



Gold Ring with Platinum Granulation

BY JACK AND ELIZABETH GUALTIERI

Advanced project

Part I of II: Making and fusing the granules.

Editor's note: For more information about the artists, see "Designing Partners," on page 18.

This project requires some familiarity with the granulation technique. Basic soldering and polishing skills are required.

STEP 1. Make the granules.

Take the 20-gauge platinum/iridium wire. Scribe 22 sections that are 1mm intervals and cut the wire into sections with the wire snips. Repeat the process with the 26-gauge wire, cutting 90 sections. (Note: this is the bare minimum needed to create this particular ring, always cut a few extra.) Sprinkle the sections on the platinum soldering block, making sure that none of the sections are touching each other. Using the oxy/propane torch with tip #2A and wearing the

goggles, heat up each section of wire individually until it forms a round granule. Allow the granules to air-cool. Then separate the 2 sizes into gem cups with a pair of tweezers.

STEP 2. Make the bezel.

Using the jeweler's scissors, cut a strip of the annealed 23-gauge 22K sheet 4mm wide and of sufficient length to fit around the stone snugly, but without binding. Use a fine blade (#4/0) saw to clean up the joint so that the ends



TOOLBOX

- Oxy/propane torch with tip #2A
- Air/acetylene torch with tips #1 and #0
- Welder's goggles with shade #7
- Platinum soldering block coated with zirconium paint
- Charcoal soldering block
- Ultralite kiln
- Solder pick
- Tweezers
- Locking tweezers on third arm
- Green flux in syringe bottle
- White flux and small brush
- Ochre powder and small brush
- 3 gem cups or small containers
- Klyr Fire enameling glue
- Good quality 5/0 artist's brush
- Rawhide mallet
- Goldsmithing hammer
- Karat stamps: 22K, 18K, platinum/iridium
- Maker's mark stamp
- Jeweler's scissors
- Saw frame and 4/0 blades
- Heavy duty snips
- Assorted pliers: flat/flat and 1/2 round/flat
- Round ring mandrel
- 1/2 round needle file cut #2
- Loupe
- Scribe
- Millimeter gauge
- Wire gauge measurer
- 220 grit wet/dry sandpaper
- on flat surface (preferably glass)
- Bezel pusher
- Ultra-fine point marker
- Clear plastic protractor
- Pickle pot with citric acid pickle
- Ultrasonic cleaner with small parts fine-sieve basket
- Steamer
- Combination rolling mill
- Benchmate with ring vise
- Polishing motor
- Flex shaft
- Tripoli and red rouge compound
- Large muslin buffs and inside ring felt buff
- Small drill bit
- Fine-grit silicone polishing wheel
- Brushes
- Platinum/iridium wire 20- and 26-gauge for granules and 12-gauge for side balls
- 22K yellow gold wire 16- and 19-gauge
- 22K yellow gold sheet 23-gauge
- 18K yellow gold sheet 24-gauge
- 18K yellow gold square wire stock 3mmx3mm
- Gold plumb solder: 18K h, m, and s
- Platinum 1500° solder
- Cabochon gemstone
- Ring size table

meet perfectly. Place the bezel on a charcoal block. Using the air/acetylene torch with tip #1 (a/a#1), anneal the bezel to release the tension created in forming it, adjust the seam for a tight fit, and fuse the bezel shut with a bushy flame. Flow the metal just enough to fill the seam and keep the flame moving.

STEP 3. Make the 2 base wires.

Take the piece of annealed 16-gauge 22K wire and wrap it around the base of the bezel tightly, overlapping the ends. Scribe a line on each end of the wire where it overlaps, remove the bezel, and saw the wire to length at the scribed marks. Bring the ends together tightly and fuse as described above for the bezel. Lightly file the inside of the seam if necessary, so that when the bezel is placed with the base wire in place, it is upside down on the charcoal block. Fuse the base wire to the bezel as above. (If the wire is too loose, it will sag down the bezel and fuse crookedly, so a tight fit is essential.)

