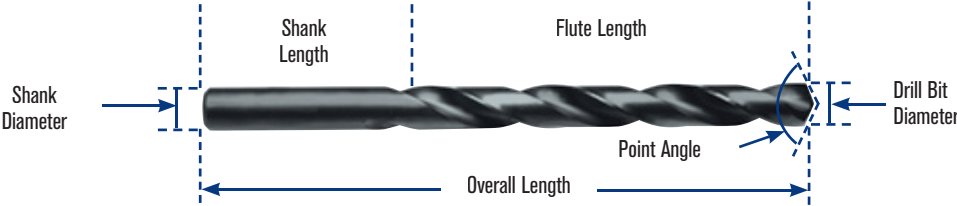


Engineered for Controlled Precision and Speed



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

Point Angle: The angle of the cutting edges

Drill Diameter: The cutting diameter of the drill bit
- 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

METAL DRILLING

118° Conventional Point

- General use
- Not self-centering
- Best for stationary drills
- Performs better in softer materials vs. hard metal

118° Point Angle

135° Split Point

- Self-centering (won't "walk")
- Best 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
- Best for portable drills
- Requires less force than 118°

Drill Bit Selection

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 Steel		●	●	●	●	●	●
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)

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

TURBOMAX® Titanium HSS Fractional Jobber Length Drill Bits (Series 3015)



3015012

- Titanium nitride (TiN) coating resists heat and friction, providing up to six times longer life than standard high speed steel bits.
- Self-centering, precision-ground TURBOMAX® feature-point tip eliminates "walking" on flat and curved surfaces, stays sharp longer, and drills faster than standard high speed steel bits.
- 3-flatted shank on 3/16" and above sizes for exceptional grip on chuck.

Sets:

Pro Set Cases: 3018008, 3018009, 3018010, 3018011

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 "pecking." Pecking is the process whereby the user drills a short distance, then backs the drill out of the hole before progressing. Pecking reduces the possibility of chips getting lodged in the flute, and allows for the reintroduction of lubricant into the hole.

Speed and Feed Reduction (Based on 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 175-176 for Tap & Drill Selection Chart

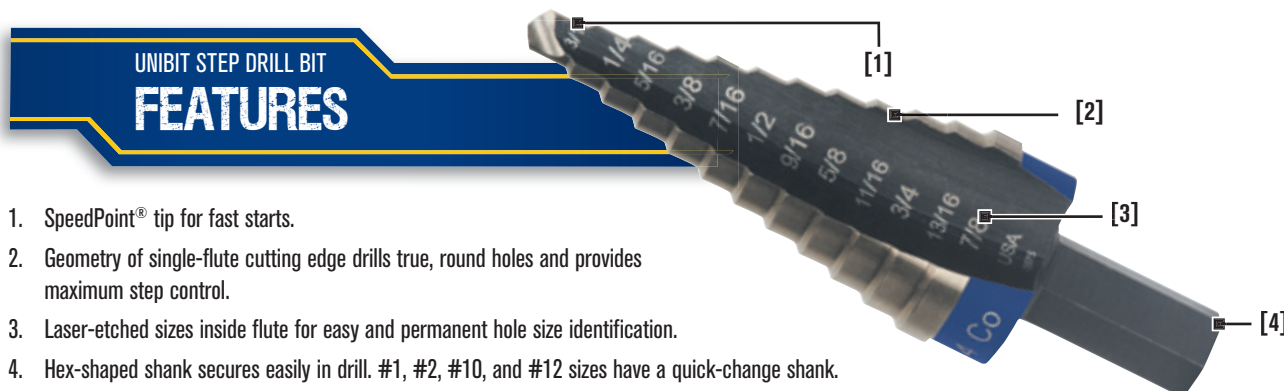
Size	Decimal Equiv.	Flute Length	Overall Length	Carded Item #	Bulk Item #
1/16"	.0625	7/8"	1-7/8"	3015004*	—
5/64"	.0781	1"	2"	3015005*	—
3/32"	.0938	1-1/8"	2-1/4"	3015006*	—
7/64"	.1094	1-1/2"	2-5/8"	3015007*	—
1/8"	.1250	1-5/8"	2-3/4"	3015008	—
9/64"	.1406	1-3/4"	2-7/8"	3015009	—
5/32"	.1563	2"	3-1/8"	3015010	—
11/64"	.1719	2-1/8"	3-1/4"	3015011	—
3/16"	.1875	2-5/16"	3-1/2"	3015012	—
13/64"	.2031	2-7/16"	3-5/8"	3015013	—
7/32"	.2188	2-1/2"	3-3/4"	3015014	—
15/64"	.2344	2-5/8"	3-7/8"	3015015	—
1/4"	.2500	2-3/4"	4"	3015016	—
17/64"	.2656	2-7/8"	4-1/8"	3015017	—
9/32"	.2813	2-15/16"	4-1/4"	3015018	—
19/64"	.2969	3-1/16"	4-3/8"	3015019	—
5/16"	.3125	3-3/16"	4-1/2"	3015020	—
21/64"	.3281	3-5/16"	4-5/8"	3015021	—
11/32"	.3438	3-7/16"	4-3/4"	3015022	—
23/64"	.3594	3-1/2"	4-7/8"	3015023	—
3/8"	.3750	3-5/8"	5"	3015024	—
25/64"***	.3906	3-3/4"	5-1/8"	3015025	—
13/32"***	.4063	3-7/8"	5-1/4"	3015026	—
27/64"***	.4219	3-15/16"	5-3/8"	3015027	—
7/16"***	.4375	4-1/16"	5-1/2"	3015028	—
29/64"***	.4531	4-3/16"	5-5/8"	3015029	—
15/32"***	.4688	4-5/16"	5-3/4"	3015030	—
31/64"***	.4844	4-3/8"	5-7/8"	3015031	—
1/2"***	.5000	4-1/2"	6"	3015032	—

