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Building Protection

New VOC Regulations effective January 01, 2009

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In 1999 the US Federal EPA enacted national limits on volatile organic compound (VOC) content of architectural, industrial and maintenance (AIM) coatings. Since that time many states have enacted their own stricter VOC regulations on AIM coatings based on the California Air Resources Board (CARB). The justification for these new regulations is that the air quality in these States does not comply with the 1990 Clean Air Act.

Presently, the following States have enacted stricter VOC regulations: Maine, New Hampshire, New York, New Jersey, Pennsylvania, Maryland, Delaware, Rhode Island, Virginia (only Northern Virginia Control Area & Fredericksburg Area), Maine, and the District of Columbia, Illinois, Ohio, and Maricopa County, AZ (greater Phoenix area) and California. The above areas have very similar VOC regulations. The greater Los Angeles area, the South Coast Air Quality Management District (SCAQMD), has even stricter VOC regulations than the above states.

Are other states going to enact stricter regulations? What about Canada?

States that exceed the ground level ozone limits of the Clean Air Act, called non-attainment areas, must develop plans to lower ozone. Any AIM VOC limit is typically one part of a larger body of regulations to lower ozone. Exact implementation dates are difficult to estimate due to the public hearings and possible court challenges. Canada will begin national AIM VOC regulation starting September 9, 2010. The Canadian limits are similar to the CARB standards.

What Products are Regulated?

All surface coatings used in AIM applications are regulated, from interior paints to rust inhibiting primers. Some examples are: Water repellents for masonry and concrete 400 grams per liter, concrete curing compounds 350 grams per liter, permanent anti-graffiti coatings and corrosion inhibitors 340 grams per liter, and bituminous roof coatings 300 grams per liter. If a product has more than one use the more stringent VOC limit is in effect.

What are the differences between the new regulations and the current Federal VOC laws?

The state laws supersede the Federal limit. Additionally, for all cases the state's VOC limits are lower than the current Federal regulation. Each state is responsible for enforcement.

Other key differences are:

- The State regulations have NO provision for paying an exceedence fee. The current Federal rules allow a manufacturer to pay a fee (a type of fine) if their product is over the VOC limit. The State regulation eliminates this loophole.
- There is no automatic small manufactuerer exemption or time extension. The Federal law allowed small manufacturers an automatic 3 year extension. The new regulations require small manufacturers seeking an exemtion to petition individually.

How will Manufacturers Comply?

Manufacturers have several options to make their water repellent and anit-graffiti products comply with the regualtions:

1. Reformulate with higher solids - With the VOC limits at such a low level this option is very limited. Resinous material such as acrylics and silicones will not function well at high solid contents. Penetrating materials such as 100 percent silanes are possible and have been used in North America for over 20 years. Other high solid formulations such as siloxanes tend to darken the substrate.
2. Reformulate using exempt solvents - There are solvents that have a negligible photochemical effect (do not contribute to ground level ozone). This option is also being restricted as more solvents are being removed from the exempt list. The products that are remaining either are not applicable as solvents in the AIM area or have other hazards, such as being potential carcinogens.
3. Reformulate to water-borne technology - This will be the most popular option. Most common water repellents are already available in water-borne formulations including acrylics, silicones, silicates, silanes and siloxanes. The biggest drawback with water based products is their application temperature (generally > 40˚F (4.5˚C). Some of

the eliminated solvent based products could be applied at 20˚F (-4˚C). Reinvent old technologies - Old technologies that will make a comeback are silicone emulsions, methyl siliconates and silicates (all available since 1970s). These old technologies may be touted to you as new or improved. In reality they were rejected by the market place due to poor performance. They tend to have low active contents (<10percent) and may be highly alkaline (pH>10). On masonry these products either have no efficacy or have serious drawbacks such as discoloration or reduced water vapor transmission. The Brick Institute of America does not recommend that these products be used (BIA Tech Note 6A). These materials have even poorer performance on concrete (see NCHRP 244 or ACI Concrete International, January 1999).

How to Meet Regulations and Maintain a Quality Specification?

VOC compliant products may be more expensive. The added cost may not be initially apparent. The price per gallon might be the same but higher labor costs, shorter life cycles or more coats make the installed cost higher. The best method for meeting the regulations and getting the best cost effective treatment is to use solvent-free products. Various pure solvent-free silane products are available with 20 year life cycles. This extended service life more than offsets the material cost and the higher labor rates prevalent in the US and Canada.

By specifying solvent and water free products you also eliminate the chance that old, ineffective technology is in your specification. Quality water repellents for brick, concrete and CMU made from pure solvent-free silanes are VOC compliant and have excellent performance. These high active content silanes have exceptional penetration and excellent resistance to wind driven rain and chloride ions.

What Products Does Evonik Manufacture That Meet These Needs?

Evonik's Protectosil Building Protection Group manufactures products that meet the criteria described above, high active-content solvent-free products of proven technology and silane emulsions. Silane emulsions have proven to be much more effective than other water-borne technologies such as silicates, silicones, acrylics or siliconates. Evonik has been selling solvent-free silane water repellents for over 20 years. Our experience in these technologies is unsurpassed.

Chem-Trete BSM 400: Pure solvent-free silane formulation designed for brick masonry. Pluses: no masking of windows required, low temperature application, 20 year warranty.
Chem-Trete PB 100: High solid silane blend for use on porous substrates such as split face block. Pluses: works down to 20˚F (-7˚C), 20 year warranty.
Aqua-Trete 20: 20 percent silane in water for most substrates. Pluses: Excellent for precast concrete.
Aqua-Trete 40: 40 percent silane in water for horizontal concrete. Pluses: Best penetration of water-borne products.
Aqua-Trete Concentrate: A special alkyltrialkoxy silane concentrate for porous block. Pluses: Only true silane with VOC content of <100 grams per liter.
Aqua Trete SG: Proprietary stain resistance treatment. Pluses: Zero VOC, repels oil, grease and food from concrete, masonry and natural stone.
Protectosil BHN: 100 percent silane for use on concrete. Pluses: Exeptional penetration and chloride screening.
Protectosil Anti-Graffiti: A zero VOC water-borne permanent anti-graffiti treatment. Pluses: breathable, clear product that works on most substrates.
Protectosil CIT: Surface applied corrosion inhibitor. Pluses: Reduces corrosion of reinforced concrete by over 90 percent.

For more information about the National VOC regulations and how the Protectosil Building Protection group can help, call 800 828-0919. For more information about our products visit our website at www.protectosil.com.

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