Take the piece of annealed 19-gauge wire and wrap it around the outside of the 16-gauge wire so that they are concentric to each other. Cut and fit tightly as with the first wire, so that the 19-gauge wire visually creates a step down from the 16-gauge wire when the bezel and wire are placed on a steel block. Fuse the seam on the 19-gauge wire, then lightly file the inside of the seam, if needed. Place the 19-gauge wire in the steel block and fit in the bezel with the 16-gauge wire. There should be some resistance. Fuse together upside down as before, watching for the seam to flow then take the torch away immediately. Pickle bezel to remove all oxidation.



STEP 4. Polish.

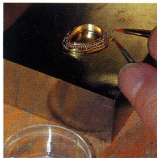
Use the flex shaft and an assortment of brushes and muslin buffs (first tripoli, then red rouge the bezel). Use the ultrasonic between compounds to avoid cross contamination of buffs. No seams should be visible. Use the ultrasonic and steamer to remove all compounds.

STEP 5. White flux.

On a separate charcoal block, liberally apply white flux to the bezel. Heat with a/a#1 tip until the flux turns clear, then immediately quench the piece in the pickle. Pickle until the flux is gone, rinse with water and dry.

STEP 6. Granulate.

Place the clean, dry bezel on the steel block. Take the 5/0 brush, dip it into the Klyr Fire glue, then use the glue-laden brush to pick up a granule. Start arranging the granules 1 or 2 at a time on the bezel in this manner until the desired pattern is achieved. Allow the glue to dry completely (10-15 minutes).



STEP 7. Fusing the granules.

Preheat the Ultralite kiln. Using tweezers, pick up the bezel at the top, being careful not to dislodge any granules. Have the a/a#1 in the other hand with a bushy flame kicking. In 1 quick motion, place the bezel, right side up, gently in the kiln while bringing the torch into position directly over the top of the bezel, moving it in small circles. (Granules will pop off if the glue is not dry.) Heat the piece evenly, constantly moving the flame.



With the bushy flame the temperature increases gradually. Watch carefully for a "flash" across the surface of the bezel. This "flash" indicates that the surface molecules are becoming liquid and bonding the granules into place. This occurs just before the whole top of the piece melts, so pull the flame away immediately.

Remove the piece from the kiln carefully with the tweezers and cool on the steel block. With a loupe look for the "stem" (the bond of gold connecting the granules to the bezel). Most likely, the first fusing is not enough. (When beginning granulation, people either go way too far or not nearly enough.) Repeat the fusing step as many times as necessary (5 or 6) to fuse all of the granules into place, each with its own stem, but being careful not to overheat the gold.

STEP 8. Check the granules.

Pickle the bezel to remove all of the oxidation. Then put it in the fine-sieve basket in the ultrasonic and shake for 10-15 minutes. If granules fall off, glue them back into place, let the glue dry, and re-fuse. Repeat as necessary. If you are unsure as to the sturdiness of a fusion stem, pick at it with a fingernail (never a metal tool). ♦

Next month, we will solder the bezel to the back sheet, solder the shank to the bezel, and set the stone.

Jack and Elizabeth Gulatieri are Portland, Oregon, based goldsmiths and woodworkers.

Want extra help with this project? Post your questions and suggestions to our web site, www.lapidaryjournal.com, and check out Mail Bag each month.



Gold Ring with Platinum Granulation

BY JACK AND ELIZABETH GUALTIERI

Advanced project.

Part II or II: The shank, bezel, and stone.



Photo of finished ring: Von Rosen

STEP 1. Preparing the bezel and the back sheet.

Place a piece of 220-grit sandpaper (face up) on a piece of glass or other smooth surface. Lightly wet-sand the bottom of the bezel and wires until there is a flat area on each of the 2 wires and the bottom edge of the bezel. (It is not necessary to eliminate the grooves in between.)

