

Make custom clips to support statement earrings

p. 48



SEPTEMBER 2014

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Explore
**4 ways to
add texture
to metal**

p. 56

METAL

Build a hollow
ring for inlay

p. 34

STONE

Cut & layer
stone to make
an intarsia!

p. 37

METAL CLAY

Mix metal clays
for a married-
metal effect

p. 66

**AND MUCH
MORE!**



*Textured copper cuffs
by Eva Sherman, p. 56*

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Volume 10 • Issue 6

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jewelry designer



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in this issue

in every issue

6 From the Editor

Getting ready for the party...

9 Up Front

- Product Review
- Reader Forum
- Exhibits
- Calls for Entry
- Book Review
- Reader Tip
- Tool Review

20 Business Savvy

Understanding Inventory

by Marlene Richey

24 Studio Savvy

Everything, Turn, Turn, Turn

by Christopher C. Darway

26 Stone Sense

Larimar

by Richard M. Shull, G.G.



30 Metalsmithing 101

Annealing and Cold Working

by Michael David Sturlin

82 The Back Page

Combining innovation and inspiration from industry, Tova Lund creates an eclectic piece using cold connections.

cover story



METAL | BEGINNER

56 Explore Texturing Techniques: 4 Ways To Dress up a Cuff

Learn to create textures on thin-gauge copper panels, then rivet them to a simple copper cuff.

by Eva Sherman

METAL | INTERMEDIATE

34 Fabricate a Hollow Ring Form for Inlay

Build a sterling silver form to showcase your choice of materials.

by Jeff Fulkerson



STONE | INTERMEDIATE

37 Inlay Stone into a Hollow Form

Use basic lapidary tools and techniques to cut, grind, and inlay a colorful patchwork of stones into a custom setting.

by Jeff Fulkerson

53

INSPIRATION

42 A Brief History of Inlay

Celebrate some of the master artisans who have made Native American inlay an art form.



42

ArtJewelry

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66



44

INSPIRATION

44 Gallery

A collection of cutting-edge jewelry to intrigue and inspire you.

METAL | INTERMEDIATE

48 Put Tension & Leverage to Work with an Omega Clip

Build a simple mechanism to balance and secure statement earrings.

by Casey Sheppard

DESIGN | ALL LEVELS

52 6 Simple Machines

What are the basic forms of machines that all jewelry makers should be familiar with?

by Casey Sheppard

METAL | INTERMEDIATE

53 Charms: Space Antenna

Implement basic techniques to create a lightweight futuristic charm.

by Marthe Roberts/Shea



37

POLYMER | BEGINNER

62 Create a Polymer Collage Bracelet

Harmonize clashing colors of leftover clay with an antique finish.

by Elvira López del Prado

METAL CLAY | BEGINNER/ INTERMEDIATE

66 Create a Married-metal Effect in Metal Clay

Combine fine silver and copper metal clay in one seamless piece with one firing.

by Michela Verani

reference

73 Basics

78 Contacts & Suppliers

on the
web



Check out what's new at artjewelrymag.com!

bonus subscriber project
www.artjewelrymag.com/projects

METAL | BEGINNER

No-Solder Copper Earrings

Transform hardware store materials into a hammered cold connection for your copper earrings.

by Gisela Kati Andara



reference section

www.artjewelrymag.com/reference

- » Chart: Metal clay firing schedule
- » Mardel Rein's "Fire Copper Metal Clay" reference article
- » Ring Size Chart, including how to determine band length
- » Sealants: How and when to use them

video section

www.artjewelrymag.com/videos

- » Roll-printing metal
- » Using a trim saw to cut stone
- » Making a simple band ring: Parts 1 & 2
- » How to make beveled edges in polymer clay



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Getting ready for the party ...

When I look at the calendar, and realize that *Art Jewelry* is just one issue away from completing its first decade, I experience strange, seemingly incompatible reactions. First: "Can it be just 10 years since we launched? Surely it's been longer!" And then there's: "A decade? Already? Surely not!"

My conflicting impressions aside, the November issue will mark *Art Jewelry*'s 10th birthday, and we want you to celebrate with us. We're accepting entries for our special anniversary photo contest, and inviting all our readers to submit photos of their very best work from the past decade. We'll be spotlighting the best of the reader work in a special online Gallery that we'll unveil as part of our 10th-anniversary celebration — and you'll have a chance to weigh in and choose your favorite pieces, as well! Check out all the details, procedures, and deadlines at www.ArtJewelryMag.com.

In the meantime, please enjoy *this* issue of *Art Jewelry*! It's not a special anniversary issue; it's just a normal, run-of-the-mill, excellent issue of *Art Jewelry*. And in a way, that's what makes me most proud — that we regularly put together a beautiful magazine that celebrates excellence and artistry. Each and every issue shares projects and techniques with reliable detail and instruction, and also shines a spotlight on some of the most beautiful work being created in our amazing, innovative field. That's what has carried us through our first 10 years, and what will ensure our vitality going forward.

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PRODUCT REVIEW



Mini Tech-Lite II

When I first saw this magnifier/light combo headpiece, I was a little unsure of what I'd think of it. I'm certainly not one for vanity when it comes to studio dress, but going on first impressions, I thought this might be more suited to a mine than a jeweler's bench. I was wrong.

The fully adjustable neoprene-lined nylon headpiece is exceedingly comfortable. Once I adjusted it to fit my head, it stayed put, and didn't dig in anywhere. The headpiece comes with a permanently attached double-hinged one-watt LED light that's powered either by a wall transformer or three AAA batteries (which give you 40 hours of work time). The wall transformer cord is about 9½ ft. (4.2 m) long; Add that to the lead from the headpiece, and you've got about 12½ ft. (5.3 m) of room to move around — more than enough for most. I preferred the battery pack simply because I tend to need things from across the room, which meant that I had to unplug the light each time I made the trip.

The magnifier clips onto the lamp at the center of the headpiece, making it easy to change between magnifications. I tried the 14-in. (35.6 cm) working-distance magnification, as it seemed to be best suited to working at my bench. The magnifier is adjustable, so make sure it's parallel to your line of sight.

I thought this might be
more suited
to a mine
 than a jeweler's bench.
I was wrong.

I found it nice to have an adjustable spotlight on my work, because sometimes you need to adjust the light to see fine lines on your metal more clearly. For example, I had scribed a design on a piece of copper, and as I sawed the piece out, I was able to change the location of the light to make sure that the scribed line was highlighted and easy to see. It was helpful to have a focused light in addition to my normal bench lighting. I particularly liked that I could flip the magnifier up when I didn't need it, yet was still able to put the light to use.

—Annie Pennington

WHERE TO BUY

Mini Tech-Lite II

\$125.00

Optional clip-on magnifiers, variable working distances, 4–20 in. (10.2–50.8 cm) \$21.00–\$27.00
 Q Lighting, www.q-lighting.com

IN THIS SECTION
 PRODUCT REVIEW
 READER FORUM
 EXHIBITS
 CALLS FOR ENTRY
 BOOK REVIEW
 READER TIP
 TOOL REVIEW

Classroom Inspiration

Inspired by Barbara Lockwood's cuff bracelet ["Wear Your Words on Your Wrist," July 2013], my student teacher, Jessica Conner, and I developed a lesson for my high school Jewelry 2 class. The lesson, titled "You in Two Words" asked students to critically think about distilling an aspect of their identity into one or two words. Students then translated their words into a language of their choice, creating another layer of meaning to their work. Using Adobe Illustrator, students experimented with fonts and learned to manipulate text, using their skills to design their bracelets. Some students added a hammered surface texture and patina.

—Deena Amont, Art Teacher
Lawrence High School, Lawrence, Kan.



Diligence by Emmalee Squires



Lysande Skydd by Matthew Weiss

Art Jewelry magazine adds: Special thanks to Barbara Lockwood for allowing her article to be adapted for this high school class.

tell us what you think!

Send your questions, comments, and tips via email to editor@artjewelrymag.com. Letters may be edited for clarity and length.

EXHIBIT

Multiple Exposures: Jewelry and Photography

What: The connection between jewelry and photography spans more than 150 years, and this exhibition examines the evolving relationship between the two worlds. Over 80 artists from 20 countries explore how photography has influenced views of beauty, perceptions of desire, and the examination of social, political, and cultural issues. Lectures and panel discussions, workshops, jewelry-making demonstrations, and a fully illustrated catalog with essays accompany this exhibit.

When: May 13–September 14, 2014

Where: Museum of Arts and Design, New York

For more information: www.madmuseum.org



▲ **Untitled brooch** by Bettina Speckner. Artist's photograph enameled on silver, cowrie shells, amethyst; 2004. Private collection. Photo courtesy of the artist.

▼ **Feeding Desire Brooch** by Mary Hallam Pearse. Digital photograph, aluminum, silver, pearls, glass. Collection of Sally von Borgen. Photo by Walker Montgomery.



CALL FOR ENTRIES

PREZIOSA 2015

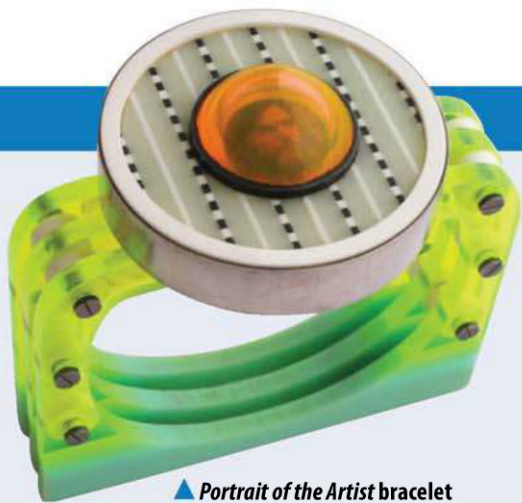
What: PREZIOSA is a cultural project designed and coordinated by Le Arti Orafe Jewellery School in Firenze, Italy. Launched in 2005, The PREZIOSA project has earned a reputation as one of the most important European events devoted to contemporary jewelry design. The exhibition will take place in the Marino Marini Contemporary Museum of Art in Florence. Each of the selected winners must present 5–10 pieces for the exhibition. The competition is open to international artists under the age of 35, creating all forms of contemporary jewelry. Registration is online, and free.

When: Deadline for entries: November 15, 2014

Where: Marino Marini Contemporary Museum of Art, Florence, Italy

For more information: www.preziosa.org





▲ **Portrait of the Artist bracelet** by Fritz Maierhofer. Analog photograph, acrylic, silver; 1971.

Photo courtesy of the artist.



► **Waterman brooch** by Gijs Bakker. Photograph, diamonds, white gold, PVC; 1991. Collection of

Angela Schaefer. Photo by Thomas Von Der Heiden.

coming in
the November
2014 issue

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READERS FROM SOME
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NAMES IN THE
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EXHIBIT

Lethal Beauty: Samurai Weapons and Armor

What: The striking duality of deadly weaponry forged with artistic beauty is on full display in "Lethal Beauty: Samurai Weapons and Armor." With 63 works by master craftsmen from the 13th to 20th centuries, the exhibition features five full sets of armor, masks, helmets, and warrior hats. Remarkable weapons include long and short swords, daggers, and examples of early Japanese rifles.

When: October 12th, 2014–January 4th, 2015

Where: Katonah Museum of Art, Katonah, NY

For information: www.katonahmuseum.org



Smitten Forum 2014: A Creative Gathering of Makers

Indiana University Press, Bloomington, IN, 2014
\$30.00

ISBN: 978-0-692-02839-1

www.smittenforum.wordpress.com

**Book
review**

In January 2014, 17 metalsmiths convened at Arrowmont School of Arts and Crafts in Gatlinburg, Tenn. for five days. This catalog is a visual record of those five days. As Marissa Saneholtz and Sara Brown set out to organize the forum, "We took a hard look at the metalsmithing community in this country and decided that we were missing the opportunity for professional metalsmiths to work side-by-side in an intimate studio environment." This event gave a diverse group of artists the opportunity to live together, prepare meals together, engage in critical dialogue about the field, and work in a fully stocked studio alongside other makers without needing to adhere to a schedule.

The catalog gives you a glimpse into the Smitten Forum through essays by the participants, artist bios, a photo of a piece created by each artist before the event and one completed during their time at Arrowmont (or finished shortly thereafter), a visual progression of each persons' work-bench over the course of the event, and a statement by each artist. As a bonus: The participants share a few of their favorite recipes they cooked during the forum.

—Annie Pennington



CALL FOR ENTRIES

Saul Bell Design Awards 2015

What: The Saul Bell Design Awards competition challenges jewelry artists to push the limits of design and imagination. This competition invites artisans to submit their innovative work in seven different categories. There are no limitations on the choice of materials, as long as the finished piece is wearable and was created by the person entering it.

When: Entry deadline mid-September; details online

For more information:
www.saulbellaward.com



Mandarine Fish by Artem Kutyrev. 18k gold, diamonds, sapphire, tsavorite, enamel. Photo courtesy Treasure House Russia.



Carnelian Wave by Bruce Hartman. Sterling silver, diamonds, gold leaf, carnelian. Photo courtesy of Rio Grande.

EXHIBIT

Setting the Table for Female Enterprise

What: With few options open to her as a widow in 1761, Hester Bateman took over her late husband's workshop. Bateman proved to be a skilled silversmith and industrious businesswoman who forged the way for her son, daughter-in-law, and grandson to follow in her footsteps. This exhibit explores a 50-year span through 50 pieces that the Bateman family created for members of 18th century society.

When: May 10–September 28, 2014

Where: Birmingham Museum of Art, Birmingham, Ala.

For more information: www.artsbma.org



Reader Tip

"I keep my jeweler's saw blades organized by keeping each size in a separate drinking straw with the size written on the straw. I've eliminated all the little plastic bags they come in, and it sure is easier to find the size I need. The different colors help, too! I cut the straws down to size, and close one end with a bit of plastic tape. With the straws all standing up in an old Danish cookie can, they're very convenient!"
— Patty Spiro, Chipley, FL.

A special hat-tip to Indira Khedun, from the Isle of Wight, UK; her tip was a variation on this. Ms. Khedun uses test tubes, set in a test-tube stand, to hold her saw blades. Khedun gets points for style and beauty, Spiro scored on economy and convenience!



We're looking for your best studio tips and tricks! We've made it easy to submit your ideas — go to www.artjewelrymag.com/TipsFromOurReaders and share your tips with us. We'll choose a new spotlight reader tip for each issue; if your tip is chosen, you'll receive a \$100 gift certificate courtesy of our Tip sponsor, Contenti (www.contenti.com)!

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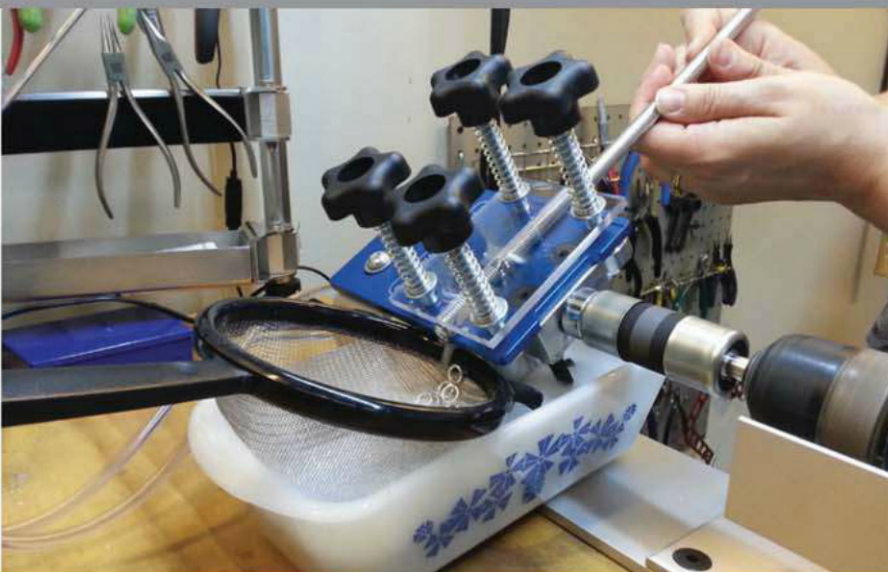
TOOL REVIEW

The Ringinator

Sonya Hayes, a fellow chain mailer from Va., and I were discussing a topic common in mailer circles: buying vs. cutting jump rings. She mentioned a tool I'd never heard of before — the "Ringinator." Once I finished giggling, I asked for more information. Hayes and her husband, Anthony, were branching out and needed to be able to make more rings, faster. That's when they discovered the Ringinator.

I contacted the Minneapolis manufacturer to see if *Art Jewelry* could take a Ringinator out for a test drive. A small, heavy box soon arrived. The contents took over nearly the entire top of our jeweler's bench. Assembly took a bit longer than I had anticipated; while there were thorough directions with photos, it would have been helpful to have a parts list. (The manufacturer has since told me that an inventory list will be included with future directions.)

The Ringinator uses a power drill as the engine to turn the cutting blade. As it turned out, finding a corded drill was the most difficult part of the entire test! Eventually, we found a loaner. A cordless drill can be used, but a corded drill has some advantages: The machine comes with a drill-speed controller and tachometer. By plugging the drill's cord into the controller, and using the tachometer, you can set the optimal cutting speed for the metal you need



to cut. With the drill securely held in the cradle by zip-ties, it was easy to use the controller to adjust and set the speed.

Clamping the Ringinator to the bench was also recommended; I used our bench pin clamp, the only clamp we had on hand that was big enough to work. While it held the Ringinator in place, it made the setup of the plastic baskets that came with the machine a bit awkward. One basket catches and holds the water and liquid lubricant that is continually pumped over the blade to keep it cool, prolonging the life of the blade and keeping the cutting operations running smoothly. The second basket catches the cut rings and a small amount of water overflow. But a quick swap of these two baskets for a bread pan and strainer overcame the awkwardness of the fit.

Everything was finally set and running smoothly. Now for the first test coil: aluminum, 14-gauge, 6.5 mm inner diameter, and over 12 in. (30.5 cm) long. Have you ever seen a wood chipper rip through a tree? It's kind of the same thing, but instead of rough mulch I had a strainer full of beautifully cut, burr-free jump rings. Within a few minutes, the Ringinator easily devoured several more feet of coil. The last rings were cut as perfectly as the first.

While cleanup was a little messy, it was fairly easy to take down the entire setup. And after removing the drill, the low-profile makes it easy to store until next time. If you only need a few rings at a time, this might not be the tool for you. But if you're looking to produce large amounts of perfectly cut rings in a short time, the Ringinator can't be beat. —Theresa D. Abelew



WHERE TO BUY

The Ringinator

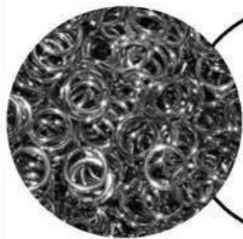
\$495.00

(Includes drill speed controller, laser photo tachometer, lubrication pump and filter, one blade, two plastic containers)

The Ringinator, www.ringinator.com

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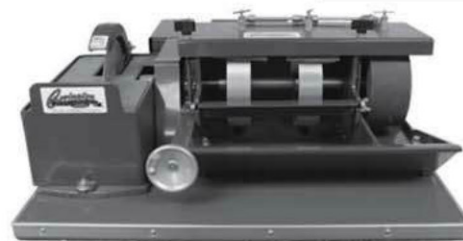
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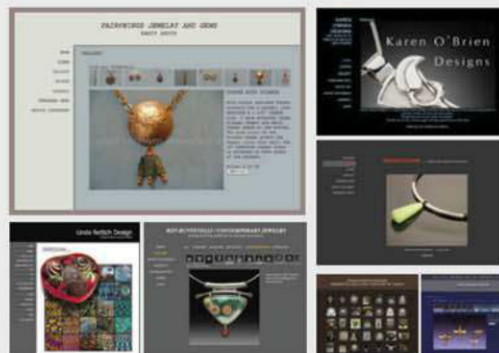
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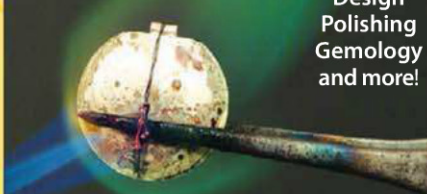
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A49ZQ

Understanding Inventory

by Marlene Richey

How natural it is to feel a shiver of trepidation at the thought of inventory. Inventory! Ick! It's one of those necessary accounting evils that are a part of most businesses. Inventory is defined by investopedia.com as, "The raw materials, work-in-progress goods, and completely finished goods that are considered to be the portion of a business's assets that are ready or will be ready for sale." That means everything you have on hand — not just finished jewelry that's ready to sell. One of the main reasons to keep track of your inventory is for tax purposes. The IRS wants this information, and they want it to be accurate!

