

TECHNICAL BRIEF #7

Solvent Rub Cure Testing

BACKGROUND

A solvent rub test is often used to check the cure of powder coatings. However, there are many variables to consider when setting up a method. This Technical Brief reviews different aspects of a solvent rub test and how to interpret results.

TIPS FOR SOLVENT RUB TESTING

- 1.) There are numerous variations for setting up a solvent rub test method and rating system
- 2.) Be consistent with the test method and how it is performed
 - a. Use a standard weight
 - i. q-tip is more commonly used
 - ii. 2 pound hammer - typical for lab testing
 - b. Use the same type of towel, cloth, or rag
 - c. Use the same chemical: 100% MEK is most common
 - d. Do the same number of double rubs; Moving the weight back and forth is considered one double rub.
 - e. **The pressure applied, number of rubs, and the type of solvent used will affect the results
- 3.) Results from this test should always be compared with fully cured panels representing the same product under evaluation
 - a. Coatings do not all have the same solvent resistance
 - b. At times the procedure must be modified for a specific product to provide a meaningful test
- 4.) This type of test method is designed to differentiate between cured and uncured powder coatings and requires interpretation
- 5.) Using the DV rating method shown in the example, a 3 is typically considered cured and passes
- 6.) A rating of less than 3 generally indicates an under cure; except for textures and metallics.
- 7.) Typical results (based on 100 double rubs with MEK):
 - a. High gloss TGICs tend to soften but are typically a 4 with good appearance, little to no loss of gloss
 - b. Epoxies are typically a 4-5 and don't soften
 - c. Semi Gloss products typically lose gloss and are a 3
 - d. Textures typically have a little color transfer (2) due to the rough surface, but the film is intact
 - e. Metallics typically have a noticeable change in appearance with metallic transfer (2) since some metallic is at the surface
 - f. 0-1 ratings will typically start to appear early on in the test and point to severe under cure
- 8.) Refer to PCI Recommended Procedure #8 for additional information

EXAMPLE

DV Powder Lab Method

Parameters

- 2 lb hammer
- Kintex towel
- 100% MEK
- 100 double rubs (unless noted)

Rating

5 = No effect on film appearance or gloss.
No softening with fingernail

4 = Some marring and slight change in appearance or softening with fingernail

3 = Loss of gloss but no removal of the film

2 = Some removal of the film (color transfer) and loss of gloss

1 = Film appears melted, partially dissolve; Removal of the film and color transfer

0 = Dissolved to bare metal

*Abbreviations for observations to go with a rating

NC = No change
S = softened
CT = color transfer
LOG = loss of gloss