



## Feed Rate Chart

Alpha Code	Feed in Inches per Revolution (IPR) ± 25%															Ø Diameter				
	1mm/ 1/32"	2mm/ 3/32"	3mm/ 1/8"	4mm/ 5/32"	5mm/ 3/16"	6mm/ 1/4"	8mm/ 5/16"	10mm/ 3/8"	12mm/ 1/2"	15mm/ 9/16"	16mm/ 5/8"	20mm/ 3/4"	25mm/ 1"	30mm/ 1.1/8"	40mm/ 1.5/8"	50mm/ 2"				
A	0.0004	0.0009	0.0011	0.0013	0.0014	0.0017	0.0021	0.0024	0.0027	0.0032	0.0034	0.0043	0.0049	0.0053	0.0061	0.0069				
B	0.0006	0.0011	0.0015	0.0016	0.0018	0.0021	0.0026	0.0031	0.0035	0.0041	0.0043	0.0053	0.0060	0.0065	0.0074	0.0082				
C	0.0006	0.0013	0.0017	0.0020	0.0022	0.0025	0.0031	0.0039	0.0043	0.0049	0.0051	0.0063	0.0071	0.0077	0.0087	0.0094				
D	0.0006	0.0015	0.0021	0.0024	0.0027	0.0031	0.0039	0.0047	0.0051	0.0059	0.0061	0.0074	0.0083	0.0090	0.0100	0.0108				
E	0.0007	0.0017	0.0024	0.0028	0.0031	0.0037	0.0045	0.0055	0.0059	0.0068	0.0071	0.0085	0.0094	0.0102	0.0112	0.0122				
F	0.0007	0.0020	0.0029	0.0033	0.0037	0.0043	0.0054	0.0065	0.0070	0.0080	0.0083	0.0098	0.0108	0.0116	0.0126	0.0135				
G	0.0007	0.0022	0.0033	0.0038	0.0043	0.0050	0.0063	0.0075	0.0081	0.0091	0.0094	0.0110	0.0122	0.0130	0.0140	0.0148				
H	0.0008	0.0026	0.0040	0.0046	0.0051	0.0059	0.0075	0.0090	0.0096	0.0107	0.0110	0.0126	0.0140	0.0148	0.0157	0.0165				
I	0.0008	0.0030	0.0047	0.0053	0.0059	0.0068	0.0087	0.0104	0.0110	0.0122	0.0126	0.0142	0.0157	0.0165	0.0173	0.0181				
J	0.0009	0.0033	0.0053	0.0060	0.0067	0.0078	0.0098	0.0117	0.0124	0.0137	0.0142	0.0159	0.0175	0.0183	0.0191	0.0198				
K	0.0010	0.0036	0.0059	0.0067	0.0075	0.0087	0.0110	0.0130	0.0138	0.0153	0.0157	0.0177	0.0193	0.0201	0.0209	0.0215				
L	0.0011	0.0040	0.0065	0.0073	0.0082	0.0094	0.0120	0.0142	0.0152	0.0165	0.0169	0.0191	0.0207	0.0215	0.0224	0.0231				
M	0.0012	0.0043	0.0071	0.0080	0.0089	0.0102	0.0130	0.0154	0.0165	0.0177	0.0181	0.0205	0.0220	0.0228	0.0238	0.0248				
N	0.0013	0.0047	0.0077	0.0086	0.0095	0.0110	0.0140	0.0165	0.0179	0.0189	0.0193	0.0219	0.0234	0.0242	0.0253	0.0265				
S	0.0003	0.0006	0.0008	0.0010	0.0012	0.0015	0.0020	0.0031	0.0039	0.0048	0.0051	0.0059	0.0070	0.0070	0.0090					
T	0.0006	0.0011	0.0016	0.0020	0.0024	0.0028	0.0035	0.0043	0.0051	0.0063	0.0067	0.0075	0.0080	0.0090	0.0100					
U	0.0010	0.0019	0.0028	0.0031	0.0035	0.0042	0.0055	0.0067	0.0079	0.0088	0.0091	0.0094	0.0110	0.0120	0.0140					
V	0.0015	0.0027	0.0039	0.0045	0.0051	0.0060	0.0079	0.0098	0.0110	0.0122	0.0126	0.0134	0.0160	0.0170	0.0200					
W	0.0019	0.0035	0.0051	0.0059	0.0067	0.0079	0.0102	0.0130	0.0150	0.0165	0.0169	0.0177	0.0190	0.0190	0.0200					
X	0.0022	0.0041	0.0059	0.0071	0.0083	0.0098	0.0130	0.0165	0.0189	0.0210	0.0217	0.0228								
Y	0.0027	0.0049	0.0071	0.0087	0.0102	0.0125	0.0169	0.0217	0.0276	0.0276	0.0276	0.0291								
Z	0.0037	0.0068	0.0098	0.0128	0.0157	0.0210	0.0315	0.0394	0.0433	0.0463	0.0472	0.0472								

### How To Use This Chart to Find Cutting Feed Rate (IPR):

1. Find your Alpha Code on the AMG Chart (example: 279 U : U is the Alpha Code)
2. Find the closest diameter for your cutting application on the chart to find your IPR

