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Sharpening system selection

Kurt Hertzog covers the basics of sharpening systems and looks at the items needed to create and maintain sharp tools

As with many pastimes, there are some mundane tasks that are absolutely critical. Tuning a musical instrument might qualify. It is necessary but usually isn't the highlight of the musical session. Needing to be done sometimes several times before and during playing, being efficient lets you move on to or continue the more enjoyable parts of the pastime. Sharpening falls into this same category for most of us. Speak to any woodturner and few, if any, would say that sharpening is the fun part of turning. It is relegated to the 'necessary evil' category. It needs to be done, and often, so the shavings can fly.

Like other aspects of woodturning, there is a lot of mystique and misconception about sharpening equipment and the process. These range from the colour of the wheel being used to the angle of the grind being imparted to the various tools, and even the after-sharpening treatments. In this article we'll try to put some of these beliefs about sharpening equipment into perspective. Getting to the end goal of a sharp and functional tool can be achieved in many ways. There isn't one answer but really many ways to get to the desired end point. Let's look at the items needed so you can create and maintain the needed sharp tools with minimum amounts of equipment and time.

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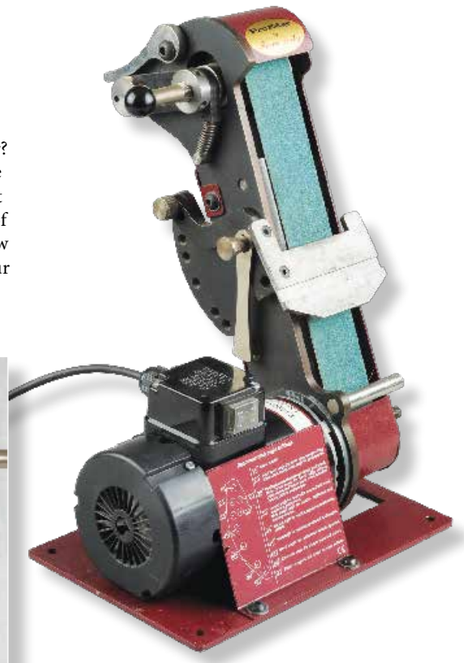
SHARPENING SYSTEMS

SHARPENING EQUIPMENT SELECTION

Depending on your learning method or person coaching you, you might view the bench grinder as the sharpening equipment of choice. Others available are the belt sander and the Tormek-style waterstone equipment. Any of these will work nicely depending on what you have and what you were taught to use. I've used them all and they all yield quality results. My choice is the bench grinder. I think it is probably the most widely used by woodturners based on the cost and availability of the basic tool – the grinder itself.

Why would you choose one over the other? If you already have one available or are more experienced with one particular system, that could make you choose it. Also, preference of a flat grind from a belt sander versus a hollow grind from a grinding wheel might sway your decision. Among those favouring a hollow grind, you might have a preference for the radius of the hollow grind. Standard bench grinders are commonly 150, 180 and 200mm wheels with the Tormek-style systems having approximately a 250mm wheel. Which you choose is your own preference providing you do your sharpening on the same equipment, or at least the same size equipment, each ▶

The Tormek or other water wheel sharpening systems offer a larger wheel diameter and a finer grit size. There are jigs and fixtures available to accommodate woodturning tools



Whether home-built or commercially available, a belt sanding sharpening system will provide flat ground tool sharpening. With the belt running away from the edge, there are some safety advantages

As a turner, you will need a sharpening system. It is as key as the lathe. Without sharpening skills and the means of sharpening your tools in an ongoing manner, every tool will functionally become a scraper. Using your cutting tools as such will be much like getting a hair cut with a pair of pliers. It will work, but it will not be pretty or enjoyable. As important as your ability to control your turning tools will be your ability to put an effective cutting edge on your tools. Depending on what you are turning, both material and technique, you may need to sharpen a tool only once a session or every few minutes. If you don't become proficient in your sharpening abilities, your woodturning results will hit a plateau and limit your further progress. While you may never get to love the sharpening process, you'll do well to develop the skill and enjoy the fruits that sharp tools will bear. Whether you use a bench grinder, belt sander, or waterstone-style machine, you'll have the sharpening machine itself, toolrests, task lighting, jigs and fixtures and dressing equipment. All are key to having a useful method of sharpening your tools.

"Using your cutting tools as such will be much like getting a hair cut with a pair of pliers"

The standard 150mm bench grinder makes a good choice for the basis of a sharpening system. Notice the task lighting included, which still needs some accessorising

◀ SHARPENING EQUIPMENT SELECTION (CONT.)

