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Professional Approach Limits Lead Liability

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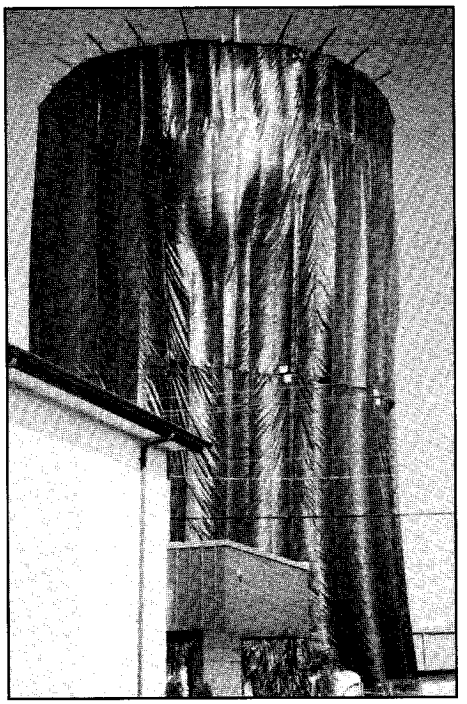
Lead—the four-letter word of the 1990s. Water operators are aware that the Safe Drinking Water Act (SDWA) mandates the amount of lead permissible in tap water. However, not only do lead regulations affect the water we drink, but also the air we breathe and the ground our children play on. For years, industrial steel structures, such as water storage tanks, were painted with red-lead primer. At that time, red lead was the most cost-effective coating method for protecting steel from corrosion. But as more was learned about lead health effects, the use of lead-based coatings was phased out.

Tank Owners Beware

Water tank owners are now faced with removing the lead-based paints from their tanks without exposing workers and the public to unsafe levels of lead in the atmosphere. Traditional methods of abrasive blasting are no longer acceptable. New regulations concerning the removal of lead-based coatings are continually being put in place, and enforcement of these regulations is becoming more stringent.

A tank owner's potential liability for public exposure to lead during the coating removal process is enormous. As a result, newer, more expensive methods of coating removal are being specified and developed. Keeping up with the latest regulations and technology is a Herculean task.

When a lead-paint abatement project is undertaken, a professional approach is essential. A professional engineer with coating and lead abatement experience should be used to tackle a project of this size. This article cannot and does not encompass all contingencies for a lead-paint abatement project. It is not intended to guide a specification writer, but rather to make tank owners aware of the huge liability associated with lead-paint abatement and to provide an overview of a typical project approach.



Full containment is frequently required on lead-abatement projects

Current Regulations

Currently, the Clean Air Act states that not more than an average of 1.5 $\mu g/m^3$ of lead may be released into the atmosphere averaged over a 90-day period. In other words, if the blast project requires 45 days, no more than an average of 3.0 $\mu g/m^3$ of lead may be released per day.

The National Ambient Air Quality Standard further states that not more than 450 $\mu g/m^3$ of particulate matter less than 10 μm in size (dust small enough to be inhaled into the deepest portion of the lungs) can be released into the atmosphere averaged during an eight-hour workday. Based on these criteria, dust emissions on projects where so-called "lead-free" coatings are being removed—and even projects involving the field blasting of uncoated or shop-primed steel for new tanks—are regulated.

Worker safety during lead-paint removal projects is also an area of concern. The Occupational Health and Safety Administration (OSHA) is currently drafting a new "Lead in Construction Standard" to better protect construction workers who are exposed to lead and lead-based coatings. Until such time as this standard is released, workers must be properly protected for their own well-being and to prevent the potential for a third-party lawsuit.

Presently, OSHA is relying on their Construction Industry Standards for Hazardous Material as a basis for determining safe working conditions.

After the lead-based coatings are removed from the tank, the blasting debris must be disposed of and treated

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Before Repainting, Test Existing Coating for Lead Content

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in accordance with US Environmental Protection Agency (USEPA) and Resource Conservation and Recovery Act (RCRA) regulations. Compliance with the "Land Ban" regulations must also be closely monitored.

In addition to lead in the air, there are also regulations for the amount of lead permissible in soil and water. Steps should be taken to protect the tank site and neighboring property or water ways during lead-paint abatement projects.

Initial Testing Procedures

Before beginning a tank repainting project, samples of the existing coating should be tested for lead content. Samples of both the tank's interior and exterior coating types should be taken. Each different color of coating should also be tested. Care should be taken to include all of the primer in each sample, because most of the lead is usually found in the prime coat of the coating system. In addition, the areas from which the samples are taken should not be areas where earlier spot cleaning has removed any previous coating.