Application Material Groups (AMG)		Hardness HRC	ISO
1. Steel	1.1 Magnetic soft steel	12L14, 12L15	<120 HB P 1
	1.2 Structural Steel/ case carburising steel	1005-1025, 1214, 1215, A36	<200 HB P 1
	1.3 Plain Carbon steel	1030-1060, 1050-1060, 1144-1146	<24 P 2
	1.4 Alloy steel	4140,4340,52100,8620 H11-H41,A2,D2,01,P20,420	<24 P 3
	1.5 Alloy steel/ Hardened and tempered steel	4140,4340,52100,8620 H11-H41,A2,D2,01,P20,420	>24<38 P 4
	1.6 Alloy steel/ Hardened and tempered steel	4140,4340,52100,8620 H11-H41,A2,D2,01,P20,420	>38 H 1
	1.7 Alloy steel Hardened	A2-D2, H10-H41, L1-L6, M1-M42, T1	49-55 H 3
	1.8 Alloy steel Hardened	A2-D2, H10-H41, L1-L6, M1-M42, T1	55-63 H 4
2. Stainless Steel	2.1 Free machining Stainless Steel	200, 303, 416, 420F, 430F, 440	<24 M 1
	2.2 Austenitic	301, 302, 304, 316, 321, 330, CUSTOM 455, AM-350	<24 M 3
	2.3 Ferritic + Austenitic, Martensitic	318-329, 400-446, DUPLEX	<32 M 2
	2.4 Precipitation Hardened	15-5PH, Custom 450 17-4PH	<32 S 2
3. Cast Iron	3.1 Lamellar graphite	Grey, G10, Gg40, J431C, A48 CLASS 20	<150 HB K 1
	3.2 Lamellar graphite	Grey, GG25-Gg40, J158, A48 CLASS 40-60	>150 HB<32 K 2
	3.3 Nodular graphite/ Malleable Cast Iron	A220, A436, A439, A602, Black, GGG40-GGG70	<200 HB K 3
	3.4 Nodular graphite/ Malleable Cast Iron	Black Gts/Gtw, J434C	>200 HB<32 K 4
4. Titanium	4.1 Titanium, unalloyed	Commercially Pure	<200 HB S 1
	4.2 Titanium, alloyed	6Al4V, 6A14V-2Sn, Monel, Monel K	<28 S 2
	4.3 Titanium, alloyed	6Al4V-4Mo, 7A14V-4Mo, 4911-4967	>28<38 S 3
5. Nickel	5.1 Nickel, unalloyed	Commercially Pure, 17644, 200, 5553	<150 HB S 1
	5.2 Nickel, alloyed	Monel 400, Hastelloy C, Inconel 625, Waspaloy	<28 S 2
	5.3 Nickel, alloyed	Inconel 718, Nimonic 75-95, Rene 41, Inconel 825, A286	>28<38 S 3
6. Copper	6.1 Copper	Commercially Pure	<100 HB N 3
	6.2 β-Brass, Bronze	314-340, 350-370	<200 HB N 4
	6.3 α-Brass	Alloyed Cu + Al + Fe, Long Chipping	<200 HB N 3
	6.4 High Strength Bronze	Ampco 18-25	<49 N 4
7. Aluminium Magnesium	7.1 Al, Mg, unalloyed	Commercially Pure	<100 HB N 1
	7.2 Al alloyed, Si<0.5%	6061 T6, 7075, 314-340	<150 HB N 1
	7.3 Al alloyed, Si>0.5%<10%	6061 T6, 380-390	<120 HB N 1
	7.4 Al alloyed, Si>10% Mg alloys	Magnesium Whisker Reinforced	<120 HB N 2
8. Synthetic Materials	8.1 Thermoplastics	Ultradim, Polystrol	---
	8.2 Thermosetting plastics	Bakelit, Pertinax	---
	8.3 Reinforced plastic materials	CFK, GFKAFK	---
9. Hard Mat.	9.1 Cermets (Metal-ceramics)	Ferrotic	<54 H
10. Graphite	10.1 Standard graphite	---	O



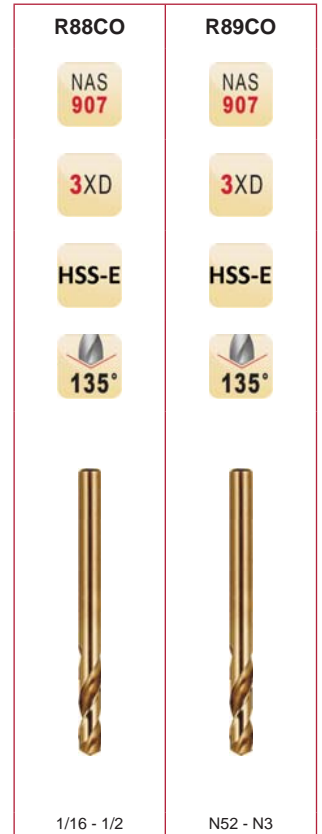
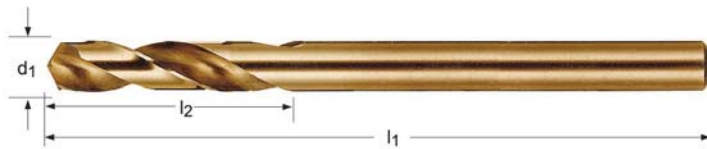
# COBALT JOBBER DRILL

## Heavy Duty Jobber Length (NAS 907 Type D)

**R88CO** - Fractional Sizes

**R89CO** - Wire Gauge Sizes

Low thrust design self centering Split Point for easier penetration. Shorter Flute Lengths. Cobalt base material with Bronze Oxide for wear resistance and lubricity.



