Powder Coating Forum



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If you have a question or comment concerning issues relating to the powder coating industry, such as system design, coating selection, features, etc., you may e-mail (aesfjournal@worldnet.att.net) or send your questions to "Powder Coating Forum," 12644 Research Pkwy., Orlando, FL 32826-3298.

Question

We are preparing to coat 2B stainless steel with a polyester powder. The final product will be an outdoor constant-temperature device. Our pretreatment is one wash/phosphate stage and two rinse stages. The parts are then run through a dry-off oven before coating. Should we expect any adhesion problems? Will this finish stand up to various weather conditions? Is there an alternative to stainless steel?

Answer

Stainless steel is very difficult to coat without adhesion problems. Let's face it—powder coating does not provide much protection over stainless steel, but it can be very effective in camouflaging the shiny surface. So adhesion of the coating is necessary to keep this camouflage in place. Without some pretreatment to promote adhesion, you can experience field failure with powder coating over stainless steel.

The wash and the iron phosphate applied in stage one will do little to prepare the surface for coating, other than clean the surface of organic soils. This is important, but the surface must still be treated for adhesion. Ask your chemical supplier for a seal rinse that has "Silane" or some other adhesion promoter. Silane is a chemistry that has gained great acceptance in the glass coating industry, where powder coating or other organic finishes are applied to smooth glass surfaces. It should be applied in the third stage of your washer and can be a "reactive rinse" (*i.e.*, a chemical reaction takes place in the dry-off oven).

Powder coatings formulated for outdoor exposure will provide excellent weatherability on the finished product. Select a coating that has been formulated for this functional characteristic. TGIC polyesters, acrylics, urethanes and pure polyesters, for instance, all have good resistance to outdoor exposure. Some, however, have better weather resistance than others, at some sacrifice in other functional properties. Acrylics, for example, have superior UV resistance over pure polyesters, but are harder and more brittle. Carefully review all your coating requirements before selecting a powder coating. A consultant and a good powder coating supplier will help ensure that your coating objectives are met.

As far as alternatives to a stainless steel substrate, changing to galvannealed steel can provide for better adhesion. It will not perform as well with corrosion, however. This substrate, with a good zinc phosphate coating and a good sealer rinse, can provide 1000+ hr of salt spray resistance. Review your corrosion performance requirements carefully before selecting an alternative to the stainless steel substrate.

Question

Some time ago, I read an article by Nick Liberto that mentioned the possibility of "water quenching" for cool-down after the bake/cure process. Where can I find some information or vendors to provide such a system? It seems that it would be much faster than a forced-air cooldown tunnel. I'd like to bring the parts down to near-ambient as fast as possible to maximize throughput. Would the "misting" leave water spots and/or salt deposits?

Answer

When I wrote that article, I was referring to a custom-designed waterquenching system. Most system houses in the powder industry can provide information and costs for such a system, and may be able to modify your forced-air cool-down system by adding water-misting nozzles.

As you have already guessed, a water-quenching system is faster than a forced-air cool-down, but with some associated risks. Rusting can occur in areas that do not have a protective powder coating, such as part interiors and threaded holes. Water spots can also be a problem if the water source has a high degree of hardness. There are sheeting agents, water softeners and ultrafiltration systems that can be employed to eliminate this problem. A combination water-quench and forced-air cool-down system can offer the best solution. This system will more rapidly cool the parts to ambient than a forced-air system alone, and the forced air can help eliminate the spotting problems. P&SF

We Need Your Help! Because this column is a questionand-answer forum, reader support is vital to keep the flow of information fresh and pertinent to the needs of our audience. Please send any questions or comments concerning powder coating issues to *P&SF* via:

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