

ADVANCED PROJECT GRANULATED FINE SILVER EARRINGS

Granulation is the process of fusing tiny metal spheres of silver or gold, in a decorative pattern, to a surface of the same metal. It is an ancient technique that produces a beautiful, delicate effect. When making Granulated jewelry, all connections are fused instead of soldered.

This project is to make a pair of round earrings in Fine Silver, with a granulated pattern on the surface and a small stone set in the center. It is an advanced level project, and assumes basic skills such as soldering, stone setting, etc.

It is important to read the entire set of instructions before starting out, to get an overview of what you will be doing. Then go back to the beginning and take it step by step.

OVERVIEW OF FUSING

Fusing involves raising the temperature of both the backsheet and the granules and wires to be fused, to the point at which they melt just enough so that they will adhere permanently to one another. This is a very delicate operation. If the correct temperature is not reached, the items to be fused will not hold properly, necessitating the reheating of the whole piece, in order to replace them. If the temperature gets too high, too fast, meltdown can occur, which is irreversible. Therefore, lots of patience is needed and both the backsheet and the object to be fused need to be brought to the appropriate temperature very slowly.

Items to be fused in this project are the bezel ends, bezel to backsheet, circular wires around bezel and outside rim of earring, and the granules, and will be done in the following order:

1. Bezel ends
2. Bezel to backsheet
3. Round wire around bezel and around outside rim of earrings
4. Granules

General Process for Placing Items for Fusing

1. Prepare a mixture of 10 drops of water, 2 drops of hide glue and 3 drops of liquid flux. This will be applied sparingly to all surfaces to be fused, and act as temporary glue to hold the items in place until they are heated. Once heated, the hide glue burns off

and the items are no longer glued down.

2. Turn up a corner of the backsheet with small pliers, so that it can be easily grasped with tweezers. This will enable you to move it easily and without tipping it. This piece will eventually be cut off.

3. Using the 000 sable brush, apply the mixture to the item to be fused before placing it on the backsheet. This mixture is also water soluble, so if you want to make a correction in placement, flood it with a small amount of water. This will dissolve the glue and you will be able to move the piece.

4. After placing the item, give it a little time to dry? -especially when placing the granules? So it cannot be easily moved by accident.

5. Once the item to be fused is air dried, start the heating process very gradually:

a) Put the earring on the small piece of ceramic tile and place it under the kiln for a few minutes to warm up.

b) Place the metal kiln cover on the kiln, and put the tile with the earring on it for two or three minutes to continue to raise the heat gradually.

c) Then, remove the tile and allow the earring to rest directly on the metal cap of the kiln until the glue mixture begins to turn brown.

d) As it heats up, the hide glue will begin to turn dark brown. (Don't worry, this will burn off). Place the earring in the kiln and cover it with the metal cap while you light the torch. Check it fairly quickly to see if all the glue has burned off. Once the glue has burned off, the earring will look radiantly silver, but the objects on top of the backsheet are all unglued and loose, so don't jar the kiln or move anything too suddenly.

The next step will be fusing the bezel and wires to the backsheet.

General Information for FUSING

1. Use the torch tip that will produce a large, soft flame. Keep your arm high above the kiln with the torch at right angles to the surface so that only the very feathery tip of the flame touches the earring.

2. Start to heat the entire piece with a slow, circular motion around the outside of the periphery of the backsheet. This will build up a cone of heat around and above the entire piece, allowing it all to rise to the same temperature at the same time, while the kiln is providing the necessary bottom heat.

3. When the outer edge of the silver begins to show signs of shimmering, pass the tip of the flame closer into the area you wish to fuse. Use a gentle, sweeping motion and do not concentrate the flame in any one spot. As you do this you will actually see the surface of the silver shine and "run" a little like solder does and you can usually see the surface change right up to the edge that needs to be fused. Withdraw the heat quickly and turn off the torch.

