

Cobalt Heavy-Duty Style 520

Features/Benefits:

- Heavy-duty geometry for drilling in tough, high-tensile, and work-hardening materials under extreme operating conditions.
- Manufactured from premium cobalt high-speed steel for increased red hardness.
- 135° split point is self-centering for reduced thrust and easier penetration. Sizes smaller than .0625" do not have split point.
- Straw finish standard from stock; alternate coatings available as stock modifications.

Application Information:

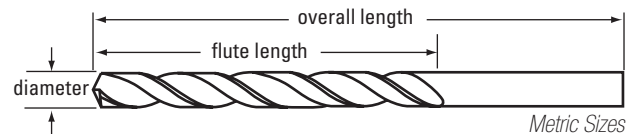
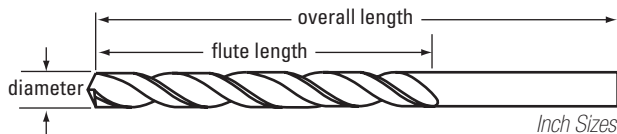
- high-tensile steels
- titanium
- manganese steel
- armour plate
- inconel
- cast iron

Surface Treatment Information:

- Straw finish easily identifies cobalt tooling.



Style 520 Straw Finish



INCH AND METRIC SIZES

Drill Diameter		Overall Length			Flute Length		Style 520		
Fraction	Wire/Let	Metric	Decimal	mm	Inch	mm	Inch	mm	Straw
		1.00	.0394		2.2047	56.00	1.2992	33.00	45050
		1.20	.0472		2.5591	65.00	1.6142	41.00	45052
		1.50	.0591		2.7559	70.00	1.7717	45.00	45055
1/16			.0625	1.59	3.0000	76.20	1.7500	44.45	44804
		1.60	.0630		2.9921	76.00	1.9685	50.00	45056
		1.70	.0669		2.9921	76.00	1.9685	50.00	45057
		1.80	.0709		3.1496	80.00	2.0866	53.00	45058
5/64			.0781	1.98	3.7500	95.25	2.0000	50.80	44805
		2.00	.0787		3.3465	85.00	2.2047	56.00	45060
3/32			.0938	2.38	4.2500	107.95	2.2500	57.15	44807
	40		.0980	2.49	4.6250	117.48	2.5000	63.50	44890
		2.50	.0984		3.7402	95.00	2.4409	62.00	45065
	38		.1015	2.58	4.6250	117.48	2.5000	63.50	44888
	37		.1040	2.64	4.6250	117.48	2.5000	63.50	44887
	36		.1065	2.71	4.6250	117.48	2.5000	63.50	44886
7/64			.1094	2.78	4.6250	117.48	2.5000	63.50	44806
	33		.1130	2.87	5.1250	130.18	2.7500	69.85	44883
		3.00	.1181		3.9370	100.00	2.5984	66.00	45070
1/8			.1250	3.18	5.1250	130.18	2.7500	69.85	44808
		3.20	.1260		4.1732	106.00	2.7165	69.00	45072
	30		.1285	3.26	5.3750	136.53	3.0000	76.20	44880
		3.30	.1299		4.1732	106.00	2.7165	69.00	45073
	29		.1360	3.45	5.3750	136.53	3.0000	76.20	44879
		3.50	.1378		4.4094	112.00	2.8740	73.00	45075

Sizes smaller than .0625 do not have split point.

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**Cobalt Heavy-Duty (continued)
Style 520**

