

In-a-Flash Opal Inlay

Get On the Fast Track to Making
Pendants and Earrings

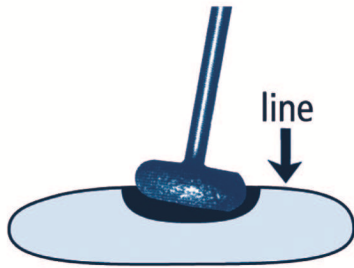
Story and Photos by Tony Thurber

In October 2001, *Rock & Gem* published a “how-to” article about creating my opal inlay pendants and earrings. Since then, the process has evolved and, I believe, improved. What follows is a description of the techniques I use in my opal inlay work. The object of my work is to create a simple, organic, complementary setting for an outstanding piece of opal. All my work involves opal; although the techniques work equally well with other materials. The equipment required is basic for any hobbyist (see the Tools list).

Rough opal is now available at the Tucson, Arizona, show from more than 50 dealers. Avoid opal in water or with a high water content, as it is more prone to crack. Above all, keep any opal out of safety deposit boxes, which are desiccated to preserve documents. Prolonged desiccation is literally death to opal. Host material can be virtually anything with a hardness similar to opal’s (Mohs 6.2 to 6.5). Softer material tends to undercut, often fails to take a crisp inlay margin, and may not hold a polish. My pieces are made with quartz, jadeite, chalcedony, chrysoprase, limbcast agate, jasper, and petrified wood.

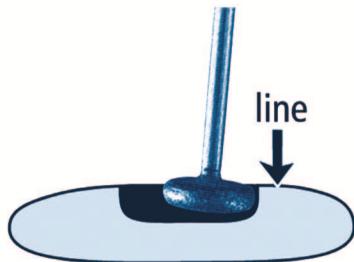


My goal is to create a simple, organic, complementary setting for an outstanding piece of opal using common hobby tools.



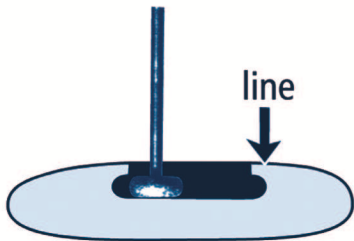
BW6 - 80 Grit

With the BW6 - 80 Grit, excavate near, but not quite up to, the scribed line.



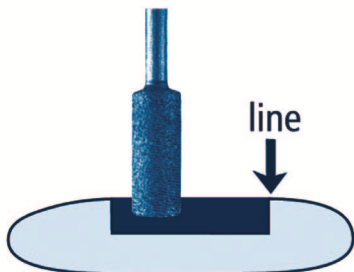
BW4 - 80 Grit

With the BW4 - 80 Grit, remove material from the curved bottom of the inlay hole.



W1 - 150 Grit

With the W1 - 150 Grit, undercut the banks of the hole slightly.



CL44 - 200 Grit

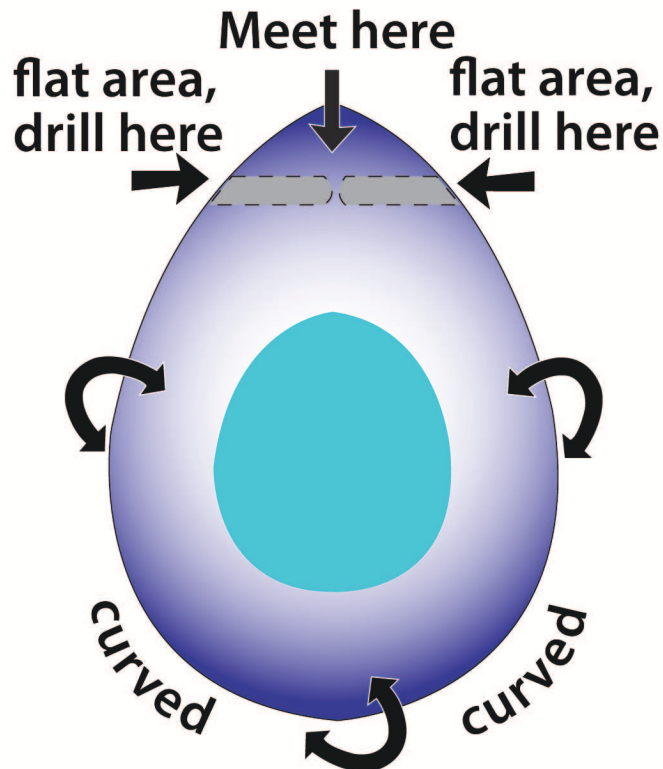
With the CL44 - 200 Grit, even and straighten up the walls of the excavation.

