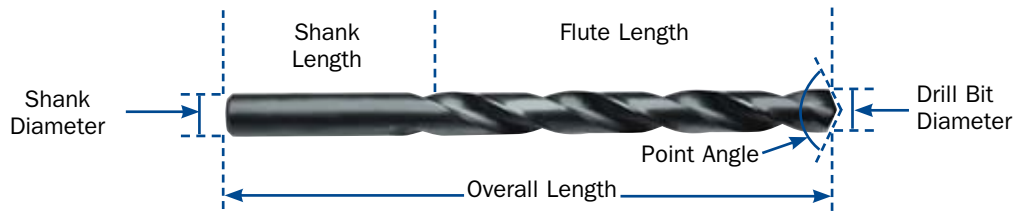


Engineered For Controlled Precision And Speed



Overall Length: The length from the point to the end of the drill

Point Angle: The angle of the cutting edges

Drill Diameter: The cutting diameter of the drill

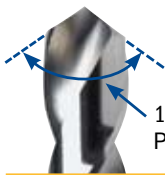
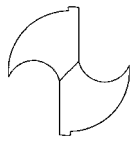
Shank Length: The end of the drill bit that is secured by the drill

Flute Length: The length from the point to the end of the flutes

Tip Geometry

118° Conventional Point

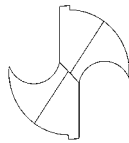
- General Use
- Not self-centering
- For Stationary Drills
- Performs better in softer materials than hard metal



118°
Point Angle

135° Split Point

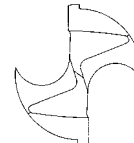
- Self-centering (won't "walk")
- For Portable Drills
- Requires less force than 118°



135°
Point Angle

TURBOMAX® Tip

- Self-centering (won't "walk")
- Precision ground to stay sharp longer and drill faster
- For Portable Drills
- Requires less force than 118°



METAL DRILLING

Drill Bit Section

Material	Point Angle	Black & Gold TURBOMAX®		Heavy-Duty	Titanium Nitride (TiN) Coated	Cobalt	General Purpose
		(135°)	(TURBOMAX®)	(135°)	(135°)	(135°)	(118°)
Wood/Drywall		●	●	●	●	●	●
Sheet Metal		●	●	●	●	●	●
Mild Steel		●	●	●	●	●	●
High Alloy Steels		●	●	●	●	●	●
Stainless Steels		●	●	●	●	●	●
Cast Iron		●	●	●	●	●	●
Aluminum, Brass & Copper		●	●	●	●	●	●
Plastic		●	●	●	●	●	●

Key: ● Recommended ● Acceptable ● Not Recommended

Cutting Speeds - by Working Material

Speeds for High Speed Steel Drills

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

*Surface Feet per Minute (SFM)

$$RPM = \frac{SFM \times 3.82}{Drill Diameter}$$

Speeds and Feeds for Deep Hole Drilling

Holes that qualify as "deep-hole drilling" are three or more drill bit diameters deep. When drilling this deep, the speed and feed rate must be adjusted to reduce friction. Friction creates heat, and heat build-up in the drill bit can cause failure and breakage. Lubricants help dissipate heat from the tip of the drill bit, prolonging drill life, and should always be used when deep-hole drilling.

Another technique that should be used when deep-hole drilling is called "pecking". Pecking is the process whereby the user drills a short distance then backs the drill out of the hole before progressing. Pecking lessens the possibility of chips getting lodged in the flute and allows for the reintroduction of lubricant into the hole.

Speed and Feed Reduction (Based upon the hole depth)

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

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 - .0050
1/4" to 3/8"	.0030 - .0050	.0050 - .0070	.0060 - .0100
3/8" to 1/2"	.0040 - .0060	.0050 - .0080	.0080 - .0120
1/2" to 3/4"	.0050 - .0070	.0070 - .0100	.0090 - .0140
3/4" to 1"	.0070 - .0100	.0090 - .0140	.0140 - .0200

See pages 127-128 for Tap & Drill Selection Chart

Titanium Nitride (TiN) Coated HSS Fractional Straight Shank Jobber Length Drill Bits 135° Split Point (Series 639/637)



63724

- Titanium Nitride coated bits last up to six times longer than standard high speed steel drill bits
- Cutting edge stays sharper longer
- Titanium Nitride coating reduces friction
- Repetitive metal drilling with Portable Drills, Stationary Drill Press

Sets:

