

# NEW BONNY DOON SYNCLASTIC FORMERS

Created by Phil Poirier

## Instructions by Cynthia Eid

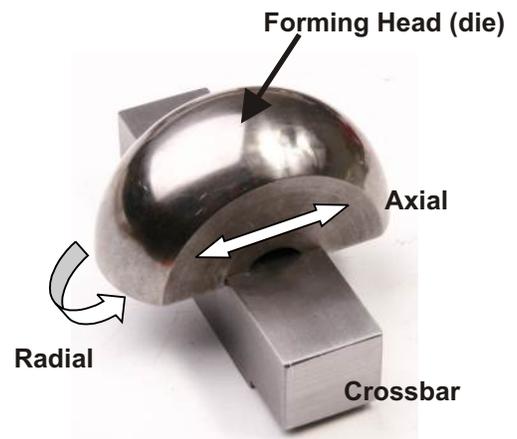
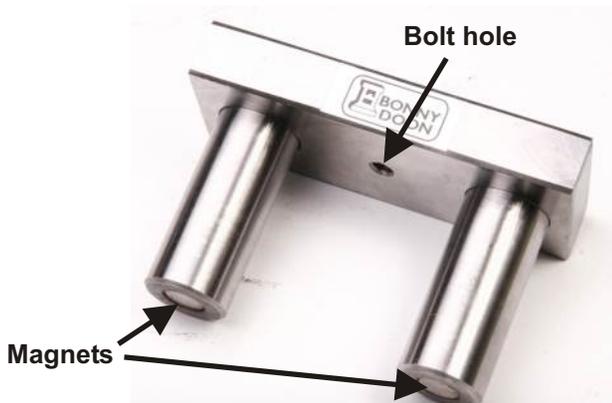
### Disclaimer:

Working with metal and tools is potentially hazardous. It is the metalsmith's responsibility to **use common sense, and appropriate safety precautions**. The authors and manufacturer specifically disclaim any responsibility or liability for damages or injury as a result of any activity undertaken in conjunction with the information presented in these notes. **Never exert more than 10 tons of force on these tools.**

10 tons =5000# on gauge with 20 ton Press



Note that there are two forming heads for each width--both formers in each pair have the same width and the radius is identical in each pair of formers. However, in each pair, one former has a long axial curve that is appropriate to the curve of the top of a wrist; the other former has a tighter axial curve that fits around the side of a wrist.



The formers are quickly interchangeable on the magnetic columns.

With this tool, a synclastic cuff bracelet can be formed from a flat strip of metal, or a synclastic bangle or bowl base can be formed from a cylinder. The cylinder can be made by soldering a strip of metal, or the cylinder can be a slice of a deep drawn form. Though the tools were developed with bracelets in mind, they can be used for synclasting metal for other purposes as well. Metal can be formed smoothly to be used for pins, pendants, or earrings. The tools can be used for hollowware as well---elegant bases for bowls can be made; the tools can be used in the manner that a hammer is used to sink a bowl---the formers can be used to synclast larger sheets of metal to make bowls, or parts for a sculpture.



Prepare the metal blank:

The surface of the metal may be prepared or enriched while the metal is flat. Most surfaces, such as engraving, etching, overlay, applique, or hammer texture will not be damaged by being formed into the urethane.

It is easiest to form metal that is the same width as the former head, or narrower. Smooth the edges of the metal to avoid damaging the urethane. Annealed metal is generally preferable for forming.

Attach the die fixture to the top platen with a bolt.

Choose the 1" wide forming heads, or the 1.5" heads.

Attach the larger head (with the longer axis) to the die fixture by aligning the magnetic columns with the recesses on the top of the mounting bars.

Place the contained urethane block on the lower platen of the press, and center it under the forming head. (1)

Place the metal blank under the forming-head. Since the forming action is most powerful directly under the center of the forming-head, it usually works well to start with about half an inch of the metal strip extending past the center.

Press, and then release the pressure enough to be able to move the metal. Do not allow wrinkles to form.



Move the metal strip about half an inch, and press again(2). Repeat until the entire strip has formed smoothly. It is helpful to watch the pressure gauge, and use the same pressure each time. It is better to press with light pressure using many strokes than to press with high pressure and few strokes.