TOOLS:

- Six-wheel lapidary set
- Trim saw with 4-inch turbo blade
- Dremel-type handpiece
- Diamond drills and burs
- Metal reamer burr
- Flat and forming pliers
- End cutter

MATERIALS:

- Rough opal
- Bamboo skewers
- Diamond paste (350, 600 and 1200 grit)
- Aluminum pencil
- Leather buffer
- Cerium or tin oxide
- X-acto knife



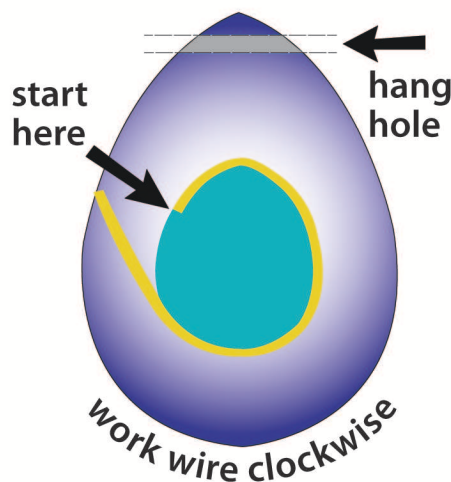
Using a diamond core drill, drill a "hanging hole", starting from both sides and meeting in the middle.

TECHNIQUES

Slab the chosen host material to about $\frac{3}{8}$ inch thick for pendants and $\frac{5}{16}$ inch thick for earrings. Carve the host to the desired shape and size on a trim saw with a 4-inch-diameter turbo diamond saw blade (available from Home Depot) and bevel cut the corners. Pendants, of course, require a hole for a bail or chain. Leave the area in which the "hanging hole" will be flat. Grind the piece to the desired shape and contour it on the most aggressive wheel of the lap set (60 to 80 grit). With an aluminum pencil, scribe an outline of the inlay hole to be excavated.

Excavation requires the use of four diamond burs of different shapes, sizes and grits from Lasco Diamond Products (see sidebar for catalog numbers). With burr No. 1, excavate near, but not quite up to, the scribed line. With No. 2, remove material from the curved bottom of the inlay hole. With No. 3, undercut the banks slightly. With No. 4, even and straighten up the walls.

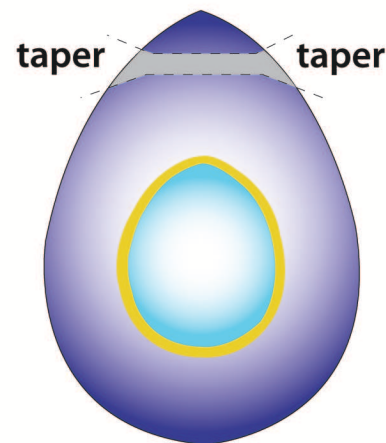
To make the "hanging hole", use a 1.5 millimeter or 2 millimeter diamond core drill to drill into one side of the flat area near the top of the piece. When you're half-way through, switch to the other side and drill until the holes meet in the middle. Use



Bend the gold wire to fit the inlay hole, working clockwise from a point on a straight section of the hole.



Score the cutting point with an X-Acto knife blade, then remove the wire to cut and solder it.



Taper the edges of the "hanging hole" with burr No. 4 and polish with bamboo skewers and diamond paste.

an ultrasonic drill if you have one, or use any high-speed rotary hand tool. Dremel, Lasco and Foredom tools work fine and are less expensive. To drill with diamond tools, use light pressure and lots of water.

Enlarge the "hanging hole" with a diamond bead reamer. Bead reamers are hard to find, but are available with the Lasco inlay kit, which I use and recommend. Be slow and gentle while reaming, working from each side alternately, with light pressure and lots of water. At 16,000 rpm or more, excessive pressure or heat can literally blow the piece apart. That can be both disappointing and dangerous, so be careful.

