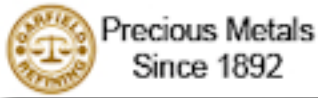


## TECHNICAL ARTICLE



This will be my final issue as *SNAG News* Technical Editor. After just over two years I have decided to step aside and concentrate on some other projects. I have greatly enjoyed soliciting articles for inclusion in *SNAG News*, and hope those articles proved informative and useful. It was nice to hear some of the articles were used as teaching aids in classrooms, and that others tried a new material or technique because of what they read here. James Thurman will be the new Technical Editor. Please share the knowledge you have built up over the years. My final submission is from Yoshinori Tsukudate, a Japanese instructor from Hiko Mizuno Jewelry College in Tokyo, Japan. The technique he writes about is Nunome Zogan.

Warmest regards, Jim Bové

## **Traditional Japanese Metal Inlay Technique “Nunome Zogan” (Nunome – fabric pattern, Zogan – inlay)**

**By Yoshinori Tsukudate**

Translated by Yoko Sekino-Bové and edited by Jim Bové

Many traditional Japanese metal techniques are widely known in the United States today. For example, Mokume-gane, Shakudo, and Shibuichi are very well known now. Mokume-gane has especially been well studied in the United States, up to the point that people can purchase the mass-produced, industrially prepared metal through the Internet. It originated in Japan, but now the United States has more advanced techniques of production. It may be related to the fact that there are not too many Japanese metalsmiths who willingly disclose the techniques they developed. The highly skilled masters especially tend to be shy about their methods. Many hesitate to share their methods or teach to others. I can understand their feeling as a metalsmith, but I believe that it is important to offer the amazing techniques of Japanese metalsmithing to the world, to share the technology and offer an opportunity for as many people as possible to be able to experience it.

That is something that I observed in the United States. I observed that the American people's strength is in sharing innovations instead of hiding them as a secret. They collectively develop the most effective and logical method to achieve the best result. Also they are good at extending the methods to transfer to business/ industrial formats, This is something we the Japanese can learn from the Americans.

There are many metal techniques in Japan that are not yet widely known in the United States. I would like to introduce a technique called “Nunome Zogan.” “Nuno” means fabric pattern, “Me” means texture, since the

finished surface looks just like a criss-crossed fabric texture. “Zogan” means an inlay technique. This technique used to be applied to hilts of Japanese swords and sword accessories, now it is being applied to jewelry.

I conducted a workshop for this technique at the Armory Art Center in West Palm Beach, Florida in the United States in May 2009. It was hard work getting the traditional Japanese materials and tools for this workshop shipped from Japan, but it turned into a wonderful experience for both the students and me. The participants were very curious about the techniques they have never seen before.

The advantage of this technique is that you don't need to spend too much money on gold or silver because they are applied as a thin layer and the patterns can be applied to any piece without heating the metal surface.



Chisels for NUNOME ZOGAN



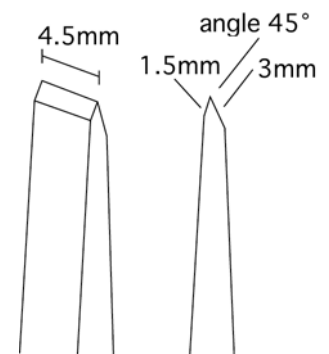
Mekiri Chisel

### About the chisels

There are three different types of Japanese chisels for this technique, “Mekiri” chisel, copper chisel, and bamboo chisel (note- the copper and bamboo “chisels” look like blunt ended punches, but we will refer to them as chisels).

First, the “Mekiri” chisel is used to create the fabric texture. This is the most important chisel for fabric-patterned inlay.

The angle and size of this chisel are varied among the Japanese metalsmiths, so it does not have to be exactly the proportion described in the illustration. If the chisel is made with tool steel, the blade lasts longer. You can make one using a belt sander and then a sharpening stone for the edge. The average length of a chisel is about 95 mm, and the width is about 4.5 mm. The angle on the blade in front and back is different. It may come in handy if you have a variety of chisels for different occasions.



