

PRODUCT EMPHASIS

Corrosion Concerns

Have you ever walked past a storage tank only to wonder what is happening inside? You assume that the stored liquid is fine, but is the tank coating doing its job? Is it protecting the tank walls from the liquid being stored? Is it protecting the vessel against corrosion?

By Mark Eklund

No doubt about it, corrosion is the principal enemy of the tank. It shortens the tank's lifespan and increases the possibility that the product being stored will be contaminated. Stored liquids are particularly aggressive toward tanks, so the coating found on the interior of the tank is essential when it comes to protection against corrosion.

If you are considering purchasing a new liquid storage tank, the type of coating found on the inside will be one of the most important factors you consider. Whether you plan to store potable water, wastewater, chemicals or other liquids, each will react differently to the storage vessel and have specific storage requirements.

Coating Benefits

Coatings provide corrosion and abrasion resistance, protecting the inside of a tank from materials that pass through and extending the tank's lifetime. Quality coatings for liquid tanks are slick, ensuring that all material passes out of the tank, leaving minimal residue. Coatings provide chemical resistance against products such as strong acids and bases. Best of all, the protection offered by high-quality coatings often means less maintenance and cause for concern.

While the old adage that "a tank is a tank" is no longer true, tanks do often share the same construction materials. Most tanks and silos are constructed of carbon steel, stainless steel, aluminum and, for exceptionally large volumes, concrete. What differentiates brands and manufacturers (and the quality and total life cycle of the tank) is the coating. Some examples of coatings include epoxy (i.e., Trico Bond EP), glass-fused-to-steel (i.e., Vitrium), high-heat coatings, cold-weather coatings and coatings designed to withstand high levels of acidity or bases.

Epoxy coatings, once applied and cured, will bend without breaking or tearing. They are most commonly applied electrostatically, either as powder or liquid.

On the exterior, epoxy coatings may be combined with urethane topcoats to provide protection against environmental elements.

What is the liquid to be stored? It is important to choose a coating that is specifically designed for your liquid and offers proven corrosion resistance over long periods of time. For example, consider that storage of wastewater and wastewater sludge will require a coating that is designed to withstand the aggressive effects of ever-present materials such as fatty acids and hydrogen sulfide.

The Safety Factor

Coatings also play a role in safety. Some coatings are designed for storing a wide variety of products, while others may react poorly with certain products. The most important consideration is making sure the tank coating is well tested and suitable for the specific application.

It is unsafe to use an old storage tank with a product for which it was not designed and tested. If you are considering recycling a used tank for storing a new product (such as using a dry material storage tank for liquids or a chemical storage tank for wastewater), be sure to have the tank evaluated for safety, flow and corrosion resistance first. Incorrect use of a tank could result in severe corrosion, premature failure of the coating, harm to the product or serious injury. Also keep in mind that if you plan

to use any tank for drinking water storage, the tank must be NSF-certified.

Application Considerations

The market today offers a variety of coatings, but the most important factor—the key difference in coatings—lies in the application process. The highest quality coatings are applied in the factory under environmentally



A high-quality coating makes a world of difference

controlled circumstances to ensure the most consistent application. Taken one step further, the best coatings are also thermally cured in the factory.

Some manufacturers apply the coatings in the factory and then allow them to air-dry and cure with ambient heat, which exposes the cure to environmental factors such as dust and humidity. Other manufacturers outsource the coating process altogether. The optimal coating solution is one that is both applied and thermally cured in controlled factory conditions before the tank is shipped and erected in the field. High quality bolted and factory-welded tanks offer this feature.

Field-welded and concrete tanks usually receive their coatings on site once the tank has been erected. These tanks may need to undergo a chemical process to protect the coating while the tank is being erected; heat from welding, for example, may damage the coating. If you are reviewing this type of tank, make sure there are adequate quality-control measures listed in the specification and consider third-party inspections.

Be aware that once a tank has been erected in the field, there are often areas of the tank that are extremely difficult to sandblast or fully prepare for field coating. Even missing the smallest spots leaves exposed areas open to corrosion. Also, the thickness of coatings applied in the field cannot be controlled as closely as is possible under ideal factory conditions, which may result in uneven application. Finally, weather and the environment (i.e., dust, humidity, temperature and wind) will affect the quality and timeliness of the curing process in the field.



Forward Thinking

Would you ever consider moving your liquid tank? Tanks featuring factory-applied coatings may be moveable without the need to recoat. Coatings applied in the field reduce the ability to move the tank, as the coating often will tear or break when the pieces are moved.

Also consider whether you plan to expand the size of your tank in the future. A tank with factory coating allows you to add rings (think upward) without affecting the coating on the original tank. A tank with a field-applied coating will require recoating after the expansion is completed.

Making the Purchase

When reviewing bids from tank manufacturers, make sure you are comparing apples to apples. If a tank manufacturer promises a low cost for tank and corrosion-resistant coating, make sure you review cost for the total life cycle of the tank, not just initial cost. A higher quality coating may have a higher upfront cost but offer lower lifetime maintenance and recoating requirements, as corrosion shortens the life of a tank.

How long has your tank manufacturer been in business? Vendor experience should be a key factor for choosing a corrosion-resistant tank and coating. Review the history of the tank manufacturer: how long the company has been fabricating tanks, whether it uses state-of-the-art, factory-applied or thermally cured coatings, company quality control measures, its volume sold and in what countries and markets. Also consider tank manufacturers with third-party accreditation, such as the ISO Quality Certification. **www**

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