1 x 4	1.0000	4.0000	0.031	1.0000 x 4.0000	505118	503014	503208	505388	505518
1 x 4-1/2	1.0000	4.5000	0.031	1.0000 x 4.5000	505162	503030			
1 x 5	1.0000	5.0000	0.031	1.0000 x 5.0000	505120	503011	503209	505389	505537
1 x 6	1.0000	6.0000	0.031	1.0000 x 6.0000	505122	503010	503210	505390	505539
1 x 7	1.0000	7.0000		1.0000 x 7.0000		505079			
1 x 8	1.0000	8.0000		1.0000 x 8.0000		505047			
1-1/4 x 4	1.2500	4.0000		1.2500 x 4.0000		503021			
1-1/4 x 4-1/2	1.2500	4.5000	0.031	1.2500 x 4.5000	505217		503213	505393	
1-1/4 x 6	1.2500	6.0000	0.031	1.2500 x 6.0000	505218	503022	503214	505394	



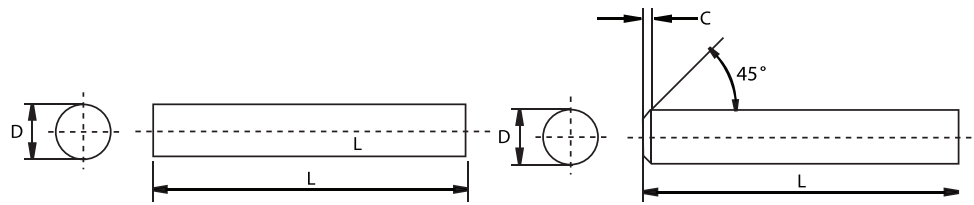
PRECISION GROUND ROD, CUT TO LENGTH

METRIC SIZES 3 TO 25 DIAMETER, H6 TOLERANCE

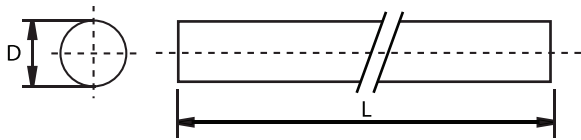
FRACTIONAL SIZE D X L	DIMENSIONS (MM)			DESCRIPTION	SUBMICRON / 10% COBALT		COMPLEMENTARY GRADES W/ CHAMFER		
	D	L	C		W/ CHAMFER	W/O CHAMFER	ULTRAFINE / 8% CO	SUBMICRON / 6% CO	ULTRAFINE / 12% CO
3 x 38	3	38	0.4	3 MM x 38 MM	505139	505088			
3 x 40	3	40		3 MM x 40 MM		505093			
3 x 50	3	50	0.4	3 MM x 50 MM	503025				
3 x 51	3	51	0.4	3 MM x 51 MM	503125	503078	505359		
3 x 53	3	53		3 MM x 53 MM		505089			
3 x 57	3	57	0.4	3 MM x 57 MM	503126				
3 x 64	3	64	0.4	3 MM x 64 MM	503127				
3 x 66	3	66		3 MM x 66 MM		505090			
3 x 76	3	76	0.4	3 MM x 76 MM	503128	503032			
3 x 78	3	78		3 MM x 78 MM		505091			
3 x 92	3	92		3 MM x 92 MM		505092			
4 x 50	4	50	0.4	4 MM x 50 MM	505164				
4 x 51	4	51	0.4	4 MM x 51 MM	503129	503033	505360		
4 x 57	4	57		4 MM x 57 MM		505147			
4 x 63.5	4	63.5		4 MM x 63.5 MM		505161			
4 x 64	4	64	0.4	4 MM x 64 MM	503130				
4 x 76	4	76	0.4	4 MM x 76 MM	503131		503016		
4 x 100	4	100	0.4	4 MM x 100 MM	503132	503034			
5 x 51	5	51	0.4	5 MM x 51 MM	503133	503101	505361		
5 x 64	5	64	0.4	5 MM x 64 MM	505180				
5 x 76	5	76		5 MM x 76 MM		505148			
5 x 100	5	100	0.4	5 MM x 100 MM	503134				
