



Sanding and Scraping

(The Unspoken Taboo of Woodturners)

By

Mark F Palma

I went to Catholic school for 8 years. The sisters that served as my teachers were very strict. They wore long habits and their hair was completely hidden under these contraptions of clothing. Rulers were used for corporal punishment and I stayed after school frequently clapping erasers outside.¹

It was fourth grade and we were given the assignment to prepare a family tree. Well, when I got to aunts and uncles, Uncle Nubs² did not seem to fit on any branch, no matter what. I had this “leaf” that just sat there. And, making matters more complex, Nubs was a favorite visitor to our home.

My mother and father sat me down and gently explained (out of earshot of my younger siblings I may add) that Uncle Nubs was “technically” not my uncle. He wasn’t married to Aunt Babe,

¹ The frequent eraser fights with Randy only ensured I would have the opportunity to come back tomorrow.

² His real name was Norbert, but all knew him as Nubs.

he was betroved to her, kind of like engagement, but without the ring. It was the family secret never spoken about.³

The same seems to be the case for sanding and using scrapers while turning. It's the unspoken element. Well, I admit it, I sand and scrape! There, it's out in the public. I feel an enormous weight has been lifted off my shoulders.

Sanding and scraping are both surface enhancement techniques. I am not a proponent of using them in place of good sharpening, cutting and tool control. However, there are times that they save the day in a particular turning project. With highly figured grain, interlocking grain, or just a stubborn piece of wood I find them to be great additional tools in my arsenal.

SCRAPING

I understand that many professional demonstrators and video turners can cut a bowl in one continuous ribbon of wood without any tear out, leaving a glass smooth surface. They also bowl 300 games, run sub-4 minute miles, bat over .500 and have perfect children. In my real world, I get to take out the garbage, shovel snow, and sometimes get ridges and torn grain on my turned items.

A properly shaped and sharpened scraper, held in the correct orientation to the wood can:

- Remove wood quickly,
- Refine a shape
- Clean out a tight corner or shadow line,
- Remove end grain for end grain hollowing,
- Clean the "nub"⁴ out of the bottom of a bowl,
- Clean out the bottom corner of a box, bowl, or vessel,
- shear scrape a bowl, and
- hollow out a vessel.

Now, I will let you in on an even bigger secret than Uncle Nubs, most carbide tools are scrapers.⁵

Scrapers need to be sharp to work well. Fortunately, single edge⁶ scrapers are straightforward to sharpen. One quick pass on the grinder and you are back at the lathe. Most single edge

³ At Babe's death (she passed first) she and Nubs were engaged for over 50 years, living with Babe's sister (my great grandmother, Mia (somehow short for Marie). Mia kept an ever vigilant eye on them to maintain decency and high moral standards.

⁴ No relationship to my Uncle!

⁵ Hunter Tools, developed by Mike Hunter (who happens to be a great person, as well), and the hollowing systems that rely on the Hunter carbide cutter as their heart, are the only exception I know of to this statement.

scrapers are sharpened to an angle of 30-40 degrees. The overall goal is to have some relief angle below the cutting edge, yet plenty of metal supporting the edge.

In researching this article (well “research” may be an exaggeration) there seem to be two camps on sharpening scrapers. Those who look for the wire burr, and those who remove the burr. The wire burr edge (left on the top of a properly sharpened scraper) can cut very aggressively. Unfortunately, the burr edge only lasts for seconds. The good news is sometimes that is all you need! Besides, a quick swipe on the grinder and its right back.

Do you “need” a burr? No, it’s optional. A sharp scraper will cut without a burr. How do I know? Well, use a scraper for longer than a minute (after proper sharpening) and guess what, it still cuts soft, fine shavings. Some cuts, such as shear scraping a highly figured bowl can seem to go better without a burr.

Negative rake scrapers seem to be the new vogue in the underworld of sharpening. Ironically, they are not new and have been around for decades. Think of a skew on its side and you have one of the typical negative rake scraper profiles.⁷ By lowering the leading edge (or cutting edge, depending on how you think about it), the aggressiveness of the scraper is lessened and it seems more forgiving and controllable.

Negative rake scrapers are used with the tool rest set up so that the tool, when held level, has the cutting edge at center. The built-in downward angle of the bevel of the scraper is the reason for its forgiving nature⁸ resulting in a safe cutting position. It is almost impossible to get a catch, and if one does occur, the cutting edge is pulled down and drops clear of the turning wood.

When using a traditional or single edge scraper, raise the tool rest above center so the tool handle is higher than the cutting edge of the tool, which should be at center. (Said another way, your hand is higher than the scraper tip.) This can seem odd, as it is opposite of how we normally cut wood at the lathe. However, scrapers are not a bevel rubbing tools in use⁹.

Scrapers can make light or heavy cuts. Scrapers can be used to remove bulk quantities of wood. Scrapers are particularly skilled of removing large quantities of end grain wood from boxes, goblets and end grain bowls. So don’t look at a scraper as only a finishing tool.

