

Portable Drills and Drill Bits



Hand Power Drills

- Hand power drills are used to drill holes.
- Cordless drills can be used to drive screws and bore holes
- Both drills are equipped with a chuck to hold a cutter or driver
- Impact drivers are designed to drive screws only and are not equipped with an adjustable chuck



Manufacturers' Spec Plate

- The plate identifies the speed of the drill in rpm
- Amps are the measure of the drill's torque.
- A 5.5-amp drill has more power than a 2-amp drill.



Amps

RPM's



Chuck Sizes

- The chuck size refers to the largest shank that will fit into that chuck.
- Turned down shanks
- 1/2" drill motors are heavy duty



1/4"

3/8"

1/2"



Chuck Types

- Keyed chucks.
- Keyless chucks.



Using a Chuck Key

- Turn clockwise to tighten
- Turn counterclockwise to loosen

'Righty-Tighty, Lefty-Loosey'



Using a Chuck Key - Safety

- Unplug the drill
- Center the bit
- Always tighten the bit with a chuck key
- Remove the key before turning on the drill



Using a Keyless Chuck

1. Grip the chuck and hold firm.
2. Run in reverse to open.
3. Run forward to close



Adjustable Depth Clutch

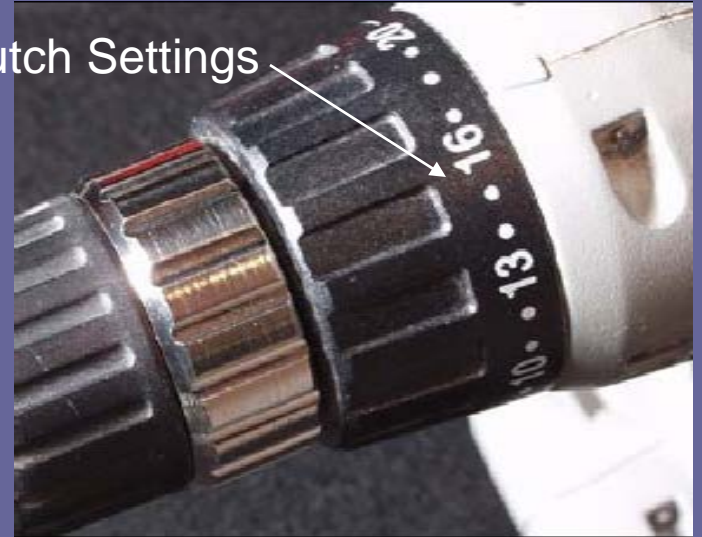
Torque Setting

The higher the number, the further the screw will be driven into the wood.

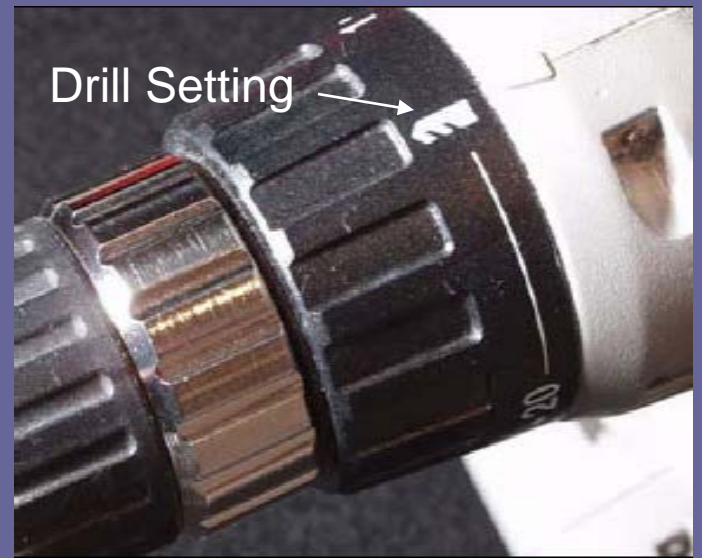
Drill bit

This setting bypasses the clutch. This position is used for all hole drilling.