6 x 50	6	50	0.4	6 MM x 50 MM	505095	505206			
6 x 51	6	51	0.4	6 MM x 51 MM	503135	503035	505362		
6 x 55	6	55	0.4	6 MM x 55 MM	503102		505363		
6 x 58	6	58	0.4	6 MM x 58 MM	503103		505364		
6 x 60	6	60	0.4	6 MM x 60 MM	503221				
6 x 63	6	63	0.4	6 MM x 63 MM	503172	503076	505365		
6 x 64	6	64	0.4	6 MM x 64 MM	505155			505347	
6 x 71	6	71	0.4	6 MM x 71 MM	503052				
6 x 75	6	75		6 MM x 75 MM		503027			
6 x 76	6	76	0.4	6 MM x 76 MM	505181			505348	
6 x 82.5	6	82.5	0.4	6 MM x 82.5 MM	505151				
6 x 100	6	100	0.4	6 MM x 100 MM	503026				
6 x 101.6	6	101.6	0.4	6 MM x 101.6 MM	505156				
6 x 150	6	150	0.4	6 MM x 150 MM	503136				
7 x 61	7	61	0.4	7 MM x 61 MM	503137				
7 x 64	7	64	0.4	7 MM x 64 MM	503138				
8 x 50	8	50	0.4	8 MM x 50 MM	503139				
8 x 59	8	59	0.4	8 MM x 59 MM	503104		505366		
8 x 60	8	60	0.4	8 MM x 60 MM	503105				
8 x 63	8	63	0.4	8 MM x 63 MM	505157	503028			
8 x 64	8	64	0.4	8 MM x 64 MM	505182	503037	505367		
8 x 71	8	71	0.4	8 MM x 71 MM	503174				
8 x 75	8	75	0.4	8 MM x 75 MM	503168				
8 x 76	8	76	0.4	8 MM x 76 MM	505183				
8 x 81	8	81	0.4	8 MM x 81 MM	503054				
8 x 100	8	100	0.4	8 MM x 100 MM	503169				
8 x 101.6	8	101.6	0.4	8 MM x 101.6 MM	505158				
8 x 200	8	200	0.4	8 MM x 200 MM	503141				
9 x 64	9	64		9 MM x 64 MM		503039			
10 x 50	10	50	0.4	10 MM x 50 MM	503041				
10 x 64	10	64	0.4	10 MM x 64 MM	503117	503092		505344	
10 x 67	10	67	0.4	10 MM x 67 MM	503106		505369		
10 x 70	10	70	0.4	10 MM x 70 MM	503107	505198			
10 x 73	10	73	0.4	10 MM x 73 MM	503142				
10 x 74	10	74	0.4	10 MM x 74 MM	503108		505370		
10 x 75	10	75	0.4	10 MM x 75 MM	505199	503029			
10 x 76	10	76	0.4	10 MM x 76 MM	505184			505345	
10 x 81	10	81	0.4	10 MM x 81 MM	503175		505371		

TOLERANCES (METRIC)

SIZES (MM)	D,H6	L
3	+0, -.006	+1.6, -0
4 to 6	+0, -.008	
7 to 10	+0, -.009	
11 to 16	+0, -.011	
16 to 18	+0, -.011	
20 to 25	+0, -.013	



