

## Tip #17 Disc Sanding

Sanding is easily the most tedious woodworking operation. It can sometimes take as long to hand sand a project as it takes to build it. Fortunately, you have four sanding choices with the Shopsmith Woodworking System: disc sander, drum sander, strip sander and belt sander. In this tip, we will concern ourselves with the disc sander.

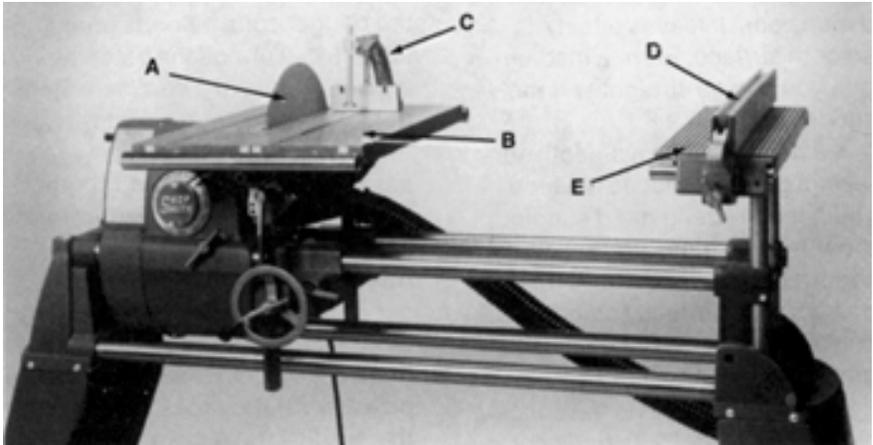
A disc sander can help eliminate some of the sanding tedium. It can't be used to fine sand, but it will remove saw marks from a ripped edge and smooth end grains. It can also be used to bring a workpiece to its final dimension, true-up joints and grind tools.

### DISC SANDER MODE- SETUP AND FEATURES

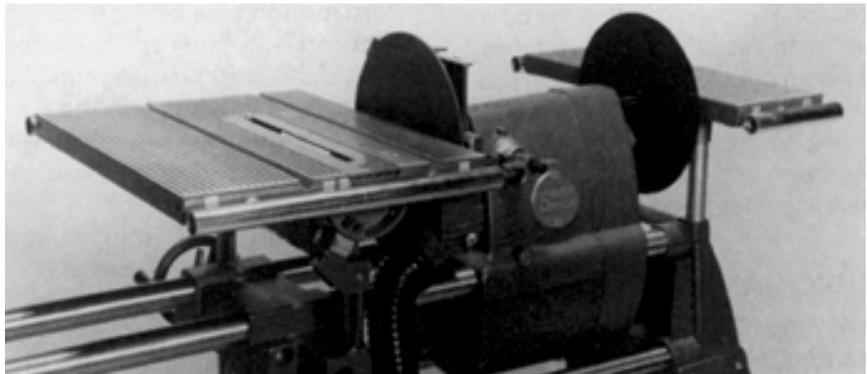
Use the accessories shown in Figure 17-1 for disc sanding operations. To set up your Mark V in the disc sander mode, follow the instructions in the Owners Manual that came with your machine.

As you work in the disc sanding mode, you'll find that the Mark V is an extremely capable disc sander with several special features:

- The 12" disc has a sanding surface of 113.04 sq. in.
- The rip fence functions as a backstop when sanding long or wide stock.
- Without a backstop, you can sand as big a workpiece as you can safely handle.
- The miter gauge can be used to hold stock at the proper angle to the disc.
- The table tilts from "0" to 45° right and the miter gauge can be adjusted from 30° left to 30° right to sand at a variety of angles.
- The rip fence can be offset to sand boards to a specific width.
- The quill feed and feed stop can be used to sand boards precisely to a specific dimension.
- You can sand without the rip fence or a miter gauge. This is particularly useful when sanding convex curves.



**Figure 17-1.** The accessories that are used for disc sanding operations are the (A) sanding disc and sandpaper, (B) worktable, (C) miter gauge, (D) rip fence, and (E) extension table. The Model 510 is shown.



**Figure 17-2.** Mount a second disc on the upper auxiliary spindle and you'll have two different abrasives available. The extension table supports the stock.

