

Drilling stainless steel?

...Look no further!



- Produces short chips in Stainless Steel & Copper alloys
- High Helix & Unique Flute Form
- Ultra Sharp Point Geometry
- Ideal pre-tapping drill

R40 VA BLACK MAGIC

for an on-site demonstration contact
Sutton Tools on 1800 335 350

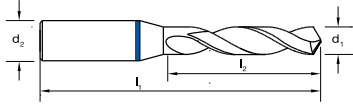
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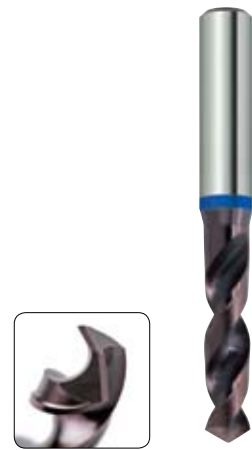
Drills Stub - R40 VA Black Magic



- Rigid twist drill
- Excellent solution for austenitic stainless steels and most long chipping materials
- Optimized geometry ensures no hardening of the workpiece material
- Common shank sizes, for use in steel collets
- For use in CNC machines



Catalogue Code		D153						
Discount Group		A1502						
Material		HSS Co						
Surface Finish		TAIN						
Colour Ring & Application		VA						
Geometry		R40°						
Point Type		4 Facet						
Shank Tolerance		h7						
d ₁		l ₁	l ₂	d ₂	Point Angle	Form	Price	Item #
0.5		20	3	3	150°			•
0.6		21	3.5	3	150°			•
0.7		24	4.5	3	150°			•
0.8		25	5	3	150°			•
0.9		26	5.5	3	150°			•
1.0		26	6	3	140°			384337
1.1		28	7	3	140°			384344
1.2		30	8	3	140°			384351
1.3		30	8	3	140°			384368
1.4		32	9	3	140°			384375
1.5		32	9	3	140°			384382
1.6		34	10	3	140°			384399
1.7		34	10	3	140°			384405
1.8		36	11	3	140°			384412
1.9		36	11	3	140°			384429
2.0		38	12	3	130°			384436
2.1		38	12	3	130°			384443
2.2		40	13	3	130°			384450
2.3		40	13	3	130°			384467
2.4		43	14	3	130°			384474
2.5		43	14	3	130°			384481
2.6		43	14	3	130°			384498
2.7		46	16	3	130°			384504
2.8		46	16	3	130°			384511
2.85		46	16	3	130°			425702
2.9		46	16	3	130°			384528
3.0		46	16	3	130°			371078
3.1		49	18	4	130°			371085
3.18	1/8	49	18	4	130°			425351
3.2		49	18	4	130°			371092
3.3		49	18	4	130°			371108
3.4		52	20	4	130°			371115
3.5		52	20	4	130°			371122
3.57	9/64	52	20	4	130°			425368
3.6		52	20	4	130°			371139
3.7		52	20	4	130°			371146
3.78		52	20	4	130°			425719
3.8		55	22	4	130°			371153
3.9		55	22	4	130°			371160
3.97	5/32	55	22	4	130°			425375
4.0		55	22	4	130°			371177
4.1		55	22	6	120°			371184
4.2		55	22	6	120°			371191
4.3		58	24	6	120°			371207