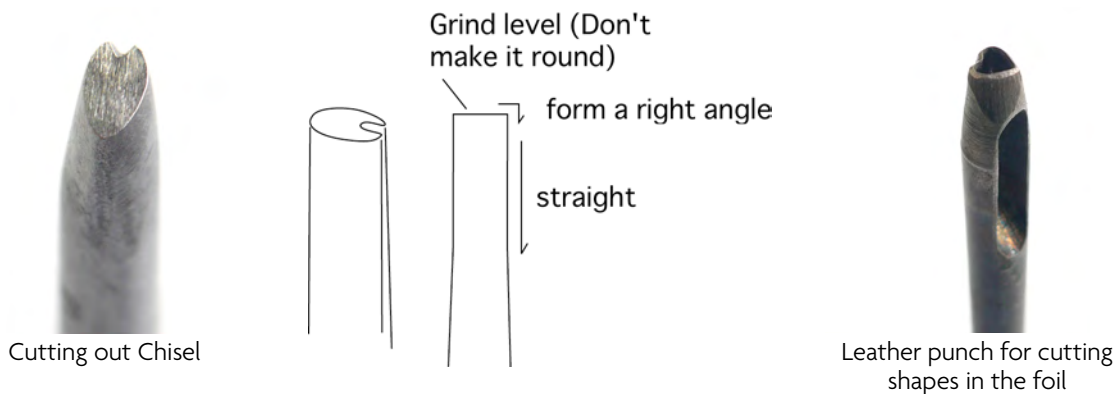
Mekiri Chisel

The bamboo chisel is used to push the metal leaf into the grooves. You can create one by cutting chopsticks or bamboo skewers. I recommend making it about 6 mm in diameter and as long as your other chisels.

Copper punches are used to smooth, or knock down, the toothed surface down. You can make one by cutting solid copper rod and cleaning the end. Heavy gauge grounding wire sold in a hardware store can be work hardened and used for this.

Bamboo  
ChiselCopper  
Chisel

If you would like to reproduce a pattern in the leaf, you can create a punch cutter, or you can use a punch cutter for leather craft. You can try a paper punch cutter from craft shop for fun.

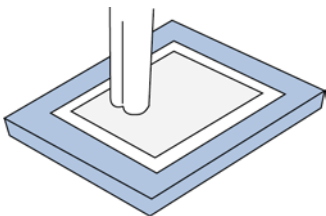


Cutting out Chisel

Leather punch for cutting  
shapes in the foil

### Annealing a leaf

Gold and silver are popular for leafing. The ideal thickness is 0.02 mm. From my experience, if the leaf is thicker than this, it gets harder to use for inlay. If you have a rolling mill, you may make a sheet of metal leaf by yourself, but your roller should be extremely flat. If there are any professional services available for leafing, it would be easier to ask to the professionals. Unfortunately I couldn't find any professional leafer while I was in the United States, please let me know if you know anyone who does it in the States.

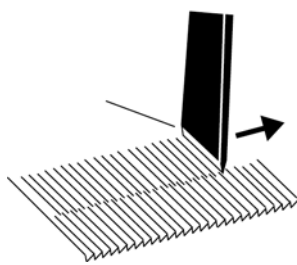
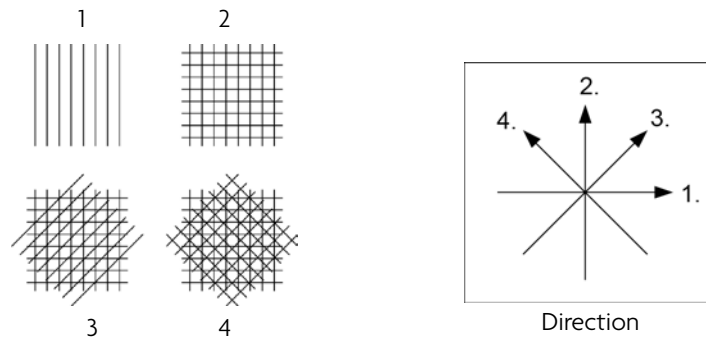
Gold (24k) and Fine silver leaf  
at 0.02mm

When you use a metal punch cutter to punch out leaf, place the leaf on top of thick paper such as a postcard. Place both on a sheet of lead or urethane. You will punch through the leaf and paper together. Especially when you use a sheet of lead as a support, you have to use a thick paper to prevent the metal tool from biting into the lead sheet. When you punch or cut the leaf, you will do so without annealing the leaf first. Anneal after you have cut the shape out.

