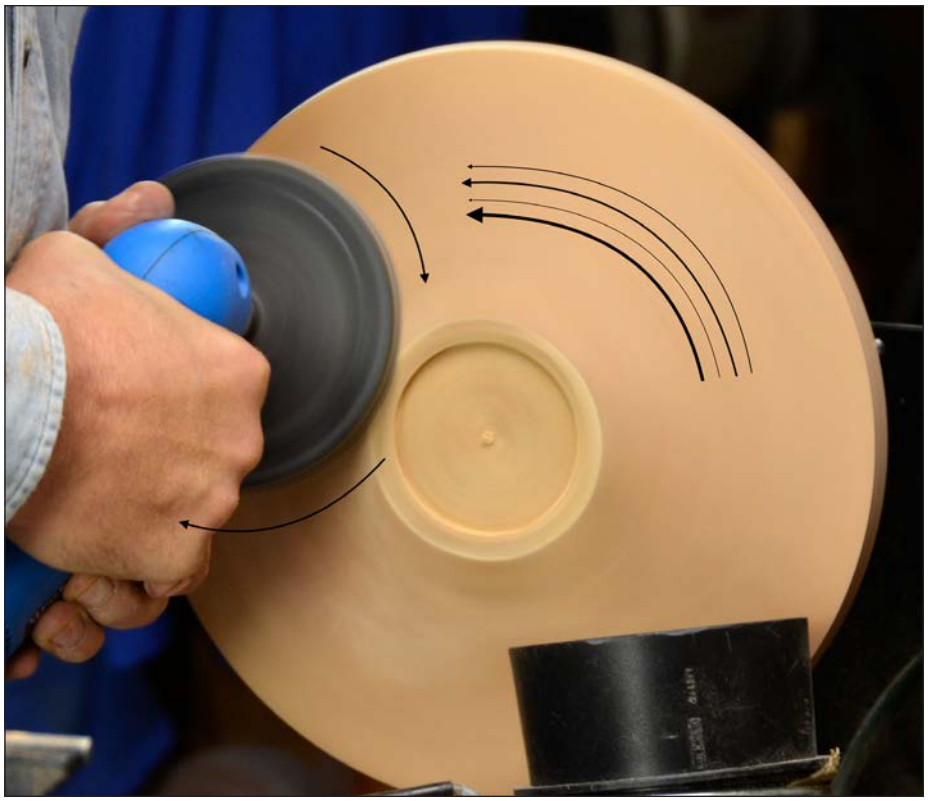
Power–Sanding to Enhance Your Turning

by Doug Reesor *Photos by John Kelsey*

One of the biggest challenges I regularly face in woodturning is executing an uninterrupted cut across a wide shallow plate or platter. I love to caress the delicate curve of a well-finished platter, but even after thirteen years of turning, I still come away dissatisfied with the tool results. Without the ability to rotate the lathe head or turn off the end of the lathe, the "woodturner's dance" is difficult to do without repositioning my feet. The result may be a surface that looks smooth, but where I still feel undulations that detract from the tactile experience I am trying to achieve. Because hand-sanding applies the grit along the same axis as the finishing cut, the sanding action tends to accentuate surface bumps. Using a coarser grit creates deeper surface scratches instead of modifying the undesirable feature. Applying more pressure to flatten the hills and valleys just generates heat and surface checking.

Abrasives at work

Magnify a piece of sandpaper and you'll see that it is comprised of an uncountable number of sharp, angular pieces of grit (stone or synthetic) adhered to a piece of paper. Inconsistencies in the size of the grit particles leads to variation in the way they cut the surface of the material they contact. To improve the wood surface, you must be able to remove the peaks left behind from the previous grit or tool cut without deepening the existing valleys. While this can be achieved using support blocks on pads behind the abrasive, it is cumbersome to have a block on hand to match every curve you make. This is where power-sanding becomes a valuable tool.



1. *The rotation direction of the sanding wheel is approximately perpendicular to the direction of rotation of the piece and any tool and hand-sanding grit marks. This presentation of the sanding surface minimizes the effort needed to remove the effects of the previous step and provides good visual clues for knowing when the sanding step is complete.*

Power-sanding

The key advantage of power-sanding is that any two opposing sides of the sanding disk are moving in opposite directions across the surface of the turning (this is true if the pad is presented flat, so that both sides of the disk are contacting the wood) (**Photo 1**). A powered sanding disk works best when it is presented perpendicular to tool marks. This makes for efficient removal of material and the creation of a more disordered pattern of surface scratches, which become harder to detect by eye as the grit progresses to finer grades. The ridges created in the previous cutting or sanding step are smoothed with less effort because the abrasive is moving across imperfections left by the cutting action of the last tool.

