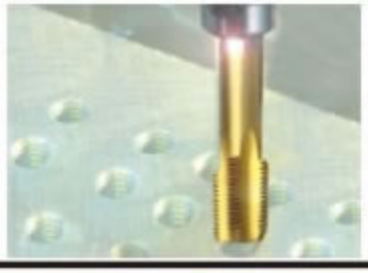
TIANGONG TOOLS

New Edition

Stock Code:0826



TIANGONG TOOLS

JIANGSU TIANGONG TOOLS COMPANY LTD.

Tiangong International are successfully listed in Hongkong. Picture of Zhu Xiaokun, the chairman of Tiangong International, and principle guests took in the trading floor of the Stock Exchange of Hong Kong.

Let's propose a toast to congratulate the listing of Tiangong Internation in Hongkong.

Tiangong International donated ten million HKD to Hongkong nonprofit foundation.

Tiangong International presented gifts to The Stock Exchange of Hong Kong.

Tiangong International is

THE MAXIM OF OUR COMPANY

Excellent Products

Excellent Service

Favorable Price

Building up a Long-term Tiangong,

Establishing a Famous Brand

While Realizing Billions of

Tiangong at an Early Date!

successfully listed in Hongkong

Stock Code:0826

Introduction

Jiangsu Tiangong International Co., Ltd., founded in 1984, is a large export-oriented enterprise of China. Tiangong is a professional manufactory of producing High-speed Steel and High-speed Steel Numerical Cutting Tools. Since it has been developed for more than 20 years, Tiangong has been the key enterprise of China's Mechanical Spot Facing Work Cutting industry and High Speed Steel manufacturing industry..

In the past twenty years, Tiangong has been always following the strategy of grasping science and technology, executing brand strategy and adhering to merit and development, and thus has finished the development from only producing the spot facing hole expert raw material to the specific manufactory of high speed steel tools, from simple process of producing Twist Drills to the coordinate process of spot facing hole cutting tools and the whole package. In this way, Tiangong has been the unique industry chain of China.

The export quantity of Tiangong spot facing work cutting tools and twist drills have taken up 15% of the whole domestic market. Tiangong products, which are produced in accordance with the International Standard, possess a huge market in European countries and also in Asia, Africa, and other continents. Since 2001, Tiangong has been the largest enterprise of manufacturing high speed steel, which has been rewarded as one of the key high technical enterprises in China. Besides, facing work cutting tools parallel shank twist drill has won China Famous Brand. The registered trademark "TG" has been regarded as China's illustrious brand name.

Tiangong possesses the first producing line of continuous rolling in China. With the introduction into Automatic 500T Precision Forging Machine from Austria, Tiangong succeed to install producing line of precision forging machine, and thus Tiangong International has been the initial pioneer of Jiangsu metallurgy industry. Steel rolling of 250,300,350,400,550,650 and continuous rolling and precision forging are all kept in stock. In the spot facing work cutting tools production field, Tiangong has introduced into the whole set of automatic numerical control tool machines from abroad. Tiangong's producing technology can be regarded as the highest flight in the Special Steel production and HSS Cutting Tools production in China and even in the world.

Tiangong International possesses a complete system from the waste material recycling to the production and then to the whole sale. It is an integration group of producing High Speed Steel and HSS Cutting Tools, which holds the most important position of exporting High Speed Steel and HSS Cutting Tools. On July 26th, 2007, Tiangong International was successfully listed in Hongkong and the stock code is 0826. The target of Tiangong is to be a famous enterprise of the Special Steel industry, to be an outstanding enterprise of tool manufactures. The tenet of Tiangong is: Building up a long-life Tiangong group, forming a world-famous brand and then realizing billions of Tiangong as soon as possible.

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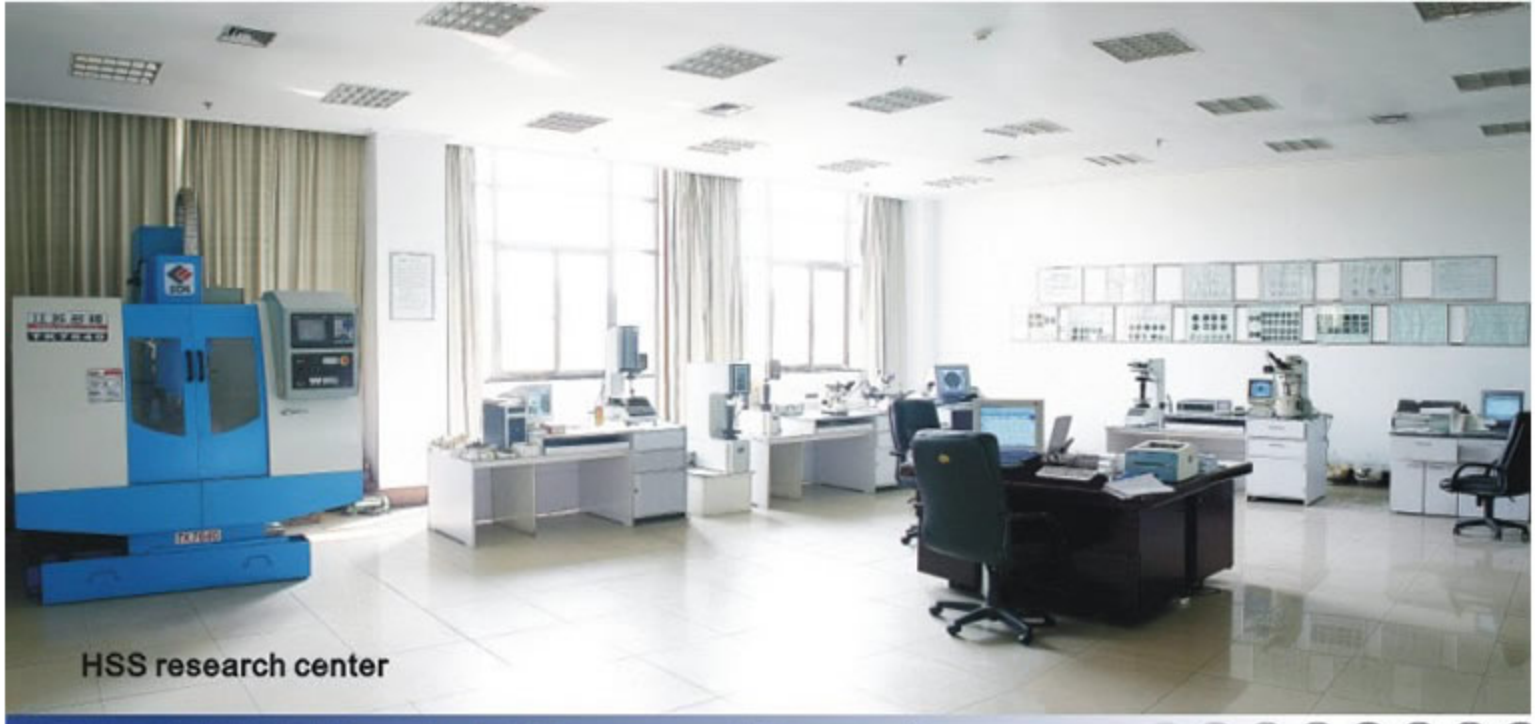


HSS research center

Digital Rockwell Hardness

Germany Zeiss2000 Microscope

Germany Zeiss2000 Metaloscope

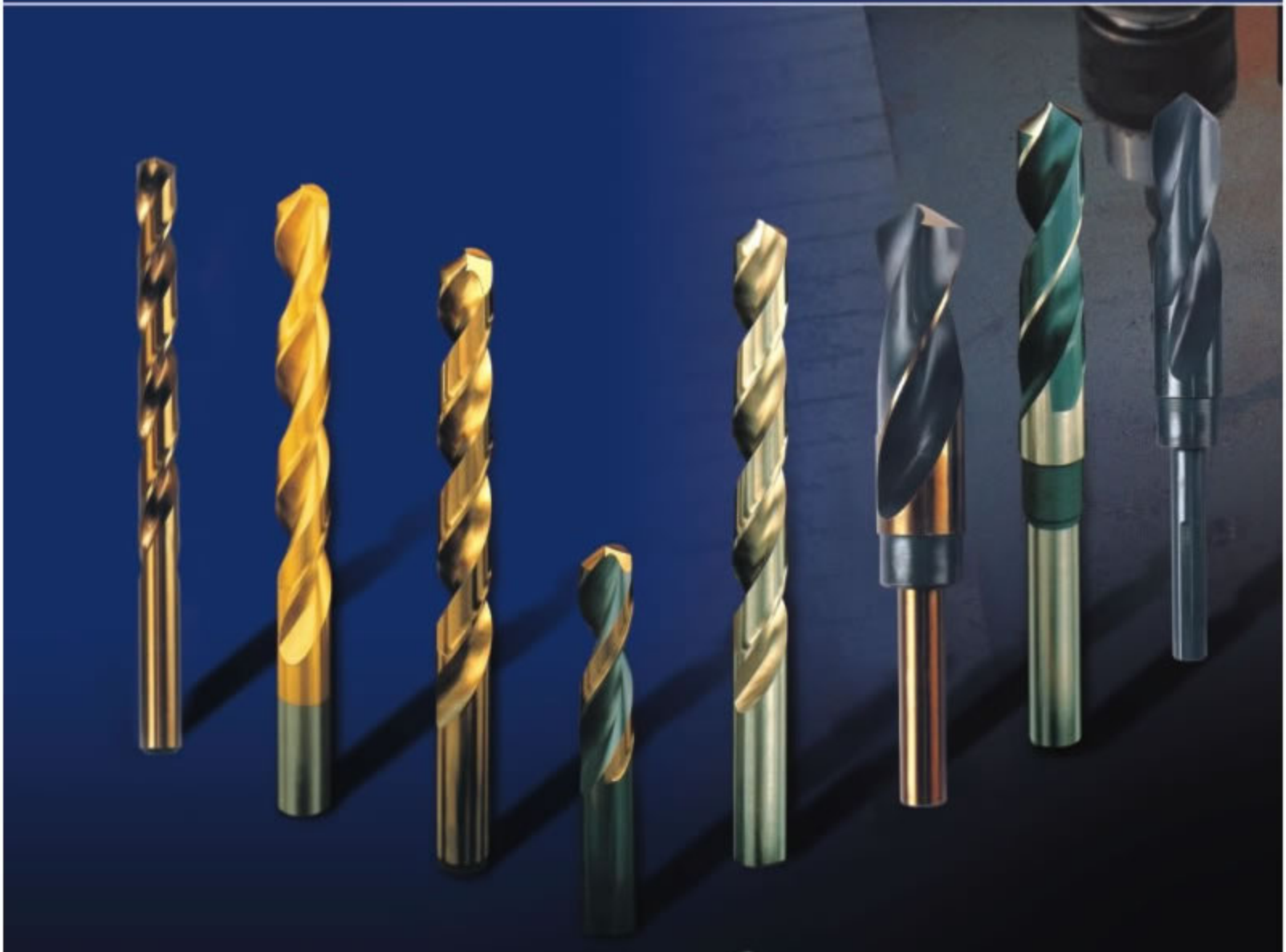
Type VMS-1510A Image measuring apparatus

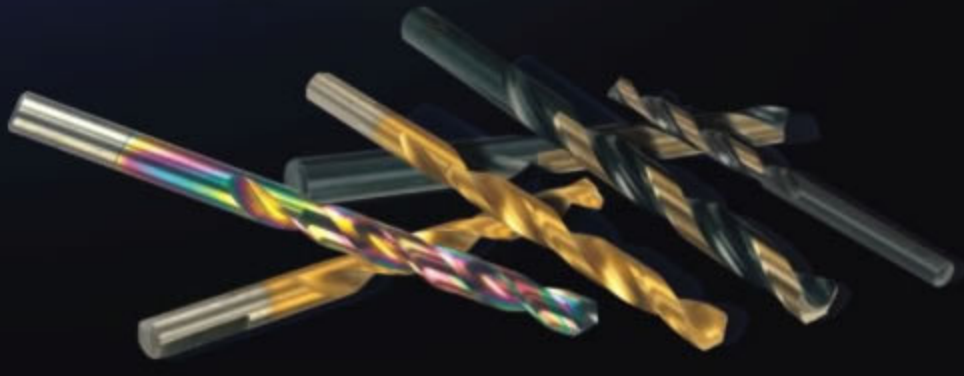
Type 2206 Surface Roughness measuring apparatus

Japanese AkashiHM-114 Digital Microhardne

TIANGONG TOOLS

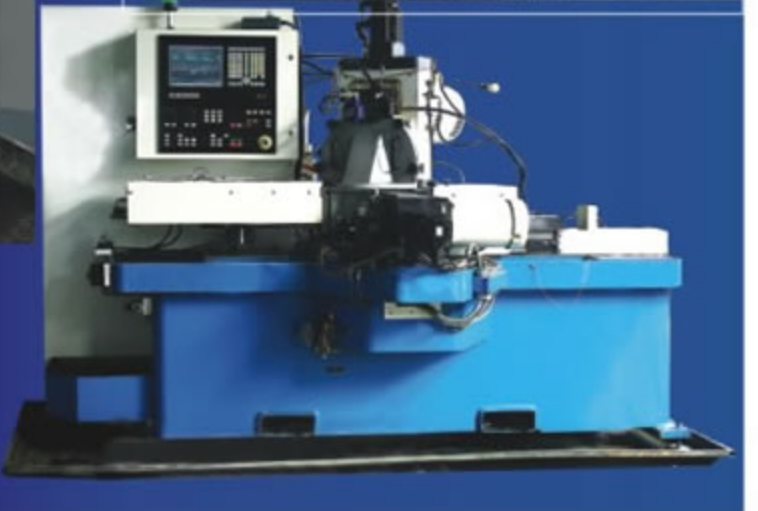
HSS STRAIGHT SHANK TWIST DRILL





HSS STRAIGHT SHANK TWIST DRILL INDEX

1A. PRODUCTION TECHNICS		
1A. 1	Roll Forged	
1A. 2	Roll & Polished	
1A. 3	Fully Ground	
1A. 4	Milled	
1B. SURFACE FINISHING		
1B. 1	Bright	
1B. 2	Black & Gold	
1B. 3	Black & Bright	
1B. 4	Coffee Color	
1B. 5	Rainbow Color	
1B. 6	Tin Coating	
1B. 7	Black Finishing	
1B. 8	Zirconium Coating	
1C. USING MATERIAL		
1C. 1	Roll Forged/Roll & Polished	HSS-M2/W9/W4
1C. 2	Fully Ground/Milled	HSS-M42/M35/M2/W9
1D. CUTTING EDGE		
1D. 1	Fast Drill Bits	
1D. 2	118° or 135° Split Point	
1D. 3	118° General Angle	
1D. 4	130° General Angle	
1E. REDUCING SHANK		
1E. 1	1/4 shank(6.5mm)	
1E. 2	3/8 shank (9.5mm)	
1E. 3	1/2 shank (13.0mm)	



HSS STRAIGHT SHANK TWIST DRILL

DIN338

Dia. mm	Inch	Flute Length mm	Overall Length mm
0.2		2.5	19
0.22		2.5	19
0.25		3	19
0.28		3	19
0.3		3	19
0.32		4	19
0.35		4	19
0.38		4	19
0.397	1/64	5	20
0.4		5	20
0.42		5	20
0.45		5	20
0.48		5	20
0.5		6	22
0.52		6	22
0.55		7	24
0.58		7	24
0.6		7	24
0.62		8	26
0.65		8	26
0.68		9	28
0.7		9	28
0.72		9	28
0.75		9	28
0.78		10	30
0.794	1/32	10	30
0.8		10	30
0.82		10	30
0.85		11	32
0.88		11	32
0.9		11	32
0.92		11	32
0.95		12	34
0.98		12	34
1		12	34
1.05		14	36
1.1		14	36
1.15		16	38
1.191	3/64	16	38
1.2		16	38
1.25		16	38
1.3		18	40
1.35		18	40
1.4		18	40
1.45		18	40
1.5		20	43
1.55		20	43
1.587	1/16	20	43
1.6		20	43
1.65		20	43
1.7		22	46
1.75		22	46

Dia.	Inch	Flute Length	Overall Length
1.8		22	46
1.85		22	46
1.9		24	46
1.95		24	49
1.984	5/64	24	49
2		24	49
2.05		24	49
2.1		24	49
2.15		27	53
2.2		27	53
2.25		27	53
2.3		27	53
2.35		27	53
2.381	3/32	30	57
2.4		30	57
2.45		30	57
2.5		30	57
2.55		30	57
2.6		30	57
2.65		30	57
2.7		33	61
2.75		33	61
2.778	7/64	33	
2.8		33	61
2.85		33	61
2.9		33	61
2.95		33	61
3		33	61
3.1		36	65
3.175	1/8	36	65
3.2		36	65
3.3		36	65
3.4		39	70
3.5		39	70
3.572	9/64	39	70
3.6		39	70
3.7		39	70
3.8		43	75
3.9		43	75
3.969	5/32	43	75
4		43	75
4.1		43	75
4.2		43	75
4.3		47	80
4.366	11/64	47	80
4.4		47	80
4.5		47	80
4.6		47	80
4.7		47	80
4.762	3/16	52	86
4.8		52	86
4.9		52	86

HSS STRAIGHT SHANK TWIST DRILL INDEX

DIN338

Dia. mm	Inch	Flute Length mm	Overall Length mm
5		52	86
5.1		52	86
5.159	13/64	52	86
5.2		52	86
5.3		52	86
5.4		57	93
5.5		57	93
5.556	7/32	57	93
5.6		57	93
5.7		57	93
5.8		57	93
5.9		57	93
5.953	15/64	57	93
6		57	93
6.1		63	101
6.2		63	101
6.3		63	101
6.35	1/4	63	101
6.4		63	101
6.5		63	101
6.6		63	101
6.7		63	101
6.747	17/64	69	109
6.8		69	109
6.9		69	109
7		69	109
7.1		69	109
7.144	9/32	69	109
7.2		69	109
7.3		69	109
7.4		69	109
7.5		69	109
7.541	19/64	75	117
7.6		75	117
7.7		75	117
7.8		75	117
7.9		75	117
7.937	5/16	75	117
8		75	117
8.1		75	117
8.2		75	117
8.3		75	117
8.334	21/64	75	117
8.4		75	117
8.5		75	117
8.6		81	125
8.7		81	125
8.731	11/32	81	125
8.8		81	125
8.9		81	125
9		81	125
9.1		81	125

Dia. mm	Inch	Flute Length mm	Overall Length mm
9.128	23/64	81	125
9.2		81	125
9.3		81	125
9.4		81	125
9.5		81	125
9.525	3/8	87	133
9.6		81	125
9.7		87	133
9.8		87	133
9.9		87	133
10		87	133
10.1		87	133
10.2		87	133
10.3		87	133
10.319	13/32	87	133
10.4		87	133
10.5		87	133
10.6		87	133
10.7		94	142
10.716	27/64	94	142
10.8		94	142
10.9		94	142
11		94	142
11.1		94	142
11.112	7/16	94	142
11.2		94	142
11.3		94	142
11.4		94	142
11.5		94	142
11.509	29/64	94	142
11.6		94	142
11.7		94	142
11.8		94	142
11.9		101	151
11.906	15/32	101	151
12		101	151
12.1		101	151
12.2		101	151
12.3		101	151
12.303	31.64	101	151
12.4		101	151
12.5		101	151
12.6		101	151
12.7		101	151
12.7	1/2	101	151
12.8		101	151
12.9		101	151
13		101	151
13.1		101	151
13.097	33/64	101	151
13.2		101	151
13.3		108	160

Dia. mm	Inch	Flute Length mm	Overall Length mm
13.4		108	160
13.494	17/32	108	160
13.5		108	160
13.6		108	160
13.7		108	160
13.8		108	160
13.891	35/64	108	160
13.9		108	160
14		108	160
14.25		114	169
14.287	9/16	114	169
14.5		114	169
14.684	37/64	114	169
14.75		114	169
15		114	169
15.081	19/32	120	178
15.25		120	178
15.478	39/64	120	178
15.5		120	178
15.75		120	178
15.875	5/8	120	178
16		120	178
16.25		125	184
16.5		125	184
16.75		125	184
17		125	184
17.25		130	191
17.5		130	191
17.75		130	191
18		130	191
18.25		135	198
18.5		135	198
18.75		135	198
19		135	198
19.25		140	205
19.5		140	205
19.75		140	205
20		140	205

Note: Split point drills available from 3mm and above sizes

Note: Split point drills available from 3mm and above sizes

HSS STRAIGHT SHANK TWIST DRILL

DIN 340

Dia.	Flute Length	Overall Length
1	33	56
1.1	37	60
1.2	41	65
1.3	41	65
1.4	45	70
1.5	45	70
1.6	50	76
1.7	50	76
1.8	53	80
1.9	53	80
2	56	85
2.1	56	85
2.2	56	90
2.3	56	90
2.4	62	95
2.5	62	95
2.6	62	95
2.7	66	100
2.8	66	100
2.9	66	100
3	63	100
3.1	69	106
3.2	9	106
3.3	69	106
3.4	73	110
3.5	73	110
3.6	73	110
3.7	73	110
3.8	78	119
3.9	78	119
4	78	119
4.1	78	119
4.2	78	119
4.3	82	126
4.4	82	126
4.5	82	126
4.6	82	126
4.7	82	126
4.8	87	132
4.9	87	132
5.0	87	132

Dia.	Flute Length	Overall Length
5.1	87	132
5.2	87	132
5.3	87	132
5.4	91	139
5.5	91	139
5.6	91	139
5.7	91	139
5.8	91	139
5.9	91	139
6	91	139
6.1	97	148
6.2	97	148
6.3	97	148
6.4	97	148
6.5	97	148
6.6	97	148
6.7	97	148
6.8	102	156
6.9	102	156
7	102	156
7.1	102	156
7.2	102	156
7.3	102	156
7.4	102	156
7.5	102	156
7.6	109	165
7.7	109	165
7.8	109	165
7.9	109	165
8	109	165
8.1	109	165
8.2	109	165
8.3	109	165
8.4	109	165
8.5	109	165
8.6	115	175
8.7	115	175
8.8	115	175
8.9	115	175
9	115	175
9.1	115	175

Dia.	Flute Length	Overall Length
9.2	115	175
9.3	115	175
9.4	115	175
9.5	115	175
9.6	121	184
9.7	121	184
9.8	121	184
9.9	121	184
10	121	184
10.1	121	184
10.2	121	184
10.3	121	184
10.4	121	184
10.5	121	184
10.6	121	184
10.7	128	195
10.8	128	195
10.9	128	195
11	128	195
11.1	128	195
11.2	128	195
11.3	128	195
11.4	128	195
11.5	128	195
11.6	128	195
11.7	128	195
11.8	128	195
11.9	134	205
12	134	205
12.1	134	205
12.2	134	205
12.3	134	205
12.4	134	205
12.5	134	205
12.6	134	205
12.7	134	205
12.8	134	205
12.9	134	205
13	134	205
13.1	134	205
13.2	134	205

Note: Split point drills available from 3mm and above sizes

HSS STRAIGHT SHANK TWIST DRILL INDEX

Dia.	Flute Length	Overall Length
13.3	140	214
13.4	140	214
13.5	140	214
13.6	140	214
13.7	140	214
13.8	140	214
13.9	140	214
14	140	214
14.25	144	220
14.5	144	220
14.75	144	220
15	144	220
15.25	149	227
15.5	149	227
15.75	149	227
16	149	227
16.25	154	235
16.5	154	235
16.75	154	235
17	154	235
17.25	158	241
17.5	158	241
17.75	158	241
18	158	241
18.25	162	247
18.5	162	247
18.75	162	247
19	162	247
19.25	166	254
19.5	166	254
19.75	166	254
20	166	254

Note: Split point drills available from 3mm and above sizes

DIN1897

Dia.	Flute Length	Overall Length
1	6	26
1.1	7	28
1.2	8	30
1.3	8	30
1.4	9	32
1.5	9	32
1.6	10	34
1.7	10	34
1.8	11	36
1.9	11	36
2	12	38
2.1	12	38
2.2	13	40
2.3	13	40
2.4	14	43
2.5	14	43
2.6	14	43
2.7	16	46
2.8	16	46
2.9	16	46
3	16	46
3.1	18	49
3.2	18	49
3.3	18	49
3.4	20	52
3.5	20	52
3.6	20	52
3.7	20	52
3.8	22	55
3.9	22	55
4	22	55
4.1	22	55
4.2	22	55
4.3	24	58
4.4	24	58
4.5	24	58
4.6	24	58
4.7	24	58
4.8	26	62

Dia.	Flute Length	Overall Length
4.9	26	62
5	26	62
5.1	26	62
5.2	26	62
5.3	28	66
5.4	28	66
5.5	28	66
5.6	28	66
5.7	28	66
5.8	28	66
5.9	28	66
6	28	66
6.1	31	70
6.2	31	70
6.3	31	70
6.4	31	70
6.5	31	70
6.6	31	70
6.7	31	70
6.8	34	74
6.9	34	74
7	34	74
7.1	34	74
7.2	34	74
7.3	34	74
7.4	34	74
7.5	34	74
7.6	37	79
7.7	37	79
7.8	37	79
7.9	37	79
8	37	79
8.1	37	79
8.2	37	79
8.3	37	79
8.4	37	79
8.5	37	79
8.6	40	84
8.7	40	84

Note: Split point drills available from 3mm and above sizes

HSS STRAIGHT SHANK TWIST DRILL

DIN1897

Dia.	Flute Length	Overall Length
8.8	40	84
8.9	40	84
9	40	84
9.1	40	84
9.2	40	84
9.3	40	84
9.4	40	84
9.5	40	84
9.6	43	89
9.7	43	89
9.8	43	89
9.9	43	89
10	43	89
10.1	43	89
10.2	43	89
10.3	43	89
10.4	43	89
10.5	43	89
10.6	43	89
10.7	47	95
10.8	47	95
10.9	47	95
11	47	95
11.1	47	95
11.2	47	95
11.3	47	95
11.4	47	95
11.5	47	95
11.6	47	95
11.7	47	95
11.8	47	95
11.9	51	102
12	51	102
12.1	51	102
12.2	51	102
12.3	51	102
12.4	51	102
12.5	51	102
12.6	51	102
12.7	51	102
12.8	51	102
12.9	51	102
13	51	102
13.1	51	102
13.2	51	102
13.3	54	107
13.4	54	107
13.5	54	107
13.6	54	107
13.7	54	107
13.8	54	107
13.9	54	107
14	54	107
14.25	56	111
14.5	56	111
14.75	56	111
15	56	111
15.25	58	115
15.5	58	115
15.75	58	115
16	58	115
16.25	58	119
16.5	58	119
16.75	58	119
17	58	119
17.25	62	123
17.5	62	123
17.75	62	123
18	62	123
18.25	62	127
18.5	62	127
18.75	62	127
19	62	127
19.25	66	131
19.5	66	131
19.75	66	131
20	66	131

Note: Split point drills available from 3mm and above sizes

Dia.	Flute Length	Overall Length
6.0	180	260
6.5	190	275
7.0	200	290
7.5	200	290
8.0	210	305
8.5	210	305
9.0	220	320
9.5	220	320
10.0	235	340
10.5	235	340
11.0	250	365
11.5	250	365
12.0	260	375
12.5	260	375
13.0	260	375
3.5	180	265
4.0	190	280
4.5	200	295
5.0	210	315
5.5	225	330
6.0	225	330
6.5	235	350
7.0	250	370
7.5	250	370
8.0	265	390
8.5	265	390
9.0	280	410
9.5	280	410
10.0	295	430
10.5	295	430
11.0	310	455
11.5	310	455
12.0	330	480
12.5	330	480
13.0	330	480
2.0	85	125
2.5	95	140
3.0	100	150
3.5	115	165
4.0	120	175
4.5	125	185
5.0	135	195
5.5	140	205
6.0	140	205
6.5	150	215
7.0	155	225
7.5	155	225
8.0	165	240
8.5	165	240
9.0	175	250
9.5	175	250
10.0	185	265
10.5	185	265
11.0	195	280
11.5	195	280
12.0	205	295
12.5	205	295
13.0	205	295

118° or 135° split-point BLACK

DIN1869

Dia.	Flute Length	Overall Length
3.0	130	190
3.5	145	210
4.0	150	220
4.5	160	235
5.0	170	245
5.5	180	260

Note: Split point drills available from 3mm and above sizes

HSS STRAIGHT SHANK TWIST DRILL INDEX

ASME B.94.11M---Jobber Length

Size	Decimal Equivalent	Flute Length	Overall Length
1/16	.0625	7/8	1-7/8
5/64	.0781	1	2
3/32	.0938	1-1/4	2-1/4
7/64	.1094	1-1/2	2-5/8
1/8	.1250	1-5/8	2-3/4
9/64	.1406	1-3/4	2-7/8
5/32	.2188	2	3-1/8
11/64	.1719	2-1/8	3-1/4
3/16	.1875	2-5/16	3-1/2
13/64	.2031	2-7/16	3-5/8
7/32	.2188	2-1/2	3-3/4
15/64	.2344	2-5/8	3-3/7
1/4	.2500	2-3/4	4
17/64	.2656	2-7/8	4-1/8
9/32	.2812	2-15/16	4-1/4
19/64	.2969	3-1/16	4-3/8
5/16	.3125	3-3/16	4-1/2
21/64	.3281	3-5/16	4-3/4
11/32	.3438	3-7/16	4-5/8
23/64	.3594	3-1/2	4-7/8
3/8	.3750	3-5/8	5
25/64	.3906	3-3/4	5-1/8
13/32	.4062	3-7/8	5-1/4
27/64	.4219	3-15/16	5-3/8
7/16	.4375	4-1/16	5-1/2
29/64	.4531	4-3/16	5-5/8
15/32	.4688	4-5/16	5-3/4
31/64	.4844	4-3/8	5-7/8
1/2	.5000	4-1/2	6

**Note: Split point drills available from 1/8 " and above sizes

Size	Decimal Equivalent	Flute Length	Overall Length
1#	.2280	2-5/8	3-7/8
2#	.2210	2-5/8	3-7/8
3#	.2130	2-1/2	3-3/4
4#	.2090	2-1/2	3-3/4
5#	.2055	2-1/2	3-3/4
6#	.2040	2-1/2	3-3/4
7#	.2010	2-7/16	3-5/8
8#	.1990	2-7/16	3-5/8
9#	.1960	2-7/16	3-5/8
10#	.1935	2-7/16	3-5/8
11#	.1910	2-5/16	3-1/2
12#	.1890	2-5/16	3-1/2
13#	.1850	2-5/16	3-1/2
14#	.1820	2-3/16	3-3/8
15#	.1800	2-3/16	3-3/8
16#	.1770	2-3/16	3-3/8
17#	.1730	2-3/16	3-3/8
18#	.1695	2-1/8	3-1/4
19#	.1660	2-1/8	3-1/4
20#	.1610	2-1/8	3-1/4
21#	.1590	2-1/8	3-1/4
22#	.1570	2	3-1/8
23#	.1540	2	3-1/8
24#	.1520	2	3-1/8
25#	.1495	1-7/8	3
26#	.1470	1-7/8	3
27#	.1440	1-7/8	3
28#	.1405	1-3/4	2-7/8
29#	.1360	1-3/4	2-7/8
30#	.1285	1-5/8	2-3/4
31#	.1200	1-5/8	2-3/4
32#	.1160	1-5/8	2-3/4
33#	.1130	1-1/2	2-5/8
34#	.1110	1-1/2	2-5/8
35#	.1100	1-1/2	2-5/8
36#	.1065	1-7/16	2-1/2
37#	.1040	1-7/16	2-1/2
38#	.1015	1-7/16	2-1/2
39#	.0995	1-3/8	2-3/8
40#	.0980	1-3/8	2-3/8
41#	.0960	1-3/8	2-3/8
42#	.0935	1-1/4	2-1/4
43#	.0890	1-1/4	2-1/4
44#	.0860	1-1/8	2-1/8
45#	.0820	1-1/8	2-1/8
46#	.0810	1-1/8	2-1/8
47#	.0785	1	2
48#	.0760	1	2
49#	.0730	1	2
50#	.0700	1	2
51#	.0670	1	2
52#	.0635	7/8	1-7/8
53#	.0595	7/8	1-7/8
54#	.0550	7/8	1-7/8
55#	.0520	7/8	1-7/8
56#	.0465	3/4	1-3/4
57#	.0430	3/4	1-3/4
58#	.0420	11/16	1-5/8
59#	.0410	11/16	1-5/8
60#	.0400	11/16	1-5/8