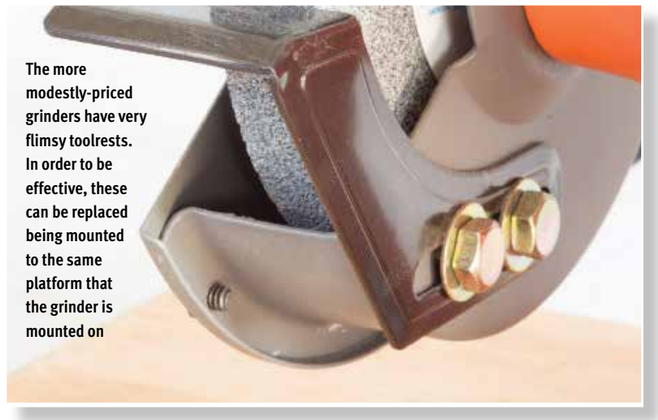
time. My grinder has 180mm wheels. I like the larger radius wheel hollow grind but can't physically carry a 200mm grinder. Using the 180mm grinder gives me the ability to use 25mm-wide grinding wheels on the grinder yet with a gentler curve hollow grind than a 150mm grinder. The choice is yours. Use what you have access to or favour, but use the same each time or you'll be regrinding your tools each time you change sizes.

My choice of a bench grinder over the belt sander or Tormek-style equipment is based on the availability, portability and preparation required. My grinder travels with me far more easily than my belt sander. My Tormek isn't ready at a moment's notice. It takes filling the reservoir, soaking the stone, using the machine, draining the system, cleaning the tank and disposing of the water and steel filings properly lest they turn to concrete somewhere in my drain pipes. The results possible are certainly worth the trouble when sharpening plane irons, bench chisels, scissors, knives, etc. I wait until I have a lot of those things to sharpen on the Tormek, which makes the preparation and cleanup time worthwhile. I don't want all of the setup and teardown time each time I want to do bit of woodturning. Because of the overwhelming popularity of the grinder, we will focus on the standard bench grinder and accessories as a sharpening system.

The 200mm bench grinder offers the advantages of a gentler-radius hollow grind and the ability to house 25mm wide grinding wheels. Available in both high and low speed as desired

GRINDER SIZE

In the bench grinder arena, the most prevalent sizes are 150mm and 200mm or imperial equivalent. While available, the 180mm bench grinder is a bit of an anomaly, being available yet not extremely common. Regardless of your type of turning and selection of tools, either a 150mm or 200mm grinder will work nicely. A 180mm will as well should you decide on it, but accept the fact that the wheel availability may not be as extensive. This is particularly true if you rely on your woodturning retailer as opposed to the machine tool supplier for grinding wheels. The difference in the hollow grind is minor between 150, 180 and 200mm and the availability of grits and wheel parameters are extensive in all sizes. Pick the size that suits you or better yet, pick the size of the grinder that you have available. The only real distinction is that most 150mm grinders sometimes have smaller wheel widths that will fit into the protective covers.



The more modestly-priced grinders have very flimsy toolrests. In order to be effective, these can be replaced being mounted to the same platform that the grinder is mounted on

If the grinder has substantial rests, they should be sturdy and reasonably sized. Too big is as much of a problem as too small. Balance your working space and ability to work with small tools

Regardless of the rests that are installed on the grinder, a sharpening system benefits from having an after-market grinding fixture system. This accommodates those special needs effectively

GRINDER SPEED

You'll hear of high-speed and low-speed grinders. There are even variable-speed grinders. For the most part, any speed will do the job at hand. The old wives' tale about needing a slow-speed grinder is just that – an old wives' tale. High-speed or low-speed will work nicely, although a slow-speed does give the newcomer a bit of forgiveness while learning and developing the touch. That said, don't fret over not having a slow-speed grinder. Get whichever speed you have access to and learn to sharpen on it. After a short learning curve, you'll find that you'll be able to sharpen quite nicely on either system. The key to selecting a grinder is to choose one that will accept your chosen wheels and run true when used after initial wheel mounting, balancing and truing.

GRINDER WHEEL SELECTION

Depending on whom you listen to, you'll be told that you need pink wheels or white wheels or some other colour wheels, or no special colour at all. Truth is that virtually any wheel, other than those meant for carbides, will work quite nicely. If the wheel is coloured green, it is made for grinding carbides and not intended for your high-speed steel turning tools. All other colours are fair game. The white wheel is usually a highly friable grinding wheel. Friability is the wheel's ability to break down as it is being used to expose new and sharp edges to continue the sharpening process effectively. Paying premium for a white or pink grinding wheel might be money that might be more wisely spent. My suggestion is that you get a wheel dresser and 'sharpen' the wheel as needed rather than counting on it crumbling as needed to present new edges to the steel during use.

Grinding wheels and their use is an extremely complex subject. There is a multi-digit code that will tell you everything you need to know about wheels and probably a lot more than you want to know. Should you wish to learn more, a quick search on Google will yield pages of websites by the various wheel grinding manufacturers that have in-depth explanations of the design, manufacture, selection, use and safe operating procedures. For the average woodturner, getting a general purpose aluminium oxide grinding wheel that is middle of the road on all of the other characteristics such as friability, hardness, density, etc. will serve well. Probably the most important specification needing selection is the grit.