FRACTIONAL SIZE D x L	DIMENSIONS (MM)			DESCRIPTION	SUBMICRON / 10% COBALT		COMPLEMENTARY GRADES W/ CHAMFER		
	D	L	C		W/ CHAMFER	W/O CHAMFER	ULTRAFINE / 8% CO	SUBMICRON / 6% CO	ULTRAFINE / 12% CO
10 x 88	10	88	0.4	10 MM x 88 MM	503023				
10 x 95	10	95	0.4	10 MM x 95 MM	503055				
10 x 100	10	100	0.4	10 MM x 100 MM	503144				
10 x 150	10	150	0.4	10 MM x 150 MM	503145				
10 x 200	10	200	0.4	10 MM x 200 MM	503146				
11 x 71	11	71	0.4	11 MM x 71 MM	503056				
11 x 84	11	84	0.4	11 MM x 84 MM	503147				
11 x 101.6	11	101.6	0.4	11 MM x 101.6 MM	503077				
12 x 63	12	63	0.8	12 MM x 63 MM	503148				
12 x 74	12	74	0.8	12 MM x 74 MM	503109		505372		
12 x 75	12	75		12 MM x 75 MM		503409			
12 x 76	12	76	0.8	12 MM x 76 MM	505185			505346	
12 x 84	12	84	0.8	12 MM x 84 MM	503110		505373		
12 x 88	12	88	0.8	12 MM x 88 MM	505186				
12 x 94	12	94	0.8	12 MM x 94 MM	503177		505374		
12 x 100	12	100	0.8	12 MM x 100 MM	503024			503012	
12 x 125	12	125	0.8	12 MM x 125 MM	503149				
12 x 127	12	127		12 MM x 127 MM		505160			
12 x 150	12	150	0.8	12 MM x 150 MM	503150				
12 x 200	12	200	0.8	12 MM x 200 MM	503151				
14 x 76	14	76	0.8	14 MM x 76 MM	503111		505375		
14 x 84	14	84	0.8	14 MM x 84 MM	503112		503038	505376	
14 x 89	14	89	0.8	14 MM x 89 MM	503170				
14 x 100	14	100	0.8	14 MM x 100 MM	503217		503046		
14 x 110	14	110	0.8	14 MM x 110 MM	505187				
14 x 125	14	125	0.8	14 MM x 125 MM	503152				
14 x 150	14	150	0.8	14 MM x 150 MM	503153				
16 x 75	16	75	0.8	16 MM x 75 MM	503113				
16 x 83	16	83	0.8	16 MM x 83 MM	503114		505377		
16 x 89	16	89	0.8	16 MM x 89 MM	503154				
16 x 93	16	93	0.8	16 MM x 93 MM	503115		505378		
16 x 95	16	95		16 MM x 95 MM		505188			
16 x 100	16	100	0.8	16 MM x 100 MM	503155				
16 x 109	16	109	0.8	16 MM x 109 MM	503178		505379		
16 x 110	16	110	0.8	16 MM x 110 MM	503156				
16 x 125	16	125	0.8	16 MM x 125 MM	503157				
16 x 126	16	126	0.8	16 MM x 126 MM	503179				
16 x 127	16	127	0.8	16 MM x 127 MM	503216				
16 x 150	16	150	0.8	16 MM x 150 MM	503158				
18 x 85	18	85	0.8	18 MM x 85 MM	503116		503042		
18 x 93	18	93	0.8	18 MM x 93 MM	503119		503043		
18 x 100	18	100	0.8	18 MM x 100 MM	503159				
18 x 102	18	102	0.8	18 MM x 102 MM	503070				
18 x 125	18	125	0.8	18 MM x 125 MM	503160				
18 x 127	18	127	0.8	18 MM x 127 MM	503171				
18 x 150	18	150	0.8	18 MM x 150 MM	503161				
20 x 93	20	93	0.8	20 MM x 93 MM	503120		505380		
20 x 100	20	100	0.8	20 MM x 100 MM	503121				
20 x 105	20	105	0.8	20 MM x 105 MM	503122		505381		
20 x 115	20	115	0.8	20 MM x 115 MM	503067				
20 x 125	20	125	0.8	20 MM x 125 MM	503162				
20 x 127	20	127	0.8	20 MM x 127 MM	503180		505382		
20 x 135	20	135	0.8	20 MM x 135 MM	503118				
20 x 136	20	136	0.8	20 MM x 136 MM	503181				
20 x 150	20	150	0.8	20 MM x 150 MM	503163				
25 x 100	25	100	0.8	25 MM x 100 MM	503164				
25 x 121	25	121	0.8	25 MM x 121 MM	503165				
25 x 150	25	150	0.8	25 MM x 150 MM	503166				
25 x 151	25	151	0.8	25 MM x 151 MM	503069				
25 x 200	25	200	0.8	25 MM x 200 MM	503167				