HSS STRAIGHT SHANK TWIST DRILL

ASME B.94.11M---Jobber Length

Size	Decimal Equivalent	Flute Length	Overall Length
A	.2340	2-5/8	3-7/8
B	.2380	2-3/4	4
C	.2420	2-3/4	4
D	.2460	2-3/4	4
E	.2500	2-3/4	4
F	.2570	2-7/8	4-1/8
G	.2610	2-7/8	4-1/8
H	.2660	2-7/8	4-1/8
I	.2720	2-7/8	4-1/8
J	.2770	2-7/8	4-1/8
K	.2810	2-15/16	4-1/4
L	.2900	2-15/16	4-1/4
M	.2950	3-1/16	4-3/8
N	.3020	3-1/16	4-3/8
O	.3160	3-3/16	4-1/2
P	.3230	3-5/16	4-5/8
Q	.3320	3-7/16	4-3/4
R	.3390	3-7/16	4-3/4
S	.3480	3-1/2	4-7/8
T	.3580	3-1/2	4-7/8
U	.3680	3-5/8	5
V	.3770	3-5/8	5
W	.3860	3-3/4	5-1/8
X	.3970	3-3/4	5-1/8
Y	.4040	3-7/8	5-1/4
Z	.4130	3-7/8	5-1/4

Size	Decimal Equivalent	Flute Length	Overall Length
1.00mm	.0394	17	41
1.50mm	.0591	22	48
2.00mm	.0787	25	51
2.50mm	.0984	35	60
3.00mm	.1181	41	70
3.30mm	.1299	44	73
3.50mm	.1378	44	73
4.00mm	.1575	54	83
4.20mm	.1654	54	83
4.50mm	.1772	56	86
5.00mm	.1969	62	92
5.50mm	.2165	64	95
6.00mm	.2362	70	102
6.50mm	.2559	73	105
7.00mm	.2756	73	105
7.50mm	.2953	78	111
8.00mm	.3150	81	114
8.50mm	.3346	87	121
9.00mm	.3543	89	124
9.50mm	.3740	92	127
10.00mm	.3937	95	130
10.50mm	.4134	98	133
11.00 mm	.4331	103	140
11.50 mm	.4528	106	143
12.00mm	.4724	111	149
12.50mm	.4921	114	152
13.00mm	.5118	114	152

****Note:** Split point drills available from 1/8 " and above sizes

* Metric sizes to ANSI specifications

HSS STRAIGHT SHANK TWIST DRILL INDEX

118° Point, High-Speed Steel, Black Oxide
Taper length Drill

Fractional

Size	Decimal Equivalent	Flute Length	Overall Length
1/64	.0156	5/16	1-1/2
1/32	.0312	3 /4	2
3/64	.0469	1-1/8	2-1/4
1/16	.0625	1-3/4	3
5/64	.0781	2	3-3/4
3/32	.0938	2-1/4	4-1/4
7/64	.1094	2-1/2	4-5/8
1/8	.1250	2-3/4	5-1/8
9/64	.1406	3	5-3/8
5/32	.1562	3	5-3/8
11/64	.1719	3-3/8	5-3/4
3/16	.1875	3-3/8	5-3/4
13/64	.2031	3-5/8	6
7/32	.2188	3-5/8	6
15/64	.2344	3-3/4	6-1/8
1 /4	.2500	3-3/4	6-1/8
17/64	.2650	3-7/8	6-1/4
9/32	.2812	3-7/8	6-1/4
19/64	.2969	4	6-3/8
5/16	.3125	4	6-3/8
21/64	.3281	4-1/8	6-1/2
11/32	.3438	4-1/8	6-1/2
23/64	.3594	4-1/4	6-3/4
3/8	.3750	4-1/4	6-3/4
25/64	.3906	4-3/8	7
13/32	.4062	4-3/8	7
27/64	.4219	4-5/8	7-1/4
7/16	.4375	4-5/8	7-1/4
29/64	.4531	4-3/4	7-1/2
15/32	.4688	4-3/4	7-1/2
31/64	.4844	4-3/4	7-3/4
1 /2	.5000	4-3/4	7-3/4
33/64	.5156	4-3/4	8
17/32	.5312	4-3/4	8
35/64	.5469	4-7/8	8-1/4
9/16	.5625	4-7/8	8-1/4
37/64	.5781	4-7/8	8-3/4
19/32	.5938	4-7/8	8-3/4
39/64	.6094	4-7/8	8-3/4
5/8	.6250	4-7/8	8-3/4
41/64	.6406	5-1/8	9
21/32	.6562	5-1/8	9
43/64	.6719	5-3/8	9-1/4
11/16	.6875	5-3/8	9-1/4

Fractional

Size	Decimal Equivalent	Flute Length	Overall Length
45/64	.7031	5-5/8	9-1/2
23/32	.7188	5-5/8	9-1/2
47/64	.7344	5-7/8	9-3/4
3 /4	.7500	5-7/8	9-3/4
49/64	.7656	6	9-7/8
25/32	.7812	6	9-7/8
51/64	.7969	6-1/8	10
13/16	.8125	6-1/8	10
53/64	.8281	6-1/8	10
27/32	.8438	6-1/8	10
55/64	.8594	6-1/8	10
7/8	.8750	6-1/8	10
57/64	.8906	6-1/8	10
29/32	.9062	6-1/8	10
59/64	.9219	6-1/8	10-3/4
15/16	.9375	6-1/8	10-3/4
61/64	.9531	6-3/8	11
31/32	.9688	6-3/8	11
63/64	.9844	6-3/8	11
1	1.0000	6-3/8	11
1-1/64	1.0156	6-1/2	11-1/8
1-1/32	1.0312	6-1/2	11-1/8
1-3/64	1.0469	6-5/8	11-1/4
1-1/16	1.0625	6-5/8	11-1/4
1-5/64	1.0781	6-7/8	11-1/2
1-3/32	1.0938	6-7/8	11-1/2
1-7/64	1.1094	7-1/8	11-3/4
1-1/8	1.1250	7-1/8	11-3/4
1-9/64	1.1406	7-1/4	11-7/8
1-5/32	1.1562	7-1/4	11-7/8
1-11/64	1.1719	7-3/8	12
1-3/16	1.1875	7-3/8	12
1-13/64	1.2031	7-1/2	12-1/8
1-7/32	1.2188	7-1/2	12-1/8
1-15/64	1.2344	7-7/8	12-1/2
1-1/4	1.2500	7-7/8	12-1/2
1-5/16	1.3125	8-5/8	14-1/4
1-3/8	1.3750	8-7/8	14-1/2
1-7/16	1.4375	9-1/8	14-3/4
1-1/2	1.5000	9-3/8	15
1-9/16	1.5625	9-5/8	15-1/4
1-5/8	1.6250	9-7/8	15-5/8
1-3/4	1.7500	10-1/2	16-1/4

Note: Split point drills available from 1/8 and above sizes

HSS STRAIGHT SHANK TWIST DRILL

ASME B.94.11 M---Taper length Drill

Wire

Size	Decimal Equivalent	Flute Length	Overall Length
#1	.2280	3-3/4	6-1/8
#2	.2210	3-3/4	6-1/8
#3	.2130	3-5/8	6
#4	.2090	3-5/8	6
#5	.2055	3-5/8	6
#6	.2040	3-5/8	6
#7	.2010	3-5/8	6
#8	.1990	3-5/8	6
#9	.1960	3-5/8	6
#10	.1935	3-5/8	6
#11	.1910	3-5/8	6
#12	.1890	3-5/8	6
#13	.1850	3-3/8	5-3/4
#14	.1820	3-3/8	5-3/4
#15	.1800	3-3/8	5-3/4
#16	.1770	3-3/8	5-3/4
#17	.1730	3-3/8	5-3/4
#18	.1695	3-3/8	5-3/4
#19	.1660	3-3/8	5-3/4
#20	.1610	3-3/8	5-3/4
#21	.1590	3-3/8	5-3/4
#22	.1570	3-3/8	5-3/4
#23	.1540	3	5-3/8
#24	.1520	3	5-3/8
#25	.1495	3	5-3/8
#26	.1470	3	5-3/8
#27	.1440	3	5-3/8
#28	.1405	3	5-3/8
#29	.1360	3	5-3/8
#30	.1285	3	5-3/8
#31	.1200	2-3/4	5-1/8
#32	.1160	2-3/4	5-1/8
#33	.1130	2-3/4	5-1/8
#34	.1110	2-3/4	5-1/8
#35	.1100	2-3/4	5-1/8
#36	.1065	2-1/2	4-5/8
#37	.1040	2-1/2	4-5/8
#38	.1015	2-1/2	4-5/8
#39	.0995	2-1/2	4-5/8
#40	.0980	2-1/2	4-5/8
#41	.0960	2-1/2	4-5/8
#42	.0935	2-1/4	4-1/4
#43	.0890	2-1/4	4-1/4
#44	.0860	2-1/4	4-1/4
#45	.0820	2-1/4	4-1/4

Size	Decimal Equivalent	Flute Length	Overall Length
#46	.0810	2-1/4	4-1/4
#47	.0785	2-1/4	4-1/4
#48	.0760	2	3-3/4
#49	.0730	2	3-3/4
#50	.0700	2	3-3/4
#51	.0670	2	3-3/4
#52	.0635	2	3-3/4
#53	.0595	1-3/4	3
#54	.0550	1-3/4	3
#55	.0520	1-3/4	3
#56	.0465	1-1/8	2-1/4
#57	.0430	1-1/8	2-1/4
#58	.0420	1-1/8	2-1/4
#59	.0410	1-1/8	2-1/4
#60	.0400	1-1/8	2-1/4
#61	.0390	1-1/8	2-1/4
#62	.0380	3/4	2
#63	.0370	3/4	2
#64	.0360	3/4	2
#65	.0350	3/4	2
#66	.0330	3/4	2
#67	.0320	3/4	2
#68	.0310	3/4	2
#69	.0292	3/4	2
#70	.0280	3/4	2
#71	.0260	3/4	2
#72	.0250	5/16	1-1/2
#73	.0240	5/16	1-1/2
#74	.0225	5/16	1-1/2
#75	.0210	5/16	1-1/2
#76	.0200	5/16	1-1/2
#77	.0180	5/16	1-1/2
#78	.0160	5/16	1-1/2
#79	.0145	5/16	1-1/2
#80	.0135	5/16	1-1/2

Note: Split point drills available from 1/8 and above sizes

HSS STRAIGHT SHANK TWIST DRILL INDEX

118° Point, High-Speed Steel, Black Oxide Taper length Drill

Size	Decimal Equivalent	Flute Length	Overall Length
A	.2340	3-3/4	6-1/8
B	.2380	3-3/4	6-1/8
C	.2420	3-3/4	6-1/8
D	.2460	3-3/4	6-1/8
E	.2500	3-3/4	6-1/8
F	.2570	3-7/8	6-1/4
G	.2610	3-7/8	6-1/4
H	.2660	3-7/8	6-1/4
I	.2720	3-7/8	6-1/4
J	.2770	3-7/8	6-1/4
K	.2810	3-7/8	6-1/4
L	.2900	4	6-3/8
M	.2950	4	6-3/8
N	.3020	4	6-3/8
O	.3160	4-1/8	6-1/2
P	.3230	4-1/8	6-1/2
Q	.3320	4-1/8	6-1/2
R	.3390	4-1/8	6-1/2
S	.3480	4-1/4	6-3/4
T	.3580	4-1/4	6-3/4
U	.3680	4-1/4	6-3/4
V	.3770	4-3/8	7
W	.3860	4-3/8	7
X	.3970	4-3/8	7
Y	.4040	4-3/8	7
Z	.4130	4-5/8	7-1/4

Note: Split point drills available from 1/8" and above sizes

ASME B.94.11M-SCREW MACHINE LENGTH

Size	Decimal Equivalent	Flute Length	Overall Length
3/64	.0469	1/2	1-3/8
1/16	.0625	5/8	1-5/8
5/64	.0781	11/16	1-11/16
3/32	.0938	3/4	1-3/4
7/64	.1094	13/16	1-13/16
1/8	.1250	7/8	1-7/8
9/64	.1406	15/16	1-15/16
5/32	.1562	1	2-1/16
11/64	.1719	1-1/16	2-1/8
3/16	.1875	1-1/8	2-3/16
13/64	.2031	1-3/16	3-1/4
7/32	.2188	1-1/4	2-3/8
15/64	.2344	1-5/16	2-7/16
1/4	.2500	1-3/8	2-1/2
17/64	.2656	1-7/16	2-5/8
9/32	.2812	1-1/2	2-11/16
19/64	.2969	1-9/16	2-3/4
5/16	.3125	1-5/8	2-13/16
21/64	.3281	1-11/16	2-15/16
11/32	.3438	1-11/16	3
23/64	.3594	1-3/4	3-1/16
3/8	.3750	1-13/16	3-1/8
25/64	.3906	1-7/8	3-1/4
13/32	.4062	1-15/16	3-5/16
27/64	.4219	2	3-3/8
7/16	.4375	2-1/16	3-7/16
29/64	.4531	2-1/8	3-9/16
15/32	.4688	2-1/8	3-5/8
31/64	.4844	2-3/16	3-11/16
1/2	.5000	2-1/4	3-3/4

HSS STRAIGHT SHANK TWIST DRILL

ASME B.94.11M-SCREW MACHINE LENGTH

Size	Decimal Equivalent	Flute Length	Overall Length
1#	.2280	1-5/16	2-7/16
2#	.2210	1-5/16	2-7/16
3#	.2130	1-1/4	2-3/8
4#	.2090	1-1/4	2-3/8
5#	.2055	1-1/4	2-3/8
6#	.2040	1-1/4	2-3/8
7#	.2010	1-3/16	2-1/4
8#	.1990	1-3/16	2-1/4
9#	.1960	1-3/16	2-1/4
10#	.1935	1-3/16	2-1/4
11#	.1910	1-3/4	2-1/4
12#	.1890	1-3/16	2-1/4
13#	.1850	1-3/16	2-3/16
14#	.1820	1-3/16	2-3/16
15#	.1800	1-3/16	2-3/16
16#	.1770	1-3/16	2-3/16
17#	.1730	1-3/16	2-3/16
18#	.1695	1-1/8	2-1/8
19#	.1660	1-1/8	2-1/8
20#	.1610	1-1/8	2-1/8
21#	.1590	1-1/8	2-1/8
22#	.1570	1-1/8	2-1/8
23#	.1540	1-1/16	2-1/16
24#	.1520	1-1/16	2-1/16
25#	.1495	1-116	2-1/16
26#	.1470	2-1/16	2-1/16
27#	.1440	2-1/16	2-1/16
28#	.1405	1-15/16	1-15/16
29#	.1360	1-15-16	1-15/16
30#	.1285	1-15/16	1-15/16
31#	.1200	7/8	1-7/8
32#	.1160	7/8	1-7/8
33#	.1130	7/8	1-7/8
34#	.1110	7/8	1-7/8
35#	.1100	7/8	1-7/8

Size	Decimal Equivalent	Flute Length	Overall Length
36#	.1065	13/16	1-13/16
37#	.1040	13/16	1-13-16
38#	.1015	13/16	1-13/16
39#	.0995	13/16	1-13/16
40#	.0980	13/16	1-13/16
41#	.0960	13/16	1-13/16
42#	.0935	3/4	1-3/4
43#	.0890	3/4	1-3/4
44#	.8660	3/4	1-3/4
45#	.0820	3/4	1-3/4
46#	.0810	3/4	1-3/4
47#	.0785	11/16	1-11/16
48#	.0760	11/16	1-11/16
49#	.0730	11/16	1-11/16
50#	.0700	11/16	1-11/16
51#	.0670	11/16	1-11/16
52#	.0635	11/16	1-11/16
53#	.0595	5/8	1-5/8
54#	.0550	5/8	1-5/8
55#	.0520	5/8	1-5/8
56#	.0465	1/2	1-3/8
57#	.0430	1/2	1-3/8
58#	.0420	1/2	1-3/8
59#	.0410	1/2	1-3/8
60#	.0400	1/2	1-3/8

Note: Split point drills available from 1/8 " and above sizes

HSS STRAIGHT SHANK TWIST DRILL INDEX

ASME B.94 11M- 6" Aircraft Extension

Fractional

Size	Decimal Equivalent	Flute Length	Overall Length
1/16	.0625	7/8	6
5/64	.0781	1	6
3/32	.0938	1-1/4	6
7/64	.1094	1-1/2	6
1/8	.1250	1-5/8	6
9/64	.1406	1-3/4	6
5/32	.1562	2	6
11/64	.1719	2-1/8	6
3/16	.1875	2-5/16	6
13/64	.2031	2-7/16	6
7/32	.2188	2-1/2	6
15/64	.2344	2-5/8	6
1/4	.2500	2-3/4	6
17/64	.2656	2-7/8	6
9/32	.2812	2-15/16	6
19/64	.2969	3-1/16	6
5/16	.3125	3-3/16	6
21/64	.3281	3-5/16	6
11/32	.3438	3-7/16	6
23/64	.3594	3-1/2	6
3/8	.3750	3-5/8	6
7/16	.4375	4-1/16	6
1/2	.5000	4-1/2	6

** **Note:** Split point drills available from 1/8 " and above sizes

ASME B 94.11M--12" Aircraft Extension

Size	Decimal Equivalent	Flute Length	Overall Length
1/16	.0625	7/8	12
5/64	.0781	1	12
3/32	.0938	1-1/4	12
7/64	.1094	1-1/2	12
1/8	.1250	1-5/8	12
9/64	.1406	1-3/4	12
5/32	.1562	2	12
11/64	.1719	2-1/8	12
3/16	.1875	2-5/16	12
13/64	.2031	2-7/16	12
7/32	.2188	2-1/2	12
15/64	.2344	2-5/8	12
1/4	.2500	2-3/4	12
17/64	.2656	2-7/8	12
9/32	.2812	2-15/16	12
19/64	.2969	3-1/16	12
5/16	.3125	3-3/16	12
21/64	.3438	3-7/16	12
11/32	.3750	3-5/8	12
23/64	.4062	3-7/8	12
3/8	4375	4-1/16	12
7/16	.4688	4-5/16	12
1/2	.5000	4-1/2	12

** **Note:** Split point drills available from 1/8 " and above sizes

118° Point, High-Speed Steel, Black Oxide Flutes-3 Flats 1/2" Shank, Silver & Deming

Size	Decimal Equivalent	Flute Length	Overall Length
33/64	.5156	3	6
17/32	.5312	3	6
35/64	.5469	3	6
9/16	.5625	3	6
37/64	.5781	3	6
19/32	.5938	3	6
39/64	.6094	3	6
5/8	.6250	3	6
41/64	.6406	3	6
21/32	.6562	3	6
43/64	.6719	3	6
11/16	.6875	3	6
45/64	.7031	3	6
23/32	.7188	3	6
47/64	.7344	3	6
3/4	.7500	3	6
49/64	.7656	3	6
25/32	.7812	3	6
51/64	.7969	3	6
13/16	.8125	3	6
53/64	.8281	3	6
27/32	.8438	3	6
55/64	.8594	3	6
7/8	.8750	3	6
57/64	.8906	3	6
29/32	.9062	3	6
59/64	.9219	3	6
15/16	.9375	3	6
61/64	.9531	3	6
31/32	.9688	3	6
63/64	.9844	3	6
1	1.0000	3	6
1-1/32	1.0312	3	6
1-1/16	1.0625	3	6
1-3/32	1.0938	3	6
1-1/8	1.1250	3	6
1-5/32	1.1562	3	6
1-3/16	1.1875	3	6
1-7/32	1.2188	3	6
1-1/4	1.2500	3	6
1-5/16	1.3125	3	6
1-3/8	1.3750	3	6
1-7/16	1.4375	3	6
1-1/2	1.5000	3	6

HSS STRAIGHT SHANK TWIST DRILL

There Flats 135° Split-Point,High-Speed Steel,Black & Bronze Oxide
ASME B.94 11M

Size	Decimal Equivalent	Flute Length	Overall Length
1/16	.0625	7/8	1-7/8
5/64	.0781	1	2
3/32	.0938	1- 1/4	2-1/4
7/64	.1094	1- 1/2	2-5/8
1/8	.1250	1-5/8	2-3/4
9/64	.1406	1-3/4	2-7/8
5/32	.2188	2	3-1/8
11/64	.1719	2- 1/8	3-1/4
3/16	.1875	2-5/16	3-1/2
13/64	.2031	2-7/16	3-5/8
7/32	.2188	2- 1/2	3-3/4
15/64	.2344	2-5/8	3-7/8
1/4	.2500	2-3/4	4
17/64	.2656	2-7/8	4-1/8
9/32	.2812	2- 15/16	4-1/4
19/64	.2969	3- 1/16	4-3/8
5/16	.3125	3-3/16	4-1/2
21/64	.3281	3-5/16	4-5/8
11/32	.3438	3-7/16	4-3/4
23/64	.3594	3- 1/2	4-7/8
3/8	.3750	3-5/8	5
25/64	.3906	3-3/4	5-1/8
13/32	.4062	3-7/8	5-1/4
27/64	.4219	3- 15/16	5-3/8
7/16	.4375	4 1/16	5-1/2
29/64	.4531	4 3/16	5-5/8
15/32	.4688	4 5/16	5-3/4
31/64	.4844	4 3/8	5-7/8
1/2	.5000	4 1/2	6

*25/64" and 13/32" drills with flats fit will fit a 3/8" chuck without reducing the shank.

3/8" Reduced Shank
1/2" Reduced Shank
ASME B.94 11M

Dia. mm	Flute Length mm		Overall Length mm
25/64	.3906	3-3/4	5-1/8
13/32	.4062	3-7/8	5-1/4
27/64	.4219	3- 15/16	5-3/8
7/16	.4375	4 1/8	5-1/2
29/64	.4531	4 3/16	5-5/8
15/32	.4688	4 5/16	5-3/4
31/64	.4844	4 3/8	5-7/8
1/2	.5000	4 1/2	6

10.0mmReduced shank
13.0mmReduced shank
DIN 338

Dia. mm	Flute Length mm	Overall Length mm
10	87	133
10.1	87	133
10.2	87	133
10.3	87	133
10.4	87	133
10.5	87	133
10.6	87	133
10.7	94	142
10.8	94	142
10.9	94	142
11	94	142
11.1	94	142
11.2	94	142
11.3	94	142
11.4	94	142
11.5	94	142
11.6	94	142
11.7	94	142
11.8	94	142
11.9	101	151
12	101	151
12.1	101	151
12.2	101	151
12.3	101	151
12.4	101	151
2.5	101	151
12.6	101	151
12.7	101	151
12.8	101	151
12.9	101	151
13	101	151
13.1	101	151
13.2	101	151
13.3	108	160
13.4	108	160
13.5	108	160
13.6	108	160
13.7	108	160
13.8	108	160
13.9	108	160
14	108	160
14.25	114	169
14.5	114	169
14.75	114	169
15	114	169
15.25	120	178
15.5	120	178
15.75	120	178
16	120	178
16.25	125	184
16.5	125	184
16.75	125	184
17	125	184
17.25	130	191
17.5	130	191
17.75	130	191
18	130	191
18.25	135	198
18.5	135	198
18.75	135	198
19	135	198
19.25	140	205
19.5	140	205
19.75	140	205
20	140	205

HSS STRAIGHT SHANK TWIST DRILL INDEX

Extra length Drill
12" General Purpose

Size	Decimal Equivalent	Flute Length	Overall Length
1/8	.1250	9	12
5/32	.1562	9	12
3/16	.2031	9	12
7/32	.2188	9	12
1/4	.2500	9	12
9/32	.2812	9	12
5/16	.3125	9	12
11/32	.3438	9	12
3/8	.3750	9	12
13/32	.4062	9	12
7/16	.4375	9	12
15/32	.4688	9	12
1/2	.5000	9	12
17/32	.5312	9	12
9/16	.5625	9	12
5/8	.6250	9	12

*Size over 1/2" are black oxide finish

18" General Purpose

Size	Decimal Equivalent	Flute Length	Overall Length
14	.2500	13	18
5/16	.3125	13	18
3/8	.3750	13	18
7/16	.4375	13	18
1/2	.5000	13	18
9/16	.5625	13	18
5/8	.6250	13	18

Note: Split point drills available from 1/8 and above sizes
*Size over 1/2" are black oxide finish

HSS STRAIGHT SHANK TWIST DRILL

Left hand series
ASME B.94 11M

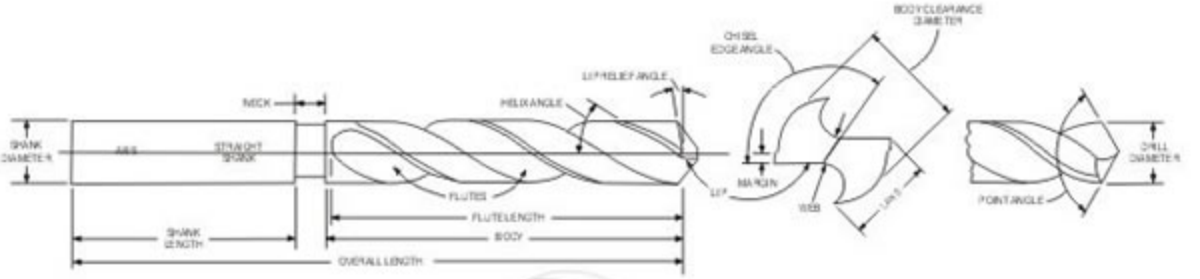
Size	Decimal Equivalent	Flute Length	Overall Length
1/16	.0625	7/8	1-7/8
5/64	.0781	1	2
3/32	.0938	1-1/4	2-1/4
7/64	.1094	1-1/2	2-5/8
1/8	.1250	1-5/8	2-3/4
9/64	.1406	1-3/4	2-7/8
5/32	.1562	2	3-1/8
11/64	.1719	2-1/8	3-1/4
3/16	.1875	2-5/16	3-1/2
13/64	.2031	2-7/16	3-5/8
7/32	.2188	2-1/2	3-3/4
15/64	.2344	2-5/8	3-7/8
1/4	.2500	2-3/4	4
17/64	.2656	2-7/8	4-1/8
9/32	.2812	2-15/16	4-1/4
19/64	.2969	3-1/16	4-3/8
5/16	.3125	3-3/16	4-1/2
21/64	.3281	3-5/16	4-5/8
11/32	.3438	3-7/16	4-3/4
23/64	.3594	3-1/2	4-7/8
3/8	.3750	3-5/8	5
25/64	.3906	3-3/4	5-1/8
13/32	.4062	3-7/8	5-1/4
27/64	.4219	3-15/16	5-3/8
7/16	.4375	4-1/16	5-1/2
29/64	.4531	4-3/16	5-5/8
15/32	.4688	4-5/16	5-3/4
31/64	.4844	4-3/8	5-7/8
1/2	.5000	4-1/2	6

DIN338

Dia. mm	Flute Length mm	Overall Length mm
1.0	12	34
1.5	20	43
2.0	24	49
2.5	30	57
3.0	33	61
3.5	39	70
4.0	43	75
4.5	47	80
5.0	52	86
5.5	27	93
6.0	57	93
6.5	63	101
7.0	69	109
7.5	69	109
8.0	75	117
8.5	75	117
9.0	81	125
9.5	81	125
10.0	87	133
10.5	87	133
11.0	94	142
11.5	94	142
12.0	101	151
12.5	101	151
13.0	101	151

Note: Split point drills available from 1/8" and above sizes

DRILL RECONDITIONING



Axis The imaginary straight line which forms the lengthwise center of a drill.

Body The section of a drill from the shank to the outer edges of the cutting lips.

Body Clearance Diameter The portion of the land that has been cut away so it will not bind against the walls of the hole.

Chip Removal The ability of a drill to pull material that has been cut away from the point, up the flutes and out of the hole.

Chisel Edge The edge at the end of the web that connects the cutting lips.

Chisel-Edge Angle The angle between the chisel edge and cutting lip, as viewed from the end of a drill.

Cobalt Steel A heat-resistant steel that produces increased drill life.

Drill Diameter The diameter over the margins of a drill, measured at the point (Dia.).

Feeds Feed rates for drilling are determined by the drill diameter, machinability of materials and depth of the desired hole. Small drills, harder materials and deeper holes require additional considerations in selecting proper feed rates (IPA).

Flute Groove cut in the body of drills to provide cutting surfaces, permit removal of chips and allow cutting fluid to reach cutting surfaces.

Flute Length The distance from the outer edges of the cutting lips to the extreme back of the flutes.

Helix Angle The angle formed between the leading edge of the land and the axis of a drill.

High-Speed Steel The high quality steel used in drills for most maintenance and industrial applications.

IPM Feed Rate in Inches Per Minute = IPR x RPM.

IPR Inches Per Revolution (Feed).

Land The outer portion of the body between two adjacent flutes.

Land Width The distance between the leading edge and heel of the land, measured at a right angle to the leading edge.

Lip Relief Angle The relief angle at the outer corner of the lip.

Lip The cutting edge of a two-flute drill which extends from the chisel edge to the outer edge.

Margin The narrow raised surface on a drill body along the flute that stabilizes the drill in the hole.

Neck The section of reduced diameter between the body and the shank of a drill.

Overall Length The length from the end of the shank to the outer corners of the cutting lip.

Point The cone shaped cutting end of a drill, made from the ends of the lands and the web.

Point Angle The angle of the cutting surfaces on a drill point, commonly 118° or 135° .

RPM Revolutions Per Minute = Dia x 3.82

SFM Surface Feet Per Minute RPM x Dia. x .26

Shank The part of a drill by which it is held and driven.

Size Measurement reference for diameter size of a drill, expressed as either Fractional, Wire, Letter or Metric.

Speed The speed of a drill is determined by the rate which the outer edge of the tool rotates in relation to the material being cut. In general, the SFM is within a range based upon the work piece material, its condition, hardness and depth of the hole. The deeper the hole, the greater tendency for more heat to be generated.

Speed reduction is often recommended to minimize the amount of heat. It is usually best to start drilling at a slower speed and then increase.

Split-Point A special point configuration that eliminates "walking," so holes stay on center.

Web The central portion of the body that joins the lands. The extreme end of the web forms the chisel edge of a two-flute drill.

Web Thickness The thickness of the web at the point, unless otherwise specified.

DRILL POINT CHARACTERISTICS

Like many things, drills are used "new" only once. The majority of a drill's life is spent in a reconditioned state. To get the best results throughout a drill's life requires the user to resharpen it before excessive wear occurs, and to do so on a regular basis.

Four steps are involved in drill resharpening: removing worn areas, regrinding the point, web thinning and inspection.

Removing Worn Areas

Drill wear usually begins at the corners of the drill, as a slight rounding, as shown in Figure 1. The cutting edges or lips and the chisel edge begin to wear at the same time. Because of this the surface has no clearance and tends to rub in the hole rather than cut. This wear increases the amount of power needed to force the dulled edge into the work, causing increased heat generation and faster wear.

There are two ways to remove worn portions. If the wear is minimal, lightly regrind the drill point surfaces. For more severe wear - when the drill body is worn back 1/4" or more - cut away the worn areas with an abrasive cutoff wheel, then restore the original point angle.

Regrinding the Point

After removing the worn areas of the drill, the surfaces of the point must be reground. The two cone-shaped surfaces intersect the faces of the flutes to form the cutting lips. They also form the chisel edge where they intersect with each other in the center, as shown in Figure 2.

Similar to other cutting tools, the surface of the cutting lips must not rub against the work, but must be relieved to allow the edge to penetrate. Without such relief the drill would not penetrate, and would only rub against the surface. This clearance is called lip relief, as shown in Figures 3 and 4. The lip relief angle is measured at the outer edge of the drill and is increased toward the center of the drill in order to obtain the correct chisel-edge angle shown in Figure 5.

