Tool Handles

Bill Neddow

Gouges, skew chisels, and scrapers are the interface between a woodturner's hands and the wood. Well-designed tools add greatly to pleasure in turning. Essential to a well-designed tool is its handle. Handles should be comfortable to grip, improve tool control, reduce stress to the body, and ensure safety.

When I first started turning, I bought Sorby tools, which I happily used for years. The handles had the typical English design: long curves with a bulge just behind the ferrule and a smaller gripping area where the handle is held most of the time. Toward the end of the handle, the diameter increases again, to warn that your hand is nearing the end. The handles on Sorby's standard bowl and spindle-roughing gouges were all approximately 1¼" (32 mm) at the waist. The smaller spindle gouges were about 1" (25 mm).

I started questioning this standardization a number of years ago after seeing David Ellsworth turn a hollow form. The handle on his tool was substantial. It was much larger in diameter than normal and over two feet long! He explained that the additional diameter gave more control over the twisting of the tool. I started applying the principle to my bowl making and discovered that a larger handle (about 1¾" [44 mm] diameter) meant I could control the tool better. A larger handle also lets me relax, yet still maintain control over the tool. Gripping tightly to control the torque results in white-knuckle turning, something everyone warns against. If you are using a small-diameter handle and fighting the torque, consider acquiring tools with larger-diameter handles.

After I started using larger handles, I found I could turn all day without waking up the next day with pain from cramps in my hands. My current bowl-roughing gouge has a handle that is 1¾" in diameter and is 18" (45 cm) long. It is a solid 1½" (40 mm) aluminum bar with a foam sleeve, perfect for the job. I would not use it to turn pens, though. For pens, the handles on my detail gouges are a little fatter than normal and shorter to provide fine control for adding details. Everything has an optimum size, but in general a fatter handle is superior.

Large-diameter handles

If you want to try a larger-diameter handle, make it yourself or search for small manufacturers; most major manufacturers understandably make one-size-fits-all handles. My first oversize handle came from Russ Pilgrim, a woodturner in Vancouver, Canada. His handles are aluminum with a vinyl grip, are 1¾" diameter, 18" long, and have a .530" bore on one end and .640" bore on other end to fit ½" (13 mm) and ⅝" (15 mm) gouges. His

Although there does not seem to be much difference in the diameter of the handles, the top one gives dramatically better control of torque with its ½" [13 mm] larger diameter.

Metal handles are popular. The front two are aluminum—the closest one is a Glaser handle with a negative-rake scraper, purchased from Stuart Batty a few years ago. Next, is a Doug Thompson handle. Behind it is a Kelton steel handle (they now make an aluminum one as well) and the back handle is shopmade from a piece of iron pipe (polished) with an interior diameter of ¾" (19 mm). It is sleeved down to ⅝" (16 mm) at the other end. The foam is from a recycle bin at a surplus store.

We woodturners need many different sizes of handles to work efficiently. The big tool is ½" (13 mm) larger in diameter than the norm, giving a much better and more comfortable grip for removing large shavings. Below it is a small skew chisel with an appropriate-sized handle for delicate tool control.

handles were the result of collaboration with Curt Theobald. Russ says that his larger-diameter handles significantly help woodturners with large hands, carpal tunnel syndrome, and/or arthritis.

I have approached other manufacturers about making larger-diameter handles, but only a few of the smaller manufacturers responded. I have several handles from each of these shops. I also make my own handles. The actual design is not important. I like a fairly straight handle (like a tube) because I want the maximum diameter to be available on the middle of the handle as well as at the end. That way, I can have the maximum amount of grip and torque control no matter where I hold the tool.

Handle length

Tool length is also a factor in comfort and safety. Optimal length in a handle will provide a balanced tool, one that allows turning to be done with minimum physical effort and maximum tool control. For hogging wood away, a longer tool handle offers more leverage, which results in less effort to control the cut. You can use this simple fact to dramatically cut down the amount of shock and vibration that your body has to absorb, especially when turning out-of-round pieces. A long handle can be tucked tight to your hip and your hips and legs can help control the tool, useful for roughing out the outsides of bowls and roughing down spindle stock.