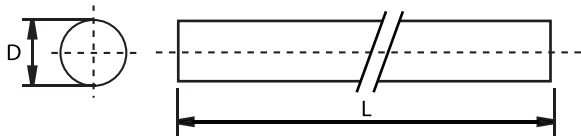
TOLERANCES (METRIC)

SIZES (MM)	D,H6	L
ALL	+0.015, -0	+ 1/2, -0

PRECISION GROUND ROD, RANDOM LENGTHS

INCH SIZES 1/16" TO 1-1/4" DIAMETER, H6 TOLERANCE

FRACTIONAL SIZE D	DIMENSIONS (INCHES)		DESCRIPTION	SUBMICRON / 10% W/O CHAMFER	COMPLEMENTARY GRADES W/ CHAMFER		
	D	L			ULTRAFINE / 8% CO	SUBMICRON / 6% CO	ULTRAFINE / 12% CO
1/16	0.0625	13-1/4	.0625 x 13.25 Centerless Grd	GRR-4			
3/32	0.0937	13-1/4	.09375 x 13.25 Centerless Grd	GRR-6			
7/64	0.1093	13-1/4	.109375 x 13.25 Centerless Grd	GRR-7			
1/8	0.1250	13-1/4	.125 x 13.25 Centerless Grd	GRR-8			
9/64	0.1406	13-1/4	.140625 x 13.25 Centerless Grd	GRR-9			
5/32	0.1562	13-1/4	.15625 x 13.25 Centerless Grd	GRR-10			
11/64	0.1718	13-1/4	.171875 x 13.25 Centerless Grd	GRR-11			
3/16	0.1875	13-1/4	.1875 x 13.25 Centerless Grd	GRR-12			
13/64	0.2031	13-1/4	.203125 x 13.25 Centerless Grd	GRR-13			
7/32	0.2187	13-1/4	.21875 x 13.25 Centerless Grd	GRR-14			
1/4	0.2500	13-1/4	.250 x 13.25 Centerless Grd	GRR-16			
5/16	0.3125	12-1/4	.3125 x 12.25 Centerless Grd	GRR-20			
3/8	0.3750	12-1/4	.375 x 12.25 Centerless Grd	GRR-24			
7/16	0.4375	12-1/4	.4375 x 12.25 Centerless Grd	GRR-28			
1/2	0.5000	12-1/4	.500 x 12.25 Centerless Grd	GRR-32			
9/16	0.5625	12-1/4	.5625 x 12.25 Centerless Grd	GRR-36			
5/8	0.6250	12-1/4	.625 x 12.25 Centerless Grd	GRR-40			
3/4	0.7500	12-1/4	.750 x 12.25 Centerless Grd	GRR-48			
7/8	0.8750	12-1/4	.875 x 12.25 Centerless Grd	GRR-56			
1	1.0000	12-1/4	1.000 x 12.25 Centerless Grd	GRR-64			
1-1/4	1.2500	12-1/4	1.250 x 12.25 Centerless Grd	GRR-80			



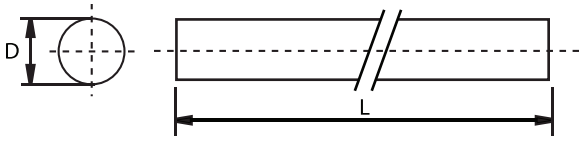
TOLERANCES (METRIC)

