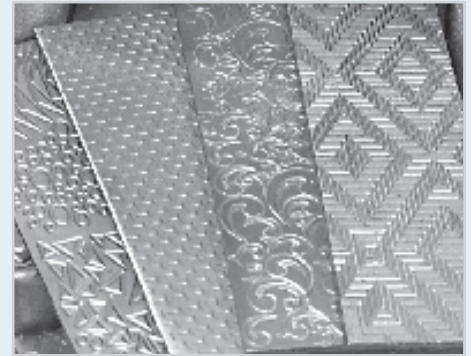


# Bonny Doon Pattern Plate Instructions



This patterned copper sheet was made by Jack Berry. See more examples of patterns on the back of this sheet.



Pattern plates are available in variety of styles.

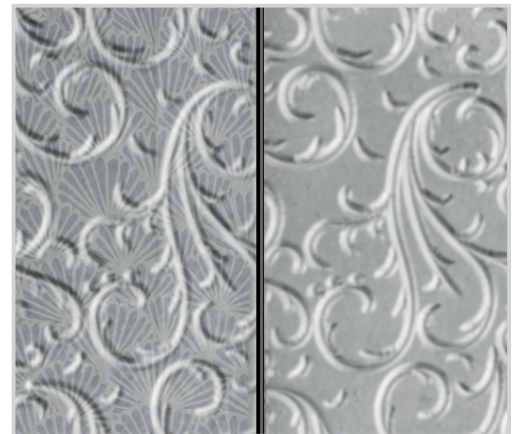
## Introduction

Bonny Doon pattern plates are made of a special scale-free steel that is softer than the rollers of a rolling mill (plates will not damage the rolling mill as long as they are kept clean). Each plate is designed to produce low-relief embossing on metal sheet. The plates can be further textured, if desired, with your flex shaft using a stone tip, diamond bur, or a mizzy wheel to give texture to the low areas of the metal to be formed.

Plates may be used in a hydraulic press or in a rolling mill, but should never be used in both machines interchangeably. Once a plate has been used in a rolling mill, it should never be used in a hydraulic press. Texture plates used in the rolling mill should be reserved only for that purpose because some curvature will develop with use in the mill; the pattern plates will begin to curve and wear with each pass through the mill. This wear is normal; the plates will continue to provide quality embossings (up to 100 uses, sometimes more).

## Hydraulic Press Technique

Use these pattern plates with a thin (1/16") hard urethane pad (110-331) and metal that's 26-36 gauge. Thicker metal can be formed but may need to be annealed between successive pressings. **Please Note:** Plates are intended to be used with metal sheet the same size as the plate; the concentration of force on a smaller surface area will emboss that shape into the plate itself.



(L) Textured background;  
(R) Smooth background

## Rolling Mill Technique

Because thinner metal does not emboss as well as thick metal, thicker metal is best when using the pattern plates in a rolling mill. Perform a printing test with mill settings using an inexpensive sheet metal such as red brass before using more costly metals. Best results are achieved with metals 24-gauge thick (0.020"/0.51mm) up to a maximum of 14-gauge thick (0.064"/1.63mm). The thinner metals will print with the raised pattern somewhat lighter; use fully annealed metal to achieve your best results.

# Procedure

1. Carefully clean all metal sheet and the pattern plate of dust and debris.

2. Stack the metal on top of the pattern plate. It is best if the metal is approximately the same width as the pattern plate. Adjust the width of the rollers on your rolling mill to accommodate the texture plate and sheet. Place the texture plate and sheet stack in the rolling mill and adjust close against the stack (just until the wheel is snug). Make a note of the location of the gauge on the wheel of the rolling mill (if your mill has no gauge, see the **Please Note** below). Gauges are usually divided into inches and millimeters (see image above). This first gauge reading is usually referred to as the "dead-pass" reading. The look of the indexing wheel gauge will vary with the model; on the gauge shown above, the outer graduations are in inches (each unit is about 0.001") while the inner graduations are in millimeters (each unit is approximately 0.025mm).

