

Tip #25 Everything You Ever Wanted To Know About Drilling

There are three basic types of drilling commonly in use by today's woodworker – and dozens of different types of drilling bits and accessories available to make your work easier and ensure the best results.

Most beginning woodworkers give very little thought to the drilling of holes. As a rule, they already have a set of common twist bits and a portable electric drill. Often, they don't discover that drilling a clean, smooth hole in a piece of wood can be a real challenge until they've created a sloppy, splintery hole in their first "real" woodworking project. This hole could be out-of-round, drilled at an incorrect angle or just look bad enough that they wouldn't want anyone to see it.

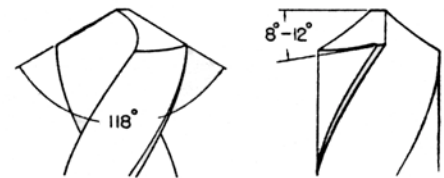
Using the right tool for the job (portable electric drill, vertical drill press or horizontal boring machine) – and choosing the proper bit – can make a big difference in your final product. In this article, we're going to take a look at both of these factors – plus – provide some valuable tips for setting everything up correctly to achieve the best, most consistent results.

Selecting the right drill bit for the job.

In woodworking, there are times when ordinary twist drills are perfectly acceptable for a job. This is especially true when you're building projects that would qualify more as "carpentry" than fine furniture or cabinet-making...or when you're drilling small holes (1/8" or smaller diameters) as pilots for screws, etc. However, there are other times when twist drills "just won't cut it". In these cases, you may need a specialized bit to create a better, cleaner hole...to locate it more accurately...or to drill special materials.

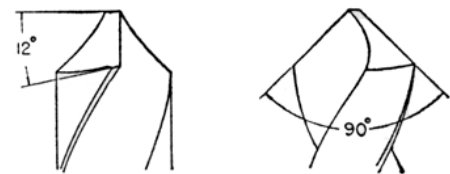
Let's take a look at the different types of drill bits available today...from the most common to the most highly specialized.

• **Twist Drills** are the most commonly available of all drill bits. Made primarily for general purpose drilling of metals, they are also suitable for some wood boring applications. Two prime examples would be small hole drilling (under 3/16" diameter) and drilling for framing-type applications where you might be joining 2" x 4" lumber together with bolts or screws or other types of jobs where the appearance of your holes makes little difference.



Common twist drill point

The majority of twist drills have points that are ground and sharpened to a fairly flat "included angle" – usually about 118-degrees. This is fine for drilling metals. However, when drilling wood, these flat angled tips have a tendency to wander off-center and create a hole with significant tear-out at the points of entry and exit. As mentioned previously, this is less of a problem with smaller diameter bits than with larger diameter bits.



Steep twist drill point for woods and plastics

Twist drills used for wood should have a steeper "included angle" – about 90-degrees is best. As a result, these bits will stay on-center and "wander" less while making a much cleaner entry and exit hole in woods and plastics.

There are two significant sub-categories of twist drills...both of which will be of interest to woodworkers on an occasional basis.

The first of these are **Hardened Twist Bits**. These bits are available in three types, 1): Cobalt Steel, 2): Titanium Nitride coated and 3): Zirconium Nitride coated. They are usually bright gold in color or have a slight gold tint and will hold their sharpness eight to ten times longer than conventional twist bits when drilling hard metal alloys.



Titanium Nitride

The second of these are **Plexiglas or Plastic Twist Bits**. These bits include a steep point angle to provide a cleaner entry/exit point without breakage when drilling plastic materials. If you're planning to drill plastics, these bits are well worth the investment.



Plastic Twist Bits



Spade Bits

- **Spade Bits** are flat, steel bits with an extremely sharp point. These points will help keep your bit on-center while their sharp flutes will cut through the wood very fast. Spade bits are usually only available in sizes from 3/8" up. When buying spade bits, look for ones with a long center point and a sharp "scoring" point near each outer edge. Short center points make these bits difficult to use in a portable drill. If you're slightly off perpendicular when drilling, you may not have enough point "buried" in your workpiece to hold the bit on-center as you drill. This is not a problem if you're using them in a drill press. The long center point will allow you to use the bits in a portable drill without The scoring points will score a sharp line around the diameter of your hole before the body of the bit enters the wood...producing a much cleaner entry hole.

A few cautions about spade bits: Watch your speed. Too fast and these bits will burn or chatter, producing a rough hole. Too slow and they'll tear the wood, producing ragged hole sides. To avoid severe splintering on the exit side of your hole, be sure to clamp a back-up board behind the exit point...or drill from one side until the point of the bit barely breaks through, then turn your workpiece over and finish your hole from the other side. **Caution:** If you use the latter of these techniques, be sure your workpiece is clamped firmly to the benchtop or held in a vise. Tilting a workpiece even slightly while drilling with spade bits can cause the bit to grab and "throw" your stock.

- **Auger Bits** look like twist drills, except with much deeper flutes or chip channels to remove the waste more quickly without clogging. Virtually all Auger Bits have sharp scoring lips to make a clean entry and sharp-edged flutes to shave the hole sides clean.

Some models of Auger Bits are designed for use in a “brace”...a crank-looking device that relies heavily on human “elbow grease” for its power. These bits typically have a screw-type feed point and a steeply tapered, 4-sided tip on one end that’s gripped by the chuck of the brace.

Machine Auger Bits may either have a threaded, screw-type point or a non-threaded point and a straight 6-sided shaft that’s gripped by your drill’s chuck.



Machine Auger

If your using an Auger Bit with a screw point on a powered drill press or in a portable electric drill, be aware of the fact that the screw point can dig quickly into your stock, grab it and spin it around, damaging your machinery or injuring you. This is especially true when boring dense, hard woods with larger sized bits. The larger the bit, the coarser the lead screw, which causes the wood to grab more. To avoid damage to your tools (or injury to yourself), clamp your workpiece firmly to your drill press table or benchtop...or drill a pilot hole in your workpiece that’s 1/32” or less smaller than the maximum diameter of your lead screw.

- **Brad Point Wood Bits** (often called “doweling” bits) are the very best all-around bits for drilling holes in wood. They feature a sharply pointed tip for keeping your hole position “on-target” throughout the boring process...precision ground edges to shave the hole sides clean and smooth...sharp side spurs to “score” the full diameter of the hole for super-clean entry and exit...and deep flutes to clear chips out of the hole fast. These are the reasons why woodworkers “in the know” use brad point bits.

They’re available in a wide range of sizes...usually from 1/8” through about 1” in diameter, and can be used in a portable electric drill or in a drill press with excellent results. As a result, a good set of Brad Point bits should easily handle 80% or more of all your wood boring needs.



Brad Point Wood Bits

- **Forstner Bits** are made for drilling jobs that other types of bits just can’t handle. They have virtually no center spur, so they’ll drill almost perfectly flat-bottomed holes. On the down-side, this means they can be difficult to hold “on-target” when used in a portable drill, and are therefore recommended for use primarily in a drill press. A benefit to this short spur is that you can usually drill to within 1/32” of the bottom of your workpiece without fear of drilling all the way through the bottom.



Forstner Bits

They’re also great for drilling exceptionally clean angled holes or overlapping holes; for relocating an existing hole by enlarging it; for making round-end mortises; for