Turn it over!

Take a few minutes and look around your studio. How much money do you have tied up in metals, castings, beads, gemstones, diamonds, partially finished pieces, sweepings, and pieces that are collecting dust in your safe? (Side note: Notice that I assumed that you have a safe? If you don't, you should.) How much inventory do you have out on consignment? How much inventory do you have tied up in a line you use as a sales tool or have out with a sales rep? Do you have any idea? Does it make you dizzy to even begin to total up the numbers?

One of the advantages of working in jewelry and metal is our inventory can't rot or spoil if it sits on a shelf. But that doesn't mean that we can sit on it forever — it *can* become dated or unfashionable. And all of us hit a point where we have a fabulous piece that might have even won an award (I am speaking from experience here) and after showing it for a couple years, all we want to do is sell the thing, find it a new home, and get a little money out of the deal. And of course, until it walks out the door we have to count that piece in the inventory as well.

I personally know beaders who have a room full of beads (yes, I'm looking at you). At some point you need to stop buying beads and either sell the ones

you have, make them into something wonderful so you can sell those pieces, or donate them to your local art center.

It seems almost too simple to need saying, but you must regularly turn over your inventory in order for your business to thrive. Use your current inventory of materials to create an inventory of finished goods. Sell your inventory of finished goods so you can restock your inventory of materials. It's a never-ending cycle, and if it stalls, your business will suffer.

Tracking your inventory

If turning over your inventory is key to business success, tracking is key to turning over your inventory effectively. "Turning over" doesn't just equal "getting rid of" — there's that "effectively" rider as well. So what constitutes efficiency in turnover?

Know when to order

As your business grows, you need to identify your busiest times of the year so you know when to reorder materials to meet production demands. For jewelry makers who are selling wholesale, that is inevitably a pre-holiday shipping date, i.e., the Tuesday before Thanksgiving, everything has to be shipped to your retail galleries. Or, it might be the summer vacation season, especially if you sell to galleries located

on either coast. Then you want to have everything out the door by Memorial Day. During rush times, you need to have more materials on hand to get your orders out the door. At these times, you have a lot of money tied up in both materials and finished goods ... in other words, inventory.

Know what to order

As Barbara Carlton, creator of the jewelry accounting/managing program Jewelry Designer Manager, states, "You need to keep track of parts inventory so that you know what's in stock for making jewelry and which parts are low or out-of-stock and need to be re-ordered. Not having enough parts on hand to make your jewelry can be frustrating and cause you to lose customers and sales." Carlton recommends keeping records of vendor names, contact information, and item/style numbers in order to make this task simple. She adds, "You also need to know how many finished jewelry pieces are available for sale or consignment at any time."

Know what it's worth

One of the questions all jewelers face is the volatile prices of metals and gemstones. As we all know, the cost of a specific metal can change drastically in a day, not to mention a few months or a year. How do you account for the change in price in your inventory? Laurie Watt,



Thinkstock.com

“Inventory represents one of the most important assets that most businesses possess ... the turnover of inventory represents one of the primary sources of revenue generation and subsequent earnings.”
—investopedia.com

owner of the designer gemstone company Mayer & Watt, says they use their purchase price when calculating their gemstone inventory; it's an accurate reflection of the costs they have incurred, rather than a vain attempt to keep up with fluctuating standard rates. Knowing how much you've spent allows you to assess how much you need to make to earn back your outlay and turn a profit. This is one reason it's important to keep accurate records of the parts in a piece and the price you paid for them.

You might, however, want to change prices on finished goods when you experience changes in the market. Keeping records of the initial prices of materials is a great resource when doing this.

Know what to make next

If I haven't told you about the Pareto Principle, also known as the 80/20 rule, then I have been neglectful. In 1906, Italian economist Vilfredo Pareto observed that 80% of the land in Italy was owned by 20% of the population. The more people explored different areas of finance and business, the more this ratio seemed to surface. A century later, the Principle is still widely used in all sorts of institutions and businesses. Examples: 80% of your profits probably come from roughly 20% of your customers. 80% of your complaints come from 20% of your customers. And 80% of your sales probably come from 20% of your inventory.

So keeping track of inventory gives you a barometer of what is selling, what is popular, and what is declining in sales. This information is invaluable when running a sales-based business. It helps you make wise business decisions. Why keep selling and ordering parts for pieces that have seen their best days?

Tracking methods

There are two ways to keep track of your inventory: perpetual and periodic systems.

Perpetual inventory tracking is when you continually record all the comings and goings of your stash. Log raw materials as they come into your studio. When you've made a piece, deduct the materials and add the piece to your inventory record. When someone buys the piece, log that separately. Software programs (such as Jewelry Designer Manager) are essential for this type of inventory management.

Periodic inventory is more familiar to most of us. Have you ever wanted to go to a store and found that it was closed due to taking inventory? This is done on a yearly basis at the end of an accounting period. Many small businesses take inventory at the end of the calendar year. For this type of tracking, you go in and literally count your findings, finished goods, stones, and other materials and compare the numbers with the previous year.

Final words of wisdom

Having an understanding of your inventory and what you have invested in your business is one of the most important pieces of information you need to run a successful jewelry business. Start today by just looking around your studio and office to see what you have. Just do it! **A**



In her more than 30 years in the jewelry business, Marlene Richey has run a wholesale business and a retail gallery. She can be reached by email at marlene_richey@gmail.com.

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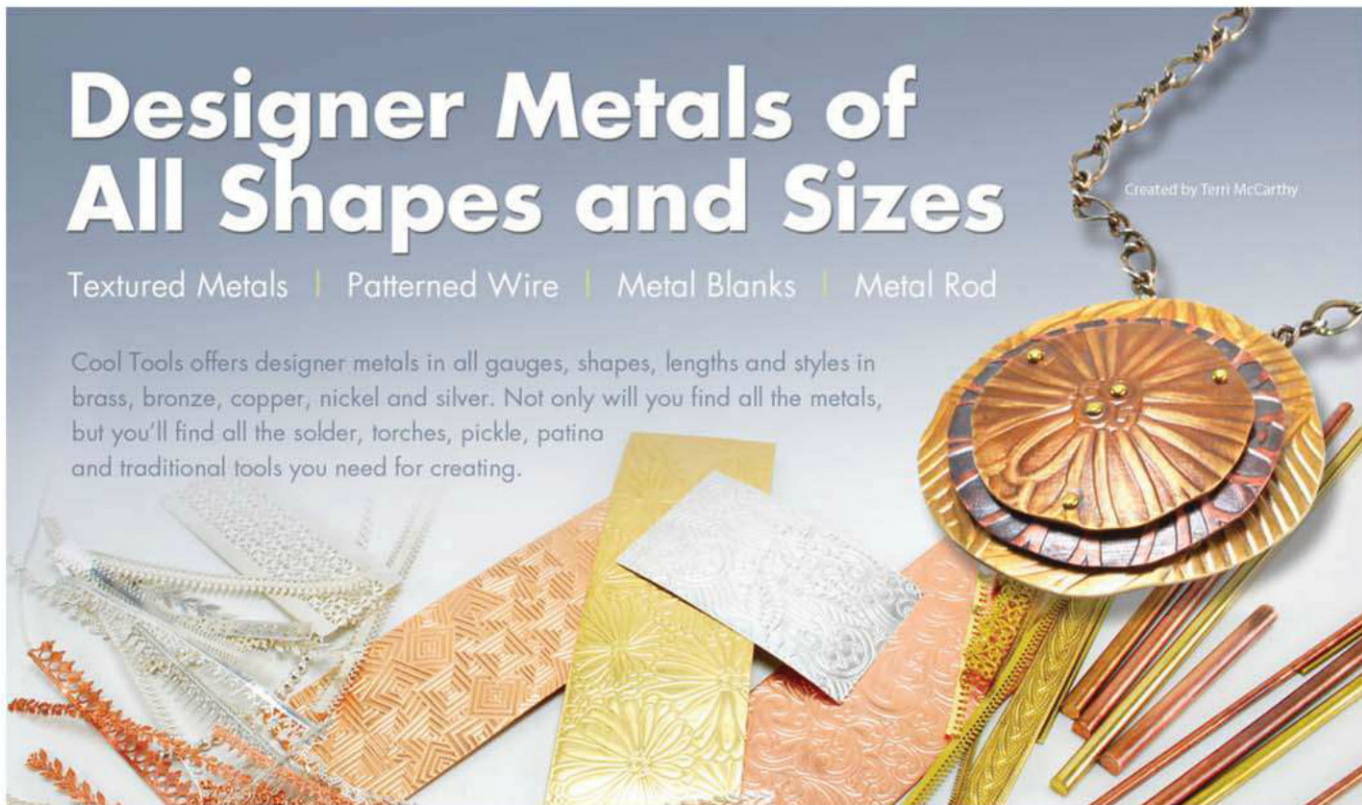
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Everything Turn, Turn, Turn

by Christopher C. Darway

My old friend and attorney once handled an estate that included numerous machines and tools that he thought might interest me. The deceased had been a gunsmith who left a basement full of metal and woodworking tools. The family wanted the stuff gone. I put in a ridiculously low bid of \$200.00 to show my appreciation for the call and to guarantee losing — I was trying to *shed* earthly possessions. The next call I received was to congratulate me on the accepted bid and tell me that I had one week to remove everything.

There was a redundancy of some tools, which allowed me to dole out treasures like a benevolent despot to a few ex-students and a tool-minded neighbor. One machine was not going anywhere but to my studio, however: A Sears Craftsman/Atlas bench lathe.

History of the lathe

A lathe is a device that holds material and rotates it. As it rotates, a chisel-like tool is pressed against the object, removing unwanted material. Spindle-shaped legs for furniture are produced this way.

The oldest image of a lathe is in a wall carving from around 300 BC in — you guessed it! — Egypt. These machines rotated forward and backward because power was supplied with rope, or treadle action. The Romans had a version of a lathe powered by a bow. (Picture a bow drill in a horizontal position, rather than vertical.) Cutting could be done in only one direction because of this. Leonardo Da Vinci gave us the first drawing of a continuous movement lathe; it shows a large flywheel, indicating this lathe may have had the power to cut metal. Go Leo!

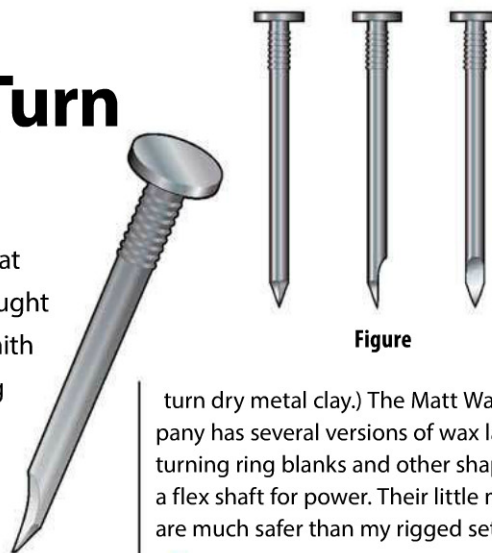
Lathes were not only getting bigger and better at this time, they were also getting smaller and more accurate. The late 1600s to early 1700s saw the introduction of the clockmakers lathe, known today as a watchmakers lathe.

All this development paved the way for the Industrial Revolution (1760–1840). Men like Sir Joseph Whitworth, Henry Maudslay, and James Watt all contributed to this era of mechanical advancement and the improvement of the lathe.



Your own studio lathe (kind of)

I'm going to show you how to make a simple wax-turning lathe using a bench vise, flex shaft, and a nail. Your turned piece of wax can then be lost-wax cast. It's a simple way to create a design element that looks like it was machined in metal without requiring a metal-cutting lathe. (With some experimenting, you could also



Figure

turn dry metal clay.) The Matt Wax Company has several versions of wax lathes for turning ring blanks and other shapes using a flex shaft for power. Their little machines are much safer than my rigged setup.

SAFETY NOTE: Wear safety glasses! If your foot control is the kind that is either "off" or "full speed," do not try this project. (Time to buy a Lucas lowboy foot control! USA made! Best!)

1. Mount your flex-shaft handpiece in a small vise using rubber, cloth, or leather to grip the handpiece. Be very careful not to distort the aluminum housing by applying too much pressure. Foredom makes a nylon holder for their #30 handpiece for this purpose. Make sure the shaft rotates toward you from above.
2. And while you're at it, clamp a 1-in (25.5 mm)-wide rectangular brass strip in the vise so that the top edge of the strip is parallel to and below the centerline of the handpiece (*photo opposite page*). This is your tool rest.
3. Select a drill bit, insert it into the handpiece, and slowly drill into the center of a wax blank.
4. Use superglue to attach the wax to the drill bit.
5. Find a large nail or hard brass rod. File or grind the end of the nail/rod to the shape in the **Figure** (above). You can also use dental tools, mini wood-carving tools, etc.
6. Turn on the flex shaft to slow-to-moderate speed. Too high a speed can cause the drill bit to bend and become a nasty tool of mayhem.
7. With the wax turning, rest the tool on the tool rest, and take small cuts into the wax. If necessary, turn off the flex shaft and adjust the brass tool rest so that your tool touches the wax below the centerline.
8. Congratulations, you have turned your first object!



With a little ingenuity, you can turn your flex shaft into a wax-turning lathe!

My Atlas

Back to my dead-guy-sale lathe. The Atlas Lathe Company was founded around 1913, and by the 1920s they were manufacturing woodworking machines, drill presses, and lathes. Their lathes were designed for serious hobbyists but also saw service in larger shops for light-duty work. Sears and Roebuck sold the Atlas 6-in. lathe under their house brand, Craftsman. The original design dates back to the 1930s. I'm guessing mine is from the late '50s. I can still order replacement parts from Sears online. This is a company formed in 1893!

Another place I've been able to find new old stock and used parts and tooling for my Atlas lathe is eBay. I was also able to update the tool holder with a brand-new, CNC-machined, quick-change holder. I've used it mostly to machine parts for jigs and shapes to form metals. I can turn wood, plastic, steel, brass, and wax.

Cost vs. quality

Like all the tools and machines we use in metal and jewelry work, there is a cost vs. quality decision to make. Harbor Freight carries a mini lathe; it is Chinese-made, and precision is not its forte. If you see a fellow in a lab coat looking through a microscope attached to a lathe, however, I would call that precision, and the machine is likely a German Boley watchmakers lathe. Expensive, but cute machine.

Other good-quality lathes are Sherline (USA), Taig (USA), Proxxon (Germany), and Prazi. (The Prazi story reads like a Cold War

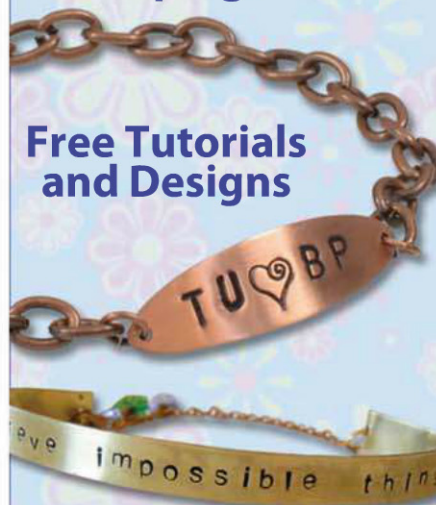
spy novel. Originally made in East Germany, the lathe was made by a company called VEB Prazisiondrehmaschinen during the Cold War, but was never sold under that name, as people thought it was Italian. In the west, it was sold under a variety of names, including Prazi and Hobbymat. When the wall came down, the company couldn't compete. Later, the lathe was made again in Germany under the name WABECO, and it's still available from International Sales and marketing Group, USA, who sells it as the Prazi II Apollo.) By their place of origin you know that none of these is cheap to buy new. One of the first home hobby mini lathes was Unimat, sometimes sold under the name EMCO. They were good Austrian stock and were made in the hundreds of thousands: eBay alert! Rio Grande carries Proxxon tools including two lathes; one is just for waxes. Other sources for small lathes are Micro-Mark, Otto Frei, and Little Machine Shop.

So, how much would you expect to pay for a used Atlas? I found one story of a yard-sale find that cost the buyer just \$75.00. The one that got me excited was an online sale price of \$925.00 for one that was close in condition to mine. I made money on that deal. ■



Christopher C. Darway can be reached via email at cdarway@outlook.com.

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by Richard M. Shull, G.G.

Whether they remind you of an event or special occasion, or instill a feeling of healing or protection, many gemstones are closely associated with the regions where they are found. But it is not often that a gemstone truly reflects the essence of a place with its color. Invoking the soothing color of the Caribbean waters that surround the island where it is found, larimar is surely one of those rare gemstones.

Ocean stone

Long known to the residents of the southwestern coast of Dominican Republic, the gemstone we now call larimar was thought to have originated in the Caribbean Sea, from which it washed onto the shore of Barahona Province.

In 1916, Father Miguel Domingo Fuertes Loren requested permission from the ministry of mines of Dominican Republic to mine a "blue rock" that he had found. Unaware of what he had discovered, the ministry denied his request.

In 1974, Miguel Mendez of Dominican Republic and Norman Rilling, a volunteer for the Peace Corps, found some unusual blue stones on a beach — inadvertently rediscovering the stones Father Loren had sought to mine. Although he first named the new stone "travelina," Mendez later combined his daughter's name, Larissa,

with the Spanish word for sea, *mar*, and gave larimar the name that reflects its Caribbean origin.

Following a lead from the locals, who believed that the stones had washed out of the hills, down the Baboruco River, and into the sea, prospectors started upstream; the now-famous deposits of larimar were discovered at Los Chupaderos in the section called Los Checheses. The stones found on the beaches of Barahona had made their way from the mountainside through erosion caused by thousands of years of tropical rain.

Chemistry and geology

Found only in the deposits of Dominican Republic, larimar is variety of the common mineral pectolite and ranges in color from green through greenish blue to blue. It forms in cavities (or vugs) in the volcanic

basalt of the region where it is found. Often found in association with zeolite minerals, pectolite is a sodium calcium silicate that is usually white or grey where it occurs in numerous other places around the world. In the deposits of Dominican Republic, some of the calcium is replaced by copper, which gives larimar its light-to-saturated blue color. While the deepest blue colors are the most rare and valuable, stones showing mottled white and blue patterns, often resembling the pattern of a turtle shell, are popular due to their distinctive appearance.

At Los Chupaderos, the site of the most important deposit, locals mine larimar with hand tools, excavating the material from a network of thousands of shafts and tunnels. Digging shafts into the basalt host rock is a laborious practice. The gem material must be broken out, hauled to the surface, and then sorted from the host rock, all of which requires a human touch that is impossible with commercial mining machinery.

LARIMAR: USE AND CARE

Mohs hardness: 4.5–5

Suitable uses: Best used in pendants and earrings due to its lower hardness. To avoid scratches and other damage, use protective settings if setting larimar in rings and bracelets.

Cleaning: Clean in warm soapy water. Steam cleaners are not recommended. Larimar is photosensitive and will fade with excessive exposure to light and heat; avoid these conditions when wearing or displaying larimar jewelry.



Larimar beads
courtesy of Heart
Bead, Arcata, Cal.

Larimar is found in cavities formed by gas bubbles in the basalt and also in tubes believed to be the hollow areas left by trees that were burned out by the basaltic lava that hosts the larimar.

Use in jewelry

Larimar, like most opaque gemstones, is usually cut into cabochons and beads to best show off its color and patterns. It is often cut into freeform shapes for artistic jewelry as well as standard calibrated round and oval cabs and beads of various shapes.

As the popularity of larimar has gained momentum and demand has risen, imitations have appeared on the market. Plastic imitations are easy to detect, as they feel unnaturally light in the hand and have a luster that is waxy or dull compared to that of stone. Colored ceramic has also been used to imitate larimar. It can be detected with a 10X loupe by looking for white gas bubbles and blue color concentrations that don't quite resemble those of real larimar.

Blue gemstones, evoking water or sky, have intrigued people around the globe for as long as gemstones have been sought and appreciated. While larimar is a "newer" gemstone, it has found its place among the classic blue gems, making it a great choice for a wide range of jewelry designs. 