Point grinding by hand involves great care and skill on the part of the operator. In order to achieve accurate point angles, lip angles, and chisel-edge angles, a point grinder is recommended. It is essential that the two cutting edges be exactly the same length and have the same slope to the axis.

Web Thinning

The next step is to restore the approximate web thickness of the drill, which has been shortened. As shown in Figure 6, the webs in most drills increase in thickness towards the shank. After removing the worn areas of the drill, the exposed area will have a larger web area, as seen in Figure 7. The longer edge would require more power and would result in shorter drill life. To prevent this, it is necessary to restore the chisel length to its previous size by reducing the web thickness. This procedure is called web thinning. While web thinning can be performed manually, machine grinding is preferred for most accurate results. Whether thinning is done by machine or an experienced operator, the grinding wheel used should be soft enough so it does not burn the cutting edges while removing the stock.

It is important that the web be thinned evenly on both sides so that it remains centered in the drill. Also, thinning should not be carried too far up the web, as this would weaken the drill. Since chips that form on the lips must flow into the flutes, thinning should be gradual to prevent interference with chip flow, which can eventually break the drill.

Inspection

After completing the previous steps it is important to visually inspect the drill. Check to see if a) the point surfaces are ground smoothly, b) the cutting lips have no burn marks and have clean, sharp edges, c) the web is in the center of the drill; equal portions have been removed from each side and d) the chisel-edge angle is correct.

Proper reconditioning serves no purpose if care is not taken when using the drills. Drilling at the proper feeds makes reconditioning easier, faster and less costly.

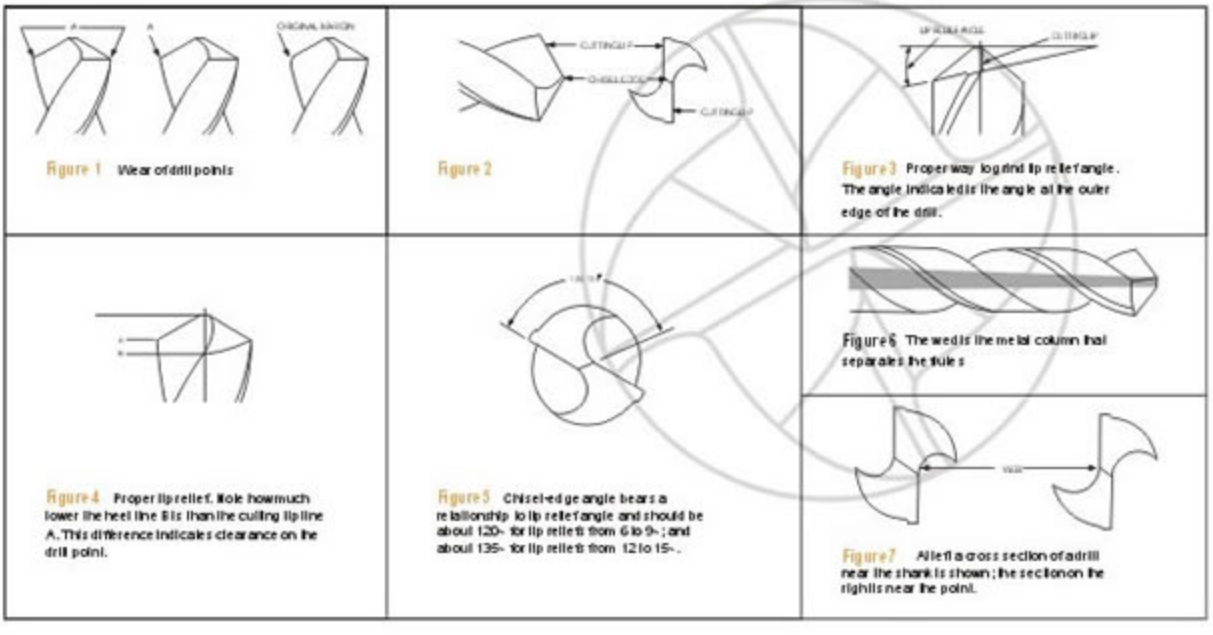


Figure 1 Wear of drill points

Figure 2

Figure 3 Proper way to grind lip relief angle. The angle indicated is the angle at the outer edge of the drill.

Figure 4 Proper lip relief. Note how much lower the heel line B is than the cutting lip line A. This difference indicates clearance on the drill point.

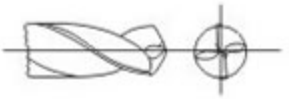
Figure 5 Chisel-edge angle bears a relationship to lip relief angle and should be about 120° for lip reliefs from 6 to 9°; and about 135° for lip reliefs from 12 to 15°.

Figure 6 The web is the metal column that separates the flutes

Figure 7 At left is a cross section of a drill near the shank is shown; the section on the right is near the point.

DRILLING TECHNIQUES/TROUBLE SHOOTING

Point Characteristics

Type	Performance Benefits*	Comments
Conventional Point (118°)	• General purpose • Widely available • Acceptable drill life • Best suited in mild steel and aluminum	• Not self-centering; "walking" can occur on hard surfaces • May produce burrs on breakthrough
Split-Point (118° and 135°) 	• Self centering • Excellent for portable drilling • Longer drill life • Good for drilling on curved surfaces • Improved penetration rates • Requires less effort • Breaks up chips • Best suited in alloy steels	• Difficult to regrind

*Depends on application.

How to Drill Effectively

Successful drilling involves three elements:

1) forming a chip

2) accommodating a chip

3) evacuating a chip

Drill Geometry Use the shortest drill possible.

Use a split-point drill if possible. Split-points begin removing material on contact and drill more efficiently.

WARNING: Two-flute drills should not be used to enlarge pre-existing holes.

Drilling the Hole

Use the proper feed rate (see p. 56).

Avoid the tendency to overspeed and underfeed.

Use low speeds and light feeds for hard materials.

Use higher speeds and heavy feeds for soft materials.

To decrease drilling effort required, use a split-point drill.

TROUBLE SHOOTING

Trouble	Possible Cause	Hou to do
Drill Breaks	Spring or back lash in press or work	Test press and work for rigidity and alignment
	Too little lip relief	Regrind properly
	Speed too low in proportion to the feed	increases speed or decrease feed
	Dull drill	Sharpen drill
	Improper chip clearing	Correct application
Outer Corner Breakdown	Material being drilled has hard spots, scale or s and inclusion	Correct application
	Too much speed	Reduce speed
	Improper cutting compound	Use proper cutting compound
Drill Breaks in Brass or Wood	Chips clog up flutes	increase speed. Use drills designed for these materials.
Cutting Lips Chipped	Too much feed	Reduce feed
	Too much lip relief	Regrind properly
Cracking or Checking in Cutting Edges	Heated and cooled too quickly while grinding or while drilling	Warm slowly before using. Do not throw cold water on hot drill while grinding or drilling.
	Too much feed	Reduce feed
Hole Too Large	Unequal angle or length of the cutting edges or both	Regrind properly
	Loose spindle	Tests pindle for rigidity
Only One Lip Cutting Drill Splits Up Center	Unequal length or angle of cutting lips or both	Regrind drill properly
	Too little lip relief	Regrind with proper relief
	Too much feed	Reduce feed
Rough Hole	Rough Hole	Regrind properly
	Dull or improperly ground drill	Lubricate or change lubricant
	Lack of lubricant or wrong lubricant	Check set-up
	improper set-up	Reduce feed
	Too much feed	

DRILLING OPERATING PARAMETERS

Speeds for High-Speed Steel Drills

Material	SFM	Material	SFM
Aluminum and its Alloys	200-300	Steel (Continued)	
Brass and Bronze (Ordinary)	150-300	Steel (.4 carbon to .5 carbon)	70-80
Bronze (High Tensile)	70-150	Tool (1.2 carbon)	50-60
Die Castings (Zinc Base)	300-400	Forgings	40-50
Iron		Alloy--300 to 400 Brinell	20-30
Cast (Soft)	100-150	High Tensile (Heat Treated)	
Cast (Medium hard)	70-100	35 to 40 Rockwell C	30-40
Hard Chilled	30-40	40 to 45 Rockwell C	25-35
Malleable	80-90	45 to 50 Rockwell C	15-25
Magnesium and its Alloys	250-400	50 to 55 Rockwell C	7-15
Monel Metal or High-Nickel Steel	30-50	Stainless Steel	
Plastics or Similar Materials (Bakelite)	100-300	Free Machining Grades	30-80
Steel		Work Hardening Grades	15-50
Mild (.2 carbon to .3 carbon)	80-110	Wood	300-400

Feed Per Drill Revolution

Drill Dia. Range	Light	Medium	Heavy
1/16 to 1/8"	.0005-.0010	.0010-.0020	.0020-.0040
1/8 to 1/4"	.0010-.0030	.0030-.0050	.0040-.0060
1/4 to 3/8"	.0030-.0050	.0050-.0070	.0060-.0100
R/R tn 1/2"	.0040-.0060	.0050-.0080	.0080-.0120
1/2 to 3/4"	.0050-.0070	.0070-.0100	.0090-.0140
F~/4 tn 1"	.0070-.0100	.0090-.0140	.0140-.0200

Speeds and Feeds for Deep-Hole Drilling

Holes which must be drilled three diameters deep or more fall into the "deep-hole' drilling class, and some adjustment of feeds and speeds is necessary. The deeper the hole, the greater the tendency there is for chips to pack and clog the flutes of the drill. This increases the amount of heat generated and prevents the coolant from conducting the heat away from the point. A build-up of heat at the point will eventually result in premature failure.

Step drilling, also called "peck" drilling, is the practice of drilling a short distance, then withdrawing the drill. This often reduces chip packing. The deeper the hole, the more frequent the drill must be retracted to be effective. Generally, a reduction in speed and feed to reduce the amount of heat generated is required in most deep-hole applications, where coolant cannot be effectively applied.

Speed and Feed Reduction (Based upon hole depth)

Hole Depth to Dia. Ratio (times drill diameter)	Speed Reduction	Feed Reduction
3	10%	10%
4	20%	10%
5	30%	20%
6	35-40%	20%

Note: Remember that these values are only a starting point. They may require adjustment based on conditions or individual requirements.

TIANGONG TOOLS

HSS TAPER SHANK TWIST DRILL

HSS TAPER SHANK TWIST DRILL

2A. PRODUCTION TECHNICS		
2A. 1	Roll Forged	
2A. 2	Milled	
2A. 3	Fully Ground	
2B. SURFACE FINISHING		
2B. 1	Bright	
2B. 2	Tin Coating	
2B. 3	Black & Bright	
2B. 4	Black Finishing	
2B. 5	Sandblast & Polished Finishing	
2C. USING MATERIAL		
2C. 1	Roll Forged	HSS-M2/W9/W4
2C. 2	Milled	HSS-M42/M35/M2/W9
2C. 3	Fully Ground(See Rurye)	HSS-M42/M35/M2/W9
2D. CUTTING EDGE		
2D. 1	118° General Angle	
2D. 2	118° Form A Point	

HSS TAPER SHANK TWIST DRILL

DIN345 GB1438-85

Dia.	Overall Length	Flute Length	MTNO.
5	52	133	1
5.2	52	133	1
2.5	57	138	1
2.8	57	138	1
6	57	138	1
6.2	63	144	1
6.5	63	144	1
6.8	69	150	1
7	69	150	1
7.2	69	150	1
7.5	69	150	1
7.8	75	156	1
8	75	156	1
8.2	75	156	1
8.5	75	156	1
8.8	81	162	1
9	81	162	1
9.2	81	162	1
9.5	81	162	1
9.8	87	168	1
10	87	168	1
10.2	87	168	1
10.5	87	168	1
10.8	94	175	1
11	94	175	1
11.2	94	175	1
11.5	94	175	1
11.8	94	175	1
12	101	182	1
12.2	101	182	1
12.5	101	182	1
12.8	101	182	1
13	101	182	1
13.2	101	182	1
13.5	108	189	1
13.8	108	189	1
14	108	189	2
*14.25	114	212	2
14.5	114	212	2
14.75	114	212	2
15	114	212	2
*15.25	120	218	2
15.5	120	218	2
*15.75	120	218	2
16	120	218	2
*16.25	125	223	2
16.5	125	223	2
*16.75	125	223	2
17	125	223	2
*17.25	130	223	2

Dia.	Overall Length	Flute Length	MTNO.
17.5	130	228	2
*17.75	130	228	2
18	130	228	2
18.5	135	233	2
*18.75	135	233	2
19	135	233	2
*19.25	140	238	2
19.5	140	238	2
*19.75	140	238	2
20	140	238	2
*20.25	145	243	2
20.5	145	243	2
*20.75	145	243	2
21	145	243	2
*21.25	150	248	2
21.5	150	248	2
*21.75	150	248	2
22	150	248	2
*22.25	150	248	2
22.5	155	253	2
*22.75	155	253	2
23	155	253	2
*23.25	155	276	3
23.5	155	276	3
*23.75	160	281	3
24	160	281	3
*24.25	160	281	3
24.5	160	281	3
*24.75	160	281	3
25	160	281	3
*25.25	165	286	3
25.5	165	286	3
*25.75	165	286	3
26	165	286	3
*26.25	165	286	3
26.5	165	286	3
*26.75	170	291	3
27	170	291	3
*27.25	170	291	3
27.5	170	291	3
*27.75	170	291	3
28	170	291	3
*28.25	175	296	3
28.5	175	296	3
*28.75	175	296	3
29	175	296	3
*29.25	175	296	3
29.5	175	296	3
*29.75	175	296	3
30	175	296	3

Note: Min.Ordering quantity may apply for the sizes as " * "

HSS TAPER SHANK TWIST DRILL

DIN345 GB1438-85

Dia.	Overall Length	Flute Length	MTNO.
*30.25	180	301	3
30.5	180	301	3
*30.75	180	301	3
31	180	301	3
*31.25	180	301	3
31.5	180	301	3
*31.75	185	306	3
32	185	334	4
32.5	185	334	4
33	185	334	4
33.5	185	334	4
34	190	339	4
34.5	190	339	4
35	190	339	4
35.5	190	339	4
36	195	344	4
36.5	195	344	4
37	195	344	4
38	200	349	4
38.5	200	349	4
39	200	349	4
39.5	200	349	4
40	200	349	4
40.5	205	354	4
41	205	354	4
41.5	205	354	4
42	205	354	4
42.5	205	354	4
43	210	359	4
43.5	210	359	4
44.5	210	359	4
45	210	359	4
45.5	215	364	4
46	215	364	4
46.5	215	364	4
47	215	364	4
47.5	215	364	4
48	220	369	4
48.5	220	369	4
49	220	369	4
49.5	220	369	4
50	220	369	4
50.5	220	374	4
51	225	412	4
52	225	412	5
53	225	412	5
54	230	417	5
55	230	417	5
56	230	417	5
57	235	422	5

Dia.	Overall Length	Flute Length	MTNO.
58	235	422	5
59	235	422	5
60	235	422	5
61	240	427	5
62	240	427	5
63	240	427	5
64	245	432	5
65	245	432	5
66	245	432	5
67	245	432	5
68	250	437	5
69	250	437	5
70	250	437	5
71	250	437	5
72	255	442	5
73	255	442	5
74	255	442	5
75	255	442	5
76	260	447	5
77	260	514	6
78	260	514	6
79	260	514	6
80	260	514	6
81	265	519	6
82	265	519	6
83	265	519	6
84	265	519	6
85	265	519	6
86	270	524	6
87	270	524	6
88	270	524	6
89	270	524	6
90	270	524	6
91	275	529	6
92	275	529	6
93	275	529	6
94	275	529	6
95	275	529	6
96	280	534	6
97	280	534	6
98	280	534	6
99	280	534	6
100	280	534	6

Note: Min.Ordering quantity may apply for the sizes as " * "

HSS TAPER SHANK TWIST DRILL

DIN341 GB1439

Dia.	Overall Length	Flute Length	MTNO.
5	155	74	1
5.2	155	74	1
5.5	161	80	1
5.8	161	80	1
6	161	80	1
6.2	167	86	1
6.5	167	86	1
6.8	174	93	1
7	174	93	1
7.2	174	93	1
7.5	174	93	1
7.8	181	100	1
8	181	100	1
8.2	181	100	1
8.5	181	100	1
8.8	188	107	1
9	188	107	1
9.2	188	107	1
9.5	188	107	1
9.8	197	116	1
10	197	116	1
10.2	197	116	1
10.5	197	116	1
10.8	206	125	1
11	206	125	1
11.2	206	125	1
11.5	206	125	1
11.8	206	125	1
12	215	134	1
12.2	215	134	1
12.5	215	134	1
12.8	215	134	1
13	215	134	1
13.2	215	134	1
13.5	223	142	1
13.8	223	142	1
14	223	142	1
*14.25	245	147	2
14.5	245	147	2
*14.75	245	147	2
15	245	147	2
*15.25	251	153	2
15.5	251	153	2
*15.75	251	153	2
16	251	153	2
*16.25	255	159	2
16.5	255	159	2
*16.75	255	159	2
17	255	159	2

Dia.	Overall Length	Flute Length	MTNO.
*17.25	263	165	2
17.5	263	165	2
*17.75	263	165	2
18	263	165	2
*18.25	269	171	2
18.5	269	171	2
*18.75	269	171	2
19	269	171	2
*19.25	275	177	2
19.5	275	177	2
*19.75	275	177	2
20	275	177	2
*20.25	282	184	2
20.5	282	184	2
*20.75	282	184	2
21	282	184	2
*21.25	289	191	2
21.5	289	191	2
*21.75	289	191	2
22	289	191	2
*22.25	289	191	2
22.5	296	198	2
*22.75	296	198	2
23	296	198	2
*23.25	319	198	3
23.5	319	198	3
*23.75	327	206	3
24	327	206	3
*24.25	327	206	3
24.5	327	206	3
*24.75	327	206	3
25	327	206	3
*25.25	335	214	3
25.5	335	214	3
*25.75	335	214	3
26	335	214	3
*26.25	335	214	3
26.5	335	214	3
*26.75	343	222	3
27	343	222	3
*27.25	343	222	3
27.5	343	222	3
*27.75	343	222	3
28	343	222	3
*28.25	351	230	3
28.5	351	230	3
*28.75	351	230	3
29	351	230	3

Note: Min.Ordering quantity may apply for the sizes as "*"

HSS TAPER SHANK TWIST DRILL

DIN341 GB1439

Dia.	Overall Length	Flute Length	MTNO.
*29.25	351	230	3
29.5	351	230	3
*29.75	351	230	3
30	351	230	3
*30.25	360	239	3
30.5	360	239	3
*30.75	360	239	3
31	360	239	3
*31.25	360	239	3
31.5	360	239	3
*31.75	369	248	3
32	397	248	4
32.5	397	248	4
33	397	248	4
33.5	397	248	4
34	406	257	4
34.5	406	257	4
35	406	257	4
35.5	406	257	4
36	416	267	4
36.5	416	267	4
37	416	267	4
37.5	416	267	4
38	426	277	4
38.5	426	277	4
39	426	277	4
39.5	426	227	4
40	426	227	4
40.5	436	287	4
41	436	287	4
41.5	436	287	4
42	436	287	4
42.5	436	287	4
43	447	298	4
43.5	447	298	4
44	447	298	4
44.5	447	298	4
45	447	298	4
45.5	459	310	4
46	459	310	4
46.5	459	310	4
47	459	310	4
47.5	459	310	4
48	470	321	4
48.5	470	321	4
49	470	321	4
49.5	470	321	4
50	470	321	4

Note: Min.Ordering quantity may apply for the sizes as " * "

DIN341 GB1439

Dia.	Overall Length	Flute Length	MTNO.
12	199	101	2
12.2	199	101	2
12.5	199	101	2
12.8	199	101	2
13	199	101	2
13.2	199	101	2
13.5	206	108	2
13.8	206	108	2
14	206	108	2
*18.25	256	135	3
18.5	256	135	3
*18.75	256	135	3
19	256	135	3
*19.25	261	140	3
19.5	261	140	3
*19.75	261	140	3
20	261	140	3
*20.25	266	145	3
20.5	266	145	3
*20.75	266	154	3
21	266	145	3
*21.25	271	150	3
21.5	271	150	3
*21.75	271	150	3

*MTNO.-- MORSE TAPER NO.

Note: Min.Ordering quantity may apply for the sizes as " * "

DIN341 GB1439

Dia.	Overall Length	Flute Length	MTNO.
31.5	329	180	4
31.75	334	185	4
40.5	392	205	5
41	392	205	5
41.5	392	205	5
42	392	205	5
42.5	392	205	5
43	397	210	5
43.5	397	210	5
44	397	210	5
44.5	397	210	5
45	397	210	5
45.5	402	215	5
46	402	215	5
46.5	402	215	5
47	402	215	5
47.5	402	215	5
48	407	220	5
48.5	407	220	5
49	407	220	5
49.5	407	220	5
50	407	220	5
50.5	412	225	5

HSS TAPER SHANK TWIST DRILL

ANSI Standard

Dia.	Dec. Equiv.	Flute Length	Overall Length	Taper Shank#
1/8	.1250	1-7/8	5-1/8	1
9/64	.1406	2-1/8	5-3/8	1
5/32	.1562	2-1/8	5-3/8	1
11/64	.1719	2-1/2	5-3/4	1
3/16	.1875	2-1/2	5-3/4	1
13/64	.2031	2-3/4	6	1
7/32	.2188	2-3/4	6	1
15/64	.2344	2-7/8	6-1/8	1
1/4	.2500	2-7/8	6-1/8	1
17/64	.2656	3	6-1/4	1
9/32	.2812	3	6-1/4	1
19/64	.2969	3-1/8	6-3/8	1
5/16	.3125	3-1/8	6-3/8	1
21/64	.3281	3-1/4	6-1/2	1
11/32	.3438	3-1/4	6-1/2	1
23/64	.3594	3-1/2	6-3/4	1
3/8	.3750	3-1/2	6-3/4	1
25/64	.3906	3-5/8	7	1
13/32	.4062	3-5/8	7	1
27/64	.4219	3-7/8	7-1/4	1
7/16	.4375	3-7/8	7-1/4	1
29/64	.4531	4-1/8	7-1/2	1
15/32	.4688	4-1/8	7-1/2	1
31/64	.4844	4-3/8	8-1/4	2
1/2	.5000	4-3/8	8-1/4	2
33/64	.5156	4-5/8	8-1/2	2
17/32	.5312	4-5/8	8-1/2	2
35/64	.5469	4-7/8	8-3/4	2
9/16	.5625	4-7/8	8-3/4	2
37/64	.5781	4-7/8	8-3/4	2
19/32	.5938	4-7/8	8-3/4	2
39/64	.6094	4-7/8	8-3/4	2
5/8	.6250	4-7/8	8-3/4	2
41/64	.6406	5-1/8	9	2
21/32	.6562	5-1/8	9	2
43/64	.6719	5-3/8	9-1/4	2
11/16	.6875	5-3/8	9-1/4	2
45/64	.7031	5-5/8	9-1/2	2
23/32	.7188	5-5/8	9-1/2	2
47/64	.7344	5-7/8	9-3/4	2
3/4	.7500	5-7/8	9-3/4	2
49/64	.7656	6	9-7/8	2
25/32	.7812	6	9-7/8	2

Dia.	Dec. Equiv.	Flute Length	Overall Length	Taper Shank#
51/64	.7969	6-1/8	10-3/4	3
13/16	.8125	6-1/8	10-3/4	3
53/64	.8281	6-1/8	10-3/4	3
27/32	.8438	6-1/8	10-3/4	3
55/64	.8594	6-1/8	10-3/4	3
7/8	.8750	6-1/8	10-3/4	3
57/64	.8906	6-1/8	10-3/4	3
29/32	.9062	6-1/8	10-3/4	3
59/64	.9219	6-1/8	10-3/4	3
15/16	.9375	6-1/8	10-3/4	3
61/64	.9531	6-3/8	11	3
31/32	.9688	6-3/8	11	3
63/64	.9844	6-3/8	11	3
1	1.0000	6-3/8	11	3
1-1/64	1.0156	6-1/2	11-1/8	3
1-1/32	1.0312	6-1/2	11-1/8	3
1-3/64	1.0469	6-5/8	11-1/4	3
1-1/16	1.0625	6-5/8	11-1/4	3
1-5/64	1.0781	6-7/8	12-1/2	4
1-3/32	1.0938	6-7/8	12-1/2	4
1-7/64	1.1094	7-1/8	12-3/4	4
1-1/8	1.1250	7-1/8	12-3/4	4
1-9/64	1.1406	7-1/4	12-7/8	4
1-5/32	1.1562	7-1/4	12-7/8	4
1-11/64	1.1719	7-3/8	13	4
1-3/16	1.1875	7-3/8	13	4
1-13/64	1.2031	7-1/2	13-1/8	4
1-7/32	1.2188	7-1/2	13-1/8	4
1-15/64	1.2344	7-7/8	13-1/2	4
1-1/4	1.2500	7-7/8	13-1/2	4
1-17/64	1.2656	8-1/2	14-1/8	4
1-9/32	1.2812	8-1/2	14-1/8	4
1-19/64	1.2969	8-5/8	14-1/4	4
1-5/16	1.3125	8-5/8	14-1/4	4
1-21/64	1.3281	8-3/4	14-3/8	4
1-11/32	1.3438	8-3/4	14-3/8	4
1-23/64	1.3594	8-7/8	14-1/2	4
1-3/8	1.3750	8-7/8	14-1/2	4
1-25/64	1.3906	9	14-5/8	4
1-13/32	1.4062	9	14-5/8	4
1-27/64	1.4219	9-1/8	14-3/4	4
1-7/16	1.4375	9-1/8	14-3/4	4
1-29/64	1.4531	9-1/4	14-7/8	4

Note: Min.Ordering quantity may apply for the sizes as "*"

HSS TAPER SHANK TWIST DRILL

ANSI Standard

Dia.	Dec. Equiv.	Flute Length	Overall Length	Taper Shank#
1-15/32	1.4688	9-1/4	14-7/8	4
1-31/64	1.4844	9-3/8	15	4
1-1/2	1.5000	9-3/8	15	4
1-17/32	1.5312	9-3/8	16-3/8	5
1-9/16	1.5625	9-5/8	16-5/8	5
1-19/32	1.5938	9-7/8	16-7/8	5
1-5/8	1.6250	10	17	5
1-21/32	1.6562	10-1/8	17-1/8	5
1-11/16	1.6875	10-1/8	17-1/8	5
1-23/32	1.7188	10-1/8	17-1/8	5
1-3/4	1.7500	10-1/8	17-1/8	5
1-25/32	1.7812	10-1/8	17-1/8	5
1-13/16	1.8125	10-1/8	17-1/8	5
1-27/32	1.8438	10-1/8	17-1/8	5
1-7/8	1.8750	10-3/8	17-3/8	5
1-29/32	1.9062	10-3/8	17-3/8	5
1-15/16	1.9375	10-3/8	17-3/8	5
1-31/32	1.9688	10-3/8	17-3/8	5
2	2.0000	10-3/8	17-3/8	5
2-1/32	2.0312	10-3/8	17-3/8	5
2-1/16	2.0625	10-1/4	17-3/8	5
2-3/32	2.0938	10-1/4	17-3/8	5
2-1/8	2.1250	10-1/4	17-3/8	5
2-5/32	2.1562	10-1/4	17-3/8	5
2-3/16	2.1875	10-1/4	17-3/8	5
2-7/32	2.2188	10-1/8	17-3/8	5
2-1/4	2.2500	10-1/8	17-3/8	5
2-5/16	2.3125	10-1/8	17-3/8	5
2-3/8	2.3750	10-1/8	17-3/8	5
2-7/16	2.4375	11-1/4	18-3/4	5
2-1/2	2.5000	11-1/4	18-3/4	5
2-9/16	2.5625	11-7/8	19-1/2	5
2-5/8	2.6250	11-7/8	19-1/2	5
2-11/16	2.6875	12-3/4	20-3/8	5
2-3/4	2.7500	12-3/4	20-3/8	5
2-13/16	2.8125	13-3/8	21-1/8	5
2-7/8	2.8750	13-3/8	21-1/8	5
2-15/16	2.9375	14	21-3/4	5
3	3.0000	14	21-3/4	5
3-1/8	3.1250	14-5/8	24-1/2	6
3-1/4	3.2500	15-1/2	25-1/2	6
3-1/2	3.5000	15-1/2	25-1/2	6

Note: Min.Ordering quantity may apply for the sizes as " * "

TIANGONG TOOLS

HSS TAPS

HSS TAPS INDEX

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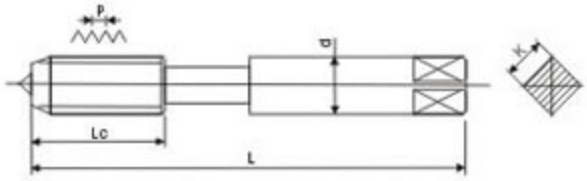
3C. USING MATERIAL		
3C. 1		HSS-M42/M35/M2

Completely imported tap production line

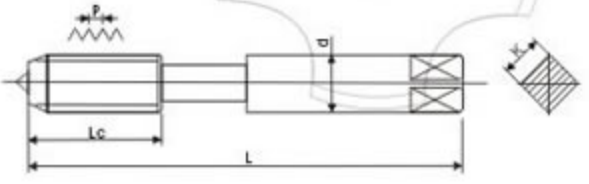


Art.11 GB(ISO)Taps with enforced shank

Conform to GB/T3464.1-94, equal to ISO529-1975
M2 HSS
For manual and machine
For through holes or blind holes

Code	M	P(mm)	L(mm)	Lc(mm)	D(mm)	K(mm)	N	Hole(mm)	Tap limits
1110030	M3	0.5	48	11	3.15	2.5	3	2.5	H1 H2 H3
1110040	M4	0.7	53	13	4.0	3.15	3	3.3	
1110050	M5	0.8	58	16	5.0	4.0	3	4.2	
1110060	M6	1.0	66	19	6.3	5.0	3	5.0	
1110080	M8	1.25	72	22	8.0	6.3	3	6.7	
1110090	M9	1.25	72	22	9.0	7.1	3	7.7	
1110100	M10	1.5	80	24	10	8.0	3	8.5	

Up to M6: With male center



Art.12 GB(ISO)Taps with enforced shank

Conform to GB/T3464.1-94, equal to ISO529-1975
M2 HSS
For manual and machine
For through holes or blind holes

Code	M	P(mm)	L(mm)	Lc(mm)	d(mm)	K(mm)	Hole(mm)	Tap limits
1210030	M3	0.5	48	11	2.24	1.8	2.5	H1 H2 H3
1210040	M4	0.7	53	13	3.15	2.5	3.3	H1 H2 H3
1210050	M5	0.8	58	16	4.0	3.15	4.2	H1 H2 H3
1210060	M6	1.0	66	19	4.5	3.55	5.0	H1 H2 H3
1210062	M6X0.75	0.75					5.25	