Clutch Settings



Drill Setting



Drill Bits

Smoke coming from the wood can indicate:

- Dull bit.
- Bit is clogged with chips.
- Drill is turning wrong direction.

Smoke or burning smells coming from the drill motor can indicate:

- Drill is under-powered for the job .



Twist Drill Bit

- Most common.
- High speed steel.
- Designed to drill steel.
- Largest variety of bit sizes up to 1/2".
- Shank sizes are normally the same as bit diameter.
- Larger drill sizes are available with turned down shank.
- Twist drill bits have a flat tip that causes the bit to skate unless a pilot hole is drilled or a center point is made with an awl.



Flat Width Does Not Cut



Pilot Hole

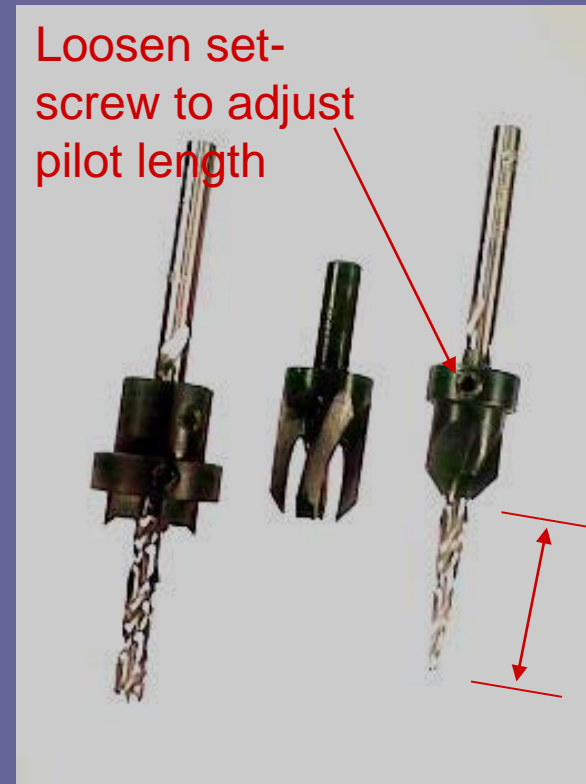
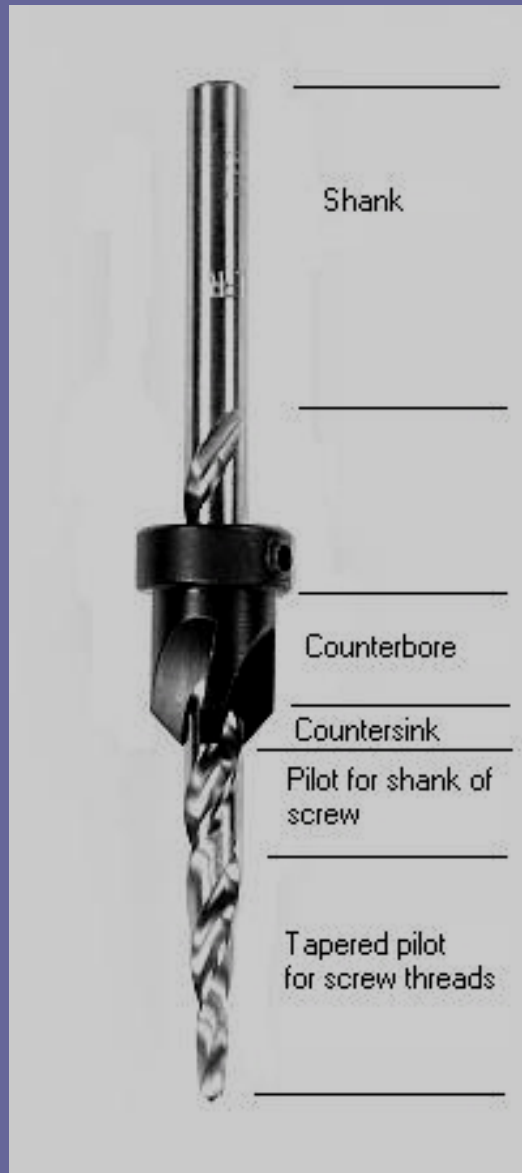
The flat tip of the twist bit does not cut. A pilot hole provides a place for the tip to go.

