

## Technical Information



### 756 Series Lead-Free Glass Enamels

#### Product Codes and Color Shades

Product Code	Shade	Pantone® Code <sup>1</sup>
107561	Flux	
117561	Chrome Green	7730C
117562	Green	328C
117563*	Christmas Green	356C
127561	Blue	293C
127563	Cyan	7704C
137561	Lemon Yellow	106C
137562*	Yellow	116C
147561	Black	Black C
167561	Yellowish Brown	7583C
167562	Dark Brown	7601C
177562*	Red	1795C
777562	Purple	2041C
777563	Purple	208C
197561	White	

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<sup>1</sup> The above mentioned Pantone® code is only a guideline for the color shade

\*Denotes cadmium-containing colors.

#### Heavy Metal Release

Colors in the 756 Series do not contain voluntary additions of heavy metals that include lead, cadmium, mercury and hexavalent chromium (Cr6+), with the exception of the cadmium-containing yellow, red and green (as marked \* below). These colors use cadmium pigments needed to achieve any applicable market-required color tones.

Ferro manages heavy metals in the 756 Series colors with controls in place to maintain the following limits:

Lead content < 300 ppm ;

Cadmium content (with the exception of cadmium-containing colors) < 100 ppm;

Lithium < 30 ppm

#### Application

These enamels are specifically formulated for opal glass dinnerware and is also suitable for a selection of glass tumblers. It is not recommended for or the decoration of pressurized containers.

#### Miscibility

These glass enamels are also intermixable, which allows decorators to mix and match their own shades for optimal productivity with minimal inventory. It is recommended to perform preliminary tests before launching production with color mixtures from this system. Additional colors are available on demand.

**Firing**

We recommend using cover flux for this system to improve the glossy. Firing temperature 600-630°C in a cycle of 1-1.5h, with a soaking period of approx.10 min, depending on both the type of furnace and the volume of ware load. We recommend an oxidizing atmosphere to give optimal fired appearance and brightness. It is essential to maintain good ventilation and an efficient extraction of the

combustion gases and the products resulting from decomposition of the medium.

**Color Deposit**

The maximum color deposit after firing, depending on the glass and the firing temperature.

Too thick color deposit may cause blistering. We recommend the customer to do the trials prior to production.

**Chemical Resistance**

Acid resistance:  $22 \pm 2^\circ\text{C}$ , 4% acetic acid, 24 h; Grade 4 or better

Alkali resistance: 9.1%NaOH+0.9Na<sub>3</sub>PO<sub>4</sub>• 12H<sub>2</sub>O, 88°C, 4 h; Grade 5 or better

1.	No attack apparent.
2.	Appearance of iridescence or visible stain on the exposed surface when viewed at a 45angle but not apparent at angles less than 30.
3.	A definite stain which does not blur reflected images and is visible at angles less than 30.
4.	Definite stain with a gross color change or strongly iridescent surface visible at angles less than 30 and which may blur reflected images.
5.	Surface dull or matte with chalking possible.
6.	Significant removal of enamel with pinhole evident.
7.	Complete removal of enamel in exposed area.

**Expansion Coefficient (CTE)**

The CTE of the colors from this series is about  $90-100 \times 10^{-7}/^\circ\text{C}$  (30-300°C). This system is suitable for the decoration of most soda-line glasses.

**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 pasting.

**Supplying Forms**

Our colors in this system are usually provided in powder form.

**Limitation of Warranty and Liability**

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