4. Give the piece a few seconds to cool, then quench in cold water. Test the parts that were fused with a sharp pointed instrument (tweezers etc) to see if they have been completely fused. If some areas are still unfused repeat the whole procedure over again as many times as necessary to get everything solidly fused.

TIP: Do not try to hurry the heating process by bringing the flame in close, or concentrating on any one spot. Work slowly and carefully

STEP BY STEP INSTRUCTIONS

STEP 1. Preparing the Back Sheet

1. Cut two pieces of 24 gauge Fine Silver sheet, each one approx. 1 1/2 inch square.

2. Flatten the squares between two steel blocks, annealing them if necessary. Be sure that they are perfectly flat.

3. Sand and tripoli the backsheet, eliminating all scratches. Then clean it very well, making sure to remove all traces of the tripoli. From here on in, try not to get fingerprints on it. Any extraneous material on the surface of the metal, such as fingerprints or polish can interfere with the fusing process.

4. Coat the back of the backsheet with ochre to prevent overheating the piece when fusing takes place.

STEP 2: Preparing and Fusing the Bezel

In this sample, we are using 6 mm. garnet cabs.

1. Cut the bezel wire to the correct size to contain the stone, but make it slightly higher than you will need. This will give you an extra edge of metal in case the bezel become deformed by the flame during repeated heating. The bezel can be filed or sanded down to size before setting the stone. FUSE the ends of the bezel together. This can be done on a piece of charcoal outside the kiln if the kiln is too hot for the thin bezel. Please read the section on Fusing before continuing. Do not solder the ends. Since fusing occurs at a higher temperature than soldering, all fusing operations must be completed before any soldering takes place.
2. To fuse the wire into a bezel, abut the ends just as you would if you were soldering them. Place them in the kiln, which has been heated, or on charcoal. Using only the feathery tip of the large flame, heat the bezel piece by creating a circle of heat around it and then gently and quickly pull the very tip of the flame over the seam. The silver becomes shiny and you can see the silver shimmer and run together. Quickly remove flame all this happens very fast!
3. File gently over the seam in the bezel until it disappears. Tripoli the bezel itself until the scratches are removed and it looks shiny and finished. Once it is fused to the back sheet, it will be very difficult to correct any blemishes.
4. Gently ochre the very top rim of the bezel. Since you will probably heat and reheat the piece several times, this will help prevent the bezel from accidentally burning around the top.
5. Find the exact center of the backsheet and mark it to indicate where the bezel should be placed.
6. Fuse the bezel in the center of the square of silver.

STEP 3: Preparing and Fusing the Decorative Wires.

You will need two circles made of round wire. One will surround the bezel; the other will be at the outer circumference of the earring

1. Using the 22 ga. round wire, shape a ring that will fit exactly around the bezel.
2. Fuse the ends together and reshape it on a mandrel to be sure it is perfectly round.
3. Check the fit of the ring around the bezel. To fuse properly, it

must be an exact fit, leaving no spaces either around the bezel or between it and the backsheet. If necessary, flatten the ring between two steel blocks.

4. Place it over the bezel and fuse it to the backsheet.

5. Using the 22 ga. wire, make a ring with a diameter of 7/8" and fuse the ends together. This will demarcate the outer edge of the finished earrings.

6. Shape on a mandrel so that it is a perfect circle and if necessary, flatten it between two steel blocks so it lies perfectly flat on the backsheet.

7. Place it on the backsheet so that it forms the outer edge of the earring. Make sure that it is placed so that the bezel is at the EXACT center of the outer ring.

8. Paste it down temporarily with the Hide Glue mixture as described in the section on Fusing. 9. Fuse the larger ring to the backsheet.

The next step will be Granulation.

GRANULATION

Overview Granulation involves placing and fusing tiny balls of silver on the surface of the backsheet in a preplanned design. The mixture of Hide Glue, flux and water is used to temporarily hold the granules in place until they are fused.

