

### **SOME TANK MANUFACTURERS' PLAY ON WORDS ABOUT THEIR COATINGS CAN BE MISLEADING.**

Inventing a fancy name for their powdered epoxy material and calling it "exclusive" does not make their epoxy coating any better than others. Superior coating systems are engineered through a combination of product (material) and process (application), supported by years and years 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. This includes conducting deeper research into what application processes are used to ensure the material's characteristics are maximized. Armed with this knowledge, you will be better equipped to interview vendors with questions that will help peel back the layers of misleading information and uncover the truth about what is the best coating choice for your particular tank application and financial criteria.

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.

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## **FACT #1 No Company Has More Experience Factory Coating Tanks Than CST**

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Experience counts. Companies who don't have much experience will try to convince you otherwise by adding up the career years of each employee and create the illusion the company has been in business for that long. CST has been engineering and manufacturing tanks since 1893 and has been leading the evolution of tank coatings ever since through extensive R&D, field testing and real life experience.

- **CST pioneered coating tanks in 1893 (as Columbian Steel Tank)**
- **CST was the first to apply glass-fused-to-steel enameling technology to tanks in the 1940s (as A. O. Smith)**
- **CST was one of the first to factory coat tanks with epoxy in 1978 (as Columbian TecTank)**

This is decades before our next closest factory coated tank and enamel tank competitors even started their businesses.

CST has over 250,000 coated tanks deployed world-wide in over 120 countries storing all types of liquid and dry products. Many of these applications are used for storing aggressive and abrasive products and in harsh environmental conditions. This unmatched experience enables us to say "CST knows coatings!"

### **SO ASK:**

**"HOW LONG HAS YOUR COMPANY BEEN MANUFACTURING TANKS?"**

**"HOW MANY TANKS HAVE YOU MANUFACTURED FOR MY APPLICATION?"**

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## **FACT #2 No Company Applies More Types of Tank Coatings Than CST**

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Unlike our epoxy-only or glass/enamel-only competitors, CST is a coatings engineering expert. Glass-fused-to-steel enamel coatings are superior to all other coatings in most applications; however, no single coating is the best for all customers for all applications. Compatibility, material protection or economic reasons are also decision-driving factors. In addition to engineering and applying glass-fused-to-steel enamel coatings, CST also manufactures epoxy coated chime bolted, flat panel bolted and welded tanks, as well as galvanized, aluminum and stainless steel tanks. Don't be sold on the "One Coating Type Fits All" mentality of some epoxy coated tank manufacturers. When you want the facts about what coating is best for your application, ask the company that manufactures tanks with the most types of coatings for the most unbiased input.

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Products	CST Storage	Competitor #1	Competitor #2	Competitor #3	Competitor #4
Glass-Fused-To-Steel Enamel	✓	✓	✗	✗	✗
Epoxy Chime Panel	✓	✗	✗	✗	✓
Epoxy Flat Panel	✓	✗	✓	✓	✗
Factory Welded	✓	✗	✗	✓	✗

SO ASK:

“WHAT COATINGS ARE OFFERED TO YOUR COMPANY?”

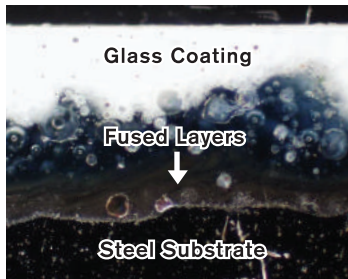
“WHICH COATING IS BEST FOR YOUR MATERIAL AND ECONOMIC CONSIDERATIONS?”

### FACT #3 Epoxy Is Not Fused To Metal Tank Panels

Some tank manufacturers are extremely liberal in their use of the term “fusing” as they apply it to their epoxy coating process and name. Do not be misled by this. True fusing involves the chemical and mechanical bonding of one material to another at the molecular level. Fusing of a coating to a steel substrate, such as the glass-fused-to-steel enameling process, occurs at temperatures around 1,500o F where the glass and steel molecules become fluid and intermix. Fusing of two materials is evidenced by inspecting the interface between those materials. When fusing materials, the interface is significantly different than either of the two original materials and is indistinguishable (such as in Figure 1) due to the change in properties of the steel substrate itself.

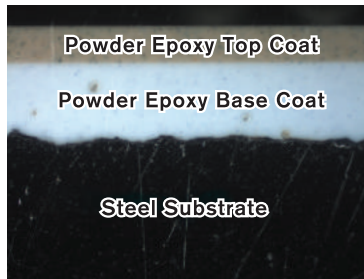
Some epoxy coated tank manufacturers will imply that their epoxy coating process involves “fusing.” Even stretching the use of the term in the epoxy coating process, it can only be used when referring to fusing one layer of epoxy to the other layer of epoxy. It does not involve fusing the epoxy to the steel. In part, epoxy layers are not fused to a steel substrate because epoxy curing occurs at temperatures only around 500° F. These lower temperatures are primarily used to accelerate the epoxy cross linking and reduce drying time. They do not create a “fusing” environment or even approach the temperature where the molecular structure of steel changes. The lack of fusing the steel substrate to the epoxy layer is evidenced by a clean visual line between the two layers of powder and the steel substrate (such as in Figure 2). Figure 3, in contrast, shows the virtually indistinguishable boundary between the liquid and powder epoxy coatings.

**CST’s Glass-Fused-To-Steel Enamel Coating**



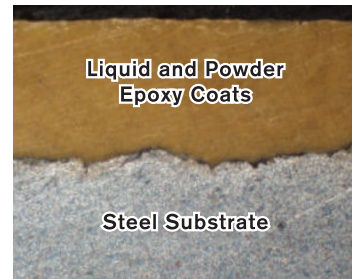
**Figure 1** – Microscopic cross section of CST’s Vitrium™ glass-fused-to-steel coating showing the fused (brown) layer and the intentional bubble structure important for providing flexibility.

**Competitor’s Epoxy Coating**



**Figure 2**– Microscopic cross section of a competitor’s epoxy coating showing the top and base coats of powder epoxy clearly distinguishable from each other and from the steel indicating they are not “fused” together.

**CST’s Epoxy Coating**



**Figure 3**– Microscopic cross section of CST’s TricoBond™ EP epoxy coated steel tank panel showing the virtually indistinguishable layers of epoxy from one another and a noticeable lack of contamination.

SO ASK:

“WHAT DOES THE TANK MANUFACTURER MEAN BY ITS EPOXY COATING BEING “FUSED” TO THE STEEL?”

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

