Single-Stage Pretreatment Evolves

One-step pretreatment has been available for decades. Recent improvements to the technology may yield the results you require for your coating needs.

BY SHARON SPIELMAN

Single-stage pretreatment processes are designed to save energy, cut waste disposal costs, and streamline your finishing operation. One such process, Plaforization, has been around for 40 years. If you have never heard of it, Plaforization is a one-step process used to clean, phosphate and seal metal surfaces. Parts are treated for one minute, dripped off and dried, and then are ready for coating. Because industry is always looking for ways to improve processes, it is no surprise that the next generation of one-step pretreatment is now available.

This new product, called Toran 3, was launched in Europe in mid-2009 by Chemtec Srl. Formerly known as Pai-Kor, the Italy-based company has refocused away from an industrial paint line they used to have and now focus totally on pretreatment, pretreatment research, lab work for customers, and continuing R&D. Pai-Kor is the inventor and maker of the one-step Plaforization process. They made it their goal to improve upon the process, and Toran 3 is the result.

Toran is a metal cleaning and pretreatment system that is a technical evolution of Plaforization, according to Carlo Guidetti, an R&D chemist at Chemtec. “It is a one-step process. No rinse, no sludge,” he says.

Specifically, Toran 3 is a pretreatment system made by organic compounds dissolved in a particular organic fluids mixture. The product can incorporate the oily contaminants present on the metal surfaces treated. During the treatment, those contaminants are dissolved by the organic fluid mixtures and then incorporated into the organic coating. After the treatment, a dripping off of at least 5 minutes is required followed by drying off in an oven for 5 to 10 minutes at 266 to 302°F (130 to 150°C). After the process the metal surfaces treated are coated by a very thin organic layer capable of increasing paint adhesion, flexibility and corrosion resistance (up to 400-500 hours in salt spray ASTM B-117 on steel with polyester powder coating TGIC Free; and well above
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Pretreatment

1,000 hours (Results of 1,800 to 2,000 salt spray hours have been recorded) with polyester powder coating with TIGIC).

Toran works by dip or by flow-coat spray without creation of mist. A dry off oven is required in order to allow the drying-off of the organic fluids. Toran 3 as it holds inside the polymeric film part of oily contaminants, does not create solid waste to dispose, typical problem of traditional water based degreasing and phosphating plant. So only addition of fresh material due to consumption is required and the life of the chemicals is unlimited if the quantity of oil present on the metal surfaces before treatment is lower than 1.5 grams per square meter as an average value.

"[Toran] does not contain any phosphoric acid and therefore cannot be considered as a phosphating system but is a passivating system."

Toran 3 can be used for simultaneous treatment of: iron, steel, cast iron, galvanized, stainless steel, aluminum and its alloys, while on metal surface like zamak, and aluminium with high silicon quantities, compatibility problems may arise. Preliminary tests must be always carried out.

Guidetti says his involvement with Toran includes the R&D development, formulation and all the primary testing in the Pai-Kor lab as well as in the industrial test that the company carried out before the product was launched on the market.

"Toran is a technical evolution because the formulation is different. It does not contain any phosphoric acid and therefore cannot be considered as a phosphating system but is a passivating system," he says.

Guidetti says that one of the limits of Plaforization technology is the reduced corrosion resistance if compared to a zinc phosphating system. "With conventional Plaforization process, it is possible to meet or have better results in terms of corrosion resistance when iron phosphating, but it is not possible to get the same
results that you can get with a zinc phosphating process," Guidetti explains. "With Toran, it is absolutely possible to have better results than iron phosphating and results as good as zinc phosphating process in many situations."

He continues, "Because [Toran] works in one step and at room temperature and because the product is very stable, because the chemical never needs to be disposed, it is very simple, very easy to use, and environmentally friendly. It can provide very good corrosion resistance."

Guidetti also points out that Europe's polyester coating does not contain TGIC. This is important because TGIC improves a lot of the corrosion resistance provided by the coating. "We have seen a big difference with the polyester coatings that have TGIC versus those that don't," he reveals.

There are the obvious environmental benefits, too, Guidetti points out. With Toran, there is no wastewater, no disposal of any kind, no sludge or anything that must be treated. "Also, there is no water use, and this is getting more and more important," he notes. "There is not enough water to meet demands sometimes of the people. This is a solution that is going to be more and more popular in dry areas. Toran works at room temp and does not require any heating, therefore there is no combustion of fossil fuel, gas or anything and no Carbon Dioxide created."

With roughly a dozen distributors worldwide, Toran is in use in several shops across the globe. Poncin SAS, a producer of metal plates in France, switched to Toran last year because they were hoping to achieve less rust on their product, which is coated using a 100 percent polyester powder paint. Frank Buffard, planning and purchasing manager at the company, says they are happy with the result, very simply, because, "Toran is a better product." He says they find Toran to be a cost-effective, efficient pretreatment solution.

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For more information, visit Carpenter Chemicals, the U.S. distributor of Toran and Platorization, at www.cc-fc.com.