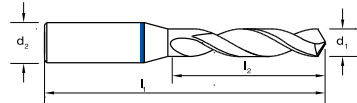
Catalogue Code		D153						
Discount Group		A1502						
Material		HSS Co						
Surface Finish		TAIN						
Colour Ring & Application		VA						
Geometry		R40°						
Point Type		4 Facet						
Shank Tolerance		h7						
d ₁		l ₁	l ₂	d ₂	Point Angle	Form	Price	Item #
4.37	11/64	58	24	6	120°			425382
4.4		58	24	6	120°			371214
4.5		58	24	6	120°			371221
4.6		58	24	6	120°			371238
4.65		58	24	6	120°			425726
4.7		58	24	6	120°			371245
4.76	3/16	62	26	6	120°			425399
4.78		62	26	6	120°			425733
4.8		62	26	6	120°			371252
4.9		62	26	6	120°			371269
5.0		62	26	6	120°			371276
5.05		62	26	6	120°			425740
5.1		62	26	6	120°			371283
5.16	13/64	62	26	6	120°			425405
5.2		62	26	6	120°			371290
5.3		62	26	6	120°			371306
5.4		66	28	6	120°			371313
5.5		66	28	6	120°			371320
5.55		66	28	6	120°			425757
5.56	7/32	66	28	6	120°			425412
5.6		66	28	6	120°			371337
5.65		66	28	6	120°			425764
5.7		66	28	6	120°			371344
5.8		66	28	6	120°			371351
5.9		66	28	6	120°			371368
5.95	15/64	66	28	6	120°			425429
6.0		66	28	6	120°			371375
6.1		70	31	8	120°			371382
6.2		70	31	8	120°			371399
6.3		70	31	8	120°			371405
6.35	1/4	70	31	8	120°			425436
6.4		70	31	8	120°			371412
6.5		70	31	8	120°			371429
6.6		70	31	8	120°			535173
6.7		70	31	8	120°			372396
6.75	17/64	74	34	8	120°			425443
6.8		74	34	8	120°			372402
6.9		74	34	8	120°			372419
7.0		74	34	8	120°			372426
7.1		74	34	8	120°			372433
7.14	9/32	74	34	8	120°			425450
7.2		74	34	8	120°			372440
7.3		74	34	8	120°			372457
7.4		74	34	8	120°			372464

• Available on request as special manufacture. Subject to lead time.

Drills Stub - R40 VA Black Magic



- Rigid twist drill
- Excellent solution for austenitic stainless steels and most long chipping materials
- Optimized geometry ensures no hardening of the workpiece material
- Common shank sizes, for use in steel collets
- For use in CNC machines



Form A



Catalogue Code	D153
Discount Group	A1502
Material	HSS Co
Surface Finish	TAIN
Colour Ring & Application	VA
Geometry	R40°
Point Type	4 Facet
Shank Tolerance	h7

d ₁	l ₁	l ₂	d ₂	Point Angle	Form	Price	Item #
7.5	74	34	8	120°			372471
7.54	19/64	79	37	8	120°		425467
7.55		79	37	8	120°		425467
7.6		79	37	8	120°		372488
7.7		79	37	8	120°		372495
7.8		79	37	8	120°		372501
7.9		79	37	8	120°		372518
7.94	5/16	79	37	8	120°		425474
8.0		79	37	8	120°		372525
8.1		79	37	10	120°		372532
8.2		79	37	10	120°		372549
8.3		79	37	10	120°		372556
8.33	21/64	79	37	10	120°		425481
8.4		79	37	10	120°		372563
8.5		79	37	10	120°		372570
8.6		84	40	10	120°		372587
8.7		84	40	10	120°		372594
8.73	11/32	84	40	10	120°		425498
8.8		84	40	10	120°		372600
8.9		84	40	10	120°		372617
9.0		84	40	10	120°		372624
9.1		84	40	10	120°		372631
9.13	23/64	84	40	10	120°		425504
9.2		84	40	10	120°		372648
9.3		84	40	10	120°		372655
9.4		84	40	10	120°		372662
9.5		84	40	10	120°		372679
9.53	3/8	89	43	10	120°		425511
9.55		89	43	10	120°		425788
9.6		89	43	10	120°		372686
9.7		89	43	10	120°		372693
9.8		89	43	10	120°		372709
9.9		89	43	10	120°		372716
9.92	25/64	89	43	10	120°		425528
10.0		89	43	10	120°		372723
10.1		89	43	10	120°		372730
10.2		89	43	10	120°		372747
10.3		89	43	10	120°		372754
10.32	13/32	89	43	10	120°		425535
10.4		89	43	10	120°		372761
10.5		89	43	10	120°		372778
10.6		89	43	12	120°		372785
10.7		95	47	12	120°		372792
10.72	27/64	95	47	12	120°		425542



