Glass painting: Copper red and silver stains

Glass painting is applied in layers on the front and back of the glass and fired in a kiln, often with several firings at different temperatures, so plan your approach before beginning.

The term “stained glass” comes from the use of silver stain to give the glass a permanent yellow color – the stain actually penetrates the glass – ranging from light lemon through deep amber to near orange tones for the silver stains, and red tones for the copper red. The effect is truly transparent!

This is a general guide – variations on these techniques are possible and there are exceptions to statements herein.

RECOMMENDED TOOLS

For mixing:

- Plate / bowl (ceramic / glass)
- Spoon to measure powder
- Palette knife / glass muller
- Water
- Respirator or dust mask
- Gloves, latex

Brushes:

- All sizes, all shapes can be used. Soft brushes to apply the paint, stiffer brushes to create shadow effects.
- Consider make-up brushes for soft effects.
- Badger brush – 2 inch professional or round badger brush, for blending.

PREPARATION

All our stains are sold by weight in powder form. Stains will keep indefinitely when stored in a closed container at room temperature, out of direct sun. Observe appropriate safety precautions when handling paints.

These powders are already mixed with a carrier medium such as ochre or clay to make the paint visible while using.

Clean glass thoroughly. If the wet paint pulls in on itself when you are applying the paint, then an oily film is on the glass. Try rubbing the glass with a small amount of wet paint, then wiping clean.

Copper red stain will only work on the tin side of float glass (and on glasses which are chemically reactive to copper, such as Bullseye and Spectrum “reactive” glass.)

Silver stain can be used on many types of glass. The tin side of float glass will increase the uptake of silver stain - the color will be deeper and more intense after firing. (Some types of glass do not accept silver stains at all.)

Test for the tin side of float glass with either the water-drop method or use a short-wave UV lamp. With the UV lamp, the tin side will glow milky white.

How to check the tin side with a drop of water?
See here for details.

- Drop a single drop of water gently onto your float glass.
- See how the water drop spreads out – or doesn’t.
- Repeat on the other side of the glass and compare the results.

When the water drop spreads out, it’s the non-tin side. If the water drop remains tight on the glass, that’s the tin side.

MIXING THE POWDER STAIN

For many applications, mix the powder stain with water (distilled is best). There is no need to add gum Arabic.

It is possible to mix silver stains with oil or glycol; some silver stains must be mixed with oils.
Silver stains can be blended with each other but not with other types of paint.

The choice and proportions of mixing agents depends on the painting technique and individual preferences.

1. Place some stain in the bowl (approximately 2 tablespoons).

2. Add ¾ tablespoon water. Press the liquid through the powder, mix thoroughly. Make every grain moist. Add a bit more water. Press, mix. Be careful – at the moment that liquid is added to dry powder; a poof of powder may come off the paint. Do not inhale the powder.

3. Transfer moistened powder to plate once the powder is thoroughly moistened. Mix thoroughly, add more water as needed. The final consistency will depend on the depth of color desired, approximately like India ink.

With the copper red stain, include a small amount of water-friendly medium (Sir Pete medium or glycol). We use roughly 2 drops medium per heaping tablespoon copper red powder.

APPLICATION
Apply the paint that has been mixed to the proper consistency using a paintbrush (natural or synthetic hair) and then use a badger brush to smooth.
Silver stain is traditionally applied to the back of the glass and fired with the silver stain side facing downwards. Protect whatever the silver stain comes in contact with during firing. Silver stain may be fired up, which prevents staining of the trays. Firing temperatures of silver stain are noted on the container label and in the PELI brochure.

Silver stain color becomes deeper with higher temperature. If silver stain has been fired and is not deep enough, it may be reapplied over the same area and re-fired.

Stains should not be applied over other paints that have been previously fired (such as grisailles) but paints and enamels may be applied over stains that have been fired. Careful, stains are aggressive on metals and paintbrushes, use separate equipment and clean immediately after use.

FIRING
To protect kiln shelves, calcium carbonate (also known as whiting or chalk) may be sprinkled over the shelf. After firing, the discolored whiting is then discarded as it will leach out stain and may affect any glass that is subsequently fired over it.

After firing, wipe or wash the residue off the glass to see the color underneath.

Copper red stain:
The firing temperature can be varied between 580-700°C (1076-1292°F) depending on the shade desired. Fire at least 30 minutes (we fire for minimum 45 minutes) and cool slowly (overnight).
Silver stain:
Silver stains generally fire 5 minutes at 566-635°C (1050-1175°F), depending on the specific stain. Softer glass absorbs silver stains more readily, and silver stains may turn blue glass green. Test first to avoid unwanted surprises.

Firing programs are dependent on the kiln type, the requirements of the specific paint, the size and thickness of the glass.
That said, some broad guidelines:

Generally, 3 mm thick glass pieces with a surface area smaller than 400 cm2 (62 in2) can be fired as fast as possible to temperature, held at temperature if desired, then turn kiln off and allow to cool. For a gas kiln, allow it to cool to 150°C (300°F) then crack the kiln open 2 cm. Open kiln fully below 100°C (212°F). For an electric kiln, open peepholes below 600°C (1110°F), open 5 cm at 200°C (390°F) and open kiln fully below 100°C (212°F).

Pieces larger than approximately 400 cm2 should be warmed more slowly and during the cooling should be allowed to anneal 5-10 minutes at a temperature of 515-550°C (1004-1022°F), depending on the type of glass.

So experiment! You must determine what works best for you.

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