

## Technical Information

DF11

Performance Coatings

### Azurico – Brilliant Blue Resistant Onglaze Colors for Porcelain, Bone China, and Earthenware

Conventional cobalt blue onglaze colors with a bright blue color shade and the typical desired transparency do not have today's required chemical resistance. Therefore, in chemically resistant color ranges true cobalt blue color shades are missing.

The **Azurico** series fills this gap and offers the following advantages:

- bright blue transparent appearance after firing with a highly glossy surface
- good chemical resistance, comparable to our Palette 70 and Sunshine colors
- good dishwasher resistance
- no chipping, even in thicker layers
- wide firing range
- suitable for fast firing cycles on porcelain and bone china.

#### Application

An intensive blue develops its rich effective color especially in a thicker color deposit. Due to their linear thermal expansion of  $63.5 \times 10^{-7}/K$  **Azurico** colors can be applied in thicker layers. These colors are especially suitable for screen printing and spray application. On hard-paste porcelain the color layer should not exceed 30  $\mu\text{m}$ . Machine lining and banding are possible and, depending upon the design, **Azurico** colors can be used also for hand painting.

#### Screen Printing

For direct and indirect screen printing (transfers) we recommend polyester screens with 73-100 threads/cm (185-255 mesh/inch). Intense layers can be obtained by printing the color twice.

## Spraying

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

## Machine Lining and Banding

Color suspensions applied with brushes, steel- or neoprene-rollers are generally based on water-soluble media. For all standard methods, Vibrantz offers suitable media and covercoats. Further detailed technical information can be found in our **CerDePrint Media Guide**.

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

**Azurico** colors are intermixable with each other in any ratio. The resistant special flux 10 2500 is well suitable for thinning. It does not change the original character of the blue color shade even in a higher mixing ratio. Other resistant fluxes cause color changes to grey-violet when fired at elevated temperatures.

To increase the reddish appearance of 72 2500 Dark Blue, we recommend adding 77 477. With the colors 12 2500 and 72 2500, midnight-blue color shades can be achieved by adding up to 5 % of 14 209 Black.

## Firing Conditions

The firing conditions are listed in the following table 1.

**Table 1: Firing conditions**

| Substrate            | Firing Cycle          | Temperature |
|----------------------|-----------------------|-------------|
| Hard-Paste Porcelain | Normal Firing         | 780-850 °C  |
| Hard-Paste Porcelain | Fast Firing (1 h)     | 860-900 °C  |
| Soft-Paste Porcelain | Normal Firing         | 760-830 °C  |
| Earthenware          | Normal Firing         | 760-800 °C  |
| Bone China           | Normal Firing         | 780-820°C   |
| Bone China           | Fast Firing (23 min.) | 900 °C      |

## Decoration with Precious Metal Preparations

Any decoration with precious metal preparations must be done in a second firing cycle. The temperature in this second cycle should be at least 50–70 °C lower than for the **Azurico** colors.

## Resistance



The alkali and acid resistance of fired color layers is influenced by the thickness of the layer, the firing conditions, and the glaze. In laboratory tests and under industrial conditions on various substrates, the **Azurico** colors show no visible acid attack (test with 3 % hydrochloric acid, 22 °C, 5 h), but a slight alkali attack (test with 0,5 % Calgonite solution, 77 °C, 16 h).

## Heavy Metal Release

The release of heavy metals is primarily influenced by the glaze composition, the firing conditions, and the color deposit. 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, the firing cycle at peak temperature too long, or the kiln atmosphere is reductive, heavy metal release might be higher. The **Azurico** colors fulfil the limits of EN 1388 1–2. The colors of the **Azurico** series are technically free of cadmium. Due to natural contamination of raw material traces of cadmium are possible. Our safety data sheets, which are available for every product, provide you with useful advice for working with our products.

**Table 2: The Azurico colors**

| Reference      | Color Shade              | Pantone® Code <sup>1</sup> | Color Sample  |
|----------------|--------------------------|----------------------------|---|
| <b>12 2500</b> | Blue                     | 661 c                      |  |
| <b>72 2500</b> | Dark Blue                | 662 c                      |  |
| <b>10 2500</b> | Transparent Flux, Milled |                            |   |

<sup>1</sup> The above-mentioned **Pantone**® code is only a guideline for the color shade. **Pantone** is a registered trademark of Pantone Inc.

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

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