

Technical Information

DF10

Performance Pigments and Colors

Indio – Resistant Decorating Colours for Enamel

In this Technical Information Ferro presents the Indio enamel colours. These colours have excellent processing characteristics in all conventional decorating methods like screen printing (direct and indirect), spraying as well as lining and banding.

Screen Printing

For direct and indirect screen printing (transfers) we recommend polyester screens with 73-120 threads/cm (185-304 mesh/inch) or stainless steel screens VA 110-VA 140.

Spraying

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

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.

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 intermiscible, also the cadmium containing colours.

For creating pastel shades out of Cobalt Blue 12 1300, this should only be mixed with White 19 810 otherwise dirty blue color-shades will occur. Other pastel shades can be obtained by addition of White 19 191.



Firing Conditions

Depending on the enamel, the colours may be fired at 750 to 850 °C in a reverse kiln or similar. The **Indio** colours stable at high temperatures and relatively resistant to “pinholes” or “blistering”. According to our experiences such faults are caused when using inappropriate printing oils, too short and rapid firing or low-quality steel or enamel.

Resistance

The dishwasher resistance according to EN 12 875 1/2 can be improved by using resitant enamel printing at a medium to thick color deposit and firing at approx. 820 °C.

In laboratory tests the **Indio** colours show no visible acid attack (test with 3 % hydrochloric acid, 20 °C, 5 h).

The **chromic acid test** for determination of resistance in electroplating (400 g H₂CrO₄ + 20 g H₂SO₄ (96%) in 1 litre distilled water for 5 minutes at 40-50 °C) is as well passed by all Indio colours without any visible attack.

Heavy Metal Release

The heavy metal release is mainly influenced by the enamel used, by the colour deposit and by the firing temperature. 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.

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

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 Indio colours

Reference	Colour Shade	Pantone® Code ¹
11 1300	Blue Green	323 c
11 1301	Emerald Green	3415 c
12 676	Cobalt Blue	541 c
12 1300	Cobalt Blue	647 c
12 1301	Cyan Blue	3015 c
13 1300	Canary Yellow	101 c
13 1301	Cadmium Yellow	108 c
14 1300	Black	Black 2c 2X
16 1300	Brown	1685 c
16 1301	Terracotta	145 c
17 1300	Cadmium Red, Dark	186 c
17 1301	Cadmium Red	Warm Red c
17 1302	Cadmium Orange	1505 c
19 191	White	
19 810	White	
77 505	Purple, Light	208 c
77 810	Rose	493 c

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

Fig. 1: Colour samples of the Indio range



11 1300 Blue Green



11 1301 Emerald Green



12 676 Cobalt Blue



12 1300 Cobalt Blue



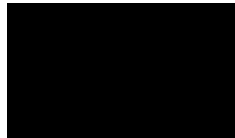
12 1301 Cyan Blue



13 1300 Canary Yellow



13 1301 Cadmium Yellow



14 1300 Black



16 1300 Brown



16 1301 Terracotta



17 1300 Cadmium Red, D.



17 1301 Cadmium Red



17 1302 Cadmium Orange



77 505 Purple, Light



77 810 Rose

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