Place the bezel on a piece of 24-gauge 18K sheet that is slightly larger in diameter than the bezel. Using the ultra-fine point marker, trace the outside and the inside edge of the bezel onto the 18K sheet. Stamp the karatages and the maker's mark within the lines at the top or the bottom, keeping in mind that the shank will be soldered across the middle. You could also wait to stamp the shank instead. On the other side of the 18K sheet, transfer the outline of the bezel; this is now the top, the bottom is the stamped side. Take a pair of flat pliers and bend up a little corner of the sheet in an area where the bezel does not touch.

STEP 2. Soldering the bezel to the back sheet.

In a gem cup, mix some ochre powder with water until it makes a loose paste. Place the bezel into position on the upper side of the back sheet. Apply green flux to both pieces and heat with the air/acetylene torch with the #1 tip (a/a#1) until the flux turns clear. Cool on the steel block. When the bezel is completely cooled, brush the ochre onto the granulated areas of the bezel only, being careful not to get any between the base wire and the sheet. (The ochre impedes the flow of solder and getting solder into the granules means starting over.)

Cut small pieces of 18K hard solder and place them (with tweezers) flat on the sheet inside the bezel so that they are touch-

ing it. Use enough solder to ensure that when the pieces are lined up around the inside of the bezel the gaps between are



half the size as the pieces themselves. With the tweezers, carefully pick up the piece by the bent corner and place it in the kiln. Use the a/a#1 to flow the solder inside the bezel and draw it out, flowing it completely around where the outside wire touches the back sheet. Pickle completely. Use the ultrasonic and the steamer to remove the excess ochre. Some will remain, but it will come off later.

STEP 3. Cleaning up the bezel.

Saw off the excess sheet as close to the edge as possible without cutting into it. File the edge with smooth strokes until the edge of the back sheet and the outer wire are an even plane. Be careful not to hit the granules with the file. Take the center punch, place the piece, back sheet side down, on the steel block and punch a divot in the center of the back sheet inside the bezel. With a drill bit on the flex shaft, drill a small pilot hole in the divot. Feed the saw blade up through the hole and cut out the excess sheet inside the bezel leaving a 1mm lip for the stone to rest upon. Smoothly file away any saw marks.

STEP 4. Polishing the bezel.

With the flex shaft and an assortment of brushes and muslin buffs, using tripoli then red rouge, polish the bezel in its entirety, being careful not to flatten the granules by over polishing. Use the ultrasonic and the steamer.

STEP 5. Making the shank.

Take the piece of annealed 18K square stock, 3mm x 3mm, and roll it through the 3mm-wide half round rollers on the rolling mill until the piece is 2.1mm thick. (Keep the thickness durable and in proportion to the bezel.) Anneal it on the charcoal block with the a/a#1 and pickle. Using a ring

TOOLBOX

For a complete list of tools and materials, see Part I, April 2001.

Always ask for the MSDS (Material Safety Data Sheet) for any materials you buy, which will give you reactivity, health hazard, and safe handling data.

size table, cut the wire to length with the saw (a size 7 is approximately 61mm in length). Use the half round flat pliers to round the shank until the ends meet. Apply green flux at the seam and solder together with 18K hard solder on the charcoal block with the a/#1 and pickle.

Finish rounding out the shank by placing it on a round ring mandrel and using the rawhide mallet. File away any excess solder. Put the shank flat on its side, in the middle between 2 steel blocks, and hammer on the top steel block. This will make the edges parallel. Polish the shank with the polishing motor using tripoli on a muslin buff and then on a felt, inside ring buff. Use the ultrasonic and steamer.

STEP 6. Preparing the shank to join the bezel.

It is very important to determine the x/y axis of the bezel so that when the shank is attached it is in the center and straight. A variety of methods can be used depending on the shape of the stone. A small, clear plastic protractor works well. Transfer the x/y axis marking to the back sheet of the bezel with the ultra-fine point marker. Carry the lines up the sides of the edge of the bezel as well. Hold the shank in place, against the back of the bezel, along the horizontal axis.

The soldered area of the shank should be in the opening of the bezel. With the marker, mark the section of the shank where it rests in the open area of the bezel. Saw away that section neatly so that the sawn edges are parallel to each other.



