



FINISHING SECRETS . . .

2. My Five Rules of Sanding

(From the original draft of an article, "Sanding Savvy", published in *American Woodturner* magazine, Spring 1999.)

Sanding is important. It is the second of the three steps in the turning process - turning, sanding, and finishing. These steps are not independent. A poorly turned surface will require more time sanding, and a poorly sanded surface will result in a poor final finish. We are usually overwhelmed with information on turning tools and finishing products. Everyone wants to know about the latest tools and techniques, or the merits of various finishing products and which ones will give them "the perfect finish". But nobody wants to hear about sanding, and very little is ever published about it. In fact, it is more important than the finishing because the final finish will only be as good as the surface on which it is applied.

Sandpaper, The Tool

We can't discuss sanding without some knowledge about sandpaper (or cloth). The commonly used abrasives can be listed in the order of their hardness, sharpness, and durability: Ceramics, Aluminum Oxide, Silicone Carbide, and Garnet. Aluminum Oxide will remove wood faster than Garnet because it is harder and sharper, making a deep V-grooved scratch pattern on the surface, while the softer Garnet wears faster and leaves a pattern of shallow U-shaped grooves. It makes sense to start sanding with Aluminum Oxide and finish with Garnet.

Don't buy cheap sandpaper. The grit designations of sandpaper do not represent a uniform fixed particle size. Rather, they are a range of particle sizes; with the majority of them being the stated size. The number and size of the particles that are different from that designated depends on the equipment and the quality specifications of the abrasive manufacturer. Unless we have access to their product specifications, we have to rely on either price or experience to determine quality. Cheap sandpaper isn't necessarily a bargain because it usually has a broader range of particle sizes within a designated grit size, and it is the big ones that we don't want because they leave deep scratches.

The Five Rules of Sanding

Everything that I know about sanding can be reduced to "The Five Rules of Sanding". These rules will shorten the time between laying down the turning tool and realizing a museum quality finish. Since sanding can't be ignored, we can try to make it an easier task. Two prerequisites to sanding should be obvious. We can't see in the dark, and we can't work when we can't breathe. Always use a bright incandescent light, the brighter the better, while sanding so that the scratch pattern on the wood surface is clearly visible. Fluorescent light has no shadows, and the surface texture can be almost invisible. Always wear a dust mask while sanding, or better yet, use both a dust mask and a dust collector.

Rule 1 - Sandpaper is a cutting tool, keep it sharp and keep it clean.

Throw it away when it gets dull. Don't use worn-out coarse grit as a substitute for finer grit. Worn-out 120-grit is just that, and it cannot be used as a substitute for 280-grit. The spaces between the grit particles are like the gullets of a saw blade. The grit can't remove wood when the spaces are full. Clean both sheet and disc abrasives with a block of crepe rubber. (Yes, it works on sheet when we lay it on a flat surface and rub the rubber block across it). Some turners glue a piece of rubber to a block of wood that is then attached to their lathe. Blocks of natural colored crepe rubber are available through most of the woodworking catalogs, a \$10.00 purchase that will last for years. Do not use colored rubber, white rubber, or any caulking materials because they contain dyes and silicones that can interfere with many finishes.

Rule 2 - Refine the shape, remove all tool damage and torn grain, and repair the surface with as coarse an abrasive as necessary to do the job - BEFORE moving through the finer grits...

The only purpose for all subsequent sanding with finer abrasives should be to refine and remove the scratch pattern made by the coarsest paper. If there is torn grain or other tool damage on the surface, go straight to a 60-grit, and don't fool around with anything finer. It makes no sense to brag about never using anything coarser than 180-grit, and then spend two hours to do the same job that could have done in ten minutes with 60-grit. The finer grit can be used, and for a shorter time, when we have improved our tool handling skills during the turning phase of our work.

Rule 3 - Sand through all of the progressively finer grits without skipping any of them, and don't quit before 320.

I usually start with 60 or 80, and proceed through 100, 120, 150, 180, 220, 250, 280, 320, and stop at 400, using whatever combination of power and/or hand-sanding that is appropriate to the task. It is much faster to use all of the abrasive grits in the smallest increments possible, than to make large jumps in grit size. This is particularly true at the coarse end of the scale. Of course, we could go directly from 60 to 320 grit if we had a lot of time and sandpaper to waste.

Rule 4 - Remove all of the scratches and the sanding dust from the previous grit before going to the next finer grit.

This step is faster when Rule 3 is also observed.

Rule 5 - Slow is good, and slower is even better.

There is a universal tendency to sand too fast. Heat is the enemy. Keep the sanding medium cool by sanding slowly. And, the slower moving abrasive will remove more material than one that quickly "skates" across the wood surface.

Don't spin the piece in the lathe so fast that the paper gets hot. If it burns your fingers, it is also burning the wood surface, and case-hardening rather than cutting it. We have all experienced the situation where the sandpaper quit cutting, and it took a coarser grade to break through the surface glaze, only to have the same problem when we used the finer sandpaper. When this happens, slow down. I typically sand with a maximum lathe speed of 250 RPM for most work.

It is very easy to generate too much heat when power sanding because we have no direct touch with the abrasive. Heat will clog the disc, and destroy either the cloth backing or the sponge rubber on the arbor. Just because we have an electric drill with a top speed of 2400 RPM doesn't mean that wide-open is the best speed for sanding.

The slower speed will remove more wood faster, the disc is easier to control, there is very little airborne dust, and the sanding discs will last longer. . I use a 3/8" Black and Decker Magnum drill for power sanding wherever it will reach because it has an excellent

trigger control and it will run continuously at less than 150 RPM.

There are many woodturners who will argue that running the disc sander at a high speed while the work is spinning slowly in the lathe, rather than both at a high speed, is the best way to go. To them I say, try running both at a lower speed and see if the sanding isn't just as fast and easier to control. Two other benefits will be less airborne dust and the sanding discs will last longer.