Spotlight on the America's:

Using COLORTREND® High Strength Colorants

For Increased Opacity

We are all familiar with architectural tinting systems and paints, either as part of our professional activities or even more likely as consumers buying paint for our homes. As with any product, there is a desire for increased product quality and performance. One property of direct interest to the end user is the opacity of a colored paint.

In architectural point of sale (POS) tinting, paint bases with fixed TiO_2 levels are used. Because of this, there is not the opportunity to optimize pigment or TiO_2 loading for each individual color as is more the case for inplant coloring. A color is made in the highest TiO_2 level base possible but the limitation is the amount of colorant that can be added to a base. In addition, the colorants traditionally used in POS tinting systems do not necessarily contain a high level of pigment. The black colorants and most of the organic pigment colorants contain a fairly low level of pigment. This was originally done to facilitate precise color reproduction of light colors in small container sizes, e. g. quarts. If a colorant was too strong, that is, had a high level of pigment, it would be difficult to reproducibly make very light colors given the dispensing machine increments and accuracy originally available.

For many years most POS systems used the same lineup of colorants, with very infrequent changes in the set of colorants. It is very difficult to change the set of colorants because of the accumulation of color matching formulas using the set of colorants. Changes would necessitate developing new color formulas, not only for colors currently featured in store displays, but also for past color matches. However, now many users are considering changes to their colorant lineup. Evaluation of newer colorants to expand color space, provide better lightfastness, move to low or no VOC colorants, and achieve greater opacity, is taking place. Users are realizing the benefits to making changes rather than benefits to not making changes.

To meet this market interest Evonik has developed a series of higher strength colorants in both the traditional COLORTREND® 888 product line and in our new COLORTREND® 808 No-VOC line*. The pigment content and tinting strength of these colorants is from 1.5 to 3+ times as strong as traditional colorants. Therefore the amount of pigment in the 12 ounces of colorant added to a Neutral base can be about 2 – 3 times the amount of total pigment usually added, thereby achieving increased opacity. The same color is achieved because the overall proportions of the pigments are the same. In addition some colors can now be made in a base with higher TiO_2 level because less colorant is needed. For example a color using 3 – 4 ounces of colorant per gallon of Deep base (which would need, for example, 10 ounces in Medium base) can now be made in Medium because it requires only 4 – 5 ounces of stronger colorants in Medium base.

Another benefit is that as less colorant needs to be added to a base there is a decrease in any paint film effects caused by colorant because of the decreased level. There can also be a reduction in the cost of tinting by the use of high strength colorants.

Figure 1 contains a comparison of a conventional strength and a high strength colorant. On the left is the product 888-5511 D green added to a white base. On the right is the colorant 808-5555 DXE from the Colortrend® 808 product line. Equal amounts of the colorants were added to the paint base. The high strength green is three times stronger than the regular green. High strength counterparts are available for yellow, black, green, blue, red, magenta, and violet colorants (colorants AXX, B, D, E, R, V, J). Figure 2 shows a comparison of a red color matched both with conventional red 888-0836 R on the left side and on the right side using a higher strength red 808-0755 REE, (along with small amounts of other colorants needed to make the match). Here the drawdowns were made on black and white cards using paints tinted with 12 ounces of colorant per gallon of Neutral base. This picture illustrates the opacity difference achieved in a neutral base.

More comparisons can be made by measuring contrast ratio (CR). Figure 3 shows three paint samples. The lowest stripe in the photo is a paint with 12 ounces per gallon of 888 R red colorant in Neutral base drawn down with a 6 mil blade. A CR of 85 is reached. The middle stripe is 888-0843 high strength red at 12 ounces and 6 mils. The CR is 96. The top stripe shows conventional strength R colorant at 12 ounces and 10 mils. Its CR is 93, showing that at least twice the film thickness would be needed to achieve the hiding of the high strength red.

A similar comparison can be made with yellows, a color with which opacity is also a problem. Figure 4 contains the comparison of regular and high strength yellows. The lowest stripe in the photo is a paint with 12 ounces per gallon of 888 AXX Yellow colorant in Neutral base drawn down with a 6 mil blade. A CR of 78 is reached. The middle stripe is 888-2543 high strength yellow at 12 ounces and 6 mils. The CR is 90. The top stripe shows conventional strength AXX at 12 ounces and 10 mils. Its CR is 88, showing that approximately twice the film thickness would be needed to achieve the hiding of the high strength yellow.

Benefits of higher strength COLORTREND® colorants can include reduced effect on paint properties and reduced tinting costs, but increased opacity is of particular value. It is seen as a direct benefit to the end user. Low opacity is especially a problem in the red-orange-yellow area, and COLORTREND® high strength colorants address this problem. High strength colorants in the 888 and 808* product lines include colorants using the same pigment types as conventional colorants, so there are no limitations in matching colors previously made with regular colorants. The 808 product line also contains products using newer pigment types for expanded color space coverage and increased durability. To meet increased product quality and performance needs and to differentiate themselves in the market, paint companies are making changes from the traditional colorant lineups. High strength colorants, providing increased opacity, will be part of the colorant lineups for the future.

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* In Europe High Strength No-VOC colorants are offered from the COLORTREND® 807 No-VOC line

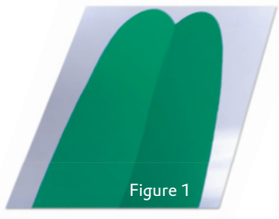
Figure 1

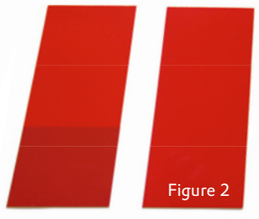
Figure 2


Figure 3


Figure 4