Enhancing Workplace Safety With Corrosion Coating

Del Williams

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. 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.

Seeking a better solution at a petrochemical facility on the Gulf Coast, Jay Harris of Mobley Industrial Services 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 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 corrosion barrier is covered by a true ceramic shell, which resists corrosion, fire, water, abrasion, chemicals and temperatures up to 1,000 °F.

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.

“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.”

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.

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.

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 °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.