

Principles

1. Metal Preparation

Dome to prevent warpage

2. Counter Enamel

Balance the stress created with enamel layer on metal

Equal (or close) amount of enamel on back

Will back of piece be seen? Use trivet

3. Enamel Layer Thickness

1st layer direct on metal: cannot be too thick

2nd layer on top of enamel can be thicker

transparent layer must be thin

4. Fine Silver and Reflectivity

Compression vs Porosity

Flashing to seal the porosity

5. Copper and Reflectivity

"Clear" transparents with high heat first firing

6. Chemical Reactions

Silver: enamels with gold (reds, oranges, pinks, opal white)

Copper: Colors with manganese have reaction

Colors with gold fire dark

7. Transparency

Air bubbles appear as cloudy areas

Larger grain size, less air bubbles

Thinner layer, less air bubbles

8. Unleaded with leaded enamels

Use unleaded UNDER leaded enamels

9. Firing Time & Temperature Relationship

Hotter the kiln, shorter the firing time.

10. Firing Stages

Enamel surface changes from sugar to orange peel to gloss

Orange peel ranges from grains just beginning to join together to almost perfectly smooth

Overfiring is relative to what you want

11. Warpage

Hot metal becomes soft and moves under weight of enamel

Longer, asymmetrical shapes warp more, use thicker metal

You have approximately 8 seconds to press on enamel after it comes out of the kiln to repair warpage

12. Fix dome with one layer of enamel fired

Enamel will still be somewhat flexible if no counter enamel has been fired

13. Color Layers

You can use transparent, opaque, and opalescent colors in any order

Opacques will cover up layer below

Transparents can be darkened with a second layer but not lightened.

13. Each Enamel Grain has Depth (size of grain)

Depth of transparent enamel creates Value

14 Each Enamel Grain has an Edge

This is where the color ends

15. Water Quality may effect enamel

Fire transparent enamel to check for cloudiness

Use distilled water for last rinses to remove salts

16. Enamel does not have to be dried before firing

Use toilet paper to blot out excess water

17. Kylr fyre should be dried before firing

Prevents gas bubbles from lifting enamels or foil

18. Blu-Stik does not have to be dry before firing.

19. Kylr fyre and 3 Dimensional Forms

3 parts water to 1 part Kylr fyre

20. Degrease Metal before wet application

Use spit or penny brite (cleans copper)

21. Fire Opalescent enamel at lower temperatures.

Between 1300 and 1400. This applies to all firings if there is opal enamel on the piece.

Prepare a Copper Shape with Opaque White Enamel

Step by Step

1. **cut out/stamp/saw** your copper shape
2. **anneal** (to soften it to make it easier to “dome”)
3. **dome** it slightly in a dapping block: very slight dome
4. **sift** an even layer of opaque white enamel (unleaded thompson 1020) onto the front
5. place onto a firing screen and **fire until glossy**
6. after cooling, **wipe** or rinse off excess/loose firescale or oxidation
7. **check dome** to make sure that your piece is not wobbly; **reshape** gently if necessary
8. **sift** a thicker layer (2-3 times thicker) onto the back: **counter-enamel layer**
9. balance piece in a trivet, place trivet onto firing screen, and **fire until “orange peel”**
10. after cooling, **wipe** excess firescale off edges
11. **sift** a second layer, even **thicker** than first counter-enamel layer.
12. balance in trivet and **fire to “orange peel”**
13. after piece has cooled, **paint a thin layer of scalex onto the back** if back will not be seen
14. piece is now ready for next firing using a firing cloth instead of trivet

Tips

3. make a custom dapping block using “jett sett”
3. make a gently sloping dome, too domed will be more difficult to place wires or grind when finished.
4. tilt piece slightly so enamel falls at 90 degree angle onto metal surface. rotate the piece as you sift.
4. first layer sifting: approximate 3 grains high. do some tests to see how much is required to create an even layer covering metal
5. slide a tool (spatula) under the piece to remove it from your fingers without smudging the edges: gently place onto screen
6. Quench your piece if desired. wait at least 20-30 seconds after removing from kiln. careful not to spill your hot pieces
7. use this ability to press the sides down after one layer to refine your dome. you don't have to make your first dome step perfect
8. if your first counter-enamel layer is too thick, it will pull away at the edges when fired and create a thicker ridge next to bare edge
9. figure out positioning of the piece onto the trivet before you sift the enamel. this way if it falls you haven't spilled your enamel
10. trivets take more time to cool. be careful when touching them after firing
11. you can sift a thicker layer onto fired enamel than you can onto bare metal without the edges pulling towards the center
13. make sure you check the front afterwards to make sure no scalex has gotten onto the front. it will act as a resist and enamel won't stick to any areas coated with scalex. when painting on the scalex start in middle of piece and brush towards the outside edges
14. you can fire your piece to “set” the scalex into the counter enamel, or proceed to the your next step and fire it then.

Fine Silver Shapes

Principle: Fine Silver and Porosity

1. plain surface, annealed
2. plain surface, not annealed
3. roller printed surface, annealed
4. roller printed surface, not annealed
5. plain surface, texture applied mechanically (burrs, scribes)
6. plain surface, flashed
7. roller printed surface, flashed
8. plain surface, flashed, mechanically textured

Making a Fine Silver Shape

1. Rollerprint your metal (if desired)
2. create your shape
3. anneal
4. dome
5. flash the surface
6. move piece to enameling desk (keep grease/fingerprints off the front surface)
7. paint and fire thin layer of flux (N3) onto front. Fire to Glossy. use firing screen
8. check the dome and fix wobble if necessary
9. sift first layer of counter enamel onto the back of the piece. 1020 unleaded opaque white, 3 times thicker than front flux layer. fire to orange peel using a trivet.
10. repeat and fire second layer of counter enamel. fire to orange peel. thicker than first layer of counter
11. check for thickness and even amount. add more if desired. fire to orange peel
12. paint THIN layer of scalex onto back.
13. let scalex dry. fire next firing on a firing cloth. you can either fire piece after applying the scalex or proceed to next step (wires, foil, or colors) and fire all at once.