

Impression Die Instructions

Tools & Materials

- Impression die
- Urethane pieces (or cardboard, leather, lead, etc.)
- Magnetic tool steel pusher
- Hydraulic press: 20-ton with spacers
- Safety Glasses
- Metal sheet: 20- or 18-gauge is best to prevent tearing; non-ferrous (brass, bronze, copper, gold, nickel, silver, aluminum, etc.)



Safety

- Wear eye protection
- Do not stand directly in front of the press
- ALWAYS center your work in the press front-to-back and side-to-side.
- Do NOT use our impression dies in a contained urethane system! That system is ONLY for use with silhouette dies.
- Do NOT attempt to cut urethane with anything other than a shear or scissors. When urethane is heated when being sawn, toxic fumes are released and if inhaled, may cause you to require hospitalization. This risk is eliminated entirely by cutting only with a shear or scissors.

General Impression Die Instructions

1. Use shears, a pancake die, or a jeweler's saw to cut a piece of metal slightly larger than the depression in the impression die. When pressed, the metal gets pulled down into the die, so it needs to be larger than the design.
2. Anneal the metal before pressing and a few times during the process. This helps achieve the best detail and helps avoid tearing.
3. Place your dry, annealed metal on top of the impression die, and place a small piece of urethane (not a large urethane puck or sheet!) on top of the metal, somewhat centered over the deepest portion of the die. Pieces of urethane smaller than the impression are best; this helps form the metal into the deepest part of the die first, and helps prevent over-thinning of the metal. You can add several small pieces of urethane pieces at once to help make the process faster.
4. Center the magnetic tool steel pusher on the upper platen of the press, and place spacers on the lower platen of the hydraulic press. Center the impression die on top of the spacers, checking from all sides to make sure it's centered.
5. Begin pumping the handle of the jack until you begin to feel resistance. Apply enough pressure to form the metal, but not too much. There's no guide for how much pressure to use, so experiment to find what works best for you. Release the pressure, move the urethane to a different part of the metal, rotate the die approx. 90°, and press again.



NOTE: If you try and press hard enough to get all of the detail of the die in a single pressing, you'll be more likely to split your metal, especially in deeper dies.

6. Release the pressure, and check your metal. If the metal is stuck, use the edge of a dull knife or chisel wedge underneath the metal's flange and pop the metal out. NOTE: If you have trouble getting all the detail, trim the metal closely around the outside of the design after each pressing. This prevents the metal from getting caught up on the edge and helps the metal flow into the die more easily by eliminating any extra metal that may be diverting pressure away from the design itself.
7. Anneal the metal, and repeat the process as necessary until you capture all the detail of the die.

There's no formula or single, correct way to determine what thickness of metal or how much pressure to use for each die. Each die is different and will require experimentation to determine what gauge and form of metal works best for you. Try a few different thicknesses, and let your experience guide and influence your next pressing. Keep notes of what thickness of metal and pressure works for each of your dies so you can repeat your results.

Special Situations

Stamping Solid

Many small and shallow impression dies work best when stamped with a solid piece of silver, rather than by forming a sheet of metal into the design to create a hollow shape. Shot plate dies are a good example of the type of die most suitable for solid stamping.

Shot plate dies

Use a torch to melt scrap silver into a ball/lump on a soldering surface. Remove any flux or debris from the ball. Experiment with different amounts of silver to create a ball of silver that's the correct size for the size of die you're using. To help with removing the silver from the die later, lightly coat the impression with any type of oil. Place the ball of silver into the impression, center the die in the press, and press the silver into the die using a tool steel pusher. Use a dull knife or chisel to remove the silver from the die. Trim the metal around the outside of the design, and anneal/press/rotate/press as needed.

Shallow dies

Start with an ingot or piece of metal sheet that's thicker than the deepest portion of the impression die. Follow the same steps for standard impression dies, only don't use any urethane. Press the metal directly into the die with a tool steel pusher, and rotate/press/rotate/press as needed. If you have trouble getting the detail, trim the metal up to the edge of the design before each round of pressing.



Ring Impression Dies: Flat/Level profile (no deep depression in the center)

- Can be used with or without a hydraulic press.
- Should be struck solid; don't use urethane/lead/etc.
- Stock options include: round wire, half-round wire.