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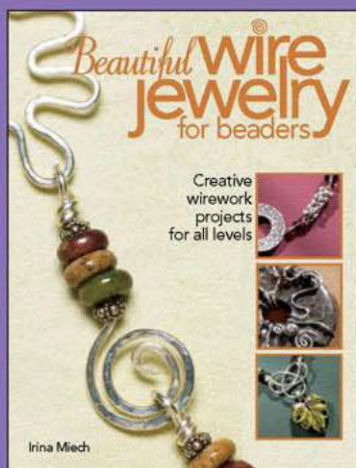
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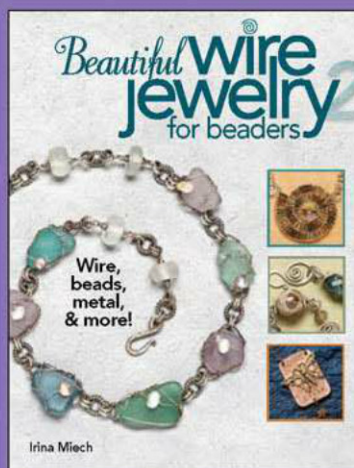
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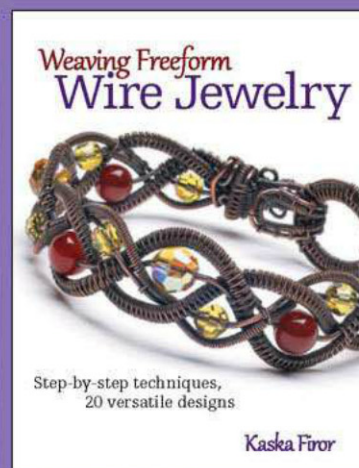
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Annealing and Cold Working

by Michael David Sturlin

Maybe this has happened to you: You were working on a piece of metal, whether you were bending, twisting, dapping, or using another forming process. You were nearly finished and feeling good about the piece. You thought, “Just one more adjustment ...” That’s when it happens — the dreaded *snap* — *crackle* — *pop!* of pushing the metal too far. The end result is fracture or failure.

Don’t feel bad; it happens to everyone, and usually more than once. It’s part of learning how metal works. What went wrong in this scenario is probably a case of overworking the metal (pushing it too far), not annealing the metal sufficiently or frequently enough, or a combination of both.

Attributes of jewelry metals

Common jewelry metals have physical and mechanical properties which make them valuable to the maker. For work wrought directly in metal, the most valuable attributes are malleability and ductility.

Malleability is the ability of a material to be shaped and spread under compressive force (hammer blows and rollers). **Ductility** is the ability to form through extrusion (rolling and drawing into rod and wire).

Metal’s structure is a crystalline lattice comprised of grains which vary in size, shape, and arrangement, according to the state of the material and how much it has been worked. All jewelry metals start as a casting from a liquid state; melted metal is poured into an ingot, solidifies, and is

worked into sheet and wire. As the molten metal solidifies, crystals form without specific orientation. In this state, the metal is annealed, or fully softened, and offers the greatest ductility.

During cold working, the grains of the crystalline structure are compacted, stressed, and reoriented by the application of external force. At a given point, the metal is fully work-hardened and can no longer stretch, bend, or distort. Beyond this point, the metal will crack, tear, split, or break.

A general rule of thumb for most precious-metal alloys is to anneal after a 50% decrease in thickness or a 100% increase in length. The properties of specific alloys vary, and the superior ductility of pure metals (24k gold, fine silver, and



Annealing sterling silver: The torch flame is blue at the outset of heating ...

copper) means they can be cold-worked more extensively between annealings. Practice will provide the most reliable indication of what yields the best result.

Annealing non-ferrous metals

In annealing, hardened metal is heated and then cooled to soften the metal and restore ductility.

Annealing is usually done with a torch. (When a suitable torch isn’t available, I anneal fine silver and copper in a tabletop kiln.) Most jewelry makers are told to judge the annealing temperature by observing the color of the metal. But the color of metal can be hard to see in a well-lit studio, and there’s always the risk of overheating the metal before you perceive the color change. Dimming the lights, as is frequently advised, isn’t always practical, especially in a shared studio. A good alternative is to use a few bricks or soldering pads to make a slightly darkened recessed area at your hot-work station specifically for annealing.

One effective test is to apply a small amount of white paste flux to the metal before heating it; the flux melts and turns clear and glassy as the metal reaches



preparing your own metal

Many goldsmiths prepare their own metal stock. They melt metal in a crucible, pour it into an ingot mold, and shape the material into sheet and wire. The cold working involved in making ingots into sheet and wire is one of the best opportunities to learn the working properties of the material. Feeling the material become harder, less ductile, and with less tensile strength as it is formed, and the subsequent relief as the metal is annealed and softened, increases your fluency with its attributes. The alternative to preparing your own metal is to purchase mill products: sheet, wire, and tubing made by a refiner.

You’ll need: torch, crucible, ingot mold, borax or boric acid (to glaze the crucible), carbon stirring rod, safety glasses, and an appropriate hot work area (brick, firebrick, or soldering board).

Pouring an ingot during a workshop at Michael Sturlin Studio. All photos by Michael David Sturlin.



... but changes to orange at the annealing temperature.

annealing temperature. Or, mark the metal with a permanent marker; the ink disappears at the annealing temperature. (This trick isn't reliable for all metals, however.)

For most silver and gold alloys, I've found the color of the flame, not the color of the metal, to be the most reliable visual gauge. As the metal approaches annealing temperature, the flame's blue tail changes to an soft, orange-tinged glow. It's much easier to see than the color of the metal.

How heating affects metal

The process of annealing causes the metal to go through three phases: recovery, recrystallization, and grain growth. **Recovery** occurs as the metal is heated: The internal stress of work hardening is lessened at the lower temperatures, but the grain size and shape hasn't changed.

As the temperature increases, the critical step in annealing, **recrystallization**, occurs: New grains form, further reducing hardness and restoring ductility.

Sustaining the temperature longer than needed causes **grain growth**, which is exactly what it sounds like, and can be problematic. Depending upon the metal, large grain growth causes a tendency to crack and can result in a surface defect known as "orange peel" — a rough surface that appears during bending or forming, or during the final step of polishing. Excessive grain growth also occurs when the metal is annealed too frequently without sufficient cold work in between. Excessive grain growth can be counteracted by subsequent cold working, such as forging or planishing.

The crucial factors in successful annealing are temperature control, cooling method, and the degree of work hardening between annealing. Contributing

typical annealing temperatures for precious metals and their alloys

(From Introduction to Precious Metals, by Mark Grimwade)

METAL/ALLOY	ANNEALING		COLOR BY EYE
	°C	°F	
Fine gold	200	392	Black heat
Fine silver	200	392	Black heat
22k Colored golds	500	932	Very dark red
18k Colored golds	550–600*	1022–1112	Very dark red
14-, 10-, 9k Colored golds	650*	1202	Dark red
Pd (Palladium) White golds	650–700	1202–1292	Cherry red
Ni (Nickel) White golds	700–750**	1292–1382	Cherry red
Sterling silver	600–650	1112–1202	Dark red
Platinum	800	1472	Bright red

*Colored golds of 18k and less should be water quenched from the annealing temperature to retain softness and ductility.

**Ni-white golds should be air cooled to minimize phase separation and color change.

EDITOR'S NOTE: Copper anneals at 700–1200°F (371–649°C), and is annealed when it is dark red to the eye. Quench copper immediately in water after annealing.

factors to *unsuccessful* annealing include insufficient deformation, heating too slowly to the annealing temperature, sustaining the temperature for too long, or heating the metal too hot.

Protecting the metal

Pure noble metals such as 24k gold and fine silver do not readily oxidize when heated; they can be heated and quenched and their color and luster is unaffected. However, most alloys of gold and silver require protective measures to prevent firestain and firescale.

The standard practice for annealing

Annealing guidelines as suggested by Prof. Dr. Erhard Brepohl in *The Theory and Practice of Goldsmithing*:

- Work the material to the maximum degree of deformation.
- Heat as rapidly as possible to the required temperature.
- Stop as soon as it is hot enough.
- Do not prolong annealing time.

with a torch is to apply a barrier flux or firescale preventative before heating. Goldsmiths typically use powdered boric acid mixed with denatured alcohol as a firescale preventative. Dip the metal into the solution, or apply it with a brush. The flame ignites the solution, the alcohol burns off with a greenish flame, and a powdery white coating appears on the metal. This coating (which is the boric acid that was suspended in the solution) protects the surface from absorbing excess oxygen.

A variety of anti-firescale products are commercially available; they're generally more costly, and some are most effective when applied to preheated metal, which can be messier than using the boric acid/alcohol solution. 



Michael David Sturlin is an award-winning goldsmith, jewelry artist, and educator. Contact him via email at michael.sturlinstudio@cox.net.

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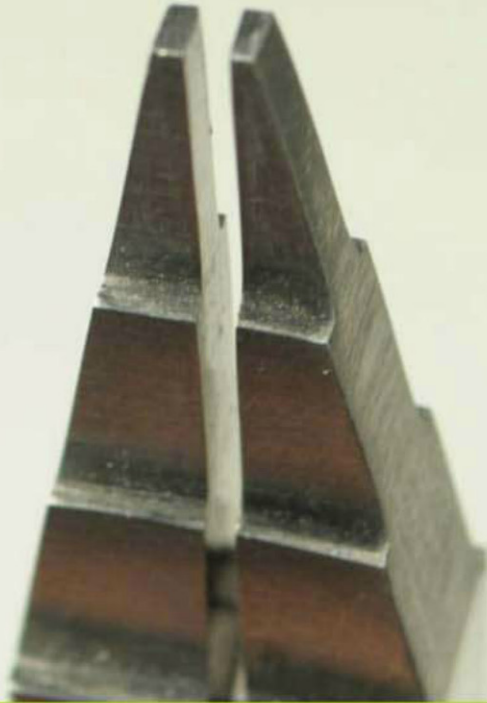
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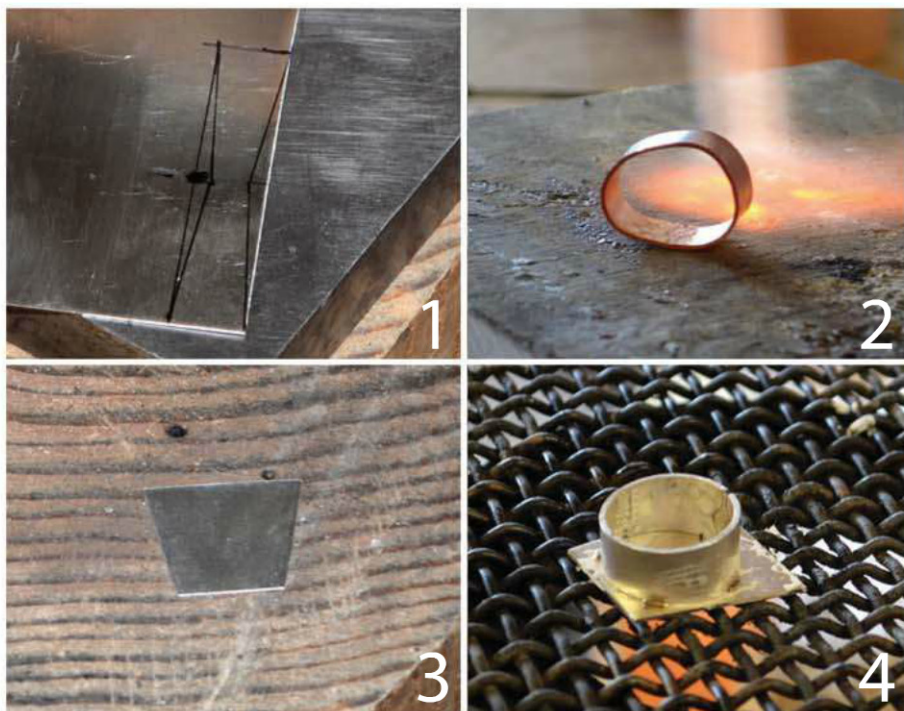
Fabricate a HOLLOW RING FORM for Inlay



*Build a **sterling silver** form to showcase
your **choice of materials**.*

by Jeff Fulkerson

The foundation for inlay is a metal form in which to hold stones. For this project, I'm building a hollow ring, but you can build whatever size, shape, or type of form you'd like. This hollow construction can be used for inlaying a variety of materials, so think about ways to add color to your piece.



Lay out the ring blank. Determine the size of your ring. Use a fine-tip permanent marker to mark a rectangle of 22-gauge (0.6 mm) sterling silver $\frac{7}{16}$ in. (11 mm) wide by the length for your ring blank [1].

I wanted my ring to have a wide opening at the top to inlay stones into, but that makes the ring uncomfortable to wear, so I tapered the shank. To add a taper, make marks $\frac{1}{16}$ in. (1.5 mm) in from each long side at the center of the strip. Use a straight edge and a scribe or fine-tip permanent marker to mark a line from each corner of the strip to the marks at the center [1].

Cut out the ring blank. Use a jeweler's saw with a 1/0 blade to cut along the outside of each line.

Solder the ring band. Use a rawhide or plastic mallet to form the ring blank around a ring mandrel. Make sure the ends meet flush.

Apply flux, and solder the band with medium solder [2]. (I use only medium solder for this ring.) Pickle, rinse, and dry the ring band.

Place the ring band back onto the mandrel, and use the mallet to make it round.

Use a wide, flat hand file to file both edges of the ring until they're flat and even. Use 320-grit sandpaper to sand the edges. Be careful not to round the edges.

Cut the front plate. Cut a trapezoidal piece of 22-gauge (0.6 mm) sterling silver sheet that's at least $\frac{1}{2}$ in. (13 mm) larger than the ring band [3].

Solder the ring band to the front plate. Align the narrow end of the ring band with the narrow end of the front plate. Position the band so that the sides are evenly spaced and there is approximately $\frac{1}{16}$ in. (1.5 mm) of the silver sheet exposed at the bottom of the band. Apply flux, place solder pallions on the outside of the band, and solder the band to the front plate [4]. Pickle, rinse, and dry the assembly.

Pierce the front plate. Use a flex shaft and a #55 (0.052-in/1.32 mm) drill bit to drill a hole through the front plate inside the band, and use the jeweler's saw to pierce out the center [5]. The large drill bit gives you plenty of room to fit your saw blade into the hole, and you're not doing precise piercing. Be careful not to saw into the band.

Cut the back plate. Lay the assembly front-plate down on the sterling silver sheet, and trace the outside edge of the front plate with the fine-tip permanent marker. This will make the back plate slightly larger than the front plate. Cut out the back plate.

materials

- Sterling silver sheet: 22-gauge (0.6 mm), 2 x 6 in. (5.1 x 15.2 cm)

toolboxes, page 76

- Sawing/Piercing
- Soldering/Annealing
- Finishing

additional tools & supplies

- Straightedge or ruler
- Fine-tip permanent marker
- Rawhide or plastic mallet
- Steel ring mandrel

Find out where to buy supplies, page 78
See Safety Basics, page 75

BASICS & VIDEOS

Learn fundamental techniques in these bonus tutorials:	B	👤
Basic sawing of metal	●	●
Making a simple band ring: Parts 1 & 2		●
Soldering	●	
Pickle basics	●	●
How to file		●
Sanding	●	
Drilling through metal	●	●
Piercing metal	●	●
Polishing metal	●	

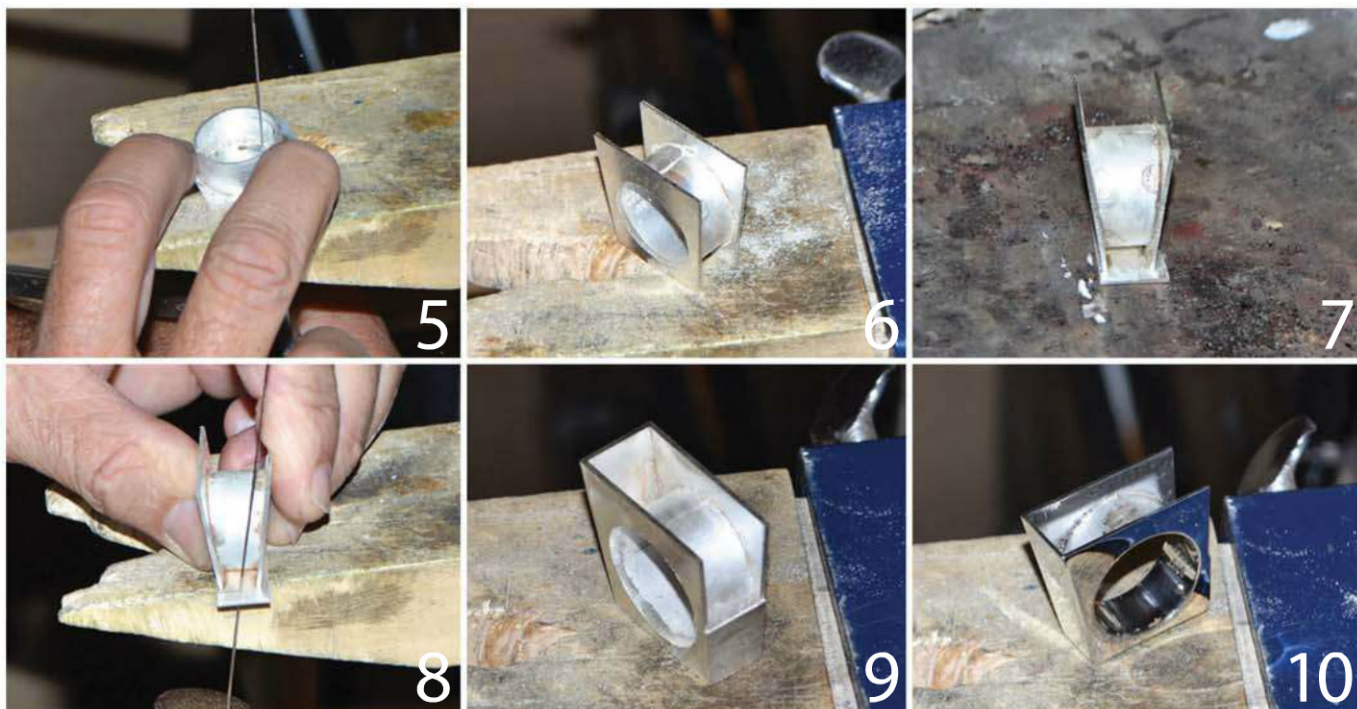
B Basics, page 73

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ONLINE EXTRA

Determine your ring-band length with our "Ring Size Chart" at www.artjewelrymag.com/reference.

Learn how to inlay this ring with custom-cut stones!
"Inlay Stone into a Hollow Form"
(page 37)



alternative inlay materials

Don't want to use stone? There are other ways to add color and contrast to your hollow ring without needing to cut, grind, and inlay stone. They can be filled with a variety of materials, including resin, polymer clay, wood, or fiber. You can also leave your piece empty, and patinate the interior.



Sterling silver and resin-inlay ring by Jillian Palone.

NOTE: The front and back plates may become misaligned while soldering, causing you to have to file everything down to make them even. Making the back plate larger than the front allows you to make adjustments without significantly affecting the size of the ring.

Solder the back plate. Align the bottom edge and one side of the back plate with the front plate, and solder it to the other side of the ring band. Pickle, rinse, and dry the assembly.

Pierce the back plate from the center of the ring band as before.

File the front and back plates. File the top and bottom of the front and back plates flat. File the side edges of the front

and back plates until they extend an even distance on either side of the band.

The side and bottom edges of the front and back plates must be level in order to attach the walls. To test this, lay your flat file across the front and back plates edges, and make adjustments as needed [6].

Attach the bottom and side walls. Cut out a piece of silver that's slightly larger than the bottom of the ring. Solder it to the bottom edges of the ring [7]. Pickle, rinse, and dry the assembly.

Saw off excess silver from the bottom piece [8], and file the ends flush with the sides of the front and back plates.

Repeat to solder a piece of silver onto each side of the ring.

NOTE: I made one side wall full height and the other nearly halfway up so that I could inlay stones into the side of the ring.

Finish the ring. Use the jeweler's saw to trim excess metal from the edges of the ring, making sure not to saw into the hollow form. It's better to do a little more filing now than to wreck your ring. File all of the joints and remove excess silver [9].

NOTE: If possible, don't file the joints until you've finished all soldering operations. If a joint has been filed completely flush and you then solder next to that joint, a little bit of solder may suck up into the joint, leaving an indented line where your flush joint was, and you'll have to do more filing.

Use 320-grit sandpaper to sand the front, back, bottom, and sides of the ring to remove firescale.

Use 120-grit sandpaper on a mandrel with a polishing motor to sand the inside of the ring. Alternatively, wrap sandpaper around a wooden dowel, and use that to sand the inside of the ring.

