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Art in Metal Clay

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Testing the Strength of Fired Pieces

How strong should a piece of jewelry be? I guess the answer to this question has changed over the years as new media have appeared in the jewelry-making arena. One thing is sure: we don't want any piece of jewelry to crumble when a customer tries it on. However, it's important to remember that jewelry strength is never absolute, regardless of the medium: a piece made of glass can break if it falls on the floor; resin inlay may stick to your fingers in the hot desert; polymer clay jewelry may break with some pressure; paper jewelry may burn if it comes in contact with a lit cigarette.

In other words, there is nothing new about jewelry media that need to be treated with care. Metal clay is one of those media, and in that sense, base metal clay is no different than silver clay. Have you ever tried to test the strength of your silver pieces by breaking them with pliers, or even with your fingers?



Well, after "crash testing" was suggested, I did. I was able to break thin, fully sintered pieces with my fingers. The piece in the photo was made with low-shrinkage silver clay. It is (or was) 2" x 1½", constructed out of at least 3 layers, 3 cards thick. Fired in a kiln 2 hours at 1650°F. It easily broke with pliers, after just one bend. And as you can see, the cross section is not so attractive either.

I've sold many rings over my metal-clay career. Many of them were returned cracked or broken. I stopped selling metal clay rings, and if a student wants to make a ring for themselves, I tell them to treat it with care.

I don't see why base metal clay should be different from silver clay in that respect. It is just as porous, and I would expect it to be even weaker because of the firing limitations. I don't test my pieces with pliers anymore. When they come out of the kiln, I buff them lightly to see if they are fully sintered by looking for any powder underneath. If there is, I re-fire. I don't try to bend them, either. With silver, copper, and bronze clay, I do all the bending before firing. With metal clay I never make bezels that need to be bent over a stone. I do finish my pieces vigorously. If they survive the finishing process, they are strong enough.

In fact, I started bending and breaking sheet metal to make my pieces, long before I began working with metal clay. One of the reasons I switched from metalsmithing to metal clay is the advantage of being able to do all the bending and joining with clay rather than with metal. Here are a pair of earrings and a ring that I made with sterling silver:

After constructing the ring and the earrings, I bent strips of sterling silver with two pairs of pliers until they cracked. I collected them and rearranged them like a puzzle, and soldered them back on the base structure. I repeated this many times with metal clay, and of course it was a lot easier.

So, sterling silver breaks with pliers.
How about brass?



And if you don't believe the photos, I'll post a video clip! :)



I don't know where this idea of breaking jewelry with pliers originated, but I am sure that a lot of professional jewelers would shudder at the thought of their creations being "crash tested." After all, if all jewelry were that sturdy, there would not be a field of expertise called jewelry repair.

I was asked to send my comments on Tim McCreight's article about bronze clay prior to its publication. Here is what he says on page 6. I did not comment on this because I thought he was right:

"Thicker pieces that have been cut open often reveal a brown powder that is most likely a mixture of copper and tin powder that did not sinter. This hollow core is not itself a problem as long as the outer shell is thick enough to provide the strength required to the piece."

Well, last night I finished this piece, which is 2" x 1½", 5 mm thick. I finished it until my fingers were bleeding. There is no way I am going to crash test this piece!

