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Marine Coatings
Spray on the ROI

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MARINE COATINGS: No Room for Error

By Patricia Keefe

SO LONG, SAILOR! The economy has packed its bags, sailed south, and left no forwarding address. As the Dow spirals ever downward, consumption drops and fuel costs fluctuate, nervous companies are slashing payrolls and budgets alike. In the ensuing wake, one thing is certain: Hard times call for paying closer attention to protecting what you've got in order to get more bang for the buck.

Take marine coatings, for example. On the face of it, the topic is hardly exciting. But scratch the surface and you'll find a myriad of issues and solutions bubbling up from below that can literally add years to the lifespan of your biggest investment with significant residual ROI. That's because the right coating is much more than a barrier – it can also be a cost-cutting, time-saving, crew-pleasing, environmentally correct way to help ensure the long-term life, safety and profitability of any vessel.

"Pay Me Now, Or Pay Me Later"

When selecting a coating, it helps to keep in mind the old adage, "Pay me now, or pay me later." This is particularly true when it comes to mixing steel and water. Case in point: In the 1990s and early 2000s, there were a "slew of ships that broke up at sea," according to Rick McRae, Global Director of Sales, Marine & Offshore, for Sherwin Williams' Protective & Marine Coatings Division. "The amount of corrosion that was allowed to occur in these cases was substantial, and the ships lost integrity. So it's not just a question of aesthetics or surface protection; it's a matter of putting people in peril at sea," he adds.

It's not for nothing that the U.S. Navy spends $9 million annually on corrosion R&D, or that it is spending $5 million annually on four multiyear corrosion-related projects, or that it sponsors an annual conference, "Mega-Rust," devoted to these issues. "[Coating] failure is not an option," says Mark Schultz, Business Development Manager - Marine for Sherwin Williams. "To take a ship and put it in drydock for repairs can cost hundreds of thousands of dollars – even millions – in costs and lost revenues while the vessel is out of commission."

Corrosive failures are often more of an issue with application than materials. Getting it right the first time is paramount. But painting the insides of a ship is akin to painting in a closet in the dark, says Sherwin William's McRae, particularly in the case of tanks, which are rife with nooks and crannies that are hard to see. Additives in Sherwin Williams' Optically Active Pigments (OAP) coating make it easier to see holidays and pinholes to better aid quality control and cut down on the need for second coats, which in turn saves time and labor costs. A companion product, Fast Clad ER ("Edge-Retentive") includes OAP but is formulated with almost 100 percent solids to stick to edges and dry quickly to combat physics. "When you look at old ships, the premature cause of failures is almost always on the edges," observes McRae.

More to Coatings Than Meets the Eye

Today's marine coatings can contribute so much more to the bottom line than just a barrier between a hulking steel vessel and the elements. To make that happen, however, you are going to have to put more thought into choosing the right product. So before committing your assets long-term to just any type of coating, consider the cost/savings repercussions in the following areas:

- Speed – How quickly and accurately can the coating be applied? How fast will it cure?
- Labor – How many workmen working how many man hours will it take to prep the surface and apply the product?
- Cleanup – How much debris will prep work and application produce, both in the air and in the area? How long will it take to clean the area and dispose of the debris? Does cleanup require more chemicals or soap and water?
- QC – How easy is it to check for "holidays" (missed spots) and to otherwise ensure complete coverage?
- Time – How much time do the above steps require? How long will your vessel and crew be laid up in drydock? How long can you expect the coating to last?
- Green – What's the chemical makeup of the product? What's going to leach into the water, and how much? What environmental regulations are in play in your shipping lanes and ports? Are there non-chemical anti-fouling options?
- Crew – What are the temperature- and sound-insulating properties? What impact will they have on energy consumption and crew comfort and safety?
- Weight – How many coats, or other materials, at what thickness, are required? How will this affect vessel speed and fuel consumption?
- Flammability – Can the products be used where you need the barrier applied?

The answers to any one, or combination, of the factors above can not only significantly raise or lower the cost of constructing, maintaining and operating a vessel, but they can also greatly influence crew comfort, environmental impact and long-term profitability. Clearly, there is much more to marine coatings than meets the eye.

Corrosion is also an exterior issue, but this is where biological contaminants collide with environmental concerns. With copper-based anti-fouling coatings increasingly under fire, Sherwin Williams developed SeaGuard Heavy Metal Free (HMF) foul-release coating, which it says is the only MIL Spec-approved marine MF technology. The combination of HMF anti-fouling in a lighter weight (by as much as 40 percent) formulation also adds to the fuel efficiency of the vessel. Otherwise, estimates Schultz, a vessel could be looking at a 30 percent fuel penalty for driving a living reef in the water.

The right coating can also cut application costs in a number of ways, such as by enabling shorter cure times and smaller work crews, and by leaving less of a mess to clean up.

It's All in the Preparation

If a quality coating job is 90 percent prep work, then the place to start looking for savings and added value is at the beginning of the process. Precision IceBlast Corp. of Wallace, Michigan offers two surface preparation products – ice blasting and "sponge" blasting. These sanding processes are environmentally and equipment friendly, nonabrasive, and are said to provide precision control. That accuracy enables users to blast weld seams without incurring collateral damage on the surrounding paint.

IceBlast utilizes a high velocity stream of dry ice up to 300 PSI. The process is much quicker than hand tooling and can be used in places where sand or stripping media can not – such as engine rooms, around electrical components, or any area that can not get wet or have grit flying around. "Our media vaporizes, leaving no mess and minus whatever was removed," says Keith Boye, Precision IceBlast's Vice President of Sales and Marketing. He described the difference in waste in terms of a 55-gallon drum versus "truckloads" of other media. "If you sand blast, you have to wait for the dust to fall and then wipe it off. If you water blast, it can promote flash rusting, and you have to wait for it to dry. You can paint right behind our crews; there is no wait time at all," says Boye.