But you have to do everything in moderation. If a tool handle is too long, the end will contact the lathe bed, especially when coring out the center of a bowl. I have a lathe with a 24" (60 cm) capacity—an 18"- (45 cm-) long handle works well for heavy-duty roughing. On a standard 12" (30 cm) lathe, however, the end of the tool often hits the bed when I am hollowing out the inside of the bowl. Shorter handles were designed in an era when lathes with 12" swings were the norm. Lathes have larger capacities in recent years; you might want to try longer tool handles.

For spindle gouges and lighter-duty gouges, I prefer a shorter handle. They do not need to be tucked against my hip. My spindle gouges range from 12" down to 6" (15 cm) long. The shorter tool handles will allow you to work in front of your body, which is a great advantage when working with smaller items. It also makes it easier to switch hands while turning. The finer the work, the smaller the tool should be. A shorter handle balances the tool.

Vibration

A heavy tool handle can help reduce vibration, which will make turning more comfortable, as well as reduce catches. Catches can happen when vibration accelerates into a bounce, which can happen in a split second.

Weight for damping vibration can be increased by adding lead or steel shot to the handle. A quick search of the Internet shows that machinists ▸

These are the parts that go into making my favorite style of tool handle. The hose and aluminum pipe come from a discount machine-shop supply house. The block of aluminum is from a large chunk I found in a junkyard. The wood is camatillo (rosewood), meant for a bottle stopper. Any hardwood (or aluminum) will do. The screws are the same size I use in other handles.

Two well-made aluminum handles. The one on the bottom is the standard Oneway handle. On the top is one made by Russ Pilgrim from Canada. It is ½" (13 mm) larger in diameter and 6" (15 cm) longer than the Oneway. I would use the Oneway for tools up to ½" diameter and the Pilgrim on larger tools, for more comfortable tool control.

More aluminum handles. In front is a beautifully machined handle by D-Way, with a sleeve in it to fit smaller tools. Next is a collet handle from Serious Tool Works, which I bought many years ago. Next is the Oneway handle, then my own shopmade one. The last is the big handle manufactured by Russ Pilgrim.

This is a lovely shopmade handle, but the tool steel sticks too far out. The length entices a turner to reach way out over the toolrest, and doing so, the tool will vibrate like a tuning fork.

There are many types of ferrules. In front is a standard ferrule in a wood handle. Behind is a Hosaluk ferrule, followed by a Oneway ferrule, and then a shopmade one out of an Oilite bearing. The back one I would not recommend, although it seems to have withstood the tests of time—the handle appears to be part of an old sledge-hammer handle, and the ferrule is simply a piece of wire wrapped around it.

universally agree that lead shot is more effective than steel shot.

Personally, I do not use lead shot and avoid really heavy handles. For the little deep hollow turning I do, I use a captured bar—it provides fingertip control without white-knuckle turning.

I have used shot in a handle and own a large solid-steel handle that I used for roughing out large bowls. I found that although it did help me balance the tool when I was reaching out over the toolrest, by the end of the day, my arms were very tired. After paying attention to the amount of time I was simply holding the tool as opposed to making cuts, I discovered that I was simply holding the tool more than a quarter of the time. This may not be important to a hobby turner, but to a production turner, that tool handle gets heavy by the end of the day. Some turners, however, like a heavy handle and claim it helps overcome problems with arthritic shoulders and backs.

There is another effective way of reducing vibration: keeping the toolrest as close as possible to the wood. It also means you have more leverage and have less need for a heavy handle in order to achieve balance. This is my solution to the vibration problem. I take time to set up my toolrest, getting it as close as reasonably possible to the wood, especially on out-of-round pieces. I also reposition the toolrest regularly. If there is a 2"- or 3"- (50 mm- or 75 mm-) gap between the toolrest and the wood, the tool's leverage drops dramatically and there is less tool control. The balance of the tool has changed. When you are cleaning out the inside of a very deep bowl, a curved toolrest will minimize overhang.

There is yet another way of reducing vibration. Instead of filling the tool handle with shot, shorten the length of the tool steel that protrudes from the handle. The tool steel can act like a giant tuning fork if it sticks out too far, vibrating with each cut. A removable handle will allow different combinations of tool-to-handle length to arrive at the best solution for eliminating vibration. Having less tool shank exposed also gives your left hand something larger to rest on than the tool shank. This cuts down on hand cramping from grasping a thin tool shank.

