The Institute for Interconnecting and Packaging Electronic Circuits
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IPC-TM-650
TEST METHODS MANUAL

Number	
2.6.2.1	
Subject	
Water Absorption, Metal Clad Plastic Laminates	
Date	Revision
5/86	**A**
Originating Task Group	
N/A	

1.0 Scope This test method is designed for use in determining the amount of water absorbed by plastic laminates when immersed in distilled water for 24 hours.

2.0 Applicable Documents

IPC-TM-650 Method 2.3.6, Etching Ammonium Persulfate Method

IPC-TM-650 Method 2.3.7, Etching, Ferric Chloride Method

IPC-TM-650 Method 2.3.7.1, Etching Cupric Chloride

3.0 Test Specimens

3.1 Dimensions The test specimens used in this test shall be 2.0 inches long by 2.0 inches wide by the thickness of the material (unless otherwise specified). Tolerance on length and width shall be ±.03.

3.2 Edge Finish The edges of the specimens shall be milled or sanded smooth with 400 grit sandpaper.

3.3 Number of Specimens Three specimens shall be used for this test.

3.4 Removal of Metal Cladding The metal cladding shall be removed by etching per IPC-TM-650, Methods 2.3.6, 2.3.7 or 2.3.7.1, or other suitable method which does not affect the surface of the laminate.

4.0 Apparatus

4.1 Circulating air oven capable of maintaining a uniform temperature of 105° to 110°C (221° to 230°F).

4.2 Desiccator A stabilization chamber (drying cabinet) capable of maintaining less than 20% R.H. at 21 ±2°C.

4.3 Analytical Balance

5.0 Procedure

5.1 Cleaning The specimens shall be cleaned by at least three repeated wipings with a clean damp cloth.

5.2 Conditioning The specimens shall be conditioned by drying in an oven for 1 hour at 105° to 110° (221° to 230°F), cooled to room temperature in a desiccator, and weighed immediately upon removal from the desiccator.

5.3 Weighing The weight of each conditioned specimen shall be determined to the nearest 0.1 milligram and recorded.

5.4 Immersion The conditioned specimens shall be placed in a container of distilled water maintained at 23° ±1.1°C (73.5 ±2°F) and shall rest on edge entirely immersed. At the end of 24 hours minus 0 plus 30 minutes, the specimens shall be removed from the water one at a time, all surface water removed with a dry cloth, and weighed immediately. A weighing bottle shall be used for materials where water absorption during weighing has been demonstrated to significantly affect results.

5.5 Calculations Calculate and record the percent increase in weight for each specimen to the nearest 0.01 percent as follows:

$$\text{Increase in weight, percent} = \frac{\text{wet weight—conditioned weight}}{\text{conditioned weight}} \times 100$$

5.6 Report Report the average for the three specimens. Report individual specimen results when requested.