- A very practical setup is shown in Figure 17-2. By mounting a second disc on the upper auxiliary spindle, you can have two different abrasive grits available at the same time.
- The Model 510 lower saw guard accommodates the sanding disc. Connect the hose from your dust collection system to the dust chute in the guard for virtually dust-free sanding. For dust collection on the Model 500, a special disc sander dust chute is available.

## SANDPAPER DISCS

The sandpaper discs are available in three garnet grits: coarse, medium, and fine. All three grits are "open coat"—only 40 to 60 percent of the disc surface is covered with abrasive material. This helps minimize "loading" at high speeds and extends the life of the disc.

The grit you choose depends on the work you have to do:

- Coarse grit will remove large amounts of stock quickly. It can be used to bring workpieces to their approximate dimensions; however, it leaves a rough surface. If you want a smooth finish, you must follow up a coarse grit with a medium or fine grit before hand sanding.
- Medium grit will remove small amounts of stock and can be used to bring workpieces to their final dimensions. It leaves a fairly smooth surface. From a medium grit, you can go straight to hand sanding.
- Fine grit leaves a smooth surface. It greatly reduces the time you need to spend hand sanding, though some hand sanding will still be required to remove swirl marks and obtain a perfectly smooth finish. Fine grit can also be used to grind and sharpen tools.

Caution: When using the sanding disc on the Model 500 that's not equipped with the special disc sander dust chute, place a wide scrap board on the way tubes directly under the disc. Sandpaper continually loses grit, and the board will keep this grit off the way tubes where it could scratch them. If you don't use a board to protect the tubes, be sure to clean the tubes thoroughly after you finish your sanding operations.

## DISC SANDER SAFETY

**Warning: Before using the disc sander, read and understand these Important safety instructions:**

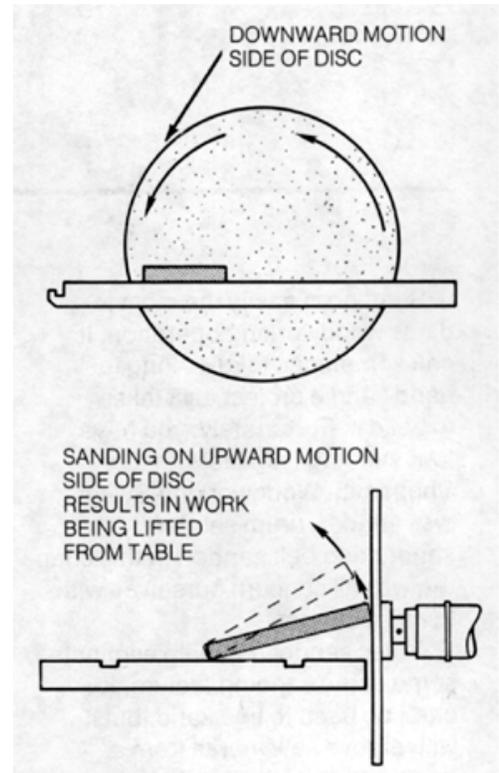
**Danger Zone**-The danger zone on the Mark V when it is in the disc sander mode extends 3" on all sides of the disc, plus 3' in front and back of the disc. The reason for the extended danger zone in the front and back of the machine is the possibility of kickback.

Always keep your fingers, hands, and other parts of your body out of the danger zone. Once inside the danger zone, the slightest mistake can result in an injury.

When you work at the disc sander, always stand to one side of the disc, never directly in line with the plane of rotation. Use push sticks and other safety tools to help guide the workpieces close to the disc. This keeps your fingers out of danger. Never reach under the table while the sanding disc is running to tighten the locks or make adjustments. Remember, the danger zone extends under the table, too. Turn off the machine and let it come to a complete stop before making adjustments.

- Always wear proper eye and ear protection, and a dust mask. If you're doing a large amount of sanding, you should wear a respirator.

- Turn on the Mark V, let the disc get up to speed, then feed the workpiece. Don't turn on the power with the stock laying on the worktable or already in contact with the disc.
- Never reach over the disc or behind it while it's running.
- Always sand on the downward motion side of the disc (Figure 17-3). The rotation helps to hold the workpiece against the table. If you sand on the upward motion side, the disc will lift the piece off the table and cause a kick-back.
- Maintain a 1/16" maximum clearance between the worktable and the disc. The one exception is when you use the quill to advance the disc. Then maintain a 1/2" maximum clearance.
- Do not sand the end grain of 3/4" stock that is wider than 5-1/2". The rotation of the disc may lift wider boards off the table.
- When you use the quill feed to advance the disc, attach the quill feed lever to the side of the power plant where you can reach it most easily.
- Always use the worktable; add the extension table if necessary.
- Never sand without a table supporting the stock.
- When using the quill feed to advance the disc, back up the stock with the rip fence. If the stock is too long to back-stop, clamp the stock to the worktable or extension table.



