

## Technical Information



### 757 Series Lead-Free Glass Enamels

#### Product Codes and Color Shades

Product Code	Color Shade	Pantone® Code <sup>1</sup>	Product Code	Color Shade	Pantone® Code <sup>1</sup>
<b>117573</b>	Green	356C	<b>117574*</b>	Green	360C
<b>117575*</b>	Yellowish green	382C	<b>117576</b>	Dark green	626C
<b>127571</b>	Blue	286C	<b>127574</b>	Intensive blue	654C
<b>137570N*</b>	Lemon yellow	Medium Yellow C	<b>137570*</b>	Lemon yellow	102C
<b>137571N</b>	Light yellow	129C	<b>137571</b>	Yellow	601C
<b>137574</b>	Metallic yellow		<b>147571</b>	Black	
<b>167571</b>	Brown	175C	<b>167573</b>	Dark Brown	477C
<b>177572*</b>	Coke Red	186C	<b>177572P*</b>	Red	1788C
<b>177575</b>	Iron red		<b>197570</b>	Etch	
<b>197571</b>	white		<b>197574</b>	Metallic White	

“\*” \*Denotes cadmium-containing colors .

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

#### Heavy Metal Release

Colors in this Series do not contain voluntary additions of heavy metals that include lead, cadmium, mercury and hexavalent chromium (Cr6+). Ferro manages heavy metals in the this 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

The glass enamels in this system are specifically formulated for the decoration of soda lime glass packaging, particularly multi-trip bottles.

#### Miscibility

These colors are intermixable, we recommend performing preliminary tests before launching production with color mixtures from this system. Additional colors are available on demand.

#### Firing

We recommend 630-650°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.

**Chemical Resistance**

Acid resistance: ASTM C 724 (10% citric acid and 3.7% HCl, 15 min) : Grade 4 or better

Alkali resistance: ASTM C 675 (9.1% NaOH + 0.9% Na<sub>3</sub>PO<sub>4</sub> · 12H<sub>2</sub>O, 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 45 degree angle 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  $85-95 \times 10^{-7} / ^\circ\text{C}$  (30-300°C). This system is suitable for the decoration of most soda-line glasses.

**Supplying Forms**

Our glass enamels from this system can be provided in Powder form and the Thermoplastic pastes (TP) form for multi-color hot screen printing.

**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.

Thermoplastic paste should be stored in cool and dry conditions, not below 5°C or above 35°C. Partly used tins must be tightly sealed after use. If stored as recommended, the shelf life is 2 years after production date.

**Limitation of Warranty and Liability**

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