2. *Because the disk is tilted, the pad hits any high points first and naturally produces a smooth concave shape. For a sharper curve use a smaller diameter disk.*

In addition, the powered disk moves through that mysterious center point of your platter or bowl, where the surface speed approaches zero regardless of your lathe speed. Note that a motor-driven sanding disk is different than floating-disk sanders. With those sanders, the disk rotation stops when pressure is applied to the part of the disk that is perpendicular to the lathe rotation—precisely the point of contact where power-sanding is most effective.

Blending and smoothing

Like tool work of any sort on the lathe, sanding can be broken into two stages: roughing (or blending), and finishing (or smoothing). When applied incorrectly in the roughing phase, abrasive can quickly soften any design features or create unwanted undulations as the wood changes density. In the case of bowls, even with a uniformly straight-grain piece of wood, transitioning from sidegrain to endgrain twice with each rotation of the piece can introduce unwanted wall thickness changes, especially when hand-sanding.

Wherever possible, I use power-sanding for the first sanding to take advantage of the cross-cutting action. I set the lathe speed as low as possible to make control of the sanding disk easier. By slightly tilting the sanding disk and using only the portion of the disk that is perpendicular to the lathe axis, the wood surface sands to a smooth curve (**Photo 2**). This practice also helps me see any cutting irregularities or tearout that I may have missed, and any significant deviations in the flowing curve I'm trying to achieve (**Photo 3**). I can also change the sanding direction by tilting my drill up and down to contact opposite sides of the sanding disk.

Inspect the surface

The greatest benefit of changing from hand– to power-sanding and back with each change in grit is that the pattern of sanding scratches changes. With single-point backlighting, it is easy to inspect the surface produced in each case, whether by hand or by disk (**Photo 4**).

3. *Using the disk sander as your first step highlights opportunities to improve tool work. The concentric rings suggest I wasn't consistently riding the bevel, and I staggered my stance as the cutting edge approached the center of the platter. The white streaks also suggest grain tearout.*

Care must be taken with a handheld backlight to inspect the surface from multiple vantage points. Like the angle of the sun in the desert where the dunes appear different depending on the time of day, scratches will appear to change depending on the angle of the light. Because the grit lines created by hand and power-sanding are essentially perpendicular, it is easy to see any residual lines from the coarser grit and continue to sand until they have disappeared. It amazes me how little sanding effort is required to remove the scratch marks left by the previous grit.

Hybrid approach

Once blending is complete, I alternate between hand sanding and power-sanding for each step. The important part is to make sure the sanding lines travel in a different direction for each subsequent grit change. In this way, each new grit of abrasive moves across the peaks left by the previous grit to eliminate valleys or deep scratches. This practice makes it easier to see when the previous swirl or line pattern has been eliminated.

Because of air entrapment at higher speeds, firmer pressure is required to get the same effective grit contact with the surface. This, leads to greater heat from friction. I turn my lathe down to its slowest speed when power-sanding. Because the sanding disk is rotating under power, the abrasive still cuts effectively. This also reduces the bucking effect of the disk when initially blending surfaces.

I always rely on hand sanding for the final grit. The residual lines left by the abrasive will flow around the center axis of my piece. I usually stop sanding with 400-grit abrasive, particularly with dense timbers that will receive a satin finish.

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4. *Single-point backlighting with an incandescent bulb makes it possible to see the disk pattern of 320-grit abrasive and see that there are no residual grit lines from the 220-grit step. I achieved this result with one pass across the platter in less than 10 seconds. There* are *still some tool marks.*

5. *A carving stand adapted to hold a four-jaw chuck gives you an extra set of hands to hold work steady. This particular stand replaces the toolrest in my banjo, expanding the options for positioning the blank for sanding or enhancement.*

Warped surfaces

Power sanding is also useful for sanding a platter that has distorted beyond re-turning after being turned green. Even though such a piece may not make a practical platter, sometimes the figure is just too beautiful to resign the blank to the firewood pile. Because it's impossible to hold a power-sanding disk against a warped spinning surface, I use the carving mount I purchased from Trent Bosch Studios to hold the distorted blank during power-sanding (**Photo 5**). It is also possible to chuck the form on the lathe and lock the headstock to prevent movement. I still alternate between power-sanding and hand-sanding with each change in grit and use visual inspection to detect residual scratches.

My woodturning motto is "cut for show, sand for dough." The shape of a well-executed vessel will attract attention in any setting. Once a viewer has approached for close inspection, the scratch-free finish will encourage the person to gingerly reach out to touch and handle the vessel. The delicate caress of a satin-smooth vessel will help ensure the admirer will want to take it home with them (**Photo 6**).

Doug Reesor is a retired Metallurgical Engineer. He left his duties working on the surface quality of aluminum sheet products to spend the last thirteen years focusing on the surface quality of turned wood. He is a member of the Lancaster Area Woodturners and the AAW.

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6. *A 12" Cherry plate with a 1/4"-deep, smooth curved surface. Finished with carnauba wax.*