Catalogue Code	D153
Discount Group	A1502
Material	HSS Co
Surface Finish	TAIN
Colour Ring & Application	VA
Geometry	R40°
Point Type	4 Facet
Shank Tolerance	h7

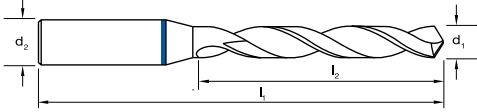
d ₁	l ₁	l ₂	d ₂	Point Angle	Form	Price	Item #
10.8	95	47	12	120°			372808
10.9	95	47	12	120°			372815
11.0	95	47	12	120°			372822
11.1	95	47	12	120°			372839
11.11	7/16	95	47	12	120°		425559
11.2	95	47	12	120°			372846
11.25	95	47	12	120°			425559
11.3	95	47	12	120°			372853
11.4	95	47	12	120°			372860
11.5	95	47	12	120°			372877
11.51	29/64	95	47	12	120°		425566
11.6	95	47	12	120°			372884
11.7	95	47	12	120°			372891
11.8	95	47	12	120°			372907
11.9	102	51	12	120°			372914
11.91	15/32	102	51	12	120°		425573
12.0	102	51	12	120°			372921
12.1	102	51	12	120°			372938
12.2	102	51	12	120°			372945
12.3	102	51	12	120°			372952
12.3	31/64	102	51	12	120°		425580
12.4	102	51	12	120°			372969
12.5	102	51	12	120°			372976
12.6	102	51	12	120°			372983
12.7	102	51	12	120°			372990
12.7	1/2	102	51	12	120°		425597
12.8	102	51	12	120°			373003
12.9	102	51	12	120°			373010
13.0	102	51	12	120°			373027
13.5	107	54	16	120°	Form A		373034
14.0	107	54	16	120°	Form A		373041
14.5	111	56	16	120°	Form A		373058
15.0	111	56	16	120°	Form A		373065
15.5	115	58	16	120°	Form A		373072
16.0	115	58	16	120°	Form A		373089
16.5	119	60	20	120°	Form A		373096
17.0	119	60	20	120°	Form A		373102
17.5	123	62	20	120°	Form A		373119
18.0	123	62	20	120°	Form A		373126
18.5	127	64	20	120°	Form A		373133
19.0	127	64	20	120°	Form A		373140
19.5	131	66	20	120°	Form A		373157
20.0	131	66	20	120°	Form A		373164

• Available on request as special manufacture. Subject to lead time.

Drills Jobber - R40 VA Black Magic



- Standard length twist drill
- Excellent solution for austenitic stainless steels and most long chipping materials
- Optimized geometry ensures no hardening of the workpiece material
- Self centring point
- Common shank sizes, for use in steel collets
- For use in CNC machines



Catalogue Code	D169
Discount Group	A1502
Material	HSS Co
Surface Finish	TIAIN
Colour Ring & Application	VA
Geometry	R40°
Point Type	4 Facet Form C
Shank Tolerance	h7

d ₁	l ₁	l ₂	d ₂	Point Angle	Form	Price	Item #
2.0	49	24	3	130°			424385
2.1	49	24	3	130°			424392
2.2	53	28	3	130°			424408
2.3	53	28	3	130°			424415
2.4	57	31	3	130°			424422
2.5	57	31	3	130°			424439
2.6	57	31	3	130°			424446
2.7	61	34	3	130°			424453
2.8	61	34	3	130°			424460
2.9	61	34	3	130°			424477
3.0	61	33	3	130°			386065
3.1	65	36	4	130°			386072
3.18	1/8	65	36	4	130°		427157
3.2	65	36	4	130°			386089
3.3	65	36	4	130°			386096
3.4	70	39	4	130°			386102
3.5	70	39	4	130°			386119
3.57	9/64	70	39	4	130°		427164
3.6	70	39	4	130°			386126
3.7	70	39	4	130°			386133
3.8	75	43	4	130°			386140
3.9	75	43	4	130°			386157
3.97	5/32	75	43	4	130°		427171
4.0	75	43	4	130°			386164
4.1	75	43	6	120°			386171
4.2	75	43	6	120°			386188
4.3	80	47	6	120°			386195
4.37	11/64	80	47	6	120°		427188
4.4	80	47	6	120°			386201
4.5	80	47	6	120°			386218
4.6	80	47	6	120°			386225
4.65	80	47	6	120°			427409
4.7	80	47	6	120°			386232
4.76	3/16	86	52	6	120°		427195
4.8	86	52	6	120°			386249
4.9	86	52	6	120°			386256
5.0	86	52	6	120°			386263
5.1	86	52	6	120°			386270
5.16	13/64	86	52	6	120°		427201
5.2	86	52	6	120°			386287
5.3	86	52	6	120°			386294
5.4	93	57	6	120°			386300
5.5	93	57	6	120°			386317
5.55	93	57	6	120°			427416

