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Roof Recoating Enhances Workplace Safety

Fri, 05/17/2013 - 11:19am

by Del Williams, technical writer

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Many industrial facilities such as petrochemical plants must remain safely, efficiently operational with virtually no downtime, unplanned maintenance, or replacement for decades. To protect equipment from corrosion, traditionally three separate coatings are used, often in a zinc, epoxy, urethane combination. While this is common, it is far from optimal.

From a safety standpoint, urethane topcoats can be slick walking surfaces, prone to slip and fall hazard, particularly if walking surfaces are wet, moist, or humid. Typical exterior coatings such as epoxy and urethane can emit hazardous VOCs, HAPs, and odors during application, and may have flash points that require extra distance or caution when used around hot or flammable processes.

Applying traditional coatings can stop production for days, since they usually require substantial metal surface preparation, a prime coat and two topcoats with at least eight hours of drying time, also known as minimum recoat time, between each. Bad weather or environmental conditions can further delay production, and even require re-blasting the surface if an environmental delay exceeds the coating's maximum recoat time.

"Traditional coatings in some cases have significant drawbacks," says Jay Harris, a project manager for Moblely Industrial Services, a multi-service specialty contractor serving the chemical, petrochemical, and refining industries. "They need extensive surface prep and must meet specific conditions, including minimum and maximum recoat times, before they can be applied. Due to this, it can take a few days or longer to apply three coats, depending on the size of the job and environmental conditions. To avoid overspray issues, hand rolled application is often required."

Seeking a better solution at a petrochemical facility on the Gulf Coast, Harris recently used a newly approved corrosion coating called EonCoat, by a Wilson, N.C.-based company of the same name, to enhance workplace safety and return an approximately 35,000 sq. ft. floating roof tank to service in about half the time required by typical coatings.

The corrosion coating is part of a new category of tough, Chemically Bonded Phosphate Ceramics (CBPCs) that can stop corrosion and extend



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equipment life. In contrast to typical paint polymer coatings which sit on top of the substrate, the anti-corrosion coating bonds through a chemical reaction with the substrate, and slight surface oxidation actually improves the reaction. This makes it impossible for corrosion promoters like oxygen and humidity to get behind the coating the way they can with ordinary paints. The corrosion barrier is covered by a true ceramic shell, which resists corrosion, fire, water, abrasion, chemicals, and temperatures up to 1,000 degrees F.

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Ceramic coatings such as this consist of two, non-hazardous ingredients that do not interact until applied by a plural component spray gun like those commonly used to apply polyurethane foam or polyurea coatings. Since the components are not mixed and do not meet prior to application, the need for hazardous VOC-generating ingredients is eliminated, as are HAPs and odor. This means that the work can get done in occupied areas.

“Unlike a slick urethane surface, the hard ceramic surface provides better footing and minimizes the risk of slip and fall hazard, particularly on wet, moist, or humid surfaces,” says Harris. “With no VOCs, HAPs, odors, or flash point, it’s also safer for the applicator and work environment.”

In contrast to traditional coatings that require three coats, one coat application and minimal prep for the protective ceramic coating provides facility maintenance managers with significant upfront savings. If the substrate is steel, a brush blast can knock off the loose rust so there is no need to sandblast until there is a bright metal surface for the coating to adhere. Once applied, the ceramic coating is dry to the touch in minutes, can be walked on in 15 minutes, and returned to service in about one hour.

While Mobley Industrial originally estimated over 20 shifts to blast and coat the floating tank roof with a conventional three-coat system, the project was completed in only ten shifts using the ceramic coating.

“With EonCoat surface prep was minimal, and there was no need for a primer or multiple topcoats because one coat did the job,” says Harris. “Unlike traditional coatings, there were no minimum or maximum recoat times, and we were able to spray the ceramic coating instead of hand roll it. Since it dry falls within ten feet, there was no concern of overspray. This expedited the application process with much less labor.”

In comparing the ceramic coating to traditional coatings for petrochemical plants, Wesley Newburn, a Mobley Industrial Services Quality Control Manager, points out a number of additional advantages that can streamline the application and quality assurance process.

“For traditional coating application, the first step is to remove soluble salts to a permissible level, which includes site checks for chlorides, nitrates and sulfates,” says Newburn. “If they are above the maximum levels allowed by the refinery, they must be removed by chloride and pressure washing. This normally will take at least one 10 hour shift. With the ceramic coating there is no need for soluble salts to be removed, which is an advantage over any other coating in the industry.”

With traditional coatings, extensive surface preparation is required and done a little at a time to avoid surface oxidation, which can require re-blasting. “Typically you need to keep an SP-10 throughout the entire blast operation, cleaning operation, and painting operation with traditional coatings,” says Newburn. “You may need to rent D-H equipment because humidity above 60 percent will oxidize the surface and require re-blasting.”

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"Perhaps the biggest advantage with EonCoat is that there's no worry about surface prep," says Newburn. "You can blast the entire surface, then coat it without concern over losing an acceptable blast. There's no need for D-H equipment because the ceramic coating can be applied when it's wet, humid, or even raining. A little surface oxidation makes it adhere better."

According to Newburn, hydrocarbons are the number one cause of coating delamination at petrochemical facilities. To avoid coating delamination at refineries with traditional coatings, all hydrocarbons such as oil and grease must be found by black light methods, then removed by chloriding until black light passes. This is not required with the ceramic coating because it will not adhere to hydrocarbons, so on surfaces that are not clean the coating will "bubble" on the poorly prepared substrate..

"You can immediately identify and correct poor surface prep during application," says Newburn. "For quality assurance, you can also take the coating's dry film thickness as early as 15 minutes after application at 75 degree F. That means the coating can be performed and corrected at the same time, which makes work quicker and gives a more predictable outcome."

"For enhanced corrosion protection, production uptime, as well as workplace and environmental safety, any industrial user who uses traditional coatings should consider EonCoat," concludes Harris.

For more info, call 252-360-3110; Fax 252-360-3109; email TonyC@EonCoat.com; visit www.eoncoat.com; or write to EonCoat, 4000 Airport Drive, Wilson, NC 27896.

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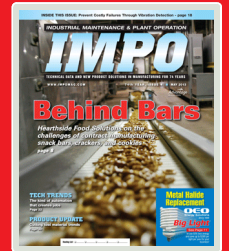
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