Continue forming until the entire metal blank has been synclasted.(3)

If a cuff bracelet is being made, remove the large forming head from the magnetic columns, and attach the smaller forming head.(5)

Form each end so that the bracelet will be oval, fitting snugly around a wrist. Use a similar pressing routine as before---pressing to the same psi, and then pressing again, in an overlapping pattern, so that the metal forms smoothly.(6)

## TIPS

To form a metal strip symmetrically, keep the center-line of the former aligned with the center line of the metal blank during forming.

As with synclasting with a hammer, overlapping "blows" or pushes create smoothly formed metal.

The ideal pressure will vary according to the metal hardness, the thickness of the metal, and the width of the blank. Remember that one can always press again with a higher pressure. Do not allow wrinkles to form.

Many light pressings form the metal better than a few heavy pressings. If wrinkles form stop and anneal the metal. Try pressing to 1,000 psi with a 1" wide 20 gauge strip of nugold, for instance. If the metal did not form well, across the full width of the strip, press again at a higher pressure. Try increasing the pressure in increments of about 500psi, until it looks like an area of at least 1-2" square forms smoothly

Because the metal is being formed against urethane, metal can be engraved, etched, or textured before forming.

It is possible to emboss and synclast simultaneously.

## USEFUL INFORMATION

Most cuff bracelets are 6" long with a 1" opening. Most bangles are about 9" in circumference (3" diameter).

In case the bolt is lost, it can be replaced at a hardware store with a 5/16" X 18 tpi X 1.5" long.

An electric press makes it faster and easier to form with this tool, but a manual press can be used effectively.

As with all Bonny Doon tools, the potential for the uses of these tools are limited only by the imagination, and the limits of safety. The information here is intended to get the user started safely. Once the basic functions of the tools are understood, think "outside the box" of other possibilities.

Definitions of synclastic and anticlastic

- There are three basic types of forms: furrows, synclasts, and anticlasts. Some examples of furrows are channels, cones, and tubes. Bowls, domes and beads are synclastic forms, while anticlastic forms include spouts, handles, and saddles. Examine the everyday objects that are around you and you will discover that all forms can be described as either a furrow, a synclast, an anticlast, or a transition from one of these to the other. Everything else is a flat plane.
  - A synclastic form is a compoundly-curving plane in which the convexity of the axial and the radial lines is oriented in the same direction. A way to understand this is to think of "syn" meaning "same," and "clastic" meaning "curve". Thus, "synclastic" means "same curve". All synclastic forms can be oriented in a position so that they can hold water.
  - An anticlastic form is a compoundly-curving plane in which the convexity of the axial and the radial lines is oriented in opposite directions. One way to remember this is to think of "anti" meaning "opposite" and "clastic" meaning "curve". Thus, "anticlastic" means "opposite curve". Anticlastic forms cannot hold water no matter how they are oriented.

### Urethane

- Urethane is a type of plastic that can be deformed, but returns to its original form. It is a yellowish translucent substance that can be dyed different colors to help identify different hardnesses. Bonny Doon's hard urethanes are dyed red. The hardness of a urethane is referred to in terms of durometers.
- Hard (95 durometer) urethane is used with this synclastic forming system because hard urethane follows the formers better than softer urethanes---it "pushes back" the metal bracelet blank against the steel forming head. The former can be used with a 1" thick 95 durometer urethane forming pad, but it works best with a contained block of urethane.
- \*Note that the new container for bracelet forming has the urethane sticking up above the edge of the container between 1/8" and 1/4". The bottom of the container has large welds or a spacer which creates a void under the urethane. These features allow the urethane to bend before it's shape upsets. Minimizing the upset gives the urethane better longevity and better forming qualities.
- The depth of the urethane allows the former to push into the urethane more deeply, forming more metal with each pressing or push.
- A general guideline when using urethane is to avoid pushing more deeply than 1/3 of the depth of the urethane. Surprisingly, this fluid material can shatter if over-stressed.
- The urethane in this kit protrudes above the edge of the container to help avoid marking the metal being formed. Containing the urethane helps assure that the urethane pushes upward, forming the metal, rather than squishing sideways.