

Technical Information

DF02

Performance Pigments and Colors

Fantasia 100 – Lead Free and Cadmium Free Metallic Colours for Porcelain, Bone China, Earthenware and Enamel

In this technical information leaflet Ferro presents the range Fantasia 100, the latest generation of our metallic colours. With a maximum lead content < 100 ppm, this series sets new standards for lead free onglaze decoration. The colours 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 colour shades can be found in table 2 and fig. 1.

Screen Printing (Direct and Indirect)

We recommend polyester screens with 49 – 77 threads/cm (125 - 195 mesh/inch) or stainless steel screens VA 110 - VA 115 (180 - 280 mesh/inch).

The colour layer should not be too thick on porcelain in order to avoid cracking of the colours.



Machine Lining and Banding

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

We supply colour pastes that should be adjusted to the correct processing viscosity by adding distilled water and/or spirit.

Spraying

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

Miscibility

All colours are all intermixable. Very interesting shades can be obtained by mixing Fantasie colours with our lead and cadmium free **SambaPlus** colours. These mixtures can also be used on porcelain. The mixing ratio should be approx. 85 parts of colours of the Fantasie range and 15 parts of the SambaPlus colours. Fig. 2 shows some mixing examples. However, we recommend to tests the mixtures under the individual processing conditions prior to use.

Firing Conditions

Table 1 shows the firing conditions for various substrates.

Table 1: Firing conditions

Substrate	Firing Conditions
Porcelain	Normal firing: 800 - 820 °C, 4 h Fast firing: 830 – 850 °C, 2 h
Bone China	Normal firing: 800 - 820 °C, 4 h Fast firing: 800 – 850 °C, 2 h
Earthenware	Normal firing: 780 - 820 °C, 4 h Fast firing: 780 – 840 °C, 1 h
Enamel	780 - 820 °C, 0,5 h

Resistance

The alkali and acid resistance of fired colour layers is influenced by the thickness of the layer, the firing conditions, and the glaze. The colours of the **Fantasie** range show in laboratory tests and under industrial conditions on a variety of different substrates no visible acid or alkali attack (tested with 3% hydrochloric acid, 20 °C, 5 h, as well as with 0,5 % Calgonite solution, 77 °C, 24 h).

Heavy Metal Release and Heavy Metal Content

The colours in the Fantasie 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.

It is absolutely necessary to apply the colours on lead free glazes. Due to the reaction between colour 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 advise for working with our products.

Colour Samples

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

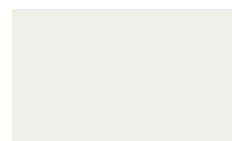
Fig. 1: Colour samples of the Fantasie colours



13 2165 Gold Yellow



13 2166 Antique Gold



15 2165 Silver



15 2166 Antique Silver



16 2165 Bronze



17 2165 Red

Table 2: The available Fantasie colour shades

Product No.	Colour Shade	Pantone® Code*
13 2165	Gold Yellow	141 c
13 2166	Antique Gold	7403 c
15 2165	Silver	7534 c
15 2166	Antique Silver	7235 c
16 2165	Bronze	722 c
17 2165	Red	167 c

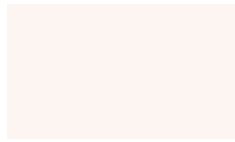
* The above mentioned **Pantone®** code is only a guideline for the colour shade.

Pantone® is a registered trade mark of Pantone Inc.

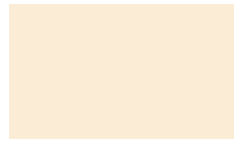
Fig. 2: Mixing examples with colour 15 2165 and a selection of SambaPlus colours



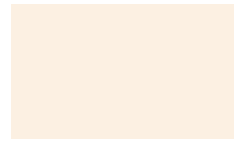
85 weight-% 15 2165
15 weight-% 77 1636



85 weight-% 15 2165
15 weight-% 18 1650



80 weight-% 15 2165
20 weight-% 17 1633



80 weight-% 15 2165
20 weight-% 17 1632



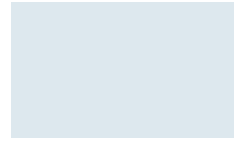
85 weight-% 15 2165
15 weight-% 16 1651



85 weight-% 15 2165
15 weight-% 15 1650



85 weight-% 15 2165
15 weight-% 14 1650



85 weight-% 15 2165
15 weight-% 12 1654



85 weight-% 15 2165
15 weight-% 12 1652



85 weight-% 15 2165
15 weight-% 11 1651



85 weight-% 15 2165
15 weight-% 11 1650

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