Use progressively finer grits of sandpaper and polishing cloths to polish all surfaces of the ring that will be exposed, including the edges of the front and back plates. Buff your ring if desired to create a high shine. **AJ**

INLAY STONE into a Hollow Form

*Use basic lapidary tools and techniques to inlay
a colorful patchwork of stones into a custom setting.*

by Jeff Fulkerson



Creating inlaid jewelry is like painting with rocks. You can choose any colors and patterns you can imagine. When you combine the freedom to create a form you desire in metal and then cut stone to your whim, the possibilities become endless. You don't have to make a ring exactly like mine — in fact, I'd be disappointed if you did! Just use it as a guideline for your own artistic voice. It's important that you learn and understand the techniques I show you, because then you can add them to your arsenal and use them in any of your designs. It isn't difficult if you have the right equipment and a lot of patience. Once you master the technique, you can incorporate it into other work either as a complete multiple-stone mosaic inlay piece or as an added touch.

materials

- Hollowform ring
- Variety of stones, Mohs hardness 4–5
- Sterling silver sheet scraps: 16-, 18-, and 24-gauge (1.3, 1.0, and 0.5 mm)



toolbox, page 76

- Sawing/Piercing

additional tools & supplies

- Masking tape, 2 in. (51 mm) wide
- Eye protection
- Respirator (optional) or dust mask
- Trim saw
- Flat lap with 180-grit diamond lap (optional)
- Lapidary arbor with 180–1500-grit belts
- Plastic apron and towel
- Toothpicks
- 5-minute epoxy
- Acetone
- Cotton swab
- Craft knife
- Superglue
- Third hand
- Flex shaft or rotary tool
- Diamond drill bits: 1, 1.3, and 2.5 mm
- Flush cutters
- Cerium oxide
- Medium silicone polishing wheel (optional)

Find out where to buy supplies, *page 78*
See Safety Basics, *page 75*

BASICS & VIDEOS

Learn fundamental techniques in these bonus tutorials:

Tour of a lapidary trim saw

B



Using a trim saw to cut stone

Tour of a flat lap

The making of a cabochon Parts 1–4

Basic sawing of metal

How to file

●

●

●

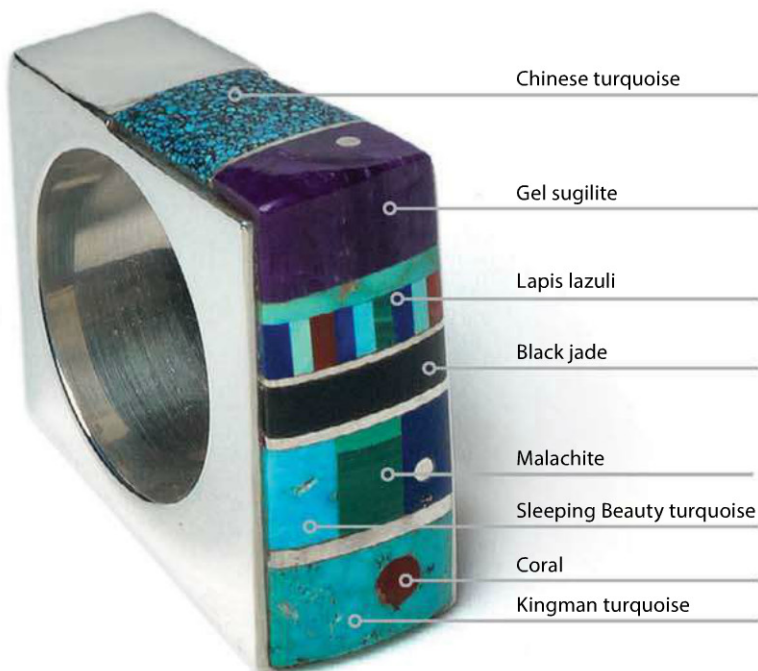
B Basics, *page 73*

V Videos, www.artjewelrymag.com/videos

ONLINE EXTRA

Download a free PDF of the Mohs Scale of Hardness at www.artjewelrymag.com/reference.

My Stones



Choose your stones. Use stones that are roughly the same hardness. Stones that are 4–5 on the Mohs scale are the easiest to use, especially when polishing all of the stones together like we will in this ring. If you try to polish a piece of opal next to a piece of agate, the opal will be ground away and the agate still won't be polished. For my ring, I used sugilite, lapis lazuli, coral, malachite, black jade, and Kingman, Sleeping Beauty, and Chinese turquoise.

NOTE: For this project, you won't use the classic lapidary technique of dopping all of your stones onto a stick. You'll do most of the cutting and grinding while holding the stones. When the wheels are turning with all that nice, cool water on them, it doesn't hurt your fingers to (very) briefly touch the wheel. But keep doing that, and you'll sand through your skin and suddenly see blood on your stone. Believe me, it hurts and takes a long time to heal. Oh, and if you have nice, long fingernails, you probably won't when your ring is done.

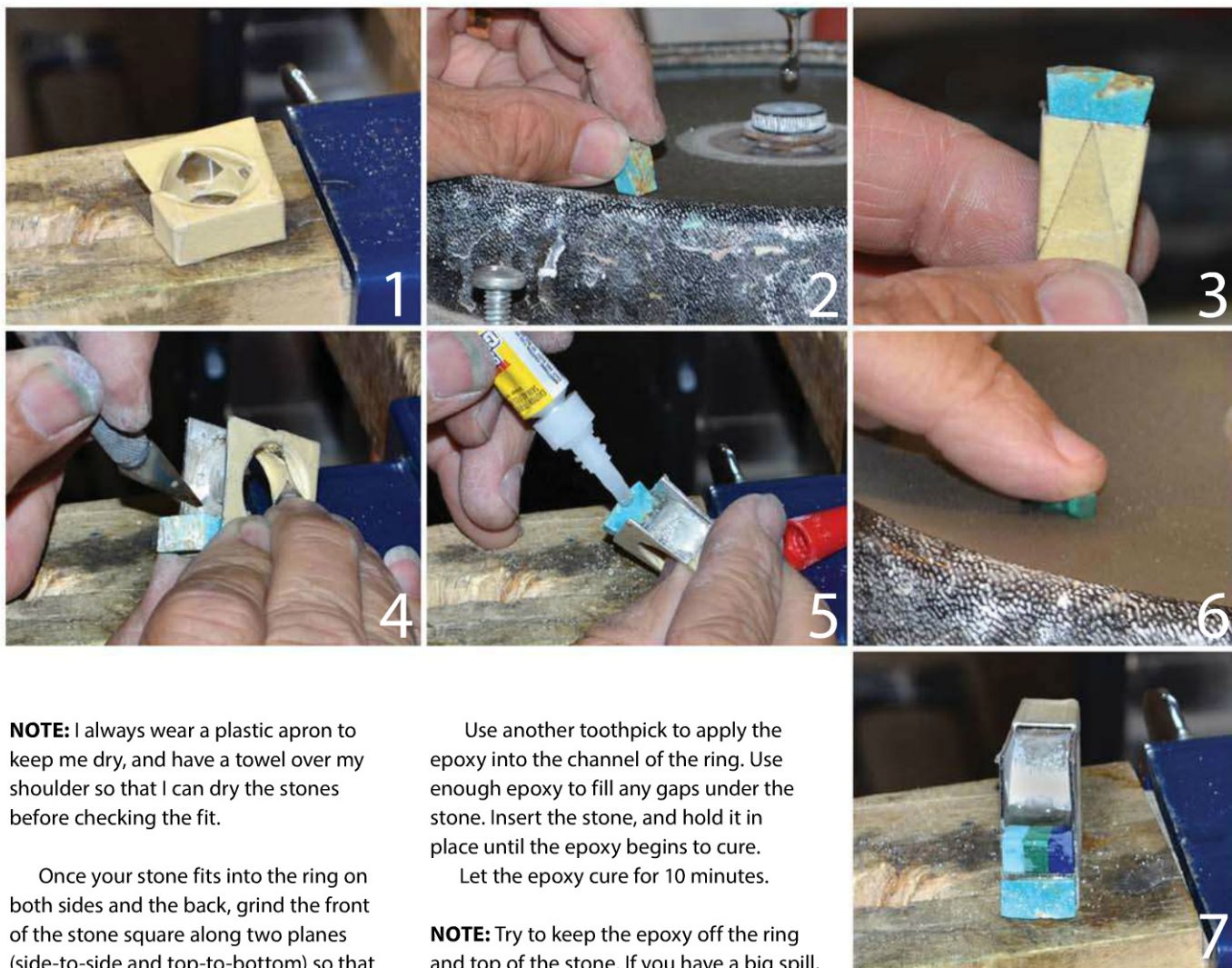
Protect the ring. Put masking tape on all of the surfaces of the ring except the narrow edges; the tape will keep epoxy off the silver while you set the stones [1].

SAFETY NOTE: Always wear eye protection when cutting and grinding stones. Sometimes stones break and fly apart. Also, if you're using any stones that create toxic dust (see "Stones with Toxic Dust," *page 41*), wear a respirator so that you don't inhale any dust. Always keep your stones wet when you cut, grind, or drill them so that the stone doesn't get too hot and crack. You can also damage your drills and grinding wheels if they overheat.

Fit the first stone. Begin at the enclosed end on the top of the ring. Choose a stone, and use a trim saw to cut the stone a little larger than needed to fit into the ring. Use a flat lap with a 180-grit diamond lap [2] or a lapidary arbor with a 180- or 220-grit belt to grind the back and one side of the stone flat.

Once the back and one side of the stone look like they will fit into the ring, begin grinding down the other side of the stone. Go slowly, remove a little stone at a time, and constantly check the fit of the stone in the ring.

Angle the sides of the stones to create a slight wedge. [3]



NOTE: I always wear a plastic apron to keep me dry, and have a towel over my shoulder so that I can dry the stones before checking the fit.

Once your stone fits into the ring on both sides and the back, grind the front of the stone square along two planes (side-to-side and top-to-bottom) so that the next piece you inlay will fit snugly against it. (All joins between stones should be tight with no gaps).

Inlay the stone. Place a 6-in. (15.2 cm) strip of 2-in. (51 mm)-wide masking tape on your bench. Use a toothpick to mix up a bit of five-minute epoxy on the masking tape. Use an equal amount of both components of the epoxy, or it won't properly cure. After you've mixed the epoxy thoroughly, stir it for another 30 seconds to ensure it's uniformly mixed.

NOTE: Mix small amounts of epoxy at a time, and mix more as you need it. You can mix three or four small batches of epoxy on one piece of tape, then peel the tape off and put another piece down. This keeps your bench clean.

Use another toothpick to apply the epoxy into the channel of the ring. Use enough epoxy to fill any gaps under the stone. Insert the stone, and hold it in place until the epoxy begins to cure.

Let the epoxy cure for 10 minutes.

NOTE: Try to keep the epoxy off the ring and top of the stone. If you have a big spill, clean up the epoxy with acetone on a cotton swab before it cures. If necessary, use a craft knife to remove any excess epoxy from the sides and bottom of the ring and face of the stone while the epoxy is still a little gummy [4].

Make a silver setting for your stone mosaic!
"Fabricate a Hollow Ring for Inlay" (page 34)

Inlay a piece of silver. Cut a piece of 16- or 18-gauge (1.3 or 1.0 mm) sterling silver sheet, and fit it into the ring as you did the stone. Once it fits and is the same height as the adjacent stone, make sure the surface of the stone is free of any epoxy residue. Place a drop of superglue on the stone, spread the glue evenly [5], and set the silver piece in place. It should instantly bond to the stone.

NOTE: Use only enough superglue to cover the surface you want to bond. If you apply too much, it won't cure properly — maybe

not at all — and it will squeeze out of the join and glue your fingers to the stone (don't ask me how I know that). It's better to apply a small drop and smear it around with a toothpick so that you don't apply too much.

Assemble an intarsia. Cut turquoise, lapis, and malachite into small rectangles which, when glued together, will be larger than the space you want to put them in the ring. It's best to cut a few more pieces than you think you'll need in case one of them breaks.

NOTE: Malachite's beauty comes from all of the lines in it, but its weakness has the same source — the stone will often split along those pretty lines. To stabilize my piece of malachite, I captured it between turquoise and lapis.



Flatten one side of a piece of lapis. Dry it and set it aside. Repeat to flatten one side of a piece of malachite [6].

Place a small drop of superglue on the flat side of the lapis, spread it evenly over the entire surface, and press the flat side of the malachite against it. They should bond instantly.

Flatten the outside surface of the malachite and one side of the turquoise. Dry the stones and glue them as before.

Inlay the intarsia. Treat the intarsia as a single stone, and shape it to fit into the ring against the silver sheet. Use epoxy to set it into the ring [7].

Hold the ring securely, and use the 220-grit wheel to grind down the set stones so that they're a uniform height [8]. Don't grind them all the way down, just enough to even up the tops.

Add additional silver and stone. Use the same process to add a piece of 18-gauge (1.0 mm) sterling silver, a piece of black jade, and a piece of 24-gauge (0.5 mm) sterling silver. Grind the tops even again.

Assemble and add a second intarsia. To add a little interest and color to the ring,

make another intarsia using turquoise, malachite, lapis, and coral. Glue a narrow strip of turquoise to one side of the intarsia before shaping it so that it doesn't fall apart as you fit it into the ring [9]. Grind and fit the intarsia into the ring as before.

Add the corner stone. Cut a piece of gel sugilite for the corner piece of the ring.

This is the hardest piece to fit because it must fit perfectly on both the top and side of the ring. Once you're happy with the fit, use epoxy to set it into place.

Add stones to the side of the ring. Add a piece of 24-gauge (0.5 mm) sterling silver and a piece of Chinese turquoise to finish the side of the ring.

Dop stones for dots. Cut a few small pieces of coral or turquoise (or whatever stone you prefer). Place a stone on your bench, and put a bit of epoxy onto the cut-off end of a toothpick. Press the toothpick against the stone, and hold it in place with a third hand until the epoxy cures (at least 30 minutes). Repeat to dop a variety of stones [10].

To see more examples of exquisite inlaid jewelry, see "A Brief History of Inlay," page 42.

NOTE: Cut and prepare a variety of stones in case you change your mind and want to add more dots or a stone pops off the toothpick while you are shaping it.

Drill holes in the inlay. While you wait for the epoxy on your dopped stones to cure, drill holes in the inlaid stones. This can be a little scary, but use a lot of water and go slowly; you should have no problems.

Use a fine-tip permanent marker to mark the spot you want the hole to be (mine is in the first piece of turquoise I set into the ring). Use the side of a 1 mm diamond drill bit (without water so that you can see the mark) to gently score the stone at the mark. This divot will prevent the 2.5 mm bit from skipping over the stone.

Use a 2.5 mm diamond bit with water to drill a hole approximately 2 mm deep at the mark [11].

Repeat to score the stone and use a 1.3 mm diamond bit to drill holes for 16-gauge (1.3 mm) sterling silver wire where you want them.

Grind the dots. Insert a toothpick with a dopped stone into your flex shaft or rotary tool. Put a 400-grit belt on the lapidary arbor, and turn the arbor on. Turn on the rotary tool at a low speed, and begin to shape the stone against the arbor [12]. This will create a perfectly round stone. Angle the stone against the arbor to give it a slight bevel and make it cone-shaped. Go slowly, and periodically dry the stone and check the fit.

Inlay the dots. Once you're happy with the fit, dry the dopped stone and the 2.5 mm hole. Put a bit of superglue into the hole, insert the dopped stone [13], and use a paper towel to wipe off any excess glue. After the glue has set, either twist the toothpick to remove it from the stone, or cut it off.

To insert the 16-gauge (1.3 mm) wire, put a drop of superglue into each 1.3 mm hole, insert the wire, and wipe off the excess glue. After the glue is set, use flush cutters to trim the excess wire.

Polish the stones. Start with a 400-grit belt to carefully grind down the inlaid stone dots and silver wire. Grind down the top and sides of all the stones to the finished dimension.

stones with toxic dust

 When cutting, grinding, and polishing stones, you want to make sure that the dust that's produced isn't going to harm you. There are some known stones that you must wear a respirator when working with. You have to be really careful with stones that have copper in them, such as azurite, malachite, and chrysacolla, but any stone with metal in it requires caution. Also, shells, pearls, coral and amber can contain bacteria. You could make a case for always wearing a respirator when cutting, grinding, or polishing stones, but I don't know anyone who does, except with these materials.



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ASK THE ARTIST: JEFF FULKERSON



How did you know that you were supposed to be a jewelry maker?

"I always wanted a big turquoise bracelet like my cousin's, so I bought a book that showed you how to make a ring, made it, and it looked like a ring! That's when I knew I could make jewelry, and the more I made, the more I liked it."

Contact: www.aldenjeffriesdesign.com

NOTE: I like to leave an approximately 1 mm (1/32-in.) lip on the stones above the metal and put a slight crown/bevel on the edges of the stones to create interest.

Move through progressively finer grits, finishing with a 1500-grit belt. Polish the entire ring with cerium oxide.

Remove the masking tape from the ring. If there is a little bit of epoxy on the edges of the silver, use a medium silicon polishing wheel on a mandrel in the flex shaft to remove it.

Repolish the silver if necessary. 



Ring shown actual size.



A Brief History of Inlay

by Jeff Fulkerson

The Zuni first set turquoise in silver in the 1890s, and are credited as being the first American Indian tribe to do so. As they evolved their own distinctive style of jewelry, they started to build the stones around the silver work, in contrast with the Navajo style of creating the silver work around the stone. Inlay was the result of this evolution. Inlay is the art of setting the stone into a silver channel, as opposed to setting it on the silver. Since the '30s, the diverse styles of the different Southwest tribes have overlapped. Now, just because you see an inlaid piece doesn't necessarily mean it's Zuni.

As modern tools and materials became available in the late '60s, the technique took off. Artists like Charles Loloma (Hopi) and Preston Monongye (Hopi/Mission) brought a real sense of style and design to their inlay pieces. Some of the most notable inlay artists today are Jesse Monongye (Hopi/Navajo), Lee Yazzie (Navajo), Richard Tsosie (Navajo), and too many more to mention in just two pages! 



Jesse Monongye. "Night Sky Bracelet."

Lawrence Jeffrey Estate Jewelers, photo courtesy of www.1stdibs.com.



Charles Loloma. Pendant. 14k gold, four parallel channels inlaid with turquoise, coral, ironwood, and opal. 3¾ in. (95 mm) long. Photo courtesy of Bonhams.

Lee Yazzie. Ring. 14k gold, coral, lapis, and turquoise. 1½ in. (17.5 mm) wide.

Photo courtesy of Bonhams.



Charles Loloma, c. 1980. Classic height inlay bracelets. Bottom: Sterling silver inlaid with Nevada Blue turquoise, coral, lapis lazuli, and 14k gold. Middle: Sterling silver inlaid with lapis lazuli, coral, and 14k gold. Top: 14k gold inlaid with coral, turquoise, lapis lazuli, and fossilized ivory.

Photo courtesy of Shiprock Santa Fe, Santa Fe, NM.



Preston Monongye. Tufa cast cuff with pictographic hallmark. Mosaic rows of turquoise, coral, jet, and shell.
Photo courtesy of Bonhams.



Raymond Yazzie. Cuff. 14k gold band inset with over 650 individually cut and polished inlays of coral, turquoise, and lapis lazuli. 2½ in. (67 mm) wide.
Photo courtesy of Bonhams.



Jesse Monongye. Bear pendant and choker. 14k gold inlaid with a mosaic of turquoise, lapis lazuli, jet, coral, shell, and gold. Pendant: 2¾ in. (70 mm) long. Overall: 9½ in. (24.1 cm) long. Photo courtesy of Bonhams.

GALLERY

[A] Danielle Miller enjoys exploring the playful aspect of jewelry by incorporating movable parts in her designs. Inspired by the freely sliding pieces of an abacus, she created *Midnight Marquise*, in which blackened sterling silver houses white pearls that slide to and fro. Photo by Hap Sakwa.

