

# Making tool handles

This month, **Kurt Hertzog** looks at making tool handles for the workshop



PHOTOGRAPHS BY KURT HERTZOG

## KURT HERTZOG



Kurt is a professional woodturner, demonstrator and teacher and writes for various woodturning and woodworking publications in the

United States as well as contributing to *Woodturning* magazine. He is on the Pen Makers' Guild Council and is past president of the American Association of Woodturners (AAW).

kurt@kurthertzog.com  
www.kurthertzog.com

Most often when you buy a tool it comes from the store already handled.

However, there are tool companies that offer tools without handles for a variety of reasons. Some that come to mind are the size and weight with their impact on shipping issues. Another reason is that the end user may favour a handle of the size and weight of their own design. Paying for a handle that will be removed and replaced isn't desirable

by the customer. The end user selects the tool design and steel with the knowledge they will be mounting it in their own handle. Can you buy great handles in the market to mount your tool into? Certainly. You can choose from woods and metals with both permanent and removable versions available.

For those who would rather not tackle making your own, these are an available option. Why wouldn't you turn your own? Whether you've bought an unhandled tool, would like to change the handle on a current tool, make your own tools and need to equip them with a handle, or turn a handle for the challenge of it, we'll take a look at the considerations and techniques of making tool handles. While you can deal with metals on your wood lathe, we'll focus mainly on wood as the material for our handles using metals where needed in the ferrule area.

## Safety

You should always be using the appropriate PPE whenever you are turning as a matter of course. Tool handles and a spindle turning of modest size don't require special considerations in their turning other than the good practices for long slender turnings. Common sense speeds and feeds are always



For drilling and cutting of round stock, a V block is essential. Store bought or shop made will be an asset

in order. Do consider your design and materials for their end use. Be certain that you've given sufficient strength in the ferrule area and embedded the shaft deep enough to provide for safe usage in your application. If you need to err, err on the side of stronger and deeper than needed. The small amount of extra effort to do so will pay dividends over the life of the tool being capable of dealing with the stresses in use.

## INITIAL THOUGHTS FOR TOOL HANDLE MAKING

- One of a kind or a family of them?
- Template required if many of the same size or design?
- Single or multiple piece design?
- Permanent installation or removable?
- Simple materials and design or 'artistic' expression?
- Adjustable mass and location?

## Considerations

After running through the initial thoughts for tool handle making, you'll need to have a plan for making any tool handle. The most obvious is the size of the tool and the size of the handle needed for that tool. Small and short detail gouges will certainly need a more dexterous handle than a very large bowl gouge. The ratio of overhang over the toolrest with respect to the overall tool handle length and heft needs to be planned. While there are ratio numbers floating around, I hesitate to quote them since they vary widely and are a personal preference. Suffice to say that it is far easier to shorten any handle than it is to



Commercial or homemade, size, shape and interchangeability are a consideration

lengthen it. Other factors that will impact your design will be the geometry to the shaft, where it will be embedded into the handle. The round tool shafts are easy to design and process. The square or rectangular tool shafts require a bit more effort. Most often, square or rectangular shafts are embedded into a round hole of sufficient diameter to accommodate the corner-to-corner dimension of the shaft. There are other methods of dealing with non-round shafts but we'll leave that for another time. Perhaps the most pressing design consideration is



Size, leverage, amount of use and need to travel will all impact your handle decisions

whether the tool will be permanently affixed in the handle or removable. Why make one that is removable? The two most common reasons are for cost and travel. If you have a handle in the 'shop that accommodates many tools, you only need one or a couple of them to hold the tools you'll be using. The obvious size and weight savings of sharing a handle when travelling is a great reason for removable handles. Taking your needed tools and only one handle to mount them will save plenty of space and weight in this day of baggage excess fees.

## Design of the handle

The first consideration probably will be the size and shape of your handle. You'll need adequate centre-to-centre distance on your lathe to be able to mount your handle blank. If not, you'll need to work on another lathe with that greater centre-to-centre capability. An option not often explored is a two-piece handle. It has the benefit of breaking down into a shorter length when travelling. This can offer some of the benefits of a removable tool handle without being of that design or shortening a long handle on a removable tool handle. Those who have turned walking canes with the breakdown hardware will see the mechanics possible. The diameter shouldn't be an issue for any lathe since it will be very nominal compared to the length.

