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ELECTRONICS INDUSTRIES ®

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IPC-TM-650
TEST METHODS MANUAL

Number	
2.4.34.1	
Subject	
Solder Paste Viscosity—T-Bar Spindle Method (Applicable at less than 300,000 Centipoise)	
Date	Revision
1/95	
Originating Task Group	
Solder Paste Task Group (5-24b)	

1.0 Scope This test specifies a standard procedure for determining the viscosity of solder paste in the range of 50,000 to 300,000 centipoise.

2.0 Applicable Documents None

3.0 Test Specimen Paste to be tested shall stabilize at 25°C ± 1°C for a minimum of 24 hours prior to testing. The paste volume shall be sufficient to fill a test container having a minimum diameter of 5 cm and a minimum depth of 5 cm.

4.0 Equipment/Apparatus Equipment used shall be a spindle type viscometer (Brookfield RVTD or equivalent) with a helipath stand and pen recorder. A TC spindle shall be used for tests. Spindle speed is 5 rpm. Other equipment may be used provided the results can be empirically correlated as mutually agreed upon with the following test. Additional shear rates may be specified by the user or supplier provided one data point is based as specified below.

5.0 Procedure

5.1 Preparation

5.1.1 Open the supply container(s); remove any internal cover(s); scrape off paste adhering to the lid(s), internal covers, and the container walls; and add this material to the paste in the supply container(s).

5.1.2 Using a spatula, stir the paste gently for 1 to 2 minutes to homogenize it; taking care to avoid the introduction of air.

5.1.3 If necessary, gently transfer the paste to the test container having the specified volume—without introducing air. Note: If the supply container meets the volume and size requirements, a separate test container is not needed.

5.1.4 The test container shall be placed in a constant temperature environment at 25°C ± 0.25°C.

5.1.5 After reaching 25°C ± 0.25°C, the solder paste shall be stirred and then tested within 20 minutes to minimize settling of the metal powder; while remaining at 25°C.

5.2 Test

5.2.1 Set the solder paste container below the spindle. Record data as the spindle penetrates the solder paste.

5.3 Evaluation The viscosity is calculated from the value recorded after the bar of the spindle comes in contact with the surface of the paste. Record the data in Table 1 ''Test Report on Solder Paste.''

6.0 *Notes*

6.1 Test Equipment Sources The equipment sources described below represent those currently known to the industry. Users of this test method are urged to submit additional source names as they become available, so that this list can be kept as current as possible.

6.1.1 Spindle Type Viscometer Equipment
Brookfield Engineering Laboratories, Inc.
11 Commerce Boulevard
Middleboro, MA 02346 USA
(800) 628-8139

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Table 1 Test Report on Solder Paste

Enter appropriate information in top portion of report and complete report by entering the test results or checkmarks in the appropriate spaces.

Inspection Purpose:
__ Qualification
__ Quality Conformance A
__ Quality Conformance B
__ Shelf-Life Extension
__ Performance

QPL I.D. Number: ______
Manufacturer's Identification: ______
Manufacturer's Batch Number: ______
Date of Manufacture: ______
Original Use-By Date: ______
Revised Use-By Date: ______

Date Inspection Completed: ______ Overall Results: __ Pass __ Fail
Inspection Performed by: ______ Witnessed by: ______

Inspections	User's Actual Requirement	Test Result	P/F (*)	Tested by & Date
Material				
Visual				
Metal Content				
Viscosity				
Solder Ball				
Slump				
Alloy				
Flux				
Powder Size				
% In Top Screen				
% In Next Screen				
% In Bottom Screen				
% In Receiver Bottom				
Max. Powder Size				
Powder Shape				
Tack				
Wetting				

* P/F = PASS/FAIL; enter P if test results are within tolerance of actual requirement; otherwise, enter F