Pretreatment of Metals Prior to Powder Coating & Troubleshooting of Powder Coating

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Metal Pretreatment

Most industry-accepted methods for pretreatment of metals are suitable for metals destined to be powder coated. Proper cleaning and pretreatment is essential for good adhesion. Typically, the cleaned material is pretreated with either a chromate or chrome-phosphate conversion coating prior to painting.

Coating Procedure

Powder should be sprayed on the parts in a diffused pattern to ensure an even coating. The guns should be held about four inches from the work. At least one cross coat is needed.

The actual technique will vary from operator to operator, but for optimum flow and appearance, the thickness should be 2.5–3 mils. Racks and fixtures must be kept clean for high transfer efficiency of powder as well as for safety considerations. Hooks in series should be avoided.

SHOP TALK TIP

Tips for Metal Pretreatment For Powder Coating

- Start with clean substrate
- Conversion coat (chrome or chrome phosphate
- Spray in diffused pattern
- Spray guns—4 in. from work area
- Cross coats: Minimum of one needed
- Coating thickness: 2.5–3.0 mils
- Keep racks & fixtures clean
- Powder must be clean & dry
- Keep the line short between air filters/moisture separators & spray unit
- Check moisture content frequently
- Guns must be clean & properly adjusted

To ensure that the powder is both clean and dry, air filters and moisture separators should be as close to the spray unit as possible. The moisture content of the air supply should be frequently checked.

The guns must be kept clean and properly adjusted. Poor adjustment can result in rejects or uneven film thickness. Powder supply lines should be as short as possible.

Troubleshooting Powder Coating

The powder coating booth itself may have problems with contamination, as well as part coverage and powder recovery percentages. Contamination can come from the air supply, hangers, conveyor systems and the recovered powder.

Poor part coverage can be the result of too much air supply to the booth or room drafts. Low powder recovery can be attirbuted to booth variables, such as too low air volume, poor booth containment and too many powder lines.

General problems from the curing end include temperature controllers, such as thermocouples, air curtain seals and exhaust rates. Part contamination from improperly maintained air handling systems or oven contamination can occur. Powder blow-off can result from too high an air impingement on the parts.

Most problems can be solved with the use of a small pilot system in which the controls can easily be manipulated and the problem quickly resolved. P&SF

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Troubleshooting For Powder Coating

Fault	Usual Cause
Physical properties	Poor treatment, moist or contaminated air supply
Poor gloss	Moist powder, poor grounding, excessive reclaim powder
Orange peel/ poor adhesion	Moist powder, high coating thickness, poor pretreatment, low curing
Dust in coating	Air/oven contamination, pretreatment problems, powder reclaim
Brittleness	Insufficient cure
Yellowing	Over-bake, oven/air contamination

Editor's note: *This information was excerpted from the "Organic Finishing of Light Metals" lecture in AESF's new Light Metals Finishing Course. The course will be given on December 6-8 in Elk Grove Village, IL.*

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