If you think of the grinding wheel as a sander for your woodturning tools' edges, you can relate grit directly to sandpaper. The coarser the grit used, the bigger the scratches and the faster the steel removal. The finer the grit used, the smaller the scratches and the finer the finish at the expense of slow material removal. Most woodturners use one wheel grit rather than the machinist method of a coarse grit on one side of the grinder and a finer grit on the other side. Rare is the turner with dedicated turning grinder with a coarse grit on one wheel and a finer grit on the other. If you are the one wheel grit fits all person, your selection of grit size will be a balance of coarseness for cool and effective steel removal needed when shaping the tool and fineness for putting a keen edge on the tool. Whether a belt sander or a grinding wheel is used to sharpen your turning tools, sharpening creates a serrated knife edge on the tools with the grit of the abrasive being the spacing on the serrations. A close look at the ground edge of a tool will reveal the wheel grit size used for sharpening.

When picking your wheel grit size, I recommend something in the middle of the range. I wouldn't go coarser than 60 unless you have special grinding requirements, and not finer than 80 unless you never intend to do any shaping of your tools. With a 60 or 80 grit wheel, you'll be able to sharpen and shape your tools as needed yet not compromise the ability to do both pretty well. Will a finer grit than 80, such as 100 or 120, yield a finer ground edge? Certainly it will but you'll consume a lot of wheel life if you do much shaping with that wheel. It is your choice on wheel grit selection but somewhere in the middle of the range such as 60 or 80 will serve you well.

Wheels coloured white are usually an indication of high friability or the ability to break down during use to present unused and sharp particles. Wheel dressing will accomplish the same function, and on demand

There is an alphanumeric code that will detail all of the grinding wheel specifications, including abrasive, bonding, grit, density, friability, hardness and more. Middle-of-the-road on all suits the turner

Grit selection is a balance of steel removal capability and fineness of ground edge. A look at the end of the tool will tell what grit grinding wheel was used

The reason that the Tormek is sometimes selected is for the keenness of the edge. The effective grit size of the Tormek wheel is 200 grit

WHEEL DRESSERS & HONES

If you have opted for a standard grinding wheel that you will dress as needed to rejuvenate the ability to cut steel well, you'll need a method for dressing the wheel. The other need for dressing is if you habitually use the same spot on the wheel and create a 'dish' where the wear is excessive. In that case, you'll also need to dress the wheel to flatten the front face on occasion. My suggestion to use a randomly selected spot on the wheel each time will leave you with the need to dress the wheel only to sharpen the edges for cutting.

There are several tools for dressing a grinding wheel, ranging from the old to the new. All work but some are relegated to the museums. In essence, you are breaking the bonding of the aluminium oxide cutting particles to expose new and unused ones underneath. This fracturing of the bonding and cutting materials exposes new sharp edges ready to grind your tools in the same manner as reaching for a new piece of sandpaper. New sharp edges are available to do the work. Often asked is when do you dress the wheel? Not being smart but the answer is, 'it depends'. The wheel needs to be dressed when needed. If you use it little it won't need dressing as often. Properly selected and used without creating dishing, a wheel needs to be dressed when it doesn't cut efficiently. If you have been shaping tools, the wheel might need constant dressing. The sandpaper analogy will do well. You reach for a fresh piece of sandpaper when the current one begins to cut ineffectively. This is exactly the same with dressing a wheel. Don't worry about the appearance of the wheel – whether shiny, dull, black in the white, or other discolourations. How it cuts your tool steel is what is important, not that it is perfectly white or perfectly absent of shiny spots.

The last item I would add to a sharpening system list is a set of diamond hones. I am not a fan of honing tools for the sake of removing the burr or doing the honing process. I do, however, use hones to perform the sharpening process. I recommend a set of the inexpensive hones, which are available from a variety of manufacturers and retailers. More on this in the next article when we'll tackle the sharpening process.

Wheel dressers from old to new. The 'devil stick' – lower left – is from another time – with the star wheels – right – not far behind. The most modern and effective diamond dresser is in the upper left

A properly dressed wheel will be flat across the face with the colour being 'dull'. The absence of shiny spots, embedded steel and the dullness indicates fresh sharp cutting particles ready to work

A set of very modestly-priced diamond hones rounds out the sharpening system list. These are available from a variety of manufacturers and retailers

CONCLUSION

The topic of sharpening is so important to a successful woodturner that it can't be effectively conveyed in the space allowed for this column in a single issue. As much as I dislike having multi-part topics, the actual process of sharpening will be contained in the next issue. This background on equipment selection and why will be built upon next time. We'll cover safety procedures, angles and selection, toolrests, jigs and fixtures, honing tools, placement, wheel dressing and general best practices. The goal will be to make sharpening a simple, repeatable process to make and keep your tools sharp. There is no magic formula other than understanding what you are doing and having a bit of practice doing it. The requirements of a sharpening system can be modest and one can be obtained at a reasonable cost. It is, however, as important as any other part of the woodturner's kit and perhaps the most important. With sharp tools in skilled hands, the turner can work on nearly any project.

The ability to sharpen your tools efficiently is absolutely key to your success as a woodturner. Without sharp tools and proper usage, every tool becomes a scraper, thus limiting your progress