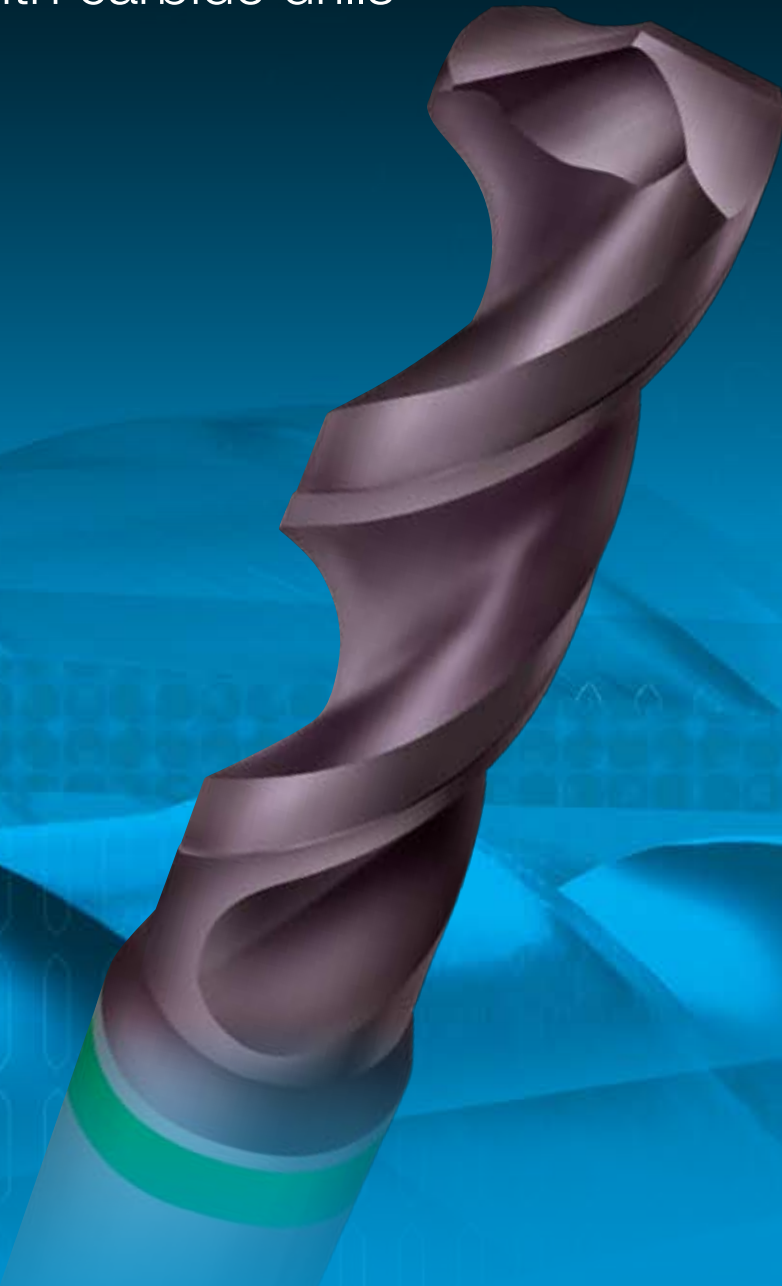


# Bridging the gap...

with carbide drills



The 130° four facet point with a web profile grind combined with a 40° helix and parabolic flute shape produces an extremely strong wedge angle, providing increased stability enabling drilling of accurate straight holes up to 3 x D without pecking.

The above features combined, provides the optimal performance in a wide range of materials, particularly steels to a hardness of 1300 N/mm<sup>2</sup>, allowing higher speeds and feeds to be achieved, resulting in higher productivity and bridging the gap with expensive carbide tooling.

