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Vitreous enamel by the Soyer family

Composition:
Enamel is a vitreous paste made of silica and melting elements such as sodium or potassium, which help reduce fusion temperature. To this transparent paste, colour can be added using various minerals or can be subdued with tin oxide. These elements are crushed, washed and reduced into a powder and diluted in grease to create the final paste, which vitrifies when it reaches fusion temperature (800°C). Enamels are applied on a metal plate. Copper was preferred to gold or silver, for financial and technical reasons: its high fusion point (1088°C) avoids risks of cracks during the cooling process due to the retraction difference of glass and copper. The metal must be pure to guarantee shiny enamels.

Preparation of the base:
The copper plate is hammered into a convex shape, to strengthen its resistance to heat, and polished. It is then put in a bath of sulphuric acid to eliminate oxides. This stage is particularly important for the transparency of the enamel. A coat of counter-enamel is applied to the back of the piece to counteract tension, prevent warping, reduce stress during the firing process, and avoid oxidation. A first coat of enamel is then applied to the front. When dry, the piece is put in the fire.
Applying the décor
The image is transferred to the plate by decal; the colours are then applied with a spatula, layer by layer, in a way that is similar to painting. The piece is fired between each layer according to the heat resistance of each oxide. The colours that melt faster are applied last.

Variations:
- Grisaille, French term meaning "greying", where dark, often blue or black background is applied, and then white enamel is applied on top. This layer is then scratched to create a design in a monochrome gradient. A third transparent layer is then applied.
- Translucent or opalescent enamel: enamel with no tin oxide through which the copper plate can be seen. Often used with other types of enamel. The effect of this shiny background, is a great transparency; the copper plate itself was often chiselled or covered with a thin layer of gold, for extra effect.