

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. A two pound hammer is 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 cured and uncured powder coatings and requires interpretation.
5. Using the DV rating method shown in the example, a three is typically considered cured and passes.
6. A rating of less than three 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 four with good appearance, little to no loss of gloss.
 - b. Epoxies are typically a four to five and don't soften.
 - c. Semi-gloss products typically lose gloss and are a three.
 - 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. Zero to one ratings will typically start to appear early 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
- Kimtex 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 dissolved; 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