HSS TAPS

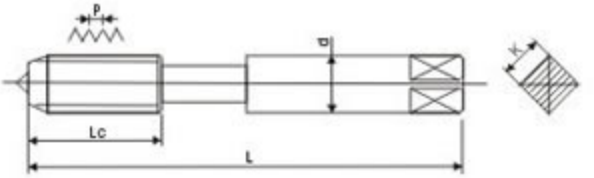
Code	M	P(mm)	L(mm)	Lc(mm)	d(mm)	K(mm)	Hole(mm)	Tap limits
1210080	M8	1.25	72	22	6.3	5.0	6.7	H1 H2 H3
1210083	M8X1.0	1.0					7.0	
1210100	M10	1.5	80	24	8.0	6.3	8.5	H1 H2 H3
1210104	M10X1.25	1.25					8.75	
1210103	M10X1.0	1.0					9.0	
1210120	M12	1.75	80	29	9.0	7.1	10.25	H1 H2 H3
1210124	M12X1.25	1.25					10.75	
1210123	M12X1.0	1.0	80	22			11.0	
1210140	M14	2.0	95	30	11.2	9.0	12.0	H1 H2 H3
1210145	M14X1.5	1.5					12.5	
1210143	M14X1.0	1.0	87	22			13.0	
1210160	M16	2.0	102	32	12.5	10	14.0	H1 H2 H3
1210165	M16X1.5	1.5					14.5	
1210163	M16X1.0	1.0	92	22			15.0	
1210180	M18	2.5	112	37	14	11.2	15.5	H1 H2 H3
1210185	M18X1.5	1.5					16.5	
1210183	M18X1.0	1.0	97	22			17.0	
1210200	M20	2.5	112	37	14	11.2	17.5	H1 H2 H3
1210207	M20X2.0	2.0					18.0	
1210205	M20X1.5	1.5					15.5	
1210203	M20X1.0	1.0	102	22			19.0	
1210220	M22	2.5	118	38	16	12.5	19.5	H1 H2 H3
1210227	M22X2.0	2.0					20.0	
1210225	M22X1.5	1.5	118	38	16	12.5	20.5	H1 H2 H3
1210223	M22X1.0	1.0	109	24		12.5	21.0	
1210240	M24	3.0	130	45	18	14	21.0	H1 H2 H3
1210247	M24X2.0	2.0					22.0	
1210245	M24X1.5	1.5					22.5	
1210243	M24X1.0	1.0	114	24			23.0	
1210270	M27	3.0	125	45	20	16	24.0	H1 H2 H3
1210277	M27X2.0	2.0	127	37			25.0	
1210300	M30	3.5	138	48	20	16	26.5	H1 H2 H3
1210307	M30X2.0	2.0	127	37			28.0	
1210305	M30X1.5	1.5					28.5	
1210325	M32X1.5	1.5	137	37	22.4	18	30.5	H1 H2 H3
1210330	M33	3.5	151	51	22.4	18	29.5	H1 H2 H3
1210355	M35X1.5	1.5	144	39	25	20	33.5	H1 H2 H3
1210360	M36	4.0	162	57	25	20	32.0	H1 H2 H3
1210365	M36X1.5	1.5	144	39			34.5	
1210390	M39	4.0	170	60	28	22.4	35.0	H1 H2 H3
1210405	M40X1.5	1.5	149	39	28	22.4	38.5	H1 H2 H3
1210420	M42	4.5	170	60	28	22.4	37.5	H1 H2 H3
1210425	M42X1.5	1.5	149	39			40.5	
1210450	M45	4.5	187	67	31.5	25	40.5	H1 H2 H3
1210455	M45X1.5	1.5	165	45	28	22.4	43.5	
1210480	M48	5.0	187	67	31.5	25	43.0	H1 H2 H3
1210485	M48X1.5	1.5	165	45			46.5	
1210505	M50X1.5	1.5	165	45	31.5	25	48.5	H1 H2 H3
1210520	M52	5.0	200	70	35.5	28	47.0	H1 H2 H3
1210525	M52X1.5	1.5	175	45			50.5	

Up to M6: With male center

P≤2.5mm: Both one piece and 3 of set are available
One piece with chamfer of 3.5P,2P
3 of set with chamfers 8P,4P,2P

P>2.5mm: 3 of set with chamfers 8P,4P,2P are available

HSS TAPS



Art.13 GB(ISO)Taps with long shank

Conform to GB/T3464.1-94, equal to ISO2283-1975
M2 HSS
For deep holes
For manual and machine

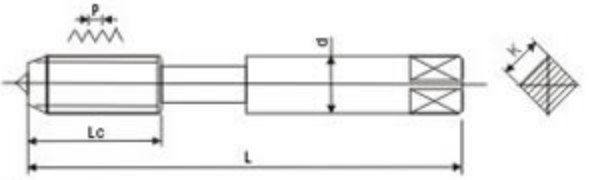
Code	M	P(mm)	L(mm)	Lc(mm)	d(mm)	K(mm)	Hole(mm)	Tap limits
1310030	M3	0.5	66	11	2.24	1.8	2.5	H1 H2 H3
1310040	M4	0.7	73	13	3.15	2.5	3.3	H1 H2 H3
1310050	M5	0.8	79	16	4.0	3.15	4.2	H1 H2 H3
1310060	M6	1.0	89	19	4.5	3.55	5.0	H1 H2 H3
1310062	M6X0.75	0.75					5.25	
1310080	M8	1.25	97	22	6.3	5.0	6.7	H1 H2 H3
1310083	M8X1.0	1.0	97	19			7.0	
1310100	M10	1.5	108	24	8.0	6.3	8.5	H1 H2 H3
1310104	M10X1.25	1.25		20			8.75	
1310103	M10X1.0	1.0					9.0	
1310120	M12	1.75	119	29	9.0	7.1	10.25	H1 H2 H3
1310125	M12X1.5	1.5					10.5	
1310140	M14	2.0	127	30	11.2	9.0	12.0	H1 H2 H3
1310125	M14X1.5	1.5					12.5	
1310160	M16	2.0	137	32	12.5	10	14.0	H1 H2 H3
1310165	M16X1.5	1.5					14.5	
1310180	M18	2.5	149	37	14	11.2	15.5	H1 H2 H3
1310185	M18X1.5	1.5		29			16.5	
1310200	M20	2.5	149	37	14	11.2	17.5	H1 H2 H3
1310205	M20X1.5	1.5		29			18.5	
1310220	M22	2.5	158	38	16	12.5	19.5	H1 H2 H3
1310225	M22X1.5	1.5		33	16	12.5	20.5	
1310240	M24	3	172	45	18	14	21	H1 H2 H3
1310245	M24X1.5			35			22.5	

Up to M6: With male center

P≤2.5mm: Both one piece and 3 of set are available
One piece with chamfer of 3.5P and
3 of set with chamfers 8P,4P,2P

P>2.5mm: 3 of set with chamfers 8P,4P,2P are available

HSS TAPS

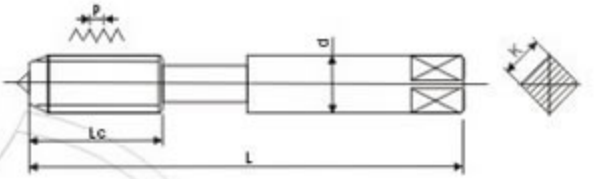


Art.13 GB(ISO)Taps with long shank

Conform to GB/T3464.1-94, equal to ISO529-1975
M2 HSS
For manual and machine
For through holes or bind holes

Code	M	P(mm)	L(mm)	Lc(mm)	d(mm)	Chamfer	K(mm)	N	Hole(mm)	Tap limits
1410030	M3	0.5	40	11	3.15	3P	2.5	3	2.5	H1 H2 H3
1410040	M4	0.7	45	13	4.0	3P	3.15	3	3.3	
1410050	M5	0.8	50	16	5.0	3P	4.0	3	4.2	
1410060	M6	1.0	55	19	6.3	3P	5.0	3	5.0	
1410080	M8	1.25	65	22	8.0	3P	6.3	3	6.7	
1410100	M10	1.5	70	24	10	3P	8.0	3	8.5	

Up to M6: With male center



Art.15 GB(ISO)Taps with short-straight shank

Conform to GB/T3464.1-94, equal to ISO527-1975
M2 HSS
For manual and machine
For through holes or bind holes

Code	M	P(mm)	L(mm)	Lc(mm)	d(mm)	K(mm)	Hole(mm)	Tap limits
1510030	M3	0.5	40	11	2.24	1.8	2.5	H1 H2 H3
1510040	M4	0.7	45	13	3.15	2.5	3.3	H1 H2 H3
1510050	M5	0.8	50	16	4.0	3.15	4.2	H1 H2 H3
1510060	M6	1.0	55	19	4.5	3.55	5.0	H1 H2 H3
1510062	M6X0.75	0.75	50	19			5.25	

HSS TAPS

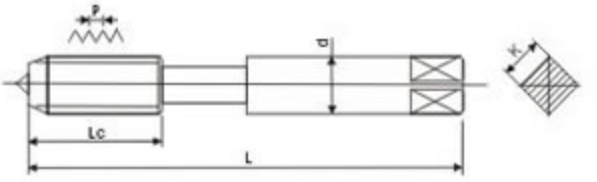
Code	M	P(mm)	L(mm)	Lc(mm)	d(mm)	K(mm)	Hole(mm)	Taplimits
1510080	M8	1.25	65	22	6.3	5.0	6.7	H1 H2 H3
1510083	M8X1.0	1.0	60	22			7.0	
1510100	M10	1.5	70	24	8.0	6.3	8.5	H1 H2 H3
1510104	M10X1.25	1.25	65	24			8.75	
1510103	M10X1.0	1.0					9.0	
1510120	M12	1.75	80	29	9.0	7.1	10.25	H1 H2 H3
1510125	M12X1.25	1.25	70	29			10.5	
1510123	M12X1.0	1.0	70	22			11.0	
1510140	M14	2.0	90	30	11.2	9.0	12.0	H1 H2 H3
1510145	M14X1.5	1.5	70	30			12.5	
1510143	M14X1.0	1.0	70	22			13.0	
1510160	M16	2.0	90	32	12.5	10.0	14.0	H1 H2 H3
1510165	M16X1.5	1.5	80	32			14.5	
1510163	M16X1.0	1.0	80	22			15.0	
1510180	M18	2.5	100	37	14	11.2	15.5	H1 H2 H3
1510185	M18X1.5	1.5	90	37			16.5	
1510183	M18X1.0	1.0	90	22			17.0	
1510200	M20	2.5	100	37	14	11.2	17.5	H1 H2 H3
1510207	M20X2.0	2.0	90	37			18.0	
1510205	M20X1.5	1.5	90	37			15.5	
1510203	M20X1.0	1.0	90	22			19.0	
1510220	M22	2.5	110	38	16	12.5	19.5	H1 H2 H3
1510227	M22X2.0	2.0	90	38			20.0	
1510225	M22X1.5	1.5	90	38			20.5	H1 H2 H3
1510223	M22X1.0	1.0	90	24			21.0	
1510240	M24	3.0	120	45	18	14	21.0	H1 H2 H3
1510247	M24X2.0	2.0	95	45			22.0	
1510245	M24X1.5	1.5	95	45			22.5	
1510243	M24X1.0	1.0	95	24			23.0	
1510270	M27	3.0	120	45	20	16	24.0	H1 H2 H3
1510277	M27X2.0	2.0	95	37			25.0	
1510300	M30	3.5	130	48	20	16	26.5	H1 H2 H3
1510307	M30X2.0	2.0	105	37			28.0	
1510305	M30X1.5	1.5					28.5	
1510325	M32X1.5	1.5	115	37	22.4	18	30.5	H1 H2 H3
1510330	M33	3.5	130	51	22.4	18	29.5	H1 H2 H3
1510355	M35X1.5	1.5	125	39	25	20	33.5	H1 H2 H3
1510360	M36	4.0	145	57	25	20	32.0	H1 H2 H3
1510365	M36X1.5	1.5	125	39			34.5	
1510390	M39	4.0	145	60	28	22.4	35.0	H1 H2 H3
1510405	M40X1.5	1.5	130	39	28	22.4	38.5	H1 H2 H3
1510420	M42	4.5	160	60	28	22.4	37.5	H1 H2 H3
1510425	M42X1.5	1.5	130	39			40.5	
1510450	M45	4.5	160	67	31.5	25	40.5	H1 H2 H3
1510455	M45X1.5	1.5	140	45	28	25	43.5	
1510480	M48	5.0	175	67	31.5	25	43.0	H1 H2 H3
1510485	M48X1.5	1.5	150	45			46.5	
1510505	M50X1.5	1.5	150	45	31.5	25	48.5	H1 H2 H3
1510520	M52	5.0	175	70	35.5	28	47.0	H1 H2 H3
1510525	M52X1.5	1.5	150	45			50.5	

Up to M6: With male center

P ≤ 2.5mm: Both one piece and 3 of set are available
One piece with chamfer of 3.5P and
3 of set with chamfers 8P,4P,2P

P > 2.5mm: 3 of set with chamfers 8P,4P,2P are available

HSS TAPS

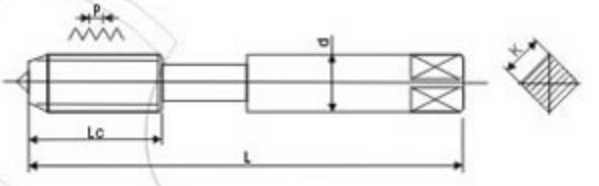


Art.16 Spiral Pointed Taps with enforced shank

Conform to GB/T3464.1-94, equal to ISO529-1975
M2 HSS
M35 HSS-E, Coatings, available for specified requirements
For machine
For through holes
Good cutting action, high speeding

Code	M	P(mm)	L(mm)	Lc(mm)	d(mm)	K(mm)	N	Hole(mm)	Tap limits
1610030	M3	0.5	48	11	3.15	2.5	3	2.5	H1 H2 H3
1610040	M4	0.7	53	13	4.0	3.15	3	3.3	
1610050	M5	0.8	58	16	5.0	4.0	3	4.2	
1610060	M6	1.0	66	19	6.3	5.0	3	5.0	
1610080	M8	1.25	72	22	8.0	6.3	3	6.7	
1610100	M10	1.5	80	24	10	8.0	3	8.5	

Up to M6: With male center



Art.17 Spiral Pointed Taps with straight shank

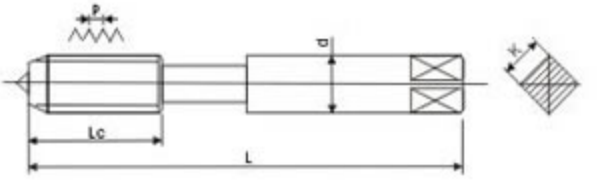
Conform to GB/T3464.1-94, equal to ISO529-1975
M2 HSS
M35 HSS-E, Coatings, available for specified requirements
For machine
For through holes
Good cutting action, high speeding

HSS TAPS

Code	M	P(mm)	L(mm)	Lc(mm)	d(mm)	K(mm)	Hole(mm)	Taplimits
1710030	M3	0.5	48	11	2.24	1.8	2.5	H1 H2 H3
1710040	M4	0.7	53	13	3.15	2.5	3.3	H1 H2 H3
1710050	M5	0.8	58	16	4.0	3.15	4.2	H1 H2 H3
1710060	M6	1.0	66	19	4.5	3.55	5.0	H1 H2 H3
1710062	M6X0.75	0.75					5.25	
1710080	M8	1.25	72	22	6.3	5.0	6.7	H1 H2 H3
1710083	M8X1.0	1.0					7.0	
1710100	M10	1.5	80	24	8.0	6.3	8.5	H1 H2 H3
1710104	M10X1.25	1.25					8.75	
1710103	M10X1.0	1.0					9.0	
1710120	M12	1.75	89	29	9.0	7.1	10.25	H1 H2 H3
1710125	M12X1.5	1.5					10.5	
1710123	M12X1.0	1.0	80	22			11.0	
1710140	M14	2.0	95	30	11.2	9.0	12.0	H1 H2 H3
1710145	M14X1.5	1.5					12.5	
1710143	M14X1.0	1.0	87	22			13.0	
1710160	M16	2.0	102	32	12.5	10	14.0	H1 H2 H3
1710165	M16X1.5	1.5					14.5	
1710163	M16X1.0	1.0	92	22			15.0	
1710180	M18	2.5	112	37	14	11.2	15.5	H1 H2 H3
1710185	M18X1.5	1.5					16.5	
1710183	M18X1.0	1.0	97	22			17.0	
1710200	M20	2.5	112	37	14	11.2	17.5	H1 H2 H3
1710207	M20X2.0	2.0					18	
1710205	M20X1.5	1.5					18.5	
1710203	M20X1.0	1.0	102	22			19.0	H1 H2 H3
1710220	M22	2.5	118	38	16	12.5	19.5	H1 H2 H3
1710227	M22X2.0	2.0					20.0	
1710225	M22X1.5	1.5					20.5	
1710223	M22X1.0	1.0	109	24			21.0	
1710240	M24	3.0	130	45	18	14	21.0	H1 H2 H3
1710247	M24X2.0	2.0					22.0	
1710245	M24X1.5	1.5					22.5	
1710243	M24X1.0	1.0	114	24			23.0	

Up to M6: With male center

HSS TAPS

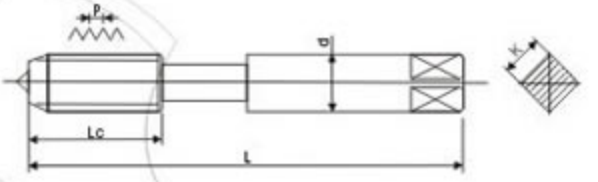


Art.18 Spiral Flute Taps with enforced shank

Conform to GB/T3464.1-94, equal to ISO529-1975
M2 HSS
M35 HSS-E, Coatings, available for specified requirements
For machine
For through holes
Good cutting action, high speeding

Code	M	P(mm)	L(mm)	Lc(mm)	d(mm)	K(mm)	N	Hole(mm)	Tap limits
1810030	M3	0.5	48	11	3.15	2.5	3	2.5	H1 H2 H3
1810040	M4	0.7	53	13	4.0	3.15	3	3.3	
1810050	M5	0.8	58	16	5.0	4.0	3	4.2	
1810060	M6	1.0	66	19	6.3	5.0	3	5.0	
1810080	M8	1.25	72	22	8.0	6.3	3	6.7	
1810100	M10	1.5	80	24	10	8.0	3	8.5	

Up to M6: With male center



Art.19 Spiral Pointed Taps with straight shank

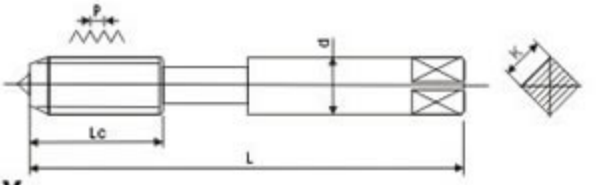
Conform to GB/T3464.1-94, equal to ISO527-1975
M2 HSS
M35 HSS-E, Coatings, available for specified requirements
For machine
For through holes
Good cutting action, high speeding

HSS TAPS

Code	M	P(mm)	L(mm)	Lc(mm)	d(mm)	K(mm)	Hole(mm)	Taplimits
1910030	M3	0.5	48	11	2.24	1.8	2.5	H1 H2 H3
1910040	M4	0.7	53	13	3.15	2.5	3.3	H1 H2 H3
1910050	M5	0.8	58	16	4.0	3.15	4.2	H1 H2 H3
1910060	M6	1.0	66	19	4.5	3.55	5.0	H1 H2 H3
1910062	M6X0.75	0.75					5.25	
1910080	M8	1.25	72	22	6.3	5.0	6.7	H1 H2 H3
1910083	M8X1.0	1.0					7.0	
1910100	M10	1.5	80	24	8.0	6.3	8.5	H1 H2 H3
1910104	M10X1.25	1.25					8.75	
1910103	M10X1.0	1.0					9.0	
1910120	M12	1.75	89	29	9.0	7.1	10.25	H1 H2 H3
1910125	M12X1.5	1.5					10.75	
1910123	M12X1.0	1.0	80	22			11.0	
1910140	M14	2.0	95	30	11.2	9.0	12.0	H1 H2 H3
1910145	M14X1.5	1.5					12.5	
1910143	M14X1.0	1.0	87	22			13.0	
1910160	M16	2.0	102	32	12.5	10	14.0	H1 H2 H3
1910165	M16X1.5	1.5					14.5	
1910163	M16X1.0	1.0	92	22			15.0	
1910180	M18	2.5	112	37	14	11.2	15.5	H1 H2 H3
1910185	M18X1.5	1.5					16.5	
1910183	M18X1.0	1.0	97	22			17.0	
1910200	M20	2.5	112	37	14	11.2	17.5	H1 H2 H3
1910207	M20X2.0	2.0					18	
1910205	M20X1.5	1.5					18.5	
1910203	M20X1.0	1.0	102	22			19.0	H1 H2 H3
1910220	M22	2.5	118	38	16	12.5	19.5	H1 H2 H3
1910227	M22X2.0	2.0					20.0	
1910225	M22X1.5	1.5					20.5	
1910223	M22X1.0	1.0	109	24			21.0	
1910240	M24	3.0	130	45	18	14	21.0	H1 H2 H3
1910247	M24X2.0	2.0					22.0	
1910245	M24X1.5	1.5					22.5	
1910243	M24X1.0	1.0	114	24			23.0	

Up to M6: With male center

HSS TAPS

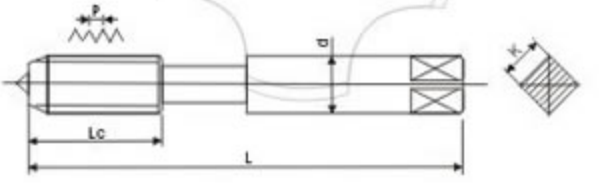


Art.S O T Taps for Titanium Alloy

Made of Powder metallurgy HSS.
Special designed and coated.
For difficult to machine materials, such as Titanium Alloy, only for machine.
With a highly diluted water soluble oil.
Long life, high speeding and steady quality of the tapped thrad.

Code	M	P(mm)	L(mm)	Lc(mm)	Ll(mm)	Chamfer	d(mm)	n	Hole(mm)	Tap limits
S04403T	M3	0.5	46	11	19	2.5P	4	3	2.5	H2 H3
S04404T	M4	0.7	52	13	21	2.5P	5	3	3.3	
S04405T	M5	0.8	60	16	24	2.5P	5.5	3	4.2	
S04406T	M6	1.0	62	19	29	2.5P	6	3	5.0	
S04408T	M8	1.25	70	22	36	2.5P	7	3	6.7	
S04410T	M10	1.5	75	24	41	2.5P	8.5	3	8.5	
S04412T	M12	1.75	82	29	43	2.5P	10.5	3	10.2	

Up to M6: With male center
ANSI, DIN, JIS and metric-fine thread are available for specified requiremens



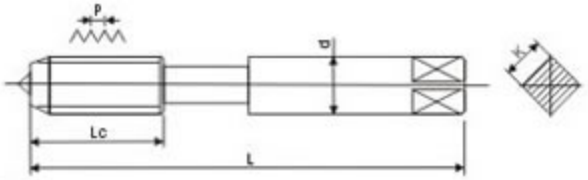
Art.S O C Taps for Copper

Made of HSS-E
Special designed and coated.
For COPPER
Long life, high speeding and steady quality of the tapped thrad.

Code	M	P(mm)	L(mm)	Lc(mm)	Chamfer	d(mm)	n	Hole(mm)	Tap limits
S02303C	M3	0.5	46	3.5	2.5P	4	3	2.5	H2 H3
S02304C	M4	0.7	52	5.0	2.5P	5	3	3.3	
S02305C	M5	0.8	60	5.5	2.5P	5.5	3	4.2	
S02306C	M6	1.0	62	7.0	2.5P	6	3	5.0	
S02308C	M8	1.25	70	8.5	2.5P	6.2	3	6.7	
S02310C	M10	1.5	75	10.5	2.5P	7.0	3	8.5	
S02312C	M12	1.75	82	12	2.5P	8.5	3	10.2	

Up to M6: With male center
ANSI, DIN, JIS and metric-fine thread are available for specified requiremens

HSS TAPS



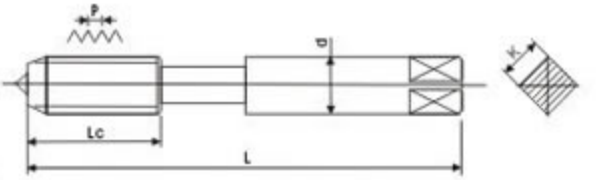
Art.S O A Taps for Aluminums

Made of HSS-E
Special designed
For Aluminum
Long life, high speeding and steady quality of the tapped thrad.

Code	M	P(mm)	L(mm)	Lc(mm)	Chamfer	d(mm)	n	Hole(mm)	Tap limits
S02003A	M3	0.5	46	4	2.5P	4	2	2.5	H2 H3
S02004A	M4	0.7	52	5.6	2.5P	5	2	3.3	
S02005A	M5	0.8	60	6.4	2.5P	5.5	2	4.2	
S02006A	M6	1.0	62	8	2.5P	6	2	5.0	
S02008A	M8	1.25	70	10	2.5P	6.2	2	6.7	
S02010A	M10	1.5	75	12	2.5P	7.0	2	8.5	
S02012A	M12	1.75	82	14	2.5P	8.5	2	10.2	

Up to M6: With male center
ANSI, DIN, JIS and metric-fine thread are available for specified requiremens

HSS TAPS



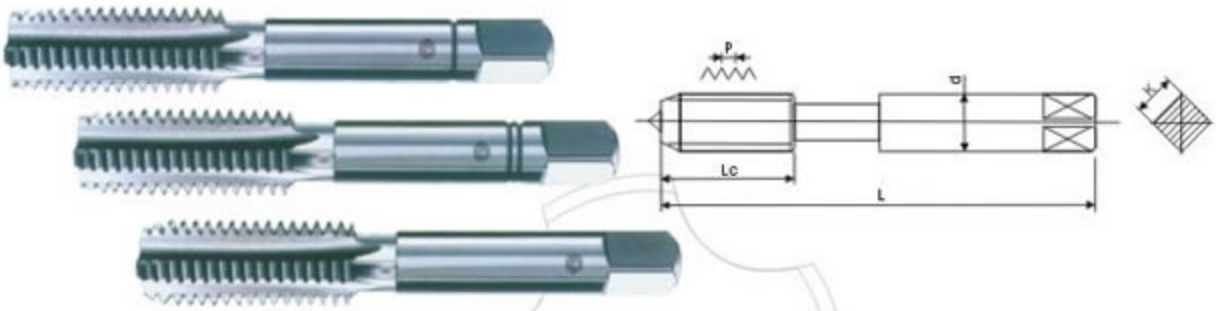
Art.S O S Taps for Stainless

Made of HSS-E
Special designed and coated
For stainless steels
With a highly diluted water soluble oil
Long life, high speeding and steady quality of the tapped thrad.

Code	M	P(mm)	L(mm)	Lc(mm)	Chamfer	d(mm)	n	Hole(mm)	Tap limits
S02203S	M3	0.5	46	11	2.5P	4	3	2.5	H2 H3
S02204S	M4	0.7	52	13	2.5P	5	3	3.3	
S02205S	M5	0.8	60	16	2.5P	5.5	3	4.2	
S02206S	M6	1.0	62	19	2.5P	6	3	5.0	
S02208S	M8	1.25	70	22	2.5P	6.2	3	6.7	
S02210S	M10	1.5	75	24	2.5P	7.0	3	8.5	
S02212S	M12	1.75	82	29	2.5P	8.5	3	10.2	
S02214S	M14	2.0	88	30	2.5P	10.5	3	12.0	
S02216S	M16	2.0	95	32	2.5P	12.5	3	14.0	
S02218S	M18	2.5	100	37	2.5P	14	4	15.5	
S02220S	M20	2.5	105	37	2.5P	14	4	17.5	
S02222S	M22	2.5	115	38	2.5P	17	4	19.5	
S02224S	M24	3.0	120	45	2.5P	19	4	21.0	
S02227S	M27	3.0	130	45	2.5P	20	4	24.0	

Up to M6: With male center
ANSI, DIN, JIS and metric-fine thread are available for specified requiremens

HSS TAPS

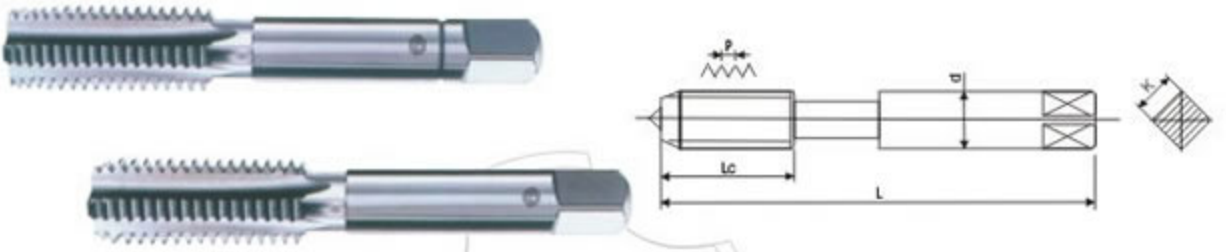


Art.2 1 DIN352 Hand Taps

DIN352, for metric-ISO thread DIN13, Tolerance 6H=ISO2
M2 HSS
M35 HSS-E, Coating, available for specified requirements
3 of set: Taper, Second and Plug.
For through holes and blind holes

Code	M	P(mm)	L(mm)	Lc(mm)	d(mm)	K(mm)	Hole(mm)	Taplimits
2110030	M3	0.5	40	11	3.5	2.7	2.5	
2110040	M4	0.7	45	13	4.5	3.4	3.3	
2110050	M5	0.8	50	16	6	4.9	4.2	
2110060	M6	1.0	50	19	6	4.9	5.0	
2110070	M7	1.0	50	19	6	4.9	6.0	
2110080	M8	1.25	56	22	6	4.9	6.75	
2110090	M9	1.25	63	22	7	5.5	7.75	
2110100	M10	1.5	70	24	7	5.5	8.5	
2110110	M11	1.5	70	24	8	6.2	9.5	
2110120	M12	1.75	75	29	9	7	10.25	
2110140	M14	2.0	80	30	11	9	12.0	
2110160	M16	2.0	80	32	12	9	14.0	
2110180	M18	2.5	95	40	14	11	15.5	6H
2110200	M20	2.5	95	40	16	12	17.5	
2110220	M22	2.5	100	40	18	14.5	19.5	
2110240	M24	3.0	110	50	18	14.5	21.0	
2110270	M27	3.0	110	50	20	16	24.0	
2110300	M30	3.5	125	56	22	18	26.5	
2110330	M33	3.5	125	56	25	20	29.5	
2110360	M36	4.0	150	63	28	22	32.0	
2110390	M39	4.0	150	63	32	24	35.0	
2110420	M42	4.5	150	63	32	24	37.5	
2110450	M45	4.5	160	70	36	29	40.5	
2110480	M48	5.0	180	75	36	29	43.0	
2110520	M52	5.0	180	75	40	32	47.0	

HSS TAPS



Art.2 2 DIN2181 Hand Taps

DIN2181, for metric-ISO thread DIN13, Tolerance 6H=ISO2
M2 HSS
M35 HSS-E, Coating, available for specified requirements
2 of set: Taper and Plug.
For through holes and blind holes

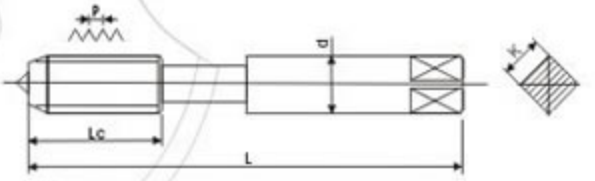
Code	M	P(mm)	L(mm)	Lc(mm)	d(mm)	K(mm)	Hole(mm)	Tap limits
2210030	M3x0.35	0.35	40	9	3.5	2.7	2.65	6H
2210041	M4X0.5	0.5	50	12	6	4.9	3.5	
2210051	M5X0.5	0.5	50	12	6	4.9	4.5	
2210052	M5X0.75	0.75					4.25	
2210061	M6X0.5	0.5	50	14	6	4.9	5.5	
2210062	M6X0.75	0.75					5.25	
2210072	M7X0.75	0.75	50	14	6	4.9	6.25	
2210081	M8X0.5	0.5	50	19	6	4.9	7.5	
2210082	M8X0.75	0.75					7.25	
2210083	M8X1.0	1.0	56	22			7.0	
2210092	M9X0.75	0.75	56	19	7	5.5	8.25	
2210093	M9X1.0	1.0	63	22			8.0	
2210102	M10X0.75	0.75	63	20	7	5.5	9.25	
2210103	M10X1.0	1.0					9.0	
2210104	M10X1.25	1.25	63	24			8.75	
2210113	M11X1.0	1.0	63	20	8	6.2	10.0	
2210114	M11X1.25	1.25					9.75	
2210122	M12X0.75	0.75	63	22	9	7	11.25	
2210123	M12X1.0	1.0	70	22			11.0	
2210124	M12X1.25	1.25					10.75	
2210125	M12X1.5	1.5					10.5	
2210133	M13X1.0	1.0	70	22	11	9	12.0	
2210135	M13X1.5	1.5					11.5	
2210142	M14X0.75	0.75	70	22	11	9	13.25	
2210143	M14X1.0	1.0					13.0	