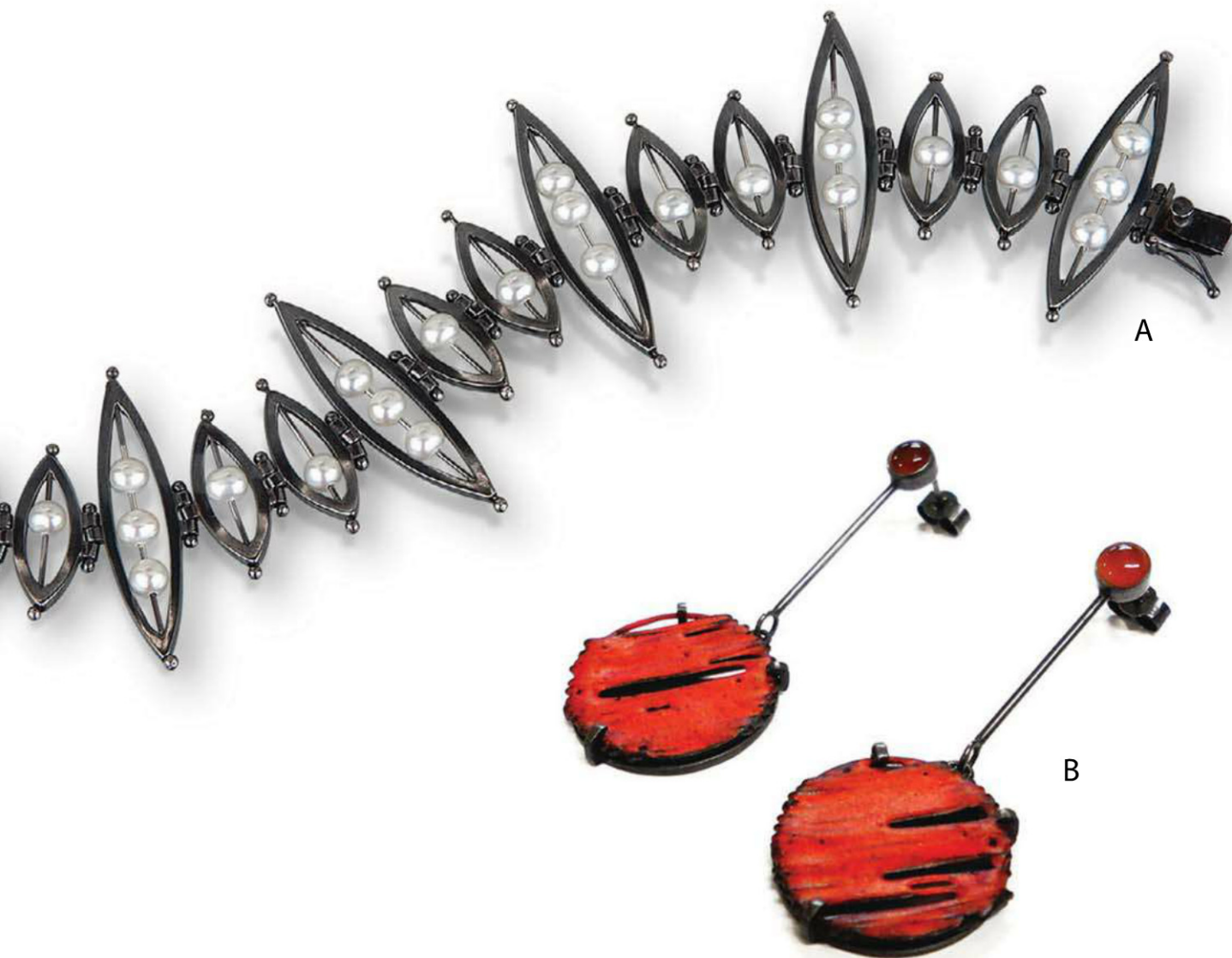
[B] Fascinated by the process and intense color options of enameling, **Stacey Bentley** creates a fusion of

traditional techniques and contemporary ideas. Using a mixed-media approach to reflect an urban landscape, Bentley combines iron and sterling silver, stones, and enamel to achieve a painterly expression.

[C] *Where She Stops, Nobody Knows* by **Ann Marie Cianciolo** depicts humor, duality, and mischief. Close examination of the playful carousel ring adorned with tiny bird fashionistas

reveals that Cianciolo crafted her piece with movable parts, adding to the intrigue and surprise. Oxidized sterling silver, 18- and 14k gold, copper, spinel, and pearls. 2½ x 1¼ x 1¼ in. (63.5 x 12.7 x 12.7 mm). Photo by Larry Sanders.

[D] **Maureen and Michael Banner** worked together to create their stunning silver collar, *Ionic Collar #3*. First, Michael forms silver sheet into beautiful hollowform components that



Maureen then assembles into a lively statement piece. The end result is gently bead-blasted to achieve a matte finish. Photo by John Polak.

[E] *Jitterbug*, from **Jeanie Pratt's** "Bugs are Beautiful" series, displays Pratt's fascination with the surreal beauty of insects. She uses fiber techniques to layer copper wire for texture, then employs niobium to mimic the colors of iridescent beetles. Photo by Carol Holyday.



To contact the featured artists, see *Contacts*, page 78.

[F] Harold O'Connor has been creating exquisite metal jewelry for over 40 years. For this leaf brooch, he first incorporated notes of nature by roll-printing a natural leaf onto sterling silver, then adorned the silver with granules of 18k gold for added texture, color, and interest. His brooch is from a series of work based on autumn, when leaves change from green and full-bodied, through an amazing range of colors, and finally to skeletal forms.

[G] Ephemeral is based on the ideas of impermanence and constant change.

Lital Mendel created her delicate statement piece by carefully wrapping string into a striking organic form. The shape of her jewelry seems at first to be a whole, coherent construct, but closer inspection reveals the fragile delicacy of the thread, simply wrapped and coiled to create a hollow form.

Photo by Noa Kedmi.

[H] Working with materials from the hardware store, such as aluminum and rubber tubing, **Ian Henderson** created his pendant, *Conjoined Chimeras*. Henderson uses an intuitive process that resembles natural incremental growth patterns: He cuts and layers components one at a time, building and creating as he goes rather than cutting to a predetermined design.

3½ x ½ in. (88.9 x 12.7 mm). Photo by

Tom Bloom. **[A]**



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H

To contact the featured artists, see Contacts, page 78.

Put Tension & Leverage to Work with an **OMEGA CLIP**



*Build a simple mechanism
to balance and secure
statement earrings.*

by Casey Sheppard

What is more beautiful, fun, or necessary in jewelry (and life) than mechanics?

The challenges of creating jewelry can be figuring out the movement, function, and overall mechanics of a piece. Being a self-taught artist who makes all elements by hand (chains, clasps, ear posts, etc.), I've been forced (in a good way) to dive in and figure out how to make these parts.

This led me to the Omega clip. I love big, bold jewelry, but the problem with the large awesomeness of statement earrings is comfort. There is only so much an ear can hold, and with age ... oh, let's not go there!



Drill and cut the tubing. Use a ruler or calipers to measure 3 mm ($\frac{1}{8}$ in.) from the end of a length of 3 mm outside-diameter (OD) sterling silver square tubing. Use a permanent marker to mark this point [1].

Make a mark at the midpoint of one side of the tubing 1.5 mm ($\frac{1}{16}$ in.) from the end. Use a #55 (0.052-in./1.32 mm) drill bit to drill a hole through the top and bottom walls of the tube at the mark [2].

File a groove in the tubing. Use a round needle file to make a 0.5–1 mm ($\frac{1}{64}$ – $\frac{1}{32}$ -in.) deep groove in one of the drilled walls of

the tubing; the groove should be aligned with the hole and perpendicular to the tubing [3].

NOTE: This groove is where the magic happens; it will act like an automatic spring, locking the clip in place vertically when the earrings are assembled. (It's not magic yet, but it will be, you'll see!)

Place the tubing in a tube-cutting jig or rest it on your bench pin. Use a jeweler's saw with a 3/0 blade to cut the tubing at the marked line [4].

materials

- Sterling silver tubing: 3 mm ($\frac{1}{8}$ -in.) outside diameter (OD) x 0.635 mm wall thickness, square, 13 mm ($\frac{1}{2}$ in.)
- Sterling silver wire:
 - 20-gauge (0.8 mm), 20 mm ($2\frac{3}{4}$ in.)
 - 16-gauge (1.3 mm), 89 mm ($3\frac{1}{2}$ in.)
- Materials to finish the front of earrings

toolboxes, page 76

- Sawing/Piercing
- Soldering/Annealing

additional tools & supplies

- Ruler or calipers
- Tube-cutting jig (optional)
- Flatnose pliers
- Sandpaper, various grits
- Fine mini-fiber wheel with mandrel
- Steel bench block
- Dapping punch or dowel, 9 mm ($2\frac{3}{64}$ -in.) diameter
- Cup bur (optional)
- Chasing hammer

Find out where to buy supplies, page 78
See Safety Basics, page 75

BASICS & VIDEOS

Learn fundamental techniques in these bonus tutorials:

Drilling through metal

B



How to file

Basic sawing of metal

Sanding

Soldering

Annealing metal

Pickle basics

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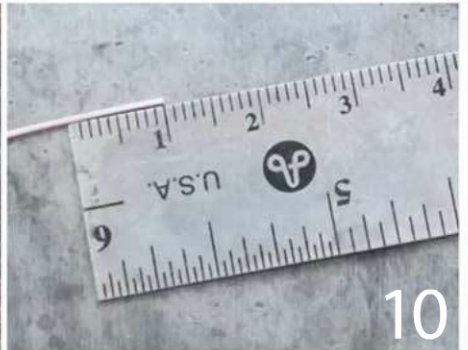
B Basics, page 73

V Videos, www.artjewelrymag.com/videos

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There's more than one way to cut a tube!
Find a variety of ways to cut tubing at
www.artjewelrymag.com/reference.



Flatten the tube. Use flatnose pliers to hold the cut tube, and file the ends flat. It's important the tube is flat so that it can be soldered to the earring back. You can also place a piece of sandpaper on a flat surface and sand the tube until it's flat [5].

NOTE: Flatnose pliers are one of my most-used tools. They're like death-grip fingers for holding onto small pieces when filing, sanding, or polishing.

Refine the tube. Sand the tube with progressively finer grits of sandpaper to refine the edges. You can use a fine mini-fiber wheel in a flex shaft, but hold on tight! You don't want the tube to go flying across the room, because then you'll have a temper tantrum when you can't find it and have to make another (been there, done that!).

Repeat to make four drilled, grooved, and sanded tubes.

Form the Omega loops. Flush-cut two 44 mm (1¾-in.) long pieces of 16-gauge (1.3 mm) sterling silver wire. File and sand the ends flat and smooth.

Make marks at the midpoint and 3 mm (⅜-in.) from each end of one wire. Line up the flatnose pliers jaws with one of the 3 mm (⅜-in.) end marks, and grip the wire. Use a steel bench block as leverage to bend the wire to a 90° angle at the mark.

Repeat to bend the opposite end of the wire at its mark, making sure the ends point the same direction.

Repeat to mark and bend the second wire [6].

Center one of the bent wires on a 9 mm (23⁄64-in.) mandrel (I used a dapping-punch shank; a dowel would also do). Use your fingers to bend the wire evenly around the mandrel until the two bent ends touch [7].

Repeat to form the second wire.

NOTE: If the wire is difficult to form, anneal it to make it more malleable.

Remove the mandrel, and use your fingers to form the wire into an Omega symbol. (Ah, that's why it's called an Omega clip; I thought it had something to do with Charlton Heston!)



Solder the tube to the earring back.

Find the midpoint of the top edge of your earring back, and mark it with the permanent marker. Draw a 16 mm (5⁄8-in.) long vertical line down the body of the earring back from the mark. Draw a 10 mm (25⁄64-in.) horizontal line centered on the vertical line [8].

Align the outside edge of a tube with the end of the horizontal line; make sure

the groove faces inward and is parallel to the earring back. Repeat to align a second tube at the other end of the line with the groove facing inward [9]. The tubes should measure 10 mm (25⁄64 in.) from end to end. (If it's not exact, that's okay.)

Apply a light coat of flux to the tubes and the earring back, and use hard solder to solder the tubes to the earring back.

NOTE: To keep the holes aligned while soldering, place a broken or dull #55 (0.052-in./1.32 mm) drill bit into the tubes' holes. This also helps hold the tubes in place on the earring back.

Repeat to solder two tubes to the second earring back.

Place the earring backs in pickle to clean them, and rinse and dry them.

Attach the ear posts. Cut two 10 mm (25⁄64-in.) pieces of 20-gauge (0.8 mm) sterling silver wire [10], and file the ends flat. The marks on the earring back will be gone, so draw a 6.5 mm (¼-in.) vertical line down from the midpoint of the top edge of each earring back.

Use crosslocking tweezers to hold a wire in place aligned at the end of the mark. Apply flux, and use medium solder to solder the wire to the earring back. Pickle, rinse, and dry it thoroughly.



ASK THE ARTIST: CASEY SHEPPARD



How did you know that you were supposed to be a jewelry maker?

"Well, after I was kicked out of the convent I decided I needed a new direction! Okay, seriously, I didn't know I was supposed to be a jewelry maker until my different skills and loves came together — art, fashion, tools, metal, and hard work. But the ah-ha moment was when I spent a day at my work bench, created (what I thought was) a killer piece, and didn't realize how I did it or that I'd been working all day

long, without even a pee break! That's love!"

Contact: www.caseyshepparddesigns.com

Repeat to solder the second wire to the second earring back.

Finish the ear posts. Use flatnose pliers to twist the ear posts 8–10 times to make sure they're securely attached and to work-harden them [11].

Use sandpaper or a cup bur in a flex shaft to finish the ends of the ear posts and remove all burrs. Rub your finger over the end of each post: If it snags, continue to sand the post until it's smooth. There's nothing worse than putting on an earring with an evil, scratchy post. Ouch!

Attach the Omega loop. Use flatnose pliers to insert one end of an Omega loop into one of the inner holes in the tubing. Then, insert the other end of the loop into the hole in the second tube. This can be a little tricky, and may take a few attempts. (No temper tantrums here; your patience will pay off.)

Once the wire is in place, wedge the tips of your flatnose pliers between the wires in the tube, and open the pliers to spread the loop [12]. This may require a little force. The goal is to get the ends of the wires to expand into the holes in the

outer wall of the tubing. As you stretch the loop with pliers, the wires should just click into place.

NOTE: If the loop still feels a bit loose, use flatnose pliers to slightly flatten the top of the loop [13]. That will do the trick!

Open the clip so that the loop lies flat on the bench block. Use a chasing hammer to flatten the top curve of the loop slightly [14]. Hammering helps work-harden the loop so that the clip will stay in place and have a spring in its step.

NOTE: Be careful not to hit the ear post: It'd be awful to do all that work, and then accidentally knock off the ear post. (Again, been there, done that!)

Repeat to attach the second Omega clip to the second earring back.

Finish the front of the earrings to your creative heart's content! 🎨



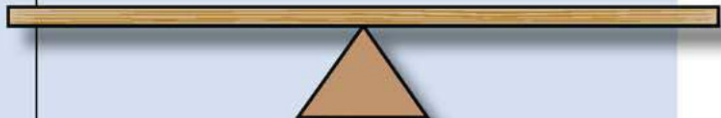
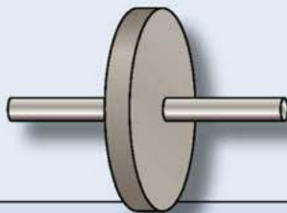
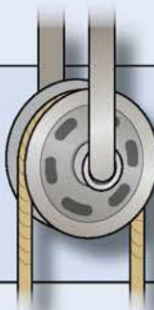
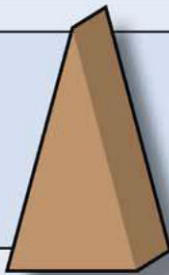
Sheppard's Cabinet of Curiosities earrings are 83 x 30 mm (3¼ x 1⅜ in.). She used sterling silver wire and tubing to stitch and rivet painted PVC pipe to the back plates. Earrings shown actual size.

6 Simple Machines

by Casey Sheppard



Simple machines are, as their name describes, machines that are simple in function. They are everywhere — just look around. The Omega clip (see “Put Tension to Work with an Omega Clip,” *page 48*) is a version of a simple machine: it’s a lever. There are six types of simple machines: lever, wheel and axle, pulley, inclined plane, wedge, and screw. Try incorporating these simple machines to add movement to your jewelry designs!

1	A lever is a stiff bar that rests on a support (fulcrum) and lifts or moves objects. Examples include a bottle opener, wheelbarrow, or even scissors.	
2	A wheel and axle can be a doorknob or windmill, which means it’s a wheel with a rod (called an axle) through its center that lifts or moves weight loads.	
3	A pulley uses a wheel and rope to move or lift things. Kind of like that NordicTrack you no longer use, or a flagpole.	
4	An inclined plane is a slanted surface connecting an upper and lower level. That’s an easy example: stairs, or a ramp.	
5	A wedge is like a portable inclined plane. It can be used to split items apart, like an axe splitting wood, or can be used to hold items in place, such as a door or that annoyingly wobbly dinner table.	
6	And finally, a screw is the last simple machine. It is pretty much an inclined plane wrapped around a rod or pole. I use this one a lot: vise, C-clamps, and I make screws as fasteners in my work. ■	

Space Antenna Charm

by Marthe Roberts/Shea



This charm reminds me of something that would have come out of Spacely Sprockets in the TV cartoon series “The Jetsons.” Do you remember that show? Even as a little kid, high-tech futuristic scenarios fascinated me.

I watched that show religiously!

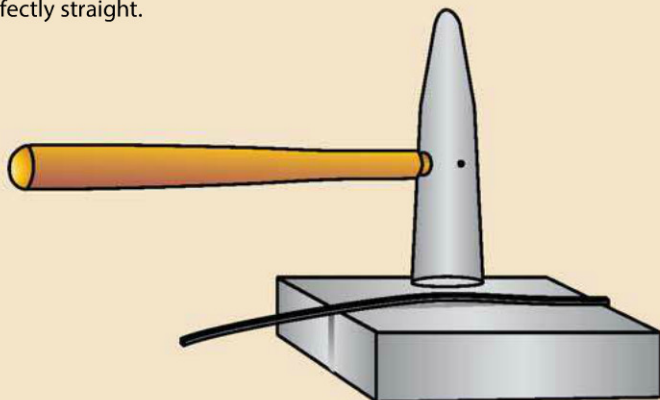
I designed this charm to be lightweight and still have a large presence. Using metal strips instead of heavier sheet underneath the rings greatly reduces the charm’s weight — making a light and airy design perfect for earrings, pendants, and charm bracelets.

- 1 Use a jeweler’s saw with a #2 blade to cut approximately 9 in. (22.9 cm) of straightened 16-gauge (1.3 mm) square wire.

NOTE: Some vendors sell square wire already straightened. When you place your order, ask them about this, or see if they have the capabilities to straighten it for you.

To straighten square wire, anneal it, and then quench, pickle, rinse, and dry the wire. Lay the wire on a bench block and use a plastic flat-faced mallet to lightly tap the arches and curves. Tapping lightly with the mallet will make it less likely to mar the metal.

Turn the wire to flatten each plane. Continue tapping the wire until it’s straight. You may need to anneal the wire a few times before it is perfectly straight.



materials

- Wire: 16-gauge (1.3 mm), square, approximately 9 in. (22.9 cm)
- Metal sheet: 30-gauge (0.26 mm), approximately ¾ x ½ in. (19 x 13 mm)

toolboxes, page 76

- Soldering/Annealing
- Wirework
- Sawing/Piercing

additional tools & supplies

- Mallets: plastic or rawhide
- Handheld shears
- Straightedge
- Wood block

Find out where to buy supplies, [page 78](#)
See Safety Basics, [page 75](#)

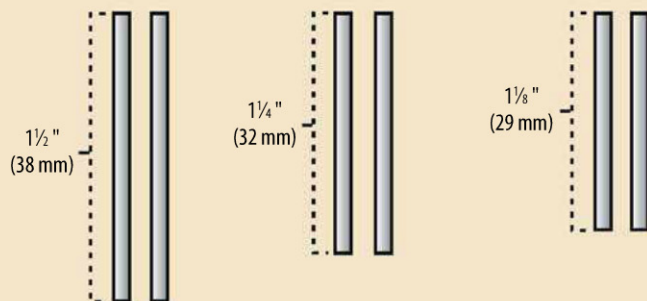
BASICS & VIDEOS

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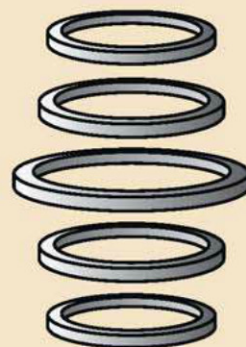
	B	🎥
Annealing wire	●	●
Pickle basics	●	●
How to file		●
Soldering	●	
Using shears to cut metal		●
Basic sawing of metal	●	●
Drilling through metal	●	●
Making jump rings	●	●
Liver of sulfur patina	●	●

B Basics, [page 73](#)

V Videos, www.artjewelrymag.com/videos

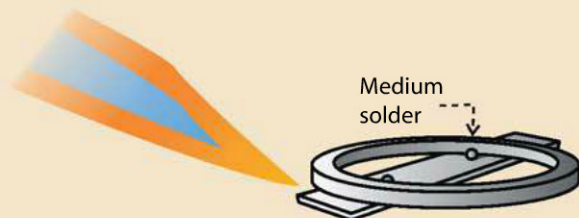


2 Cut two 1½-in. (38 mm), two 1¼-in. (32 mm), and two 1⅛-in. (29 mm) pieces of the straightened square wire. Use a flat needle file to file the ends of each wire flat.