#### Features

- Rigid strong design
- High performance solution for wide range of materials
- Endmill type plain shank, h7 tolerance, for use in collet chuck
- SPM contains Co10%, greater toughness than Carbide & higher performance than HSS Co

#### Benefits

- Capable of drilling 3 times dia without pecking
- Significantly reduces cycle times
- Self centering, web thinned point

## **R40 UNI SPM DRILLS**

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

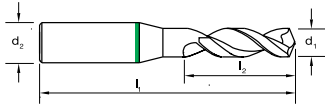
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# Drills Stub - R40 UNI



- Rigid twist drill
- Optimal productivity gains in small to medium batch production, alternative to carbide drills
- For free machining materials, with higher metal removal possibilities
- Point geometry ensures high strength & short chips
- Common shank sizes, for use in steel collets
- For use in CNC machines



Catalogue Code	<b>D155</b>
Discount Group	A1502
Material	<b>SPM</b>
Surface Finish	<b>TAIN</b>
Colour Ring & Application	<b>UNI</b>
Geometry	R40°
Point Type	130° 4 Facet Form B
Shank Tolerance	h7

d <sub>1</sub>	l <sub>1</sub>	l <sub>2</sub>	d <sub>2</sub>	Price	Item #
1.0	26	6	3		434162
1.1	28	7	3		434179
1.2	30	8	3		434186
1.3	30	8	3		434193
1.4	32	9	3		434209
1.5	32	9	3		434216
1.6	34	10	3		434223
1.7	34	10	3		434230
1.8	36	11	3		434247
1.9	36	11	3		434254
2.0	38	12	3		411286
2.1	38	12	3		419671
2.2	40	13	3		419688
2.3	40	13	3		419695
2.4	43	14	3		434292
2.5	43	14	3		411293
2.6	43	14	3		419701
2.7	46	16	3		434315
2.8	46	16	3		418773
2.9	46	16	3		419718
3.0	46	16	3		411309
3.1	49	18	4		420752
3.2	49	18	4		418780
3.3	49	18	4		411316
3.4	52	20	4		411323
3.5	52	20	4		411330
3.6	52	20	4		434339
3.7	52	20	4		418797
3.8	55	22	4		420769
3.9	55	22	4		419725
4.0	55	22	4		411347
4.1	55	22	6		434353
4.2	55	22	6		411354
4.3	58	24	6		411361
4.4	58	24	6		434360
4.5	58	24	6		411378
4.6	58	24	6		418803
4.7	58	24	6		434377



Catalogue Code	<b>D155</b>
Discount Group	A1502
Material	<b>SPM</b>
Surface Finish	<b>TAIN</b>
Colour Ring & Application	<b>UNI</b>
Geometry	R40°
Point Type	130° 4 Facet Form B
Shank Tolerance	h7

d <sub>1</sub>	l <sub>1</sub>	l <sub>2</sub>	d <sub>2</sub>	Price	Item #
4.8	62	26	6		434384
4.9	62	26	6		419732
5.0	62	26	6		411385
5.1	62	26	6		411392
5.2	62	26	6		434407
5.3	62	26	6		419749
5.4	66	28	6		436678
5.5	66	28	6		411408
5.6	66	28	6		434421
5.7	66	28	6		434438
5.8	66	28	6		420776
5.9	66	28	6		419756
6.0	66	28	6		411415
6.1	70	31	8		434452
6.2	70	31	8		434469
6.3	70	31	8		411422
6.4	70	31	8		411439
6.5	70	31	8		411446
6.6	70	31	8		419770
6.7	70	31	8		434483
6.8	74	34	8		411453
6.9	74	34	8		411460
7.0	74	34	8		411477
7.1	74	34	8		434490
7.2	74	34	8		434506
7.3	74	34	8		419787
7.4	74	34	8		411484
7.5	74	34	8		411491
7.6	79	37	8		434520
7.7	79	37	8		434537
7.8	79	37	8		434544
7.9	79	37	8		411507
8.0	79	37	8		411514
8.1	79	37	10		434568
8.2	79	37	10		434575
8.3	79	37	10		434582
8.4	79	37	10		434599
8.5	79	37	10		411521

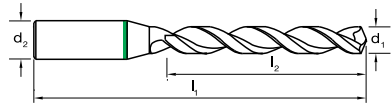
• Available on request as special manufacture. Subject to lead time.



