

Lead-Free System Technical Data

Performance Colors & Glass

VN System

Main Market Use

These lead-free enamels are recommended for decoration of cosmetic and perfume containers.

Chemical Composition

Colors in this System do not contain voluntary additions of heavy metals – Pb, Cd, Hg and Cr⁶⁺. Exceptions are the cadmium-containing green, yellow, reds and oranges (marked * below) which need to use cadmium pigments, to provide the color tones required by the market.

COLOR	REFERENCE	Pantone
TURQUOISE	VN 1301	329 C
APPLE GREEN	VN 1306	347 C
COBALT BLUE	VN 2301	2746 C
BLUE	VN 2305	286 C
YELLOW	VN 3301 *	3955 C
DARK RED	VN 7301 *	187 C
RED	VN 7300 *	1795 C
ORANGE	VN 7315 *	152 C
BROWN	VN 6301	4695 C
WHITE	VN 9320	
BLACK	VN 4300	
FLUX	VN 821	
ETCH	VN 9326	

The Pantone references and color prints are provided as an indication of the shade only.

The above mentioned references are randomly selected color shades, please contact your respective Ferro Technical Service to get more information on further available colors.

The above mentioned references refer to the powder form only. If you want the thermoplastic paste, liquid paste or spraying form, make sure to add the suitable name of the medium – mentioned on page 5 - at the end of the reference.

These colors are intermixable. We recommend performing preliminary tests before launching production with color mixtures from this System, especially for combinations of red or yellow cadmium-containing colors (marked *) with any other colors.

Additional colours are available on demand. Our technical service teams also offer a full custom-color matching service.

Expansion Coefficient (C.o.E.)

This system is suitable for most chemical compositions used in the production of soda-lime glass bottles.

Recommended Firing Conditions

From 580°C to 600°C in a cycle of 1 h-1.5 h with a soaking period of approx.10 min, dependent on both the type of furnace and the volume of ware fired. Enamels from this System are sensitive to overfiring. We recommend an oxidising atmosphere to give optimal fired appearance, gloss 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: 7
Alkali resistance: 7

Limitation of Warranty and Liability

Ferro believes that the information contained in this document is accurate at the time of its publication. Ferro makes no warranty with respect to the information contained in this document. The information in this document is not a product specification, either in whole or in part. Your use of the information contained in this document and your purchase and use of this Ferro product are at your sole discretion. Downstream users are responsible for determination of the suitability of this product and for testing in specific applications. Nothing in this document shall be construed as a license for use that infringes upon any property rights of any third party. Please refer to the Safety Data Sheet (SDS) for safe use, handling and disposal information. All sales by Ferro to you are subject to Ferro's Terms and Conditions of Sale, as amended from time to time and available at www.ferro.com. In the event this document conflicts with Ferro's Terms and Conditions of Sale, Ferro's Terms and Conditions of Sale shall control.