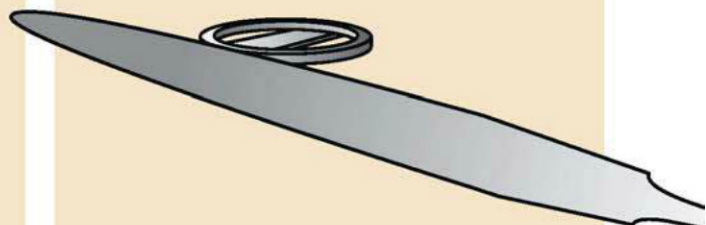
3 Form one 1½-in. (38 mm) wire into a ring, and solder it closed with hard solder. (Set the second 1½-in. [38 mm] piece aside.) Pickle, rinse, and dry the ring. Use a bezel mandrel and rawhide mallet to form the ring into a perfect circle. Use a #2-cut file to remove any excess solder. This will be the center ring of the charm.

Solder and shape the two 1¼-in. (32 mm) and two 1⅛-in. (29 mm) wires into rings using the same technique. You should have five rings: one large, two medium, and two small rings.



4 Use shears to cut a strip of 30-gauge (0.26 mm) metal sheet that is approximately ⅜ in. (5 mm) wide and long enough to span the largest ring with a small amount extending beyond the ring. Flatten the strip, if necessary.

Center the strip underneath the large ring. Place medium solder inside the ring where the strip meets the ring. Draw the solder outward by holding the torch on the outside of the ring. Quench, pickle, rinse, and dry the ring.

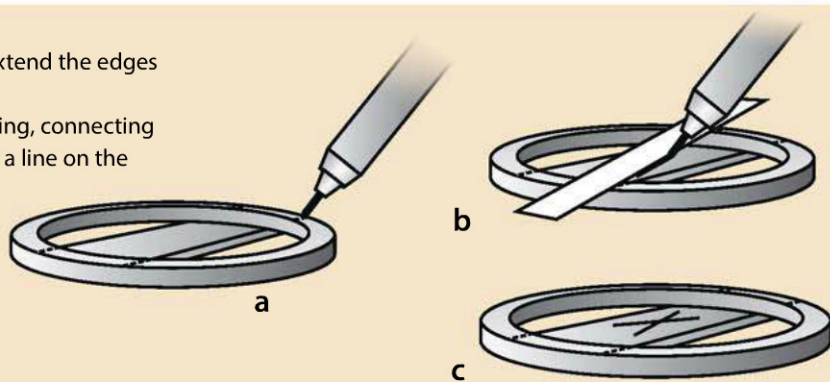


5 Use the jeweler's saw and an 8/0 blade to trim the excess strip on the outside of the ring. File the joins until they're smooth.

6 Use a fine-tip permanent marker to visually extend the edges of the strip onto the ring **[a]**.

Line up a straightedge diagonally across the ring, connecting two of the marks you just drew on the ring. Mark a line on the visual center of the strip **[b]**.

Align the straightedge with the opposite marks, and make another line on the strip, creating an X **[c]**. The center of the X is the center of the piece.

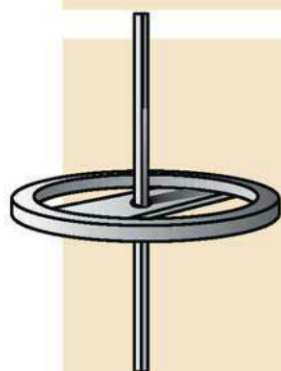
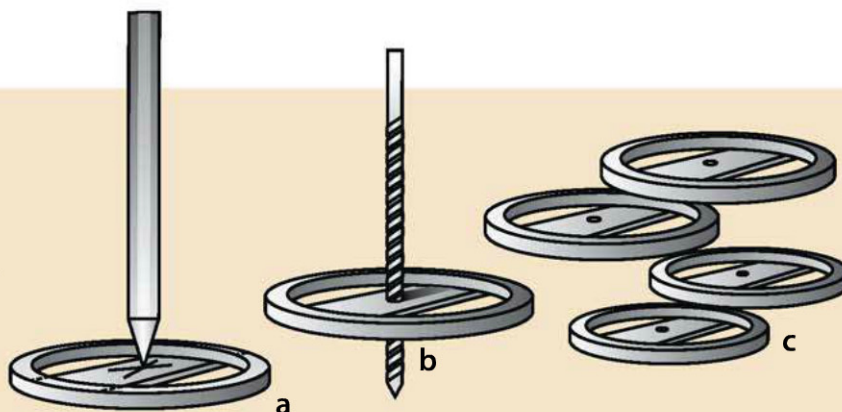


Marthe Roberts/Shea's work has been shown in galleries nationally and has appeared in Art Jewelry's Gallery. She teaches jewelry making at the Cheltenham Center for the Arts (Cheltenham, Pa.) and the Main Line Art Center (Haverford, Pa.). She is also the president of the Pennsylvania Society of Goldsmiths. You can reach her via her website, www.jewelrybymars.com.

7 Place the ring strip-side down on a steel bench block, and use a scribe to make a divot in the center of the X [a].

Move the ring to a wood block, and use a #53 (0.059-in./1.5 mm) drill bit to drill a hole at the divot, perpendicular to the strip [b].

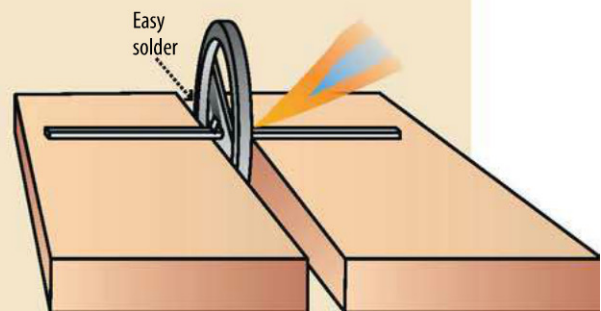
Repeat steps 4–7 to assemble and drill the remaining rings [c].



8 Thread the large ring onto the remaining 1½-in. (38 mm) wire. If necessary, use a needle file to enlarge the hole. Center the ring on the wire.

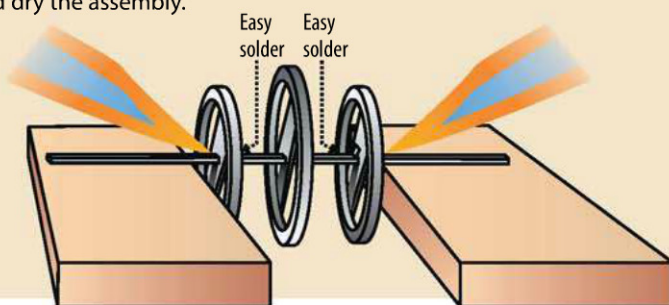
9 Support the assembly between two soldering pads with the ring between them.

Place a pallion of easy solder on the wire and against the strip. Heat the piece from the opposite side of the ring, drawing the solder through the join. Quench, pickle, rinse, and dry the assembly.

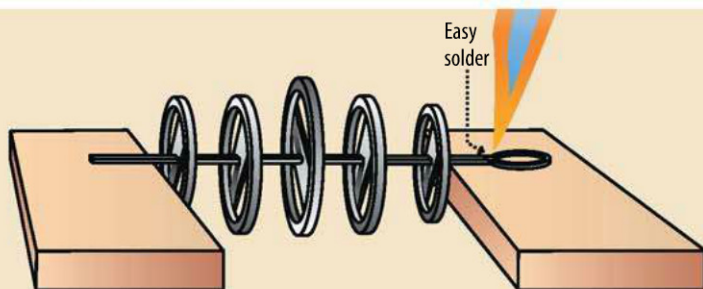
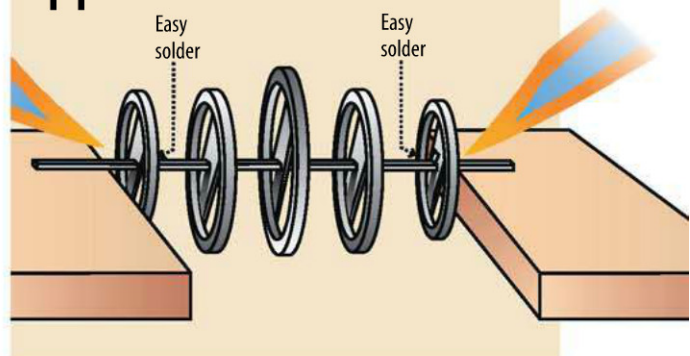


10 Thread the medium rings onto the wire, approximately ⅛ in. (3 mm) from either side of the large ring. Align the center strips, or keep them at different angles to simulate the appearance of movement. Support the piece between two soldering pads, as before.

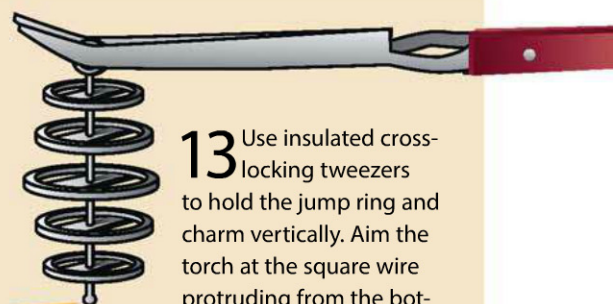
Place a pallion of easy solder on the inside of the rings where the wire touches the strips. Heat the ring from the outside, where you have the most room to maneuver the torch tip. Quench, pickle, rinse, and dry the assembly.



11 Repeat to add the two small rings.



12 Make a small jump ring out of the remaining square wire. Align the end of the square wire and ring assembly with the jump ring join, and use easy solder to solder the jump ring closed and to attach it to the end of the wire at the same time.



13 Use insulated cross-locking tweezers to hold the jump ring and charm vertically. Aim the torch at the square wire protruding from the bottom of the charm, and ball up the end of the wire. Quench, pickle, rinse, and dry the assembly.

Polish or patinate your charm as desired. 

EXPLORE TEXTURING TECHNIQUES:

4 Ways to Dress up a Cuff

Learn to create a variety of textures on thin-gauge copper, then rivet them to a simple copper cuff.

by Eva Sherman

By applying different textures, you can dramatically alter the look and feel of a finished piece of jewelry. All of these cuffs were created using the same materials and assembly techniques, but it's the texture that forms the individual personality of each finished piece. Try these four techniques, and then begin experimenting to see how many different looks you can devise!





BASICS & VIDEOS

Learn fundamental techniques in these bonus tutorials:

Annealing

B



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•

Using shears to cut metal

•

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How to file

•

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Roll-printing metal

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Drilling/Piercing

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Pickle basics

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•

Setting wire rivets

•

•

Patinating with liver of sulfur

•

•

B Basics, page 73

V Videos, www.artjewelrymag.com/videos

materials

- Copper sheet (per cuff):
 - 20-gauge (0.8 mm): 1¼ x 6 in. (3.2 x 15.2 cm)
 - 30-gauge (0.26 mm): 2 x 8 in. (5.1 x 20.3 cm)
- Copper wire: 20-gauge (0.8 mm), round, 10 in. (25.4 cm) (for wire-wrapped texture only)
- 4 copper rivets (per cuff), ½ in. (13 mm)



toolboxes, page 76

- Finishing
- Soldering/Annealing
- Wirework

additional tools & supplies

- Embossing machine (optional)
- Embossing folder (optional)
- Microfold brake or tube wringer (optional)
- Steel oval bracelet mandrel
- Guillotine cutter (optional)
- Shears
- Flex shaft or rotary tool with #54 (0.055-in./1.40 mm) drill bit, or 1.5 mm (⅛ in.) metal hole punch
- Spray sealant (optional)

Find out where to buy supplies, page 78

See Safety Basics, page 75

METAL PREPARATION

Make the cuff base

Use a jeweler's saw with a 2/0 blade, or a bench shear to cut a strip of 20-gauge (0.8 mm) copper to 2 x 8 in. (5.1 x 20.3 cm). Use a flat file to round the corners and file the edges. Use 400-grit sandpaper to refine the edges.

Use a rubber mallet to form and work-harden the blank around a bracelet mandrel. (If you don't have a bracelet mandrel, see "Alternative Bracelet Mandrels," page 60.)

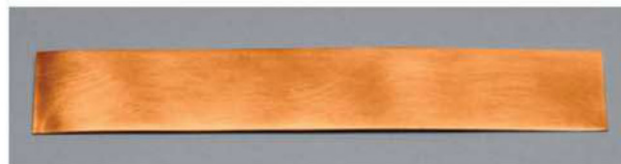
Cut the panel blank

Use a bench shear or a jeweler's saw with a 2/0 blade to cut a strip of 20-gauge (0.8 mm) copper to 1 1/4 x 6 in. (3.2 x 15.2 cm).

Anneal the panel blank

Annealing the panel blank will allow it to take a texture more easily. Place the blank on a heat-resistant soldering surface, such as a firebrick or soldering pad. Use a torch to heat the metal evenly until it glows red. Quench the metal in water, pickle it to clean it, then rinse and dry it thoroughly.

NOTE: Be careful when annealing thin-gauge metal. Because it's thin, the metal is easy to overheat, and it may melt. Keep your torch moving, and watch the color of the metal to prevent it from overheating.



Learn how to make a bracelet blank!

www.artjewelrymag.com/videos



TEXTURES

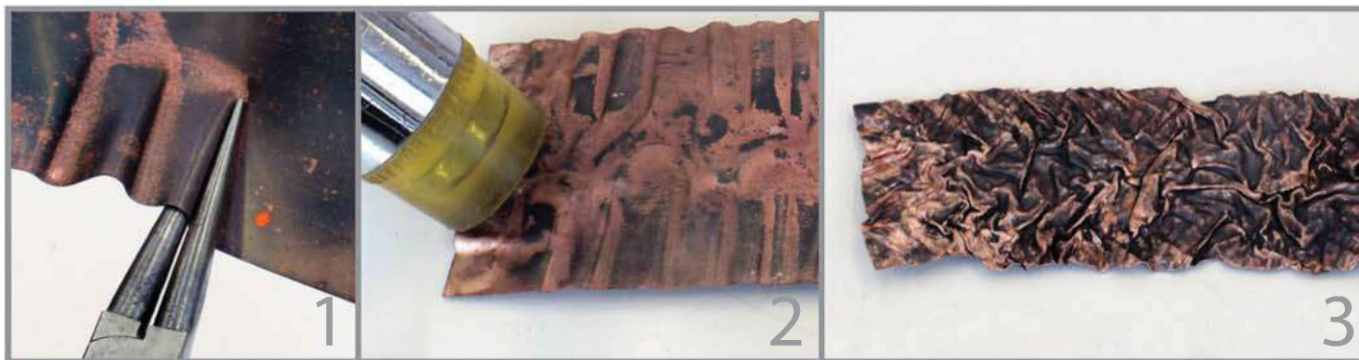
Technique #1: Sherman fold

Use roundnose pliers to grasp the edge of an annealed copper panel and twist. Repeat to grasp and twist another section of the metal adjacent to the first twist. Continue to work your way around the perimeter of the metal, and continue twisting sections [1].

Place the panel on a bench block and use a rubber mallet to flatten it and compress the folds [2]. Anneal, quench, and dry the metal.

Repeat the process, twisting the metal from different angles. The more you repeat the process, the more dramatic the wrinkled effect will be.

Keep in mind that the more wrinkles you make in the panel, the shorter it becomes. I repeated the process five times; the length of my panel reduced from 8 in. (20.3 cm) to 6 in. (15.2 cm). The width stayed approximately the same, but some curvature occurred [3].



Technique #2: Embossing

Some of the current paper-craft embossing machines can also emboss thin gauges of metal, much like a rolling mill.

NOTE: I use the Sizzix Big Shot, which can emboss 36–24 gauge (0.13–0.5 mm) metal. The thicker gauges show a softer impression and the thinner gauges show a crisper impression. A number of other embossing machines on the market will also work for metal.

Follow the manufacturer's instructions for your machine. For the Sizzix machine, sandwich an annealed 30-gauge (0.26 mm) copper panel in a plastic embossing folder [1]. Run the folder through the embosser twice: once forward, and once backward [2].



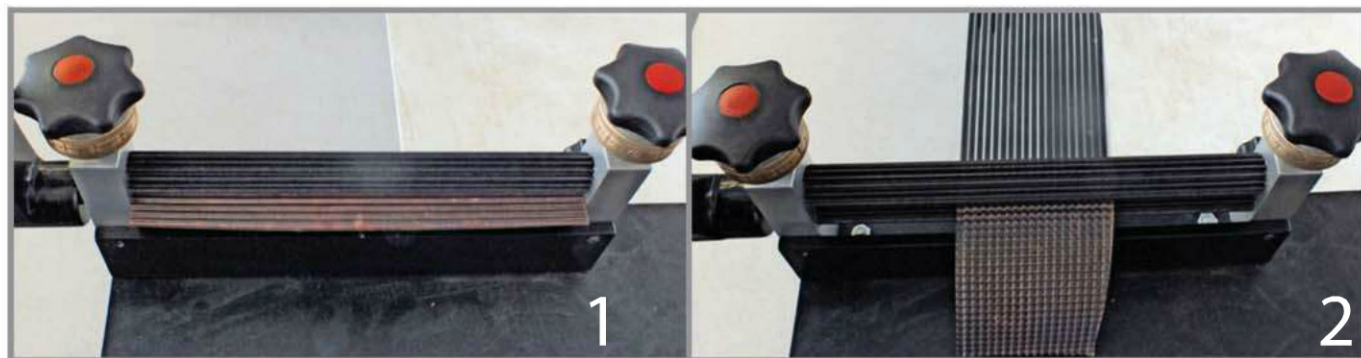
Technique #3: Corrugating

With its grooved rollers, a microfold brake can make metal mimic the wavy layer of corrugation found in cardboard boxes. Calibrate and test the microfold brake according to the manufacturer's instructions.

Line up the long edge of an annealed 30-gauge (0.26 mm) copper panel parallel to the rollers of the brake, and run the metal through [1]. Anneal, quench, pickle, and dry the panel.

Widen the space between the rollers to compensate for the new height of the corrugated panel. Align the short edge of the panel parallel to the rollers, and run the panel through the brake a second time to create a checkerboard effect [2].

NOTE: You can use a tube wringer to create a corrugated pattern, but the tool is too narrow to corrugate the full 8-in. (20.3 cm) length on the second pass.





Technique #4: Wire wrapping

Wrap 20-gauge (0.8 mm) round copper wire around one end of an annealed 30-gauge (0.26 mm) copper panel. Continue to wrap around the panel, spacing out the wraps as you desire, until you reach the other end of the panel [1].

Set the wrapped panel on a bench block and use a rubber mallet to hammer it. Unwrap the wire.

If you want to add more texture, anneal the panel and repeat the process until the desired texture is achieved [2]. (To get the flared edges on this cuff, see "Add Ruffles to the Base," below.)



add ruffles to the base

After you've formed the cuff base on the bracelet mandrel, anneal it and lay it on a solid surface. Beginning at the midpoint of one long side, use chainnose pliers to bend the edge of the metal outward (sort of like making a pie crust). Protect the metal by wrapping the tips of your pliers with painter's tape. Continue to make bends on both sides of the cuff; space the bends $\frac{1}{2}$ – $\frac{3}{4}$ in. (13–19 mm) apart. Anneal the cuff base again, and accentuate the bends by hammering the ruffles with the cross-peen end of a riveting hammer. After you've achieved the desired ruffled effect, place the cuff base back on the mandrel. Reshape it, and use a rubber mallet to work-harden the flat center of the base.

alternative bracelet mandrels

Don't have a bracelet mandrel? While forming can be accomplished by incorporating a wooden alternative, work hardening and riveting will need a more rigid metal surface. Some of these household items make good substitutes:

- Wooden baseball bat
- Wooden rolling pin
- Soup can
- PVC or metal pipe from the hardware store
- Chair leg or table leg
- Wooden lamp base
- Head of a sledge hammer (metal) or a tent-stake mallet (rubber)



ASSEMBLY

Trim and refine the textured panel. Use a guillotine cutter or shears to trim the copper panel to 1 x 6 in. (2.55 x 15.2 cm) [1]. Use shears to trim the corners.

Use a hand file to remove any burrs from the edges and to round the corners. Refine the edges with 220-grit sandpaper.

Make the holes in the panel. Use a 1.5 mm metal punch or a #53 (0.055-in./1.40 mm) drill bit in a flex shaft or rotary tool to make holes in all four corners of the panel [2].

NOTE: Each hole should be at least 1/8 in. (3 mm) away from its nearest edge.