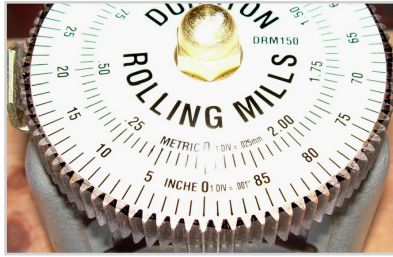
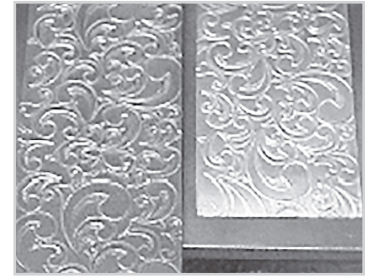


Figure 1: Indexing wheel gauge

3. Open the rollers just enough to remove the stack, close the rollers again to the dead-pass reading, then close the rollers by an additional 0.012" (12 units on the outer gauge) or 0.03mm (12 units on the inner gauge). **Please Note:** If your mill doesn't have a gauge, you can use the pitch of the adjustment screw to achieve the same purpose. The pitch is the distance the rollers move in one revolution of the adjustment screw(s). To determine the pitch of your rolling mill, count the number of threads in a one-inch length of the adjustment screw. Divide the number 1 by the number of threads per inch to determine your pitch in inches. From this you can then determine how much of a revolution is required to move the rollers the necessary distance.

For example, if your adjustment screw is 12 threads per inch, divide 1 by 12 (1/12) to get .083"—this tells you that one full turn moves the rollers .083" and 1/2-turn moves the rollers .042", 1/3-turn, .027", 1/4-turn, .021", 1/8-turn, .010".

4. Roll the stack smoothly through the rollers. If it is too difficult to roll, remove the stack (roll it backwards), and try again by closing the rollers only an additional 0.010" (10 units rather than 12 units). If the rolling was very easy (and your pattern is not clearly embossed) you can try decreasing the roller gap by more than 12 units.



(L) Pattern plate; (R) Embossed silver sheet

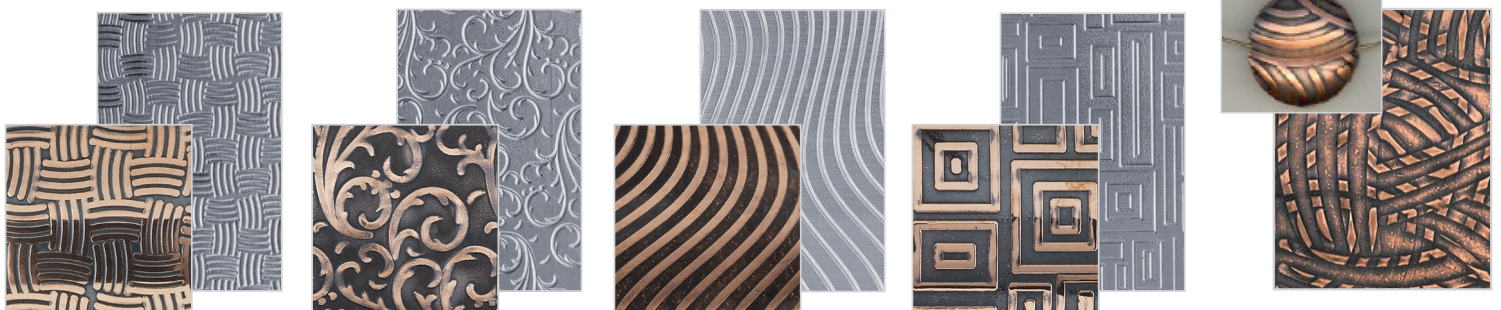
**Please Note:** Closing the rollers much more than 0.012" (0.3mm) will not improve the embossing and will wear the plate prematurely. Take note of the dead-pass reading for this particular texture plate paired with this gauge of target metal so you won't need to repeat this process. The texture plates will vary slightly in thickness, so you will need to determine the dead-pass for each of your texture plates individually.

5. Taking note of the dead-pass reading each time you roll some metal should be done for each plate. The plates vary slightly in thickness, so you will need to determine the dead-pass reading for each of your pattern plates.

**It is most important to keep the plates and your metal very clean. If you drop either on the floor, please take the time to thoroughly clean each part. Any dust or debris that is picked up from the floor or work surfaces can cause damage and wear to your rolling mill and may impress onto your metal.**

Remember that pattern plates will begin to curve and wear with each pass through the mill. This wear is normal; the plates will continue to provide quality embossings.

**These instructions are for rolling a full sheet of metal; to roll anything less than a full sheet, you will need less force or pressure from the mill. Run some samples with red brass and adjust for minimum pressure needed to achieve the best pattern in your metal.** If the force appropriate to a full sheet is applied to a narrower or shorter piece of metal, the concentration of force on the smaller surface area will emboss that shape into the plate itself. The plates can be cut smaller to accommodate rolling smaller pieces.



Sample textures using copper and highlighted with a heavy patina of liver of sulfur. The far right inset shows a bead made with patterned metal; the pattern on that sheet was achieved by rolling the sheet twice, rotating the copper 180° for the second printing.