Technical Information

DF44

Performance Pigments and Colors

23 Series – Metallic Glass Colours

In this technical information leaflet Ferro presents the **23 Series**. This series comprises four lead containing metallic glass colours for the decoration of cosmetic flacons, drinking bottles, giftware etc. in indirect printing.

The colours are usually delivered in powder form.

The main properties of the 23 Series colours are their intense metallic effect and a comparable smooth surface. After firing, the colours form a metallic surface on light as well as dark glasses.

The available colours are listed in table 1 and fig. 1.

Application

The colours of the **23 Series** have excellent processing properties in all common decoration methods like screen printing (direct and indirect), spraying, pad printing and brushing.

For cleaning the equipment and screens we recommend cleaning oil 80 452.

It is important that the colours are not milled too long when pasted, because otherwise the fine metallic plates could be destroyed.

Screen Printing (Direct and Indirect)

For direct and indirect screen printing of metallic colours we recommend polyester screens with 77 threads/cm (270 mesh/inch).

Media

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

Storage

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.

According to our experience, pastes can be stored up to 6 months in originally sealed containers. We recommend using pasted colours as soon as possible. If the paste is too thick, the viscosity has to be adjusted by addition of a medium.

Miscibility and Compatibility

All metallic colours of the 23 Series are intermixable.

Firing Conditions

The firing temperature range is between 560 and 600 °C.

The optimum firing result depends on the firing temperature, on the total firing time, the soak time and not least on the properties of the glass. To achieve an optimized firing result, we therefore recommend the user to check under his own individual conditions.

Acid and Alkali Resistance

The alkali and acid resistance of fired colour layers is influenced by the thickness of the layer and the firing conditions. In lab tests and under industrial conditions, the colours of the **23 Series** show a limited resistance to acids and alkalis (test with 4% acidic acid, 22 °C, 5 h, as well as with 0.5 % Calgonite solution, 77 °C, 16 h).

Heavy Metal Release and Heavy Metal Content

The release of heavy metals is primarily influenced by the colour composition, the colour deposit and the firing conditions It is therefore 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.

If the layers are too thin, the firing temperature too high, or the firing cycle at peak temperature too long, heavy metal release might be higher.

The colours of the **23 Series** fulfil the limits of EN 1388 1-2. According to our experiences, mixtures have the same resistance as the basic colours.

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

Fig. 1: The available 23 Series colours

13 2303 Yellow Gold | 15 2308 Silver Grey | 16 2307 Bronze | 17 2309 Red Metallic

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

Table 1: The 23 Series colours

Product No.	Colour Shade
13 2303	Yellow Gold
15 2308	Silver Grey
16 2307	Bronze
17 2309	Red Metallic

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