Technical Information

DF42

Performance Coatings

31 Series – Transparent Glass Colors

In this Technical Information Vibrantz presents the **31 Series**. This series comprises ten lead containing glass colors for the decoration of decorative glasses by indirect printing.

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

Application

The colors of the **31 Series** have excellent processing properties in all conventional decorating methods like screen printing (direct and indirect), spraying and brush application. For cleaning of equipment and screens, we recommend cleaning oil 80 452.

Screen Printing (Direct and Indirect)

We recommend polyester screens with 68 - 90 threads/cm (175 - 230 mesh/inch) or stainless-steel screens VA with 220 – 300 mesh/inch.

For further enhancement of opacity and color intensity, a white underlayer may be printed first. For this purpose 19 33130 is perfectly suited.

Media

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

Storage

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 Compatibility

The gold and silver containing colors (77 291, 77 396, 77 435, 77 436 and 78 149) may be mixed with each other in any desired ratio. Regarding mixtures with other colors of this series we recommend performing tests to ensure the firing stability of the mixed shades. The gold and silver free colors are all intermixable. The transparent flux 10 104 may be added to every color for obtaining lighter shades.

The color shade can be influenced by a pre-treatment of the surface, e.g. with tin or titanium, depending on the type of coating.

Firing Conditions

The firing temperature range is between 540 and 580 °C.

For a higher transparency, the higher temperature is recommended wherever possible. By adding 20-30% of the flux 10 104, the firing temperature is lowered by approx. 20 °C. The color shade of purple colors is strongly influenced by the firing temperature.

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

Expansion Coefficient

The expansion coefficient of the colors lies between 100 and 120 x 10-7/K.

Acid and Alkali Resistance

The alkali and acid resistance of fired color layers is influenced by the thickness of the layer and the firing conditions. The colors of the **31 Series** are not resistant to acids and alkalis (tested with 4% acetic 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 colors of the **31 Series** are lead containing.

The colors of the **31 Series** do not fulfil the limits of the EN 1388 1-2 standard.

Fig. 1: The available colors of the 31 Series

12 33602 Dark Blue

14 125 Black

77 291 Intensive Purple

77 396 Purple

77 435 Amethyst

77 436 Ruby

78 149 Violet

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

Table 1: The colors of the 31 Series

Product No.	Color Shade	Pantone® Code[1]
12 33602	Dark Blue	Reflex Blue c
14 125	Black	Black c
77 291	Intensive Purple	227 c
77 396	Purple	226 c
77 435	Amethyst	248 c
77 436	Ruby	1797 c
78 149	Violet	2597 c
19 33130	Underlayer White	
10 104	Transparent Flux	

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