STEP 4: Acquiring the Granules

Granules can be either bought or made by hand. The obvious advantage to buying granules is that you save a great deal of time that you would otherwise spend in making them, and that they will be very uniform in size. Uniformity is important because it affects the final look of the design. The downside is that they are expensive, and usually need to be purchased in larger quantities than you would need for one project.

For this project you would need about 3 Dwt. of Fine Silver granules.

They generally come in 3 sizes-Large (.032)

Medium (.024) and Small (really tiny-- .016) The large size was used for these earrings. (See supply list for source of granules).

Making your own:

The main advantage to making your own granules is cost. After some experimenting, you can also make granules of different sizes, and find the size that suits your work better than those that are purchased. You can also make as many as you need, as you need them. Some experimentation and practice is very helpful. The downside is time and getting uniformity

Granules are made by coiling fine silver wire around a pin stem or needle that is used as a mandrel. The final size is a variable of the thickness of the wire, the diameter of the 'mandrel' that is used for coiling the wire, and the point on the curve of the coil where the wire is cut. To maintain uniformity, the wire should be cut at precisely the same point in the curve each time.

1. Using a pin stem or needle as a mandrel, and 26 ga. round wire, wrap the wire around it in a tight coil.
2. Remove the coil from the pin, and stretch it out slightly so that you can get a small cutting tool between the loops. Snip the top of each loop (do a few and see if you are getting the size you want)
3. Spread the little curls out on a charcoal block, -don't put them too close to each other or they will tend to roll around and merge when they are heated, giving you granules that are much too big.

TIP: It is helpful to carve a ridge around the top of the charcoal block, about 1/4 from the edges. This provides a channel for the granules to roll into and makes them easy to retrieve.

4. Using a small tip on your torch, heat each granule briefly until it turns into a perfect ball. Try not to bring the flame too close to the granules because the force of the flame will blow the granules around, sometimes causing them to collide or to fly off the charcoal. Remove the heat promptly when the ball is formed.
5. Once you have found the correct size continue to make granules until you have as many as you need. As mentioned before, you don't need to do them all at once but can make them up in batches as you need them.

STEP 5: PLACING THE GRANULES

1. Make sure the back sheet is flat, clean and as smooth as you can get it. Pickle it and then be sure to clean it in hot soapy water

and rinse in clear water to remove any traces of pickle. Try not to get any fingerprints on it.

2. Have handy the Hide Glue mixture, a small amount of water, the 000 brush and either another fine brush or fine tweezers. It is helpful to work on a clean piece of paper toweling.

3. Pick up a small amount of Hide Glue mixture on the brush, and then pick up a few granules. Place them on the backsheet, starting at the outside wire. Place a row of granules all around the inside of that wire. This will form the first line of your pattern. Use the Hide Glue sparingly, and dilute it with a little water on your brush when necessary. Give the granules a chance to dry a little before going on to the next line. This will help prevent them moving about when you continue the pattern. I have found it helpful to work on both earrings at the same time, alternating them- do the outer circle on one earring, set it aside and do the other, and then go back to the first one, etc.

4. Making the triangles: Place five granules under the first row. Make sure the granules touch each other and the row above them. They will settle into the angles made by the joining of the above granules. Next place four granules below them, then three, then two and then one. That completes the first triangle.

5. To start the second triangle, skip one granule space, and then repeat the procedure. The pattern will look different depending on where you place each triangle. Try to be consistent in how far apart they will be.

6. Continue making the triangles all around the piece.

7. Place a row of granules around the wire that surrounds the bezel. Then make small triangles of three granules each, spacing them evenly so that the point of the little triangle points to the opening between two larger ones.

8. Set the earrings aside and let them air dry for about 5 to 10 minutes.

STEP 6: Fusing the Granules:

1. Wait until the kiln is very hot. Do one earring at a time. Place the earrings on the small piece of ceramic tile and place the tile under the kiln so that the heat from the kiln will begin to dry the glue mixture.

2. Next, put the cover on the kiln, and place the tile with the first earring on it on top of the cover. Let this heat up for a few minutes. DO NOT RUSH THIS PROCESS! When the glue mixture starts to turn a little brown, gently and carefully slip the metal piece off the tile and onto the kiln cover. Try not to jar it, as the granules become loose as the glue mixture burns off.

