



ASSOCIATION CONNECTING
ELECTRONICS INDUSTRIES

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IPC-TM-650 TEST METHODS MANUAL

1 Scope This test method is to determine the resistance of the applied conformal coating to reverting to liquid when exposed to high humidity at a specific temperature and time condition for each class. This test method is to evaluate the quality of the coated printed boards under storage conditions (nonoperating).

2 Applicable Documents

IPC-CC-830 Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies

FED-STD-141 Method 4061 (Dry-Through For Varnish, Lacquers And Enamels)

3 Test Specimens Five coated “Y” shape patterns (see Figure 1) containing two resistors, one with marking ink and one with color code bars, coated with conformal coating per the coating supplier's recommendations.

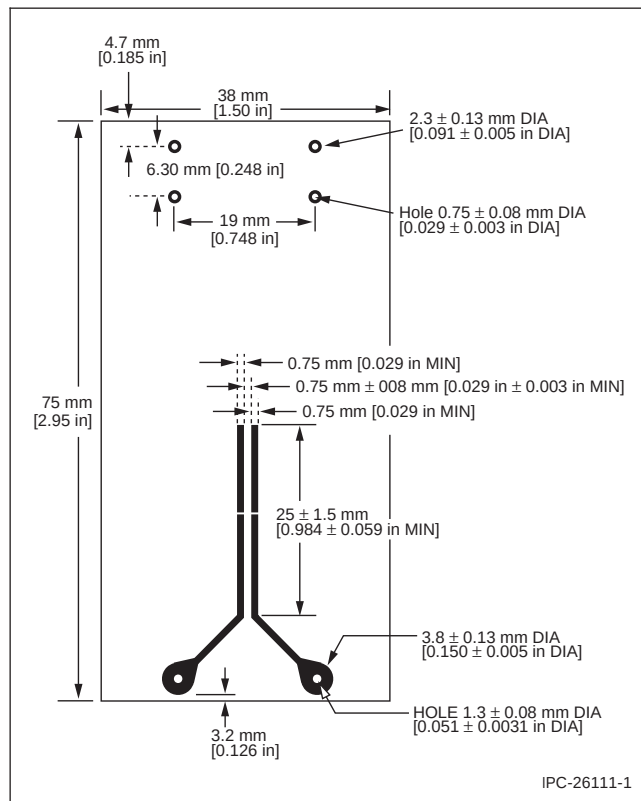


Figure 1 “Y” Shape Pattern

Number 2.6.11.1 (Supersedes 2.6.11B for Conformal Coating Test)	
Subject Hydrolytic Stability - Conformal Coating	
Date 07/00	Revision
Originating Task Group Conformal Coating Task Group (5-33a)	

4 Equipment

4.1 Desiccator At least 25 cm [9.84 in] in diameter

4.2 Potassium Sulfate Reagent grade potassium sulfate

4.3 Cotton Swabs

4.4 Oven Capable of maintaining temperature up to 100°C [212°F].

4.5 Test Chamber Capable of maintaining a constant temperature of 85° ± 2°C [185° ± 3.6°F] with 95 ± 4% relative humidity

4.6 Soldering Iron If applicable

4.7 High Temperature Silicone Grease

5.0 Procedures

5.1 Desiccator Method

5.1.1 Prepare a saturated solution of distilled or deionized water and potassium sulfate (35 grams per 100 cm³) at a temperature of 85° ± 2°C [185° ± 3.6°F]. Pour the solution into the desiccator just below the ceramic plate. Crystals of potassium sulfate should remain visible in the saturated solution during testing.

Note: Relative humidity is not to exceed 98%.

5.1.2 Place four of the five test specimens on the ceramic plate in the desiccator so that they are not touching each other. The fifth specimen is used as a control.

5.1.3 Seal the desiccator with high temperature silicone grease and close the desiccator.

5.1.4 Place the desiccator in the oven maintained at 85° ± 2°C [185° ± 3.6°F].

5.1.5 Allow the desiccator, containing the test specimens, to remain in the oven for 120 days.

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5.2 Evaluation

5.2.1 During testing, examine the test specimens at 28th, 56th and 84th days. Prior to examining the test specimens, they shall be returned to 25°C [77°F] and 50% relative humidity for two hours. Evaluate the specimens for evidence of reversion as indicated by softening, chalking, blistering, cracking, tackiness, loss of adhesion or liquefaction. Evaluate also legibility of the markings on the board and/or the resistors.

5.2.2 After the 120-day aging period, the panels shall be returned to 25°C [77°F] and 50% relative humidity and held for seven days. The specimens shall be evaluated and compared with the control specimen as per 5.2.1. The specimens shall also be tested for tackiness in accordance with Method 4061 (Dry-Through For Varnish, Lacquers And Enamels) of FED-STD-141.

5.3 Chamber Method

5.3.1 Place four of the five test specimens into the test chamber, by placing them in a rack or hanging, so that they do not touch each other. The fifth specimen is held as a control. Close the chamber door.

5.3.2 Set the chamber's parameters at $85^{\circ} \pm 2^{\circ}\text{C}$ [$185^{\circ} \pm 3.6^{\circ}\text{F}$] and $95 \pm 4\%$ relative humidity. Activate the test chamber and begin testing.

5.3.3 Allow the specimens to remain in the test chamber for 120 days.

5.4 Evaluation

5.4.1 During testing, examine the test specimens at 28th, 56th and 84th days. Prior to examining the test specimens, they shall be returned to 25°C [77°F] and 50% relative humidity for two hours. Evaluate the specimens for evidence of reversion as indicated by softening, chalking, blistering, cracking, tackiness, loss of adhesion or liquefaction. Evaluate also legibility of the markings on the board and/or the resistors.

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