ASSOCIATION CONNECTING
ELECTRONICS INDUSTRIES®

3000 Lakeside Drive
Bannockburn, IL 60015-1249

Number	
2.4.7.1	
Subject	
Solder Mask - Determination of Machineability	
Date	Revision
03/07	
Originating Task Group	
Solder Mask Performance Task Group (5-33b)	

IPC-TM-650
TEST METHODS MANUAL

1 Scope This test method specifies techniques for the determination of machineability of a solder mask.

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. Three are to be tested as-received and three are to be tested after solder float exposure.

The IPC-A-25A-G-KIT artwork package provides the Gerber information necessary for the fabrication of the standard IPC-B-25A test board.

4 Apparatus and Reagents

4.1 Drill

4.1.1 Drill speed of 1500 ± 250 rpm

4.1.2 Drill bit size of 6.35 mm [0.25 in]

4.2 Router

4.2.1 Speed of 20,000 ± 5,000 rpm

4.2.2 Router bit to be standard for printed board fabrication and operation at recommended speed. Bit must be sharp and in good working order.

4.3 Band Saw

4.3.1 Speed of (442 ± 76) m/min [(1450 ± 250) ft/min]

4.3.2 Blade of 1.2 cm [0.5 in] width, 0.89 mm [0.035 in] gauge, and 10-14 pitch

4.4 Punch

4.4.1 2.5 cm [1 in] square die

4.4.2 Clearance range between punch and die to be [0.001 to 0.003 in]

4.5 Permanent Marker and/or Vibrating Scribe

4.6 Hammer or Mechanical Punching Apparatus

5 Procedures

5.1 Preconditioning

5.1.1 Process three of the IPC-B-25A coupons per IPC-SM-840, Resistance to Tin-Lead Solder - Solder Float

5.2 Drilling

5.2.1 Drill three holes in each coupon directly below the label ''B'' on the test specimen.

5.3 Routing

5.3.1 Route a straight edge along the top side of each coupon.

5.3.2 Use a permanent marker or vibrating scribe to serialize each resulting piece.

5.4 Sawing

5.4.1 Make a single cut along the bottom edge of each coupon removing the finger tab area.

5.4.2 Use a permanent marker or vibrating scribe to serialize each resulting piece.

5.5 Punching

5.5.1 Place the punch over the fiducial above the comb pattern labeled ''F'' on the test specimen.

1. www.ipc.org/onlinestore

5.5.2 Apply sufficient force to the punch using the apparatus in 4.6 to remove the section from the test specimen.

5.5.3 Use a permanent marker or vibrating scribe to serialize each resulting piece.

5.6 Visual Examination

5.6.1 Visually examine each coupon and the extracted pieces for evidence of tears or cracks 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.