3. When the glue mixture turns dark brown (don't get alarmed) carefully lift off the backsheet holding it perfectly horizontal so as not to disturb the granules, and place it in the hottest part of the kiln (usually there is a bright hot spot which is visible).

4. Cover the kiln for a few seconds while lighting your torch. Remember to use a large tip with a very soft flame. Check the piece to see whether the glue has all burned off. When the piece looks silvery again, it is time to begin heating the granules to fuse them. (Sometimes the glue will send up black smoke as it is burning off--do not worry about this.)

5. Use the same technique as described before. Hold the flame at right angles to the piece, and allow only the feathery tip to come in contact with the metal. Start by slowly describing a circle around the outside of the piece, to allow the heat to build up evenly while the kiln provides bottom heat. Every once in awhile, pass the tip of the flame over the metal piece itself--in a kind of sweeping, swooping motion that does not concentrate the heat in any one place. DON'T TRY TO RUSH THIS PROCESS EITHER! Work slowly and methodically, heating around and then over the piece.

6. When the metal begins to shimmer and the granules start to look like they are lighting up, gently stroke over each section of the granules until you have covered the entire area. Withdraw the heat quickly, and remove the piece from the kiln, letting it air-cool for awhile, Repeat the same process for the second earring.

7. Now comes the really hard part. It is essential to make sure that all the granules are in fact, fused to the backsheet. With a sharp tool, such as tweezers or a scribe, push each granule to see if it is securely fused. It is not unusual for one or two or several granules to come off even when others right next to it are fused. Remove any granules that are not fused, reglue them and repeat the whole process. It takes some practice and experience to determine the exact point of fusing.

TIP: Until you get experience in determining whether fusing has taken place while the piece is hot, it is probably better to

underestimate the time and then repeat the process if necessary. If the piece gets overheated, the granules will melt and the piece will not be salvageable.

STEP 7: Finishing the Earrings

1. Trim the excess metal from the backsheet by snipping around the outside wire ring. Keep the cutters at right angles to the piece and move the piece into the cutter to avoid any undercut. File and sand around the outside edge to get a perfect circle.(Fig.5)

2. Remove the ochre from the back of the piece by painting it with paste flux and heating it until the flux becomes shiny. While hot, plunge it in pickle, then rinse and use a brass brush to clean off residual ochre. This may have to be repeated a few times.

3. To bring up the fine silver and give the piece a soft look, coat it with paste flux, heat the flux to a shine and pickle. Then use a brass brush to bring out the sheen. Rouge can also be used on the granulated surface, but NOT TRIPOLI or any abrasive as that will erode the granules.

4. Sand the back of the piece and polish to a satisfactory shine. Solder the posts with medium solder. This should be the last operation before setting the stone.

5. Set the stones.

TIP: because the earrings are fairly heavy, they will hang best when clutches are used on the posts. If you prefer, an Omega earring back could also be used.

6. Sit back and enjoy your beautiful granulated earrings.

SUPPLY LIST

Fine Silver Granulation

SUPPLIES NEEDED

Silver sheet-24 gauge: two pieces approx. 1 1/4 inches square

Fine Silver round wire-22 gauge

Fine Silver-26 gauge bezel wire or make your own bezel

Fine Silver granules. *
Two 6mm. stones
Ochre
Steel bench blocks

TO PASTE GRANULES ON BACKSHEET

Hide Glue **
Liquid Flux
Eyedropper
One or two 000 paint brushes
Fine tweezers (optional)

TO FUSE GRANULES Torch with large tip (#1 Tip for Smith torch; #7 for Little Torch) Lightweight jeweler=80=99s kiln (sometimes called Tri=cket kiln) *** Charcoal block Small piece of ceramic tile
Tweezers

TO FINISH EARRINGS Either posts or wire hooks Medium solder
Stone setting tools