

Making Metal Clay Rings

By Mardel Rein

Making a ring from metal clay may seem a little intimidating at first, but it's actually very easy. I'll go over the tools you'll need along with some options, and give you some good ring building techniques to get you started.

Basic Ring Forming Tools

Finger Gauge – to measure your finger

Ring Mandrel – to form the ring on

Redy Pellets – to control the size of the ring

Freezer Paper – to keep the ring from shrink-locking to the mandrel during drying

Tape – to make a tube from the freezer paper

Finger Gauge

A finger gauge is used to determine ring size. There are several choices to determine the size of a ring. There are ring-style finger gauges, paper gauges and strip gauges.

A ring-style gauge is a set of plastic or metal rings and include one sample ring each size. The various rings are tried on until the proper size is found. Ring-style gauges offer the most accurate sizing for rings.

A paper gauge is basically a miniature tape measure for the finger. Paper gauges are good for measuring for wide bands. Flex the finger before marking the size to assure a comfortable fit.

A strip gauge works like a tie wrap, where a plastic strip slides through a plastic piece. Be careful not to pull the strip too tight. You should be able to slip the ring off with the tie in place.

Ring Mandrel

A ring mandrel is used to form the ring on. Mandrels have either multiple rods in ring sizes so the formed ring can be made to any size desired. There are several different kinds of mandrels, and they all work, but some have more uses than others.

Multi-Mandrel – The Multi Mandrel is our favorite ring-making tool because its so easy to use and so versatile. There are sets of mandrels from size 4 to 12. Select the mandrel you want to work with and place it on the metal stand. The mandrel can be rotated to access the work from all sides. Whole size and half size mandrels in aluminum or wood are available, and an optional wood storage rack holds the mandrels that are not being used. The stand can be placed so the mandrel is horizontal or vertical, depending on what you are doing. The double-ended mandrels offer lots of ring-making real estate with no tapers to throw off your sizing. Multiple projects can be created simultaneously. The only drawback to this system is that you cannot use the mandrels to round or size a ring after firing.

Tapered Ring Mandrel – This tool works well for forming metal clay rings, but keep in mind that the taper will affect the accuracy of the ring size. A wide ring formed on a tapered mandrel will have a size difference of 1 to 1-1/2 sizes from one side of the band to the other. The wooden version of the tapered ring mandrel, called a Ring Polishing Mandrel is often recommended, but is not meant for ring forming because it tapers very quickly and has a more dramatic size difference from front to back. If you use a tapered mandrel, position the center of your ring shank at your target size to account for the taper. You'll need

to provide some way of lifting the mandrel up and holding it while you work. Polymer clay works well for a quick, inexpensive mandrel holder. Here are instructions on how to make a low-cost polymer mandrel stand:

Soften a 1 oz block. Take $\frac{1}{4}$ of the clay and form it into a ball. Take $\frac{3}{4}$ of the clay and form it into a tall cylinder. These are the feet for the mandrel. The small ball holds up the large end, the cylinder holds up the small end. Position the feet, then press the mandrel into to make a place for the mandrel to rest. Bake and cool the feet.

Stepped Ring Mandrel – A stepped mandrel has about 1 inch of width for each ring size. Instead of being tapered, this mandrel has steps to each size. Make feet for this mandrel to rest on as described in the tapered ring mandrel details above, or use the type that is permanently mounted on stand.

No matter what mandrel is used, rings are never formed directly on the mandrel because metal clay shrinks a little bit as it dries, making it impossible to get the dried ring off the mandrel without damaging it. There is also an issue of galvanic corrosion which happens when 2 dissimilar metals are in contact with each other in the presence of water or acid. For these reasons, we make a sleeve that fits over the mandrel and allows easy removal of the ring as it dries.

Mandrel Sleeve – A removable sleeve that is fitted on the mandrel. To make a sleeve, cut a strip of freezer paper about 1" wide and 3" long. Wrap the paper, shiny side out, around the mandrel. Trim the strip so one end just overlaps the other end of the paper. Put a small piece of tape over the end to hold it in place. The tape should not be on the mandrel. You want it just on the paper so it makes a removable sleeve that can be slid off later. Test to be sure you haven't taped the paper to the mandrel.

Ring Sizers – A Ring Sizer is a special pellet or plug that is placed inside the ring shank during firing to control the size. The pellet is made from a special material that does not shrink or burn during firing. As metal clay sinters, it shrinks tightly around the pellet so the ring is the exact diameter of the pellet after firing. After cooling, the ring is put into water to dissolve the pellet. Rings cannot be formed directly on Redy Pellets because they would not have any room to shrink and would tear.

Redy Pellets – Are pre-cast Ring Sizers available in half and whole US ring sizes from 4 to 12. Match the Redy Pellet size to the ring size you wear. Redy Pellets have the size molded into the end of the pellet so there is never a mix-up in sizes.