Form the textured panel. Use a rubber mallet to form the textured strip into a cuff around the bracelet mandrel. Leave the panel on the mandrel and hammer it with a rubber mallet to work-harden it.

Pickle and clean the panel with a brass brush and soapy water.

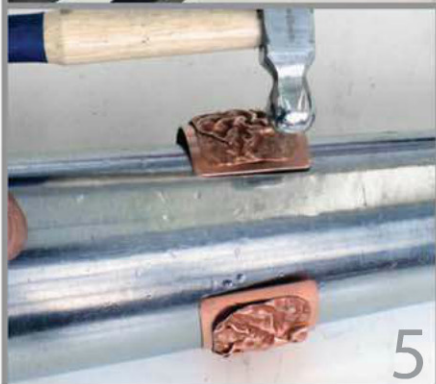
Rivet the panel to the base. Center the panel over the cuff base. Use one of the corner holes in the textured panel as a guide to

punch or drill the first hole in the base [3]. Thread a 1/2-in. (13 mm) copper rivet through the holes from the back of the bracelet. Use the mandrel to stabilize the placement of the layers. Use wire cutters to trim the rivet [4] so that only about 1/16 in. (1.5mm) protrudes from the face of the bracelet. Use a cross-peen hammer to secure the rivet [5]. Then, drill the next hole and set the rivet.

TIP: When connecting with multiple rivets, drill the pilot holes and secure the rivets one at a time to assure the materials stay aligned.

Repeat to drill and set the third and fourth rivets.

Finish the cuff. Patinate the cuff with liver of sulfur according to the manufacturer's instructions. Use #0000 steel wool to remove the patina from the high points of the texture and any part of the base cuff you desire. For extra shine, tumble-polish the cuff with steel shot and burnishing compound. I recommend using a spray sealant to prevent tarnish and to help protect the skin of the wearer.



ASK THE ARTIST: EVA SHERMAN



How did you know that you were supposed to be a jewelry maker?

"In my former career as an architect, I appreciated the integration of form, function, texture, and design to create large-scale works of art. But as soon as I discovered I could integrate those elements in jewelry design and construct the pieces with my own hands, I knew I would be a jewelry maker." Contact: evasherman@sbcglobal.net

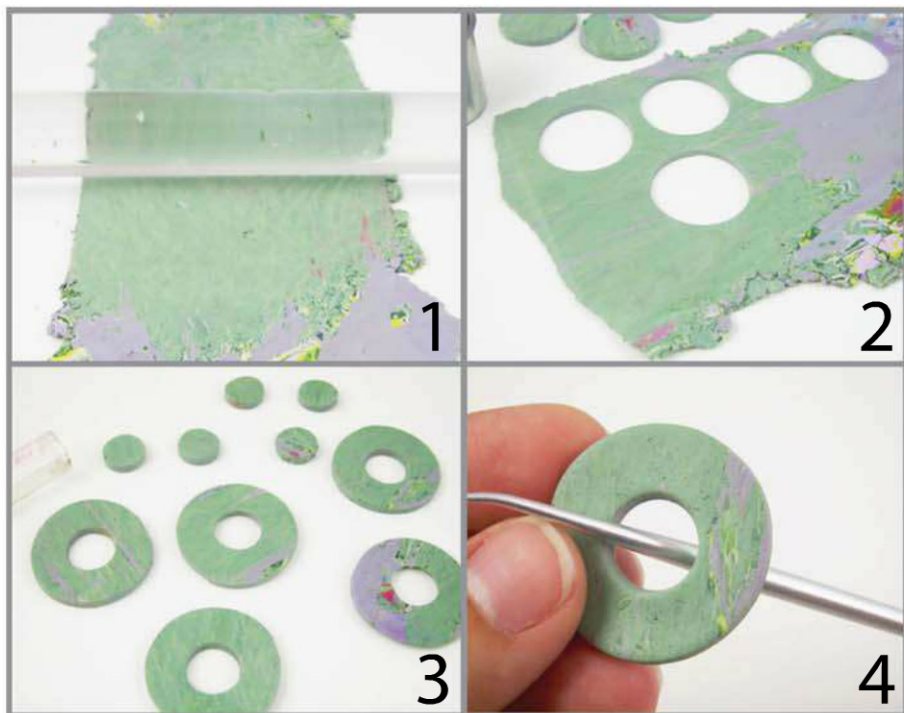
Process photos by Eva Sherman.

Create a POLYMER COLLAGE Bracelet

Harmonize clashing colors of leftover clay with an antique finish.

by Elvira López del Prado

This is one of my favorite polymer projects because it uses odds and ends of scrap clay, so the end result is always a surprise. Plus, if you're like me, you have years' worth of clay bits stashed away in various amounts, so you have plenty of clay to play with. And don't write off old, dried-out clay. It's a bit of a workout, but with liberal use of your acrylic roller and a pasta machine, you can bring it back into workable condition.



Choose a base color. From your stash of scrap clay, choose a uniform base color. If there isn't enough of a single color, mix a few colors together. Use enough clay so that when rolled out, the surface is large enough to cut out as many circles as you need your bracelet to have. The bracelet as shown uses five 3 cm (1³/₁₆-in.) circles, making it 16.5 cm (6¹/₂ in.) long. You can make your bracelet larger by adding circles of the same or different sizes.

NOTE: You can mix multiple colors of clay until you get a solid color; I under-mix my clay to highlight the individual colors.

Roll out the clay. Use an acrylic roller to condition the clay (see "Reclaiming Clay," page 65), until it stays together in a sheet [1]. Then use a pasta machine to further condition it. Once the clay is soft and pliable, run it through the thickest setting of your pasta machine, about 2 mm (5/64 in.) thick.

Cut the base pieces. Use a 3 cm (1³/₁₆-in.) circle cutter to cut out five circles [2].

NOTE: If you do not have the correct-size shape cutters, use a circle template or round container as a guide, and use a craft knife or needle tool to cut out the circles.

Use a 9.5 mm (3/8-in.) circle cutter to cut out a hole centered inside each 3 cm (1³/₁₆-in.) circle [3]. Place the side of the base piece you like best face down; that will be the back. Smooth the edges with a modeling tool [4].

For an alternative technique to smooth the edges of your polymer clay components, check out our video "Make Beveled Edges in Polymer Clay" at www.artjewelrymag.com/videos.

Make the connectors. Cut 10 pieces of 20-gauge (0.8 mm) copper wire that are 2.5 cm (1 in.) long. Use roundnose pliers to make a plain loop at one end of each wire.

Use flatnose pliers to make a 90° bend at the midpoint of each wire. For five of the connectors, the bent end should be parallel with the loop; for the other five, the bent end should be perpendicular to the loop.

Add the connectors. Add two connectors, one of each style, to each base. Set

materials

- Polymer clay: any colors, amount determined by design
- Copper wire: 20-gauge (0.8 mm), plain or enameled, round, 10 in. (25.4 cm)
- Bitumen of Judea or other patina
- Hook clasp

 **toolbox, page 76**
Polymer Clay

additional tools & supplies

- Large round cutter, 3 cm (1³/₁₆-in.) diameter
- Small round cutter, 9.5 mm (3/8-in.) diameter
- Round containers, or circle template (optional, used instead of round cutters)
- Pliers: flatnose and roundnose
- Flush cutters
- Polymer-safe liquid polish or sealant (optional)

Find out where to buy supplies, page 78
See Safety Basics, page 75

BASICS & VIDEOS

Learn fundamental techniques in these bonus tutorials:

Conditioning polymer clay

Make beveled edges in polymer clay

How to use shape cutters

Make a plain loop

Making an S-hook clasp

B



 Basics, page 73

 Videos, www.artjewelrymag.com/videos

ONLINE EXTRA

Sealants: How and When to Use Them

www.artjewelrymag.com/reference



the connectors on opposite sides of the base piece, with the loop extending just beyond the edge. Press each connector until it is embedded in the clay [5].

Make the embellishments. Roll out several long snakes of conditioned scrap clay [6]. You can use an extruder for this step, but that will blend the colors. To keep your colors distinct, roll out the snakes by hand. Make a few snakes in solid colors as well.

Coil a snake into a spiral and place it on top of one of the base pieces. Lightly press it onto the base to secure it, and use a tissue blade to trim the tail [7]. Repeat to add one or more snakes to all the base pieces.

Roll up little balls of clay to fill spaces between the snakes. I often work with white because it provides high contrast. Here, I used bright pink, which brings intensity to the piece as well as contrast [8].

TIP: To create consistently sized balls of clay, cut equal pieces from a snake and roll them into balls.

Use the remaining snakes to add zigzags, or layer snakes to mimic a plaid effect [9]. Fill the entire surface of each base, taking care to conceal the connectors.

Texture the embellishments. I am an unconditional fan of texturing, and I love finishing these pieces with a little bit of texture. Be creative. Make grooves using your tissue blade, but be careful to not cut in to your base. Try a modeling or needle tool to texture the clay [10].

Cure the links. When you are satisfied with the texture and your embellishments, follow the manufacturer's directions for your brand of polymer clay to cure it.

Antique the links. The finishing touch is to give the bracelet a warm, aged feel and unify the colors to give the piece a more cohesive look. Put on latex or nitrile gloves, and lay a protective cloth over your workspace; this can get dirty.

NOTE: I prefer Bitumen of Judea to antique my polymer. It is a pigment that is used to age wood, stone, metal, and (in our case) polymer clay. However, if you're in the United States, you'll need to find an alternative, as Bitumen of Judea is not available there. (See "coloring alternatives," opposite page). I apply the liquid Bitumen of Judea with a paintbrush [11]. Thoroughly coat the links with Bitumen of Judea and let your piece dry for 24 hours.

Use 800-grit sandpaper to lightly wet-sand the high points of each link to remove some of the coloring agent [12].





Process photos by Elvira López del Prado.



This technique is not limited to bracelets, or even circles. Use the same method for a pair of earrings.

reclaiming clay

All polymer clay must be conditioned to some degree before you can work with it. Older or stiffer clays may need more attention before they can pass through a pasta machine. A few minutes of preparation to avoid any damage or misalignment to your pasta rollers translates to more time to play and create.

Divide and conquer: Smaller chunks of clay can be conditioned faster and more effectively than one giant lump. Use your tissue blade, or a food processor dedicated to non-food use, to chop the clay into small pieces. Scoop up a small amount of these bits, roll them into a ball, flatten it, and roll into a snake. Fold the snake in half, twist it, and roll it into a ball again. Repeat until the clay is soft and pliable.

Use gentle heat: Warm your clay before conditioning, but remember, too much heat and the clay will start to cure. Try one of these warming methods:

- Place the clay on a heating pad set to low.
- Seal the clay in a plastic bag, and place it in a bowl of warm water.
- Put a sealed plastic bag of clay in your pocket or keep it close to your body.
- The warmth from your hands works, too.



coloring alternatives

Although Bitumen of Judea is easily found online, it can be difficult to find vendors that ship this product outside their country of origin. Depending on where you live, you may need to try some of these alternative water-safe ways to antique polymer:

- Alcohol ink (Piñata is my favorite brand)
- Gilders paste
- Shoe polish
- Acrylic paint
- Swellegant/VerDay reactive metallic paints

SAFETY NOTE: Always wet-sand cured polymer clay to avoid breathing the dust and prolong the life of the sandpaper.

Rinse the links with water to remove the dust. After the links dry, apply a polymer-safe liquid polish or sealant, if desired.

Connect the links. Use chainnose pliers to open the loops in the connectors. Connect the parallel loops with perpendicular loops, and then close them. Add a clasp to one end of the chain. 

ASK THE ARTIST: ELVIRA LÓPEZ DEL PRADO



How did you know that you were supposed to be a jewelry maker?

"I discovered jewelry making as a craft. It didn't require much space or many tools, plus you don't really have to wait a lot to see the final results. But when it evolved from a hobby into an art form, that is when I decided that I wanted to make jewelry." Contact: www.lopezdelprado.com



Create a Married-Metal Effect in Metal Clay



*Combine fine silver and copper metal clay
in one seamless piece with one firing.*

by Michela Verani

After seeing some mixed-metal clay pieces in a class listing offered by Art Clay World, and some silver and copper metal clay pieces by Hadar Jacobson, I was inspired to experiment on my own. I collected information from various sources and worked out my own firing schedule, but the first pieces were a fiasco! The kiln was too hot, so the silver alloyed with the copper, ruining the pieces. I kept at it and eventually sorted out a firing schedule. All the extra work was worth it to be able to showcase the sharp contrast of silver in copper.

materials

- 14-gauge (1.6 mm) scrap wire
- Copper metal clay, 50 g
- Fine-silver metal clay, 7 g



toolboxes, page 76

- Metal Clay
- Bronze/Copper Metal Clay

additional tools & supplies

- Pliers: roundnose, forming, or flatnose
- Rawhide hammer and bench block
- Shape template: Fat rectangle (optional)
- Tsukineko Fantastix Coloring Tool Brush (optional)
- Cosmetic sponge (optional)
- Radial bristle disks, 30-grit, on a screw mandrel
- Flex shaft
- Baldwin (or other) patina (optional)

Find out where to buy supplies, *page 78*
See Safety Basics, *page 75*



BASICS & VIDEOS

Learn fundamental techniques in these bonus tutorials:

Rolling & cutting metal clay

B



Drying metal clay

●

●

Drilling a hole in metal clay

●

●

B Basics, *page 73*

V Videos, www.artjewelrymag.com/videos

ONLINE EXTRAS

- Get an in-depth look at carbon firing with Mardel Rein's "Fire Copper Metal Clay" reference article.
- Learn about how to sinter different types of metal clay with our "Metal Clay Firing Schedules" chart.

www.artjewelrymag.com/reference

Make a wire shape. Use pliers to form a length of 14-gauge (1.6 mm) wire into a meandering coil or pleasing shape of your choice [1]. Use the appropriate pliers for your pattern — roundnose or forming pliers for curves and spirals, flatnose pliers to make corners and sharp angles. If necessary, use a rawhide mallet on a steel bench block to flatten the shape.

NOTE: Instead of making a custom wire shape, you can use a stamp or texture plate for this process. Just be sure your pattern is of uniform depth; any subtle shading will be lost when the recesses are filled with fine-silver metal clay.

Roll out the base clay. Use olive oil or hand balm to lightly lubricate a flexible Teflon sheet and an acrylic roller. Roll out roughly a third of the 50 g package of wet copper clay to 9 cards (2.25 mm) thick [2].

Remove 3 cards (0.75 mm). Press the wire shape into the wet clay using either the roller or your fingers [3]. Do not press too hard; you want to create an indent without going through the clay. Remove the wire shape; if you can't grasp it with your fingers, carefully use a needle tool to pry it out of the clay.

Add dot patterns with the rounded end of a paint brush, ball burnishers, or other items [4].

NOTE: Since I'm using smooth items to impress the clay, I don't need to use a lubricant. However, if the items you're using have a highly textured surface, or you doubt they will release easily, use olive oil or other lubricant.

Cut the base layer. Use a craft knife or a needle tool to cut out the base layer. I use a "fat rectangle" shape template [5].

Dry the clay until it is completely dry (see "Metal Clay Dryness" chart, *below left*).

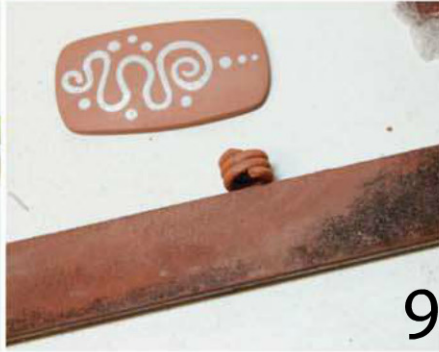
Remove blemishes. Use polishing pads or your preferred tool (see "Dust-free Clean Up?" *page 70*) to sand the sides and surface of the base layer to a smooth finish.

Add the silver metal clay. Moisten the recessed shape in the copper clay base layer with a damp fine-tip paintbrush. Open a 7 g package of fine-silver metal clay. Scrape a craft knife over the lump clay to collect a small amount of clay. Use the blade of the knife to pack the silver clay into the recess in the copper clay base layer [6].

NOTE: A craft knife is a great tool for this step, as it has less give than a rubber shaper and more completely presses the clay into the recesses. I don't use a separate set of tools for silver and copper

Metal Clay Dryness

Wet	A lot of moisture; very pliable
Semi-dry	Some moisture; firm, holds its shape
Mostly dry	Nearly devoid of moisture; rigid
Completely dry	No moisture; can be fired



metal clay, I just clean my tools well before moving to a different clay. The exception is my sanding items — polishing papers, sanding sticks, needle files, etc. — since those items can be trickier to clean. I keep one set for silver clay, one for copper clay, and one for mixed silver/copper metal clay.

Continue to fill the recesses. Pack the silver clay firmly to avoid any air pockets or gaps. Don't worry if you get some silver on the surface of your copper [7]; you'll sand it off after the pendant is dry.

NOTE: To help keep your silver clay uncontaminated by copper clay, wipe off the craft knife before picking up fresh silver clay. If you do contaminate your silver, copper-to-pinkish streaks will appear in the silver. Set the contaminated clay aside. Do not discard this clay, you can use it to make alloyed silver and copper clays. I've had some success creating whole pieces out of the contaminated clay that glow with a pinkish silver color.

Once you have filled the recesses, set the base layer aside to dry completely. I prefer to air dry, but you can use a dehydrator or mug warmer to speed up the drying process.

Refine the base layer. Once the base layer is completely dry, use 220/320-grit sandpaper to sand the excess silver from the piece until the silver pattern is revealed. For this step I find it helpful to use emery boards.

If any areas need more silver clay, remoisten them and repeat the process to add more clay.

Add a bail. With your fingers, roll wet copper clay into a thin snake. As you roll it, lightly moisten the snake with a fine-tip paintbrush. Wrap the snake around a straw or other plastic form 2–3 times [8]. Let the bail dry completely.

Sand a flat surface on one section of the dry bail, then remove it from the form [9]. Add a bit of moistened wet clay to the top edge of the base, and set the flat surface of the bail against the wet clay. Press the two components together firmly to adhere the bail to the base layer. Let the pendant dry completely [10].

Finish the back of the pendant. Roll a short copper clay snake and add it to the back of the pendant, mimicking the pattern on the front of the pendant [11].

Use a variety of sizes of drill bits in a pin vise to make three round recesses in graduated sizes on the back of the

sintering test

To test that a piece is fully sintered, use a 80-grit radial bristle disk on a screw mandrel in a flex shaft or rotary tool to begin polishing the back of the piece.

If there are spots that remain powdery and black where it is being polished, patch those areas by adding more clay, let the clay dry, and then refire.

If you see a copper layer and then a black powdery layer, refire without the binder burnout phase.

If your piece shows only copper, it is fully sintered. Continue to polish to remove all surface oxidation.



stainless steel lidded container in a brick kiln. Fire to 900°F (482°C) for 20 minutes.

Let the kiln begin to cool. When the kiln is 300°F (149°C) or cool enough to open, add another inch of charcoal to cover the now-blackened piece.

Replace the lid, and fire at a 1500°F (816°C) ramp to 1400°F (760°C) and hold for two hours. If you prefer not to open the kiln during firing, see "Alternative Firing Schedule" (below left).

NOTE: If you're using a muffle fiber kiln, you may have to raise the temperature to get the copper to sinter. However, too high a temperature will cause the copper and silver to alloy. I find this happens around 1500°F (816°C). All kilns are different, so test your kiln before firing your piece.

Remove the piece from the charcoal. Since this is a low temperature for sintering copper, a second firing is occasionally necessary (see "Sintering Test," page 69).

If there are any cracks or holes along the silver/copper border, fill them with either clay, let the clay dry, and refire.

NOTE: Some cracks are so tiny that filling them is almost impossible; you may have to let a few go.

Finish the pendant. Polish the piece or tumble finish if desired.

NOTE: To add a little more pop, add a patina. I use Baldwin's to accentuate the contrast between metals. A mirror finish doesn't take patina well, so use a matting disc in a flex shaft or rotary tool to give the surface a slight matte finish before patinating. 

dust-free cleanup?

Tsukineko Fantastix Coloring Tool has a nice, rough surface that, when moistened, can be used as a wet sander that effectively rounds and cleans up edges. These tools are gentler than a sanding pad; they also rehydrate the surface of the dry clay and move the clay around, so you can fill small cracks and blemishes without adding more clay.

Their greatest benefit, however, is keeping metal clay dust out of your work area. They leave a slight texture on the clay; remove the texture with a cosmetic sponge or polishing pad if desired.



alternative firing schedule

Recently, I have been experimenting, with excellent success, firing pieces covered by carbon during the entire firing schedule. I will program my kiln to burn out the binder, cool down, and then ramp up to sinter. It takes longer this way, but I don't have to watch it or wait for it to cool down to cover the pieces with more carbon.

