



Combining Sterling Silver and PMC without Solder Doris King, July 2006

In this presentation, I will discuss design, structure, and technique when using PMC and Sterling together. You may already be using sterling wire and bezel cups with your PMC. Now, we will take the next step: Combining sterling sheet and manufactured components in your designs and doing that without solder.

I. What are some qualities and differences of sterling and PMC?

A. PMC

1. .999 fine silver
2. Soft and brittle metal
3. Doesn't oxidize or tarnish readily
4. We can sculpt it, mold it, and carve it easily
5. Paint with it as slip
6. Create unique surface designs and textures

B. Sterling Silver

1. .925 silver with copper added for strength and resilience
2. Strong and resilient metal
3. It does oxidize, due to the copper
4. Is not as easily textured
5. Many forms available: sheet, wire, manufactured components

III. What are some examples of when we might choose to use sterling and PMC together?

Example One: Cuff or bangle bracelet

A. PMC

1. PMC is soft and brittle.
2. To compensate for the softness, we need to make the bracelet thick.
3. Making the bracelet thick uses a significant amount of PMC
4. Expensive
5. NOTE: The thickness does not make the PMC less brittle. PMC is brittle due to its porosity.

B. Sterling

1. Strong and resilient metal
2. It can be made thinner, thus requiring less material.
3. Cost effective
4. Catalogs offer many choices of sterling stock

My conclusion: I prefer sterling for bracelet cuffs & bangles.

Example Two: Making the band of a ring; strength is important and sizing is critical.

A. PMC

1. PMC is soft. Narrow rings can easily bend and break.
2. We need to calculate sizing, due to the shrinkage of PMC.

My conclusion: I use PMC for ring bands that are wide, irregular, and very organic in style.

B. Sterling

1. Strong
2. No shrinkage.
3. Manufactured ring shanks available
4. Many sterling wire patterns to choose

My conclusion: For the strength and ease of sizing, I prefer sterling for most ring bands.





C. Surface Design and Embellishments

A. PMC

1. Easily textured and molded
2. The tools needed are easily available and usually inexpensive

B. Sterling

1. Surface design on sterling requires additional skills, effort, time, and expensive tools. Examples of such techniques are stamping, reticulation, rolling mill, casting, soldering

My conclusion: Use PMC for surface design and embellishment, and then connect those components to the sterling.

IV. Why haven't we been using these metals together all along? Because sterling and PMC do not consistently fuse. The usual solutions depend on solder or cold connections. I will demonstrate a combination of mechanical connections and depletion gilding.

A. Defining the Terms

1. Mechanical connections in this method create a physical attachment between the PMC and sterling parts. To achieve the attachment, rough up the surface of the sterling where PMC will attach, then drill small holes that will create PMC rivets as the PMC oozes through the sterling.
2. Depletion gilding is the process of heating the sterling to create copper oxides on the surface, then dissolving the copper compound in a mild acid solution called pickle. This leaves a thin layer of fine silver on the sterling. Now we have two like metal surfaces, both fine silver, and they will fuse. This process can be done with a torch, but I use a kiln to do the depletion gilding.

B. Steps for depletion gilding?

1. Put sterling in kiln and heat to 1200 degrees for 5 minutes.
2. Remove from kiln
3. Pickle
4. Brass brush
5. Return to kiln and heat to 1200 degrees for 10 minutes.
6. Remove from kiln
7. Pickle
8. Brass brush

V. Connecting PMC components to sterling

- A. Use slip and syringe
- B. Mechanical connections

VI. Firing the assembled piece

- A. Maximum temperature for sterling is 1470 degrees.
- B. I have fired sterling and PMC as low as 1200 degrees.
- C. Thinner sterling requires lower kiln temperatures.

My conclusion: I usually to fire at 1350 °F for 30 minutes.

VII. What tools are needed?

- A. Kiln
- B. Pickle pot and solution (Sparex)
- C. Copper tongs
- D. Brass brush
- E. Metal saw frame and blades
- F. Plastic mallet
- G. Ring and Bracelet Mandrels





VIII. What are some other design situations when we might choose to use sterling with PMC?

- A. Use sterling anytime a smooth, shiny, flat surface is preferred
- B. Building boxes
- C. Use sterling where the most wear will occur, i.e. bails
- D. Use sterling as the flat surface under stones where you are attaching a bezel.
- E. Attach the bezel and stones with PMC
- F. Fill in pits in sterling casting with PMC

Examples: Bracelet cuff and ring band are sterling. All the embellishments are PMC. The stones are set with fine silver bezel wire and PMC.



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