SIZES (MM)	D,H6	L
ALL	+0.015, -0	+ 1/2, -0

PRECISION GROUND ROD, RANDOM LENGTHS

METRIC SIZES 5 MM TO 24 MM DIAMETER, H6 TOLERANCE

FRACTIONAL SIZE D	DIMENSIONS (MM)		DESCRIPTION	SUBMICRON / 10% W/O CHAMFER	COMPLEMENTARY GRADES W/ CHAMFER		
	D	L			ULTRAFINE / 8% CO	SUBMICRON / 6% CO	ULTRAFINE / 12% CO
5	5.000	330	5 MM x 330 MM Centerless Grd	GRR-5MM			
6	6.000	330	6 MM x 330 MM Centerless Grd	GRR-6MM			
8	8.000	330	8 MM x 330 MM Centerless Grd	GRR-8MM			
9	9.000	330	9 MM x 330 MM Centerless Grd	GRR-9MM			
10	10.000	330	10 MM x 330 MM Centerless Grd	GRR-10MM			
12	12.000	330	12 MM x 330 MM Centerless Grd	GRR-12MM			
13	13.000	330	13 MM x 330 MM Centerless Grd	GRR-13MM			
14	14.000	330	14 MM x 330 MM Centerless Grd	GRR-14MM			
15	15.000	330	15 MM x 330 MM Centerless Grd	GRR-15MM			
16	16.000	330	16 MM x 330 MM Centerless Grd	GRR-16MM			
18	18.000	330	18 MM x 330 MM Centerless Grd	GRR-18MM			
20	20.000	330	20 MM x 330 MM Centerless Grd	GRR-20MM			
24	24.000	330	24 MM x 330 MM Centerless Grd	GRR-24MM			



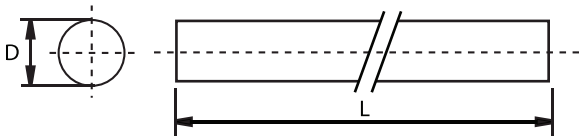
TOLERANCES (METRIC)

SIZES (MM)	D,H6	L
ALL	+0.015, -0	+ 1/2, -0

UNGROUND ROD, RANDOM LENGTHS RR

INCH SIZES 1/16" TO 27/64" DIAMETER

NOMINAL FRACTIONAL SIZE D	DIMENSIONS (INCHES)		DESCRIPTION	SUBMICRON / 10% COBALT W/O CHAMFER	COMPLEMENTARY GRADES W/ CHAMFER		
	D	L			ULTRAFINE / 8% CO	SUBMICRON / 6% CO	ULTRAFINE / 12% CO
1/16	0.073	13-1/4	1/16 x 13.25 Rod Blank	RR-4		RR-4-326	
5/64	0.088	13-1/4	5/64 x 13.25 Rod Blank	RR-5		RR-5-326	
3/32	0.104	13-1/4	3/32 x 13.25 Rod Blank	RR-6		RR-6-326	
7/64	0.119	13-1/4	7/64 x 13.25 Rod Blank	RR-7		RR-7-326	
1/8	0.135	13-1/4	1/8 x 13.25 Rod Blank	RR-8		RR-8-326	
9/64	0.151	13-1/4	9/64 x 13.25 Rod Blank	RR-9		RR-9-326	
5/32	0.166	13-1/4	5/32 x 13.25 Rod Blank	RR-10		RR-10-326	
11/64	0.182	13-1/4	11/64 x 13.25 Rod Blank	RR-11		RR-11-326	
3/16	0.198	13-1/4	3/16 x 13.25 Rod Blank	RR-12		RR-12-326	
13/64	0.213	13-1/4	13/64 x 13.25 Rod Blank	RR-13		RR-13-326	
7/32	0.229	13-1/4	7/32 x 13.25 Rod Blank	RR-14		RR-14-326	
15/64	0.244	13-1/4	15/64 x 13.25 Rod Blank	RR-15		RR-15-326	
1/4	0.260	13-1/4	1/4 x 13.25 Rod Blank	RR-16		RR-16-326	
17/64	0.276	12-1/4	17/64 x 12.25 Rod Blank	RR-17		RR-17-326	
9/32	0.291	12-1/4	9/32 x 12.25 Rod Blank	RR-18		RR-18-326	
19/64	0.307	12-1/4	19/64 x 12.25 Rod Blank	RR-19		RR-19-326	
5/16	0.323	12-1/4	5/16 x 12.25 Rod Blank	RR-20		RR-20-326	
21/64	0.338	12-1/4	21/64 x 12.25 Rod Blank	RR-21		RR-21-326	
11/32	0.354	12-1/4	11/32 x 12.25 Rod Blank	RR-22		RR-22-326	
23/64	0.369	12-1/4	23/64 x 12.25 Rod Blank	RR-23		RR-23-326	
3/8	0.385	12-1/4	3/8 x 12.25 Rod Blank	RR-24		RR-24-326	
25/64	0.401	12-1/4	25/64 x 12.25 Rod Blank	RR-25		RR-25-326	
13/32	0.416	12-1/4	13/32 x 12.25 Rod Blank	RR-26		RR-26-326	
27/64	0.432	12-1/4	27/64 x 12.25 Rod Blank	RR-27		RR-27-326	