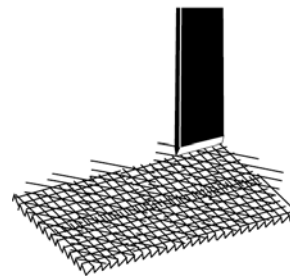
After cutting the leaf, you can soften the leaf by annealing. The leaf will melt if you directly take it to fire. Instead you can place the leaf on a sheet of stainless steel (0.3 mm thickness) and hold the sheet above the flame until the sheet turns red. When the stainless steel sheet is red hot, the leaf is softened.

### Directions of texturing (How to make Nunome patterns)

You can create the fabric-like texture by tapping a Mekiri chisel with a small hammer. The narrower side of the blade should be facing you. Start from the nearest part and work away from you in a row. After cutting the first row, the next row should be over-lapping a little bit on the row before. Usually three or four different directions will be applied on the surface. Every time you change the direction, try to go the opposite direction (as illustrated). The denser the cutting patterns, the neater it will look when finished.

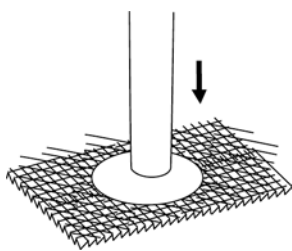


1. Sliding a chisel with small hammer blows, cut grooves from the close side to the far side.

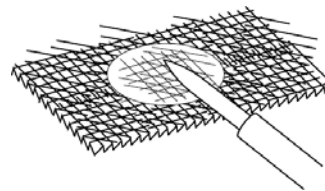


2. Cutting from each direction gives the metal cloth texture similar to the surface of a file.

After cutting the texture on the metal surface, place the annealed leaf on top. Push the leaf into the grooves using the bamboo chisel. At the beginning, use only the hand to push the bamboo chisel without a hammer. Push down on the leaf until the leaf stops shifting. Once the leaf gets secured, start using a hammer on the bamboo chisel to firmly push the leaf into the textured metal. The leaf's sheen disappears as the leaf becomes securely fixed into the grooves. The edges tend to peel off easily, make sure to check them and secure them well. After the bamboo chisel, smooth the whole area with the copper chisel. This will even out the surface and knock the tooth created by the Mekiri chisel down. At the end, burnish the leafed section to make it shiny using a polished metal burnisher.



3. Fill the pattern in the grooves with bamboo chisel. Then hammer the leaf lightly with copper chisel.



4. Fix and burnish with a burnisher.

Note: use pitch and a pitch bowl to secure the metal while creating the Nunome.

**Conclusion:**

You can apply this Nunome Zogan technique to any metal that is harder than the leaf. Steel is especially desirable, as well as is Shakudo and Shibuichi. Comparing to other inlay techniques, Nunome Zogan's advantage is that you can cut the metal leaf into any detailed shape you like. You can create very detailed expressions, as detailed as illustrations. It all depends on how you use it. There are many possibilities within the technique that will allow you to create unique and original artwork.



Shibuichi, 24K Gold, Fine silver

This piece is a pendant top. It was inspired by the landscape of New Paltz, New York while I was staying at SUNY in New Paltz.

*SNAG News* will pay up to \$125 per page (up to 4 pages) for informative technical articles aimed at any level — from intermediate to advanced, from student to the highly skilled professional. If you teach a workshop, have a clever bench trick or technique of interest to other jewelers and metalsmiths, or have more academically based technical research, please share it with our SNAG community.

Send your submission to James Thurman,  
418 Marietta St., Denton, TX 76201 <James.Thurman@unt.edu>

**REMINDER – The deadline dates for SNAG News are:**

December 15 • posted January 15

February 15 • posted March 1

May 15 • posted June 1

July 15 • posted August 1

September 15 • posted October 1