**Figure 17-3.** Always work on the downward motion side of the disc.

## DISC SANDER SPEEDS

Before you begin any disc sanding operation, set the Mark V to run at the correct speed. To do this: turn the machine on, turn the speed dial to the correct speed and let the disc come up to speed.

The operating speeds for disc sanding are determined by the grit you're using and the material you're sanding. Generally, you can use faster speeds on softer woods. Faster speeds will also give you a smoother finish. Slower speeds reduce the risk of "burning" the workpiece and are better for sanding away large amounts of stock.

To help determine the right speed for the job, use Table 17-1. A good rule of thumb is: The softer the material or the finer the grit, the faster you can run the sander. However, don't run the sanding disc too fast or the wood may heat up and burn.

**Table 17-1: Disc Sander Speed Chart**

Grit	Hardwood	Softwood
Course(#60)	D(1050 RPM)	E(1150 RPM)
Medium (#80)	F(1300 RPM)	G(1450 RPM)
Fine (100#)	G (1450 RPM)	H (1600 RPM)
Grinding or Sharpening Metal Tools --Slow (700 RPM)		

Note: These speeds are for 60 hz operations.

## END GRAIN SANDING

End grain is harder to sand than any other surface, but the Mark V in the disc sander mode makes short work of this chore. You can also use the disc sander to sand workpieces to precisely the same length.

### General End Grain Sanding

To sand end grain, position the worktable no farther than 1/16" away from the disc (if you're not using the quill feed) or 1/2" (if you are using the quill feed). Adjust the table height so that the underside of the table just clears the dust chute and the table is slightly above the center of the disc. When selecting the speed, keep in mind that you want to run the sanding disc a little slower than you would for other types of sanding because end grain will burn easily.

Use the miter gauge to align the workpiece with the disc. Check that the miter gauge is square to the disc, and mount it in the left table slot, closest to the disc. Position the gauge so it will guide the workpiece against the downward motion side of the disc; then lock the miter gauge in the slot.

Make a five-point check. If you plan to feed the stock into the disc, all five locks—power plant, carriage, table height, table tilt and quill—should be secure. If you want to use the quill to feed the disc into the stock, the quill lock should be loose. Stand to the right or left of the sanding disc. Turn on the Mark V and let the disc get up to speed.

If you're feeding the workpiece into the disc, place it against the face of the miter gauge and carefully feed it toward the disc until it lightly contacts the abrasive. Hold it there a few seconds, back it out, then feed it forward again. This back-and-forth motion will keep the end grain from heating up and burning. Repeat until the end grain is completely smooth.

If you feed the disc into the workpiece, use the quill feed to advance the disc until it lightly contacts the workpiece (Figure 17-4). Let it stay there a few seconds, back it off, and feed it forward again. Once again, a back-and-forth motion helps prevent burning. Repeat until the end grain is smooth.

As you work, don't press the workpiece and abrasive together too hard. Heavy pressure will cause the sandpaper to "load up" with sawdust and pitch. It will also increase the likelihood of burning. A light, momentary pressure is all that's needed.

### Sanding to Exact Length

If you need to sand a number of boards to precisely the same length, use the rip fence mounted to the worktable or the extension table as a backstop. Position the backstop so that it will hold the end of the workpiece about 1/4" away from the sanding disc when the quill is completely retracted.

Set the depth control to halt the disc where you want to stop sanding. To do this easily, use a board that you've already sanded or scrap wood that you've cut off at the desired length (Figure 17-5).

Position the workpiece on the table, against the miter gauge and the rip fence, so that it overhangs the table slightly. Be sure the workpiece doesn't contact the sanding disc. Then make a five-point check. Four of the locks—power plant, carriage, table height, table tilt—should be secure. The quill lock should be loose. If the workpiece is long, use a miter gauge extension for more support.



**Figure 17-4.** When using the quill feed, move the disc in and out as shown. Don't let the stock contact the abrasive for more than a few seconds at a time.