ASSOCIATION CONNECTING
ELECTRONICS INDUSTRIES®

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IPC-TM-650
TEST METHODS MANUAL

Number	
2.3.42	
Subject	
Solder Mask - Resistance to Solvents and Cleaning Agents	
Date	Revision
03/07	
Originating Task Group	
Solder Mask Performance Task Group (5-33b)	

1 Scope This test method is used to determine the ability of a solder mask to resist degradation by solvents and cleaning agents.

2 Applicable Documents

IPC-SM-840 Qualification and Performance of Permanent Solder Mask

IPC-A-25A-G-KIT[1] Multipurpose One-Sided Test Pattern

3 Test Specimens Six (6) IPC-B-25A boards coated with solder mask on the top side. Five are to be tested and one is to be held as a control.

The IPC-A-25A-G-KIT artwork package provides the Gerber files necessary for the fabrication of the standard IPC-B-25A test board used with this test method.

4 Apparatus and Reagents

4.1 Reagent Grade 2-Propanol (Isopropyl Alcohol)

4.2 Deionized Water (DI Water) with resistivity ≥2 MΩ-cm and ≤10 MΩ-cm

4.3 10% Alkaline Detergent [by volume], which shall be comprised of

- 5% alkanolamine
- 2.5% 2-butoxyethanol
- 2.5% glycol ether
- 90% DI Water

4.4 Monoethanolamine

4.5 Miscellaneous laboratory-ware (e.g., beakers, funnels, storage bottles, graduated cylinders) including:

1) A hot plate capable of heating up to 65 °C [149 °F]
2) A thermometer capable of measuring accurately up to 100 °C [212 °F]
3) A vent hood, or performed with adequate ventilation

4.6 Thermometer with measurement uncertainty less than 2 °C [3.6 °F] and precision better than 1 °C [1.8 °F].

5 Procedures

5.1 Chemical Exposure

5.1.1 Prepare the solvents and cleaning agents as outlined in Section 4 and Table 1.

5.1.2 Completely immerse one test specimen in each of the solutions shown in Table 1. A new specimen is to be used for each chemical.

5.1.3 After immersion, hang the specimens to dry for ten minutes at ambient laboratory conditions.

Table 1 Exposure of Solder Mask to Solvents/Cleaning Agents

Solvent/ Cleaning Agent	Temperature (°C) [°F]	Time (Minutes)
Isopropanol	Ambient Laboratory Conditions	2
75% isopropanol/ 25% deionized water	46 ± 2 °C [115 ± 3.6 °F]	15
10% Alkaline detergent	57 ± 2 °C [135 ± °F]	2
Monoethanolamine	57 ± 2 °C [135 ± °F]	2
Deionized water	60 ± 2 °C [140 ± °F]	5
D-Limonene	Ambient Laboratory Conditions	2

Note: Record the ambient temperature and temperature measurement uncertainty in °C.

5.2 Visual Examination

5.2.1 Visually examine each printed board with corrected 20/20 vision without magnification for delamination or surface degradation such as cracks, tackiness, blisters or swelling of the solder mask.

6 Notes

6.1 Safety Operator should be trained and familiar with the hazards inherent to the chemicals being used and analyzed. Proper personal safety equipment, such as safety glasses, gloves and splash apron, and adequate ventilation shall be used.

1. www.ipc.org/onlinestore