



Tank linings — A supplier's perspective

In the world of industrial coatings and linings, there is a stark contrast between the needs of a coating system used for atmospheric exposure and a lining that is used for a tank that is storing some commodity. A missed edge or corner, or a dry film thickness that is a little light or too thick for atmospheric exposure, is not the end of the world. But these issues in a tank lining can lead to early failure. The risk of a contaminated commodity, tank corrosion, process shutdowns and downtimes adds up to significant expenses in a hurry. A tank lining application really has to go by the book. Do it right or don't do it at all. Cutting corners is never a prudent thing to do when it comes to linings.

Repairs are too expensive, and the risk of failure is too great.

And yet, the desire for faster curing systems, low-temperature curing systems, single-coat systems, thicker films, higher temperature resistance, higher pressure resistance, better abrasion and impact resistance, and better flexibility are challenges the industrial lining manufacturer is faced with more and more. The supplier often hears, "We need to put the tank back in service quickly," or "We can't supply heat. We need it to cure down to zero degrees." And while the development of newer technologies and creative formulating has addressed many of these needs, the success or failure of a tank

Nine key steps to a good quality lining

1. Tank design and fabrication: Proper tank design, chemical addition ports, heating coils, internal stiffeners, etc. play a large part in ease of application and long service life.
2. Lining selection: A proper lining selection can't be made without knowing the exposure, chemical composition, temperature, process cycles, chemical additions (if any), cleaning procedures, expected application and curing conditions, and surface prep requirements/capabilities. The specification and/or manufacturer's instructions should be followed from this point forward.
3. Surface preparation: If this is not done properly, expect early failure. Sharp edges, weld treatment, cleanliness and profile are critical to long-term performance.
4. Application: A skilled and properly trained crew is vital to success. Proper equipment, proper mixing, honoring recoat and curing schedules, and using supplemental heat or dehumidification will help ensure a good quality application. Personnel using wet film thickness gauges and adequate lighting are just two examples of doing it right and paying attention to the details.
5. Curing process/conditions: As mentioned earlier, the chemical resistance of a lining will largely be dictated by the curing conditions (temperature and time). For most linings, this is a chemical reaction driven by formulation, time and temperature. Compromising one or more of these can dramatically affect performance and service life.
6. Inspection: Evaluating the cure, catching missed areas (holidays), low dry film thickness, excessive film thickness, catching poor surface prep, etc. will help ensure a good quality lining and extend the service life under which the lining was selected.
7. Repair and maintenance: It is not uncommon to have to make minor repairs before the tank is placed in service. Count on it. It is well worth the time and expense to make them before the lining goes into service. Making repairs at this early stage is a lot less expensive than after the lining has failed.
8. Documentation: It is always a good thing! If there is a problem later, the documentation could shed light as to why the problem may have occurred or eliminate variables that would otherwise be considered causes of the failure. Record batch numbers, equipment used, ambient conditions, surface prep details, application reports, curing records and post lining tests.
9. Safety: We would be remiss if we didn't emphasize the need to follow all safety procedures as lining applications, by definition, are a confined space procedure. Tank linings are critical service applications. Cutting corners, whether in material selection or application, is a recipe for premature failure. And the risk is great. A ruined commodity, process downtimes and relines can be exceedingly expensive, yet preventable. A good supplier understands linings, conducts testing to verify performance, recommends the proper lining for the application and provides the needed field support for a successful application. A supplier that has a rich history of lining experience is a partner that cannot be overemphasized. Understanding why linings fail and how to prevent failures is a warranty that makes its own promise. When it comes to linings, do it right or don't do it at all.



lining project remains with doing it right. New age linings are pushing the limits of application parameters (temperature, humidity, surface prep or cleanliness). Thicker resins that are more difficult to work with now require heated plural component spray equipment with an associated increase in painter/operator skills. These are now sophisticated linings with a new learning curve for contractors. In the end, this is a good thing for the industry. The bar is being raised.

EPA and state air emission regulations have forced raw material suppliers and coating formulators to develop newer technologies for compliance, and the benefits of this development have been well received by industry. Single-coat, solvent-free linings are fairly commonplace now. The thicker films project longer service lives and longer reline cycles. The elimination of solvent has all but eliminated the risk of solvent entrapment and early failure if the tanks were put in service too quickly. Although painful at first, the volatile organic compound regulations have been a net benefit to the industry and the environment in the end. The old mantra "better, faster, cheaper" wins business.

From a supplier's perspective, when it comes to tank linings, performance comes first. It won't matter if the lining can be placed in service in 24 hours if it won't



handle the commodity, or the lining will "cure" down to 20 F but won't handle the ethanol that will be stored in the tank.

The careful selection of a tank lining goes way beyond whether a lining will handle a certain cargo. Knowing the application and curing conditions under which the lining will be installed is often more critical to a lining selection than simply chemical resistance. The resistance of a lining is very dependent on the length of cure and the conditions under which it is cured. A supplier that understands these parameters that are backed by years of experience can help prevent premature failures and keep customers out of trouble.

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