

Tip #33 Tips & Techniques For Better Lathe Turning

Lathe turning is one of the most enjoyable and rewarding of all woodworking operations. You mount a piece of wood in your lathe and “turn” it into a thing of beauty, from start-to-finish, without ever removing it from the machine.

Some prime examples of lathe-turned projects include: Spindles for stair rails, bed posts, fences or chair backs; table legs; candle sconces, lamp standards, bowls, round boxes, goblets or dinnerware. The list goes on and on.

And although lathe turning is a great deal of fun, mastery of the techniques involved in the process can take a fair amount of practice. The information provided here represents a good overview of the process, but by no means, attempts to cover everything you need to know.

Choosing the right stock and preparing it for turning

Turned projects can be made from soft woods or hard woods with equal ease. If a turned component is to provide structural integrity for a project (such as a table leg or chair spindle), it's important that you use tough, straight-grained hardwoods such as Ash, Beech, Cherry, Maple, Oak, Walnut or similar woods.

If structural integrity isn't an issue, straight-grained soft woods such as Pine, Poplar, Spruce or Fir may be acceptable. The selection of the right species is more often than not based on the project at hand. For example, if you're making a maple Windsor chair, your spindles will need to be turned from maple.

It is important that your wood be of the clear, straight-grained variety if at all possible, and that it be free of defects such as splits, checks, loose knots and other problems which could adversely affect the integrity of the finished project...and your safety while you're turning it. Be careful.

Once you've selected your stock, the next step is to get it properly prepared for mounting. Since most turned objects will be round when completed (some are actually oval), the first step is to find the center of your stock. The closer you get to the exact center, the smoother the actual process of turning will go for you.

Marking the centers. If your stock is square (or slightly rectangular), the easiest way is to draw diagonal lines from corner-to-corner. If you're going to mount your project on a faceplate, screw center or special chuck, you'll only need to do this on one end of your stock. If you'll be turning a spindle between centers, you will, of course, need to mark the centers on both ends.

If you're starting out with a round piece of stock, a Center Finder will make locating and marking the centers much easier.

“Pre-rounding” the stock. Whether you're turning a cylinder (spindle) or a bowl, if your finished project is to be rounded from end-to-end, you can save time -- as well as wear and tear on your lathe and chisels - by removing the sharp corners along its edges before you mount it on the lathe. With a spindle, this can be done on your Jointer by tilting its fence to 45-degrees and making a few passes along the edges, turning your blank into an octagonal shape. Of course, if you're turning table legs where their tops are to be left square for attachment to the table's apron, don't use this approach. Instead, do ALL of your rounding on the lathe.

If you're turning a bowl or other larger diameter object, use a compass or pair of dividers to draw a circle on your stock. Once marked, you can use your Bandsaw, Sabre Saw or Scroll saw to pre-round your stock before mounting it to your faceplate or chuck. This pre-rounding is especially desirable if your turning blank is fairly large, as it will make the turning process much smoother as you get started.

Mounting your stock to the lathe

There are as many ways to mount a project to the lathe as there are devices for doing so. Virtually all of these mounting systems involve either a Drive Center, Screw Center, Faceplate or special Turning Chuck. The method you use depends on what you're planning to turn and how. Here are the basics:

- **Spindle turning between centers.** Once the ends of your stock are marked-out properly, position the point of your Drive Center on the marked centerpoint and tap it firmly with a wooden, rubber or composite mallet. Be sure the spurs of your Center are seated deeply and not likely to tear out of the wood once you start the turning process. If you're turning an especially hard or large piece of stock, tapping alone may not seat the spurs sufficiently for them to hold. In this case, you could use a hand-held back saw or small Razor Saw to cut kerfs in your workpiece ends, giving your Drive Center spurs a better grip on the wood.

Next, drive your Cup Center into the marked opposite end of your stock. These centers are often known as “Dead” centers, since they have a straight, pointed tip with no spurs and are NOT used to “drive” the workpiece, but merely to support its opposite end during turning. If you're using a conventional Cup Center as described above, you can drive it directly into your stock, using a non-marring mallet such as those described above. Coat the tip thoroughly with beeswax or paste wax before mounting to help prevent burning.

An alternative to the Cup Center is the ball bearing “Live” center. This Center contains a ball bearing mechanism that eliminates friction and the need for wax. However, these centers should NOT be driven into the stock with a mallet, as this could damage their bearings. Instead, mark the centerpoint with a center punch before positioning the Live Center.

- **Turning with a Screw Center.** This is one method of choice for turning short, small diameter projects such as egg cups, small bowls, etc. In this instance, the Screw Center is either screwed directly into the bottom of the project blank, or into a scrap block, which is then attached to the project blank with glue or double-stick tape. In either case, turning with a Screw Center provides support for only one end of your stock during the process, allowing you to turn details into the opposite end. Again, screw centers are best for turning small or short objects, and are not recommended for large turnings.
- **Turning with a Faceplate.** This is the most conventional way of turning bowls, plates, goblets or other large diameter, disc-shaped objects where one end must be open for turning. Faceplates are available in a variety of different diameters, for use with different-sized projects.

