Preparing and Lining Salt Storage Bins

What kind of surface preparation and lining specifications are suitable for resisting abrasion presented in the interior of a tall storage bin for salt (depending on whether or not the salt is intended for human consumption)?

**Luis F. Granes, Sauereisen Inc.**

The interior surfaces of a storage bin for salt must be prepared, no matter if the bin has been in service or is brand new. For bins made of new concrete, the surfaces must be prepared to remove laitance, which interferes with proper adhesion capability and may cause a coating to disbond and fail. For preparing bins previously in service, if the steel reinforcement in the old concrete has been compromised, you must remove, replace, seal, and restore it, replace the concrete, and prepare the surface. Similarly, salt bins with steel surfaces, both those new and previously in service, must be prepared and profiled before coatings application.

The profile on both concrete and steel has to be done right to obtain good coating adhesion. The better the surface profile, the better the adhesion between the surface and the protective lining.

Salts and chlorides must be removed. Their removal is easier to achieve on a steel surface than on concrete.

A penetrating primer will help seal the surface and enhance the bond between the surface and the protective lining. The better the bond between the primer and the substrate, the better the adhesion between the protective lining and the substrate. A solvent-borne, high-solids primer is better for steel; a waterborne primer is much better for concrete, although either primer may be specified for concrete.

If temperature, either high or low, is not an issue, an epoxy coating will be better than vinyl ester products, because it will provide a smooth and solid surface. 100%-solid epoxy primer, coatings, and linings can be applied faster, are easier to apply, and cure faster than solvent-borne products, saving time and money. With 100% solids products, the recommended thickness will be achieved much faster than with solvent-borne coatings and linings.

Soft coatings and linings (e.g., rubber linings and bag liners) have been used in salt storage bin service, but they are eventually penetrated by salt and humidity, which will reach the concrete and damage it. Of bigger concern is that damage to the lining will contaminate the salt. As soon as a hole or penetration develops on a soft lining, it starts to fail and contaminates the salt. The salt then begins to accumulate at the damaged areas, creating clusters and increasing the abrasion and turbulence over the nearby coated area. Thus, instead of soft coatings, those that create smooth, hard surfaces, such as epoxies or even vulcanized rubbers, are better for this service because their surfaces resist impact and abrasion.

If the main lining has a rough finish, the application of a topcoat that enhances the smoothness of the surface will avoid the problem of salt accumulation on the surface. The smoother the lining, the less friction and less abrasion over the lining.

If the salt in the storage bin is for human consumption, the procedure for preparing the surface is the same as the procedure described above, but all linings in contact with the salt must be made of only FDA-approved substances to ensure the salt will not be contaminated by anything leaching from the lining or by direct contact with the lining.

**Editor’s Note:** The question and response above were adapted from SSPC’s Coatings Talk Listserve. To register for the Listserve, go to www.sspc.org.

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