Keith Boye, Vice President of Sales and Marketing, Precision IceBlast

His company prepped three Staten Island ferries for Marinette Marine - work that normally would have required six to eight weeks to hand-tool everything, says Boye. "We got that done in seven or eight 12-hour shifts running four guns, and they painted right behind them." The sponge-blasting product is comprised of an aluminum oxide abrasive mixed in with tiny polyurethane sponges that suck up the debris, a process that generates virtually no cleanup and related costs, unlike traditional sandblasting, such as Black Beauty. Sponge blasting by comparison is 98 percent less dusty and produces one-tenth or less, the amount of waste, claims Boye. "That's huge." It does this in part by being recyclable as many as 10 to 15 times.

Temperature Control, Noise Abatement and Weight Loss

Surface preparation and corrosion prevention aren't the only areas where marine coatings can cut costs and add value. Houston-based Mascoat Products provides, among other offerings, spray-on thermal insulating and sound-dampening coatings.

Its Delta T Marine Insulation Coating is used to either replace or enhance conventional blanket insulation, which involves shooting a pin and pushing mineral wool or fiberglass squares on top of it. The latter work is dusty and requires personnel protection. Delta T Marine, by comparison, is environmentally safe, has a low VOC rating and is water-based. Since it is spray applied (with a less than five-foot dry fall), workmen can cover a wider area much faster.

According to company President and CEO George Moore, steel is the perfect translator of heat applied, "once a piece of steel reaches saturation temperatures of say 140 degrees Fahrenheit – 140 degrees can be reached internally in a matter of hours depending on the hull color." By applying Mascoat's coating inside, even though the metal will still get to 140 degrees technically, the insulating barrier is able to become an absorber of heat, retarding its entry into the vessel. In addition, a reflective

Photo credit: Mascoat Products

Once traditional insulation gets wet, the material becomes a heat conduit, an odor wick and exposes the metal surface to mold and corrosion. Insulating coatings have no have ability to absorb humidity and cause negative effects, according to Mascoat.

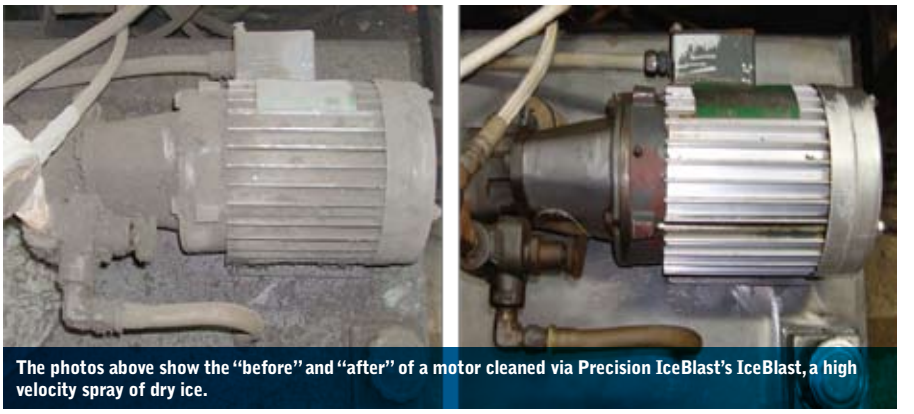
and refractive index is built into the coatings to reflect heat off the outer hull so that the hull is not absorbing 140 degrees anymore – but more like 120/125 degrees. As a result, Moore says, "We are not solving a symptom of heat; we are actually solving the problem of heat."

An unexpected benefit of Mascoat's spray-on coating is weight loss. Moore says his coatings are typically a tenth of the weight of conventional insulations. "We're talking about saving thousands and thousands of pounds per unit. Do your own math – it's dramatic." One such example involves an offshore oil platform that sought to stop condensation effects to the interior environment by applying Mascoat's coating to the outside underneath structure. But the biggest problem was that the vessel was overweight. According to Moore, Mascoat's thin coating ended up saving over five tons of weight, creating an unexpected issue: "We saved them so much weight that they had to recalculate their center of gravity."

Another Mascoat product line, Delta dB, targets sound transfer. Moore cites both Naval studies done on World War II veterans suffering hearing loss and pressure from OSHA as reasons why ship owners such as the Navy are going on the offensive to design ships with less vibration and sound attenuation. Ship owners are also trying to make ships quieter in order to attract better crews and protect their health. "Hearing loss is really becoming one of the top occupational expenses," he adds.

Mascoat also addresses biological noise abatement, which Moore says is expected to be a priority for the new Administration in regards to the green movement and a desire to retard noise signatures into the water column. Delta dB V2 provides as much as 12 to 15dB(A) decibels' reduction in a lightweight coating format by reducing the translation of vibration of movement in steel. "If retarded on the inside, it's retarded on the outside."

Clearly, all of these and other coating products today do more than just cover the substrate. Speed of application, cleanup and curing, as well as better performance, lighter weight and more environmentally friendly formulations, not only protect the vessel but help owners spend as little time in drydock as possible. And as that can only lead to greater profitability in the long run, more and more ship owners are choosing their marine coatings as if their bottom line depended on it. ***Mar*Ex**



The photos above show the "before" and "after" of a motor cleaned via Precision IceBlast's IceBlast, a high velocity spray of dry ice.

Photo Credit: Precision IceBlast

Mascoat's Delta dB helps to reduce internal and external sound, enabling vessel owners to better protect their crew and meet environmental regulations.

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