Bowl Sanding Tool

By Mack DeBose

This is a process for building a rotating bowl sanding tool that is used for sanding the interior and exterior curved surfaces of turned bowls and similar projects. It is used by simply holding the sanding disk against the surface to be sanded while the bowl is rotating in the lathe. Spindle speed should be kept below 1000 RPM. The sanding disk rotation speed and direction will depend upon the angle and location of its contact with the surface.

This design and process has been developed by several GCWA members including **Bill Berry, Greg Gonsalves, Marty Kaminsky and Bill Dyer**. I have attempted to document it and have taken some liberties with the materials and process.

Materials required; **Bearing Assembly**:
- 1 ~ ¾" PVC 45° Elbow
- 1 ~ ¾" x ½" PVC Bushing or 1" of ¾" PVC Pipe
- 2 ~ Inline Roller Skate Bearings
- 1 ~ 5/16" -18 x 1-1/2" Hex Head Cap Screw
- 1 ~ 5/16" -18 Locking Hex Nut

Materials required; **Sanding Heads**
- 1 ~ ½" x 2" Dia. Hardwood Blank
- 1 ~ ½" x 3" Dia. Hardwood Blank
- 2 ~ 5/16" -18 T-Nuts
- 1 ~ ¾" x 3¼" x 5½" Closed Cell Foam Cushion Material (upholstery padding or kneeling pad from Lowe's and Home Depot Garden Tools)
- 1 ~ 3¼" x 5½" Funky Foam Material (from Hobby Lobby) - Or
- 1 ~ 3" x 5" Velcro hook Material (from Klingspor)

Materials required; **Handle**
- 1 ~ 1¼" square by 6" long wood blank for Handle
      - Or
- 1 ~ ¾" x 6" PVC Pipe
- 1 ~ ¾" PVC Cap

Tools required
- 4 jaw lathe chuck with jaws that will grip on a 1" dia.
- Small faceplate
- Glue block to fit faceplate or chuck
- Parting tool
- Mini bowl scraper (3/16" dia.)
- Skew chisel
- ¼" or ? " spindle gouge
- 11/64" Dia. drill bit
- 5/16" Dia. drill bit
- ? " Dia. Forester or spade drill bit

- Scissors
- 5/16"-18 x 1½" or 2" Carriage Bolt
- 5/16" Washer (Fender type preferred)
- 2 ~ 5/16" -18 Hex Nuts
- ½" Open-end Wrench
- 6" or 12" Ruler or Dial Caliper
- Glue brush
- 150 Grit Sandpaper
- CA Glue
- PVC Glue (Optional)
- Contact Glue
- Sanding Pad Adhesive (Klingspor)

Bearing Assembly Process

1) Mount the ¾" x ½" bushing in a chuck with the large diameter or hex end facing out. A 1" piece of ¾" PVC pipe may be substituted but will provide less of a shoulder to seat the bearing against.

2) Part off or turn off the upset or hex area to establish an overall length of approximately 7/8". The OD should be smooth with no upset.

3) Carefully counter bore the ID for a press fit of the skate bearing. The depth of the counterbore should not be greater than the thickness of the bearing. Leave a shoulder for the bearing to seat against. Recommended tool is a mini bowl scraper made from a 3/16" Allen wrench using the shortened right angle leg for the cutter.

4) Remove the bushing, invert and re-insert into the glue block. The bearing can be installed and left in place to provide extra strength against the chucking force.

5) Turn the face of the bushing to establish an overall length of approximately 13/16".
6) Repeat step 3.
7) Remove the bushing from the chuck.

Sanding Head Process
1) Drill a 5/16" dia. hole thru the center of a glue block mounted on a faceplate or chucked.

2) From the backside of the glue block, insert a 5/16" carriage bolt long enough to provide approximately 1" of threaded end exposed. Jam the carriage bolt so that it will not turn. Hold in place with a 5/16" nut. Make sure the bolt turns true on center. Use of a fender washer will help to stabilize the bolt.
4) Locate the center of each hardwood blank.
5) Preferably on a drill press, using a Forester bit or spade bit, spot drill a 7/8" dia. Approximately 1/16" deep in the center of each blank.
6) Drill an 11/64" dia. hole thru the center of each blank. This hole should be true to perpendicular with the face of the blank.