What about the shape? From the ferrule area to the very butt end, the shape is up to you. Take a look at the various shapes offered in the marketplace on the handled tools. Those shapes evolved over years based on the comfort and feel that the end customers preferred. The grip area, location and diameter, are planned to give the user an easy place to find without looking. Often a feature or marking is incorporated to know the orientation of the cutting edge. This can be helpful for those whose tool tip will be out of sight such as when deep hollowing. Being able to 'choke up' on the tool is also an important consideration. Depending on the tool type and the uses, that grip for more control is very important. My suggestion

is to review the tool handles you own and like as well as look at those differing shapes available. What do you like about any particular handle? Why? Incorporate those features into your design. Some tools have designs that are very unique to the brand. Once you've selected the size and shape you think you'll like, a sketch with dimensions or a story stick might be in order. The reasons you'd want to document the design are to allow you something to work to at the lathe as well as replicate should you wish in the future. Moments to do and takes little space to store. A visit to *Woodturning* 253, 'Duplicating turnings' might be helpful to you for the measuring and documenting aspects.



Plain Jane and fully functional. The short handle on a detail tool works perfectly



Most of the home-turned handles I made are of the same basic shape but sized as needed

## Permanent or interchangeable?



You can find an assortment of handles, with and without threaded shafts. Threaded stock is available

Once your length and shape has been determined, you'll need to plan for the interface of the tool and handle. Permanent is an easy task. We'll bore a hole of adequate size to receive the shaft, whatever the shape, with a bit of clearance for adhesive. The ferrule strengthening and cosmetics can be dealt with per your wishes. If you are going to make an interchangeable handle, things become a bit more complicated but certainly doable. The easiest methods for removability are set screws or a threaded knob in the ferrule. These



For more ornate handles, look in the cabinet section of your home improvement centre

can be tightened down when the tool shaft is seated in the hole and will hold the tool in place. Whether you use set screws or a threaded knob of sorts, you'll need to provide material and enough wall thickness for threads and sufficient strength for the stresses on the threads. Not only will you need to plan accordingly but you'll also need to be able to tap the ferrule for threads. Tapping a hole isn't difficult but since taps are very hard and brittle, you may wish to have someone experienced help you with this if it is totally



Drilling and tapping a ferrule is not difficult. Be certain you have or make a V block to assist

foreign to you. The technique of starting the tap perpendicular to the hole and the ongoing process of breaking the chip are easily learned but sometimes a challenge for the newcomer. An experienced friend, nearby machinist, or local garage mechanic should be able to tap a couple of holes for you in two minutes or less. If you want to learn, review the wealth of materials available on the web or learn from an experienced friend, and then practise on some scrap rather than risk learning on your sized and ready to use ferrule.

## Drilling the tool shaft hole

You can use the marked callout of the tool shaft diameter if you wish but I always measure it. An inexpensive pair of dial or Vernier callipers will give you the measurement. If round shafted, you'll just need the diameter. If square or rectangular, you will need the measurement across the corners at the maximum dimension. Some folks use a diameter a bit smaller and pound the corners in. I'm a fan of a slip fit and then fastening with epoxy or set screw depending on your system. Ideally, you'd like to use your lathe to drill the tool shaft hole but sometimes the length overall of the handle prevents it. Options for drilling the tool shaft hole range from using the lathe to a pistol drill. I prefer using the lathe but if needed you can often use the drill press depending on size and setup. Without those, you can easily use a pistol drill with the tool blank held in a vice. I suggest you drill your tool shaft hole into the unturned handle blank. Drilling the hole after you've turned the handle is possible but less attractive. Not required but piloting on the drilled hole will keep everything on axis. Once you've drilled your tool shaft hole, you can test the fit of the shaft for depth and clearance. For the permanent mount, you'll want a slip fit to allow room for the adhesive as well as a path for the trapped air to escape.



ABOVE: Your drilled size will usually fall into a couple of standard diameters but the square, rectangular and tapered vary. RIGHT: Adapters are available so you can accommodate a couple of different shaft sizes with one hole diameter

With no path for the air to escape from the hole, you'll create a piston when you glue the shaft into the handle. I use a very small bleed hole drilled into the ferrule area from the side of the shaft at the bottom of the hole. This allows the air to escape and will ultimately fill with adhesive. It doesn't need to be a big hole. Just large enough that the air can bleed out of the compressed piston as you seat the tool when glued.





You can drill with a twist drill or a Forstner bit. The Forstner will give you a square bottom. Notice the cut in glue traps



I know exactly my drill depth by setting the bit extension in the chuck and drilling to the chuck face

## Turning the handle

You can turn the handle in many different manners between centres. If you've used a chuck to mount your handle for drilling, you can simply bring the tail centre up into the drilled hole. The cone centre will work well with this. I will usually put the ferrule on even as a slip fit to prevent splitting. You can use a mandrel to pilot on the drilled hole axis. That will keep everything turning on the drilled hole axis. While it is nice to have everything perfectly on axis, in the real world it almost doesn't matter. You don't want to be way off but unless you get too sloppy, a bit of misalignment

will go unnoticed. Your design can now be implemented as you planned. Turn, sand and finish as you wish. I use my lathe as a work holding device for finishing so I finish right on the lathe. You can do all of the work short of finishing should your selected finish be better applied outdoors or in a paint booth. I am a fan of Ca or lacquer finishes and find they are best applied right on my lathe. Be certain your workspace is equipped properly if you are spraying and certainly use all of the recommended PPE when using finishes.