*Note: 2 bits per Card

**Note: 3/8" reduced shank

UNIBIT Step Drill Bits — Drill Multiple Hole Sizes with One Bit

IRWIN® UNIBIT® step drill bits are ideal for drilling holes in just about any type of thin material. General purpose high speed steel UNIBIT step drill bits are perfect for use in mild steel, copper, brass, aluminum, plexiglass, wood, and laminate. Our Titanium Nitride-coated (TiN) bits resist heat and friction, which extends the life of the cutting edge six times longer than standard step drills. And, our Cobalt step drill bits are engineered with M35 Cobalt steel for maximum life when drilling in the toughest steel, including stainless steel. Most UNIBIT step drills are designed with a SpeedPoint® tip that guarantees fast starts. They're manufactured with a single-flute cutting edge that drills multiple sizes of true, round holes with precise step control. Plus, the hole sizes are permanently laser-etched on the inside of the flute, so they can be easily identified throughout the life of the bit.



1. SpeedPoint® tip for fast starts.
2. Geometry of single-flute cutting edge drills true, round holes and provides maximum step control.
3. Laser-etched sizes inside flute for easy and permanent hole size identification.
4. Hex-shaped shank secures easily in drill. #1, #2, #10, and #12 sizes have a quick-change shank.

UNIBIT Application Guide

Cobalt	Titanium Nitride (TiN)	High Speed Steel (HSS)
Stainless Steel or Other Tough Materials	Repetitive Drilling	General Use

UNIBIT Cobalt HSS



10231CB

- Engineered with M35 Cobalt steel for maximum life when drilling in tough steel.
- SpeedPoint® tip for fast starts.*

Description	# of Hole Sizes	Hex Shank Size	Carded Item #
#1 1/8" - 1/2" (1/32" steps)	13	1/4"	10231CB
#2 3/16" - 1/2" (1/16" steps)	6	1/4"	10232CB
#3 1/4" - 3/4" (1/16" steps)	9	3/8"	10233CB
#4 3/16" - 7/8" (1/16" steps)	12	3/8"	10234CB
#9 7/8" and 1-1/8" for (1/2" and 3/4") KO	2	7/16"	10239CB
#20 9/16" - 1" (1/16") Inc - Hole Enlarging	8	7/16"	10220CB
#1M 4 mm - 12 mm (1 mm steps)	9	1/4"	11101CB
#2M 4 mm - 12 mm (2 mm steps)	5	1/4"	11102CB
#3M 6 mm - 18 mm (2 mm steps)	7	3/8"	11103CB
#4M 4 mm - 22 mm (2 mm steps)	10	3/8"	11104CB

UNIBIT HSS Fractional Titanium Nitride (TiN) Coated



15101ZR

- Titanium Nitride coating resists heat and friction, extending the cutting edge life up to six times longer than other high speed steel step drill bits.
- SpeedPoint® tip for fast starts.*

Set: 15502

Description	# of Hole Sizes	Hex Shank Size	Carded Item #
#1T 1/8" - 1/2" (1/32" steps)	13	1/4"	15101ZR
#2T 3/16" - 1/2" (1/16" steps)	6	1/4"	15102ZR
#3T 1/4" - 3/4" (1/16" steps)	9	3/8"	15103ZR
#4T 3/16" - 7/8" (1/16" steps)	12	3/8"	15104
#13T 1-1/8" (single hole)	1	7/16"	15313
#20T 9/16" - 1" (hole enlarging)	8	7/16"	15200
#21T 13/16" - 1-3/8" (hole enlarging)	10	7/16"	15221

▲ — SpeedPoint™ Tip

*included on all self-starting sizes except for #1