TOLERANCES (METRIC)

SIZES (MM)	D,H6	L
ALL	+0.015, -0	+ 1/2, -0

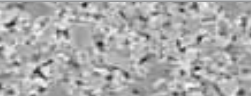
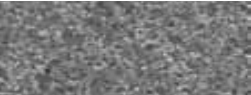
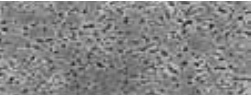

UNGROUND ROD, RANDOM LENGTHS RR

INCH SIZES 1/16" TO 27/64" DIAMETER

NOMINAL FRACTIONAL SIZE D	DIMENSIONS (INCHES)		DESCRIPTION	SUBMICRON / 10% COBALT W/O CHAMFER	COMPLEMENTARY GRADES W/ CHAMFER		
	D	L			ULTRAFINE / 8% CO	SUBMICRON / 6% CO	ULTRAFINE / 12% CO
7/16	0.448	12-1/4	7/16 x 12.25 Rod Blank	RR-28		RR-28-326	
29/64	0.463	12-1/4	29/64 x 12.25 Rod Blank	RR-29		RR-29-326	
15/32	0.479	12-1/4	15/32 x 12.25 Rod Blank	RR-30		RR-30-326	
31/64	0.494	12-1/4	31/64 x 12.25 Rod Blank	RR-31		RR-31-326	
1/2	0.510	12-1/4	1/2 x 12.25 Rod Blank	RR-32			
17/32	0.541	12-1/4	17/32 x 12.25 Rod Blank	RR-34			
9/16	0.573	12-1/4	9/16 x 12.25 Rod Blank	RR-36			
5/8	0.635	12-1/4	5/8 x 12.25 Rod Blank	RR-40			
11/16	0.698	12-1/4	11/16 x 12.25 Rod Blank	RR-44			
3/4	0.760	12-1/4	3/4 x 12.25 Rod Blank	RR-48			
13/16	0.823	12-1/4	13/16 x 12.25 Rod Blank	RR-52			
7/8	0.885	12-1/4	7/8 x 12.25 Rod Blank	RR-56			
1	1.010	12-1/4	1 x 12.25 Rod Blank	RR-64			