7) Press a T-Nut into each blank from the spot drilled side. Surface of the T-nut should be flush with the face of the blank.

8) Cut two pieces of closed cell foam material (from the kneeling pad) approximately 3-1/4" diameter and 2-1/4" diameter. Cutting is best accomplished with a fine tooth (10tpi) bandsaw blade on a bandsaw. It can also be cut with a sharp knife or scissors.

9) Cut two pieces of "Funky Foam" material to match the closed cell pieces. If Hook
and Loop is to be used, cut two pieces of Hook material and substitute for the "Funky Foam".

10) Spread contact glue on all surfaces to be joined and let dry until no longer tacky. This
consists of the T-nut face of the sanding block, both faces of the closed cell foam and one face of
the "Funky Foam" or Hook material.
12) Join all glued surfaces to create two sanding blocks, a 3" and a 2".
13) Mount one of the blanks onto the glue block with the carriage bolt. Use a second hex nut as a
spacer to provide work clearance to the backside of the sanding pad blank when threaded onto
the bolt.
14) Turn the OD of the glued-up pad with approximately a 10° or 15° angle. The minor OD of
the angled edge must be toward the lathe headstock. The major OD of the pad should be either
2" or 3" depending upon which blank is being turned. Turning of the foam material is best
accomplished with a sharp skew using the long point leading technique. A razor blade type
box cutter will also work. A spindle gouge works best on the hardwood blank due to the cross-
grain.
15) Sand with 150 grit sandpaper.
16) Apply any type of finish to the hardwood.
17) Repeat steps 1 thru 16 for the other size blank.

Tool Assembly
1) Install a skate bearing in each end of the bushing. If too loose, use a small amount of CA glue
but be careful to keep it out of the bearing.
2) Insert the cap screw through both bearings and secure with a lock nut. Adjust preload on the
bearing by tightening or loosening the lock nut. The cap screw should turn freely with no
noticeable resistance. There will be some lateral movement as the bearing ID is 8mm and
the 5/16" screw is slightly smaller.

3) Insert the bearing assembly into the 45° PVC Elbow with the threaded end of the cap screw
exposed. The bushing should fit tight enough without gluing. This will allow for removable if
bearings should ever need replacement.

4) With an open-end wrench holding the lock nut, screw one of the sanding pads onto the cap screw hand tight.

5) PSA sanding disks are available in 5" and 6" diameters. PSA sanding strips are also available for oscillating palm sanders. These can be trimmed to size for application to the sanding pads. Standard, cloth back or "wet-or-dry" sandpaper can also be used by applying sanding pad adhesive to the backside.
NOTE: Don't use spray adhesive or other permanent type glues, as the sanding disks will be impossible to remove.
6a) Turn a handle from any appropriate wood and press fit into the 45° elbow. CA glue will hold it in place.

　　-or-

6b) Cut a piece of ¾" PVC pipe to approximately 6" long. Glue the ¾" cap onto the pipe and glue the pipe into the 45° elbow. Use PVC or CA glue.

7) Kneeling pads and "Funky Foam" are available in several different colors. Several sanding pads could be made using different colors to distinguish between sanding grits, viz, red for 150, yellow for 220, green for 400 and blue for 600.

8) Hook and loop (Velcro) 2" and 3" sanding disks are readily available from sources such as Klingspor Catalog and are hard to beat for convenience and grit variety.

9) The Hook material is also available from Klingspor in 12" x 24" sheets listed as "Kling-on Conversion Kit" in their catalog. The "Conversion Kit" also includes Sanding Disk Adhesive which is not suitable for attaching the Hook material to the pad but works very well as a PSA.

10) Hook material can also be purchased from various other sources including sewing and fabric stores but will probably be limited to tape or strip configuration up to 2" wide. This can be effectively used, even for 3" or larger pads, as long as it is properly and securely attached with contact glue. Obviously, this process is not limited to 2" and 3" sanding pads. The pads could just as easily be made in 4", 5" or 6" diameters if the need arises. This process produces a professional looking tool that works very well and does not cost a bundle.