

**CEILCOTE CORROSION CONTROL PRODUCTS  
TECHNICAL BULLETIN  
#CC26**

**LINING vs. COATING**

**WHAT'S THE DIFFERENCE? WHO CARES?**

Definitions from the McGraw-Hill *Dictionary of Scientific and Technical Terms*:

Coating – any material that will form a continuous film over a surface.

Lining – a material used to protect inner surfaces as of tunnels, pipe, or process equipment.

From the above, the distinction appears moot, since a coating can be applied as a lining, and a lining, by the definitions, is a type of coating.

In today's industrial vernacular, "coating" generally implies a thinner spray, brush or roller applied material, while a lining is considered to be thicker, usually trowel applied. Many linings today, are in fact, thicker layers of material that are also spray applied.

**THE END USER SHOULD CARE!**

The end user (owner or operator of a facility) has one goal when specifying or selecting a corrosion protection material. That is to protect surfaces (tanks, ducts, process vessels, floors, trenches, etc.) from chemical attack by the material being processed, stored, or conveyed.

Cost is, of course, always a factor; but reliable long-term service is normally the prime objective because of the high direct and indirect cost of having critical equipment down for maintenance or repair.

**THAT HAS ALWAYS BEEN THE CASE, WHATS DIFFERENT NOW?**

For the past 35 years, Ceilcote has been able to offer a wide range of lining/coating systems. We wanted to be able to offer the most cost effective, yet reliable, solution to myriad industrial corrosion environments.

Many major industrial firms across all industries had their own internal corrosion experts. Being aware of their company's specific needs and the protection system alternatives available, they could make informed selections consistent with company goals and priorities. Some tended to be very conservative, placing high value on system reliability and longevity. Others were guided to minimize costs, even at the later expense of repair and/or relining, with the attendant cost of equipment down time.

Over the last 10-15 years, economic factors have forced many companies to reduce much of their internal technical expertise, using outsourcing or depending more heavily on external Engineering/Contracting firms to reduce operating costs.

**RESULT**

As corrosion specialists and problem solvers, we have experienced potential lining applications, where a thinner, less expensive coating system is chosen because of the lower cost, sometimes with the expectation that the same reliable, long term performance will be obtained. In many of these cases, we

are asked (within a year or two) to remove the remnants of the wrongly selected coating and apply the lining system that would best have been selected in the first place.

## **COATING SYSTEM LIMITATIONS**

Thinner coating systems, in general, offer lower performance, reliability, and longevity for several reasons:

- **Permeance**  
Permeance is a numerical measure of the ability of materials to penetrate into and through the coating (or lining). That factor is particularly important to gauge resistance to elevated temperature aqueous service. Performance of a given system is inversely proportional to the applied thickness. The permeance or permeability of a lining or coating material is measured using water vapor. Most inorganic chemicals do not penetrate polymer coatings significantly, but chloride ions and many organic chemicals do. So for hot aqueous environments, hydrochloric acid and organic chemicals, good permeation resistance is essential to long term lining performance.
- **Physical Factors**  
Many unplanned factors including substrate defects, mechanical damage, impact, etc. may be survived by thicker, multilayer or reinforced systems, whereas a thinner coating system will be breached, allowing chemical attack of the substrate.
- **Thickness / Layers / Reliability**  
The best specifications and installation quality control notwithstanding, these systems are applied by human beings. Perfection is not assured. A thicker system will be less susceptible to failure over time as a result of any given workmanship error.

## **OUR OBJECTIVE**

Our goal, as always, is to make the best, most cost-effective product recommendation for every potential corrosion application, considering the service environment (chemistry, temperatures, substrate, physical challenges, etc) and the end users intent (reliability and longevity vs. total installed cost over the anticipated period of use).

Where appropriate, we will offer alternative lower cost systems and provide explanation of the performance to be expected. Most importantly, the engineer / owner should be able to compare “apples to apples” when making the selection of a corrosion protection system. Everyone will be better off if the selection is made on an informed basis, not simply on the lowest up front cost.