HSS TAPS

Code	M	P(mm)	L(mm)	Lc(mm)	d(mm)	K(mm)	Hole(mm)	Tap limits
2210144	M14X1.25	1.25	70	22	11	9	12.75	6H
2210145	M14X1.5	1.5					12.5	
2210153	M15X1.0	1.0			12	9	14.0	
2210155	M15X15	1.5					13.5	
2210163	M16X1.0	1.0	70	22	12	9	15.0	
2210164	M16X1.25	1.25					14.75	
2210165	M16X1.5	1.5					14.5	
2210183	M18X1.0	1.0	70	22	14	11	17.0	
2210184	M18X1.25	1.25					16.75	
2210185	M18X1.5	1.5					16.5	
2210187	M18X2.0	2.0					16.0	
2210203	M20X1.0	1.0	80	22	16	12	19.0	
2210204	M20X1.25	1.25					18.75	
2210205	M20X1.5	1.5					18.5	
2210207	M20X2.0	2.0					18.0	
2210215	M21X1.5	1.5	80	22	16	12	19.5	
2210223	M22X1.0	1.0	80	22	18	14.5	21.0	
2210224	M22X1.25	1.25					20.75	
2210225	M22X1.5	1.5					20.5	
2210227	M22X2.0	2.0					20.0	
2210235	M23X1.5	1.5	80	22	18	14.5	21.5	
2210243	M24X1.0	1.0	90	22	18	14.5	23.0	
2210245	M24X1.5	1.5					22.5	
2210247	M24X2.0	2.0					22.0	
2210255	M25X1.5	1.5	90	22	18	14.5	23.5	
2210263	M26X1.0	1.0	90	22	18	14.5	25.0	
2210265	M26X1.5	1.5					24.5	
2210267	M26X2.0	2.0					24.0	
2210275	M27X1.5	1.5	90	22	20	16	25.5	
2210277	M27X2.0	2.0					25.0	
2210283	M28X1.0	1.0	90	22	20	16	27.0	
2210285	M28X1.5	1.5					26.5	
2210287	M28X2.0	2.0					26.0	
2210295	M29X1.5	1.5	90	22	22	18	27.5	
2210303	M30X1.0	1.0	90	22	22	18	29.0	
2210305	M30X1.5	1.5					28.5	
2210307	M30X2.0	2.0					28.0	
2210309	M30X3.0	3.0	125	66	22	18	27.0	
2210325	M32X1.5	1.5	90	22	22	18	30.5	

HSS TAPS

Code	M	P(mm)	L(mm)	Lc(mm)	d(mm)	K(mm)	Hole(mm)	Tap limits
2210335	M33X1.5	1.5	100	25	28	20	31.5	6H
2210337	M33X2.0	2.0					31.0	
2210339	M33X3.0	3.0	100	25	28	20	30.0	
2210345	M34X1.5	1.5	100	25	25	20	32.5	
2210347	M34X2.0	2.0					32.0	
2210355	M35X1.5	1.5	100	25	25	20	33.5	
2210365	M36X1.5	1.5	125	40	25	20	34.5	
2210367	M36X2.0	2.0	100	25	25	20	34.0	
2210369	M36X3.0	3.0	110	25	32	24	33.0	
2210385	M38X1.5	1.5	100	25	25	20	36.5	
2210395	M39X1.5	1.5	100	25	25	20	37.5	
2210397	M39X2.0	2.0	110	40	32	24	37.0	
2210399	M39X3.0	3.0					36.0	
2210405	M40X1.5	1.5	110	25	32	24	38.5	
2210407	M40X2.0	2.0	125	40	32	24	38.0	
2210409	M40X3.0	3.0					37.0	
2210425	M42X1.5	1.5	110	25	32	24	40.5	
2210427	M42X2.0	2.0	125	40	32	24	40.0	
2210429	M42X3.0	3.0					39.0	
2210455	M45X1.5	1.5	110	25	36	29	43.5	
2210457	M45X2.0	2.0	125	40	36	29	43.0	
2210459	M45X3.0	3.0					42.0	
2210485	M48X1.5	1.5	140	40	36	29	46.5	
2210487	M48X2.0	2.0					46.0	
2210489	M48X3.0	3.0					45.0	
2210505	M50X1.5	1.5	140	40	36	29	48.5	
2210525	M52X1.5	1.5	140	40	40	32	50.5	
2210527	M52X2.0	2.0					50.0	
2210529	M52X3.0	3.0					49.0	



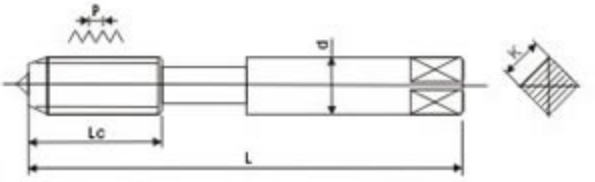
Art.2 3 DIN351 UNC/UNF Hand Taps

DIN351, for UNC/UNF thread, tolerance 2B
M2 HSS
M35 HSS-E, Coating, available for specified requirements
3 of set: Taper, Second and Plug.
For through holes and blind holes

HSS TAPS

Code	Size	T.P.I	D(mm)	L(mm)	Lc(mm)	d(mm)	K(mm)	Hole(mm)	Tap limits
2310100	NO.5-40UNC	40	3.18	40	12	3.5	2.7	2.6	2B
2310101	NO.5-44UNF	44	3.18	40	12			2.7	
2310110	NO.6-32UNC	32	3.51	45	14	4	3	2.8	
2310111	NO.6-40UNF	40	3.51	45	14			3.0	
2310120	NO.8-32UNC	32	4.17	45	14	4.5	3.4	3.4	
2310121	NO.8-36UNF	36	4.17	45	14			3.5	
2310130	NO.10-24UNC	24	4.83	48	16	6	4.9	3.9	
2310131	NO.10-32UNF	32	4.83	48	16			4.1	
2310140	NO.12-24UNC	24	5.49	50	18	6	4.9	4.5	
2310141	NO.12-28UNF	28	5.49	50	16			4.65	
2310150	1/4-20UNC	20	6.35	56	22	6	4.9	5.2	
2310151	1/4-28UNF	28	6.35	50	16			5.5	
2310160	5/16-18UNC	18	7.94	56	22	6	4.9	6.6	
2310161	5-16-24UNF	24	7.94	56	16			6.9	
2310170	3/8-16UNC	16	9.53	70	28	7	5.5	8.0	
2310171	3/8-24UNF	24	9.53	56	16			8.5	
2310180	7/16-14UNC	14	11.11	75	30	8	6.2	9.4	
2310181	7/16-20UNF	20	11.11	63	18			9.9	
2310190	1/2-13UNC	13	12.70	75	30	9	7	10.8	
2310191	1/2-20UNF	20	12.70	70	20			11.5	
2310200	9/16-12UNC	12	14.29	80	32	11	9	12.3	
2310201	9/16-18UNF	18	14.29	70	22			13.0	
2310210	5/8-11UNC	11	15.88	80	32	12	9	13.5	
2310211	5/8-18UNF	18	15.88	70	22			14.6	
2310220	3/4-10UNC	10	19.05	95	40	14	11	16.5	
2310221	3/4-16UNF	16	19.05	80	22			17.5	
2310230	7/8-9UNC	9	22.23	100	40	18	14.5	19.5	
2310231	7/8-14UNC	14	22.23	90	28			20.5	
2310240	1-8UNC	8	25.4	110	50	20	16	22.3	
2310241	1-12UNF	12	25.4	100	32			23.5	
2310250	1 1/8-7UNC	7	28.58	132	56	22	18	25.0	
2310251	1 1/8-12UNF	12	28.58	100	32			26.5	
2310260	1 1/4-7UNC	7	31.75	132	56	28	20	28.3	
2310261	1 1/4-12UNF	12	31.75	100	32	25		29.5	
2310270	1 3/8-6UNC	6	34.93	150	63	28	22	30.8	
2310271	1 3/8-12UNF	12	34.93	110	32			32.5	
2310280	1 1/2-6UNC	6	38.10	150	63	32	24	34.0	
2310281	1 1/2-12UNF	12	38.10	110	32			36.0	
2310290	1 3/4-5UNC	5	44.45	160	70	36	29	39.5	
2310291	2-41/2UNC	4 1/2	50.80	180	75	40	32	45.0	

HSS TAPS

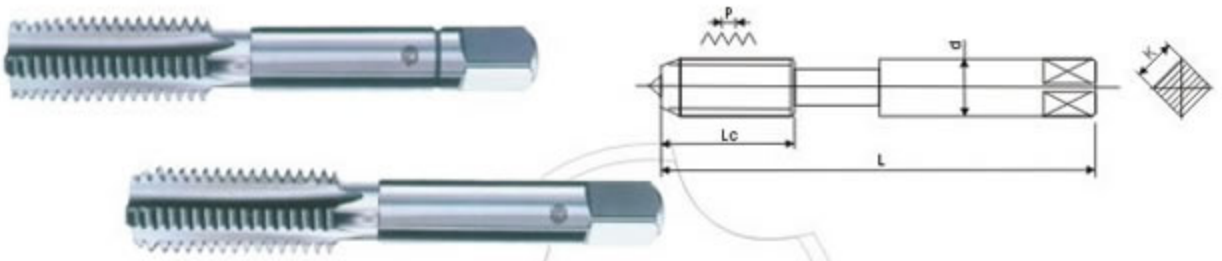


Art.2 4 DIN351 BSW Hand Taps

DIN351, for BSW thread DIN13
M2 HSS
M35 HSS-E, Coating, available for specified requirements
3 of set: Taper, Second and Plug.
For through holes and blind holes

Code	Size	T.P.I	D(mm)	L(mm)	Lc(mm)	d(mm)	K(mm)	Hole(mm)
2410100	Ww1/8-40	**40**	3.18	40	12	3.5	2.7	2.60
2410110	Ww5/32-32	**32**	3.97	45	14	4.5	3.4	3.20
2410120	Ww3/16-24	**24**	4.76	45	14	5.5	4.3	3.80
2410130	Ww7/32-24	**24**	5.56	50	18	6	4.9	4.60
2410140	Ww1/4-20	**20**	6.35	56	22	6	4.9	5.10
2410150	Ww5/16-18	**18**	7.94	56	22	6	4.9	6.50
2410160	Ww3/8-16	**16**	9.53	70	25	7	5.5	7.90
2410170	Ww7/16-14	**14**	11.11	75	30	8	6.2	9.30
2410180	Ww1/2-12	**12**	12.70	75	30	9	7	10.5
2410190	Ww6/19-12	**12**	14.29	80	32	11	9	12.0
2410200	Ww5/8-11	**11**	15.88	80	32	12	9	13.5
2410210	Ww3/4-10	**10**	19.05	95	40	14	11	16.5
2410220	Ww7/8-9	**9**	22.23	100	40	18	14.5	19.5
2410230	Ww1-8	**8**	25.4	110	50	20	16	22.0
2410240	Ww1 1/8-7	**7**	28.58	132	56	22	18	24.5
2410250	Ww1 1/4-7	**7**	31.75	132	56	25	20	28.0
2410260	Ww1 3/8-6	**6**	34.93	150	63	28	22	30.5
2410270	Ww1 1/2-6	**6**	38.10	150	63	32	24	33.5
2410280	Ww1 5/8-5	**5**	41.28	160	70	32	24	35.5
2410290	Ww1 3/4-5	**5**	44.45	160	70	36	29	39.0
2410300	Ww1 7/8-41/2	**4 1/2**	47.63	190	80	36	29	41.5
2410310	Ww2-4 1/2	**4 1/2**	50.8	190	80	40	32	44.5

HSS TAPS



Art.2 5 DIN5157 BSW Pipe Taps

DIN5157, for Whitworth-Pipe thread DIN259, equal to ISO 228
M2 HSS
M35 HSS-E,Coating,available for specified requirements
2 of set: Taper and Plug.
For through holes and blind holes
For connections not sealing in the thread

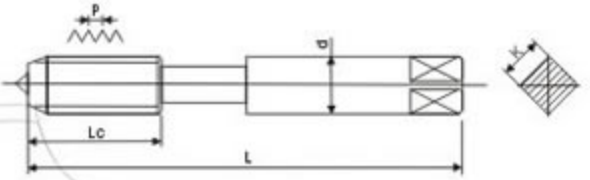
Code	Size	T.P.I	D(mm)	L(mm)	Lc(mm)	d(mm)	K(mm)	Hole(mm)
2510100	**G1/8**	28	9.73	63	20	7	5.5	8.80
2510110	**G1/4**	19	13.16	70	20	11	9	11.8
2510120	**G3/8**	19	16.66	70	22	12	9	15.3
2510130	**G1/2**	14	20.96	80	22	16	12	19.0
2510140	**G5/8**	14	22.91	80	22	18	14.5	21.0
2510150	**G3/4**	14	26.44	90	22	20	16	24.5
2510160	**G7/8**	14	30.20	90	22	22	18	28.25
2510170	**G1**	11	33.25	100	25	25	20	30.5
2510180	**G1 1/8**	11	37.90	125	40	28	22	35.5
2510190	**G1 1/4**	11	41.91	125	40	32	24	39.5
2510200	**G1 3/8**	11	44.33	125	40	36	29	42.0
2510210	**G1 1/2**	11	47.81	140	40	36	29	45.0
2510220	**G1 3/4**	11	53.75	140	40	40	32	51.0
2510230	**G2**	11	59.62	160	40	45	35	57.0

HSS TAPS

Art.2 6 DIN352 Manual and Machine Taps

DIN352, for ISO-thread DIN13, Tolerance 6H=ISO2, one piece
M2 HSS
M35 HSS-E,Coating,available for specified requirements
For manual and machine
Short version for through holes and blind holes

Code	M	P(mm)	L(mm)	Lc(mm)	d(mm)	K(mm)	n	Hole(mm)	Tap limits
2610030	M3	0.5	40	11	3.5	2.7	3	2.5	6H
2610040	M4	0.7	45	13	4.5	3.4	3	3.3	
2610050	M5	0.8	50	16	6	4.9	3	4.2	
2610060	M6	1.0	50	19	6	4.9	3	5.0	
2610070	M7	1.0	50	19	6	4.9	3	6	
2610080	M8	1.25	56	22	6	4.9	3	6.75	
2610090	M9	1.25	63	22	7	5.5	3	7.75	
2610100	M10	1.5	70	24	7	5.5	3	8.5	
2610110	M11	1.5	70	24	8	6.2	3	9.5	
2610120	M12	1.75	75	29	9	7	3	10.25	
2610140	M14	2.0	80	30	11	9	4	12.0	
2610160	M16	2.0	80	32	12	9	4	14.0	
2610180	M18	2.5	90	40	14	11	4	15.5	
2610200	M20	2.5	95	40	16	12	4	17.5	
2610220	M22	2.5	100	40	18	14.5	4	19.5	
2610240	M24	3.0	110	50	18	14.5	4	21.0	

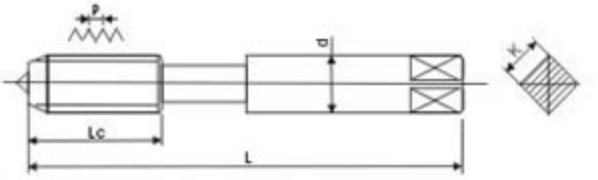


Art.2 7 DIN351 UNC/UNF Manual and Machine Taps

DIN351, for UNC/UNF thread, tolerance 2B, one piece
M2 HSS
M35 HSS-E, Coating, available for specified requirements
For manual and machine
Short version for through holes and blind holes

Code	Size	T.P.I	D(mm)	L(mm)	Lc(mm)	d(mm)	K(mm)	Hole(mm)	Taplimits
2710150	1/4-20UNC	20	6.35	56	22	6	4.9	5.20	2B
2710151	1/4-28UNF	28	6.35	56	18			5.50	
2710160	5/16-18UNC	18	7.94	56	22	6	4.9	6.60	
2710161	5/16-24UNF	24	7.94	63	18			6.90	
2710170	3/8-16UNC	16	9.53	70	25	7	5.5	8.00	
2710171	3/8-24UNF	24	9.53	63	18			8.50	
2710180	7/16-14UNC	14	11.11	75	30	8	6.2	9.40	
2710181	7/16-20UNF	20	11.11	63	18			9.90	
2710190	1/2-13UNC	13	12.70	75	30	9	7	10.8	
2710191	1/2-20UNF	20	12.70	63	20			11.5	
2710200	9/16-12UNC	12	14.29	80	32	11	9	12.0	
2710201	9/16-18UNF	18	14.29	70	20			13.0	
2710210	5/8-11UNC	11	15.88	80	32	12	9	13.5	
2710211	5/8-18UNF	18	15.88	70	20			14.6	
2710220	3/4-10UNC	10	19.05	95	40	14	11	16.5	
2710221	3/4-16UNF	16	19.05	80	22			17.5	

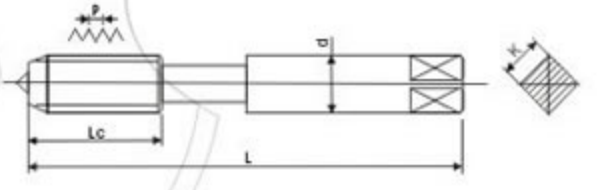
HSS TAPS



Art.2 8 DIN351 BSW Manual and Machine Taps

DIN351, for BSW thread DIN11, one piece
M2 HSS
M35 HSS-E, Coating, available for specified requirements
For manual and machine
Short version for through holes and blind holes

Code	Size	T.P.I	D(mm)	L(mm)	Lc(mm)	d(mm)	K(mm)	Hole(mm)
2810100	Ww1/8-40	40	3.18	40	12	3.5	2.7	2.60
2810110	Ww5/32-32	32	3.97	45	14	4.5	3.4	3.20
2810120	Ww3/16-24	24	4.76	45	14	5.5	4.3	3.80
2810130	Ww7/32-24	24	5.56	50	18	6	4.9	4.60
2810140	Ww1/4-20	20	6.35	56	22	6	4.9	5.10
2810150	Ww5/16-18	18	7.94	56	22	6	4.9	6.50
2810160	Ww3/8-16	16	9.53	70	28	7	5.5	7.90
2810170	Ww7/16-14	14	11.11	75	30	8	6.2	9.30
2810180	Ww1/2-12	12	12.70	75	30	9	7	10.5
2810190	Ww6/19-12	12	14.29	80	32	11	9	12.0
2810200	Ww5/8-11	11	15.88	80	32	12	9	13.5
2810210	Ww3/4-10	10	19.05	95	40	14	11	16.5



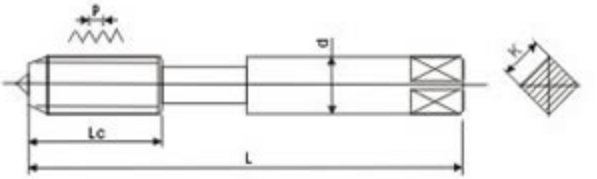
Art.2 9 DIN374 Manual and Machine Taps

DIN374, for metric-ISO thread DIN11, tolerance 6H, one piece
M2 HSS
M35 HSS-E, Coating, available for specified requirements
For manual and machine
For through holes and blind holes

HSS TAPS

Code	M	P(mm)	L(mm)	Lc(mm)	d(mm)	K(mm)	Hole(mm)	Tap limits
2910062	M6X0.75	0.75	80	14	4.5	3.4	5.25	6H
2910082	M8X0.75	0.75	80	19	6	4.9	7.25	
2910083	M8X1.0	1.0	90	22	6	4.9	7.0	
2910103	M10X1.0	1.0	90	16	7	5.5	9.0	
2910104	M10X1.25	1.25	100	22	7	5.5	8.75	
2910123	M12X1.0	1.0	100	22	9	7	11.0	
2910124	M12X1.25	1.25	100	22	9	7	10.75	
2910125	M12X1.5	1.5	100	22	9	7	10.5	
2910142	M14X0.75	0.75	100	22	11	9	13.25	
2910143	M14X1.0	1.0	100	22	11	9	13.0	
2910144	M14X1.25	1.25	100	22	11	9	12.75	
2910145	M14X1.5	1.5	100	22	11	9	12.5	
2910163	M16X1.0	1.0	100	22	12	9	15.0	
2910165	M16X1.5	1.5	100	22	12	9	14.5	
2910183	M18X1.0	1.0	110	22	14	11	17.0	
2910185	M18X1.5	1.5	110	25	14	99	16.5	
2910187	M18X2.0	2.0	125	34	14	11	16.0	
2910203	M20X1.0	1.0	125	25	16	12	19.0	
2910205	M20X1.5	1.5	125	25	16	12	18.5	
2910207	M20X2.0	2.0	140	34	16	12	18.0	
2910223	M22X1.0	1.0	125	25	18	14.5	21.0	
2910225	M22X1.5	1.5	125	25	18	14.5	20.5	
2910227	M22X2.0	2.0	140	34	18	14.5	20.0	
2910243	M24X1.0	1.0	140	28	18	14.5	23.0	
2910245	M24X1.5	1.5	140	28	18	14.5	22.5	
2910247	M24X2.0	2.0	140	28	18	14.5	22.0	
2910255	M25X1.5	1.5	140	28	18	14.5	23.5	
2910265	M26X1.5	1.5	140	28	18	14.5	24.5	
2910277	M27X2.0	2.0	140	28	20	16	25.0	
2910285	M28X1.5	1.5	150	28	22	18	26.5	
2910305	M30X1.5	1.5	150	28	22	18	28.5	
2910307	M30X2.0	2.0	150	28	22	18	28.0	
2910325	M32X1.5	1.5	150	28	22	18	30.5	
2910355	M35X1.5	1.5	170	30	28	22	33.5	
2910365	M36X1.5	1.5	170	28	28	22	34.5	
2910385	M38X1.5	1.5	170	28	28	22	36.5	
2910405	M40X1.5	1.5	170	30	32	24	38.5	
2910425	M42X1.5	1.5	170	30	32	24	40.5	
2910455	M45X1.5	1.5	180	32	36	29	43.5	
2910485	M48X1.5	1.5	190	32	36	29	46.5	
2910505	M50X1.5	1.5	190	32	36	29	48.5	
2910525	M52X1.5	1.5	190	32	40	32	50.5	

HSS TAPS



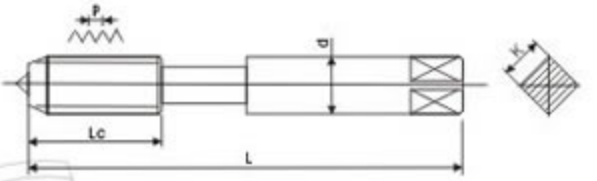
Art.3 0 DIN352 Spiral Pointed Machine Taps

DIN352, for metric-ISO thread DIN13, tolerance 6H
M2 HSS
M35 HSS-E, Coating, available for specified requirements
For machine
Short version for through holes
Good cutting action, high speeding

Code	M	P(mm)	L(mm)	Lc(mm)	Chamfer	d(mm)	K(mm)	n	Hole(mm)	Tap limits
3010030	M3	0.5	40	11	5P	3.5	2.7	3	2.5	
3010040	M4	0.7	45	13	5P	4.5	3.4	3	3.3	
3010050	M5	0.8	50	16	5P	6	4.9	3	4.2	
3010060	M6	1.0	50	19	5P	6	4.9	3	5.0	
3010070	M7	1.0	50	19	5P	6	4.9	3	6.0	
3010080	M8	1.25	56	22	5P	6	4.9	3	6.75	
3010090	M9	1.25	63	22	5P	7	5.5	3	7.75	
3010100	M10	1.5	70	24	5P	7	5.5	3	8.5	6H
3010110	M11	1.5	70	24	5P	8	6.2	3	9.5	
3010120	M12	1.75	75	29	5P	9	7	3	10.25	
3010140	M14	2.0	80	30	5P	11	9	3	12.0	
3010160	M16	2.0	80	32	5P	12	9	4	14.0	
3010180	M18	2.5	90	40	5P	14	11	4	15.5	
3010200	M20	2.5	95	40	5P	16	12	4	17.5	
3010220	M22	2.5	100	40	5P	18	14.5	4	19.5	

Metric-fine thread available for specified requirements

HSS TAPS

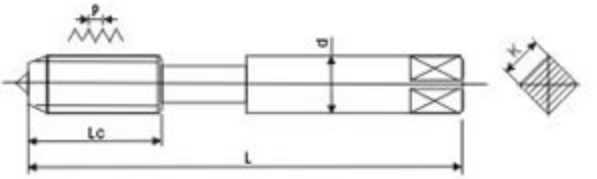


Art.3 0 DIN352 Spiral Pointed Machine Taps

DIN352, for metric-ISO thread DIN13, tolerance 6H
M2 HSS
M35 HSS-E, Coating, available for specified requirements
For machine
Short version for through holes
Good cutting action, high speeding

Code	M	P(mm)	L(mm)	Lc(mm)	Chamfer	d(mm)	K(mm)	n	Hole(mm)	Tap limits
DIN371										
3110030	M3	0.5	56	11	5P	3.5	2.7	3	2.5	6H
3110040	M4	0.7	63	13	5P	4.5	3.4	3	3.3	
3110050	M5	0.8	70	16	5P	6	4.9	3	4.2	
3110060	M6	1.0	80	19	5P	6	4.9	3	5.0	
3110080	M8	1.25	90	22	5P	8	6.2	3	6.75	
3110100	M10	1.5	100	24	5P	10	8	3	8.5	
DIN376										
3110120	M12	1.75	110	29	5P	9	7	4	10.25	6H
3110140	M14	2.0	110	30	5P	11	9	4	12.0	
3110160	M16	2.0	110	32	5P	12	9	4	14.0	
3110180	M18	2.5	125	34	5P	14	11	4	15.5	
3110200	M20	2.5	140	34	5P	16	12	4	17.5	
3110220	M22	2.5	140	34	5P	18	14.5	4	19.5	
3110240	M24	3.0	160	38	5P	18	14.5	4	21.0	

HSS TAPS

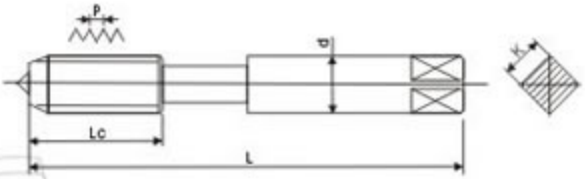


Art.3 2 DIN374 Spiral Pointed Machine Taps

DIN374, for metric-fine ISO thread DIN13, tolerance 6H, one piece
M2 HSS
M35 HSS-E, Coating, available for specified requirements
For machine
For through holes
Good cutting action, high speeding

Code	Mf	P(mm)	L(mm)	Lc(mm)	d(mm)	K(mm)	Hole(mm)	Tap limits
3210062	Mf6x0.75	0.75	80	14	4.5	3.4	5.25	6H
3210082	Mf8x0.75	0.75	80	19	6	4.9	7.25	
3210083	Mf8x1.0	1.0	90	22	6	4.9	7.0	
3210103	Mf10x1.0	1.0	90	16	7	5.5	9.0	
3210104	Mf10x1.25	1.25	100	24	7	5.5	8.75	
3210123	Mf12x1.0	1.0	100	22	9	7	11.0	
3210124	Mf12x1.25	1.25	100	22	9	7	10.75	
3210125	Mf12x1.5	1.5	100	22	9	7	10.5	
3210143	Mf14x1.0	1.0	100	22	11	9	13.0	
3210144	Mf14x1.25	1.25	100	22	11	9	12.75	
3210145	Mf14x1.5	1.5	100	22	11	9	12.5	
3210163	Mf16x1.0	1.0	100	22	12	9	15.0	
3210165	Mf16x1.5	1.5	100	22	12	9	14.5	
3210183	Mf18x1.0	1.0	110	22	14	11	17.0	
3210185	Mf18x1.5	1.5	110	25	14	11	16.5	
3210187	Mf18x2.0	2.0	125	34	14	11	16.0	
3210203	Mf20x1.0	1.0	125	25	16	12	19.0	
3210205	Mf20x1.5	1.5	125	25	16	12	18.5	
3210207	Mf20x2.0	2.0	140	34	16	12	18.0	
3210223	Mf22x1.0	1.0	125	25	18	14.5	21.0	
3210225	Mf22x1.5	1.5	125	25	18	14.5	20.5	
3210227	Mf22x2.0	2.0	140	34	18	14.5	20.0	

HSS TAPS



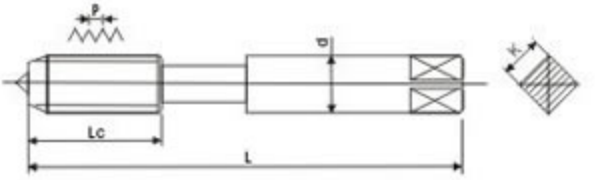
Art.3 3 DIN2182/2183 UNC/UNF

Art.3 3 DIN2182/2183 UNC/UNF Spiral Pointed Machine Taps

DIN352, for metric-ISO thread DIN13, tolerance 6H
M2 HSS
M35 HSS-E, Coating, available for specified requirements
For machine
Short version for through holes
Good cutting action, high speeding

Code	Size	T.P.I	D(mm)	L(mm)	Lc(mm)	d(mm)	K(mm)	Hole(mm)	Tap limits
DIN2182									
3310150	1/4-20UNC	20	6.35	80	22	7	5.5	5.10	2B
3310151	1/4-28UNF	28						5.50	
3310160	5/16-18UNC	18	7.94	90	25	8	6.2	6.50	
3310161	5/16-24UNF	24						6.90	
3310170	3/8-16UNC	16	9.53	100	38	9	7	7.90	
3310171	3/8-24UNF	24						8.50	
DIN2183									
3310180	7/16-14UNC	14	11.11	100	28	8	6.2	9.30	2B
3310181	7/16-20UNF	20						9.90	
3310190	1/2-13UNC	13	12.70	110	32	9	7	10.8	
3310191	1/2-20UNF	20						11.50	
3310200	9/16-12UNC	12	14.29	110	32	11	9	12.3	
3310201	9/16-18UNF	18						13.0	
3310210	5/8-11UNC	11	15.88	110	32	12	9	13.5	
3310211	5/8-18UNF	18						14.6	
3310220	3/4-10UNC	10	19.05	125	36	14	11	16.5	
3310221	3/4-16UNF	16						17.5	
3310230	7/8-9UNC	9	22.23	140	40	18	14.5	19.5	
3310231	7/8-14UNF	14						20.5	

HSS TAPS

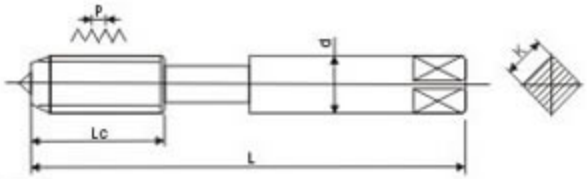


Art.3 4 DIN5156 BSW
Art.3 4 DIN5156 Whitworth-pipe thread Spiral Pointed Machine Taps

DIN5156, for Whitworth-Pipe thread DIN259, equal to ISO228,tolerance 6H
M2 HSS
M35 HSS-E,Coating,available for specified requirements
For machine
For through holes
Good cutting action,high speeding

Code	Size	T.P.I	D(mm)	Chamfer	L(mm)	Lc(mm)	d(mm)	K(mm)	Hole(mm)
2410100	**G 1/8**	28	9.73	5P	90	20	8	6.2	8.80
2410110	**G 1/4**	19	13.16	5P	100	20	11	9	11.8
2410120	**G 3/8**	19	16.66	5P	100	22	12	9	15.3
2410130	**G 1/2**	14	20.96	5P	140	25	16	12	19.0
2410140	**G 5/8**	14	22.91	5P	140	25	18	14.5	21.0
2410150	**G 3/4**	14	26.44	5P	140	30	20	16	24.5
2410160	**G 7/8**	14	30.20	5P	160	30	22	18	28.25
2410170	**G 1**	11	33.25	5P	170	36	25	20	30.5
2410180	**G 1 1/8**	11	37.90	5P	180	36	28	22	35.5
2410190	**G 1 1/4**	11	41.91	5P	190	40	32	24	39.5
2410200	**G 1 3/8**	11	44.33	5P	190	40	36	29	41.5
2410210	**G 1 1/2**	11	47.81	5P	200	40	36	29	45.0
2410220	**G 1 3/4**	11	53.75	5P	200	45	36	29	51.0
2410230	**G 2**	11	59.62	5P	210	45	36	29	57.0

