

LOW-VOC COATING SYSTEMS DELIVER INDUSTRIAL STRENGTH PERFORMANCE

Despite the recent delay by the U.S. Environmental Protection Agency (EPA) in issuing stricter ozone standards, a new wave of volatile organic compound (VOC) regulations is expected to drive future demand for industrial maintenance coatings and linings. “We will continue to see the VOC rules tighten,” acknowledged Kyle Frakes, manager, Environmental Health and Safety for Tnemec. In an article for CoatingsPro magazine (September 2010 issue), Frakes reported, “We can expect to see a lot of new regulations coming out in the next few years making incremental decreases in VOC limits in both existing and new areas of the U.S.”

Frakes cited the example of the Ozone Transport Commission (OTC), a coalition of Northeast states, which has initiated a rule-making process to adopt a VOC limit of 250 grams per liter for industrial maintenance coatings, which is currently at 340 grams per liter limit. The model rule has a January 2014 proposed implementation date.

The current national Architectural and Industrial Maintenance (AIM) rule, which covers most of the U.S., will eventually adopt a VOC limit of 340 grams per liter, compared to its current standard of 420 grams per liter, Frakes noted. Despite the recent delays, the EPA is expected to revisit the ozone standard in 2013 and may again propose to lower the limits from 0.075 parts per million (ppm) to 0.06 to 0.07 ppm. “If they adopt this new ozone standard, the potential impact is that there will be huge areas of the U.S. that will be in non-attainment for ozone air pollution,” Frakes observed. “These areas will have to get into attainment, which will likely require more local or statewide VOC regulations.”

As VOC regulations across the country evolve, solvent-based, thin-film industrial maintenance coatings will be replaced in many situations by higher solids, thick-film lining and coating technology, according to Frakes.

Tnemec Tank Armor 100 percent solids epoxy linings are VOC compliant with the most stringent VOC regulations in the U.S., including the South Coast Air Quality Management District (SCAQMD), which leads the industry in regulatory limits for coating VOCs. These industrial maintenance



linings are specially formulated for the harsh conditions of refineries, fuel terminals, biofuel facilities, chemical plants and specialized aggressive environments.

“In addition to being VOC compliant, thick-film 100 percent solids technology provides better performance in terms of its chemical resistance due to its higher crosslink density,” Frakes acknowledged. “Low odor is another advantage, although it still may be necessary to protect workers in the same manner that you would protect them with a solvent-based product.”

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For some coating contractors, the use of 100 percent solids linings will require training in the use of plural component equipment. “There’s going to be a learning curve,” Frakes said. “With thick-film linings, you have to be more careful and make sure you mix them properly. Some of them have a shorter pot life and may require higher-pressure pumps. So there will definitely be a learning curve for applicators as they move to these newer technology products.”

VOC-compliant coating systems formulated to protect the shell of aboveground storage tanks, floating roofs, piping, stairways and exposed structural steel are also available for refineries, fuel terminals and chemical plants. “We’re seeing a lot of corrosion with floating roof tanks – both on the interior and exterior,” confirmed Gary Zinn, sales director, Industrial Markets for Tnemec. “In some cases, the corrosion engineer has had cause not only to line the bottom of the tank, but also the entire shell.”

Weather and environmental conditions, flexing, corrosiveness of the products being stored and their temperatures are all considerations when selecting exterior coating systems. “Other factors include the fallout from the plant’s cooling towers and various processes that leave a corrosive film on the exterior of the floating roof,” Zinn noted. “You also have rain that will pond on the roof, so you have to plan for immersion conditions. In order to evaluate exterior roof coatings, we test them in constant immersion at 140 degrees in de-ionized water.”

A typical coating system for exterior exposures includes a zinc-rich urethane primer, and a low-VOC chemical-resistant, high-build epoxy finish coat specified at more than 20 mils dry film thickness (DFT). Tnemec’s Series 94H2O Hydro-Zinc, a 62 percent solids (96 grams per liter) and Series 27WB Typoxy, a high-solids water-based epoxy, are VOC compliant in all areas of the U.S. and Canada.



Other low-VOC finish coating options used to enhance color and gloss retention on tank exteriors include Series 1028 or Series 1029 Enduratone, a High Dispersion Pure (HDP) acrylic polymer; Series 740 or Series 750 UVX, a 74 percent solids advanced technology hybrid polyurethane; and a next generation version of Series 700 HydroFlon, a fluoropolymer polyurethane.

As regulatory pressure on coatings VOC content continues to become more stringent, conventional, low-solids field-applied coatings will be phased out, Frakes advised. “The industry is definitely going to see more thick-film, high-solids technology.”

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