

Miniature Hollow Vessels – KISS

By Paul Coppinger & Mike DeLong

August 9, 2008

Why Turn Miniature Vessels

- Miniature turnings provide a way to use those scraps you're hoarding that are just too beautiful to throw away.
- Miniatures also provide a way to turn those expensive figured and exotic woods without a huge monetary investment.
- Miniature turnings are usually "one-day" projects and make excellent spur-of-the-moment gift items.
- Miniature turnings can be made on any size lathe.
- Miniatures are good projects for "*getting a feel*" for the hollowing process.

Commercial Miniature Hollowing Tools

- Robert Sorby: 3-tool set \$150: 1/4"Ø Swan-neck , 3/8"Ø adjustable head, 5/8"Ø boring tool; M2 steel
- Packard: 3-tool set \$93 (Straight, 45°, 80°, 1/4" square; M2 steel) available individually
- Kelton: 3-tool set \$66 (Straight, 45°, 80°, 5/16 Ø"; special alloy laminated to HSS)

Pros

Steel Quality – made from M2 High Speed steel or better which holds an edge longer than softer steels commonly available to the do-it-yourselfer. These harder steels also make the tool stiffer along its shaft resulting in less chatter and likely-hood of bending during use.

Cons

Expense - \$66-\$150 for three tool packages

Versatility – tool bends & shapes are already decided for you and may not be exactly what you need for a given project.

Homemade Miniature Hollowing Tools

Homemade miniature hollowing tools can be made from a variety of steel items. The following list is in order of quality in the author's opinion (worst first):

- Old screwdrivers - anneal, bend, sharpen, harden & temper
- Old hex wrenches - anneal, bend, sharpen, harden & temper
- O-1 drill rod 1/4"Ø - anneal, bend, sharpen, harden & temper
- 1/4" square mild steel - bend and sharpened (*tempering optional*)
- 1/4" square mild steel with a HSS cutter silver soldered at an appropriate angle. (*tempering unnecessary*)

Pros

Expense - \$3-\$5 for three tools

Versatility – you can create the bends & shapes that are exactly what you need for a given project.

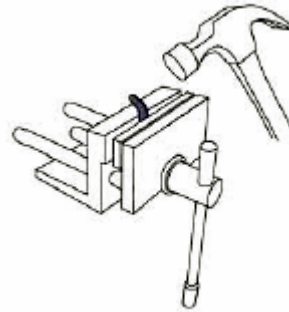
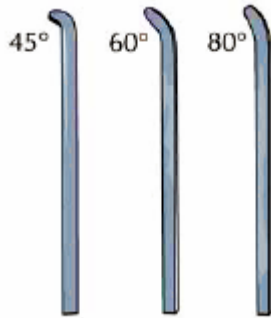
Cons

Steel Quality – Screwdrivers and hex wrenches can be made from a variety of steels – some hard, some soft – that will probably need heating to bend along with hardening and tempering. Drill rod holds a decent edge, but is only available in round stock, and will need annealing to bend along with hardening and tempering. Square mild steel requires frequent sharpening. It is also more likely to chatter or bend if over-extended on tool rest. To get the best edge possible from sharpened mild steel it will need to be tempered. Square mild steel with a HSS cutter attached holds an excellent edge, but requires the ability to silver soldered a strong joint. No tempering necessary.

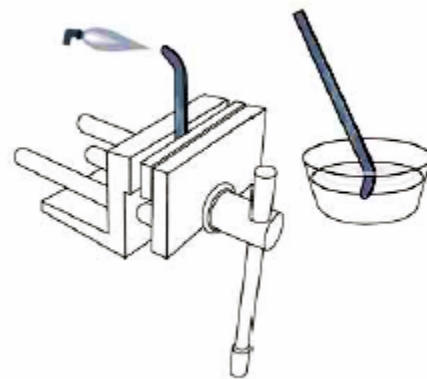
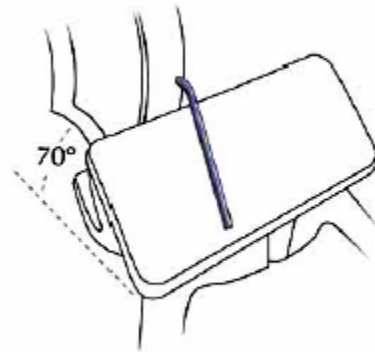
Making Your Own Miniature Hollowing Tools From Mild Steel

Materials: ¼" square key-stock

1. Cut bar to desired length (6"- 8" preferable) with a hacksaw
2. Place bar in vise with about ¾" sticking up & hammer to desired angle. There is no wrong angle, but start with 45°, 60° & 80°



3. Grind the compression protrusions from the top and bottom surfaces of the bend
4. Set the grinder's tool rest to approximately 70° from horizontal or 20° from vertical. Hold the bar flat on the tool rest and grind the bent end of the bar. The edge inside the bend is where the majority of the wood cutting will be done, so grind it back about 3/8". The ground edge needs to curve around the point of the tool forming a fingernail shape. This is easily accomplished by placing your thumb about mid-point of the bar and using your other hand to pivot the bar as it touches the grinding wheel.*
5. *Optional* - after the bent end of the steel rod has been ground to create a 70 degree bevel, heat the bent end of the tool with MAP gas (Propane gas does not get hot enough) until it is cherry red. Once it is cherry red, immediately dip it into a container of water. Heating the rod will release the tension that results from bending.*



Resources:

Kelton tools: Craft Supplies

Sorby tools: Craft Supplies & Packard

Packard 3-Tool Set: Packard

¼" Key-stock: Lew's Welding, Erwin St. (East of Beckham)

Gold Synthetic Steel Wool: English Color, Erwin St, Tyler (West of old Mason Machinery)

Beall Collet Chuck: Craft Supplies, Packard, Beall Tool Co.

ER-32 Collets: Enco

* Thanks to Frank Penta for the descriptions and graphics used on this page.

Angle Gauge for Miniature Hollowing Tools

(full-size)

