

Working the Material: This mokume is easily formed by raising, cold forming, die striking and sawing. Anneal after a 40% to 50% reduction has been achieved. Use a solder that flows at a temperature lower than the melting point. Easy and medium silver solder are recommended or easy flow, easy and medium gold solders. If a solder line that is etch resistant is desired, use gold solder. **Do not hot form this material, doing so will void the warranty.**

Annealing: Recommended annealing temperature is 1250°F/675°C. This material may be torch or kiln annealed. Soaking at the annealing temperature is not necessary. Protection from oxygen by coating with flux or annealing in a reducing atmosphere will reduce the amount of oxide formation on the silver and gold alloys. Pickle as needed, taking care not to leave in the pickle too long to prevent unwanted etching.

Over-annealing in frequency, time and temperature is not recommended. Over annealing can cause excessive grain growth and significantly weaken the metal.

Finishing: This mokume may be finished using standard jewelry finishing techniques. Heavy buffing is not recommended as this may smear the surface of the metal and muddy the pattern. Use abrasives and tools that cut rather than grind. If a rotary file tool is used, it is often best to remove the tool marks with abrasive paper or water stones before buffing.

A matte surface will best show off the colors of the metals in the mokume. Sand-blasting or glass beading can produce interesting results; experimentation with surface finish is recommended before determining a final form.

Etching: Etch with nitric acid or reverse plating. Experimentation is highly recommended. Use proper precautions when handling acids and other corrosive chemicals. A post etch treatment often brings out the pattern to its best effect, using bristle brushes and very fine abrasives followed by a very light polish. Keep in mind that a matte surface will show the colors of the gold alloys better than a highly polished surface.

Patina: This mokume is most often used in its bright form, however striking results may be obtained by darkening the silver with a sulfide such as liver of sulfur, or a chloride such as ferric nitrate. Heat may be used to color the red and yellow golds and the sterling. Experimentation is highly recommended.

Note: Be sure to take proper safety precautions when using any chemicals or tools. This information represents the best knowledge and experience regarding the use of Reactive Metals products by their manufacturer, however it is not guaranteed to produce an expected result and is no substitute for experimentation by the user of Reactive Metals products.



Data Sheet

Mokume-gane

18K Yellow Gold
18K Palladium White Gold
18K Rose Gold & Sterling Silver
Rod & Samidare

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18K Tri Gold/Sterling Rod

Composition:

Nominal, by weight: 18KY (med) 13.5%, 18KPW-14.30%, 18KR-12.85%, Sterling Silver-59.35%. Silver layers are approximately twice as thick as the gold layers. There are three layers of each gold color for a total of 9 and ten layers of sterling, with the two outside layers being sterling. The arrangement of layers is in a ABACAD pattern repeated three times, ending with a silver layer.

Pattern:

19-layer 1/4" square rod is stock.

Melting Point:

Starts to melt at 1439°F (779°C).

Appearance:

All the gold colors in one mokume with the white of the sterling offsetting the warmth of the red, white and yellow golds.

Quality Mark:

40% 18K

Working the Material

This mokume is easily formed by standard methods including forging, bending, rolling, die striking and stock removal. Anneal after a 30% to 40% reduction has been achieved. Pattern is often developed by twisting. **Do not hot work this material, doing so will void the warranty.**

Use a solder that flows at a temperature lower than the melting point of the sterling; we suggest using easy or medium silver solders and easy gold solders. The ends of the rod may be sealed with silver or 18K gold solder during the initial stages of rolling or forging, though this is not needed during the fabrication process. The solder can be filed off when nearing the final shape of the work.

This mokume can be enameled on with enamels that will work on gold and sterling silver.

Annealing:

Recommended annealing temperature is 1100°F to 1250°F (590°C - 675°C). This material may be torch or kiln annealed. This is about a medium red in a dark room, if done by eye. Soaking at the annealing temperature is not recommended. Protection from oxygen by coating with flux or annealing in a reducing atmosphere will maintain the brightness of the gold. **Do not quench after annealing.** Let air cool to about 500°F before cooling rapidly. A note to the impatient: Speed cooling can be done by resting the hot metal on a heavy steel plate. Pickle as needed. Over-annealing in frequency, time and temperature is not recommended. Over annealing can cause excessive grain growth and significantly weaken the metal.

Please see the following guide on twist patterning: <https://www.reactivemetals.com/downloads>

Finishing:

This mokume may be finished using standard jewelry finishing techniques. Heavy buffing is not recommended as this may smear the surface of the metal and muddy the pattern. Use abrasives and tools that cut rather than grind. If a rotary file tool is used, it is often best to remove the tool marks with abrasive paper or water stones before buffing.

A matte surface will show off the colors of the metals in the mokume. Sandblasting or glass beading can produce interesting results; experimentation with surface finish is recommended before determining a final form.

Etching:

Use a 20 to 25% percent solution of Nitric Acid (HNO₃). Mask any areas not to be etched, such as silver solder seams, or non-gold elements with nail polish or some other resist. Carefully watch the object while etching so as not to over etch. Etching often leaves a thin film of silver deposited on the gold layers and this must be removed by the use of a light abrasive and a bristle brush in order to display the colors of the gold accurately.

Patination:

If desired the sterling layers may be patinaed after etching as above. Liver of Sulphur or Antique Patina may be used.

Note:

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18K Tri Gold/Sterling Samidare Sheet

Composition: Twelve layers of 18K gold, four each of 18K Red, 18K Yellow and 18K Palladium White alternating with 13 layers of Sterling Silver. The layer arrangement is Y-Stg-W-Stg-R-Stg, repeating four times with silver on the outside of each billet. The approximate composition by weight is 12.5% of each color gold with the balance being sterling. The sterling layers are about 2.5 times the thickness of the gold layers.

Description: A single sided, patterned sheet with a "Samidare" pattern (very fine burl grain on one side).

Pattern: Samidare pattern dies, cut by P. Baldwin 2003.

Uses: Jewelry, flatware and other decorative metalwork. The two component metals, sterling and 18K gold are suitable for continuous skin contact for most people. This group of metals may also be used for the preparation, serving and storage of food items without adverse effects.

Melting Point: Starts to melt at about 1620°F/881°C, slightly less than the melting point of sterling silver.

Quality Mark: No existing category in the current quality marking system.