For inlay, I normally use 18k yellow gold that I alloy and roll out on a rolling mill to 1 millimeter by 1.5 millimeters for pendants and .75 millimeter by 1 millimeter for earrings. The hand tools for this step include forming pliers, flat pliers, an X-Acto knife, and an end cutter.

Using fingers and forming pliers, bend the rectangular gold wire to fit the inlay hole, working clockwise from a starting point on a straight section of the hole. When you have worked completely around the inlay hole, overlap the remaining gold wire over the beginning end. Score the cutting point with an X-Acto blade, remove the gold, and cut cleanly on the scored line with the end cutters. Work the ends into alignment with the flat pliers. Braise the wire ends together with a mini torch, or have a goldsmith do it for you. Pickle the gold to remove oxidation.

The gold ring will have a small lump of gold solder where the ends were joined. Grind the wire sides flat again on the 240 lap wheel. Fit the gold ring into the inlay hole. Adjust the gold with the forming pliers and modify the hole walls with the No. 4 burr as needed until you have a nice, tight fit.

Mark the host stone with the aluminum pencil where the gold joint belongs, and angle-grind a bit off the bottom of the gold ring. This will remind you which way the ring goes in, and which side goes down. These are important things to know during the next step.

The next step is to epoxy the gold ring into the inlay hole. I use a 2-ton, de-layed set, two-stage clear epoxy from Home Depot. Leave the top of the gold ring at or very slightly above the host stone level.

When the epoxy sets, grind the inlaid gold down to the host stone level on the 240 lap wheel, always working toward the center of the hole. Grinding toward the hole leaves a crisper, cleaner inlay margin between the host stone and the gold.

Remove any hardened epoxy from the inlay hole, and at the same time remove the remaining gold solder and burrs from inside the inlaid gold ring with a high-speed metal reamer. This carbide tool (not diamond) is included in the Lasco inlay kit.

The pressure from grinding the wire will have created a thin overhang of gold on the

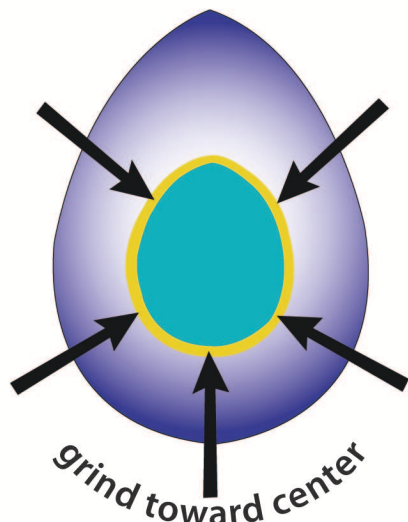
inside of the wire ring. Use the X-Acto knife to trim away the overhang.

The inlay process is next. Select and cut an opal to approximately $\frac{1}{8}$ inch thick. Orient the opal so it flashes best with the pendant (or earring) held vertically. Mark the opal's top, then start cutting it on the 240 lap wheel to fit the inlay hole. Work slowly, bit by bit, counter-clockwise around the opal. Grind each small section to fit as perfectly as you can before moving on. While cutting the inlay piece, taper the sides toward the bottom slightly. This allows the inlay to fit tighter into the gold ring as it settles.

When the inlay fits perfectly (or very nearly), by all means stop working on it! You must now make a choice between finishing the piece as a "flush" inlay or a "cushion" inlay. If the opal barely protrudes above the level of the host, a "flush" inlay is best. In that case, clean the inlay hole and the opal with steam or acetone, mix the epoxy, fill the hole with epoxy, and insert the opal. Squeeze out any air bubbles, as compressed air acts like a spring.

When the epoxy has set, grind the opal down to the level of the host on the 240 wheel. Pre-polish the front and rear of the piece as you would an ordinary cabochon and give it a final polish on coarse leather at slow speed with optical-grade cerium or tin oxide. The final lap wheel should be a 3,000 rather than the stock 14,000, which burns opal badly. Diamond Pacific's current

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Grind the inlaid gold to the host level, working outside to inside to leave a crisper inlay margin.

lap sets have a 3,000 wheel; earlier models will need one.