# Drills Jobber - R40 UNI



- Standard length twist drill
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- For use in CNC machines



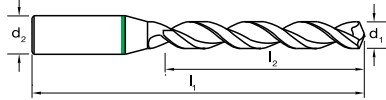
Catalogue Code					<b>D168</b>	
Discount Group					A1502	
Material					<b>SPM</b>	
Surface Finish					<b>TAIIN</b>	
Colour Ring & Application					<b>UNI</b>	
Geometry					R40°	
Point Type					130° 4 Facet Form B	
Shank Tolerance					h7	
d <sub>1</sub>	l <sub>1</sub>	l <sub>2</sub>	d <sub>2</sub>	Price	Item #	
1.0	34	12	3		434551	
1.1	36	14	3		434612	
1.2	38	16	3		434650	
1.3	38	16	3		434667	
1.4	40	18	3		434711	
1.5	40	18	3		434728	
1.6	43	20	3		434735	
1.7	43	20	3		434780	
1.8	46	22	3		434797	
1.9	46	22	3		434810	
2.0	49	24	3		434858	
2.1	49	24	3		434865	
2.2	53	28	3		434872	
2.3	53	28	3		436906	
2.4	57	31	3		436913	
2.5	57	31	3		436920	
2.6	57	31	3		436937	
2.7	61	34	3		436944	
2.8	61	34	3		452845	
2.9	61	34	3		436951	
3.0	61	33	3		422107	
3.1	65	36	4		436968	
3.2	65	36	4		422114	
3.3	65	36	4		422121	
3.4	70	39	4		436975	
3.5	70	39	4		422138	
3.6	70	39	4		436982	
3.7	70	39	4		436999	
3.8	75	43	4		437002	
3.9	75	43	4		437019	
4.0	75	43	4		422145	
4.1	75	43	6		437026	
4.2	75	43	6		422152	
4.3	80	47	6		437033	
4.4	80	47	6		437040	
4.5	80	47	6		422169	
4.6	80	47	6		437057	
4.65	80	47	6		437064	

Catalogue Code					<b>D168</b>	
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Material					<b>SPM</b>	
Surface Finish					<b>TAIIN</b>	
Colour Ring & Application					<b>UNI</b>	
Geometry					R40°	
Point Type					130° 4 Facet Form B	
Shank Tolerance					h7	
d <sub>1</sub>	l <sub>1</sub>	l <sub>2</sub>	d <sub>2</sub>	Price	Item #	
4.7	80	47	6		437071	
4.8	86	52	6		452852	
4.9	86	52	6		437088	
5.0	86	52	6		422176	
5.1	86	52	6		437095	
5.2	86	52	6		452869	
5.3	86	52	6		437101	
5.4	93	57	6		437118	
5.5	93	57	6		422183	
5.55	93	57	6		437125	
5.6	93	57	6		437132	
5.7	93	57	6		437149	
5.8	93	57	6		452876	
5.9	93	57	6		437156	
6.0	93	57	6		422190	
6.1	101	63	8		437163	
6.2	101	63	8		437170	
6.3	101	63	8		437187	
6.4	101	63	8		437194	
6.5	101	63	8		422206	
6.6	101	63	8		437200	
6.7	101	63	8		437217	
6.8	109	69	8		422213	
6.9	109	69	8		437224	
7.0	109	69	8		422220	
7.1	109	69	8		437231	
7.2	109	69	8		437248	
7.3	109	69	8		437255	
7.4	109	69	8		437262	
7.5	109	69	8		422237	
7.55	117	75	8		437279	
7.6	117	75	8		437286	
7.7	117	75	8		437293	
7.8	117	75	8		437309	
7.9	117	75	8		437316	
8.0	117	75	8		422244	
8.1	117	75	10		437323	
8.2	117	75	10		437330	