Burnout: ramp, full. 950°F (510°C). Hold 1 hour.

Cool down: ramp, full. 250°F (121°C). Hold 15 minutes.

Sintering: ramp, full. 1450°F (788°C). Hold 2 hours.

pendant. Do not drill all the way through the pendant.

Fill the recesses with silver metal clay. Dry the pendant completely, and sand to remove any excess silver [12]. Check your piece closely for blemishes before firing it.

Fire the pendant. Place the pendant on a 1-in. (25.5 mm) layer of activated charcoal (I use acid-washed coconut carbon) in a

ASK THE ARTIST: MICHELA VERANI



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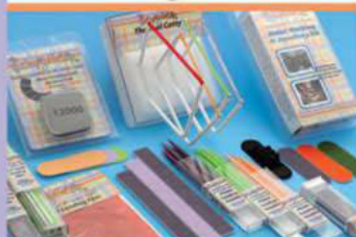
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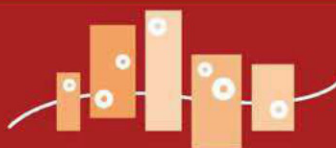
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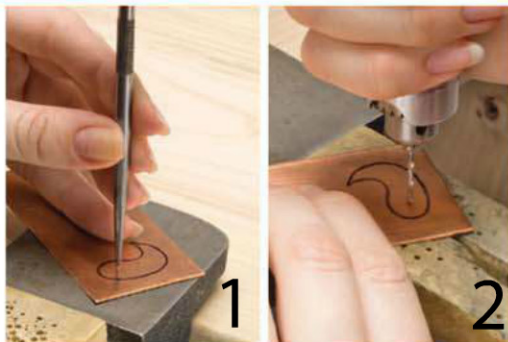
No matter what medium you work in, there are some jewelry-making techniques that are so essential, you'll use them in nearly every project you make. These tutorials will walk you through the beginner techniques that you'll need to learn in order to make the projects in this issue.

metalworking techniques

DRILLING/PIERCING

Place your metal on a steel bench block or anvil. Use a center punch and a mallet to create a shallow dimple in the section of the metal you want to remove [1]. Place the metal on a piece of wood and drill a hole, using the dimple as a guide [2].

Remove one end of the saw blade from the saw frame. Slide the blade through the hole in the metal, then reinsert the blade into the frame, and tighten. Pierce the inside section of the metal. Release one end of the blade from the saw frame so you can remove the blade from the metal.



ONLINE EXTRA

Download a free "Metal Piercing Chart" to help you select the best saw blade and drill bit size for your project. Visit www.artjewelrymag.com/reference.

SAWING

Select a saw blade that is the correct size for the gauge (thickness) of metal that you are going to cut.

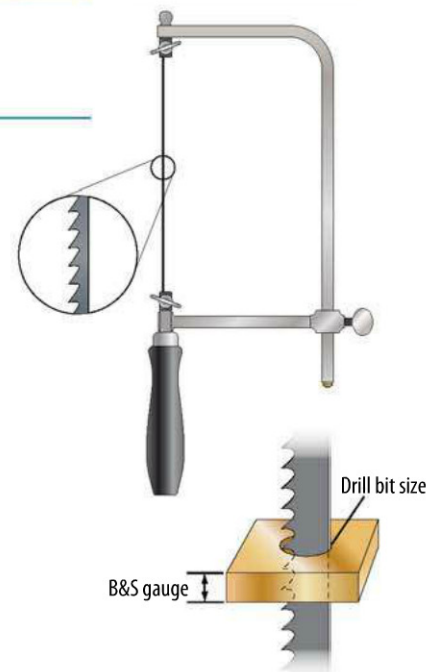
To thread a saw blade, insert the blade, with the teeth of the blade facing down and out, away from the frame, into the top wing nut of the saw frame. Tighten the wing nut. Brace the handle in the hollow of your shoulder, and apply pressure to the saw frame against your bench pin. Maintaining pressure, insert the bottom of the blade into the wing nut closest to the handle [1], and tighten the wing nut [2].

The blade should be taut and should make a high-pitched "ping" sound when you pluck it with your thumbnail. If you get a dull "twang" instead, reinstall your blade while putting

pressure on the saw frame. Then, lubricate the blade.

When sawing, sit in an erect posture with the top of your workbench at upper chest level. Slouching or having your work too low causes back and wrist strain and leads to broken blades.

To saw, grip the saw frame loosely in your hand. Use long, smooth motions, using as much of the blade as possible. The blade will work best when it's perpendicular to the metal [3]. Putting excessive pressure on the saw frame will make you work harder. Turn corners by sawing in place while slowly turning the metal; trying to turn the saw will break the blade.



SOLDERING

Clean the metal you plan to solder by sanding it with 400-grit sandpaper. Surfaces must be clean and in complete contact with each other for solder to flow; solder won't fill holes or gaps. Flux the metal you plan to solder to prevent oxidation and to help solder flow. Heat the entire piece evenly, not just the solder, and keep the torch moving in a circular motion.

If there is more than one solder joint in a piece, solder the first one using hard solder, the second using medium solder, and the third using easy solder, as hard solder has the highest melting point and easy solder has the lowest. To keep the solder in previous joints from flowing when you heat the metal again, apply an anti-flux to those areas.

During soldering, the solder will flow toward where the heat is the greatest. If your solder is flowing in the wrong direction, adjust the direction of your flame.

Once the solder flows, quench the piece in water, and then place it in a pickle solution to remove oxidation and flux residue. Rinse the piece in clean water.

SANDING

To give your metal the desired finish, smooth the surface and edges by sanding with progressively finer grits of sandpaper. Begin with a coarse grit (220–400) and work up to a fine grit (600–1000). Rub each grit of sandpaper back and forth in one direction. When you switch to the next finer grit, rub the sandpaper perpendicular to the marks from the previous grit until you can no longer see them.

ANNEALING

Annealing restores malleability to work-hardened metal. Place the metal on a soldering pad and heat it with a torch. When the metal has a dull, rose-colored glow, it is annealed. Quench the metal in water, and then soak it in pickle to remove oxides.

PATINATING WITH LIVER OF SULFUR

Polish your piece before patinating. (If you tumble-polish your piece after patinating, reserve the used shot for future patinated pieces; the liver of sulfur residue will contaminate other pieces.) Oil and dirt on the piece can affect the patina, so clean the metal with degreasing soap before patinating.

Prepare a liver of sulfur solution according to the manufacturer's instructions. Dip the metal in the solution for a few seconds, then rinse the metal in cool water to stop the chemical reaction. For a darker patina, continue to dip and rinse the metal. Use a brass brush with soapy water to remove or modify the patina. By varying the temperature and amount of water you use to make the solution, you can achieve different colors of patina; experiment to find the result you prefer.

PICKLE

Pickle is a mildly acidic solution that cleans oxides from metal by removing small amounts of copper. Pickle is generally sold in powdered form and is available from jewelry supply companies. To make a pickle solution, mix the powder with water according to the manufacturer's instructions.

If steel (binding wire or tweezers) comes in contact with used pickle, it can cause a chemical reaction that will copper-plate whatever metal is in your solution. To prevent this, use copper or plastic tongs to place metals in the solution.

SETTING WIRE RIVETS

Use a brass gauge or calipers to measure the diameter of the rivet hole. Select wire in a gauge that's the same diameter as the hole. The wire should fit snugly in the hole.

Measure how thick your metal is at the rivet hole. Your rivet wire will need to be this long plus a little more. A general rule is to add half the wire's diameter for each end of the rivet. Cut the rivet wire to length, and file the ends flat with a needle file.

Insert the rivet wire into the hole, resting one end of the wire on a bench block. Center the metal piece on the rivet wire, and lightly hammer one end of the wire with either the tapered face of a riveting hammer [Figure 1] or the rounded face of a ball-peen hammer. Flip the piece over and lightly hammer the other end to gently flare it. Since you're only flaring a little each time, you may need to flip and hammer many times to achieve the flare you'd like.

To further flatten the rivet, hammer each end with the flat face of either a chasing hammer [Figure 2] or a planishing hammer. Clean up the edges of the rivet with a needle file, if desired, and then sand and polish the rivet.

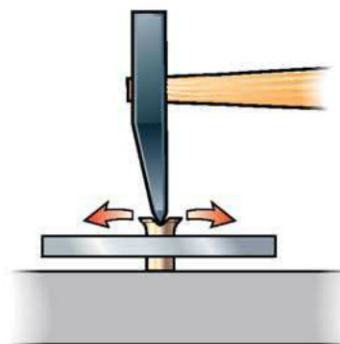


Figure 1

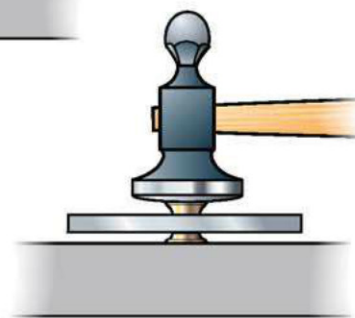


Figure 2

wireworking techniques

MAKING AN S-HOOK CLASP

Cut a 2-in. (51 mm) piece of 18-gauge (1.0 mm) sterling silver wire. Use 400-grit sandpaper to smooth the ends. Use roundnose pliers to grasp the wire ½ in. (13 mm) from one end. Bend the wire around one jaw of the pliers. Repeat on the other end to create an S-shaped hook. Use the tip of the pliers to make a slight bend at each end of the S. Hold half of the hook on a bench block, and use a planishing hammer to work-harden the curved portion of the hook. Repeat on the other half of the hook.



metal clay techniques

ROLLING METAL CLAY

Metal clay dries rapidly, so remove only the amount you will use during a given work session. Store unused clay in an airtight container with a small piece of moist sponge or paper towel. Cover clay with plastic wrap while you are not working with it. Use a spray bottle to remoisten the clay if it begins to dry out. Apply olive oil or natural hand balm to your hands, tools, and work surface to prevent the clay from sticking. Decide how thick you want your metal clay sheet to be. Make two stacks of either playing cards, mat board, or thickness guides that equal that thickness. Place your lump of clay on your work surface between the two even stacks. Roll the clay to a uniform thickness, using an acrylic roller or PVC tube. Rotate the clay 90° and roll it again.



DRYING METAL CLAY

Metal clay can be air-dried or placed on a mug warmer to shorten the drying time. Alternatively, place the metal clay in a food dehydrator dedicated to nonfood use.

To check the moisture content of metal clay, place the piece on a sheet of glass. After 15 seconds, lift the clay from the glass. Any condensation on the glass indicates that the clay contains moisture. Do not fire the clay until it is completely dry.



safety basics

Metal clay

- Use your kiln in a well-ventilated area to sinter clay.
- All tools should be dedicated for nonfood use.
- Follow manufacturers' instructions for programming your kiln and sintering times and temperatures.
- Do not torch-fire metal clay pieces that have a core inclusion, such as cork or wood clay.
- Do not sinter or torch-fire metal clay pieces that are not completely dry, as they may explode.

Metals

- Wear eye protection at all times while working with metals, wire, and metalsmithing tools.
- Wear a non-flammable apron to protect your clothing.
- Tie back long hair.
- Work in a well-ventilated area at all times.
- Wear close-toed shoes.
- Do not wear clothing or jewelry that might get caught in machinery or catch fire.

Polymer clay

- Use a calibrated toaster oven to cure clay.
- Cure clay in a well-ventilated area.
- Your oven and all tools should be dedicated for nonfood use.
- Follow manufacturers' instructions for curing times and temperatures.
- Always wet-sand using wet/dry sandpaper.

All media

- Wear a dust mask while working with materials and tools that generate particulates.
- Read all Material Safety Data Sheets (MSDSs) before using a new material, and keep a copy of the MSDS for any material you use.
- Do not use tools or chemicals in ways that are contrary to the manufacturer's intended purpose.
- Wear protective gloves while handling caustic materials or chemicals.
- Keep a properly rated fire extinguisher and a source of clean water near your workstation.
- Keep cutting tools sharp and all tools and equipment properly maintained.



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■ BASICS | ESSENTIAL BEGINNER TECHNIQUES

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Finishing

- Brass brush
- Copper tongs
- Files: hand, needle
- Flex shaft or buffing wheel, buffs, polishing compound
- Liver of sulfur or other patina, lidded glass container
- Microcrystalline wax
- Polishing cloth
- Polishing papers
- Sandpaper: various grits
- Scouring pad
- Steel burnisher
- Steel wool
- Tumbler, steel shot, burnishing compound
- Ultrasonic cleaner

Metal clay

- Acrylic or PVC roller
- Airtight storage container
- Brass brush
- Burnisher
- Clear, hard plastic sheet
- Craft knife
- Drinking straw
- Fine-tip paintbrush
- Flexible Teflon sheet
- Kiln, kiln shelf
- Mug warmer
- Needle files
- Needle tool
- Olive oil or natural hand balm
- Pin vise or holder, drill bits
- Plastic wrap
- Playing cards or thickness gauge
- Rubber block
- Shape cutters
- Smoothing tool
- Spatula or palette knife
- Syringe
- Texture sheets or molds
- Tissue blade: flexible, rigid, or wavy
- Tumbler, steel shot, burnishing compound
- Vermiculite, kiln-safe container
- Water: distilled

- Wet/dry sandpaper: various grits, or nail buff/emery board

Bronze/copper metal clay

- Acid-free activated carbon
- Kiln-safe container with lid
- Programmable kiln (with kiln stilts)

Polymer clay

- Acrylic roller or brayer
- Aluminum foil
- Clear, hard plastic sheet
- Craft knife
- Drinking straw*
- Fine-tip paintbrush
- Latex/nitrile gloves
- Liquid polymer clay
- Nail buff or emery board
- Needle tool
- Nonstick rigid surface
- Oven thermometer
- Pasta machine*
- Shaped cutters
- Shaping tools
- Smooth ceramic baking surface
- Smoothing tools
- Texture sheets or molds
- Tissue blade: flexible, rigid, or wavy
- Toaster oven*
- Wet/dry sandpaper: various grits

*Dedicated for nonfood use

Sawing/Piercing

- Adhesive bandages
- Alligator tape (optional)
- Bench pin
- Center punch: manual or automatic
- Dividers
- Files: hand or needle

- Flex shaft, drill bits
- Jeweler's saw frame, saw blades
- Lubricant or beeswax
- Rubber cement or glue stick
- Safety glasses

Soldering

- Anti-flux
- Binding wire
- Borax (for borax solution)
- Copper tongs
- Fire-resistant surface: soldering pad, firebrick, or charcoal block
- Flux, flux brush
- Pickle pot with pickle
- Solder: hard, medium, easy
- Soldering pick
- Sparker: manual or automatic
- Third hand, insulated cross-locking tweezers
- Torch, various tips
- Sandpaper: various grits
- Tumbler, steel shot, burnishing compound

Wirework

- Bench block or anvil
- Cutters: side, end, or flush
- Hammers: chasing, ball peen, cross peen
- Mallet: rawhide or plastic
- Mandrels or dowels
- Needle files
- Pliers: chainnose, flatnose, roundnose, parallel, nylon jaw
- Polishing cloth
- Sandpaper: various grits
- Tumbler, steel shot, burnishing compound

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44

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suppliers

FABRICATE A HOLLOW RING FORM FOR INLAY

page 34

- Silver and metalsmithing tools: any jewelry supplier

INLAY STONE INTO A HOLLOW FORM

page 37

- Flat lap, lapidary arbor, lapidary belts, and cerium oxide belt: Diamond Pacific, www.diamondpacific.com; Lortone, www.lortone.com; or Rio Grande, *below*
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- JoAnn Fabric and Craft Stores
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WHERE TO FIND IT

PUT TENSION & LEVERAGE TO WORK WITH AN OMEGA CLIP

page 48

All materials and supplies: A&A Jewelry Supply, www.aajewelry.com; Rio Grande, *below left*; local hardware stores

CHARMS: SPACE ANTENNA

page 53

- All tools and materials: Rio Grande, *below left*

EXPLORE TEXTURING TECHNIQUES: 4 WAYS TO DRESS UP A CUFF

page 56

- Copper sheet, wire, and rivets: Rio Grande, *below left*

CREATE A POLYMER COLLAGE BRACELET

page 62

- Materials, tools, and supplies: Michaels, www.michaels.com; JoAnn Fabrics and Craft stores, *below left*; Rio Grande, *below left*; Polymer Clay Express, www.polymerclayexpress.com

CREATE A MARRIED-METAL EFFECT IN METAL CLAY

page 66

- Colossal collection nail files, 220/320-grit (also come in fine and coarse grits): Sally's Beauty Supply, www.sallybeauty.com
- Baldwin's patina: Reactive Metals, www.reactivemetals.com
- AdvantEdge Plus polishing kit, matting wheels (unmounted mini fiber wheel, extra fine): Rio Grande, *below left*
- Tsukineko Fantastix coloring tool, brush point: Amazon.com or JoAnn Fabrics and Craft Stores, *below left*
- Metal Clay & Coconut Carbon: PMC Connection, www.pmcconnection.com, Art Clay World, www.artclayworld.com
- Stainless steel bowl/container: local discount store **A**



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Aelectronic Bonding, Inc.....	72	■ FIRE MOUNTAIN GEMS.....	84	■ OTTO FREI.....	7	■ WUBBERS.....	3
Alpha Precision Abrasives, Inc.....	72	Gem & Lapidary Wholesalers.....	23	■ PANDAHALL.COM.....	29	Xuron.....	23
American Jewelers Institute.....	80	Greco.....	80	Paragon Industries, Inc.....	76	classes & workshops section	
Arrowhead Lapidary & Supply, LLC.....	21	Halstead Bead, Inc.....	27	PMC Connection, Inc.....	27	Academy of Art University.....	19
Aves Studio.....	32	Hord Crystal Corp.....	23	pmcsupply.com.....	8	Arrowmont.....	19
■ ART JEWELRY BOOKS.....	28	ImpressArt.....	14	Polymer Clay Express.....	79	Art Clay World USA.....	18
Art Jewelry DVD.....	79	Jewelry Designer Manager.....	22	Reactive Metals Studio.....	78	Creative Side Jewelry Academy.....	18
■ ART JEWELRY MAGAZINE.....	77	Jewelspan.....	15	Ringinator.....	14	Daivide Bigazzi Studio.....	18
Art Jewelry magazine - Digital.....	32	Jewelrythings, Inc.....	80	Rings & Things.....	25	Drouhard Nat'l. Jewelers School.....	18
■ ART JEWELRY SPECIAL ISSUE.....	71	Kandubeads.....	79	■ RIO GRANDE, INC.....	2	Elentari Handverk.....	18
Bead&Button magazine.....	78	Kentucky Guild of Artists.....	80	Royalwood, Ltd.....	80	■ GEMOLOGICAL INST. OF AMERICA....	17
BeadFX.....	79	Lillypilly Designs.....	14	Ruidoso Metal Works, Inc.....	80	Genevieve Flynn Studio.....	16
Beaducation - Lisa Niven Kelly.....	72	Lonnie's, Inc.....	80	Satin Cord Store.....	72	Guilled Lynx.....	18
Billanti Casting Company, Inc.....	76	Lortone, Inc.....	72	Speedbrite.....	79	John C. Campbell Folk School.....	16
■ CONTENTI COMPANY.....	83	Melanie Muir Jewellery Design.....	21	Texas Institute of Jewelry Technology.....	80	New Approach School.....	16
Cool Tools.....	22	Minnesota Lapidary Supply Co.....	22	Tru-Square Metal Products, Inc.....	22	Otto Frei.....	16
Covington Engineering Corp.....	14	Monsterslayer, Inc.....	8	Urban Bearer, The.....	72	Penland School of Crafts.....	18
CraftOptics.....	15	Munro Crafts.....	79	Volcano Arts.....	21	Revere Academy of Jewelry Arts.....	16
Diamond Pacific Tool.....	32	Now That's a Jig/Brenda Schweder Jewelry.....	22	Wayne Arts Center.....	80	Silvera Jewelry Studios.....	16
Diane Miller Designs.....	21	Nunn Design.....	8	Weave Got Maille.....	15	Studio JSD.....	18
Eastern Findings Corporation.....	15	Om Tara.....	32	■ WIRE-SCULPTURE.COM.....	33	Taos School of Metalsmithing.....	18
Evenheat Kiln, Inc.....	14	Optima Gem.....	79	Wirework Fall 2014.....	19	Terri McCarthy Studios, LLC.....	18
						William Holland School of Lapidary Arts....	16

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