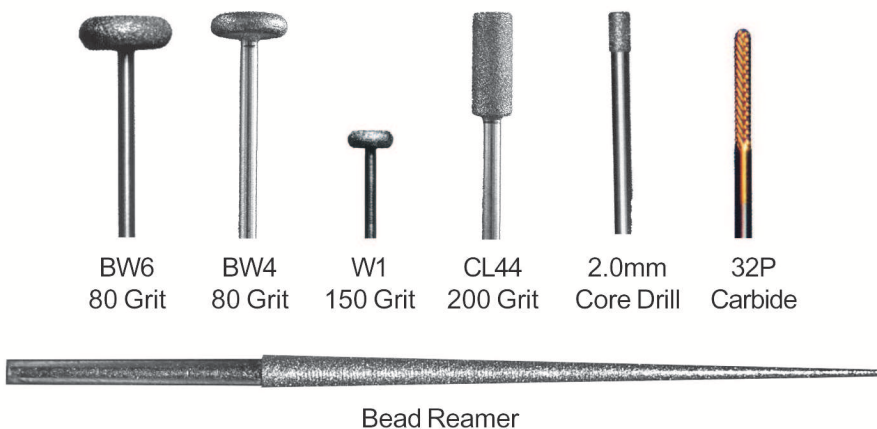
If, on the other hand, the opal protrudes above the host by $\frac{1}{16}$ inch or more, consider completing the piece as a “cushion” inlay. This involves a few extra steps, but adds a third dimension to the piece and allows the opal to flash its colors in more directions. It also preserves the opal’s intrinsic value, which is lost with a “flush” inlay. A “cushion” inlaid opal may later be removed and used in a different setting.

To produce a “cushion” inlay, insert the opal firmly into the hole, sharpen the aluminum pencil, and scribe a fine line around the outside of the opal where it meets the inlaid gold ring.

Remove the opal and dop it onto a finish nail. Contour cut the opal down to the scribed line, then pre-polish and polish it as above. Clean the inlay hole and the opal with steam or acetone, and epoxy the opal in. Clean the stone well with acetone before the epoxy sets. When the epoxy has set, soften the epoxy by immersing the piece in acetone for a few minutes, then scrape off any excess with the X-Acto knife. Taper the sharp edges of the “hanging hole” with the No. 4 burr.

For a professional touch, polish the inside of the hole using $1\frac{1}{4}$ -inch pieces of bamboo skewer and successive diamond compounds of 325, 600 and 1200 grit. Between grits, clean the piece thoroughly with soap, water, a toothbrush, and Q-tips.

Lasco’s Opal Inlay Kit



Excavation requires the use of four diamond burrs of different shapes, sizes, and grits. (See Photo Lasco’s Opal Inlay Kit)

The hand tools for forming the gold wire include forming pliers, flat pliers, and an end cutter. (See photo on right)



Use a different piece of bamboo for each diamond grit to avoid contamination.

For post earrings, before inlaying the opal, drill a 1-millimeter hole through the bottom of the inlay hole and insert a $\frac{1}{2}$ -inch 14k fusion post (available from Rio Grande). For French hooks, drill a 1-millimeter hole near the top of the piece, cut a piece of 20 gauge 14k wire $2\frac{1}{2}$ inches long, and melt a small ball on one end. Polish the wire, insert it into the hole, and bend it artistically.

Clean the piece with soap, water, and a toothbrush, and finally with window cleaner. You’ve done it. Congratulations!

This brief guide should help you make it through an opal inlay project and avoid most of my early mistakes. Making mistakes and getting stuck is inevitable. When (not if, but when) that happens, call and I’ll try to help. 💎

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Suppliers

The Lasco catalog numbers for the burrs are:

- No. 1 - BW6 80 Grit
- No. 2 - BW4 80 Grit
- No. 3 - W1 150 Grit
- No. 4 - CL44 200 Grit

Lasco Diamond Products provides an “opal inlay kit”, a complete set of the needed burrs, including a core drill and both a metal reamer and bead reamer. I suggest having several sets, as they are not expensive, and all tools do eventually become lost, broken, or worn out. Lasco Diamond Products, P.O. Box 4657, Chatsworth, CA 91313, toll free (800) 621-4726, in California (800) 621-4727; e-mail: info@lascodiamond.com; Web site: www.lascodiamond.com/products

An ultrasonic drill may be obtained from Bill Ritter of Cutting Edge Solutions. Cutting Edge Solutions, 22704 Ventura Blvd. #336, Woodland Hills, CA 91364, (818) 992-1982; e-mail: ba.ritter@earthlink.net; Web site: www.cesdiamondtools.com