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

Number	
2.4.49	
Subject	
Solder Pool Test	
Date	Revision
1/95	
Originating Task Group	
Solder Alloy Task Group (5-24c)	

1.0 Scope This solder pool test method provides a measurement of wetting characteristics of flux on/in flux-coated and/or flux-cored solder.

2.0 Applicable Documents

J-STD-006 Requirements and Test Methods for Electronic Grade Solder Alloys and Fluxed and Non-fluxed Solid Solders for Electronic Soldering Applications

ASTM B-36 Brass Plate, Sheet, Strip, and Rolled Bar

3.0 Test Specimen

3.1 Three approximately 30 mm long pieces of 1.5 mm diameter, flux-cored wire solder, three approximate 2 gram pieces of flux-coated, flux-cored, or flux-coated and flux-cored ribbon solder, or three approximately 2 gram quantities of flux-coated, flux-cored, or flux-coated and flux-cored solder preforms.

3.2 Approximately 10 ml of flux extracted and prepared in accordance with J-STD-006, and three pieces of 1.5 mm, non-fluxed wire solder per J-STD-006.

4.0 Apparatus and Reagents

4.1 Three flat pieces of 0.25 mm thick 70/30 brass (per ASTM B-36 C2600 H02) approximately 75 x 40 mm.

4.2 Degreased steel wool #00.

4.3 Solder pot containing not less than 4 Kg of molten solder at a stabilized temperature of 60 ± 10°C above the liquidus temperature of the alloy used in the solder specimens, and having a solder surface diameter of not less than 80 mm and a solder depth of not less than 25 mm.

4.4 Mandrel having a diameter of 3 ± 0.5 mm.

4.5 One pair laboratory forceps suitable for use in handling hot brass coupons.

4.6 Timer with a seconds display.

5.0 Test Procedure

5.1 Preparation for Test

5.1.1 Thoroughly clean three brass coupons with steel wool and bend one corner of each coupon up at an angle of approximately 60° to facilitate the handling of the coupons with forceps.

5.1.2 Preparation of Test Specimen

5.1.2.1 When using fluxed wire or ribbon solder specimens, individually coil each piece of the solder specimen around mandrel and place one coiled piece in the approximate center of each brass test coupon.

5.1.2.2 When using fluxed solder preform specimens, place one approximately 2 gram quantity in the approximate center of each brass test coupon.

5.1.2.3 When using extracted flux and non-fluxed wire solder, individually coil each piece of the non-fluxed solder specimen around mandrel, place one drop of flux (approximately 0.05 ml) in the approximate center of each brass test coupon, and place one coiled piece of non-fluxed solder in the center of the flux drop on each brass test coupon.

5.2 Test CAUTION: When moving the brass test coupons, take extreme care to move coupons slowly and keep their test surface horizontal, so that the tests are not prejudiced by movement of flux or solder unrelated to the fluxing action.

5.2.1 Scrape the surface of the molten solder in the solder pot to remove any dross.

5.2.2 Carefully place one test coupon on the surface of the molten solder, leave for 15 ± 1 second, and remove it to a flat, level surface allowing the solder pool to solidify undisturbed.

5.2.3 Repeat step 5.2.2 with the remaining two test coupons.

5.3 Evaluation

5.3.1 Visually examine the surface of the test coupons for any evidence of flux spattering as evidenced by spots of flux and/or flux residue outside of the main pool of solder and flux residue.

5.3.2 Using a suitable solvent, remove the flux residues from the three coupons sufficient to clearly see the solidified solder pool and the remaining brass coupon surface.

5.3.3 Visually examine the thickness of the solder pool edge on the surface test coupons for any evidence of non-wetting or de-wetting.

5.3.4 The fluxed solder and/or the solder from which the flux was extracted shall fail this solder pool test if there is any evidence of non-wetting, de-wetting, or flux spattering or if the solder pool does not feather out to a thin edge.

Note: Irregularly shaped solder pools do not necessarily indicate de-wetting or non-wetting.

6.0 Safety Observe all appropriate safety precautions. Consult MSDS sheets for safety precautions for chemicals involved in this test method.