Catalogue Code	D169
Discount Group	A1502
Material	HSS Co
Surface Finish	TIAIN
Colour Ring & Application	VA
Geometry	R40°
Point Type	4 Facet Form C
Shank Tolerance	h7

d ₁	l ₁	l ₂	d ₂	Point Angle	Form	Price	Item #
5.56	7/32	93	57	6	120°		427218
5.6	93	57	6	120°			386324
5.7	93	57	6	120°			386331
5.8	93	57	6	120°			386348
5.9	93	57	6	120°			386355
5.95	15/64	93	57	6	120°		427225
6.0	93	57	6	120°			386362
6.1	101	63	8	120°			386379
6.2	101	63	8	120°			386386
6.3	101	63	8	120°			386393
6.35	1/4	101	63	8	120°		427232
6.4	101	63	8	120°			386409
6.5	101	63	8	120°			386416
6.6	101	63	8	120°			386423
6.7	101	63	8	120°			386430
6.75	17/64	101	63	8	120°		427249
6.8	109	69	8	120°			386447
6.9	109	69	8	120°			386454
7.0	109	69	8	120°			386461
7.1	109	69	8	120°			386478
7.14	9/32	109	69	8	120°		427256
7.2	109	69	8	120°			386485
7.3	109	69	8	120°			386492
7.4	109	69	8	120°			386508
7.5	109	69	8	120°			386515
7.54	19/64	117	75	8	120°		427263
7.55	117	75	8	120°			427423
7.6	117	75	8	120°			386522
7.7	117	75	8	120°			386539
7.8	117	75	8	120°			386546
7.9	117	75	8	120°			386553
7.94	5/16	117	75	8	120°		427270
8.0	117	75	8	120°			386560
8.1	117	75	10	120°			386577
8.2	117	75	10	120°			386584
8.3	117	75	10	120°			386591
8.33	21/64	117	75	10	120°		427287
8.4	117	75	10	120°			386607
8.5	117	75	10	120°			386614
8.6	125	81	10	120°			386621
8.7	125	81	10	120°			386638
8.73	11/32	125	81	10	120°		427294
8.8	125	81	10	120°			386645
8.9	125	81	10	120°			386652

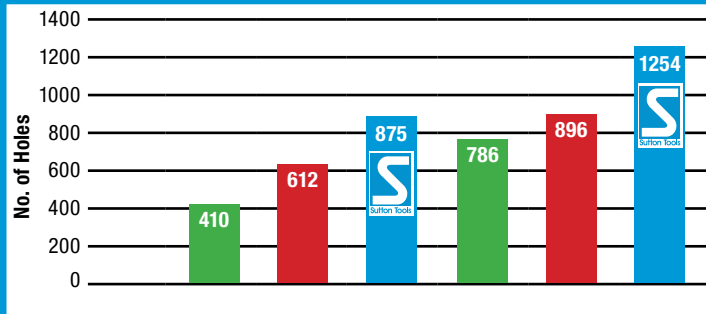
Product Information

Due to 300 and 400 series Stainless Steels possessing excellent resistance to corrosion, its use in various industries is very popular, especially in ship building, medical equipment, automotive and the food processing industries. Yet, for sometime the drilling of this material has been somewhat difficult due to its toughness and high work hardening properties.

