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THE GREEN PAPER

Color and the Environment

True environmental friendliness is a journey of compromises. Many choices can be best made when **all** of the factors are considered. The choice may still be the same, but at least it will have been made with **all** the information at hand. One of the best examples is **color choice**.

In the past, many have not taken into account other factors which impact on the environment:

- Factors like performance impact duty cycle. Duty cycle has a direct bearing on **true** environmental friendliness.
- Factors like the addition of further Volatile Organic Compounds (VOCs) when universal colorants are added.
- Factors like the reduction of light reflectance, as darker colors are chosen. This choice will require greater light contribution from other energy sources.
- Factors like reduced hiding power often an additional coat(s) to achieve complete coverage.

First, let us look at colorants and additional VOCs. All standards organizations, and MPI is no exception, test whites. The VOCs listed, therefore, are based upon whites. To achieve other colors (even 'Contractor Beige'), most paint is tinted at the store level using universal tinters. (A minority is done at the factory with factory tinting paste, but even these colorants often add to the VOC total.) Paint companies use different color systems. Some use as few as two (2) tint bases, and some as many as seven (7) tint bases. This means that different color systems need different amounts of universal tinters to be added to achieve the same color. Most universal tinters are not what are called environmentally friendly. Many of these tinters add an average of approx. **12** g/L of VOC's per ounce when used to tint a gallon of paint. There are low VOC tinters, but they are not yet in common use and are rarely available at most paint outlets.

Therefore, if one were to need 15 ounces of the average tinter to achieve a specified 'deep' color, one would add 180 g/L of VOCs to a gallon. To put this in perspective, if one used a LEED-approved paint at 150 g/L, the use of the tinters would now take that gallon to **330** g/L. If a MPI Institutional Low VOC / Low Odor paint (at a maximum of 10 g/L) were used, the same tinters would add the same 180 g/l VOCs to the paint portion, to yield a total of **190** g/L VOCs. The net savings to the environment are **140** g/L of VOCs, or 42%!

Using lighter colors requires less colorant, therefore less VOCs!

Secondly, let us look at light reflectance. As the color deepens from white, light reflectance generally drops. As this happens, greater amounts of artificial light needs to be made available. As this most often requires more energy, other factors begin to have an environmental impact.

Using lighter colors usually requires the use of less energy!

Thirdly, let us look at performance and its impact on duty cycle. Use of more universal tinters most often drops the gloss/sheen **and** the durability of the applied coating. For example, use of 15 ounces of universal tinters on a recent school hallway project virtually reduced the semi-gloss specified to the performance of a 'velvet' or flat. The resulting 'softer' finish in the hallways was 'marred' sufficiently after only four days of student contact to cause the official opening of the school to be deferred for repainting.

All other things being equal, using lighter colors provides greater durability. Greater durability means longer duty cycle. Longer duty cycle means fewer VOCs released on repainting cycles.

Using lighter colors often means fewer VOCs over time!

Fourthly, deep, bright colors derived from 'clear' tint bases often require additional coats. (It is rare to have colored bases available in all locations for all colors.) Bright reds and bright yellows may require 1 or 2 additional coats to adequately cover. Using this example, let us compare a two-coat white (or off-white) application with a bright yellow application that typically would require four coats. The VOC contribution increases from (2 coats of a LEED-approved paint X 150) 300 g/L for the two-coat application to (4 coats X 330) **1320** g/L. This cycle may continue with a color change upon repainting!

In this example, if MPI High Performance Architectural Latex were used in place of conventional latex, the duty cycle would be extended considerably, thereby reducing the long term VOC contribution. If MPI Institutional Low Odor /Low VOC were used, while some performance and some stain resistance would be given up (over HIPAL), the VOC gain would be (140 X 4) **560** g/L of VOCs (a 42% reduction). These two examples support MPI's position that Appropriate Specified Use can minimize environmental impact while maximizing duty cycle!

Using lighter colors often reduces costs and a substantial amount of VOCs contibuted!

In conclusion, if darker colors ('mediums' or 'deeps') are what are desired, then specify them, but do so knowing the extra environmental cost. Choosing the appropriate MPI product category can often assist in minimizing the Environmental Performance impact. Contact MPI for creative solution suggestions.

Special Points

- Duty cycle
- Universal colorants
- Light reflectance
- Hiding power

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