As with Screw Centers, Faceplates are either screwed directly into the bottom of the project blank, or into a scrap block, to which the project blank is then attached with glue or double-stick tape. When mounting to the scrap with glue, use ordinary yellow woodworker's glue with a small piece of newspaper or brown paper grocery bag between the turning blank and scrap block. Allow to dry overnight before turning. When mounting with double stick tape, be sure to use

special high adhesion tape and not the “carpet tape” that's readily available at hardware stores and home centers. Carpet tape is not strong enough to hold during turning. When using the tape method, mount your workpiece to scrap block and squeeze the two pieces firmly together with clamps or a vise before screwing the scrap block to your faceplate.

Whether you're using the glue or tape method, once your project has been turned, you can separate it from the scrap block with a chisel or screwdriver.

- **Turning with a Chuck.** For many, this is considered to be the most convenient way to turn bowls, plates, goblets or similar objects. With a lathe chuck, your workpiece doesn't have to be screwed solidly to a faceplate and may be removed and re-attached again and again, quickly and with automatic self-centering assurance.

There are many different types of lathe chucks available today. Most turners prefer the 4-jaw, self-centering type, which will either grasp the object to be turned by contracting around its outer circumference - or by expanding against its inside edges or small, shallow hole or “hollow” that's been turned on the object's bottom.

These special turning chucks are available in a variety of sizes and with a host of accessories for all types of specialized jobs. One such accessory is a set of add-on plates (or jaws) that expand the chuck's jaw capacity significantly for grasping very large bowls or turned objects.

Selecting the best turning chisel for the job

There are four basic chisel configurations for most turning projects...and a host of others for more specialized operations. Let's take a quick look.

- **(A) The Gouge** is the chisel preferred by most turners for the initial rounding of a turning blank. In addition, the Gouge is also used for creating concave “coves”, primarily in spindle turnings. Gouges are available in both small and large sizes...from about 1/4" across to 1-1/2" or more. In addition, they are available in “shallow” (for spindle turning) or “deep” configurations (for bowl or faceplate turning).
- **(B) The Skew** is a straight, slant-edged chisel, used primarily for cutting convex “beads”, or for creating straight or tapered cylinders on spindle turnings. Skews are typically available in widths from about 1/2" to 1" - some longer. Although Skews can be used on the outer edges of a faceplate turning, they're typically not used on the insides of bowls or faceplate-turned objects.
- **(C) The Roundnose** is used primarily in a scraping action to form coves on spindle and faceplate turnings. Available in widths that typically range from 1/2" to 1", the Roundnose is a great tool for beginning turners, as well as experienced craftsmen
- **(D) The Parting Tool** is used to “part” the finished, turned spindle from the scrap, and for making sizing cuts to a pre-determined depth in the spindle. Once these sizing cuts are made, the turner follows-up by cutting down to these depths using other chisels. Parting Tools are available in varying widths (usually from 1/16" through about 3/8") - and with edges of varying lengths...usually about 1/2".

In addition to these basic chisels, there are a host of other configurations available for specialized jobs. Let's take a look at a couple of these.

- **Special Scraping Tools** are designed specifically for bowl or faceplate turning, using a scraping (rather than shearing) action. There are a number of configurations available, including Deep Flute Gouges, Square End Scrapers, Roundnoses, Radiused Scrapers, Profiled Side-Cutters and lots more.
- **Hollow Forming Chisels** are used to hollow-out bowls and similar objects, usually with openings that are much smaller in diameter than their overall outer sizes. Often, these chisels are bent or feature a side-directed cutter that will “reach around” on the insides of these turnings to hollow-out the insides.

There are literally hundreds of different shaped chisels available to perform every conceivable lathe turning operation and cut any profile you could ever imagine. There are “long & strong” chisels with blades up to 2" wide and handles up to 30" long for turning huge objects; miniature chisels with tiny cutting edges for working on small turnings; carbide-tipped chisels for turning extremely hard woods; “chatter tools” that produce special effects on the surface of your turnings; the list goes on and on.

Setting up your Lathe for the job

Before you get started, it's important that you get your machine set-up properly.

- **Speed Adjustment:** Before you get started, adjust your Lathe's speed for the operation you'll be performing. Here's a table of proper speeds for various operations (the letters indicate Shopsmith MARK V Speed Dial settings):

Stock Size	Rounding	Shaping	Sanding
up to 2" dia.	950 rpm (C)	1300 rpm (F)	2050 rpm (K)
2" to 4" dia.	850 rpm (B)	1150 rpm (E)	1900 rpm (J)
4" to 6" dia.	750 rpm (A)	1050 rpm (D)	1600 rpm (H)
over 6" dia.	700 rpm (Slow)	750 rpm (A)	850 rpm (B)

- **Choose the appropriate Tool Rest** for the job. For most spindle-turning applications, a standard, straight Tool Rest is the best choice. Just drop the Rest into the Tool Rest Arm and go to work. By the way, a Tool Rest Arm with quick-release levers will speed the job of making adjustments while working. If you're turning bowls or faceplate-mounted objects, you may want to consider an optional Tool Rest designed specifically for this purpose. Here are four options:
- **A 4" Straight Tool Rest** will help you get in closer for deep cove or hollowing work.
- **An "S-Shaped" Tool Rest** will allow you to reach up to 4" deep into a hollowed-out bowl while providing a resting surface that matches the curved profile of the inner bowl sides.
- **A 90-Degree Tool Rest** will let you make continuous cuts from the outer to the inner surfaces of bowls, goblets and similar objects in a single, continuous motion.