The options for drilling Stainless Steels can be expensive ones; solid carbide drills in particular are not cost effective due to its less than ideal geometry & characteristics for drilling stainless steel. This is where the R40 VA drills have been specifically designed to meet the requirements & demands of this area of application.

Case Study

Tool life comparison between Sutton R40 VA Drill & competitors drill, 5mm diameter & 15mm deep.



Drill type	Competitor A	Competitor B	R40 VA	Competitor A	Competitor B	R40 VA
Material:		SS304		SS430F		
Vc:		20m/min		30m/min		
f:		0.11mm/rev		0.135mm/rev		
Lubrication:		7% water soluble		7% water soluble		

High Helix & Unique Flute Form

40° flute helix with unique radiused flute form. Produces short chips, even in Stainless Steel & Copper alloys, allowing for non-step drilling of 3 to 4xd hole depths possible. Resulting in superior drill life & hole condition.



Material: SS304
Ø8mm / depth 16mm
Vc = 20m/min
f = 0.15mm/rev



Material: Cu
Ø8mm / depth 5mm
Vc = 40m/min
f = 0.15mm/rev

Point Geometry

The cutting edge point geometry is ultra sharp, which generates lower forces when drilling stainless steels. This also makes it ideal for soft steels, copper and aluminum alloys.

Tool Material & Coating

Made from Premium Cobalt grade of High Speed Steel (HSSCo) with a super smooth TiAlN coating, provides the optimal combination for high heat resistance.

Tapping Drill!

Ideal pre-tapping drill, improves tap life, as work hardening the walls of the hole are eliminated.

	Stub	Jobber
Drilling Depth	≤ 3xØ	≤ 5xØ
Catalogue Code	D153	D169
Material	HSS Co	HSS Co
Surface Finish	TiAlN	TiAlN
Colour Ring & Application	VA	VA
Geometry	R40°	R40°



Metal Removal Volume		Medium/High		Medium/High	
Materials	Material examples	Vc (m/min)	Feed No.	Vc (m/min)	Feed No.

Materials	Material examples	Vc (m/min)	Feed No.	Vc (m/min)	Feed No.
Steels					
Free-cutting steels	S1214L, Leaded Steels	64	6	58	6
Structural steels		64	6	58	6
Carbon steels	1020, 1024, 1045, 1060	62	5	58	5
Stainless Steels					
Free machining stainless steel	416, 430F	30	6	25	6
Austenitic stainless steels	303, 304, 316, 317, 321	20	5	14	5
Coppers					
Copper unalloyed		80	3	70	3
Long chip brass		50	5	40	5
Aluminiums					
Al/Mg unalloyed		112	8	112	8
Al alloyed Si < 5%		80	7	80	7
Al alloyed Si > 1.5% < 10%		70	7	70	6

Ø	Feed Table (f) (mm/rev)			
	Feed No.			
	3	4	5	6
2	0.030	0.040	0.050	0.060
3	0.050	0.060	0.080	0.100
4	0.060	0.080	0.100	0.120
5	0.065	0.085	0.110	0.135
6	0.080	0.100	0.120	0.150
8	0.100	0.120	0.150	0.200
10	0.120	0.150	0.200	0.250
12	0.120	0.150	0.200	0.250
16	0.150	0.200	0.250	0.300
20	0.250	0.300	0.400	0.500

LEGEND

n = rev. per minute
Vc = cutting speed (m/min)
f = feed (mm/rev)
vf = feed rate (mm/min)

FORMULAS

$n = (v_c \times 1000) / (\phi \times \pi)$
 $v_c = (\phi \times \pi \times n) / 1000$
 $v_f = f \times n$

Notes on Drilling

- Step feeding or pecking is required for drilling greater than 3 x diameter
- When drilling cast surface & black (ie. not machined surface), reduce drilling speed by 20%
- For optimal positional accuracy and hole size, the use of spot drills is recommended prior to drilling desired hole, refer to our standard range (product group A1124).