Redy Pellet Mold – The Redy Pellet Mold is a cost-effective way for metal clay artists to cast their own Redy Pellets Ring Sizers as needed. The molds are available in whole, half and gang sizes. A half sized mold produces one of each pellet in half sizes from 4 to 12. A whole size mold makes one pellet in whole sizes from 4 to 12. A Gang mold produces 9 Redy Pellets all the same size. To cast your own Ring Sizing Pellets, you'll need investment or paper clay to fill the mold cavities. Choose the Ring Pellet Mold to match your desired ring size. See info below on choosing an investment for casting Ring Sizing or Redy Pellets.

Investment – is a product that is used in casting metals. Investment is mixed and poured into the Redy Pellet Mold to cast ring sizers. Any type of silver, gold or platinum casting investment can be used, however the mold works best when a crystobolite-based product is used. Crystobolite is a silica-bearing product, so it must be used with a dust mask, or use a silica-free investment.

Our Ultra-Smooth investment makes Redy Pellets that are very smooth and strong, do not shrink, and can be de-molded in 25 minutes. Silica-Free Investment is an alternative to traditional investment that does not contain crystobolite. Redy Pellets made from Silica-Free Investment are not as dense as traditional investment, and require 2 hours to set up before they can be demolded. The mold also has to be treated with a soapy water release before casting and cleaned thoroughly between castings.

Steps to Making a Ring

1. Measure your finger to determine your ring size. Form your ring 2 sizes larger than your desired final size. For example, if you wear a size 7 ring, you would form the ring at size 9. (I often add an additional 1/2 size when the ring shank is wide and 5 cards or less in thickness.)
2. Fit your mandrel with a mandrel sleeve. The ring is created directly on the sleeve. As the shank begins to dry, it will shrink a little. This can be enough to stress a seam, so after it has dried for 10 or 15 minutes, slide the sleeve down one size on the mandrel so it can complete drying on the outside without any strain. Once firmed up, the sleeve with the ring on it can be slid off the mandrel and dried on a cup warmer or other drying device.
3. Once your creation is ready to fire and completely dry, place a Redy Pellet in your desired final ring size into the shank and fire. During sintering the ring will shrink tightly around the Redy Pellet, resulting in a ring that is the same size as the pellet. If the top of the ring is larger than the shank, the ring will have to be propped up so it doesn't warp. The ring can be placed on a fiber blanket or in a dish of vermiculite or alumina hydrate for support during firing. Be certain that nothing will get between the Redy Pellet and the metal clay as it sinters and shrinks. Rings can be fired with a torch, however the strongest final product will result when fired at 1650F for 2 hours. After cooling, the Redy Pellet is dissolved in water, and the ring is polished and finished as desired.

Ring Making Tips

What Clay To Use

Sintered fine silver is soft and brittle compared to cast silver, so it dings up pretty quickly and its fairly easy to break when its thin. Low-fire clays such as ACS 650 Low Fire and PMC 3 have the smallest particle sizes so they sinter more densely than other formulas and are the best choice for ring creation. Since rings receive the most abuse during wear, a strong final product is desirable.

Recommended Firing Schedule for Rings:

- PMC 3 fired at 1650F for 2 hours for best strength
- ArtClay Silver Low Fire at 1650F for 2 hours for best strength

How Thick to Make the Shank

- 5 cards thick is a good standard for rings. For heavily textured rings, make sure you have a floor of at least 3 cards in the thinnest area.
- Removing the Ring Sleeve
- Once the outside of the ring feels dry, remove the sleeve so the inside can dry. Place a needle tool on the top edge of the sleeve and collapse it downward. Pinch the sides of the sleeve together and slide it out of the ring shank. Be careful not to nick the inside of the shank as it will be soft. The ring can be speed dried on a hot plate or left to air dry. Save the sleeve! It can be used again and again.

Seams

- When you have 2 ends that meet and you want to blend them, use a small ball stylus or clay shaper to “stir” the ends together rather than trying to add water and paste them together. The result is a much more reliable joint.
- Seams should be joined in a bias cut rather than a straight up and down cut. This gives more area to joint and results in a stronger seam
- Use the seam as a design element or position the seam so it is at the top of the ring and will be covered with a decoration or top.

Seam Stress

Metal clay shrinks a little bit as it dries. To keep the ring seam from tearing, I move the ring to a smaller mandrel size as soon as it's firm enough to hold its shape. I usually let it air dry for about 20 minutes and then I slide the ring to a mandrel 1 size smaller. Giving a little bit of slack allows the clay to shrink unobstructed. I've seen seams open when no slack was given. This also usually means the ring was not thick enough.

Sizing

Rings have to be formed larger than their final size to allow for shrinkage. I prefer to form rings 2-1/2 sizes larger than my ring size. For a size 7 ring, I form it at 9-1/2 on the mandrel. If you only want to purchase one set of mandrels, get the whole sizes. You can create half sizes by doubling up the freezer paper sleeve (directions above).

Placeholders

Investment can be used to make placeholders for stones that must be set after firing. Make a seat for your stone or object, fill the cavity with investment and allow to set up. Then fire. After firing, the investment is dissolved away and the stone can then be set in the perfectly sized seat.