⁶ Scrapers are usually only single edge (flat on top) or negative rake (either equal or unequal bevel edged). Multi-edged scrapers can be easily sharpened, but make sure you understand the angles involved before you grind away on them.

⁷ Others exist. This statement is only meant as an illustration. And no, a skew should NEVER be used on a bowl or any cross grain profile.

⁸ Maybe my negative rake scraper should have had a talk with Sister Rosina!

⁹ One tip, never sight down a scraper like a gun barrel, a catch will smack you right in the face.

Scrapers can make a good cut better. That isn't to say I scrape on every project. What I find is I need to find out how the wood is cutting with a gouge. If a sharp gouge is resulting in tear out, consider trying a scraper. With a fresh edge and a light touch you may find ridges disappear and tear out reduced. I sometimes find that when I have tear out the gouge seems to lift the torn wood fibers on each pass and just make the tear out deeper. A scraper sometimes doesn't seem to have the same lifting effect and lets me cut the area flush.

Scrapers can also do some jobs with remarkable efficiency. Some turners find scraping a dovetail groove for a chuck a faster and more consistent process. Scrapers excel in getting into tight areas and next to details such as raised beads.

Scrapers are "catch friendly" tools. I find some turners accomplish a cut with a scraper, when a gouge is frustrating them on the same cut. The dragging nature of their inherent angle of use, is less likely to dig into the wood.

Scrapers come in many profiles, thicknesses, and shapes. They can be easily reconfigured to a special use. So shape them to fit your needs.

I sat down with a pile of scrapers I had accumulated. They were sorted by size, shape and profile. The ones who seem to be the best ones got sharpened and put into service. The odd ball ones are those that you experiment with, shape for a particular use (such as dovetails, ring cutters, pointed scrapers or whatever you need). Really, what do you have to lose?

So dust off and sharpen those scrapers. Spend some time getting reacquainted with this versatile turning tool. Then you too can shout from the rooftops "I scrape and I am proud of it!"

SANDING¹⁰

Sanding is a relatively new invention in the history of woodworking.¹¹ Broken glass was used as a scraper for decades before sandpaper was prevalent. Technology has brought significant changes to abrasives, so here is a new look at this often taken for granted product.

Sandpaper¹² is not gold, frankincense or myrrh! Sometimes we treat sandpaper as something just too precious. As has been said by several demonstrators "use abrasives as though someone else is paying for them".¹³

¹⁰ Please note when I use the term "abrasive" in this article I am not referring to co-workers and relatives.

¹¹ Isaac Fisher Jr. patented sandpaper using shards of seashells, seeds, glass and other materials in 1834. However it wasn't until 1916 that 3M commercialized practical sandpaper for use first in the newly important automotive industry. The wood lathe has been in use since the 13th century!

¹² I am using the term "sandpaper" and "abrasive" in the broader sense. So I encompass both here.

Yes, I know every club has boastful turners who do not need to sand, or never need an abrasive grit coarser than 320 off the tool surface. How many articles, professional demonstrators, video turners and club members say:

- “...I am going to skip showing you how to sand , everyone knows how to do that...”
- “...sanding is boring...”
- “... no one likes to sand so get through it as soon as possible...”
- “...great turners don’t need to sand...” or
- “I always power sand...”

Well, let me share two secrets with you:

1. Some of them lie; and
2. No one can tell if the finished piece was turned, scraped or sanded.

Understand that abrasives are a complex topic. Abrasives have changed dramatically. If you understood abrasives at an earlier time of your life, you may not fully understand abrasives today.

All abrasives are not alike! Some things to consider in choosing an abrasive include:

- Is it the US grit system printed on the back or the “P” European grit system?
- What is the best abrasive material to use:
 - Garnet (normally brown)
 - Silicon carbide (normally black)
 - Aluminum Oxide (normally white)
 - Ceramic (often blue)
 - Exotics, Synthetics and other cool stuff
 - Woven materials (green, maroon, gray white)
 - Steel wool
 - Others
- Backing material (cloth or paper)
- Backing weight (often given in letters)
- Binding material holding the abrasives to the backing (latex is one of the tougher materials)
- Open coat or closed coat paper
- Serrate and non-serrate abrasives
- Cheap vs. quality paper

¹³ Just take the money out of kids or grandkids college fund, their all above average anyway!

- Disc shape (round or scalloped)

Each type of abrasive has advantages and disadvantages, as well as applications where they perform, superior, average, or in a below average manner. So do not grab any paper on sale at the big box retailer or mass discounter and expect a great result.

I am not going to provide you a treatise on abrasives. There are plenty of charts on the internet about abrasive grits numbering systems and application recommendations for different grit types. Do some research, quit being a Luddite¹⁴ and join the 21st century!