CARBIDE GRADES

PRIMARY GRADES

TMK-320	First-choice grade, offering outstanding performance in a broad range of materials and applications. Especially well-suited for drilling and milling grey cast iron, stainless steels and heat-resistant alloys. TMK-320 is a 10% cobalt micrograin tungsten carbide grade.						
ANSI Classification	ISO Classification	WC %	Co %	TaC %	Hardness (HRA)	Density (g/cm3)	TRS, min (psi)
C-2/10	K20	90	10	-	92.0	14.45	500,000
TMK-3028	High hardness and wear resistance characteristics, suitable for machining higher hard-ness materials. Can be used to offer extended tool life with proper application. Used extensively for micro drills, circuit board drills and abrasive applications. TMK-3028 is an 8% cobalt ultrafine grain tungsten carbide grade.						
ANSI Classification	ISO Classification	WC %	Co %	TaC %	Hardness (HRA)	Density (g/cm3)	TRS, min (psi)
C-4/9	K05	92	8	-	93.5	14.60	610,000
TMK-326	Superior wear resistance in composite materials and abrasive applications. Often used for drilling and reaming with high cutting speeds. Well-suited for the light cuts used with high speed machining techniques in hardened steels and heat-resistant alloys. TMK-326 is a 6% cobalt micrograin tungsten carbide grade.						
ANSI Classification	ISO Classification	WC %	Co %	TaC %	Hardness (HRA)	Density (g/cm3)	TRS, min (psi)
C-3/9	K10	94	6	-	93.2	14.85	410,000
TMK-3012	Offers an excellent combination of high hardness, high strength and wear resistance. Suitable for titanium and heat-resistant alloys and hardened steels. Often used for larger diameter milling applications. TMK-3012 is a 12% cobalt ultrafine grain tungsten carbide grade.						
ANSI Classification	ISO Classification	WC %	Co %	TaC %	Hardness (HRA)	Density (g/cm3)	TRS, min (psi)
C-3	K20	86.8	12	1.2	92.7	14.10	650,000

SPECIALTY GRADES

GRADE	ANSI CLASSIFICATION	ISO CLASSIFICATION	WC %	CO %	TIC %	TAC %	HARDNESS (HRA)	DENSITY (G/CM3)	TRS, MIN (PSI)	CHARACTERISTICS
TMK-3	C-3	K20	96	3	-	1	93.3	15.20	250,000	Medium grain size. Excellent wear and corrosion resistance.
TMK-7	C-3/9	K10	95.6	4.4	-	-	92.7	15.10	300,000	Medium grain size. Used for light finishing applications. Good wear resistance.
TMK-10	C-11/12	K40	87	13	-	-	88.5	14.20	450,000	Coarse grain size. For wear and medium shock applications.
TMK-11	C-13	K40	85	15	-	-	87.5	14.00	470,000	Coarse grain size. Light wear and medium shock resistance applications.
TMK-15	C-1/10	K40	94	6	-	-	91.0	14.95	410,000	Coarse grain size. Used for roughing.
TMK15B	C-1/10	K40	92 (min)	6 (min)	0.5 (max)	0.5 (max)	90.8	14.60	300,000	Medium/coarse grain size. Used for bur blanks and non-critical wear applications.
TMK-22	C-2/10	K20/30	94	6	-	-	92.1	14.95	400,000	Medium grain size. For general purpose non-ferrous applications.
TMK-3026	C-4/9	K05	94	6	-	-	93.7	14.85	400,000	Ultra-fine grain size. Offers very high wear resistance.
TMP-810	C-7/8	P10	84	6	6	3	93.0	13.00	275,000	Fine grain size. Excellent wear and corrosion resistance.
TMP-820	C-6	P20/30	72	8	8	12	92.2	12.55	325,000	Medium grain size. For general purpose turning and finishing of ferrous materials.
TMP-821	C-5/6	P20/30	75.8	8	6.2	10	91.5	12.90	350,000	Medium grain size. For general purpose machining of ferrous materials.
TMP-825	C-6	P25/30	69	10.5	6	14.5	91.5	12.80	350,000	Fine grain size. Used for milling and turning of ferrous materials.
TMP-840	C-5	P30/40	80	10	5	5	90.5	13.10	350,000	Medium/coarse grain size. For general purpose roughing of ferrous materials.
TMP-845	C-5	P40/50	71	13	4	12	90.4	13.10	380,000	Medium grain size. Premium roughing grade for ferrous materials.

NOMINAL GRAIN SIZE RANGES

ultra-fine	micro	fine	medium	coarse
0.4 to 0.6 μ	0.8 to 1.0 μ	> 1 to 2 μ	> 2 to 4 μ	> 4 μ