

## On Lining a Demineralized Water Tank

**A high-quality epoxy phenolic lining failed after only five years inside a demineralized water tank. The 560,000-gallon tank is made out of carbon steel. The design pressure and temperature of the tank are atmospheric and 100 F (38 C). What advice can you provide for this application to avoid another premature failure?**

**Travis LeFever,  
Crossway Protective Coatings**

Whatever coating you end up selecting (and I would say there are many that would be appropriate), keep in mind that the contractor selected, the contractor's QA/QC procedures, and independent third-party inspection (during pre-cleaning, surface prep, and application and curing) may be the difference in any coating's ability to endure the anticipated life cycle, regardless of coating technology.



Travis LeFever is the president of Crossway Protective Coatings (Greensboro, NC). With 11 years of experience in the industrial painting business, he is a SSPC Certified Coating Inspector as well as a NACE Coating Inspector Level 3 and NACE Coating Inspector Program Instructor.

taking extra special care to thoroughly decontaminate the surface before coating by using one of the proven decontamination systems after SSPC-SP 5 White-Metal abrasive blasting.



Jeff Longmore joined International Paints Ltd. in 1965 and left as technical director of the Western U.S.

states in 1983 to join Hempel Coatings as technical director of the Eastern Provinces of Saudi Arabia. He eventually became technical director and plant manager of Hempel Coatings USA. He started Thin Film Technology in 1990 in Houston, TX, where he is presently technical director.

**Julian Hay, ACS Industrial Painting**

Contrary to general opinion, demineralized, or deionized (DI), water is very nasty stuff, precisely because it is deionized and would like to become re-ionized in a hurry. To do so, it will go right through your coating if it possibly can.

A good quality immersion-grade epoxy should do the job, but the surface prep and surface cleanliness are absolutely critical. Based on observation and personal experience, I think surface cleanliness is the most important factor of all, and one that is fre-

quently overlooked, to the great chagrin of many. Never omit rigorous substrate testing for low level "salts" contamination. The industry in general is just beginning to wake up to this factor, but, fortunately, there are some who recognize the magnitude and pervasive nature of this problem. Just because you cannot see the contamination does not mean it is not present. Regardless of where the steel came from, who made it, and how many times it has been blasted or water blasted, or how completely impossible it is that "your steel" is contaminated, it is still likely contaminated. Sorry about that, it's just the nature of the beast. (There is quite a bit of extant data on this. We have all been waiting for an industry consensus document on the topic.)

Here's what I would suggest: Blast to a real, proven SSPC-SP 5 White-Metal, with a suitable profile, then test for chloride contamination. In my opinion, you want less than 10 ppm of chlorides, but I would rather see 0 ppm—and it can be achieved. If chlorides are nil right off the bat (which is very unlikely—either you do not know how to test, cannot read, or are looking for the wrong salt) and you have extensive osmotic blistering (which I bet you do!), then test for sulphates and nitrates. Actually, you could just cut to the chase and insist upon a mandatory post-blast wash-down with a proprietary salt-removal product, followed by yet more substrate testing, until levels of 10 ppm or less are achieved. Then pay attention to the cure (temperature and time), and insist upon a full pinhole test.

Now, let's talk about inspection! Some people consider it an unnecessary expense. But it is cheap insurance and you absolutely need it, full-time, for the duration of the job, by a fully qualified,

*Continued*

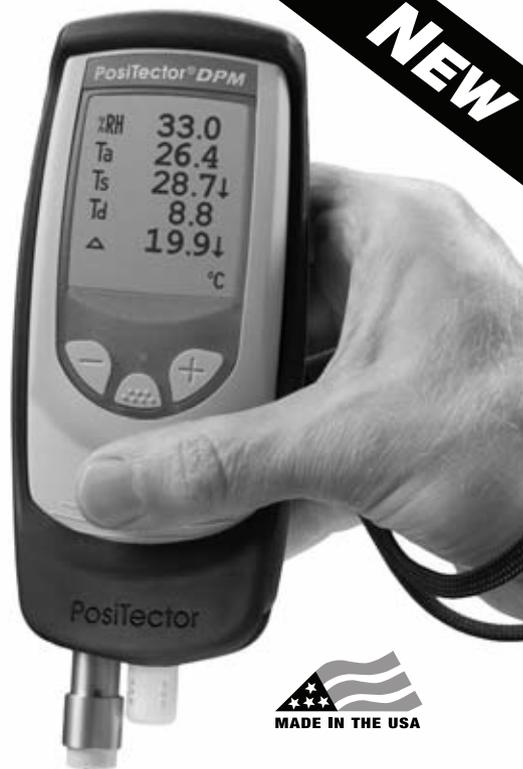
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## Problem Solving Forum

certified coating inspector. Your company produces a product, does it not? Presumably it is inspected and qualified every step of the way, correct? So why would you even think of doing an expensive and technically demanding job without inspecting it every step of the way?

Full disclosure: I'm an independent,

third-party inspector and I also own and operate a specialty coatings company, but I am writing here as a wise old dog (well, not that old) who has seen more than 25 years of coating work. Inspected jobs are always done better than non-inspected jobs.

While it is true that a really good, honest, competent contractor will have

his own QC, who is QCing the QC? The contractor's QC has a vested interest, and the owner ain't necessarily it when the chips are down and money or time is scarce. Your coating failed in five years, so it was probably pooched (that's a technical term, meaning "gone to the dogs") or going that way by three years, I would imagine. With proper inspection (based on good specs and a good inspection and testing procedure), you would likely still be admiring your intact lining! My favorite quote is "You don't get what you expect, you get what you inspect."

Involve the most experienced person in the technical department of the coating manufacturer, and get the person's input, especially regarding quirks and foibles of the proposed coating (and yes, they all have some). And it would be smart to get all that in writing!

Pay careful attention to ventilation criteria and issues, and make sure the cure schedule is properly followed and done right.

Last but not least, face east and bow to the rising sun while crossing your fingers and holding garlic. DI water is nasty stuff and can be sneaky. It may still come back to haunt you.



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Julian Hay has 25 years of experience in the specialty coatings/industrial painting business. He began as a sprayman and sand blaster in his own company, Toronto, ON-based Associated Coating Services (aka ACS Industrial Painting). A NACE Certified Coating Inspector, he also acts as a coating consultant to major engineering firms and local municipal governments and performs third-party NACE inspections, particularly for the nuclear and petrochemical industry. Mr. Hay is fluent in English, French, Spanish, and Swahili.



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