



IPC-TM-650 TEST METHODS MANUAL

Number 2.4.42.1	
Subject High Temperature Mechanical Strength Retention of Adhesives	
Date 3/88	Revision
Originating Task Group N/A	

1.0 Scope The object of this test is to determine the component hold-down capability of the adhesive material at wave soldering temperatures due to material softening or degradation. Test coupons are assembled using the adhesive material and 1206 size chip resistors. The test coupons are preheated then floated on a solder pot, after which the loss of any components is noted.

2.0 Applicable Documents

MIL-F-14256 Flux, Soldering, Liquid (Rosin based)

QQ-S-571 Solder, Tin Alloy, Tin-lead Alloy, and Lead Alloy

3.0 Test Specimens

1. Bare FR-4 Test Coupon—approximately 50.8 mm [2.0 in] square
2. 1206 sized surface mount chip resistors

4.0 Apparatus Solder pot Sn 60 Sn 62 Sn 63 per QQ-S-571—temperature controlled to provide 260 ± 5°C.

5.0 Procedures

5.1 Test Coupon Fabrication A single test coupon is made by applying 20 adhesive dots or rectangles on to a bare FR-4 coupon. The thermal cure adhesive dots shall be stenciled providing a dot 0.1 mm [0.004 in] thick and 1.27 mm [0.050 in] in diameter. The ultraviolet cured adhesive deposits shall be stenciled into a 2.0 x 0.76 mm [0.080 x 0.030 in] rectangular slit of 0.1 mm [0.004 in] thickness.

The chip resistors are first centered over then securely pressed into the adhesive deposits. The resistors are aligned

over the UV adhesive rectangles such that equal adhesive volumes are observed at both component sides.

The assembly is then cured per manufacturers recommended conditions.

5.2 Solder Float The test coupon is fluxed with a type R per MIL-F-14256 flux and excess drained off. The coupon is then held approximately 12.7 mm [0.5 in] above the dross-free solder pot surface for 60 ± 5 seconds with the component side facing the solder surface. The coupon is then brought into contact with the clean solder surface and allowed to float for 10 + 1-0 seconds while being lightly but continuously agitated.

After cooling, the remaining flux residue is cleaned from the surface and the coupon examined for severely displaced components. A component is severely displaced if:

1. No longer on the test coupon.
2. It is rotated more than 30 degrees from its original position.
3. It is lifted or tilted away from the board's surface leaving a gap between either component termination and the board of more than 1 mm [0.040 in]. A suitable thickness shim may be used in this determination.

5.3 Evacuation Any evidence of severely displaced components on the processed test coupons shall be noted.

6.0 Notes None