

# Technical Information

## DF40



## Onglaze and Inglaze Relief Colors for Porcelain, Bone China, Vitreous China, Earthenware and Tiles

In this Technical Information Ferro presents the relief colors. With these colors, thickly printed reliefs on porcelain, bone china, vitreous china, earthenware and tiles may be achieved.

All mentioned relief colors have a glossy surface after firing.

### Screen Printing

We recommend polyester screens with 24-77 threads/cm.

In combination with other decorating colors, interesting effects can be obtained. If for example a colored underlayer (e.g. printed with Series 64 colors) is overprinted with the relief color 10 5008, a transparent relief layer is formed on top of the colored decoration.

Alternatively, the onglaze relief colors can also be mixed with decorating colors. An addition of up to 10% decorating color to transparent relief fluxes creates brilliant color reliefs. If a white relief color is used, the resulting reliefs have a pastel shade.

For all standard methods, Ferro 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.

### Firing Conditions

The firing ranges for the different substrates are listed in the following **table 1**.

Substrate	Onglaze	Inglaze
Porcelain	820-880 °C	1180-1220 °C
Bone China	750-880 °C	950-1050 °C
Vitreous China	750-850 °C	950-1050 °C
Earthenware	650-740 °C	950-1050 °C
Tiles	800-880 °C	950-1050 °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 glaze. To achieve an optimized firing result, we therefore recommend the user to check under his own individual conditions.

## Heavy Metal Release

Correctly processed, decorations produced with the mentioned onglaze and inglaze colors reach lead release values well under the limits of DIN 51032. They are resistant according to DIN 51031/32

(exception: 19 43001 and 19 083, colors for tile decoration).

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

**Table 2: The available relief colors**

Reference	Color Shade	Onglaze	Inglaze	Porcelain	Vitreous China	Bone China	Earthenware	Tiles	lead free	c.t.e. [x10 <sup>-7</sup> /°K]	Firing Temperature [° C]
10 122	Transparent	x		x	x	x	x			48	850 - 950
10 153	Transparent	x			x	x	x			53	800 - 850
10 5008	Transparent	x			x	x	x			56	820 - 880
19 083 <sup>1</sup>	White	x						x		60	780 - 850
19 2001 <sup>1</sup>	White	x		x	x	x	x			48	850 - 1000
19 2002 <sup>1</sup>	White	x		x	x	x	x			48	850 - 1000
19 43001 <sup>1</sup>	White	x						x		49	780 - 910
19 44000	White	x			x	x	x			70	780 - 850
19 5009	White	x			x	x	x			56	820 - 880
19 8006	White		x	x	x		x			49	1180 - 1220

<sup>1</sup> GHS symbol 07, 08, 09, H phrases 302, 332, 360Df, 373, 410

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