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Prep for long life

Commercial shipping fleets are working toward longer coating service lives by tailoring prep for high-solid, plural-component systems

Jack Innis, Jamicha Co. LLC

The latest coating systems have proved that they are up to the task of providing 15- to 20-year service life, but reports show that some coating failures still occur within six to 18 months. Investigations have found that the culprit for these failures is often inadequate surface preparation.

Recent studies on high-solid coating failures point the finger of blame at high-pressure water-blasting and secondary repairs using power tools. One way to eradicate this problem is to rethink the specifications for the preparation of coatings. Experts understand that for shipyard recoating projects, it doesn't make sense to specify anything less than new-build-quality cleanliness and roughness. Current high-solid, plural-component coatings tend to be a bit more rigid and perform best when mated with a clean surface and a sharp angular profile, such as those delivered by garnet, aluminum oxide, and other high-quality angular abrasives.

A recent US study, conducted at Portsmouth Naval Shipyard, stated, "High-solid tank coatings are very unforgiving of anything less than SSPC-SP-10/NACE 2/ISO 2.5 surface preparation. Assume that if you do not blast, the paint will fall off."

False economies

However, at some shipyard and marine repair facilities, old habits, perceptions, and shortcuts prevail. Rather than investing time and money in abrasive blasting, decisions are made by vessel owners to attack old coatings with high-pressure water-blast and mechanical power tools. This is sometimes not in their best long-term financial interests as it achieves results that are less effective than near-white metal blast. The logic often used to justify water blasting is that, once the old coatings are removed from the substrate, all that remains is the original anchor profile. But simply removing old coatings does not guarantee near-white metal blast and will not provide the fresh, more angular profile that pairs well with the current generation of high-solid, plural-component coating systems. In addition, many original anchor profiles were lower (25 to 50µm/1-2mils) than minimum

ABOVE: **Low-dust vacuum blasting (photo courtesy of Clemco Industries Corp)**

ABOVE: **Low-dust abrasive blasting with recyclable encapsulated abrasive media (photo courtesy of Sponge-Jet, Inc.)**

requirements for current generation coating systems (75 to125µm/3-5mils). The driving forces behind these practices and policies are well known. The view held by a number of contractors, and shared by many maintenance foremen, production managers, captains, and ship owners is that water blasting is quicker and easier than conventional abrasive blasting with products such as garnet, aluminum oxide, or black beauty. They recommend water blasting even though no test data shows that it provides the best coating performance because they still feel it does a decent job and is cheaper for the contractor. (Admittedly, water blasting does not kick up dust that may cause health concerns or damage nearby machinery.) Yet with anything less than near-white metal blast, paint continues to fall off ships. Coating systems in some ballast tanks and floodable voids last just two to five years; bilges and topsides survive one to three years. Properly prepared, these spaces can achieve zero coating failure for 15 or 20 years.

Sponge blasting

The US Navy has evaluated encapsulated sponge blasting and concluded that it provides significant cost and technical advantages over power tooling. Sponge blasting uses abrasives, including aluminum oxide, encapsulated within small bits of industrial-grade sponge to provide the cleaning and cutting power of conventional abrasives while offering a dry, low-dust, low-rebound blast. The US Navy and many in the commercial shipping industry have already embraced this technology.

In tests conducted by the Australian Navy, it was found that the use of sponge blasting saved US$120,000 per vessel, as well as extending the service life of coatings.

Most oil tankers, cruise liners, ferries, and tugs make money only while in service, not in dry dock, and cashflow keeps the commercial shipping industry afloat. Money sensibly spent on battling corrosion can yield great dividends; however, money spent on coatings that fail prematurely is money squandered. \\