# Drills Jobber - R40 UNI



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Catalogue Code	<b>D168</b>
Discount Group	A1502
Material	<b>SPM</b>
Surface Finish	<b>TAIN</b>
Colour Ring & Application	<b>UNI</b>
Geometry	R40°
Point Type	130° 4 Facet Form B
Shank Tolerance	h7

d <sub>1</sub>	l <sub>1</sub>	l <sub>2</sub>	d <sub>2</sub>	Price	Item #
8.3	117	75	10		437347
8.4	117	75	10		437354
8.5	117	75	10		422251
8.6	125	81	10		437361
8.7	125	81	10		437378
8.8	125	81	10		437385
8.9	125	81	10		437392
9.0	125	81	10		422268
9.1	125	81	10		437408
9.2	125	81	10		437415
9.3	125	81	10		437422
9.4	125	81	10		437439
9.5	125	81	10		422275
9.55	133	87	10		437446
9.6	133	87	10		437453
9.7	133	87	10		437460
9.8	133	87	10		452883
9.9	133	87	10		437477
10.0	133	87	10		422282
10.1	133	87	10		437484
10.2	133	87	10		422299
10.3	133	87	10		437491
10.4	133	87	10		437507
10.5	133	87	10		422305
10.6	133	87	12		437514
10.7	142	94	12		437521
10.8	142	94	12		437538
10.9	142	94	12		437545
11.0	142	94	12		422312
11.1	142	94	12		437552
11.2	142	94	12		437569
11.3	142	94	12		437576
11.4	142	94	12		437583
11.5	142	94	12		422329
11.6	142	94	12		437590
11.7	142	94	12		437606
11.8	142	94	12		437613
11.9	151	101	12		437620



Catalogue Code	<b>D168</b>
Discount Group	A1502
Material	<b>SPM</b>
Surface Finish	<b>TAIN</b>
Colour Ring & Application	<b>UNI</b>
Geometry	R40°
Point Type	130° 4 Facet Form B
Shank Tolerance	h7

d <sub>1</sub>	l <sub>1</sub>	l <sub>2</sub>	d <sub>2</sub>	Price	Item #
12.0	151	101	12		422336
12.1	151	101	12		437637
12.2	151	101	12		437644
12.3	151	101	12		437651
12.4	151	101	12		437668
12.5	151	101	12		422343
12.6	151	101	12		437675
12.7	151	101	12		437682
12.8	151	101	12		437699
12.9	151	101	12		437705
13.0	151	101	12		422350
13.5	160	108	16		437712
14.0	160	108	16		437729
14.5	169	114	16		437736
15.0	169	114	16		437743
15.5	178	120	16		437750
16.0	178	120	16		437767
16.5	184	125	20		437774
17.0	184	125	20		437781
17.5	191	130	20		437798
18.0	191	130	20		437804
18.5	198	135	20		437811
19.0	198	135	20		437828
19.5	205	140	20		437835
20.0	205	140	20		437842

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

## Product Information

### Tool Material

Made from Powdered Metallurgy grade of High Speed Steel (SPM) which incorporates a much finer grain & homogeneous structure than conventional HSS, this allows for higher hardness of the tool, whilst maintaining toughness, and capable of operating at high cutting edge temperatures.

### Point Geometry

130° four facet drill point with the profile web grind is designed to provide strength at the drill point, whilst maintaining excellent chip flow with optimised CNC generated profile flute shape at 40° helix angle.

### Tool Coating

The super smooth TiAlN coating provides low friction, reducing cutting edge temperature and improving wear resistance.



## Bridging the gap

Solid Carbide drills are not always cost effective on small batch sizes or less than perfect machines, & HSS drills don't always meet the demands of the component to be machined.