$d_1$ Ø Inch	$d_1$ Ø Nr.	$d_1$ decimal Inch	$l_2$ Inch	$l_1$ Inch	Pack Qty	R88CO	R89CO
1/16		0.0625	7/16	1.7/8	12	058704	—
	52	0.0635	7/16	1.7/8	12	—	058852
	51	0.0670	1/2	2"	12	—	058851
	50	0.0700	1/2	2"	12	—	058850
	49	0.0730	1/2	2"	12	—	058849
5/64		0.0781	1/2	2"	12	058705	—
	46	0.0810	9/16	2.1/8	12	—	058846
	45	0.0820	9/16	2.1/8	12	—	058845
	44	0.0860	9/16	2.1/8	12	—	058844
	43	0.0890	5/8	2.1/4	12	—	058843
	42	0.0935	5/8	2.1/4	12	—	058842
3/32		0.0938	5/8	2.1/4	12	058706	—
	41	0.0960	5/8	2.3/8	12	—	058841
	40	0.0980	13/16	2.3/8	12	—	058840
	39	0.0995	13/16	2.3/8	12	—	058839
	36	0.1065	13/16	2.1/2	12	—	058836
7/64		0.1094	13/16	2.5/8	12	058707	—
	31	0.1200	7/8	2.3/4	12	—	058831
1/8		0.1250	7/8	2.3/4	12	058708	—
	30	0.1285	15/16	2.3/4	12	—	058830
	29	0.1360	15/16	2.7/8	12	—	058829
9/64		0.1406	15/16	2.7/8	12	058709	—
	27	0.1440	1"	3"	12	—	058827
	26	0.1470	1"	3"	12	—	058826
	25	0.1495	1"	3"	12	—	058825
	24	0.1520	1"	3.1/8	12	—	058824
5/32		0.1563	1"	3.1/8	12	058710	—
	22	0.1570	1.1/16	3.1/8	12	—	058822
	21	0.1590	1.1/16	3.1/4	12	—	058821
	20	0.1610	1.1/16	3.1/4	12	—	058820
11/64		0.1719	1.1/16	3.1/4	12	058711	—
	16	0.1770	1.1/8	3.3/8	12	—	058816
	13	0.1850	1.1/8	3.1/2	12	—	058813

# COBALT JOBBER DRILL



$d_1$ Ø Inch	$d_1$ Ø Nr.	$d_1$ decimal Inch	$l_2$ Inch	$l_1$ Inch	Pack Qty	R88CO	R89CO
3/16		0.1875	1.1/8	3.1/2	12	058712	—
	12	0.1890	1.1/8	3.1/2	12	—	058812
	11	0.1910	1.3/16	3.1/2	12	—	058811
	10	0.1935	1.3/16	3.5/8	12	—	058810
	9	0.1960	1.3/16	3.5/8	12	—	058809
	8	0.1990	1.3/16	3.5/8	12	—	058808
	7	0.2010	1.3/16	3.5/8	12	—	058807
13/64		0.2031	1.3/16	3.5/8	12	058713	—
	6	0.2040	1.1/4	3.3/4	12	—	058806
	5	0.2055	1.1/4	3.3/4	12	—	058805
	3	0.2130	1.1/4	3.3/4	12	—	058803
7/32		0.2188	1.1/4	3.3/4	12	058714	—
15/64		0.2344	1.5/16	3.7/8	12	058715	—
1/4		0.2500	1.3/8	4"	12	058716	—
17/64		0.2656	1.7/16	4.1/8	12	058717	—
9/32		0.2813	1.1/2	4.1/4	12	058718	—
19/64		0.2969	1.9/16	4.3/8	12	058719	—
5/16		0.3125	1.5/8	4.1/2	6	058720	—
21/64		0.3281	1.11/16	4.5/8	6	058721	—
11/32		0.3437	1.11/16	4.3/4	6	058722	—
23/64		0.3594	1.3/4	4.7/8	6	058723	—
3/8		0.3750	1.13/16	5"	6	058724	—
25/64		0.3906	1.7/8	5.1/8	6	058725	—
13/32		0.4063	1.15/16	5.1/4	6	058726	—
27/64		0.4219	2"	5.3/8	6	058727	—
7/16		0.4375	2.1/16	5.1/2	6	058728	—
29/64		0.4531	2.1/8	5.5/8	6	058729	—
15/32		0.4687	2.1/8	5.3/4	6	058730	—
31/64		0.4844	2.3/16	5.7/8	6	058731	—
1/2		0.5000	2.1/4	6"	6	058732	—