Put the shank in the ring vise, sawn-out area up, and file a flat spot on the top of the shank on each side of the open area. Place the shank, flat spot down, on the steel block periodically to check the shape. Next,

using a fine-grit, silicone polishing wheel on the flex shaft, clean up the sawn gap in the shank as it will be difficult to clean properly once the shank is soldered to the bezel.



STEP 7. Soldering the shank to the bezel.

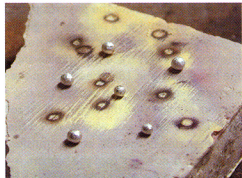
Place the bezel, top down, on the charcoal block. Put the back of the shank in the locking tweezers of the third hand

and center the filed flat spot along the marked horizontal axis of the bezel, also checking that it is centered on either side of the opening in the back of the bezel. Green-flux the area to be soldered and heat the pieces with the a/#1 tip until the flux clears. Cut a very small piece of 18K medium solder, ball up the solder on the charcoal block, and using the solder pick, place the solder on 1 side of the back sheet also touching the shank. Flow the solder and pickle. Check the alignment of the shank. (Using only a little solder on 1 side makes minor adjustments or removal easier.) If everything is aligned, solder the shank completely to the back sheet using very small pieces of 18K medium solder, 1 at a time, as described earlier. The smaller the balls of solder, the less solder stain to clean up later. Pickle.

STEP 8. Making the decorative side balls.

Take the 12-gauge, platinum/iridium wire and scribe 6 sections at 2.25mm each. Saw or snip each section and place on the platinum block so that they are not touching. Wearing the goggles

and using the oxy/propane torch with the #2A tip (o/p#2A), ball up the sections. On balls of this size, gravity creates a flat spot on the bottom, keeping the flat spots down, arrange the balls into 2 sets for each triangle. Solder the balls together with the o/p#2A (remember to wear the goggles).



STEP 9. Soldering the side balls to the ring.

Put the back of the shank in the locking tweezers of the third arm and position the ring on its side, on the charcoal block so that the top of the bezel faces you and the shank is sticking up, perpendicular to the charcoal block. The side balls will now sit in position, flat spots down, on the center of the shank, touching the side of the bottom base wire of the bezel.

Apply green flux and heat with the air/acetylene torch with the #0 tip until the flux clears. Reposition the balls with the solder pick if they were shifted by the bubbling of the flux. Allow the entire piece to air-cool without moving



it. Ochre the granules on the bezel nearest to the side balls. Heat the piece. Solder the side balls to the base wire and to the shank, applying very small pieces of balled up 18K soft solder 1 at a time with the solder pick. Only use just enough solder so that each ball is connected to the ring. Pickle and repeat for the other side, making sure that the side balls line up evenly on the center of the shank. Pickle, and use the ultrasonic and steamer to remove excess ochre.

STEP 10. Prepare to set the stone.

If ochre residue remains on the ring, coat it with white flux and heat it with the a/a #1 until it is clear. Quench it in the pickle. Repeat as necessary until all the ochre is removed.

Wet-sand the top of the bezel on the 220-grit paper, moving the ring in a figure-8 motion until the top is smooth and flat. Final bezel height is deter-



mined by a correlation between the cut of the stone, a minimum of 1.5mm between the top of the granules and the top of the bezel, the side balls, and the area where the shank was joined to the back sheet. Again, do not flatten the granules by over polishing them. Use the ultrasonic and steamer and do a final louped inspection before setting.

STEP 11. Set the stone.

Hold the stone steady in the ring vise and set the stone using a bezel pusher. Push at the major axis first, followed by the minor axis.

Then work evenly all around the stone, being careful not to slip and smash granules. At the flex shaft, use a fine-grit silicone polishing wheel to smooth out any bezel pusher marks. Lightly use red rouge on the entire piece with a soft buff. Quickly use the ultrasonic and steamer to remove any excess compound, being mindful of a stone's compatibility with the ultrasonic and the steamer.◆



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