Final Inspection of an Interior Potable Water Tank Lining

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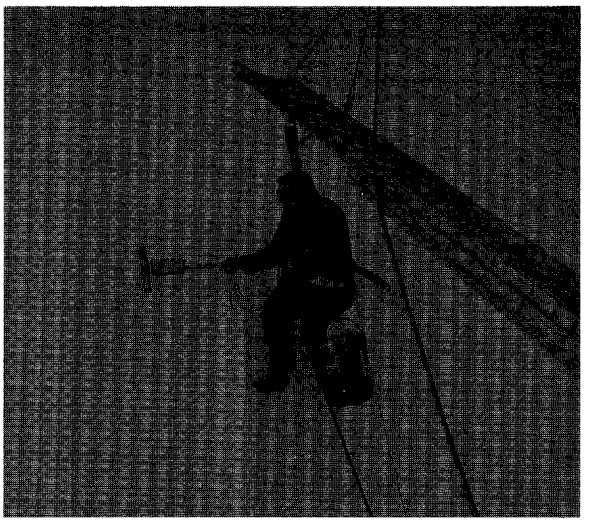
A thorough inspection of a completed interior lining system can provide assurance to a contractor that little or no remedial work will be required at the one-year warranty inspection, and to the tank owner that the coating system will have a long life. By no means, however, does a final inspection override the need for inspection throughout the project.

The final inspection should be performed when the coating has cured for a sufficient period of time to allow the solvents to escape; however, the inspection should occur before the contractor removes the rigging used to apply the coatings so that the inspector can have access to every part of the tank interior.

A final coating inspection consists of a visual inspection, with emphasis on difficult-to-coat areas; dry film thickness measurements; and a holiday test to detect pinholes or voids in the coating. Approximately 7 days at 75 F (24 C) after the finish coat is applied, a solvent rub and/or pencil hardness test should be performed to determine if the coating is cured adequately for immersion service.

Visual Inspection

Visual inspection is carried out with a hand-held light to illuminate the area to be inspected, and a small inspection mirror to inspect the top and back sides of roof rafters and areas that are difficult to see. The visual inspection is performed first to assure that there are no obvious holidays in the coating, entrapped dirt or debris, excessive runs and sags, or overspray. The areas that are difficult to paint should be checked carefully. They include the back sides of roof rafters and stiffening angles, pitted and rough areas of plates and seams, and accessories including overflow weir boxes and riser safety grates. Discontinuities found during the visual inspection should be identified for touch-up. Slight color variation of the finish coat should be checked closely for dry film thickness. Occasionally, the finish coat does not completely hide the prime coat, causing shadows that may or may not indicate low coating thickness.



■ Conducting a holiday test on the interior of a potable water tank

Courtesy of Tank Industry Consultants

Coating Dry Film Thickness

A dry film thickness gage and calibration standards are required to check dry film thickness. The dry film thickness gage should be calibrated before and after each measuring session, as well as between measurements if necessary. The minimum number of dry film thickness readings taken should be in accordance with SSPC-PA 2, Measurement of Dry Paint Thickness with Magnetic Gages. When checking dry film thickness, the inspector should refer to the complete text of SSPC-PA 2. The following description is only a summary of the specification. Three 100-square-foot areas within the first 1,000 sq ft of the surface to be evaluated should be checked using 5 spot thickness measurements in each. For each additional 1,000 sq ft, one 100-square-foot area is selected for measurement. Each of the 5 spot thickness measurements consists of the average of 3 readings of the dry film thickness gage on the surface. All surfaces of stiffening angles, roof plates and supports, shell plates, bowl and/or floor plates, and the riser pipe require checking.

The thickness should be checked for being below the minimum specified coating thickness (which could cause premature coating failure and rust), as well as above the maximum specified coating thickness (which could cause cracking and loss of adhesion when the coating cures). The coating manufacturer's recommendations and project specifications should be followed closely.

Holiday Test

The next test to be performed is low voltage, wet sponge holiday detection, in accordance with the AWWA D-102-78 stan-

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dard, Section 8.4. With a coating over 10 mils dry film thickness, a wetting agent can be added to the tap water used to wet the sponge electrode in order to more readily detect the voids. Tap water alone is usually sufficient for coating thicknesses up to 10-12 mils. Because residues from the wetting agent can affect the adhesion of the touch-up coating where holidays are repaired, residues should be removed prior to touch-up. According to AWWA D-102-78, all areas below the overflow level are to be tested, unless the project specifications also require the roof area to be tested.

Due to the possibility of roof and roof structure corrosion caused by the corrosive atmosphere above the high water level, the additional holiday testing and touch-up of the entire roof will in most cases extend the life of the coating system. The holiday detector will also indicate a holiday if there are intermittently welded or unsealed seams. Care must be taken so these design features are not mistaken for a coating problem. Holidays should be marked for repair, then rechecked after touch-up is complete and the coating is cured.

Test to Indicate Coating Cure

After the curing time is completed according to the specification or coating manufacturer's recommendations, the cure of the coating should be checked. It is important to achieve complete cure before the tank is filled with water; otherwise, organics could leach into the water causing the water samples to fail volatile organic compound (VOC) tests. Testing for VOCs is required in many areas of the country to determine if VOCs from the coating have contaminated the water. In addition, incomplete cure of the coating could cause blistering. Two cure tests are solvent rub and pencil hardness. A solvent rub test consists of using the appropriate thinner and a clean rag, performing 50 double rubs on the coating surface, and observing for evidence of coating rubbing off on the rag or softening on the surface. A pencil hardness test (ASTM D 3363-74) is a procedure employing a series of different hardness drafting pencils to indicate the hardness of the coating. The coating manufacturer should be consulted for the acceptance criteria of these 2 tests for each of their products. In general, the results of the solvent rub test indicate cure if there is no softening of the coating and only slight residue on the rag. The hardness test indicates cure if a 6H hardness pencil does not gouge or damage the coating.

These final inspection steps, in addition to close monitoring of the blast cleaning and coating operations, and providing adequate ventilation during the application and curing period, should provide the necessary assurance of a long-lasting interior coating system. ❑