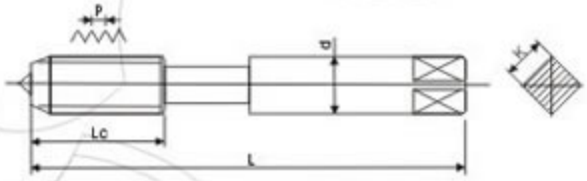
HSS TAPS



Art.3 5 DIN357 Machine Nut Taps

DIN357, for metric-ISO thread DIN13, tolerance 6H=ISO2
M2 HSS
M35 HSS-E,Coating,available for specified requirements

Code	M	P(mm)	L(mm)	Lc(mm)	Chamfer	d(mm)	K(mm)	Hole(mm)	Taplimits
3510030	M3	0.5	70	22	13P	2.2	-	2.5	6H
3510040	M4	0.7	90	25	13P	2.8	2.1	3.3	
3510050	M5	0.8	100	28	13P	3.5	2.7	4.2	
3510060	M6	1.0	110	32	13P	4.5	3.4	5.0	
3510080	M8	1.25	125	40	13P	6	4.9	6.75	
3510100	M10	1.5	140	45	13P	7	5.5	8.5	
3510120	M12	1.75	180	50	13P	9	7	10.25	
3510140	M14	2.0	200	56	13P	11	9	12.0	
3510160	M16	2.0	200	63	13P	12	9	14.0	
3510180	M18	2.5	220	63	13P	14	11	15.5	
3510200	M20	2.5	250	70	13P	16	12	17.5	
3510220	M22	2.5	280	80	13P	18	14.5	19.5	
3510240	M24	3.0	280	80	13P	18	15.5	21.0	

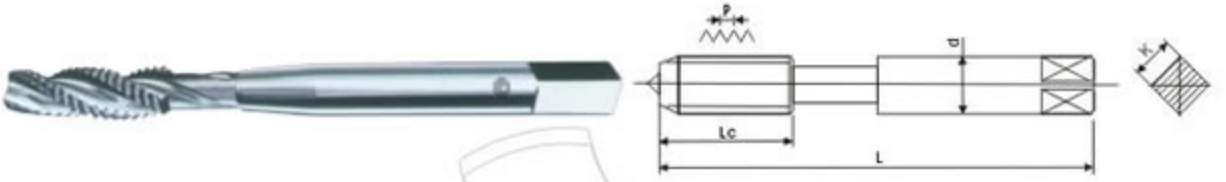


Art.3 6 DIN352 Spiral Flute Short Machine Taps

Din352, with 35° spiral flute, metric-iso thread din13, tolerance 6h=iso2
M2 hss
M35 hss-e,coating,available for specified requirements
For blind holes
Gopd cutting actiin, high speeding

Code	M	P(mm)	L(mm)	Lc(mm)	Chamfer	d(mm)	K(mm)	n	Hole(mm)	Taplimits
3610030	M3	0.5	40	11	2.5P	3.5	2.7	3	2.5	6H
3610040	M4	0.7	45	13	2.5P	4.5	3.4	3	3.5	
3610050	M5	0.8	50	16	2.5P	6	4.9	3	4.2	
3610060	M6	1.0	50	19	2.5P	6	4.9	3	5.0	
3610070	M7	1.0	50	19	2.5P	6	4.9	3	6.0	
3610080	M8	1.25	56	22	2.5P	6	4.9	3	6.75	
3610100	M10	1.5	70	24	2.5P	7	5.5	3	8.5	
3610120	M12	1.75	75	29	2.5P	9	7	4	10.25	

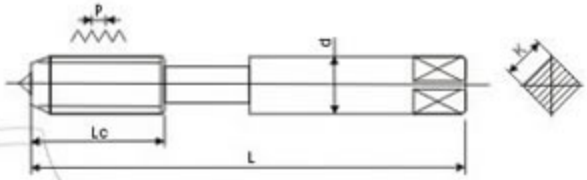
HSS TAPS



Art.3 7 DIN371/376 Spiral Flute Machine Taps

DIN371/376, with 35° Spiral flute, metric-ISO thread DIN13, tolerance 6H=ISO2
M2 HSS
M35 HSS-E, Coating, available for specified requirements
For blind holes
Good cutting action, high speeding

Code	M	P(mm)	L(mm)	Lc(mm)	Chamfer	d(mm)	K(mm)	n	Hole(mm)	Tap limits
DIN371										
3710030	M3	0.5	56	11	2.5P	3.5	2.7	3	2.5	6H
3710040	M4	0.7	63	13	2.5P	4.5	3.4	3	3.3	
3710050	M5	0.8	70	16	2.5P	6	4.3	3	4.2	
3710060	M6	1.0	80	19	2.5P	6	4.9	3	5.0	
3710080	M8	1.25	90	22	2.5P	8	6.2	3	6.75	
3710100	M10	1.5	100	24	2.5P	10	8	3	8.5	
DIN376										
3710120	M12	1.75	110	29	2.5P	9	7	3	10.25	6H
3710140	M14	2.0	110	30	2.5P	11	9	4	12.0	
3710160	M16	2.0	110	32	2.5P	12	9	4	14.0	
3710180	M18	2.5	125	34	2.5P	14	11	4	15.5	
3710200	M20	2.5	140	34	2.5P	16	12	4	17.5	
3710220	M22	2.5	140	34	2.5P	18	14.5	4	19.5	
3710240	M24	3.0	160	38	2.5P	18	14.5	4	21.0	

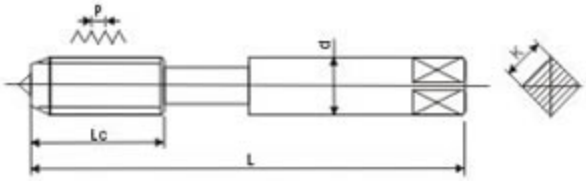


Art.3 8 DIN374 Spiral Flute Machine Taps

DIN374, with 35° Spiral flute,metric-ISO thread DIN13, tolerance 6H=ISO2
M2 HSS
M35 HSS-E,Coating,available for specified requirements
For blind holes
Good cutting action,high speeding

Code	Mf	P(mm)	L(mm)	Lc(mm)	d(mm)	K(mm)	Hole(mm)	Tap limits
3810062	Mf6x0.75	0.75	80	14	4.5	3.4	5.25	6H
3810082	Mf8x0.75	0.75	80	19	6	4.9	7.25	
3810083	Mf8x1.0	1.0	90	22	6	4.9	7.0	
3810103	Mf10x1.0	1.0	90	16	7	5.5	9.0	
3810104	Mf10x1.25	1.25	100	24	7	5.5	8.75	
3810123	Mf12x1.0	1.0	100	22	9	7	11.0	
3810124	Mf12x1.25	1.25	100	22	9	7	10.75	
3810125	Mf12x1.5	1.5	100	22	9	7	10.5	
3810142	Mf14x1.75	0.75	100	22	11	9	13.25	
3810143	Mf14x1.0	1.0	100	22	11	9	13.0	
3810144	Mf14x1.25	1.25	100	22	11	9	12.75	
3810145	Mf14x1.5	1.5	100	22	11	9	12.5	
3810163	Mf16x1.0	1.0	100	22	12	9	15.0	
3810165	Mf16x1.5	1.5	100	22	12	9	14.5	
3810183	Mf18x1.0	1.0	110	25	14	11	17.0	
3810185	Mf18x1.5	1.5	110	25	14	11	16.5	
3810187	Mf18x2.0	2.0	125	34	14	11	16.0	
3810203	Mf20x1.0	1.0	125	25	16	12	19.0	
3810205	Mf20x1.5	1.5	125	25	16	12	18.5	
3810207	Mf20x2.0	2.0	140	34	16	12	18.0	
3810223	Mf22x1.0	1.0	125	25	18	14.5	21.0	
3810225	Mf22x1.5	1.5	125	25	18	14.5	20.5	
3810227	Mf22x2.0	2.0	140	34	18	14.5	20.0	
3810243	Mf24x1.0	1.0	140	28	18	14.5	23.0	
3810245	Mf24x1.5	1.5	140	28	18	14.5	22.5	
3810247	Mf24x20	2.0	140	28	18	14.5	22.0	

HSS TAPS



Art.3 9 DIN2182/2183 UNC/UNF

Art.3 9 DIN2182/2183 UNC/UNF Spiral Flute Machine Taps

DIN2182/2183, with 35° Spiral flute,UNC/UNF thread, tolerance 2B
M2 HSS
M35 HSS-E,Coating,available for specified requirements
For blind holes
Good cutting action,high speeding

Code	Size	T.P.I	D(mm)	L(mm)	Lc(mm)	d(mm)	K(mm)	Hole(mm)	Tap limits
DIN2182									
3910150	1/4-20UNC	20	6.35	80	18	7	5.5	5.10	2B
3910151	1/4-28UNF	28	6.35	80	22			5.50	
3910160	5/16-18UNC	18	7.94	90	20	8	6.2	6.50	
3910161	5/16-24UNF	24	7.94	90	25			6.90	
3910170	3/8-16UNC	16	9.53	100	22	9	7	8.00	
3910171	3/8-24UNF	24	9.53	90	38			8.50	
DIN2183									
3910180	7/16-14UNC	14	11.11	110	24	8	6.2	9.30	2B
3910181	7/16-20UNF	20	11.11	100	28			9.90	
3910190	1/2-13UNC	13	12.70	110	26	9	7	10.8	
3910191	1/2-20UNF	20	12.70	100	32			11.50	
3910200	9/16-12UNC	12	14.29	110	28	11	9	12.3	
3910201	9/16-18UNF	18	14.29	100	32			13.0	
3910210	5/8-11UNC	11	15.88	110	30	12	9	13.5	
3910211	5/8-18UNF	18	15.88	110	32			14.6	
3910220	3/4-10UNC	10	19.05	125	32	14	11	16.5	
3910221	3/4-16UNF	16	19.05	125	36			17.5	
3910230	7/8-9UNC	9	22.23	140	32	18	14.5	19.5	
3910230	7/8-14UNF	14	22.23	140	40			20.5	

Straight Fluted Taps

Taper Pipe Tap

Bronze oxide surface tratment for easier tapping, higher speeds and greater abrasion resistance
Precis on ground cutting surfaces for precise thread production
For tapping pipe fittings or coupings
See Page 59 for Tap Speed Selector

T65HD Series (Piug)

Tube

Size/Pitch	Thread Designation	# of Flutes	Drill Size	Stock#	Pkg Qty
1/8-27	NPT	4	R	071250	1
1/4-18	NPT	4	7/16	071251	1
3/8-18	NPT	4	37/64	071252	1
1/2-14	NPT	4	45/64	071253	1
3/4-14	NPT	5	59/64	071254	1
1-11-1/2	NPT	5	1-5/32	071255	1
1-1/4-11-1/2	NPT	5	1-1/2	071256	1*
1-1/2-11-1/2	NPT	7	1-47/64	071257	1*

*Wrapped

HSS TAPS

Taper Pipe Taps

Heat-treated carbon steel for improved wear resistance
Strong, precise threads are accurately formed for longer tool life
For hand tapping operations
NOT RECOMMENDED FOR MACHINE TAPPING
See Page 59 for Tap Speed Selector

JC103 Series

Tube

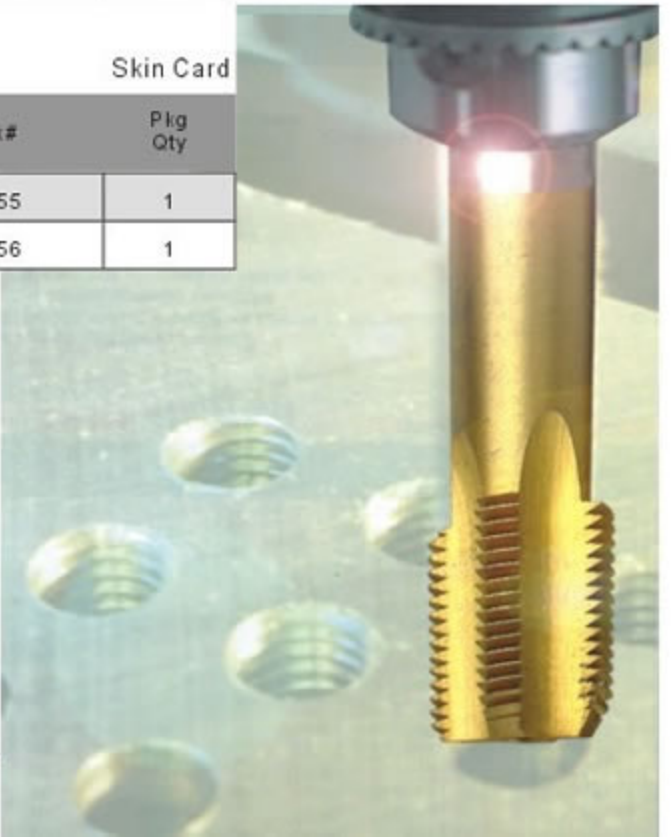
Size/Pitch	Thread Designation	# of Flutes	Stock#	Pkg Qty
1/8-27	NPT	4	068518	1
1/4-18	NPT	4	068514	1
3/8-18	NPT	4	068538	1
1/2-14	NPT	4	068512	1
3/4-14	NPT	4	068534	1
1-11-1/2	NPT	4	068501	1
1-1/4-11-1/2	NPT	4	068554	1*
1-1/2-11-1/2	NPT	5	068552	1*
2-11-1/2	NPT	6	068502	1*

*Box

JC103BP Series

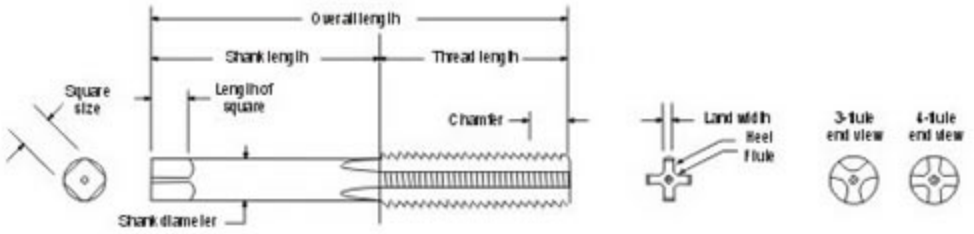
Skin Card

Size/Pitch	Thread Designation	# of Flutes	Stock#	Pkg Qty
1/8-27	NPT	4	068555	1
1/4-18	NPT	4	068556	1

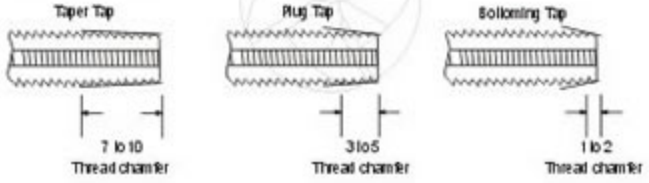


Straight Fluted Taps

Basic Tap Terminology



Chamfer Styles in Standard Taps



Angle of Thread The angle included between the flanks of the thread measured in an axial plane.

Back Taper A slight axial relief on the thread of the tap which makes the pitch diameter of the thread near the shank somewhat smaller than. that of the chamfered end.

Bottoming Chamfer The shortest chamfer (1-2 threads long), for threading close to the bottom of blind holes.

Chamfer The tapering of the threads at the front end of each land of a tap by cutting away and relieving the crest of the first few teeth to distribute the cutting action over several teeth. Also see Taper, Plug and Bottoming Chamfers.

Chamfer Relief The gradual decrease in land height from cutting edge to heel on the chamfered portion, to provide clearance for the cutting action as the tap advances.

Chordal Hook Angle The angle between the chord passing through the root and crest of a thread form at the cutting face, and a radial line through the crest at the cutting edge.

Crest The top surface joining the two flanks of a thread. The crest of an external thread is at its major diameter, while the crest of an internal thread is at its minor diameter.

Cutting Face The leading side of the land in the direction of rotation for cutting on which the chip impinges.

Flutes The longitudinal channels formed in a tap to create cutting edges on the thread profile and to provide chip spaces and cutting fluid passages.

Height of Thread The distance between the crest and the Base of a thread measured normal to the axis.

Lead The distance a screw thread advances axially in one complete turn. On a single lead screw or tap, the lead and pitch are identical. On a double lead screw or tap, the lead is twice the pitch, etc.

Pitch The distance from any point on a screw or tap thread to a corresponding point on the next thread, measured parallel to the axis. The pitch equals one divided by the number of threads per inch.

Pitch Diameter On a straight thread, the diameter of an imaginary co-axial cylinder, the surface of which would pass through the thread profile at such points as to make equal the width of the threads and the width of the spaces cut by the surface of the cylinder.

On a taper thread, the diameter at a given distance from a reference plane perpendicular to the axis of an imaginary co-axial cone, the surface of which would pass through the thread profile at such points as to make equal the width of the threads and the width of the spaces cut by the surface of the cone.

Plug Chamfer The most common chamfer (3-5 threads long), for hand or machine tapping in through or blind holes.

Rake Any deviation of a straight cutting face of the tooth from a radial line. Positive Rake means that the crest of the cutting face is angularly advanced ahead of the balance of the face of the tooth. Negative Rake means that the same point is angularly behind the balance of the cutting face of the tooth. Zero Rake means that the cutting face is directly on the center line.

Spiral Point (Chip Driver) A supplementary angular fluting cut in the cutting face of the land at the chamfer end. It is slightly longer than the chamfer on the tap and of the opposite hand to that of rotation.

Taper Chamfer A long chamfer (7-10 threads long) for easier starting and engagement in the work piece. More working teeth means that less tapping torque is required and the chip load is reduced on each tooth.

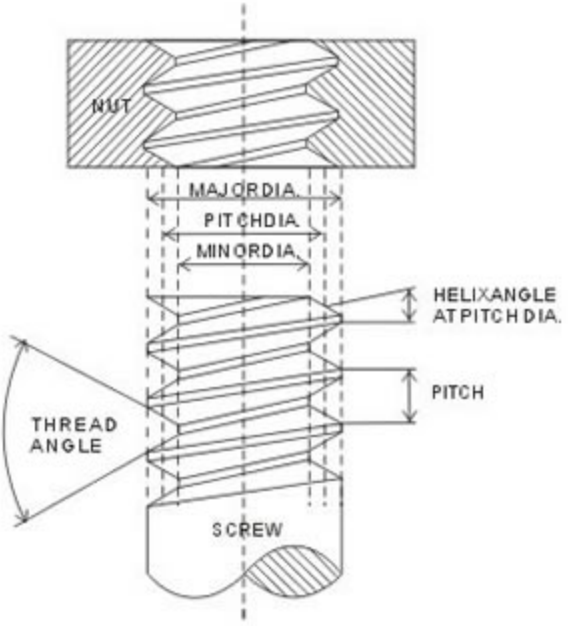
Threads Per Inch The number of threads in one inch of length.

HSS TAPS

TroUble	Possible Cause	Correction
Oversize Pitch Diameter	Incorrect tap	Use correct H limit
		Use longer chamfered tap
	Chip Packing	Use spiral pointed tap
		Use larger drill size
		Shorten length of thread in blind holes
		Reduce tapping speed
	Galling	Use lubricants
Torn or Rough Threads	Dull tap	Resharpen or replace
	Chamfer too short	Increase chamfer length
	Galling	Use lubricant
		Reduce speed
		Use larger drill
Breakage	Incorrect tap selection	Increase chamfer length
		Use spiral pointed taps in through holes
		Tapping too deep
	Excessive tapping torque	Increase hole size
		Shorten thread length
		Increase chamfer length
	Operating conditions	Reduce tapping speed
		Avoid bottoming out the tap
Chipping	Incorrect tap selection	Increase chamfer length
		Avoid chip packing in flutes
	Operating conditions	Reduce tapping speed
		Use larger drill
		Ensure adequate lubricant
Excessive Wear	Incorrect tap selection	Increase chamfer length
	Operating conditions	Reduce tapping speed
		Ensure adequate lubricant
		Use larger drill

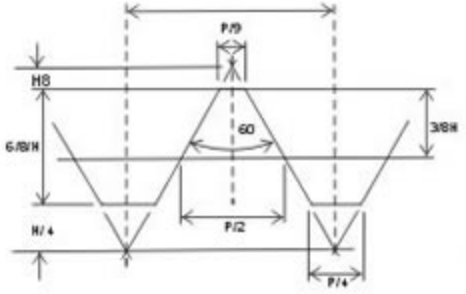
HSS TAPS

COMPONENT ELEMENTS



SIC FORM OF ISO METRIC OUNIFIED THREAD FORMS

H	=0.86603XXP
H/4	=0.21651XP
H/8	=0.10825XP
3/8H	=0.32476XP
5/8H	=0.54127XP



BASIC FORMOF WHITWORTHREAD

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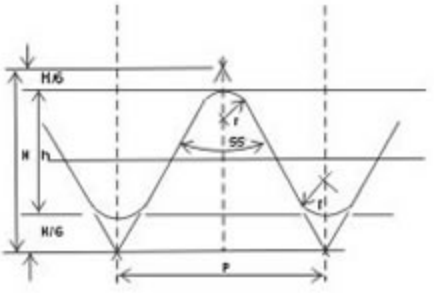
h	=2/3H=0.64033 XP
H/6	=0.16008XP
r	=0.13733XP



BASIC FORM OF BA THREAD

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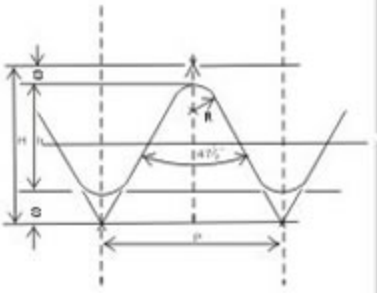
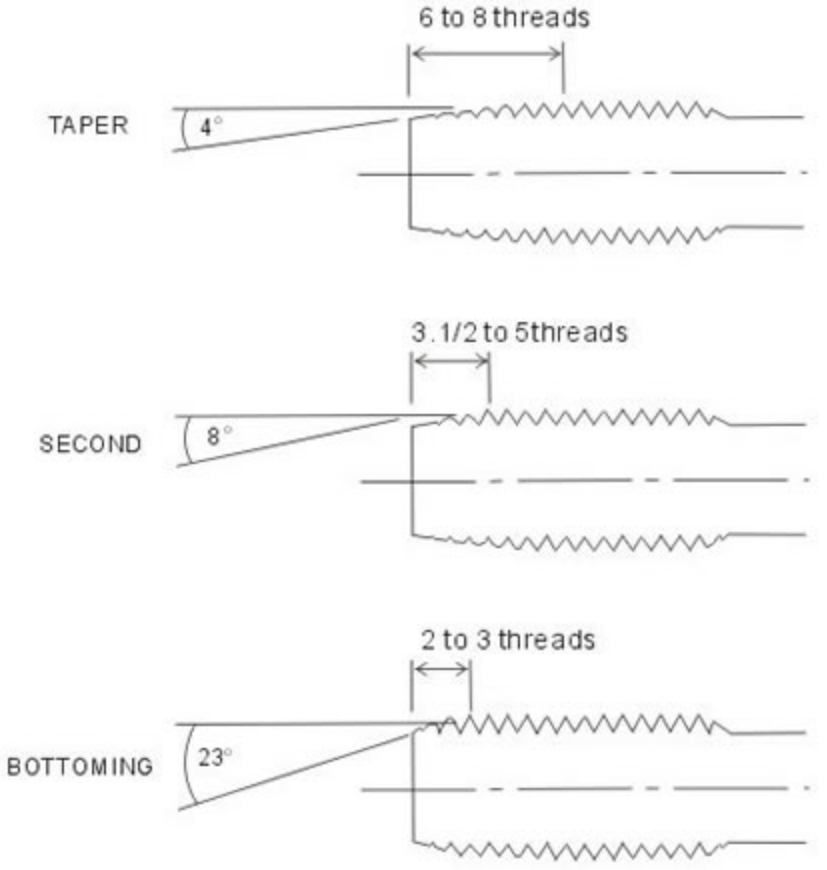
s	=0.26817XP



HSS TAPS

STANDARDLEAD(CHAMFER ANGLES)

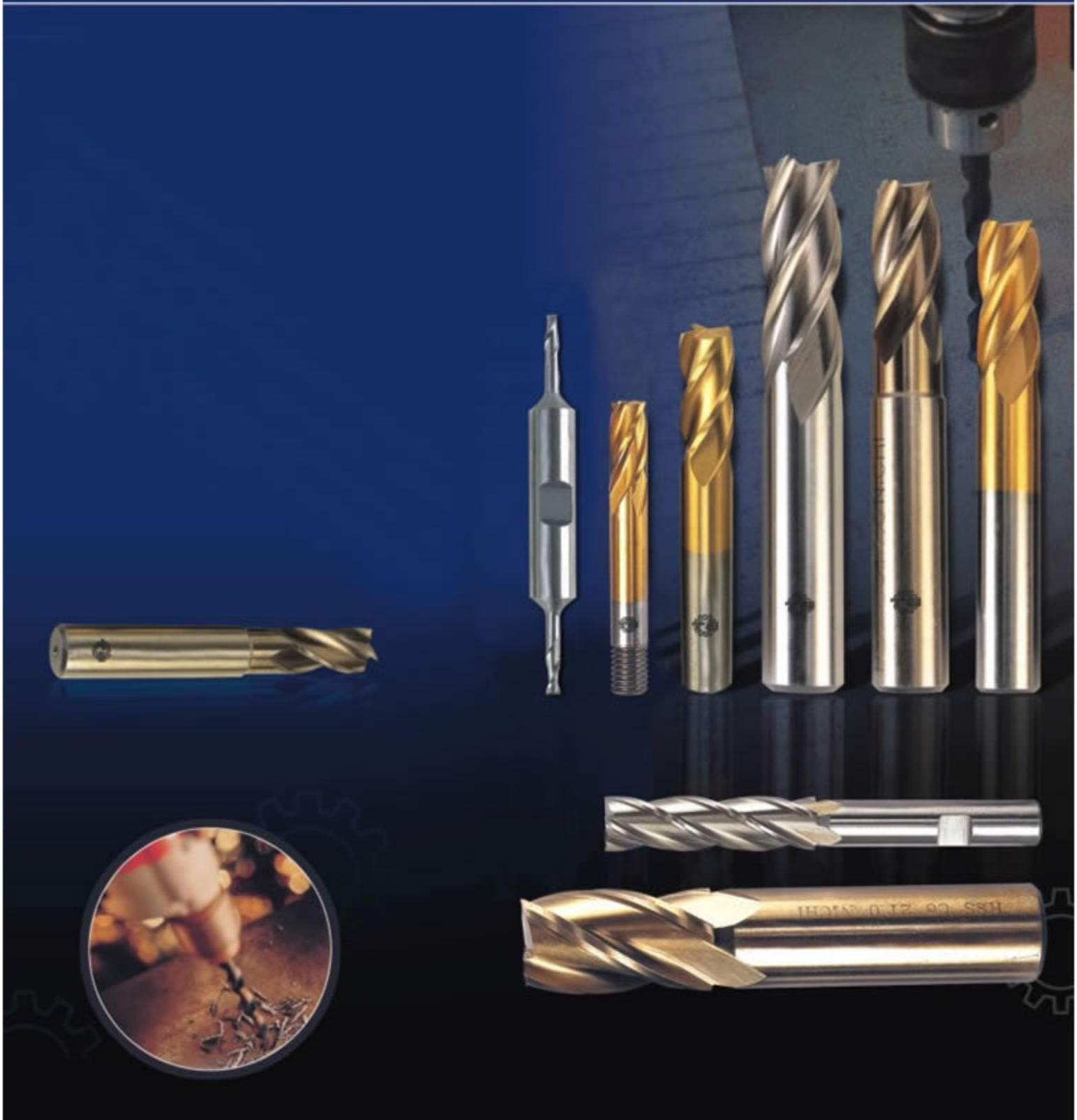


In some countries the name "PLUG" is commonly used to indicate a Bottoming tap.
In America it is used to indicate a Second tap. To avoid confusion with American terms,the terminology adopted by British Standard 949 1979 as shown above, should be used.