New materials

A composite made by embedding carbon fiber, Kevlar, or other fibers in a polymer, such as epoxy, is used in racing bicycles for strength and to dampen vibration. It is also used to build canoes capable of withstanding massive shocks and for golf club and tennis-racquet handles. Stuart Batty displayed carbon-fiber-handle prototypes at the Saint Paul symposium; they looked interesting. Glenn Roberts, an Australian woodturner and tool developer, is also working on a carbon-fiber design. (The Kelton ER handle is based on his original concept.) I hope other tool developers explore this material. If the composite materials can dramatically reduce the shock of hitting a golf ball and stand up to the pounding of a racing bike, they should work for woodturning-tool handles.

Handle core

There are many materials that can be used as a core for a tool handle: solid round bars of aluminum and steel, tubes of aluminum, steel, or black iron pipe, plastic pipe, and wood. On a wood lathe, it is easy to turn a piece of aluminum into a sleeve that will be the right size for the cutting tool and will fit into your chosen core.

Some manufacturers use solid aluminum or steel for the core and simply drill out the center for the tool.

Even plastic pipe (Schedule 40) can be used as a core for a tool handle. Hunter Tools makes an aluminum sleeve to fit this pipe and to fit your

My favorite tool handle

This is my favorite tool handle. It has the characteristics I need for the type of woodturning I do. I make bowls in the 12" (30 cm) to 20" (50 cm) range. If I were making jewelry, hollow forms, or smaller or larger bowls, the handle would be different—in some cases, radically.

- The handle is 1¾" (45 mm) in diameter, larger than most woodturners use. I have been a production turner for years; ergonomics, efficiency, and comfort are important. White-knuckle turning decreases productivity, and the increased diameter of this handle gives me greater torque control. Only a minimum of effort is required to make those long shearing pull cuts that remove masses of wood.
- It has a soft grip, in this case, plastic. Foam rubber is also a favorite. The reason is comfort. I do not end up with blisters, holding on to something hard for eight hours. The grip I can get on these softer handles means that I am not fighting torque trying to hold on to a shiny, slippery surface.
- The tool steel is easily and quickly removed with one twist on each of two screws holding it in. A collet may be faster, but they have a tendency to seize sometimes if you have been doing a lot of heavy work with them.

- The handle is hollow (basically, a hollow aluminum tube with a piece of solid aluminum bar 2½" [63 mm] long, and fitted to one end). This means I can bury the shank of a new tool deep into the handle, cutting down the length of the exposed steel and eliminating much of its tendency to vibrate.
- It is lightweight. I am not carrying around a heavy weight all day, tiring out my arms and shoulders. I achieve balance in the tool by keeping the toolrest close to the wood, creating the most advantageous fulcrum. I do not need weight to create an ideal fulcrum.
- It is long enough to rest against my hip to give me an efficient cutting stance when making those big cuts. It is short enough at 14½" (37 cm) to clear the bed of my lathe when hollowing out the center of the bowl.
- Because the handle is hollow, I can add ballast in the form of lead shot to the back end of the handle if needed. I simply remove the press-fit cocobolo plug at the back end, force a cork or other soft compressible material a little way into the handle, add the shot, and press-fit the plug back into place. I have never needed to do that.

Additional features I would like to have

- Ribs or flat spots running the length of the handle would help keep the tool from rolling off the lathe bed. Ribs would also make my grip on the tool more efficient by increasing the amount of torque I can control with ease.
- I would like it better machined. I am foremost a woodturner and secondly a machinist, and it shows. Although I am proud of this handle and use it all the time, I would be even prouder if it looked more professionally made.

chosen tool. You can leave it light, or make a wood plug for the back end and fill it with lead shot.

Of course, there is also wood, the traditional material. Just make sure the grain is straight; a piece of wood with the grain running out the side is likely to splinter and break if you get a catch. Wood handles can also be bored out to accept shot to make them heavier. If you like heavy handles, you can also choose a dense wood like cocobolo. For a lighter-weight handle use ash or maple.

Handle surface

The surface of a tool handle affects control and comfort. Rubber or foam rubber are excellent materials—comfortable, nonslip, and optimal for tool control. Both are warm when the shop is cold.

