

# ChemLine® Coating Protects Stainless Steel Reactor Against Saponification Reaction

**ChemLINE®**  
CASE STUDY

At the Alimentos Polar Comercial Planta Limpieza, in Valencia, Carabobo Estate, Venezuela, the stainless steel clutcher reactor tank needed protection against chemical attack and surface erosion due to the saponification reaction.

In brief, saponification is the chemical reaction that leads to the formation of soap in the reactor tank. Originally, Planta Limpieza operated the stainless steel clutcher reactor tank without an internal lining. But corrosion issues raised the need for an internal lining as the tank failed. Because of ChemLine's excellent's reputation for handling critical situations, GECCO Services was contacted to provide a lining recommendation.

According to Vasil Panti, CEO of GECCO Services, the exclusive ChemLine® representative of Advanced Polymer Coatings in Venezuela, the Caribbean, and Costa Rica, the chemical reaction and the turbulent mixing process during mixing/production wears down the stainless steel tank material and causes pitting. This occurs because the Saponification reaction, the key for soap production, uses Phenylsulphonic Acid reacting with caustic soda (base – acid reaction) and other chemicals such as silicates, Sulphuric Acid, and organic acids to produce an exothermal reaction. This increases the corrosion rate over the stainless steel surface. Chlorides in the solution also further corrode the surface.

ChemLine® 784/32 was recommended to coat the entire internal surface. The coating application was conducted by GECCO Services. First, the tank's stainless steel internal surface was abrasively blasted to SSPC-SP10 (NACE #2, SA2.5) near white metal finish with a 4-5 mil profile, using clean, sharp angular abrasives.

Then, ChemLine® 784/32 red was applied in two coats using a 63:1 single airless pump. A wet film thickness of 16-18 mils (400-460 microns) was applied to achieve a DFT of 14-16 mils (350-400 microns). A holiday test was performed to confirm that the ChemLine® system was pin hole free. Finally, the coating was cured using infrared lamps for 14 days.

Since the application has been completed this tank has been in service for more than two years without any issues to the ChemLine® coating.

The client has been pleased with the ChemLine® coating results, first the protection of their tank asset against erosion and chemical attack, and second by not having to perform any shutdowns of the equipment. Enr. Ricardo Leon, Maintenance Senior Chief at the Alimentos Polar Comercial Limpieza Plant add, "I am very glad with the ChemLine® performance in our production vessels, with NO issues!"

The Limpieza Plant is now also considering ChemLine® to protect other tanks and pumps at the facility.



Alimentos Polar



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- 1) Bare stainless steel reactor tank prior to coating with ChemLine®. Previously, the turbulent mixing during saponification reaction process wore down the bare stainless steel tank material and caused pitting.
- 2) The tank is now lined with the protective ChemLine® system and ready for service.
- 3) The tank cap is also coated with ChemLine®.
- 4) Showing the mixing process in action.
- 5) After mixing, an empty tank is shown, with the ChemLine® tank coating in excellent working condition.



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**Advanced Polymer Coatings**  
Avon Ohio 44011 U.S.A.  
www.adv-polymer.com

+1 440-937-6218 Phone  
+1 440-937-5046 Fax  
800-334-7193 Toll-Free in USA & Canada