Here are some suggestions from Mark's shop¹⁵:

- Abrasives are a consumable! They wear out. A 2" 220 or 320 grit disc may have a life of measured in seconds.
- Abrasive discs¹⁶ get dirty, use an abrasive cleaner to remove dust from discs. Clean discs last longer.
- Think about sanding as refining scratches. Each scratch is a "hump" and a "groove." Think of an lp record album¹⁷. You are trying to level out the whole surface.
- Watch the flow of dust off the work. If the dust slows down your cutting action has become inefficient. Change your paper if your cutting action slows down noticeably or you feel heat starting to come off the work.
- Abrasives cut; they do not rub, grind, or just magically make a uniform scratch pattern.
- If your paper "gums" up, consider an open coat or serrate paper. These abrasives are designed to gum up less.
- Sand at a slower r.p.m. compared to the speed that you cut the work at. Heat build-up is not your friend when sanding. If you find your fingers getting hot, then you are not doing something right.
- Get the tool rest out of the way when you are sanding. I try to take the tool rest off as an extra safety measure and leave the banjo empty.
- Use a quality, clean and properly fitting dust mask, even if you have dust extraction. If you are coughing more, it may be dust in your lungs!
- Watch you dust trail over your work when sanding. You can see low areas and tear out because the dust will "catch" in these areas and they will remain "white" as you pass

¹⁴ The Luddites were English textile workers in 1811-1816 who were opposed to the industrialization of factories.

¹⁵ The author is just sharing my pragmatic ideas and the results of my mistakes.

¹⁶ Is it a "Disk" or a "Disc" which is it? Ironically a "Disk" is to be used for computer and technology related circular material. Given the exotic nature of ceramics and some of the woven abrasives such as Abranet, it may be the correct term here.

¹⁷ A "lp" album is a reference to long play records. The stereophonic record was commercially introduced in 1957 and help the market until it ultimately fell victim to the Compact Disk (CD) that was introduced in 1982.

over them. If an area doesn't seem to sand out, stop the lathe, and figure out what is going on.

- Think about which grit is your best starting point. Look at the piece, consider the specie of wood, how the gouge gods were treating you and pick the best grit.
- If your initial choice isn't doing the job, go one courser.
- When you finish your first grit stop the lathe and look for radial scratches. If you see radial scratches, sand them out with the same grit as you just used for sanding.
- Note that finer grits will not get rid of radial scratches from coarser grit. They may wear down the "bumps" but the grooves are still there.
- Don't skip grits. If I start at 120, I go:
 - 120
 - 150 (the forgotten grit)
 - 180
 - 220
 - 320
 - 400
 - 600¹⁸
 - 1000
 - Non-abrasive pad
- Sometimes sanding isn't fixing the problem. If so, recut the area.
- Not everything can be power sanded. Sometimes you need to sand off the lathe.
- Just because you started power sanding it doesn't mean you have to power sand every grit. I sometimes power sand until 180 and thereafter hand sand.
- Sometimes I use ceramic grit for my coarsest grit, then shift to aluminum oxide paper, and shift to serrate for my finer grits.
- If you want to cut down on dust, you can dip your abrasive in wax and sand with the wax.
- Not everything can be sanded on the lathe. Sometimes you need to put on some good music and sit down, chill out and sand!

So what do I normally do?

1. Power sand bowls through the first three grits. Then I sand the last few grits.
2. Start with a ceramic disc for my coarsest grit. Then I switch to aluminum oxide through 180, and serrate for 220 or finer.
3. Keep a disc cleaner right next to the lathe and use it all the time.

¹⁸ 600 and 1000 are optional. It depends on the specie and how I plan to finish the piece.

4. Use a non-abrasive pad to wipe off the work as the last step. I use either white 3M non-abrasive pads or cheap pads from a “dollar’ store. This is not a place where I find quality impacts the outcome. I use them to burnish the final surface and look hard at the overall outcome.
5. Abranet is my preferred abrasive for exotic woods and non-wood materials.
6. 6” PSA (pressure sensitive adhesive) serrate discs are my favorite for hand sanding on the lathe. This gives me a hard, sharp edge (the fold) and a soft edge (the ½ round). It costs more, but I use the abrasive more efficiently. It also gives me two sides. I use one side at a time.
7. I view abrasives as a system and do not view them as individual pieces of paper (or cloth). So, I throw away the used abrasives at the end of a project and start with new for the next.¹⁹
8. A wastebasket next to the lathe allows me to throw away worn abrasives and not confuse the new and the old.
9. I write on the face of my abrasives with magic marker the grit in big letters so I can tell what is going on while I am in the throes of turning. I start with them in order and use an office binding clip to keep them in order at the lathe.
10. Use the off switch and take time to inspect your progress. Areas of tear out may require hand sanding (or some judicious power sanding).
11. If I see a sanding mistake that got missed that got missed, I say “ugh”²⁰ and then go back and fix it. If that means going through all the grits again, then that is the price of perfection.
12. A change of mindset is in order regarding sanding. I think of sanding as of equal importance to every other step in turning.
13. My goal is the overall quality of the end product. I do not compromise my work (I give it away; I do not sell my work). If I need to spend extra time sanding, it’s ok. I am still hanging out in my shop.

So, once we focus on the end product, rather than the taboos of sanding and scraping, we open up a world of possibilities.

Have fun in your shop.

¹⁹ A project is not a small piece, so if I am doing bottle stoppers for example, I consider all the stoppers one project.

²⁰ Or words to that effect).