

Enamel Guide

Step 1: Prepare the metal

Enamelling is commonly done on copper, silver or gold. Alloys containing zinc and nickel are unsuitable as the enamel tends to react and not fuse to the surface. When enamelling, always remember that cleanliness is key and each metal type requires different preparation:

- Copper prepare your metal by using abrasive papers to remove any oxides. We then recommend you pickle the metal before applying any enamel.
- Silver or gold clean the metal using a brass brush. Or alternatively use a glass brush under running water with protective gloves on.
- Steel can be prepared through pickling

Step 2: Counter Enamel

Counter enamel is used to prevent metal warping. This can happen due to the high temperature of the kiln, causing cracks in the enamel. Apply a layer of counter enamel to the back of your metal beforehand to create equal stress on both the front and back of the piece. Counter enamel can be applied using sifting, wet packing or with liquid enamel. Thinner and/or larger pieces are more like to warp, as are flat pieces rather than domed pieces.

As a general rule we suggest:

- 1mm or lower should be counter-enamelled
- 1mm-1.3mm may need to be counter-enamelled, depending on size and shape
- 1.3mm of thicker does not usually need to be counter-enamelled

Step 3: Applying Enamel

Depending on the enamels used, and the desired effect, a variety of methods can be used:

• Sifting – dry powder can be applied directly onto the metal or over a flux layer using a sieve

- Wet process finely ground powder is mixed in water can be applied to the metal using a paintbrush, sprayed or dipped.
- Painting Enamel mixed with painting medium (often pine oil) and painted onto the surface of a flux or coloured layer (usually white) and fired in layers.

Step 4: Firing

Any moisture needs to be dried off before firing, especially oil from painting medium as the oil will burn. You can do this by leaving wet pieces under a lamp, or on a trivet above the kiln. Firing times will vary depending on the piece and the temperature of the kiln, usually between 30 seconds and 2 minutes. Don't forget to check the temperatures of your kiln before you start firing. Firing temperature is usually between 800°C and 820°C.

When firing the enamel will go through three stages as it melts:

- Crystalline/granular
- Orange peel effect
- Smooth and fully fired

Final enamelling tips

- Cleanliness and keeping colours separate and uncontaminated is key to successful enamelling
- Finished enamelled pieces will not withstand being heated again. Think about how you can solder beforehand, cold connections and set pieces into mounts
- Finished pieces are fragile protect them and treat them with care

SAFETY

Please follow the precautions below when using enamel

- Keep the work area free from food or drink to avoid contamination and accidents
- Enamel is a powder so use in a well ventilated area and use a respirator mask designed for dust
- Wear heat-protective gloves taking items in and out of the kiln
- Wear protective goggles to protect eyes from shards of fired enamel which may 'ping' off a piece, and use welders goggles if firing for long periods of time
- Use water when sanding or stoning enamel to prevent inhalation of airborne glass particles

- Work on a heat proof work surface, and away from flammable materials
- Pieces coming out of the kiln are HOT! Allow to cool completely before handling

Using red, orange and yellow enamels

These enamels can be the most difficult to use, as these colours are highly sensitive to temperature and firing time due to containing cadmium pigment. Sometimes they can have black spots and be lacking in colour.

If you are using a kiln, reduce both the temperature and firing time. 780°C for 2 minutes is a good starting point. If using a torch, stop firing as soon as the enamel has melted. If you are doing multiple colour/firings use the opaque red, yellow or orange only on the final firing.

If you follow these tips, you shouldn't have a problem.