Short Hand and Maching, Long Shank Machine and Pipe Taps	4° (6-8 threads) Taper 8° (3.1/2-5 threads) Second 23° (2-3 threads) Bottoming
Spiral Point Taps	8° (4-5 threads)
Spiral Flute Taps	23° (2-3 threads)
Fluteless Taps	23° (2-3 threads)

TIANGONG TOOLS

HSS END MILL



TIANGONG TOOLS

HSS END MILL INDEX

4A. PRODUCTION TECHNICS		
4A. 1	Plain Shank End Mill	
4A. 2	Flat Shank End Mill	
4A. 3	Thread Shank End Mill	
4A. 4	Taper Shank End Mill	
4B. SURFACE FINISHING		
4B. 1	Bright Finish	
4B. 2	Tin Coating	
4C. USING MATERIAL		
4C. 1		HSS-M42/M35/M2

HSS END MILL

DIN844---Short Length Series

Size. mm d	Shank Dia. d1	Flute Length L1	Overall Length L	Flutes
3.0	6	8	52	2 or 4
4.0	6	11	55	2 or 4
5.0	6	13	57	2 or 4
6.0	6	13	57	2 or 4
7.0	10	16	66	2 or 4
8.0	10	19	69	2 or 4
9.0	10	19	69	2 or 4
10.0	10	22	72	2 or 4
11.0	12	22	79	2 or 4
12.0	12	26	83	2 or 4
14.0	12	26	83	2 or 4
16.0	16	32	92	2 or 4
18.0	16	32	92	2 or 4
20.0	20	38	104	2 or 4
22.0	20	38	104	2 or 4
25.0	25	45	121	2 or 4

DIN844---Long Length Series

Size. mm d	Shank Dia. d1	Flute Length L1	Overall Length L	Flutes
3.0	6	12	56	2 or 4
4.0	6	19	63	2 or 4
5.0	6	24	68	2 or 4
6.0	6	24	68	2 or 4
7.0	10	30	80	2 or 4
8.0	10	38	88	2 or 4
9.0	10	38	88	2 or 4
10.0	10	45	95	2 or 4
11.0	12	45	102	2 or 4
12.0	12	53	110	2 or 4
14.0	12	53	110	2 or 4
16.0	16	63	123	2 or 4
18.0	16	63	123	2 or 4
20.0	20	75	141	2 or 4
22.0	20	75	141	2 or 4
25.0	25	90	166	2 or 4

ANSI--Fully Grounded End mill. As 2 flutes

Size. mm INCH	MM	Shank Dia. d1	Flute Length L1	Overall Length L	Flutes
1/8	3.175	3/8	3/8"	2-5/16"	2
3/16	4.763	3/8	7/16"	2-5/16"	2
1/4	6.350	3/8	1/2"	2-5/16"	2
5/16	7.938	3/8	9/16"	2-5/16"	2
3/8	9.525	3/8	9/16"	2-5/16"	2
7/16	11.113	3/8	13/16"	2-1/2"	2
1/2	12.700	3/8	13/16"	2-1/2"	2
1/2	12.700	1/2	1"	3"	2
9/16	14.288	1/2	1-1/8"	3-1/8"	2
5/8	15.875	1/2	1-1/8"	3-1/8"	2
11/16	17.463	1/2	1-5/16"	3-5/16"	2
3/4	19.050	1/2	1-5/16"	3-5/16"	2
5/8	20.638	5/8	1-5/16"	3-7/16"	2
11/16	17.463	5/8	1-5/16"	3-7/16"	2
3/4	19.050	5/8	1-5/16"	3-7/16"	2
13/16	20.638	5/8	1-1/2"	3-5/8"	2
7/8	22.225	5/8	1-1/2"	3-5/8"	2
1	25.400	5/8	1-1/2"	3-5/8"	2
7/8	22.225	7/8	1-1/2"	3-3/4"	2
1	25.400	7/8	1-1/2"	3-3/4"	2

ANSI--Fully Grounded Double End as .3 flutes

Size. mm INCH	MM	Shank Dia. d1	Flute Length L1	Overall Length L	Flutes
1/8	3.175	3/8	3/8"	3-1/16"	3
3/16	4.763	3/8	1/2"	3-1/4"	3
1/4	6.350	3/8	5/8"	3-3/8"	3
5/16	7.938	3/8	3/4"	3-1/2"	3
3/8	9.525	3/8	3/4"	3-1/2"	3
7/16	11.113	1/2	1"	4-1/8"	3
1/2	12.700	1/2	1"	4-1/8"	3
9/16	14.288	5/8	1-3/8"	5"	3
5/8	15.875	5/8	1-3/8"	5"	3
3/4	19.050	5/8	1-5/8"	5-5/8"	3
1	25.400	1"	1-7/8"	6-3/8"	3

HSS END MILL

ANSI--Fully Grounded Double end End mill. as 4 flutes

Size. mm INCH	MM	Shank Dia. d1	Flute Length L1	Overall Length L	Flutes
1/8	3.175	3/8	3/8"	3-1/16"	4
3/16	4.763	3/8	1/2"	3-1/4"	4
1/4	6.350	3/8	5/8"	3-3/8"	4
5/16	7.938	3/8	3/4"	3-1/2"	4
3/8	9.525	3/8	3/4"	3-1/2"	4
1/2	12.700	1/2	1"	4-1/8"	4
5/8	15.875	5/8	1-3/8"	5"	4
3/4	19.050	3/4	1-5/8"	5-5/8"	4
7/8	22.225	7/8	1-7/8"	6-1/8"	4
1	25.400	1"	1-7/8"	6-3/8"	4

ANSI--4 Flutes End mill as Cutting & Single End Regular Length

Size. mm INCH	MM	Shank Dia. d1	Flute Length L1	Overall Length L	Flutes
1/8	3.175	3/8	3/8"	2-5/16"	4
3/16	4.763	3/8	1/2"	2-3/8"	4
1/4	6.350	3/8	5/8"	2-7/16"	4
5/16	7.938	3/8	3/4"	2-1/2"	4
3/8	9.525	3/8	3/4"	2-1/2"	4
1/2	12.700	1/2	1-1/4"	3-1/4"	4
5/8	15.875	5/8	1-5/8"	3-3/4"	4
11/16	17.463	5/8	1-5/8"	3-3/4"	4
3/4	19.050	3/4	1-5/8"	3-7/8"	4
7/8	25.400	7/8	1-7/8"	4-1/8"	4
1	25.400	1"	2	4-1/2"	4

ANSI--4 Flutes End mill as Cutting & Single End Regular Length

Size. mm INCH	MM	Shank Dia. d1	Flute Length L1	Overall Length L	Flutes
1/4	6.350	3/8	1-1/4"	3-1/16"	4
5/16	7.938	3/8	1-3/8"	3-1/8"	4
3/8	9.525	3/8	1-1/2"	3-1/4"	4
1/2	12.700	1/2	2"	4"	4
5/8	15.875	5/8	2-1/2"	4-5/8"	4
3/4	19.050	3/4	3"	5-1/4"	4
7/8	25.400	7/8	3-1/2"	5-3/4"	4
1	25.400	1"	4"	6-1/2"	4

HSS END MILL

ANSI--3 Flutes End mill as Center Cutting & Single End Long Length

Size. mm INCH	MM	Shank Dia. d1	Flute Length L1	Overall Length L	Flutes
1/8	3.175	3/8	3/8"	2-5/16"	3
3/16	4.763	3/8	1/2"	2-3/8"	3
1/4	6.350	3/8	5/8"	2-7/16"	3
5/16	7.938	3/8	3/4"	2-1/2"	3
3/8	9.525	3/8	3/4"	2-1/2"	3
7/16	11.113	3/8	1"	2-11/16"	3
1/2	12.700	3/8	1"	2-11/16"	3
1/2	12.700	1/2	1-1/4"	3-1/4"	3
9/16	14.288	1/2	1-3/8"	3-3/8"	3
5/8	15.875	1/2	1-3/8"	3-3/8"	3
3/4	19.050	1/2	1-5/8"	3-5/8"	3
5/8	15.875	5/8	1-5/8"	3-3/4"	3
3/4	19.050	5/8	1-5/8"	3-3/4"	3
7/8	22.225	5/8	1-7/8"	4"	3
1	25.400	5/8	1-7/8"	4"	3
3/4	19.050	3/4	1-5/8"	3-7/8"	3
7/8	22.225	3/4	1-7/8"	4-1/8"	3
1	25.400	3/4	1-7/8"	4-1/8"	3
1	25.400	7/8	1-7/8"	4-1/8"	3
1	25.400	1	2"	4-1/2"	3

Taper Shank End Mill Short Length Series

Size. Mm	Flute Length	Overall Length	MT NO.
d	L1	L	1#MT
6.0	13	83	1#MT
8.0	19	89	1#MT
10.0	22	92	1#MT
12.0	26	96	1#MT
16.0	32	117	2#MT
20.0	38	123	2#MT
25.0	45	147	3#MT
32.0	53	155	3#MT
40.0	63	188	4#MT
50.0	75	200	5#MT
63.0	90	248	5#MT

ANSI--3 Flutes End Mill as Center Cutting & Single End Long Length

Size. mm INCH	MM	Shank Dia. d1	Flute Length L1	Overall Length L	Flutes
1/4	6.350	3/8	1-1/4"	3-1/16"	3
5/16	7.938	3/8	1-3/8"	3-1/8"	3
3/8	9.525	3/8	1-1/2"	3-1/4"	3
7/16	11.113	1/2	1-3/4"	3-3/4"	3
1/2	12.700	1/2	2"	4"	3
5/8	15.875	5/8	2-1/2"	4-5/8"	3
3/4	19.050	3/4	3"	5-1/4"	3
1	25.400	1	4"	6-1/2"	3

Taper Shank End Mill Long Length Series

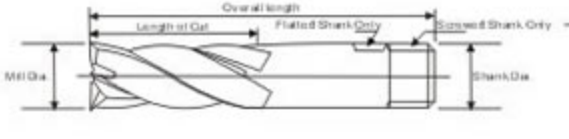
Size. Mm	Flute Length	Overall Length	MT NO.
d	L1	L	1#MT
6.0	24	94	1#MT
8.0	38	108	1#MT
10.0	45	115	1#MT
12.0	53	123	1#MT
16.0	63	148	2#MT
20.0	75	160	2#MT
25.0	90	192	3#MT
32.0	106	208	3#MT
40.0	125	250	4#MT
50.0	150	275	5#MT
63.0	180	338	5#MT

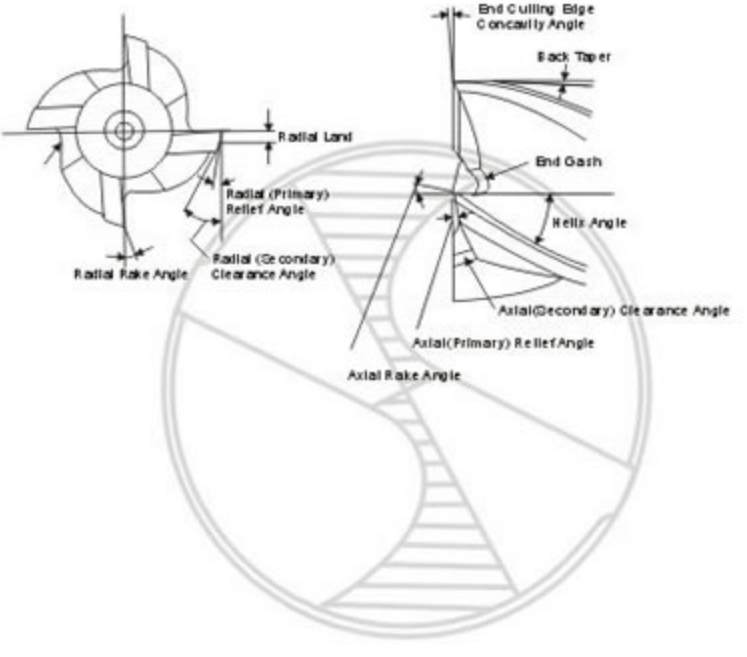
HSS END MILL

Troubleshooting in Endmilling

Breaking of tool	At time of engaging with work material When ending cut	1. Decrease feed rate. 2. Decrease projection amount. 3. Shorten cutting edge length to required minimun limit.
	During normal cutting	1. Decrease feed rate. 2. Contral wear→replace tool early. 3. Replace chuck or collet. 4. Decrease projection amount. 5. Carry out honing. 6. If 4 flute, reduce to 2 flute (clogging of chipping) 7. If dry cutting change to wet cutting utilize cutting fluid. In case of wet cutting flowoil supplied from the frint, change to from rear angle of side top. Use ample with rate.
	When changing direction of feed	1. Utilize circular interpolation(in case of NC machine)or temporarily stop feed(Dowelling) 2. Reduce feed rate before and after change of directions 3. Replace chuck or collet
Fracture of cutting edge	Fracture of corners	1. Carry out chamfering or nose with hand lapper. 2. Down cut→Up cut.
	Fracture at boundary of depth of cut	1. Down cut→Up cut 2. Reduce cutting speed
	Chipping at center part or overall	1. Carry out honing. Or enlarge. 2. Change number of rotation(in case machine vibrates). 3. Increase cutting speed. 4. In ease of squeaking noise during cutting, increase feed. 5. It dry cutting use cutting fluid or blow air. 6. Replace chuke or collet. 7. Reduce cutting speed.
	Large fracturing of cutting edge	1. Decrease feed rate. 2. If 4 flute reduce to 2 flute 3. Carry out honing. Or enlaege 4. Replace chuck or collet 5. Reduce cutting speed from the front, change to rear at an angle or from side top. Use ample supply.
Rapid tool wear		1. Reduce cutting speed 2. Up cut→Down cut 3. Increse feed 4. Utilize wet cutting or air 5. If reground tool, improve surface roughness of flank
	Surface is good but rough	1. Decrease feed 2. In case using 2 flute, increase to 4 flute

Names of End Mill Parts





Type of End Mill

Square End Mill

Taper End Mill

THE STEPS AND LADDERS DRILL

HSS

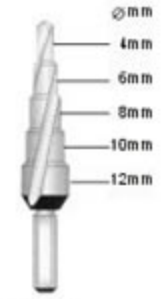
HSS+TIN

HSS Step Drill Bits, with Split Point

Art.No HSS	Art.No HSS+TIN
-0412	-0412
-0413	-0413
-0420	-0420
-0430	-0430
-0638	-0638
-0620	-0620
-0439	-0439
-0632	-0632
-0528	-0528
-0630	-0630
-0637	-0637
-0410	-0410
-0625	-0625
-0633	-0633
-0640	-0640
-0530	-0530
-0634	-0634
-0538	-0538
-0641	-0641

Size No.	Drilling range mm	Total length mm	Steps	Shank-Ø mm
0/5	4.0-12.00	65	5	6
0/9	4.0-12.00	65	9	6
1	4.0-20.00	75	9	8
2	4.0-30.00	100	14	10
3	5.0-38.00	100	12	10
4	6.0-26.75	75	8	10
5	4.0-39.00	107	13	10
6	6.0-32.00	75	8	10
7	5.0-28.00	69	7	10
8	6.0-30.50	50	9	10
9	6.0-37.00	100	12	10
10	4.8-10.65	54	5	6
11	6.0-25.00	65	7	10
12	6.0-32.00	76	9	10
13	6.0-40.00	105	16	13
14	5.3-30.50	79	9	10
15	6.5-32.50	79	9	10
16	5.3-38.50	96	11	10
17	6.5-40.50	96	11	10

THE STEPS AND LADDERS DRILL



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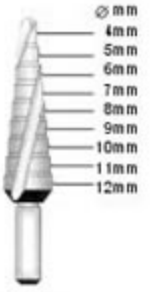

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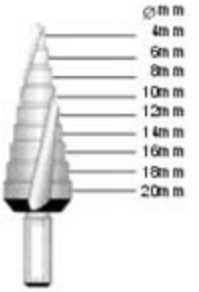

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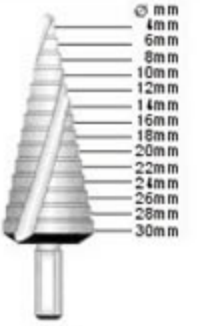

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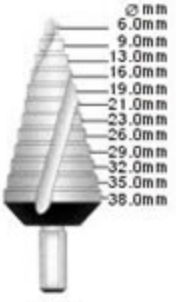

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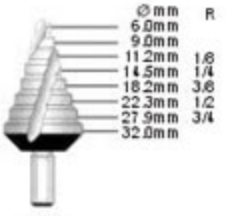

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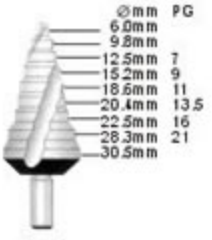

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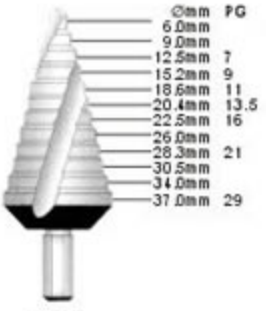

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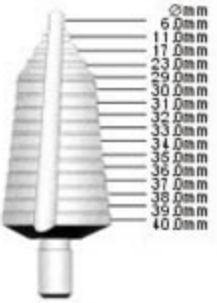
No.10

No.11

No.12



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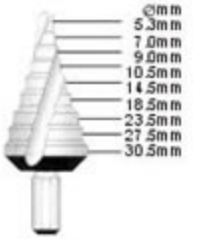
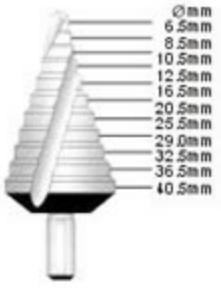


No.14

No.15

No.16



No.17

TIANGONG TOOLS

OTHER GENERAL TOOLS

OTHER GENERAL TOOLS

Double End Drill Bit

Size	Decimal Equivalent	Flute Length
2.5	10	43
3.0	12	46
3.1	12	49
3.2	12	49
3.3	12	49
3.5	12	52
4.0	12	55
4.1	12	55
4.2	12	55
4.5	12	58
4.8	14	62
4.9	14	62
5.0	14	62
5.1	14	62
5.2	14	62
5.5	16	66
6.0	19	66

Size	Decimal Equivalent	Flute Length
2.5	10	43
3.0	12	46
3.1	12	49
3.2	12	49
3.3	12	49
3.5	12	52
4.0	12	55
4.1	12	55
4.2	12	55
4.5	12	58
4.8	14	62
5.0	14	62
5.1	14	62
5.2	14	62
5.5	16	66
6.0	19	66

Hole Saw Pilot Drill

118° Split-Point, High-Speed Steel, Bright

Size	Decimal Equivalent	Flute Length	Overall Length	Env. Qty.
1/4	.2500	1-3/8	4-1/4	12

Body Drills, Single End

135° Split-Point, High-Speed Steel, Black Oxide

Size	Decimal Equivalent	Flute Length	Overall Length	Env. Qty.
1/8	.1250	1/2	1-7/8	12
3/16	.1875	1/2	2-3/16	12

Size	Decimal Equivalent	Flute Length	Overall Length	Env. Qty.
30	.1285	1/2	1-15/16	12

Body Drills, Double End

135° Split-Point, High-Speed Steel, Black Oxide/Bright

Size	Decimal Equivalent	Flute Length	Overall Length	Env. Qty.
7/64	.1094	1/2	1-7/8	12
1/8	.1250	1/2	2	12
9/64	.1406	1/2	2	12
5/32	.1562	1/2	2-1/16	12
3/16	.1875	1/2	2-3/16	12
7/32	.2188	1/2	2-3/8	12
1/4	.2500	1/2	2-1/2	12

Size	Decimal Equivalent	Flute Length	Overall Length	Env. Qty.
11	.1910	1/2	2-1/4	
20	.1610	1/2	2-1/8	
30	.1285	1/2	2	

OTHER GENERAL TOOLS

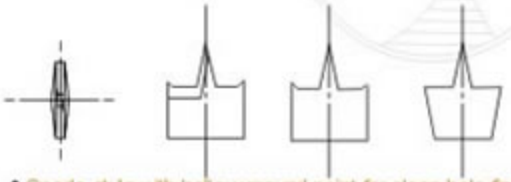
Wood Drill Bit Hss

Three Point,HSS,Black & White Finished

Size	Decimal Equivalent	Overall Length
3.0	33	61
4.0	43	75
5.0	52	86
6.0	57	93
7.0	69	109
8.0	75	117
9.0	81	125
10.0	87	133
11.0	94	142
12.0	101	151
13.0	101	151

Flat Woodboring Bit

Spade-Point, Carbon, Bright



- Spade-style with hollowground point for clean hole finish
- Rapid penetration in hard woods, formica and particleboard

Size	Overall Length
6.0	155
8.0	155
10.0	155
12.0	155
13.0	155
14.0	155
16.0	155
18.0	155
19.0	155
20.0	155
22.0	155
24.0	155
25.0	155
26.0	155
28.0	155
30.0	155
32.0	155
36.0	155
38.0	155

Set

Set Qty.	Size Range
6 pc.	3/8-1" by 8ths
13pcs	1/4-1"

Size	Decimal Equivalent	Overall Length
5/16	.3125	6
3/8	.3750	6
7/16	.4375	6
1/2	.5000	6
9/16	.5625	6
5/8	.6250	6
11/16	.6875	6
3/4	.7500	6
13/16	.8125	6
7/8	.8750	6
15/16	.9275	6
1	1.0000	6
1-1/8	1.1250	6
1-1/4	1.2500	6
1-3/8	1.3750	6
1-1/2	1.5000	6

OTHER GENERAL TOOLS

Description

1. M3/M42 High Speed Bi-metal Edge Welded to Alloy Steel Back for Heavy Duty Cutting;
2. 4/6 TPI variable Teeth;
3. Cutting Safely and Efficiently, the Best Way to Cut Large Holes, Clearing the Chips in Touch Materials;
4. Cutting Depth to 1-1/2 " (38mm) and 1-7/8 " (47mm);
5. Diameters from 9/16 " --8-17/64 " (14-210mm);
6. Can be used in Portable Electric or Pneumatic Tools, Vertical Drill Machines, Lathe, Boring/Milling Machines and Other Machine Tools;
7. Cuts Through Stainless Steel and Other Materials Pipe, Nail-Embedded wood, Hard Wood Floors, Plywood and Plastics;
8. All the specifications for arbored hole saws are the same as hole saws. There is an extra charge for the pilots.

Bl-Metal Haesaus

Art No.	Diameter	
10101014	14	9/16 "
10101016	16	5/8 "
10101017	17	11/16 "
10101019	19	3/4 "
10101020	20	25/32 "
10101021	21	13/16 "
10101022	22	7/8 "
10101024	24	15/16 "
10101025	25	1 "
10101027	27	1-1/16 "
10101029	29	1-1/8 "
10101030	30	1-3/16 "
10101032	32	1-1/4 "
10101033	33	1-5/16 "
10101035	35	1-3/8 "
10101037	37	1-7/16 "
10101038	38	1-1/2 "
10101040	40	1-9/16 "
10101041	41	1-5/8 "
10101043	43	1-11/16 "

Art No.	Diameter	
10101044	44	1-3/4 "
10101046	46	1-13/16 "
10101048	48	1-7/8 "
10101051	51	2 "
10101052	52	2-1/16 "
10101054	54	2-1/8 "
10101057	57	2-1/4 "
10101059	59	2-5/16 "
10101060	60	2-3/8 "
10101064	64	2-1/2 "
10101065	65	2-9/16 "
10101067	67	2-5/8 "
10101068	68	2-11/16 "
10101070	70	2-3/4 "
10101073	73	2-7/8 "
10101076	76	3 "
10101079	79	3-1/8 "
10101083	83	3-1/4 "
10101086	86	3-3/8 "
10101089	89	3-1/2 "

Art No.	Diameter	
10101092	92	3-5/8 "
10101095	95	3-3/4 "
10101098	98	3-7/8 "
10101102	102	4 "
10101105	105	4-1/8 "
10101108	108	4-1/4 "
10101111	111	4-3/8 "
10101114	114	4-1/2 "
10101121	121	4-3/4 "
10101127	127	5 "
10101133	133	5-1/4 "
10101140	140	5-1/2 "
10101146	146	5-3/4 "
10101152	152	6 "
10101160	160	6-19/64 "
10101165	165	6-1/2 "
10101168	168	6-5/8 "
10101177	177	6-31/32 "
10101200	200	7-7/8 "
10101210	210	8-17/64 "

OTHER GENERAL TOOLS

Holesaw Accessories

Top quality arbors & accessories universally inter-changeble with most other makes of holesaws

Code:Q
Minimum Order:
1 Accessory
Box

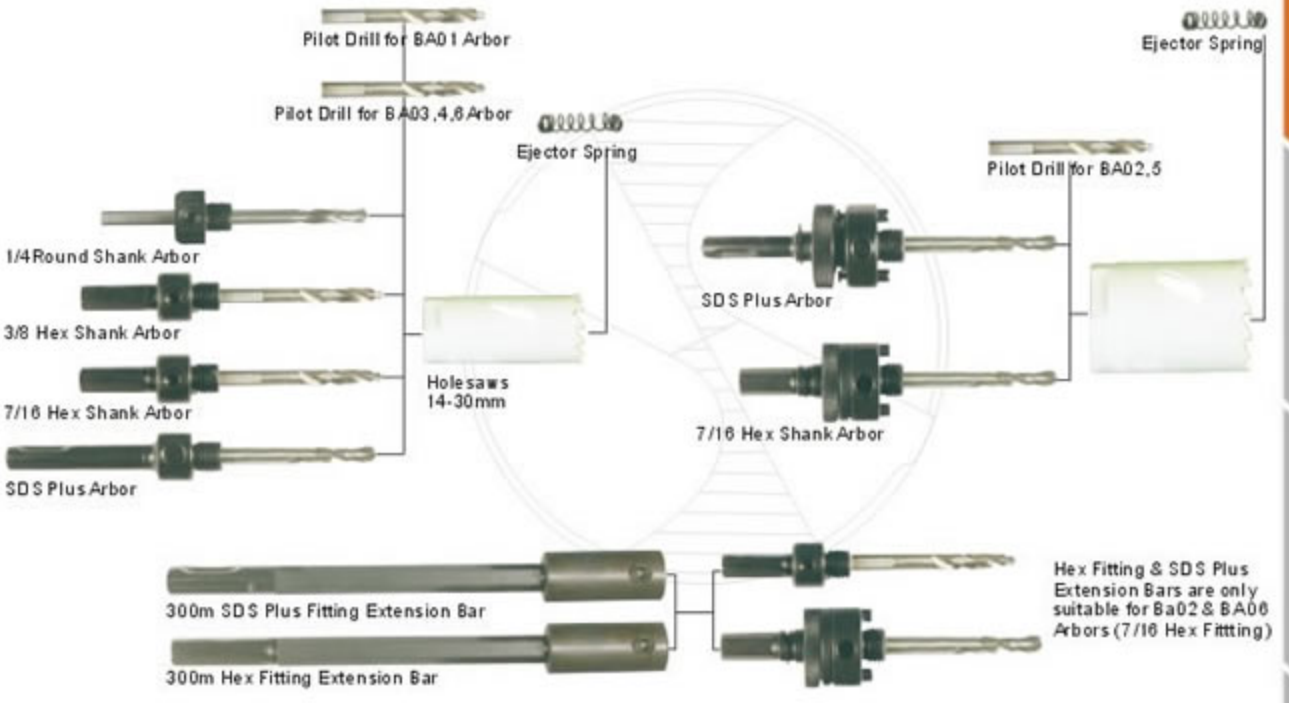
Holesaw Arbors

Fitting	For Holesaws (Diameter)
1/4 " Round Shank Arbor	14-30mm
3/8 " Hex Shank Arbor	14-30mm
7/16 " Hex Shank Arbor	14-30mm
7/16 " Hex Shank Arbor	32-152mm
SDS Plus Shank	14-30mm
SDS Plus Shank	32-152mm

Holesaw Accessories

Fitting
Bush for Aybors Ba01, 3, 4, 6
12 " Hex Shank Extension Bar
12 " SDS Plus Extension Bar
Pilot Drill 6.0x105mm
Pilot Drill 6.0x75mm
Ejector Spring

Holesaw Assembly Chart



OTHER GENERAL TOOLS

Centre Drill-type A
Plain Type-60° Countersink Angle

Size	Decimal Equivalent	Overall Length
0.5	20	0.8
0.8	20	1.1
1	31.5	1.3
1.25	31.5	1.6
1.6	35.5	2
2	40	2.5
2.5	45	3.1
3.15	50	3.9
4	56	5
5	63	6.3
6.3	71	8
8	80	10.1
10	100	12.8
12.5	125	16.5

Size	Body Diameter	Drill Dia. and Length	Overall Length
000	1/8	0.020	1-1/4
00	1/8	0.025	1-1/4
0	1/8	1/32	1-1/4
1	1/8	3/64	1-1/4
2	3/16	5/64	1-7/8
3	1/4	7/64	2
4	5/16	1/8	2-1/8
4-1/2	3/8	9/64	2-1/2
5	7/16	3/16	2-3/4
6	1/2	7/32	3
7	5/8	1/4	3-1/4
8	3/4	5/16	3-1/2
9	7/8	11/32	3-5/8
10	1	3/8	3-3/4

Centre Drill-type B
Bell Type-60° Countersink Angle

Size	Decimal Equivalent	Overall Length
1	35.5	1.3
1.25	40	1.6
1.6	45	2
2	50	2.5
2.5	56	3.1
3.15	60	3.9
4	67	5
5	75	6.3
6.3	80	8
8	100	10.1
10	125	12.8

Size	Body Diameter	Drill Dia. and Length	Overall Length
11	1/8	3/64	1-1/4
12	3/16	1/16	1-7/8
13	1/4	3/32	2
14	5/16	7/64	2-1/8
15	7/16	5/32	2-3/4
16	1/2	3/16	3
17	5/8	7/32	3-1/4
18	3/4	1/4	3-1/2

OTHER GENERAL TOOLS

TOOL Bits

Inch

Round

Size	Overall Length	Overall Length	Overall Length	Size	Overall Length	Overall Length	Overall Length	Size	Overall Length	Overall Length	Overall Length
1/16	4	-	-	17/64	4	6	8	29/64	4	6	8
5/64	4	-	-	9/32	4	6	8	15/32	4	6	8
3/32	4	-	-	19/64	4	6	8	31/64	4	6	8
7/64	4	-	-	5/16	4	6	8	1/2	4	6	8
1/8	4	6	-	21/64	4	6	8	9/16	4	6	8
9/64	4	6	8	11/32	4	6	8	5/8	4	6	8
5/32	4	6	8	23/64	4	6	8	11/16	4	6	8
11/64	4	6	8	3/8	4	6	8	3/4	4	6	8
3/16	4	6	8	25/64	4	6	8	13/16	4	6	8
13/64	4	6	8	13/32	4	6	8	7/8	4	6	8
7/32	4	6	8	27/64	4	6	8	15/16	4	6	8
15/64	4	6	8	7/16	4	6	8	1	4	6	8
1/4	4	6	8								

Square

Size	Overall Length	Overall Length	Overall Length	Size	Overall Length	Overall Length	Overall Length	Size	Overall Length	Overall Length	Overall Length
1/8	1/8	4	6	-	-	1 1/8	1 1/8	4	6	8	12
3/16	3/16	4	6	6	-	1 3/16	1 3/16	4	6	8	12
1/4	1/4	4	6	6	-	1 1/4	1 1/4	4	6	8	12
5/16	5/16	4	6	6	12	1 5/16	1 5/16	4	6	8	12
3/8	3/8	4	6	6	12	1 3/8	1 3/8	4	6	8	12
7/16	7/16	4	6	6	12	1 7/16	1 7/16	4	6	8	12
1/2	1/2	4	6	6	12	1 1/2	1 1/2	4	6	8	12
9/16	9/16	4	6	6	12	1 9/16	1 9/16	4	6	8	12
5/8	5/8	4	6	6	12	1 5/8	1 5/8	4	6	8	12
11/16	11/16	4	6	6	12	1 11/16	1 11/16	4	6	8	12
3/4	3/4	4	6	6	12	1 3/4	1 3/4	4	6	8	12
13/16	13/16	4	6	6	12	1 13/16	1 13/16	4	6	8	12
7/8	7/8	4	6	6	12	1 7/8	1 7/8	4	6	8	12
15/16	15/16	4	6	6	12	1 15/16	1 15/16	4	6	8	12
1	1	4	6	6	12	2	2	4	6	8	12
1 1/16	1 1/16	4	6	6	12			4	6	8	12

Rectangle

Size	Overall Length	Overall Length	Overall Length	Size	Overall Length	Overall Length	Overall Length	Size	Overall Length	Overall Length	Overall Length
1/4	3/16	5/32	1/8	7/8	21/32	35/64	7/16	1 1/2	1 1/8	15/16	3/4
5/16	15/64	8/41	5/32	15/16	45/64	58/99	15/32	1 9/16	1 1/16	83/85	25/32
3/8	9/32	15/64	3/16	1	3/4	5/8	1/2	1 5/8	1 7/32	1 1/64	13/16
7/16	21/64	3/11	7/32	1 1/16	51/64	2/3	17/32	1 11/16	1 17/64	1 4/73	27/32
1/2	3/8	5/16	1/4	1 1/8	27/32	45/64	9/16	1 3/4	1 5/16	1 3/32	7/8
9/16	27/64	13/37	9/32	1 3/16	57/64	72/97	19/32	1 13/16	1 23/64	1 2/15	29/32
5/8	15/32	25/64	5/16	1 1/4	15/16	25/32	5/8	1 7/8	1 13/32	1 11/64	15/16
11/16	33/64	3/7	11/32	1 5/16	63/64	73/89	21/32	1 15/16	1 29/64	1 4/19	31/32
3/4	9/16	15/32	3/8	1 3/8	1 1/32	55/64	11/16	2	1 1/2	1 1/4	1
13/16	39/64	33/65	13/32	1 7/16	1 5/64	53/59	23/32				

L: 4" 6" 8" 12"

METERIAL: M42;M35; M2; M7;W9; W4

OTHER GENERAL TOOLS

TOOL Bits
Metric Sizes

Round

Size	Overall Length	Overall Length	Overall Length	Size	Overall Length	Overall Length	Overall Length	Size	Overall Length	Overall Length	Overall Length
1.1	100	-	-	2.5	100	150	-	7.5	100	150	200
1.2	100	-	-	2.6	100	150	-	8.0	100	150	200
1.3	100	-	-	2.7	100	150	-	8.5	100	150	200
1.4	100	-	-	2.8	100	150	-	9.0	100	150	200
1.5	100	-	-	2.9	100	150	-	9.5	100	150	200
1.6	100	-	-	3.0	100	150	200	10.0	100	150	200
1.7	100	-	-	3.5	100	150	200	12.0	100	150	200
1.8	100	-	-	4.0	100	150	200	14.0	100	150	200
1.9	100	-	-	4.5	100	150	200	16.0	100	150	200
2.0	100	-	-	5.0	100	150	200	18.0	100	150	200
2.1	100	-	-	5.5	100	150	200	20.0	100	150	200
2.2	100	-	-	6.0	100	150	200	22.0	100	150	200
2.3	100	-	-	6.5	100	150	200	24.0	100	150	200
2.4	100	-	-	7.0	100	150	200	26.0	100	150	200

Square

Size	Overall Length	Overall Length	Overall Length	Size	Overall Length	Overall Length	Overall Length	Size	Overall Length	Overall Length	Overall Length
3	3	100	150	-	-	26	26	100	150	200	300
4	4	100	150	200	-	28	28	100	150	200	300
5	5	100	150	200	-	30	30	100	150	200	300
6	6	100	150	200	-	32	32	100	150	200	300
8	8	100	150	200	200	34	34	100	150	200	300
10	10	100	150	200	200	36	36	100	150	200	300
12	12	100	150	200	200	38	38	100	150	200	300
14	14	100	150	200	200	40	40	100	150	200	300
16	16	100	150	200	200	42	42	100	150	200	300
18	18	100	150	200	200	44	44	100	150	200	300
20	20	100	150	200	200	46	46	100	150	200	300
22	22	100	150	200	200	48	48	100	150	200	300
24	24	100	150	200	200	50	50	100	150	200	300