I was concerned about foam rubber deterioration when I bought the first handle covered with it years ago, so I used it very little. Then I saw a local manufacturer assembling a handle with a foam cover. Several people were in his shop and he became distracted when he went to pull the foam over the aluminum bar. The lubricant on the aluminum dried, he got the foam halfway on, and it stuck. His friends pitched in to help. Two guys held the handle while a burly fellow grabbed the edge of the foam with two pairs of needle-nose pliers. They pulled and pulled. It would not budge. So, they tried to turn the foam inside out to pull it off. The foam stretched at least 4" out from the handle before it let go. I thought the foam sleeve was ruined. I was surprised when the manufacturer picked it up off the floor, lubricated the ▸

HannesTool collet handles provide a fantastic grip. They are made with an injection-molded cover that gives firm control and keeps the tool from rotating in your hand. The three ribs can be positioned so your thumb naturally falls into one of the grooves, enhancing the control even more. The ribs keep the handle from rolling off a flat surface.

When I first heard of the Kel McNaughton ER System of handles, I thought it might be a sales gimmick—but it is a brilliant idea. The System provides versatility, allowing turners to customize the perfect handle for the job.

Many of the components of the ER System can be combined. Here, an ER16 handle has been attached to the back end of the ER25 handle, and a torque-arresting handle added to the side.

The McNaughton Torque Arrestor handle has been added to the end of an ER16 handle and the two have been added to the biggest handle in the System.

The McNaughton System uses universally available ER collets, so you can get either metric or imperial collets to better match the tools you are inserting into the handle.

These are sturdy collets and they have a clamping range capacity of about 1 mm (.04"), so you should be able to find one to fit almost any tool.

If you buy collets from a tool supplier (rather than from McNaughton), check the manufacturer's specs carefully. Some manufacturers identify their collets by *actual* range. For example, 18–19 indicates that the collet will accommodate from 18 mm to 19 mm. Others use a single number such as 19, which indicates the upper limit of the collet. Yet others may identify the collet by its mid-range using a single number: 19 mm would accommodate a shaft range of 18.5 to 19.5 mm.

aluminum, and slipped the foam on again, this time all the way. The foam was perfect, and I have been using this very tool for several years. The foam is still in excellent condition. Many of my tools now have foam covers.

Plastic (often in the form of clear reinforced tubing) is also a good choice. It does not feel as warm as rubber; however, it provides a good grip.

Metal, whether aluminum or steel, is hard and cold. Cold handles are not pleasant in a Canadian winter. If you live in the south, though, a cool handle might be an asset. I find aluminum or steel handles can be slippery, which does nothing for tool control. Some people wrap this type of tool with golf club or tennis-racket tape, which gives a good grip and is also lightly padded.

Wood is the old standard. It has a solid feel, and a good grip is possible, as long as the surface is not sanded ultra smooth. My wood handles are sanded to 100 grit and many do not have a finish. They may not be pretty, but they are practical.

Putting flats or ribs on a handle is a way of enhancing the tool; some commercial models are available with three or more flats or ribs on the plastic or metal surface. Shopmade wood handles often end up with at least one flat, which will keep the tool from rolling off the bed of the lathe. Flat sides on an otherwise round handle will improve grip.

Ferrules

Ferrules are meant to keep wood handles from cracking or breaking and are necessary for safety. They can be made from many different objects, including copper and brass pipe, wire, springs, and compression fittings (see Tim Heil's article, "Fancy Ferrules for Everyday Use," *AW*, vol 26, no 2). I use a thick Oilite bearing of an appropriate size. The thick bearing provides for sufficient threads for setscrews.

Removable handles

There has been an upsurge of interest in recent years of developing tools that can be easily removed from their handles. Collet systems have become popular. A quick twist, and the tool releases from the handle with no need for Allen wrenches and no lost setscrews. When you change tool sizes, however, you have to change the collet. Some manufacturers use industry-standard ER collets. This is a nice feature. You can buy extra collets from most machine shop suppliers to fit those oddball-sized shopmade tools you may have. Some manufacturers simply cut slots in the tubular metal of the handle so the handle material will flex and squeeze onto the tool as you tighten the nut. In order to use different-diameter tools, you have to have a sleeve that fits onto the tool, to accommodate the diameter of the hole in the handle. A setscrew usually holds these sleeves in place, similar to the method described later for the cam-lock systems. Also, some after-market tools are slightly larger than the standard collet sizes, and they might not fit in the handle. A few passes on the belt sander to reduce the tool diameter will solve this, but that will do nothing for the beauty of a tool.