It is in this area the R40 UNI drill has distinct benefits, not only does it bridge the gap between carbide & HSS drills, but to out perform carbide in some applications, with lower tool costs & shorter cycle time.

### Performance comparison between Sutton R40 UNI Drill & a universal carbide drill, 8.0mm diameter & 20mm deep.

Drill type	Carbide Drill Universal	R40 UNI
Material	Carbide	SPM
Drill Size	8mm	8mm
Material:	AISI-P20 (32Rc)	AISI-P20 (32Rc)
V <sub>c</sub> :	80 m/min	45 m/min
V <sub>f</sub> :	413 mm/min	358 mm/min
f:	0.13 mm/rev	0.20 mm/rev
n:	3180	1789
Cutting Time	2.9 secs	3.4 secs

	Stub	Jobber
Drilling Depth	≤ 3xØ	≤ 5xØ
Catalogue Code	D155	D168
Material	SPM	SPM
Surface Finish	TiAlN	TiAlN
Colour Ring & Application	UNI	UNI
Geometry	R40°	R40°
		
Metal Removal Volume	Medium/High	Medium/High

Materials	Material examples	V <sub>c</sub> (m/min)	Feed No.	V <sub>c</sub> (m/min)	Feed No.
<b>Steels</b>					
Free-cutting steels	S1214L, Leaded Steels	77	7	70	7
Structural steels		55	7	50	7
Carbon steels	1020, 1024, 1045, 1060	55	7	50	7
Alloy steels 850 - 1200 N/mm <sup>2</sup>	4140, 01, A2, D3, M42, P20	45	6	40	6
Alloy steels hard./temp. 1200 - 1400 N/mm <sup>2</sup>	EN26, 01, L6, M42, D3, 4140	10	4	12	4
<b>Stainless Steels</b>					
Free machining stainless steel	416, 430F	10	4	16	4
Austenitic stainless steels	303, 304, 316, 317, 321	8	4	12	4
Ferritic + martensitic < 1000 N/mm <sup>2</sup>	409, 430, 436, Duplex Alloys	10	3	14	3
<b>Cast Irons</b>					
Cast iron ≤ 240 HB	GG10, GG20	44	6	40	6
Cast iron < 240 HB	GG25, GG40	39	6	35	6
Spheroidal graphite + Malleable cast iron	GG60, GG670	44	5	40	5
<b>Coppers</b>					
Copper unalloyed		33	4	30	5
Shortchip brass + phosphor bronze + gun metal		44	5	40	5
Long chip brass		39	4	35	4
<b>Aluminiums</b>					
Al/Mg unalloyed		88	5	80	5
Al alloyed Si < 5%		70	6	64	6
Al alloyed Si > 1.5% < 10%		53	5	48	5
Al alloyed Si > 10%, Mg - Alloys		-	-	30	5

Ø	Feed Table (f) (mm/rev)						
	Feed No.						
	1	2	3	4	5	6	7
2	0.040	0.060	0.080	0.040	0.050	0.060	0.080
3	0.060	0.100	0.120	0.060	0.080	0.100	0.120
4	0.080	0.120	0.150	0.080	0.100	0.120	0.150
5	0.085	0.135	0.165	0.085	0.110	0.135	0.165
6	0.100	0.150	0.180	0.100	0.120	0.150	0.180
8	0.120	0.200	0.250	0.120	0.150	0.200	0.250
10	0.150	0.250	0.300	0.150	0.200	0.250	0.300
12	0.150	0.250	0.300	0.150	0.200	0.250	0.300
16	0.200	0.300	0.400	0.200	0.250	0.300	0.400
20	0.300	0.500	0.600	0.300	0.400	0.500	0.600

### LEGEND

n = rev. per minute  
 v<sub>c</sub> = cutting speed (m/min)  
 f = feed (mm/rev)  
 v<sub>f</sub> = 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%