To make a pilot hole:

1. Locate the center of the hole.
2. Draw intersecting lines with a square .
3. Tap with an awl to make the pilot hole.



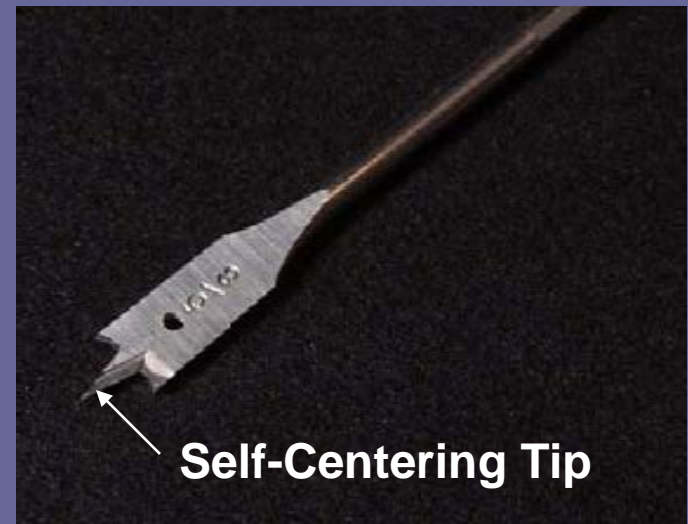
Taper Point Drills



Spade Bits

Features:

- Inexpensive.
- Variety of sizes (1/4" to 2").
- Self-centering.
- Small shank (always 1/4").
- Makes a rough hole.
- Hole has a flat bottom.
- High speed steel.
- Can be ground into different shapes



Brad Point Bits

A **Brad Point Drill**- the cleanest and most accurately sized hole (to $\frac{3}{4}$ ") in wood of any reasonably priced tool on the market today.

Features:

- Self-centering.
- Has spurs to slice the grain as you drill.
- High speed steel or carbide.
- Hole has a flat bottom.
- Usually less than a $\frac{3}{4}$ " hole.