INCH AND METRIC SIZES

Drill Diameter		Overall Length			Flute Length		Style 520
Fraction	Wire/Let	Metric	Decimal	mm	Inch	mm	Straw
9/64			.1406	3.57	5.3750	136.53	44809
		3.60	.1417		4.4094	112.00	45076
	27		.1440	3.66	5.3750	136.53	44877
	26		.1470	3.73	5.3750	136.53	44876
5/32			.1562	3.97	5.3750	136.53	44810
		4.00	.1575		4.6850	119.00	45080
	21		.1590	4.04	5.7500	146.05	44871
	20		.1610	4.09	5.7500	146.05	44870
		4.10	.1614		4.6850	119.00	45081
		4.20	.1654		4.6850	119.00	45082
11/64			.1719	4.37	5.7500	146.05	44811
		4.40	.1732		4.9606	126.00	45084
	16		.1770	4.50	5.7500	146.05	44866
		4.50	.1772		4.9606	126.00	45085
	15		.1800	4.57	5.7500	146.05	44865
		4.60	.1811		4.9606	126.00	45086
3/16			.1875	4.76	5.7500	146.05	44812
		4.80	.1890		5.1968	132.00	45088
		4.90	.1929		5.1968	132.00	45089
		5.00	.1969		5.1968	132.00	45090
	7		.2010	5.11	6.0000	152.40	44857
13/64			.2031	5.16	6.0000	152.40	44813
		5.20	.2047		5.1968	132.00	45092
		5.30	.2087		5.1968	132.00	45093
	3		.2130	5.41	6.0000	152.40	44853
		5.50	.2165		5.4724	139.00	45095
7/32			.2188	5.56	6.0000	152.40	44814
	1		.2280	5.79	6.1250	155.58	44851
15/64			.2344	5.95	6.1250	155.58	44815
		6.00	.2362		5.4724	139.00	45100
1/4	E		.2500	6.35	6.1250	155.58	44816
		6.50	.2559		5.8268	148.00	45105
17/64			.2656	6.75	6.2500	158.75	44817
		6.80	.2677		6.1417	156.00	45108
	J		.2770		6.2500	158.75	45155
		7.00	.2756		6.1417	156.00	45110
9/32			.2812	7.14	6.2500	158.75	44818
		7.50	.2953		6.1417	156.00	45115
19/64			.2969	7.54	6.3750	161.93	44819
5/16			.3125	7.94	6.3750	161.93	44820
		8.00	.3150		6.4961	165.00	45120
21/64			.3281	8.33	6.5000	165.10	44821
		8.50	.3346		6.4961	165.00	45125
11/32			.3438	8.73	6.5000	165.10	44822
		9.00	.3543		6.8898	175.00	45130
23/64			.3594	9.13	6.7500	171.45	44823
		9.50	.3740		6.8898	175.00	45135

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Cobalt Heavy-Duty (continued) Style 520

INCH AND METRIC SIZES

Drill Diameter		Overall Length			Flute Length		Style 520	
Fraction	Wire/Let	Metric	Decimal	mm	Inch	mm	Straw	
3/8			.3750	9.53	6.7500	171.45	4.2500 107.95	44824
25/64			.3906	9.92	7.0000	177.80	4.3750 111.13	44825
		10.00	.3937		7.2441	184.00	4.7638 121.00	45140
13/32			.4062	10.32	7.0000	177.80	4.3750 111.13	44826
		10.50	.4134		7.2441	184.00	4.7638 121.00	45143
27/64			.4219	10.72	7.2500	184.15	4.6250 117.48	44827
		11.00	.4331		7.6772	195.00	5.0394 128.00	45145
7/16			.4375	11.11	7.2500	184.15	4.6250 117.48	44828
		11.50	.4528		7.6772	195.00	5.0394 128.00	45147
29/64			.4531	11.51	7.5000	190.50	4.7500 120.65	44829
15/32			.4688	11.91	7.5000	190.50	4.7500 120.65	44830
		12.00	.4724		8.0709	205.00	5.2756 134.00	45149
31/64			.4844	12.30	7.7500	196.85	4.7500 120.65	44831
		12.50	.4921		8.0709	205.00	5.2756 134.00	45151
1/2			.5000	12.70	7.7500	196.85	4.7500 120.65	44832

TECH TIP

Deep Hole Tips

Drilling deep holes in some cases requires drilling to depths of 20 times drill diameter. Drilling to these depths causes concern for chip evacuation and heat build up on the tool, generating excessive wear at the point. Consider the following factors when drilling to these depths.

- Material to be cut and its hardness will determine whether to use high-speed steel M-2 or the cobalt grade M-42. Although M-2 is the most frequently used HSS, M-42 is the choice when machining in the Brinell range 296 and above.
- Tool construction must be of a heavy-duty style, with typical web thickness of 40% to

45% of the drill diameter to maintain rigidity over the long flute length.

- Helix angles of 36° to 38° are common to efficiently evacuate chips up the flutes.
- Points are generally 135° heavy-duty and split, sometimes referred to as crankshaft drill points.
- Consider other flute styles including parabolic.
- When calculating OAL consider the reach length, amount of re-sharpening required, bushing or fixture length and part thickness.
- Minimize excessive overhang.
- Drill points should always be kept sharp.

- Proper lubrication is critical and coolant should be well filtered.
- The most critical machining function is the evacuation of chips, drilling depth and the critical path of chip evacuation as well as knowing when to withdraw the tool before the chips get hot and anneal the tool.
- For controlling the chip, choose the right feeds and speeds. In general, 50 to 65 SFM is standard. The feed will depend on the tool diameter. If the chip is long and stringy, increase feeds until chip is broken into smaller pieces.