

Jobbing coater finds a simple, disposal-free solution in pretreatment: 'PlafORIZATION'

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At Smart Manufacturing, parts are dipped in the cleaning solution for approximately 90 seconds and then hung to drain and air-dry for 20 minutes before being placed inside an oven for 20 minutes to complete the drying process.

"During our first year of operation we powder coated approximately 100,000 tubes that were 20in long x 1.5in diameter and never had a problem with pretreatment quality," says VanDyk. "Our customer had the least amount of rejects in their history and therefore I am very pleased with the PlafORIZATION process." The company is able to treat steel, cast iron, zinc-coated steel and aluminum in the same solution with good adhesion properties. PlafORIZATION does not provide the extended corrosion resistance that would typically be required for some products that are used in some outdoor applications where high corrosion resistance is important, but performance is typically in the 300- to 500-hours salt spray range, equal to more traditional iron phosphate processes.

Environmentally friendly

In addition to being a very simple process with no waste disposal, the PlafORIZATION product is environmentally friendly and worker friendly. Because of its very low vapour pressure, it is virtually VOC-free. Based on the volatility of the components and their ability to photochemically react in the atmosphere, the estimated VOC content for the products ranges from approximately 0 grams/litre to less than 5 grams/litre (0.5%). PlafORIZATION products contain no chlorinated fluorinated compounds (CFCs), hazardous air pollutants (HAPs), aromatic, chromium or ozone-depleting substances. Routine chemical titration is not necessary. Chemical analysis is performed every other month by a certified laboratory.

Like any chemical cleaning process, PlafORIZATION must fit the process needs of the customer, and the products to be processed. The soils likely to be present on the part surface must be ones that PlafORIZATION can handle (for example, PlafORIZATION is not a rust or

scale remover). Oils must be within the type and quantity range of the chemistry so that they can be effectively removed from the surface without adverse impact on the performance of the chemistry. Parts testing should be done to confirm that the oils present on the part are within the profile.

In the case of Smart Manufacturing, the fit for the soils that it anticipated was very good. Over time, the analysis of the expected soils and the effective use of the PlafORIZATION process have proved out, and successful cleaning and phosphating is reported to have worked out very well. Parts are effectively cleaned and protected from flash rusting. Adhesion and field performance have been very good. Although the chemical is more expensive by the gallon than traditional cleaning and phosphating products, it does the work in a single, unheated stage that does not need to be recharged or disposed of. This means that overall costs (per square foot or square metre) are lower than many traditional approaches and the results on the products are excellent.

Efficient and cost-effective

Like any process, PlafORIZATION is not a "one size fits all" process, but it provides an efficient and cost-effective way to clean and treat multiple metals in various types of operations that practice has shown is hard to beat. In addition to batch operations as at Smart Manufacturing, PlafORIZATION is used in larger operations, including an in-line dip process for munitions manufacturing and several in-line flowcoat operations.

The newest product is 'Ecophor B700'. This has the best coverage because its low vapour pressure and high boiling point ensure that evaporation basically does not occur until the parts are placed in the oven to dry. Therefore, virtually all the product not actually used on the part is returned to the tank during drip-off. 'B700' also uses a new resin that is clear, rather than the slight yellowish cast of the 'A447' and 'B407'. That is only important for those few users that use a bright white topcoat where a slight yellow tinge may telegraph through the coating.



Parts can be densely racked for treatment in the dip tank.



This automotive intake manifold was 'PlafORIZED' prior to powder coating.

'Ecophor B637' and 'A447' are essentially the same product, except that B637 uses the new resin. These two products, which have a somewhat lower flash point and higher vapour pressure than B700, can therefore be air dried in a batch process in which there is time to allow 30 minutes or so after drip-off for room-temperature drying. It is recommended in batch operations where in-plant temperature does not generally rise above 30...C (85...F).

'Ecophor B407' is a speciality product designed to give up to 72 hours of uncoated salt spray resistance, which it accomplishes by putting on a somewhat thicker seal. It is best used in a two-step process with one of the other PlafORIZATION products as the first step, because the other products have greater oil removal capacity.

At Smart Manufacturing, the primary concerns were waste disposal, simplicity, flexibility for different substrates, low capital costs, low operating costs and limited space requirements. The PlafORIZATION process fit these needs perfectly.

The venture into powder coating has worked out very well for Smart Manufacturing. Although it is open to expansion, possibly an automated in line flowcoat installation, the company is doing well with the flexibility of the batch operation for now.

For more details about the PlafORIZATION process, phone Envirometal Technologies on 01926 624326. www.envirometaltech.co.uk

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Product	Dip/Flowcoat	Air Dry/Oven Dry	Color of resin	VOC content
Ecophor B700	Dip and Flowcoat	Oven dry	Clear	~ 0 grams/liter
Ecophor B637	Dip and Flowcoat	Oven dry; also, if properly drained, air dries in 30 min at 70°F.	Clear	< 5 grams/liter (< 0.5%)
Ecophor A447	Dip and Flowcoat	Oven dry; also, if properly drained, air dries in 30 min at 70°F.	Slightly yellowish	< 5 grams/liter (< 0.5%)
Ecophor B407	Dip and (if thinned somewhat with its fluids) flowcoat	Oven dry	Slightly yellowish	< 5 grams/liter (< 0.5%)

'PlafORIZATION' is available in different grades for different applications.

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