The Institute for Interconnecting and Packaging Electronic Circuits
2215 Sanders Road • Northbrook, IL 60062-6135

IPC-TM-650
TEST METHODS MANUAL

Number	
2.3.6	
Subject	
Etching Ammonium Persulfate Method	
Date	Revision
7/75	**A**
Originating Task Group	
N/A	

1.0 Scope To determine the quality of the dielectric material after etching with ammonium persulfate.

2.0 Applicable Document None.

3.0 Test Specimen Specimen 2 in. x 2 in. X thickness of one ounce or two ounces copper clad.

4.0 Apparatus

4.1 Heated Electrical Equipment for etching the specimen.

4.2 Air Circulating Chamber capable of maintaining 80°C ± 3°C (176°F).

4.3 Equipment and Chemicals needed to perform this test are as follows: Rubber or polyethylene gloves, lint-free cloth, grade FFF pumice and plastic scrubbing brushes, distilled water, 10% solution oxalic acid, ammonium persulfate solution, methylethyl ketone, toluol, and trichlorethylene.

5.0 Procedure

5.1 Preparation of Specimen Remove rough edges from the specimen by sanding or other suitable means.

5.2 Etching Etch specimen with vigorous agitation for the minimum time in 66° BAUME ammonium persulfate solution monitored at 43°C ± 3° (109.4°F). After removal of the copper, immediately wash the specimen with running tap water for 2 to 5 minutes and keep the specimen from drying until the specimen is placed in the chamber. Immerse the specimens in a 10% solution of oxalic acid in distilled water 25°C ± 8° (77°F) for 15 to 20 minutes providing gentle circulation of the oxalic acid solution during this period. Flush the specimen with tap water for 2 to 5 minutes, then scrub the specimens with pumice to remove resist. Wipe the resist off with a lint free cloth moistened with a suitable solvent. Scrub the specimen with a plastic bristled brush under running tap water for 2 to 5 minutes. Rinse the specimen again in distilled water.

5.3 Condition Dry the specimens for 1 hour in a chamber maintained at 80°C (176°F). If specimens are for electrical tests, handle only with rubber or polyethylene gloves.

5.4 Evaluation of Test Examine specimens for white deposits or other surface contaminants, loss of surface resin, softness, delaminations, blistering or measling. Clad specimens also should be evaluated for blisters or delamination of the copper foil.

6.0 *Notes*

6.1 If the etching time exceeds 15 minutes for 1 ounce copper or 30 minutes for 2 ounces copper, renew the etching solution.

6.2 Oxalic acid is very toxic and extreme care should be exercised.

6.3 The time to produce a clean pattern with a minimum of undercutting is approximately 7 minutes for 1 ounce copper and 15 minutes for 2 ounces copper, using fresh solution.