An atomic absorption spectroscopy (AAS) test should be performed on each coating sample. The AAS test will indicate the percentage of lead (by weight) in the coating sample.

The Consumer Product Safety Commission has a guideline for nonhazardous levels of lead in a coating, which has been adopted by the coatings industry. In order to be considered "lead-free," the coating must contain less than 0.06 percent lead by weight.

A word of caution—this initial AAS test only determines if there is lead present in the coating samples that have been taken. An AAS test in no way guarantees a specific result for leachable lead in the spent debris. Because it is difficult to collect a truly representative sample of primer from the steel profile, this test may not accurately represent the total coating system. Additionally, variations in the thickness of the coating, types of coatings applied, graffiti, and the previous cleaning and painting operations will also affect the actual readings.

Additional testing to determine the amount of leachable contaminants (lead or other heavy metals) that are present in the spent cleaning debris will need to be performed following cleaning operations at the time of repainting. The initial AAS test does, however, alert the tank owner, specifying engineer, and contractor to the presence of lead in the coatings on the tank, highlighting a potential threat to the environment, surrounding residents, and workers.

Preparation of Specifications

After it has been determined whether or not the existing coatings contain lead, a specific project approach can be determined. Rather than completely removing the existing coatings, more and more tank owners are investigating the possibility of applying a topcoat over the existing coating, hoping that with advances in technology lead-paint removal will become less risky and costly in the future.

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When considering a topcoating operation, the "topcoatability" of the existing coating system should be thoroughly evaluated. Although it may be feasible to apply a similar generic coating over the existing coating, factors such as the adhesion of the existing coating, the quality of workmanship of the original painting, and the topcoating operations can greatly affect the life of the topcoated system.

Compared with preparing the entire tank for repainting, spot cleaning the existing coating in preparation for topcoating will likely result in a smaller volume of dust and coating debris. Even so, it is important to keep in mind that the debris must be contained, tested, treated, and disposed of as any other potential hazardous waste material.

On the plus side, a properly applied topcoat can sometimes extend the life of the existing lead-based coating system as much as 15 years or more. In the meantime, extensive research in elastomeric coating technology (coating that is used to topcoat older, poorer adhering coatings) may provide a viable alternative to removing lead-based coatings in the future.

While the lead-based paint is on your water tank's exterior, the coatings are not a hazardous waste. It is not until the coatings are removed that environmental regulations and restrictions come into play. Before any lead-based paint removal project is considered, all options should be carefully weighed to determine what is the best approach to meet the short-term and long-term needs of the water system and to properly protect public health and welfare.

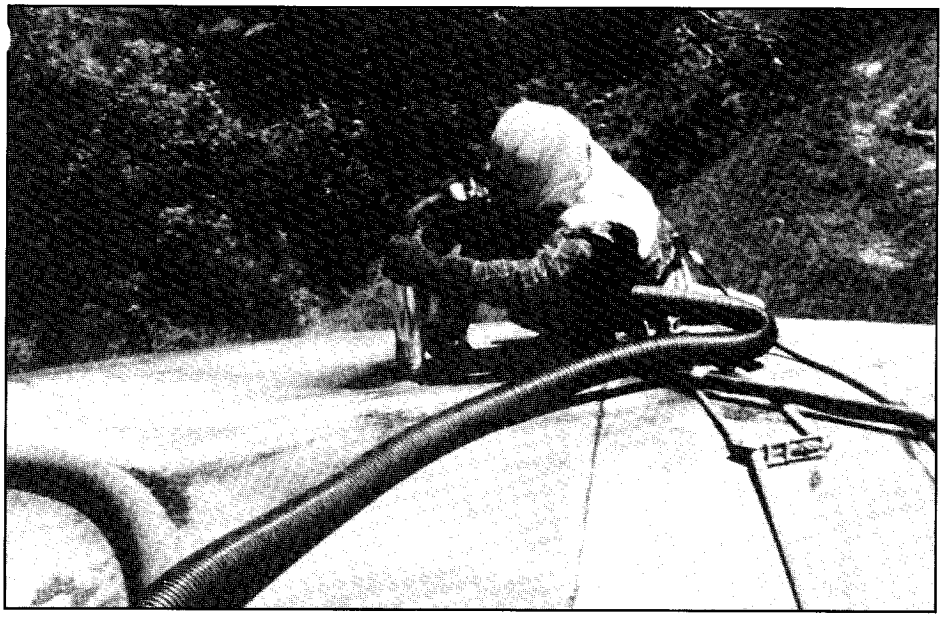
Tank repainting specifications must be carefully and professionally prepared. The specifications should spell out (at a minimum)

- whether the coating being removed contains lead
- requirements concerning worker safety
- method(s) to be used to protect the tank site and property surrounding the site
- method(s) to be used to protect the atmosphere
- storage of blast debris
- blast debris (or paint residue) handling procedures
- sampling and testing procedures

Don't rely solely on a single paragraph in the specification requiring the contractor to "comply with all laws and regulations." In a competitive bidding situation, contractors who bid the job to comply with "all laws and regulations" may not be the low bidder. Awarding a contract to a bidder who has obviously not included a sufficient amount of money to comply with the environmental regulations implies that compliance may be "optional," and, therefore, places additional responsibility on the owner and engineer.

