

**FORREST TECHNICAL COATINGS**  
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**Introduction**

The purpose of this document is to provide a guideline for the application of our powder coatings. FORREST provides powder coatings for use in general industrial, furniture, heat resistant, electrostatic dissipative (ESD), and other unique performance applications.

Our powder coatings provide properties such as: corrosion resistance, chemical resistance, overbake stability, heat resistance, and exterior durability.

In order for the coating to have optimal performance the following steps are critical.

1. Surface preparation
2. Pretreatment
3. Coverage
4. Cure (Oven temperature, line speed, and substrate temperature)
5. Storage

**Surface Preparation and Pre-treatment**

Clean all surfaces to be coated in accordance with SSPC-SP-1, Solvent Cleaning, prior to additional surface preparation or coating application. Surface must be clean, dry and free of any dirt, dust, oil, and all other visible contaminants that could potentially interfere with adhesion of the coating.

The overall performance of the coating system is largely dependent on the nature of the substrate and the type and quality of the surface preparation. Surfaces to receive coating may be prepared using liquid pretreatment or abrasive blast cleaning. Powder coatings that require heat resistance must use a liquid pretreatment that has been designed for high temperature service. Before using phosphate pretreatments contact your supplier for temperature limitations. Substrates also have structural physical temperature limits that must be observed.

For optimal results we recommend abrasive blast cleaning in accordance with SSPC SP-10/NACE #2, ISO SA 2.5, with an anchor profile of .75 to 1.5 mils (18.5 to 37.5 microns).

**Methods of Application**

There are many methods available for applying powder coating materials that range from simple fluidized beds to more sophisticated electrostatic spray process. Selection should be based on the product characteristics, means of applying the powder, and the available space. A typical method of applying powder coatings is through electrostatic spray. A charge is applied to the powder using voltage or friction. The sprayed powder is aimed at an earth grounded part. Charged powder is attracted to earth grounded parts and sticks to surface it is being applied to.