Rectangle

Size	Overall Length	Overall Length	Overall Length	Size	Overall Length	Overall Length	Overall Length	Size	Overall Length	Overall Length	Overall Length
6	5	4	3	22	17	13	11	38	29	23	19
8	6	5	4	24	18	14	12	40	30	24	20
10	8	6	5	26	20	16	13	42	32	25	21
12	9	7	6	28	21	17	14	44	33	26	22
14	11	8	7	30	23	18	15	46	35	28	23
16	12	10	8	32	24	19	16	48	36	29	24
18	14	11	9	34	26	20	17	50	38	30	25
20	15	12	10	36	27	22	18				

L: 4" 6" 8" 12"

METERIAL: M42;M35; M2; M7;W9; W4

CARBIDE TIP DRILLS

TIANGONG TOOLS

Carbide-Tipped Drill

SDS Hammer Drill

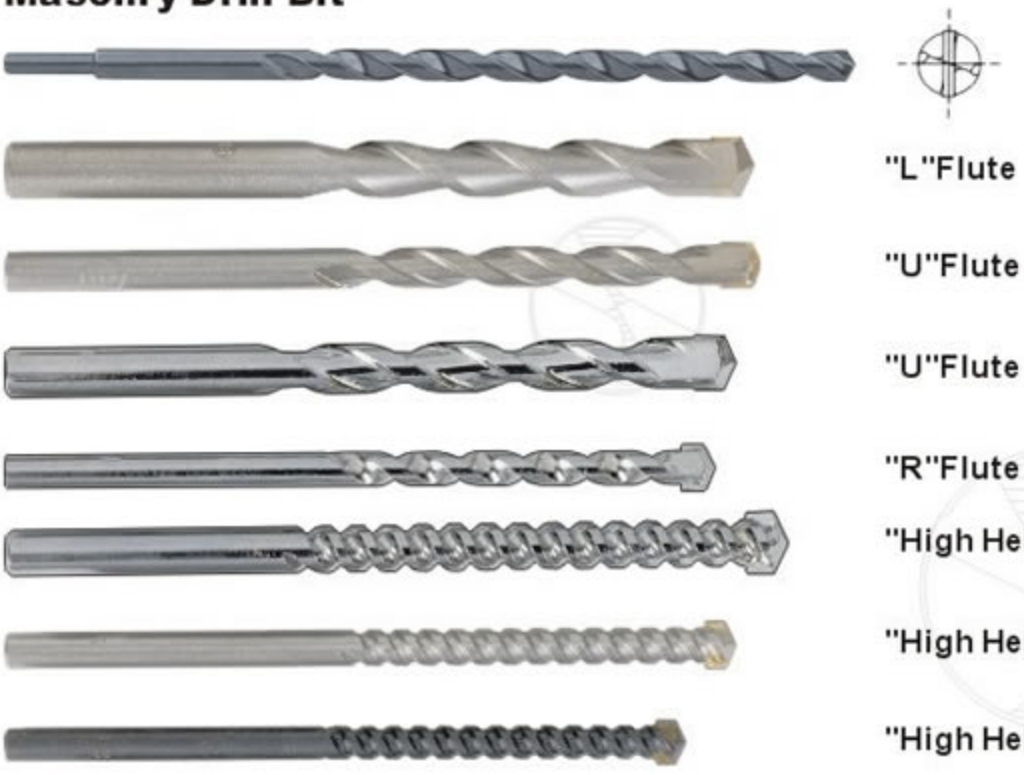
Dia.	Flute Length	Overall Length
4.0 5/32	50	110
5.0 3/16	50	110
5.5 7/32	50	110
6.0 15/64	50	110
6.5 1/4	50	110
7.0 9/32	50	110
8.0 5/16	50	110
10.0 3/8	50	110
5.0 3/16	100	160
5.5 7/32	100	160
6.0 15/64	100	160
6.5 1/4	100	160
7.0 9/32	100	160
8.0 5/16	100	160
10.0 3/8	100	160
11.0 7/16	100	160
12.0 15/32	100	166
13.0 1/2	100	166
14.0 9/16	100	166
15.0 19/32	100	166
16.0 5/8	100	166

Dia.	Flute Length	Overall Length
5.0 3/16	150	210
6.0 15/64	150	210
7.0 9/32	150	210
8.0 5/16	150	210
9.0 11/32	150	210
10.0 3/8	150	210
12.0 15/32	150	200
14.0 9/16	150	200
15.0 19/32	150	200
16.0 5/8	150	200
18.0 23/32	150	200
20.0 3/4	150	200
6.0 15/64	200	260
8.0 5/16	200	260
10.0 3/8	200	260
10.0 3/8	250	310
11.0 7/16	200	260
12.0 15/32	200	266
12.0 15/32	250	310
13.0 1/2	250	300
14.0 9/16	250	300
15.0 19/32	200	266
16.0 5/8	250	300
18.0 23/32	250	300
20.0 3/4	250	300
22.0 7/8	200	250
24.0 15/16	200	250
25.0 1	200	250

Dia.	Flute Length	Overall Length
8.0 5/16	400	450
10.0 3/8	400	450
12.0 15/32	400	450
13.0 1/2	400	450
14.0 9/16	400	450
15.0 19/32	400	450
16.0 5/8	400	450
18.0 23/32	400	450
20.0 3/4	400	450
22.0 7/8	400	450
24.0 15/16	400	450
25.0 1	400	450
26.0 -	400	450
28.0 -	400	450
10.0 3/8	550	600
12.0 15/32	550	600
14.0 9/16	550	600
16.0 5/8	550	600
18.0 23/32	550	600
20.0 3/4	550	600
16.0 5/8	750	800
12.0 15/32	950	1000
14.0 9/16	950	1000
16.0 5/8	950	1000
18.0 23/32	950	1000
20.0 3/4	950	1000

Carbide-Tipped Drill

Masonry Drill Bit



"L"Flute

"U"Flute

"U"Flute

"R"Flute

"High Helix"

"High Helix"

"High Helix"

Dia.		Flute Length	Overall Length
6.0	15/64	300	400
6.5	1/4	300	400
8.0	5/16	300	400
9.0	11/32	300	400
10.0	3/8	300	400
11.0	7/16	300	400
12.0	15/32	300	400
13.0	1/2	300	400
14.0	9/16	300	400
15.0	19/32	300	400
16.0	5/8	300	400
18.0	22/32	300	400
19.0	3/4	300	400
20.0	25/32	300	400
22.0	7/8	300	400
24.0	15/16	300	400
25.0	1	300	400

Dia.		Flute Length	Overall Length
8.0	5/16	450	600
10.0	3/8	450	600
11.0	7/16	450	600
12.0	15/32	450	600
13.0	1/2	450	600
14.0	9/16	450	600
15.0	19/32	450	600
16.0	5/8	450	600
18.0	22/32	450	600
19.0	3/4	450	600
20.0	25/32	450	600

Carbide-Tipped Drill

Masonry,Regular Helix

Carbide Tip.Sand blast/Chrome coated/Zine coated

Masonry, milled"u" type flute or "L" type flute.

"L"Flute

"U"Flute

"U"Flute

"R"Flute

"High Helix"

"High Helix"

"High Helix"

Dia.		Flute Length	Overall Length
3.0	1/8	30	60
4.0	5/32	40	75
5.0	3/16	50	85
5.5	7/32	50	85
6.0	15/64	60	100
6.5	1/4	60	100
7.0	9/32	60	100
8.0	5/16	80	120
9.0	11/32	80	120
10.0	3/8	80	120
11.0	7/16	85	150
12.0	15/32	85	150
13.0	1/2	95	150
14.0	9/16	95	150
15.0	19/32	95	150
16.0	5/8	95	150
17.0	11/16	95	150
18.0	22/32	105	160
19.0	3/4	105	160
20.0	25/32	105	160
22.0	7/8	105	160
25.0	1.0	105	160

Dia.		Flute Length	Overall Length
5.0	3/16	85	150
5.5	7/32	85	150
6.0	15/64	85	150
6.5	1/4	85	150
7.0	9/32	85	150
8.0	5/16	85	150
10.0	3/8	85	150
6.0	15/64	135	200
8.0	5/16	135	200
10.0	3/8	135	200
12.0	15/32	135	200
13.0	1/2	135	200
14.0	35/64	135	200

TIANGONG TOOLS

HSS DRILL BLANKS

HSS DRILL BLANKS IDEX

7A. PRODUCTION TECHNICS		
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7D. Cutting Edge		

HSS DRILL BLANKS

HSS 1/2 Shank S & D Drill Blanks

Size	Basic Size	Dia.	Material Flute	Shank Length
1-3/8	34.925	38.0	99	79
1-25/64	35.322	40.0		
1-13/32	35.719			
1-27/64	36.116	41.0		
1-7/16	36.513			
1-29/64	36.909			
1-15/32	37.306	42.0		
1-31/64	37.703			
1-1/2	38.100			
33/64	13.097	16.0	88	76
17/32	13.494			
35/64	13.891	17.0		
9/16	14.288			
37/64	14.684			
19/32	15.081	18.0	89	
39/64	15.478			
5/8	15.875	19.0		
41/64	16.272			
21/32	16.669			
43/64	17.066	20.0		
11/16	17.463			
45/64	17.859	21.0	90	
23/32	18.256			
47/64	18.653			
3/4	19.050	22.0		
49/64	19.447			
25/32	19.844	23.0		
51/64	20.241			
13/16	20.638			
53/64	21.034	24.0	91	
27/32	21.431			
55/64	21.828	25.0		
7/8	22.225			
57/64	22.622			
29/32	23.019	26.0		
59/64	23.416			

Size	Basic Size	Dia.	Material Flute	Shank Length
15/16	23.813	27.0	91	76
61/64	24.209			
31/32	24.606			
63/64	25.003	28.0	92	
1	25.400			
1-1/64	25.797			
1-1/32	26.194	29.0		
1-3/64	26.591			
1-1/16	26.988	30.0		
1-5/64	27.384			
1-3/32	27.781			
1-7/64	28.178	31.0	93	
1-1/8	28.575			
1-9/64	28.972	32.0		
1-5/32	29.369			
1-11/64	29.766			
1-3/16	30.163	33.0		
1-13/64	30.559			
1-7/32	30.956	34.0		
1-15/64	31.353			
1-1/4	31.750			
1-17/64	32.147	35.0	94	
1-9/32	32.544			
1-19/64	32.941	36.0	98	
1-5/16	33.338	37.0		
1-21/64	33.734			
1-11/32	34.131	38.0	99	79
1-23/64	34.528			

HSS DRILL BLANKS

Taper Shank Drill Blanks

Size	Basic Size	Overall Length	Neck Dia.
33/64	13.155	216	11.684
17/32	13.551		12.827
35/64	13.950	222	12.827
9/16	14.346		13.640
37/64	14.742		14.046
19/32	15.141		14.427
39/64	15.537		14.834
5/8	15.933		15.240
41/64	16.330	229	15.621
21/32	16.726		16.027
43/64	17.125	235	16.408
11/16	17.526		16.815
45/64	17.922	241	17.221
23/32	18.321		17.602
47/64	18.717	248	18.009
3/4	19.114		18.415
49/64	19.510	251	18.720
25/32	19.906		19.126
51/64	20.305	273	19.507
13/16	20.701		19.914
53/64	20.097		20.320
27/32	21.496		20.701
55/64	21.892		21.107
7/8	22.289		21.488
57/64	22.685		22.685
29/32	23.081		23.081
59/64	23.480		23.480
15/16	23.876		23.876
61/64	24.272	279	24.272
31/32	24.671		24.671
63/64	25.067		25.067
1	25.464		25.464
1-1/64	25.860	283	25.860
1-1/32	26.256		26.256
1-3/64	26.655	286	26.655
1-1/16	27.051		27.051
1-5/64	27.447	318	27.447
1-3/32	27.846		27.846
1-7/64	28.242	324	28.242
1-1/8	28.639		28.639
1-9/64	29.035	327	29.035
1-5/32	29.434		29.434
1-11/64	29.830	330	29.830
1-3/16	30.226		30.226
1-13/64	30.622	359	30.622
1-7/32	31.021		31.021
1-15/64	31.417	333	31.417
1-1/4	31.814		31.814
1-17/64	32.563	343	31.369
1-9/32	32.969		31.775
1-19/64	33.350	362	32.156
1-5/16	33.757		32.563

Size	Basic Size	Overall Length	Neck Dia.
1-21/64	34.163	365	32.944
1-11/32	34.544		33.350
1-23/64	34.950	368	33.731
1-3/8	35.357		34.138
1-25/64	35.738	371	34.544
1-13/32	36.144		34.950
1-27/64	36.525	375	35.306
1-7/16	36.932		35.738
1-29/64	37.338	378	36.119
1-15/32	37.719		36.525
1-31/64	38.125	381	36.906
1-1/2	38.532		37.313
1-17/32	39.319	416	38.125
1-9/16	40.107	422	38.913
1-19/32	40.894	429	39.700
1-5/8	41.707	432	40.488
1-21/32	42.494	435	41.300
1-11/16	43.282		41.681
1-23/32	44.069		42.875
1-3/4	44.882		43.663
1-15/32	45.669		44.384
1-13/16	46.457		45.263
1-27/32	47.244		46.050
1-7/8	48.057	441	46.838
1-29/32	48.844		47.625
1-15/16	49.632		48.438
1-31/32	50.419		49.225
2	51.232		50.013
2-1/8	54.407		53.188
2-1/4	57.582		56.363
2-5/16	59.157		57.963
2-7/16	62.332	476	61.138
2-1/2	63.932		62.713

Straight Shank Drill Blanks

Size	d	L	Flute Length
>0.95-1.06	d+0.10	34	12
>1.06-1.18		36	14
>1.08-1.32		38	16
>1.32-1.50		40	18
>1.50-1.70		43	20
>1.70-1.90		46	22
>1.90-2.12		49	24
>2.12-2.36		53	27
>2.36-2.65		57	30
>2.65-3.00		61	33
>3.00-3.35		65	36
>3.35-3.75		70	39
>3.75-4.25		75	43
>4.25-4.75		80	47
>4.75-5.30		86	52
>5.30-6.00		93	57
>6.00-6.70		101	63
>6.70-7.50		109	69
>7.50-8.50		117	75
>8.50-9.50		125	81
>9.50-10.60		133	87
>10.60-11.80		142	94
>11.80-13.00		151	101

HSS DRILL BLANKS

HSS Taps Blanks

Size	Overall Length	Thread Length
1-3/8-16UN-H4	4	1-1/2
1-3/8-18NEF-H4	4	1-1/2
1-3/8-20UN-H4	4	1-1/2
1-7/16-8UN-H4	6-1/16	3
1-7/16-12UN-H4	6-1/16	3
1-7/16-16UN-H4	4	1-1/2
1-7/16-18NEF-H4	4	1-1/2
1-1/2-6NC-H4	6-3/8	3
1-1/2-8UN-H4	6-3/8	3
1-1/2-10NS-H4	6-3/8	3
1-1/2-12NF-H4	6-3/8	3
1-1/2-16UN-H4	4	1-1/2
1-1/2-18NEF-H4	4	1-1/2
1-1/2-20UN-H4	4	1-1/2
1-1/2-24NS-H4	4	1-1/2
1-1/2-27UN-H4	4	1-1/2
1-1/2-28UN-H4	4	1-1/2
1-9/16-12UN-H4	5	2
1-9/16-16UN-H4	5	2
1-9/16-18NEF-H4	5	2
1-9/16-20UN-H4	5	2
1-5/8-5UN-H7	6-11/16	3-3/16
1-5/8-5-1/2UN-H6	6-11/16	3-3/16
1-5/8-5-1/2UN-H7	6-11/16	3-3/16
1-5/8-8UN-H6	6-11/16	3-3/16
1-5/8-10NS-H6	5	2
1-5/8-12UN-H6	5	2
1-5/8-16UN-H5	5	2
1-5/8-18NEF-H4	5	2
1-5/8-18NEF-H5	5	2
1-5/8-20UN-H5	5	2
1-5/8-24NS-H3	5	2
1-11/16-12UN-H6	5	2
1-11/16-16UN-H5	5	2
1-11/16-18NEF-H4	5	2
1-3/4-5NC-H6	7	3-3/16
1-3/4-5NC-H7	7	3-3/16
1-3/4-6UN-H7	7	3-3/16
1-3/4-8UN-H4	7	3-3/16
1-3/4-8UN-H6	7	3-3/16
1-3/4-10NS-H6	5	2
1-3/4-12UN-H4	5	2
1-3/4-12UN-H6	5	2
1-3/4-14NS-H6	5	2
1-3/4-16UN-H5	5	2
1-3/4-18NS-H5	5	2
1-3/4-20UN-H5	5	2

Size	Overall Length	Thread Length
1-7/8-4-1/2UN-H6	7-5/16	3-9/16
1-7/8-5UN-H7	7-5/16	3-9/16
1-7/8-8UN-H6	7-5/16	3-9/16
1-7/8-10NS-H6	5	2
1-7/8-12UN-H6	5	2
1-7/8-16UN-H5	5	2
1-7/8-20UN-H5	5	2
1-15/16-16NS-H4	5	2
2-4-1/2NC-H7	7-5/8	3-9/16
2-6UN-H7	7-5/8	3-9/16
2-8UN-H6	7-5/8	3-9/16
2-10NS-H6	5	2
2-12UN-H6	5	2
2-16UN-H5	5	2
2-20UN-H5	5	2
2-1/8-12UN-H6	5-1/4	2
2-1/8-16UN-H5	5-1/4	2
2-1/8-8UN-H6	8	3-9/16
2-1/4-4-1/2NC-H7	8-1/4	3-9/16
2-1/4-8UN-H6	8-1/4	3-9/16
2-1/4-12UN-H6	5-1/4	2
2-3/8-4-1/2UN-H7	8-1/2	4
2-3/8-8UN-H6	8-1/2	4
2-3/8-12UN-H6	5-1/4	2
2-3/8-14NS-H6	5-1/4	2
2-1/2-4NC-H7	8-3/4	4
2-1/2-8UN-H6	8-3/4	4
2-1/2-12UN-H6	5-1/4	2
2-1/2-16UN-H5	5-1/4	2
2-5/8-16UN-H7	5-1/2	2
2-5/8-18NS-H6	5-1/2	2
2-3/4-8UN-H8	9-1/4	4
3-3/4-12UN-H7	5-1/2	2
2-3/4-16UN-H7	5-1/2	2
2-3/4-18NS-H6	5-1/2	2
2-7/8-12UN-H7	5-1/2	2
3-4NC-H9	9-3/4	4-9/16
3-8UN-H8	9-3/4	4-9/16
3-12UN-H7	5-1/2	2
3-16UN-H7	5-1/2	2
3-1/4-4NC-H9	10	4-9/16
3-1/4-8UN-H8	10	4-9/16
3-1/4-12UN-H7	5-3/4	2
3-1/2-12UN-H7	5-3/4	2
3-3/4-8UN-H8	10-1/2	5-5/16
3-3/4-12UN-H7	6	2
3-7/8-12UN-H7	6	2
4-8UN-H8	10-3/4	5-5/16

HSS TAPS BLANKS

HSS Taps Blanks

Size	Overall Length	Thread Length
3/4-12UN-H3	4-1/4	2
3/4-14NS-H3	4-1/4	2
3/4-16NF-H3	4-1/4	2
3/4-18NS-H3	4-1/4	2
3/4-20NEF-H3	4-1/4	2
3/4-24NS-H3	4-1/4	2
3/4-26UN-H3	4-1/4	2
3/4-27NS-H3	4-1/4	2
3/4-28UN-H3	4-1/4	2
3/4-32UN-H3	4-1/4	2
13/16-10UN-H3	4-15/32	2
13/16-14UN-H3	4-15/32	2
13/16-16UN-H3	4-15/32	2
13/16-18NS-H3	4-15/32	2
13/16-20NEF-H3	4-15/32	2
13/16-24NS-H3	4-15/32	2
13/16-27NS-H3	4-15/32	2
13/16-28UN-H3	4-15/32	2
13/16-32UN-H3	4-15/32	2
7/8-9NC-H4	4-11/16	2-7/32
7/8-12UN-H4	4-11/16	2-7/32
7/8-14NF-H4	4-11/16	2-7/32
7/8-16UN-H3	4-11/16	2-7/32
7/8-16UN-H4	4-11/16	2-7/32
7/8-18NS-H3	4-11/16	2-7/32
7/8-18NS-H4	4-11/16	2-7/32
7/8-20NEF-H3	4-11/16	2-7/32
7/8-24NS-H3	4-11/16	2-7/32
7/8-27NS-H3	4-11/16	2-7/32
7/8-28UN-H3	4-11/16	2-7/32
7/8-32UN-H3	4-11/16	2-7/32
15/16-12UN-H4	4-29/32	2-7/32
15/16-14UN-H4	4-29/32	2-7/32
15/16-16UN-H3	4-29/32	2-7/32
15/16-18NS-H3	4-29/32	2-7/32
15/16-20NEF-H3	4-29/32	2-7/32
15/16-24NS-H4	4-29/32	2-7/32
15/16-27NS-H3	4-29/32	2-7/32
15/16-32UN-H3	4-29/32	2-7/32
1-8NC-H4	]5-1/8	2-1/2
1-10NS-H4	5-1/8	2-1/2
1-12NF-H4	5-1/8	2-1/2
1-14NS-H	5-1/8	2-1/2
1-16UN-H3	5-1/8	2-1/2
1-18NS-H4	5-1/8	2-1/2
1-20NEF-H4	5-1/8	2-1/2
1-24NS-H3	5-1/8	2-1/2

Size	Overall Length	Thread Length
1-27NS-H3	5-1/8	2-1/2
1-28UN-H3	5-1/8	2-1/2
1-32UN-H3	5-1/8	2-1/2
1-40NS-H3	5-1/8	2-1/2
1-40NS-H4	5-1/8	2-1/2
1-48UN-H3	5-1/8	2-1/2
1-1/16-10NS-H5	5-1/8	2-1/2
1-1/16-12NS-H4	5-1/8	2-1/2
1-1/16-16UN-H3	4	1-1/2
1-1/16-16UN-H4	4	1-1/2
1-1/16-8NEF-H4	4	1-1/2
1-1/16-20UN-H3	4	1-1/2
1-1/16-24NS-H3	4	1-1/2
1-1/16-27UN-H3	4	1-1/2
1-1/16-32UN-H3	4	1-1/2
1-1/8-7NC-H4	5-7/16	2-9/16
1-1/8-8UN-H4	5-7/16	2-9/16
1-1/8-12NF-H4	5-7/16	2-9/16
1-1/8-16UN-H4	4	1-1/2
1-1/8-18NEF-H3	4	1-1/2
1-1/8-18NEF-H4	4	1-1/2
1-1/8-20UN-H4	4	1-1/2
1-1/8-32UN-H3	4	1-1/2
1-3/16-12UN-H4	5-7/16	2-9/16
1-3/16-16UN-H4	4	1-1/2
1-3/16-18NEF-H4	4	1-1/2
1-3/16-20UN-H3	4	1-1/2
1-3/16-28UN-H3	4	1-1/2
1-3/16-32UN-H3	4	1-1/2
1-1/4-7NC-H4	5-3/4	2-9/16
1-1/4-8UN-H4	5-3/4	2-9/16
1-1/4-10NS-H4	5-3/4	2-9/16
1-1/4-12NF-H4	5-3/4	2-9/16
1-1/4-14NS-H4	4	1-1/2
1-1/4-16UN-H4	4	1-1/2
1-1/4-18NEF-H4	4	1-1/2
1-1/4-20UN-H4	4	1-1/2
1-1/4-24NS-H4	4	1-1/2
1-5/16-8UN-H4	5-3/4	2-9/16
1-5/16-12UN-H4	5-3/4	2-9/16
1-5/16-16UN-H4	4	1-1/2
1-5/16-18NEF-H4	4	1-1/2
1-5/16-20UN-H4	4	1-1/2
1-3/8-6NC-H4	6-1/16	3
1-3/8-8UN-H4	6-1/16	3
1-3/8-12NF-H4	6-1/16	3
1-3/8-14NS-H4	4	1-1/2

TIANGONG TOOLS

DRILL SET

Drill set

DIN338 Standanl Drill Sets and Jobber Length Belusec Metric Size Sets, Metal Index

Fractional Sizes in Metal Index

Set Qty.	Size Range	General Purpose: Bright Finish	General Purpose: Black Oxide	Heavy Duty: Black Oxide	Cobalt: Bronze Oxide	Black & Bronze Oxide	TiN Coated
13 pc.	1/16-1/4" by 64ths						
13 pc.	1.5-6.5x0.5 +3.2+4.8mm						
15 pc.	1/16-1/2" by 32nd						
19 pc.	1.0-10.0x0.5mm						
21 pc.	1/16-3/8" by 64ths						
25 pc.	1.0-10.0mm 0.5mm						
29 pc.	1/16-1/2" by 64ths						

13 pc. Set shown

Wire Size in Metal Index

Set Qty.	Size Range	General Purpose: Bright Finish	General Purpose: Black Oxide	Black & Bronze Oxide
60 pc.	1-60			
20 PC.	61-80			

29 pc. Set shown

Letter Size

Set Qty.	Size Range	General Purpose: Black Oxide	Black & Bronze Oxide
26 pc.	A - Z		

26 pc. Set shown

Drill set

Three Flat Sets

Fractional Sizes in Metal Index		General Purpose		
Set Qty.	Size Range	Black & Bronze Oxide	Black Oxide	Tincoulid
13 pc.	1/16-1/4" by 64ths			
15 pc.	1/16-1/2" by 32nds			
21 pc.	1/16-3/8" by 64ths			
29 pc.	1/16-1/2" by 64ths			
29 pc.	1/16-1/2" by 64ths			
	3/8" Shank			

29 pc. Set shown

Jobber Length Sets

Combination Size Metal Index		General Purpose		Heavy Duty	Cobalt	
Set Qty.	Size Range	Bright Finish	Black Oxide	Black Oxide	Bronze Oxide	Black & Bronze Oxide
115pc.	1/16-1/2" by 64ths 1-60, A-Z					

115 pc. Set shown

Fractional Size in Select-a-Drill Case		General Purpose		
Set Qty.	Size Range	Bright Finish	Black Oxide	Black & Bronze Oxide
13 pc.	1/16–1/4" by 64ths			
19 pc.	1.0–10.0by 0.5mm			
21 pc.	1/16–3/8" by 64ths			

13 pc. Set shown

Drill set

Fractional Size in Folding Plastic Case

Set Qty.	Size Range	General Purpose: Black Oxide	General Purpose: Black & Bronze Oxide
10 pc.	1/16,5/64,3/32,7/64,1/8 9/64,5/32,3/16,7/32,1/4"		
13 pc.	1/16-1/4" by 64ths		

13 pc. Set shown

Metric Size in Metal Box

Set Qty.	Size Range	Style	General Purpose: Black Oxide/Bright/TiN /Black &Bronze	Rainbow Colar
170 pc	1.0-8.0x10pc 8.5-10.0x5pc			

1/4"Hex Shank Sets

Fractional Sizes in Clamshell

Set Qty.	Size Range	Style	General Purpose: Black Oxide/Bright/TiN
7 pc.	1/16-1/4" by 32nds		
13 pc.	1/16-1/4" by 64nds		
13 pc.	1.5-6.5 by 0.5mm +3.2-4.8mm		

Drill set

1/2 Shank S & D Drill

Fractional in wood box

Set Qty.	Screw Extractor & Drill Size Range	Style	General Purpose Gray Finish (Bright Finish Drills)/Black Oxide
5 pc.	9/16-1"		
8 pc.			
13 pc.			

Jobber Length Sets

Fractional Size in Metal Index

Set Qty.	Size Range	Style	General Purpose Bright Finish	General Purpose Black Oxide	Cobalt Bronze Oxide	Black & Bronze Oxide
540 pc.	1/16-1/4" by 64ths					
	(24) 1/16-7/64,(60) 1/8,					
	(24)9/64-11/64,(48)3/16,					
	(24) 13/64-15/64,(60) 1/4,					
	(12) 17/64-5/16,					
	(6)21/64-23/64,(12)3/8,					
	(6)25/64-27/64,(12)7/16,					
	(6)29/64-1/2					

SDS Hammer Drill Sets

Descriptions	Shipment Carton QUANTITY	Dimensions (cm)	N.W (kg)	G.W (kg)
5/5/6/6/8mm with drills	20	56.5x20x12.5	11.5	12.5
5/6/8x110mm+6/8/10/12x160mm With drills	20	56.5x20x12.5	11.5	12.5
5/6/x110mm+6/8/10/12x160mm with drills	20	56.5x20x12.5	11.5	12.5
5.5/6/8x110mm+6/8/10/12x160mm with drills	20	56.5x20x12.5	11.5	12.5
5.5/6/8x110mm+6/8/10x160mm with drills	20	56.5x20x12.5	11.5	12.5

Drill set

Art No.	Sets	Unit Price
10105001	6PC Hole Saws Set	

4PC Hole Saws: 2-1/2 " (64mm), 3 " (76mm),
3-1/2 " (89mm), 4 " (102mm)
1PC Arbors: 7/16 " Hex, Fit 32-210mm,
1PC Drills: 1/4 " x75mm

Art No.	Sets	Unit Price
10105002	7PC Hole Saws Set	

5PC Hole Saws: 7/8 " (22mm), 1 " (76mm),1-1/8 " (29mm),
1-1/4 " (32mm), 1-1/2 " (38mm)
1PC Arbors: 3/8 " Hex, Fit 14-30mm,
1PC Adapter: 1/2-20UNF-5/8-18UNF

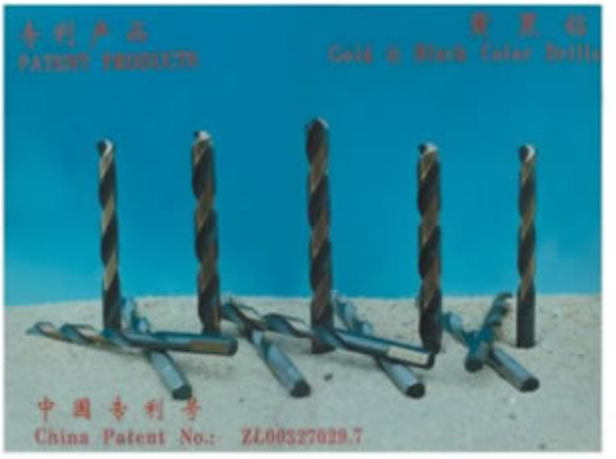
Art No.	Sets	Unit Price
10105003	7PC Hole Saws Set	

5PC Hole Saws: 3/4 " (19mm), 7/8 " (22mm), 1 " (25mm),
1-1/8 " (29mm), 1-1/4 " (32mm)
1PC Arbors: 3/8 " Hex, Fit 14-30mm,
1PC Adapter: 1/2-20 UNF-5/8-18UNF

Art No.	Sets	Unit Price
10105004	7PC Hole Saws Set	

4PC Hole Saws: 3/4 " (19mm), 7/8 " (22mm),
1-1/8 " (29mm), 1-3/8 " (35mm)
1PC Arbors: 3/8 " Hex, Fit 14-30mm,
1PC Drills: 1/4 " x75mm
1PC Adapter: 1/2-20UNF-5/8-18UNF

**PATENT PRODUCTS IN CHINA



CERTIFICATE
管理体系认证证书
江苏天工工具有限公司
GB/T 19001-2000 idt ISO 9001:2000标准要求
IAF
方圆标志认证集团

IQNet
THE INTERNATIONAL CERTIFICATION NETWORK
CERTIFICATE
IQNet and CQM
hereby certify that the organization
Jiangsu Tiangong Tools Corporation Limited
Houxiang Town, Danyang City, Jiangsu, P.R.China
Postcode.:212312
is in conformity with
ISO 9001:2000 Standard
This certificate is valid to the following product(s)/service:
Design and production of HSS tools and HSS twist drill
Issued on: 2007-03-06
Validity date: 2010-03-03
Registration Number: CN-00307Q11262R3L
Dr. Fabio Roversi
President of IQNet
Zhang Wei
CEO of CQM

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