

Technical Information

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Starlight100 – Lead and Cadmium Free High-Temperature Fast Firing Metallic Colors

In this technical information leaflet Ferro presents for the first time lead free and cadmium free high-temperature fast firing metallic colors. With a maximum lead content of 100 ppm, the **Starlight100** series sets new standards in the area of lead free porcelain decoration. The colors have excellent processing characteristics in all conventional decorating methods like screen printing (direct and indirect), lining and banding, spraying as well as hand painting. All available color shades can be found in table 1 and fig. 1.

Screen Printing (Direct and Indirect)

For direct and indirect screen printing, we recommend polyester screens with 73 – 77 threads/cm (186 - 195 mesh/inch) or stainless steel screens VA115 (300 Maschen/inch). The color layer should not be too thick on porcelain in order to avoid cracking of the colors.

We recommend medium Nr 221 with the following mixing ratio:

Silver:

100 parts color : 220-240 parts Nr 221,

Gold, Bronze and Copper:

100 parts color : 200-220 parts Nr 221.

Machine Lining and Banding

Color suspensions applied with brushes, steel- or neoprene-rollers are generally based on water-soluble media.

Spraying

Color suspensions for spraying application can be produced with oil-based media as well as with water-soluble media.

For all standard methods, Ferro offers suitable media and covercoats. Further detailed technical information can be found in our **CerDePrint Media Guide**.

The colors should be stored in a dry place. Opened containers should be closed carefully. To ensure that the colors have not absorbed any humidity, we recommend drying the color powder at approx. 130 °C prior to mixing.

Miscibility and Color Combinations

All colors are intermixable. Very interesting shades can be obtained by mixing **Starlight100** colors with our lead and cadmium free **SKY100** series. The mixing ratio should be approx. 85 parts of colors of the **Starlight100** series and 15 parts of the **SKY100** colors. However, we recommend to test the mixtures under the individual processing conditions prior to use.

It should be ensured, that the color Silver 15 1930, is not applied near chromium or cobalt containing colors. In such cases unexpected radiance effects might occur (halo effect).

For further questions, please contact our technical service.

Firing Conditions

The firing range in fast firing conditions (60 to 90 minutes) lies between 1100°C and 1150 °C.

Resistance

The alkali and acid resistance of fired color layers is influenced by the thickness of the layer, the firing conditions, and the glaze.

Heavy Metal Release and Heavy Metal Content

The colors of the **Starlight100** series are controlled lead and cadmium free, with following upper limits: 100 ppm Pb and 600 ppm Cd. This ensures that the limits for heavy metal release

according to EN 1388 1-2 as well as the Californian prop. 65 and the FDA requirements will be fulfilled.

However, it is still necessary that the end user tests the heavy metal release according to the relevant standard procedures for all products manufactured under his technical production conditions.

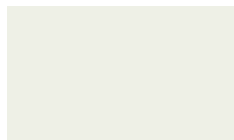
It is absolutely necessary to apply the colors on lead free glazes. Due to the reaction between color and glaze the surface of lead containing glazes may be altered chemically during firing, and considerable amounts of lead are released.

Our safety data sheets, which are available for every product, provide you with useful advice for working with our products.

Fig. 1: Color samples of the Starlight100 series



13 1930 Gold



15 1930 Silver



16 1931 Bronze



17 1930 Copper

While every attempt has been made to reproduce colors exactly, the samples printed here may differ slightly from the finished ceramic products.

Table 2: The available Starlight100 color shades

Product No.	Color Shade	Pantone® Code*
13 1930	Gold	141 c M
15 1930	Silver	7534 c M
16 1931	Bronze	7585 c M
17 1930	Copper	167 c M

* The above mentioned **Pantone®** code is only a guideline for the color shade. **Pantone®** is a registered trade mark of Pantone Inc.

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