With a hydraulic press

1. Measure the depth of the die.
2. Choose metal wire slightly thicker than the depth of the die.
3. Cut a strip slightly narrower than the width of the die to allow space for the metal to flow into the die. Cut the strip slightly longer than the die to help with removing the strip after pressing.
4. Anneal the metal.
5. If desired, use painter's tape to secure the metal onto the die.
6. Center the tool steel pusher on the upper platen of your press.
7. Place the ring die and metal horizontally on the lower platen, and center it under the pusher.
8. Press gently, and check to see if the metal has begun to flow into the die. Re-register the metal in the die, rotate the die on the lower platen, and press again.
9. Anneal, and continue to rotate and press all parts of the die. NOTE: Be sure to re-register the metal in the die before each pressing, or you'll get a double impression.
10. Trim the flange (if needed), file and refine the edges and flat surface of the metal, and form into a ring.

Without a hydraulic press

You'll need a large anvil, heavy hammer, and a steel/brass punch slightly wider than the width of the ring die. Kevin posted a video in our Facebook group, Potter People, showing how to use these dies with a hammer and punch (search in group: Kevin Ring Video).

1. Measure the depth of the die.
2. Choose metal wire slightly thicker than the depth of the die.
3. Cut a length slightly narrower than the width of the die to allow space for the metal to flow into the die. Cut the strip slightly longer than the die to help with removing the strip after pressing.
4. Anneal the metal.
5. If desired, use painter's tape to secure the metal onto the die.
6. Place the punch on top of the metal at one end, and strike the punch.
7. Re-register the metal in the die, if needed, and continue to work from one end of the die to the other.

Troubleshooting for ring dies

- No flange/poor detail? Metal was too thin; use thicker material.
- Thin flange/poor detail? Metal was slightly too thin; use thicker material. Use a pusher to focus pressure on the design.
- Thick flange/poor detail? Trim the flange, anneal, and press again. Start with a thinner gauge. Use a pusher to focus pressure on the design.
- Thick flange/good detail? Metal was too thick; use thinner/narrower material.

FAQs

How much pressure do I need to use? There's no single answer to this question. Every metal type, gauge of metal, and die combination will require a different amount of pressure, so take notes and make sample pieces. If your jack has a pressure gauge, keep an eye on the gauge and write down what psi works for each metal/gauge/die. If your jack doesn't have a gauge, count the number of pumps needed for each combination—you don't have to take complete strokes once you feel resistance.

Why do I need to use spacers? Spacers are used to take up space in the press so that you do not overextend the jack, which can make it leak and then cause problems. Do not use wood or acrylic as spacers, only steel or aluminum.

Why is my metal splitting? Don't try to get all the detail in one go. If you try and press hard enough to get all of the detail of the die in a single pressing, you'll be more likely to split your metal, especially in deeper dies. Go slowly, and check/anneal your metal often. Use 20- or 18-gauge metal. Thinner metal can be used, but is more likely to tear. It's better to practice with thicker material until you become comfortable with the process before experimenting with thinner material which requires a more delicate touch.

My die has a marred background...why? The antique hubs from which we make many of our impression dies were often carved by hand. The stamped designs were always meant to be stamped, cut out, and soldered onto a backplate or wire frame, depending on the design. The area surrounding the design was of no concern, since it would always be removed. If you want to remove any marks from your die, it only takes a few minutes. The special steel we use for our dies is soft enough to be easily manipulated with traditional jewelry abrasives. As when finishing jewelry metals, start with a coarse abrasive paper or wheel, and work your way through finer grits to achieve your desired finish. We like to use snap-on sanding discs in a flex shaft, abrasive sticks, and other polishing wheels and points with a rotary tool.

My metal is stuck...now what? If your metal gets stuck in the die, you have a few options. First, to prevent this, always make sure to leave a little bit of a flange so that you'll have something to wedge a dull knife or chisel under to help remove the metal from the die. You can also lightly coat the die with any oil to help with removal later.

- Place the die into the freezer for a few minutes. This causes the metal to contract, and may loosen it enough for it to be removed. You can also try placing an ice cube into the die.
- If you stamped your metal solid, place the die on a heavy anvil, and use a large hammer to drive a nail set into the back of the metal using a single, strong strike. This often displaces the metal enough that you can pop it out of the die. The stamping may be unusable, but you will have saved the die.
- If none of those tips work, the metal and die may be stuck forever, requiring you to get another die. To prevent this, always make sure to leave a flange and lubricate the die.

Thoughts on Metal Choice

- **Ring Dies:** Fine silver is a pure metal (as is 24K gold and copper), and is too soft to use as ring material. Of all types of jewelry, rings take the most abuse, so you should use a more durable alloy. Sterling silver and hardened Argentium sterling silver (also brass, bronze, 18K/14K/12K/etc. gold) are good choices. Be sure to anneal your metal for best results.
- **Standard Dies:** Fine silver is much easier to form with impression dies than harder alloys. The process of forming metal increases its strength, and for designs that won't see a lot of wear and tear, fine silver is more than sufficient. The complex curvatures achieved by forming the metal add stability and strength to the design.