Rather than measure, I use the ferrule to test fit for size. Fast, easy and accurate. Turn until you like the fit



My favourite finish is Ca adhesive. After 15 years of use, this homemade tool and handle still look good

## The ferrule

Most of the times the ferrule is cosmetic. It can prevent splitting of the shaft at the tool shaft hole but hopefully isn't needed for that. The shaft design and tool buried depth should have been planned for sufficient strength. In addition to the looks, the ferrule if made of metal can accept threads for securing the tool in the handle. Most tools from the major manufacturers have a metal ferrule that is slid into place and staked or crimped to remain in position. The home-built tool handle with a metal ferrule is most often fastened with adhesive since the home user doesn't have access to the industrial level crimping or staking tools. The options for metal ferrules are your choice. Brass or bronze are the best looking in my opinion but many turners won't have the stock or be able to work them. Alternatives are copper whether piping cut to length or unions from the hardware department. Cutting glue traps

into the ferrule area while turning will help with the cosmetics of using adhesive to fasten the ferrule. Remember, the adhesive needs

to only hold the ferrule in place! We all tend to use too much and then need to deal with squeeze out.



The easiest ferrule is no ferrule. My Chris Stott hollowing tools are light enough duty to require none



This detail tool doesn't really need a ferrule for strength but the ferrule adds a nice look



Copper from the plumber or home improvement stores will work well for permanent or taking threads



I've experimented with PVC piping for ferrules in low demand applications. It colours nicely

## Removable handle options

You'll need to fasten your tool shaft into the handle for use. There are quick lock mechanisms available but most of us will be using a threaded fastener. The ferrule will need to be drilled and tapped for the fastener you choose. You can use a set screw or two which work well but require you to have an Allen wrench of the

correct size. A bit more ornate eliminating the need for a wrench is a knob on the end of a threaded shaft. You can visit your home centre to select a knob with its pre-determined thread size or buy threaded rod to adapt or make your own knob. If drilling and tapping is new to you, ask someone experienced for some assistance.

## Decoration and ornamentation

The decoration and ornamentation of your tool handle can range from burning your initials into the butt end to a full blown artistic creation. Some of the handles I've seen are too pretty to use. The options are yours. Obviously you'll need to protect your creation so plan on decorating and then applying the protective finish. You can also apply a finish to provide for a base for your decoration and then apply additional finish over the art work to protect it.



My Stott hollowing tools certainly don't get mistaken for anyone else's



A bit of ornamentation on a detail tool by the late Gorst duPlessis

## Adding mass to the handle

There are many ways to fine-tune the mass of your handle and the location. Most aftermarket handles use lead shot in a cavity in the butt end of the handle allowing for access to the cavity via a threaded plug. You can incorporate the same method if you wish. Use a trial and error method of adding weight bands to the handle as you

evaluate the effect. Once you've arrived at your desired weight, you can drill the handle to create a pocket, add the desired weight, and then plug the cavity permanently trapping the weight in location forever. You can locate these holes in the side at one or more locations as well as the butt end.

## Conclusions

Over the years, I've seen the gamut of home turned handles ranging from pretty gnarly to exquisite. The gnarly serve their purpose and the exquisite draw favourable attention to the tool and the maker. Regardless of where your handles might fall between those extremes, if you've made your own handles you'll certainly be able to pick your tools out in the crowd. This is especially helpful when you are teaching or turning with a group. Tools tend to migrate to the various lathes and benches and if you own standard factory tools, leaving with your own is sometimes a challenge. I liken the making of your own handles as your own expression. Paint them, pyrograph them, distress them, inlay them, or one of the many other ways of personalisation. The tool handles that I'll never forget were those of Petter Herud. All of Petter's tool handles were turned

multi-axis so they wouldn't roll off the table and were of exotic wood. Not only unique but sharp looking and certainly distinctive. His entire kit was matched in shape and

species. Will you make your turned handle serviceable or a piece of art? Your choice but you now have sufficient basics to launch into turning your own handles. ●



Plain, painted, ornamented, inlaid, pyrographed, or whatever you choose, making tool handles is easy and fun