Metal Index: 63737, 3018003

*Note: 2 bits per Card

Size	Decimal Equiv.	Flute Length	Overall Length	Carded Stock #	Bulk Stock #
1/16"	.0625	7/8"	1-7/8"	63904*	63704
5/64"	.0781	1"	2"	63905*	63705
3/32"	.0938	1-1/8"	2-1/4"	63906*	63706
7/64"	.1094	1-1/2"	2-5/8"	63907*	63707
1/8"	.1250	1-5/8"	2-3/4"	63908*	63708
9/64"	.1406	1-3/4"	2-7/8"	63909	63709
5/32"	.1563	2"	3-1/8"	63910	63710
11/64"	.1719	2-1/8"	3-1/4"	63911	63711
3/16"	.1875	2-5/16"	3-1/2"	63912	63712
13/64"	.1563	2-7/16"	3-5/8"	63913	63713
7/32"	.2188	2-1/2"	3-3/4"	63914	63714
15/64"	.2344	2-5/8"	3-7/8"	63915	63715
1/4"	.2500	2-3/4"	4"	63916	63716
17/64"	.2656	2-7/8"	4-1/8"	-	63717
9/32"	.2812	2-15/16"	4-1/4"	63918	63718
19/64"	.2969	3-1/16"	4-3/8"	-	63719
5/16"	.3125	3-3/16"	4-1/2"	63920	63720
21/64"	.3281	3-5/16"	4-5/8"	-	63721
11/32"	.3438	3-7/16"	4-3/4"	63922	63722
23/64"	.3594	3-1/2"	4-7/8"	-	63723
3/8"	.3750	3-5/8"	5"	63924	63724
25/64"	.3906	3-3/4"	5-1/8"	-	63725
13/32"	.4063	3-7/8"	5-1/4"	63926	63726
27/64"	.4219	3-15/16"	5-3/8"	-	63727
7/16"	.4375	4-1/16"	5-1/2"	63928	63728
29/64"	.4531	4-3/16"	5-5/8"	-	63729
15/32"	.4689	4-5/16"	5-3/4"	63930	63730
31/64"	.4844	4-3/8"	5-7/8"	-	63731
1/2"	.5000	4-1/2"	6"	63932	63732

METAL DRILLING

JOBBER LENGTH DRILL BITS

General Purpose HSS Fractional Straight Shank Jobber Length Drill Bits 118° Point (Series 605/601)



60124

- Recommended for use in metal, wood & plastic
- 118° conventional point, bright finish

Applications:

Automotive, MRO, Stationary Drill Press

Sets:

Metal Index: 60136, 60137, 60138, 60221

Size	Decimal Equiv.	Flute Length	Overall Length	Carded Stock #	Bulk Stock #
1/64"	.0156	3/16"	3/4"	—	60101
1/32"	.0313	1/2"	1-3/8"	—	60102
3/64"	.0469	3/4"	1-3/4"	—	60103
1/16"	.0625	7/8"	1-7/8"	60504*	60104
5/64"	.0781	1"	2"	60505*	60105
3/32"	.0938	1-1/8"	2-1/4"	60506*	60106
7/64"	.1094	1-1/2"	2-5/8"	60507*	60107
1/8"	.1250	1-5/8"	2-3/4"	60508*	60108
9/64"	.1406	1-3/4"	2-7/8"	60509	60109
5/32"	.1563	2"	3-1/8"	60510	60110
11/64"	.1719	2-1/8"	3-1/4"	60511	60111
3/16"	.1875	2-5/16"	3-1/2"	60512	60112
13/64"	.2031	2-7/16"	3-5/8"	60513	60113
7/32"	.2188	2-1/2"	3-3/4"	60514	60114
15/64"	.2344	2-5/8"	3-7/8"	60515	60115
1/4"	.2500	2-3/4"	4"	60516	60116
17/64"	.2656	2-7/8"	4-1/8"	60517	60117
9/32"	.2813	2-15/16"	4-1/4"	60518	60118
19/64"	.2969	3-1/16"	4-3/8"	60519	60119
5/16"	.3125	3-3/16"	4-1/2"	60520	60120
21/64"	.3281	3-5/16"	4-5/8"	60521	60121
11/32"	.3438	3-7/16"	4-3/4"	60522	60122
23/64"	.3594	3-1/2"	4-7/8"	60523	60123
3/8"	.3750	3-5/8"	5"	60524	60124
25/64"	.3906	3-3/4"	5-1/8"	60525	60125
13/32"	.4063	3-7/8"	5-1/4"	60526	60126
27/64"	.4219	3-15/16"	5-3/8"	60527	60127
7/16"	.4375	4-1/16"	5-1/2"	60528	60128
29/64"	.4531	4-3/16"	5-5/8"	60529	60129
15/32"	.4688	4-5/16"	5-3/4"	60530	60130
31/64"	.4844	4-3/8"	5-7/8"	60531	60131
1/2"	.5000	4-1/2"	6"	60532	60132

*Note: 2 bits per Card

General Purpose HSS Fractional 3/8" Reduced Shank Jobber Length Drill Bits 118° Point (Series 738/718)



71832

- Standard general purpose bit with 3/8" reduced shanks

Applications:

Automotive, MRO, Stationary Drill Press

Sets:

Metal Index: 60147, 60148

Size	Decimal Equiv.	Flute Length	Overall Length	Carded Stock #	Bulk Stock #
25/64"	.3906	3-3/4"	5-1/8"	73825	71825
13/32"	.4063	3-7/8"	5-1/4"	73826	71826
27/64"	.4219	3-15/16"	5-3/8"	73827	71827
7/16"	.4375	4-1/16"	5-1/2"	73828	71828
29/64"	.4531	4-3/16"	5-5/8"	73829	71829
15/32"	.4688	4-5/16"	5-3/4"	73830	71830
31/64"	.4844	4-3/8"	5-7/8"	73831	71831
1/2"	.5000	4-1/2"	6"	73832	71832