

# System 31

## Main Market Use

These enamels are intended mainly for the decoration of lighting fixtures and ornamental hollow-ware, where chemical durability is not important.

## Chemical Composition

Colors in this System contain lead, but are lithium-free. There are also some gold-containing colors contained in this System.

## Intermixable Color Range



COLOR	REFERENCE
GREEN	11699
BOTTLE GREEN	11934
GREEN	11940
BLUE	12601
DARK BLUE	12603
SILVER YELLOW	73018
GOLDEN YELLOW	13142
PURPLE	77396 *
VIOLET	78149 *
RUBY	77436 *
TRANSPARENT FLUX	10022

Colors marked \* are gold-containing colors and can be mixed with each other in any proportion, but are not recommended to be mixed with any of the other colors in this System.

The non-gold colors are all intermixable with each other in any proportion.

Transparent flux 10022 can be blended with any of the colors to produce weaker color tones.

The color shade can also be influenced by the surface pre-treatment of the glass, dependant on

the nature of any hollow-ware hot-end coating, such as tin or titanium.

Mixing charts are available, as a guide to the range of color shades achievable.

## Application

The unfired color layer should not exceed 20 microns, to avoid cracking during firing. Too thin layers may fire matt or very pale.

Highly effective designs can be achieved by applying a combination of transparent and opaque color layers (e.g., System VS) via spraying, screen-printing, brushing or stippling.

## Expansion Coefficient (C.o.E.)

These enamels have a high C.o.E., and therefore it is advisable to take special care when applying these colors. Enamels with a higher C.o.E. than the glass substrate to be decorated, can weaken the glass.

We recommend decorators make preliminary trials to check that the end results are in accordance with their requirements.

## Recommended Firing Conditions

From 540°C to 580°C (1000-1080°F), with the higher temperature recommended for optimal transparency.

An addition of 20-30% flux 10022 will further reduce the firing temperature by some 20 °C.

## Chemical Resistance

Transparent colors have very limited resistance to acids, alkalis and atmospheric pollution. This limited resistance is characterized by gradual fading of the colors, or iridescence may appear.