Cam-lock systems also work well: Place the tool in the handle, twist the cam cover, and the tool is secure. With the old systems, however, you needed adaptors on many tools—the cam system would only hold one size and adaptors were needed for different-diameter tools. Also, these old systems sometimes used a setscrew to hold the adaptor onto the tool. This meant dealing with Allen wrenches and lost screws. I have not seen the new systems that are being developed, but I am hoping the manufacturers have addressed this problem.

Some metal handles are glued onto tools, for example, Glaser and Hannes.

Setscrews, however, are probably the most customary way of securing a tool into a steel or aluminum handle. Using setscrews means the handle is easily shifted to another tool when the original tool wears out. As stated before, it also allows you to change the handle easily to get a properly balanced tool/handle combination for the job at hand. It is an efficient way of marrying tools and handles.

As with other removable handles, if you want to change the diameter of the tool to a smaller one, you will need a sleeve. Most manufacturers can provide one and the problem of additional setscrews is avoided by simply drilling oversized holes in the sleeve and allowing the existing setscrews in the handle to extend through the sleeve and grip the tool.

There are other ways of holding steel in a handle coming onto the market. Stuart Batty has displayed a system that works something like a Morse taper with a draw bar. There is a Morse taperlike hole on the end of the handle into which the tool fits. On the end of the tool, a threaded area screws into a similarly threaded area inside the handle.

Glaser HITEC has another couple of systems. In their mini-tool system, they seem to have an offset pin on the end of the tool steel that plugs into a hole in the handle. This keeps the tool from twisting. To keep the tool from falling out, there is a cove machined on the tool steel (in some cases, the photos on their website show a bead) that fits into some sort of a compression fitting in the handle. They also show a modification of this on their website, which has a more square knob on the end of the tool steel that fits into a similar hole in the handle.

Doug Thompson and Jimmy Clewes are working together on a prototype that involves a cam-lock system for holding the tool in the handle. Hannes Tools has a new collet system.

There are also several products on the market for making wooden tool handles into quick–change handles rather than gluing the tool into the wood. For example, Oneway produces a ferrule that allows you to mount a tool into a wood handle. To use it, you cut a taper on the end of the handle using a special template provided, then simply screw the ferrule onto the taper. The Hosaluk version involves drilling a hole in the end of the wood handle big enough for a sleeve on the ferrule to fit. The tool slides up through the ferrule and up through the sleeve into the handle. The Hunter solution is sized so you can glue a piece of Schedule 40 plastic pipe as a handle on the aluminum sleeve.

Conclusion

Manufacturers are starting to focus on tool handles; expect significant advances in efficient, comfortable, and safe handles in the near future. There may be a downside, however. If you buy a tool, you may have to buy a handle from that same manufacturer, one that cannot be used on any other manufacturer's tools. If you are planning on outfitting yourself with a complete set of these tools, it is not a problem. Understandably, manufacturers need to protect their inventions with copyright or patents. Doing so will protect inventors in the short term. However, that system will not be adopted as an industry standard; other systems will continue to thrive.

We all have a favorite handle or group of handles. Our preferences are based on experience and what we find works for the type of turning being done. The weight, diameter, and length of a tool's handle can come together to create the perfect balance for a particular job, whether it is hogging wood off the outside of a bowl or creating a tiny captive ring. Be aware of the forces at play and know that you can be in command of them. Your turning experience can be safe, comfortable, and fun. ■

Bill Neddow spends his retirement creating bowls for galleries and taking part in studio tours. He also does some demonstrating. Bill considers himself a semi-production turner, following themes in his bowl designs, but trying something different with each one. He is fascinated not only by how to do something but in why it works, a byproduct of thirty years as a writer, editor, and publications manager. His website is billneddow.com. You can email him at bill.neddow@sympatico.ca.

The SB Woodturning Taper-Lock Handle System has a composite handle, the best material available for absorbing vibrations. With its six longitudinal lobes, the handle is designed not to roll off the lathe. The lobes also help provide a secure grip. The handle is lighter than wood and stronger than steel. The G2 grey iron tapered bolster grips the tool and provides a total of 6 square inches of secure contact between the handle and the bolster. Weight, such as lead shot, can be put in the handle to give the tool the perfect balance.

Glaser HITEC extruded handles are made from aircraft-grade 6061-T6 aluminum alloy and also have a no-roll shape. This handle was introduced by Jerry Glaser in 1985 and now features a powder-coated finish. Weight can also be added to this handle.