After the bids are received, it is important to review the low bidder's ability to complete a lead-paint abatement project. The low bidder's experience, references, and insurance should be closely reviewed. The project should be awarded to the lowest, responsible bidder.

Before beginning fieldwork, the contractor's submittals should be carefully reviewed for compliance with the specifications and to determine the practical workability of the contractor's approach. The proposed methods of



Vacuum blasting of lead-based paints on the exterior of a water storage tank will control atmospheric emissions. (See related story, page 7.)

containment, testing, and disposal should also be thoroughly examined.

Currently, there are six proven methods for removing lead-based coatings from steel tanks that comply with Clean Air Act regulations. These methods include the following: chemical stripping; power tool cleaning (with vacuum attachments); vacuum blasting; wet abrasive blasting; abrasive blasting within a relatively small enclosure around the blaster (mini-containment); and containment of the entire tank structure. There are also a number of methods being used on a prototype basis. However, to avoid the possibility of soil or water contamination, a combination of methods may be required.

Another consideration that should be evaluated is the level of community involvement associated with your lead-paint abatement project. There is no substitute for communicating with the public, whether it concerns the repainting project on the water tank in their neighborhood or a proposed rate hike. Maintaining good community relations could be one of the most crucial steps to the successful completion of your tank repainting project.

Monitoring the Work in Progress

As the project moves toward the actual fieldwork, tank owners should remember to have a full-time project representative monitoring the contractor's workmanship and compliance with the project specifications. This is especially important when dealing with lead-based paints. On these projects, not only is a tank owner concerned with the quality of the finished product, but also with protecting the environment and the public well-being. Environmental monitoring during lead-paint removal is being required more frequently.

Testing and Disposal of the Waste

As the lead paint is being removed from the tank, the debris must be cleaned up at least daily and stored in watertight, covered containers. No debris should be allowed to fall directly on the ground. After the lead paint has been removed, the debris should be tested.

A sampling plan should be developed and at least four samples of each type of coating should be subjected to the Toxicity Characteristics Leaching Procedure (TCLP) test.

Each TCLP test requires approximately 100 g (1 cup) of the debris. If the tests indicate that the debris has less than 5 ppm leachable lead, then the debris can be disposed of at an industrial-waste facility. If the testing indicates that the debris is hazardous, then the debris must be disposed of or treated in accordance with USEPA, RCRA, and other state and local regulations.

Applicable regulations include the USEPA "Land Ban," which prohibits the disposal of much of the untreated abrasive blast residue in hazardous-waste sites. The Land Ban requires that debris which is tested and found to contain greater than the allowable levels of lead must, in many cases, be stabilized or the lead extracted prior to disposing of the materials.

The tank owner is the "generator" of the hazardous waste, and therefore must obtain a generator's identification (ID) number from the regional EPA office. No matter what wording is contained in the project documents, the owner cannot abdicate this responsibility to the contractor. The owner "purchased" this lead-based paint, and will always own it.

Even when this lead paint is disposed of in a landfill (hazardous or otherwise), the owner still owns the lead-based paint. If the lead leaches out sometime in the future, the owner could be found to be responsible and, therefore, have the financial responsibility to clean up the area contaminated by the lead-based paint. Therefore, proper documentation, evidence of compliance with testing requirements, and completed manifest forms are necessary when handling the testing and disposal of the blast debris.

Conclusion

Obviously, a lead-paint abatement project is very expensive, as is compliance with most regulations. However, the risks and potential costs associated with noncompliance can be enormous. Several contractors, engineers, and tank owners have already experienced heavy fines, cleanup costs, legal fees, and other damages associated with noncompliance. As you consider your next tank rehabilitation project, take a professional approach. In addition to considering all of the options for removal of the existing coatings, don't overlook the tank's structural and sanitary requirements. Bring your tank into compliance with current AWWA, OSHA, and sanitary standards as well, and your tank will meet the needs of your drinking water system for many years to come. ♦

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