

### **BE INFORMED, NOT MISLEAD – KNOWLEDGE IS POWER WHEN CHOOSING THE RIGHT TANK COATING TECHNOLOGY**

Superior epoxy coatings are not created by inventing a fancy, proprietary name for epoxy material. Superior coating systems are engineered through a combination of product (material) and process (application), supported by decades of R&D, experience and field-tested data. In order to differentiate one tank coating from another, one must distinguish the facts from marketing fluff.

The Coatings Technology Report is an informational series about coatings and coating processes that will educate you on how to make the best decision on tank coatings for your particular technical and commercial decision criteria.

### **FACT #4 Proper Curing Temperature and Humidity are Critical**

Choosing a quality coating material is important. However, coating experts everywhere will tell you that the environmental conditions during coating application are as critical as the product itself to optimize the coating system's performance and durability over time. Temperature and humidity in the application area are two key conditions that need to be considered whether applying paint outdoors to a field welded tank, or epoxy or glass-fused-to-steel enamel indoors to a factory-coated tank.

All paint manufacturers specify a range of temperatures and humidity for applying and curing coatings. Field-applied paints require an accurate weather forecast and on-site monitoring of suitable weather conditions. Significant time, money and energy depend on conditions being within the specified parameters during the entire

preparation, application and curing periods. Changes in the conditions can result in significant cost overruns, additional loss of service time and reduced ROI due to rescheduling. Results must be analyzed thoroughly if the conditions fall outside the parameters during any part of the field-coating process. The tank may have to be completely stripped and repainted if full coating performance is not achieved. The temperature and humidity of the drying process for field welded tanks is generally at ambient conditions. Special covers, heaters and humidifiers can be used to adjust the drying environment but are difficult to control and are costly. Even using these advanced processes, the drying temperatures do not approach the higher curing and fusing temperatures of factory coatings.

Factory-coated tanks are also subject to limited preparation, application and curing conditions according to the manufacturer's specified conditions, including temperature and humidity. A factory-coated tank manufacturer's ability to precisely control these parameters is a significant advantage. Superior coating systems include dedicated, precision HVAC systems to control the exact conditions required throughout the coating process.

Curing or cross-linking times can be accelerated during the factory coating process by introducing heat and/or removing humidity to decrease total cycle time. Factory-controlled epoxy tanks are cured at 200-500° F (93-260° C) and enamel coatings are fused to the steel substrate at 1,500° F (815° C). Quicker curing time contributes to the overall increase in time of project completion of factory coated tanks especially if there are a large number of panels.

#### **SO ASK:**

**"HOW DO YOU CONTROL THE ENVIRONMENTAL CONDITIONS DURING COATING APPLICATION?"**



**Figure 1** – Environmentally controlled coating application booth with positive pressure environment.

## FACT #5 Contaminant Control is Critical to Proper Coating Performance

Like temperature and humidity, contaminant control is important to coating performance – in particular, the coating’s adhesion to the metal substrate. Contamination can be a major cause of coating delamination to the base metal in any stage of the coating process. There are documented failures where complete coatings have separated from storage tanks due to excessive contamination. This is a sign of complete failure in the coating system.

While covering field-welded tanks during paint application helps prevent excess paint from getting on surrounding cars, buildings and into the environment, the cover can also act as a barrier to mitigate contaminants from entering the application area.

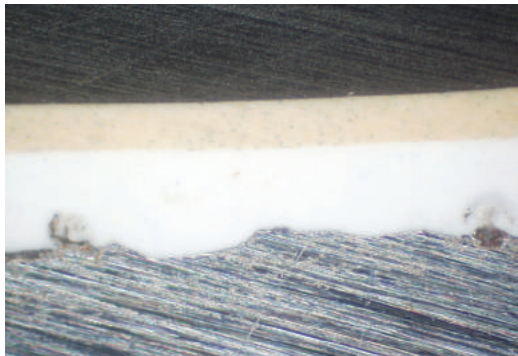
A cover can control the introduction of some particulate, but its effectiveness can be significantly diminished when wind conditions increase. Wind and site conditions (dust, airborne debris, etc.) can compromise the integrity of the cover. A good NACE-Certified inspector can inspect the enclosure before, during and after the paint application to help limit contamination.

While coating tanks indoors can eliminate some contamination issues, like the effect of wind, some manufacturers go even further to control the application environment. Higher quality factory coating processes can virtually eliminate many of the contamination issues found with field coating applications by applying the coating in an environmentally controlled, positive pressure chamber. The environment of the chamber is controlled by drawing outside air through a filtering system, creating a cleanroom environment. The positive pressure in the chamber significantly obstructs particulate from entering through the panel and operator access points.

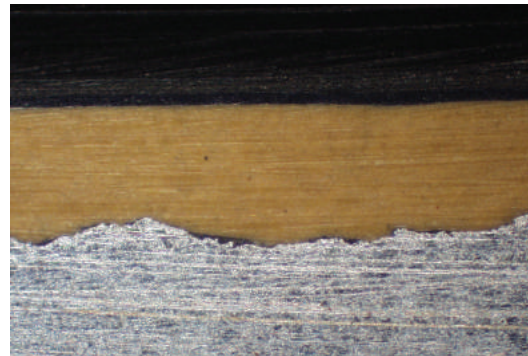
Powder coating processes are especially susceptible to particulate contamination. Electrostatic charging the base metal can also attract contaminants. Superior powder epoxy coating systems apply the powder coating in a strict environmentally-controlled chamber.



**Figure 2** – Covering a field-welded tank for control of particulate in and out of the application area



**Figure 3** – Cross section of competitor’s powder-on-powder coating showing large contamination between the base metal and first coat, and the smaller contamination throughout both coats.



**Figure 4** – Cross section of CST liquid-on-powder coating showing almost no contamination throughout the first and second coats.

**SO ASK:**

**“HOW DO YOU CONTROL CONTAMINATION DURING THE COATING PROCESS?”**

**WHICH TANK SUPPLIER CAN YOU TRUST TO GIVE YOU THE RIGHT TANK COATING RECOMMENDATION BASED ON THE FACTS?**

