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

Number	
2.6.2	
Subject	
Moisture Absorption, Flexible Printed Wiring	
Date	Revision
5/98	**C**
Originating Task Group	
Flex Peel Strength Test Methods Task Group (D-13A)	

1 Scope This test method defines the procedures to determine the moisture absorption properties of copper clad or unclad flexible dielectrics.

2 Applicable Documents None

3 Test Specimen Prepare three specimens 10 cm x 10 cm.

4 Apparatus

4.1 Apparatus Approved Method

4.1.1 Test Chamber Oven capable of maintaining the specimen at 105°C to 110°C.

4.1.2 Analytical Balance Analytical balance having an accuracy of ± 0.001 gram.

4.1.3 Miscellaneous Vessel for holding distilled water, etcher, and chemical etchants, desiccator, and 40 mm x 100 mm weighing bottles.

5 Procedure

5.1 Procedure Approved Method

5.1.1 Preparation

5.1.1.1 If the sample under test is a copper clad dielectric, proceed to 5.1.1.2. If it is an adhesive coated dielectric, laminate it to copper foil using time, temperature, and pressure, which will impart a normal state of cure to the adhesive. If it is a bare dielectric, proceed to 5.1.2.

5.1.1.2 Etch away the copper and wash thoroughly with water.

5.1.1.3 Dry a glass-stoppered weighing bottle for each specimen at 105°C to 110°C for one hour. Immediately place in a desiccator, allow to cool to room temperature, and weigh to nearest 0.001 gram. Return weighing bottles to desiccator.

5.1.2 Test

5.1.2.1 Dry the specimen(s) from 5.1.1.2 in an oven at 105°C to 110°C for one hour. Place each specimen in a tared weighing bottle stopper and weigh to nearest 0.001 gram. Repeat until constant weight is reached. Return weighing bottles to desiccator.

5.1.2.2 Immerse the specimen for 24 hours in distilled water at a temperature of 23°C ± 1°C. Specimens should rest individually in the container and not be stacked up or in surface-to-surface contact with each other.

5.1.2.3 Remove each specimen from the water and lay on a panel of dry polyethylene film, which, in turn, is laid on a flat surface (e.g., plate glass). Using a 2.54 cm diameter elastomeric roller (hardness of 70-80 durometer Shore A) roll the surface of the specimen three or four times in one direction until the surface is free of water. Turn the specimen over on a dry area of the polyethylene film and repeat the preceding step. Place the specimen between layers of absorbent paper and roll three or four times. Repeat until there is no apparent absorption by the paper. Place immediately into the tared weighing bottle, cover and weigh to the nearest 0.001 gram.

This is the most critical part of the test; care must be given to removing moisture from the samples. Limit time between removal from water to putting in weighing bottle to 30 seconds.

5.1.3 Evaluation Calculate the water absorption as follows:

$$\text{Percent of Absorption} = \frac{W_2 - W_1}{W_1} \times 100$$

where:
W_1 = weight before immersion
W_2 = weight after immersion

Average the results of the three specimens and report this average.

NOTE: If the results for the specimens vary more than 1%, the test must be repeated.