Typical Brad Point Bits



Brad Point
for Hardwood



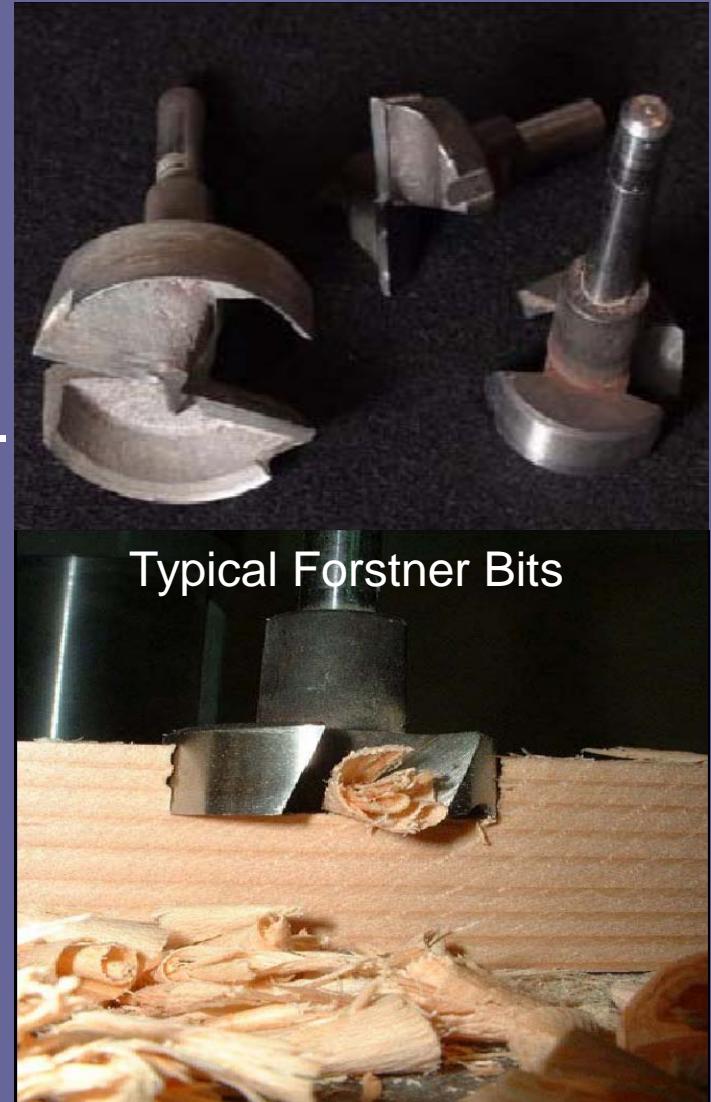
Brad Point
for Soft Wood

Forstner Bits

Features:

- Makes the cleanest holes.
- Most expensive bit.
- Drill at slow speeds to avoid burning.
- High speed steel or carbide.
- Hole has a flat bottom.

Larger bits have a tendency to grab the wood, so be careful. They should typically be used in a drill press set at a lower RPM. Refer to the RPM chart based on the bit diameter.



Vix Bits



These bits ensure that you drill perfectly centered holes for hardware time.

Hole Saws

The hole saw is a cylinder-shaped saw blade held in the drill by an arbor, which can be a built-in or separate.



Hole Saw Guidelines

- Holes up to 6” diameter.
- Requires a powerful drill turning at slow speed .
- Are commonly used to make holes in countertops for phone and computer wires.
- The “slug” remains inside the hole saw and must be removed by hand.

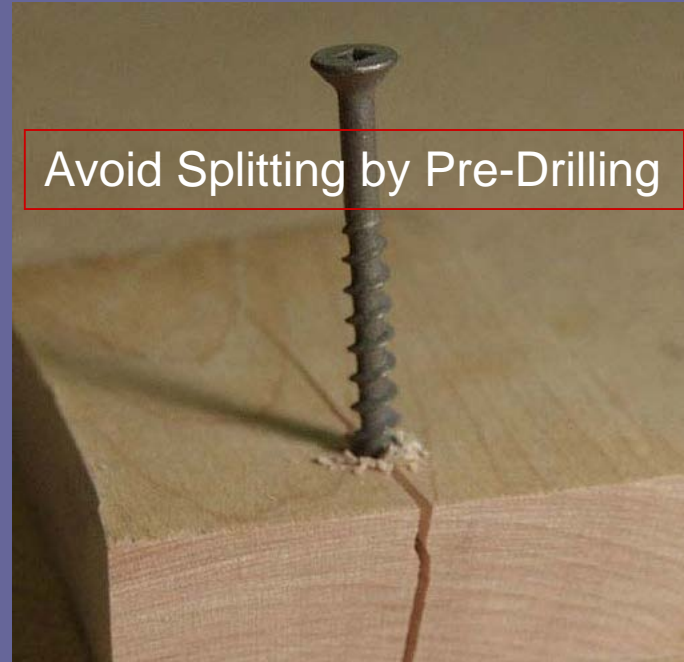


Working Safe

- The hole saw can grab suddenly and cause injury.
- Secure work and hold the drill with both hands.
- Clear chips frequently to avoid burning.

Drilling Techniques:

- Driving a screw close to the end of a board may cause the wood to split. Always pre-drill.
- Small diameter bits can break; always drill straight and steady.
- Keep the drill perpendicular to work. Use a square if necessary to help guide the bit.



Avoid Splitting by Pre-Drilling



Helpful Hints

- Set up two drills: one for the countersink bit and one for the driver bit.
- To avoid driving a screw too far into the wood, use a lower setting on the clutch.

Drilling Techniques, continued



Splintering will occur on the out-feed side of a through hole. Use a piece wood as a backer to minimize splintering.



Drill to a specific depth with a twist bit by using a piece of masking tape on the bit as a depth-marker. When the hole is the correct depth, the tape will brush the chips away.

Acknowledgements

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