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 (aesf-journal@worldnet.att.net) or send your questions to "Powder Coating Forum," 12644 Research Pkwy., Orlando, FL 32826-3298.

Question

I would like to powder-coat a steel motorcycle frame, but am hearing conflicting opinions regarding polyester powder. Some say it does not penetrate the metal, so when it chips, the frame will sweat and corrode. Are there new techniques that penetrate the metal so that it would "dent" rather than "chip"?

Answer

Most powder coatings are organic finishes, and none "penetrate" the surface of the metal part being coated. Powder coating is just another form of painting, except that there are no solvents or hazardous waste to handle. In order to answer your question, we must address powder coating adhesion and corrosion resistance characteristics.

Powder coatings have inherently good adhesion characteristics when applied and cured properly to a clean and pretreated metal substrate. Pretreatment and cure are the keys to obtaining a coating that will exhibit good adhesion and provide good corrosion resistance. In addition, most powder coatings have excellent impact resistance that will result in the coating still adhering to the part even if the metal has been dented.

A motorcycle frame should be sand-blasted clean of all old paint and filler materials. Metal defects should be fixed with standard welding and grinding techniques. Standard body fillers will not work with powder coating, because they will be outgassed under the heat used during the cure process. The surface should be free of all scratches and dents prior to final pretreatment.

The frame should then be washed clean with a chemical and water solution designed to remove all organic soils (*i.e.*, oils, handprints, waxes, etc.). After washing, a pretreatment of iron phosphate should be applied to the metal substrate. This is usually accomplished by a two-step process: First, apply the iron phosphate, and second, rinse off the residual phosphate material. The part must be completely dried prior to applying the powder coating. The part can be air-dried or forced-dried (using an oven set to 250 °F). Prior to coating, the frame must be handled carefully. Use cotton gloves so that oily fingerprints are not left on the pretreated surface.

Choose a powder coating that will provide you with the coating characteristics you most desire. Polyester, TGIC polyester, urethanes and acrylics all have the best UV resistance, and also have superior corrosion resistance when compared to standard liquid finishes.

The powder coating is electrostatically applied to a film thickness recommended by the powder formulator. After coating, the frame must be fully cured in accordance with the powder formulator's recommendation. Curing takes place in an oven with a set point adjusted to obtain the metal temperature for the prescribed period of time, as detailed in the cure curve of the powder coating.

Remember: If the part is not cleaned, pretreated, dried, coated and cured properly, then the resultant finish will not perform up to expectations.

Question

I work for a leading manufacturer of recirculating baths and chillers. We are currently bringing a white powder-coating operation in-house. Case assemblies with the white polyester powder coat receive a teal band with the company logo and model, which is screen-printed onto the case. What types of ink will exhibit strong adhesion and scratch-resistance to a polyester powder? Our current air-dry ink is fine for text and symbols, but is not durable enough for a 2-in. x 6-in. band.

Answer

Because most powder coatings have superior chemical resistance, it may be difficult to get good adhesion when using some screening inks. There are many companies, however, that silk-screen after powder coating.

The key to performing this operation successfully is to have good communication with your powder formulators. As long as they are aware of the requirement, they will ensure that the powder coating supplied will accept a screening ink. They also will be able to recommend several manufacturers of inks that have been successfully applied to their powder coatings in the past. Discuss your intentions with the powder formulator, who will be more than happy to accommodate you.

Stump the Consultant

As you may be aware, this column is new to *P&SF*. In order for it to be successful, we need your questions. Now is the time for you to participate in playing "Stump the Consultant." Send your powder coating questions, and we will be glad to answer them. *We need your help!* **P&SF**