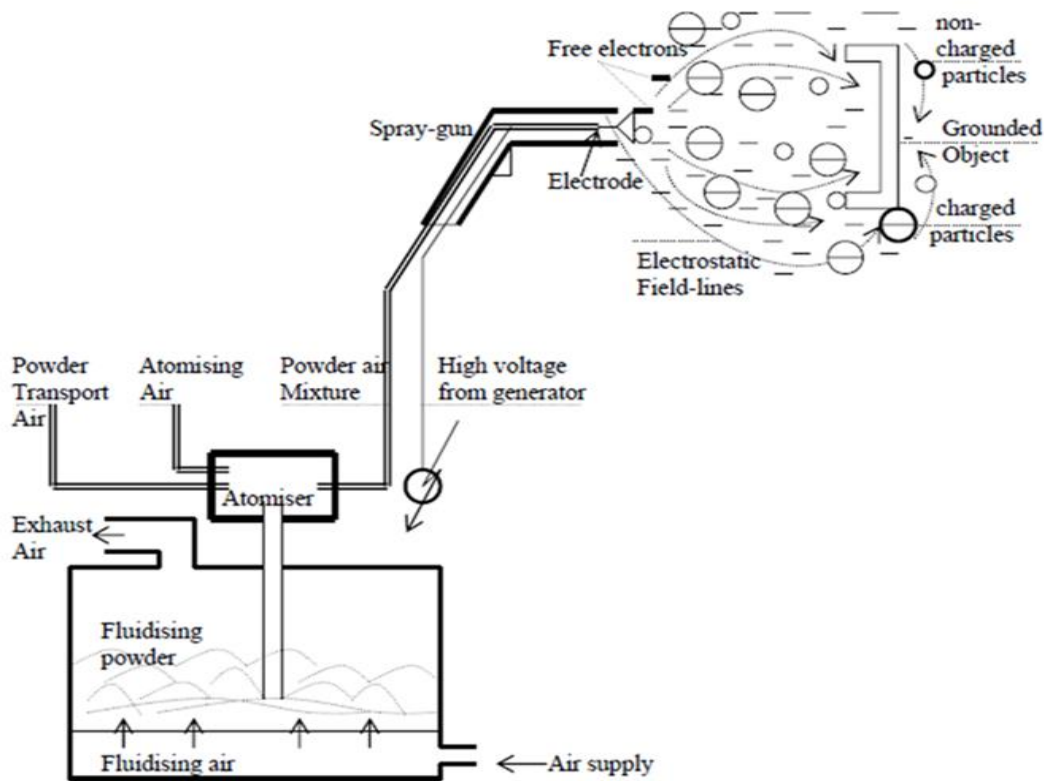


Image: Image: Electrostatic Spray Coating- Corona Type

For optimal results, when using an electrostatic powder coating spray process, operators must be adequately grounded, usually through the gun handle, to prevent buildup of a static charge on the operator's body. Powder spray gun parts that come into physical contact with moving powder must be inspected and cleaned on a regular basis. Parts contacting moving powder are prone to wear due to high velocity and impact fusion. Worn parts result in poor control of powder flow, accentuated impact fusion, and more frequent cleaning. If a part is obviously worn, it should be replaced.

Electrostatic powder spray guns (manual and automatic) should be checked periodically to determine the level of electrostatic charge being imparted to the powder material. The lack of, or decrease in, expected electrostatic charge indicates a problem in the electrostatic system which should be corrected as soon as possible. We recommend contacting your equipment supplier for additional service tips.

When possible powder should be added to a fluidized powder hopper being supplied with dry, oil-free, compressed air and allowed to fluidize for at least 30 minutes before application.

### Coverage

It is essential that the coating thickness is within the range that is recommended on the technical data sheet. We recommend that the powder coating thickness is checked using an electronic tool that allows for non-destructive measurement on metal substrates. Follow ASTM D7378 – 16, Standard Practice for Measurement of Thickness of Applied Coating Powders to Predict Cured Thickness. A

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holiday detector can be used to check the coating for pinholes, voids, contamination, cracks and damaged areas.

### **Cure**

All FORREST powder coatings must be cured according to the product data sheets. “Cure temperature” means substrate or part temperature. The best way to ensure cure is to monitor part preheat and post-bake temperature history, install automatic recording charts on ovens and check the pre-coat temperature of parts. When possible run a DataPaq or other temperature recorders on the line and/or oven to review actual oven performance. To reach proper cure adjustments can be made to line speed or oven temperature.

To determine if a product is fully cured the following tests can be performed:

- Solvent Test – After coating has cooled to room temperature place a cloth saturated with acetone or MEK on the coating for approximately 30 seconds. If the coating becomes tacky and transfers onto the cloth, leading to exposure of substrate, it is not cured. This test is only good for determining drastic under-cure. A nearly cured coating may pass this test. Also, some coatings have pigments soluble in MEK or acetone. These pigments will leave traces of color on a cloth even though the coating is fully cured.
- Impact Test – Because an uncured film of fusion bonded epoxy coating is more brittle than a cured film impact resistance can be used as a cure indicator. Uncured coatings fracture readily when impacted. This test is destructive and should be used with care. Substrate thickness, substrate curvature, substrate cleanliness and shape of the impact device all affect results. Reference ASTM D2794-90, Standard Test Method for Resistance of Organic Coatings to the Effects of Rapid Deformation (Impact).

### **Storage**

Powder coatings require a cool, dry storage environment. Ideal storage conditions are at temperatures below 80°F/27°C and humidity levels under 60 percent. Please note low-cure powder coatings may require even cooler temperatures. In locations prone to hot, humid conditions, air conditioned storage is a good option. Avoid placing powder inventory in close proximity to any heat source such as an oven, washer, furnace, space heater, etc. Powder packaging is designed to protect the contents from compression that can result in clumps that are not readily broken. Do not stack packages that are broken or collapsed. Some powders with special appearance, performance, or cure properties may have greater sensitivity to storage conditions, and should receive greater attention when stored to ensure the desired results. Check powder which has been sitting in fluid beds, reclaim systems or gun delivery systems for extended periods of time to make sure it’s free of clumps. Clumps indicate moisture in the powder. If clumps are present a sieve may be used to break up powder agglomerations before spraying.