



**Shining Wave Metals**

## **Data Sheet**

# *Bi-Metals*

*22K/Sterling silver  
Shakudo/Sterling silver  
Shibuichi/Sterling silver  
Copper/Sterling silver*

Note: Patinas may be waxed or sealed to help prolong their life. They will inevitably change with time and usage. The chemical balance of the wearer may also affect the color.

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**NAME: 22K-STERLING SILVER BI-METAL****Composition:** Volume: 8.3% 22K gold, 91.7% Sterling silver**Weight:** 12.5% 22K gold, 87.5% sterling silver.**Description:** One layer 22K gold, one layer sterling silver. The 22K layer is 1/8<sup>th</sup> of the volume, 1/12<sup>th</sup> of the thickness.**Hallmark:** 1/8 22KGF**Solder:** 18K with a melting point below sterling silver or 1425°F.**Melting Point:** Has not been determined, but will not melt below 1432° F.**Annealing range:** 1150°-1350° F. **Do not quench!****Density:** About the same as sterling silver.**Approximate weight/square inch:** 24ga-3.64 grams.**NAME: SHAKUDO-STERLING SILVER BI-METAL****Composition:** 10% Shakudo(4% gold, 96% copper), 90% Sterling silver**Description:** One layer shakudo, one layer sterling silver. The shakudo layer is 1/8<sup>th</sup> of the total sheet volume.**Melting Point:** The approximate start to melt point is 1432°F.**Annealing:** Temperature from 1150°–1325°F. Anneal like sterling silver with flux as a temperature indicator. Do not heat above 1325°F. Note: This material starts to melt at a significantly lower temperature than sterling.**Density:** About the same as sterling silver.**Approximate weight/square inch:** 24ga-3.6 grams.**NAME: 15% SHIBUICHI-STERLING SILVER BI-METAL****Composition:** 10% Shibuichi(15% silver, 85% copper), 90% Sterling silver**Description:** One layer shibuichi, one layer sterling silver. The shibuichi layer is 1/8<sup>th</sup> of the total sheet volume.**Melting Point:** The approximate start to melt point is 1410°F.**Annealing:** Temperature from 1150°–1325°F. Anneal like sterling silver with flux as a temperature indicator. Do not heat above 1325°F. Note: This material starts to melt at a significantly lower temperature than sterling.**Density:** About the same as sterling silver.**Approximate weight/square inch:** 24ga-3.4 grams.**NAME: COPPER-STERLING SILVER BI-METAL****Composition:** 10% Copper, 90% Sterling silver**Description:** One layer copper, one layer sterling silver. The copper layer is 1/8<sup>th</sup> of the total sheet volume.**Melting Point:** The approximate start to melt point is 1325°F.**Annealing:** Temperature from 1150°–1325°F. Anneal like sterling silver with flux as a temperature indicator. Do not heat above 1325°F. Note: This material starts to melt at a significantly lower temperature than sterling.**Density:** About the same as sterling silver.**Approximate weight/square inch:** 24ga-3.9 grams.

Our exclusive **Bi-Metals** are two welded layers of compatible metals. A thick top layer is diffusion bonded(no solder) to a heavy backing of sterling silver. This top layer lends itself to decorative surface treatments, such as engraving, scraping, burnishing and chasing. There is little danger of removing the layer by accident.

## Working with Bi-Metal

**Characteristics:** Bi-Metals work very much like sterling silver. Do not be afraid to push the material. Excessive annealing should be avoided. (Do not quench 22K Bi-Metal). This material can be pattern developed by selectively removing the top layer to expose the sterling. Low relief patterns can be developed by etching.

**Soldering:** Use the same considerations as if soldering sterling silver. Use the lower melting temperature easy and medium solders with a flux coating to help avoid firescale.

**Finishing:** Finishes may be developed with the same polishing products as used on sterling and karat golds. Check closely for dark shadows on shakudo indicating firescale.

**Etching:** Two etchants may be used: 1) 30% solution of Nitric Acid and water, 2) mild Ferric Chloride. Rinse with baking soda and polish lightly.

**Use all chemical solutions with proper ventilation and supervision.**

**Patinas:** (See the patina section of our current catalog). Antique Patina or traditional liver of sulfur can be used to patina sterling silver from brown to black.

Use Baldwin's Patina on copper/sterling and copper/brass to color the copper brown. Baldwin's will not discolor sterling.

**Shakudo** turns purple/black. Use Baldwin's Patina or diluted Antique Patina. Firescale will show as orange splotches against the black and should be removed.

**Shibuichi** can be patinated to a wide range of grays, olive greens and even sky blue. Pale greens can be produced by alternately swabbing with clear ammonia and rinsing in warm water. Heavy textured greens can be produced by adding salt to an ammonia/vinegar solution. Baldwin's Patina will produce grays and pale olive greens.