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

Number	
2.6.18	
Subject	
Low Temperature Flexibility, Flexible Printed Wiring Materials	
Date	Revision
7/85	**A**
Originating Task Group	
N/A	

1.0 Scope This test method defines the procedure for determining the low temperature flexibility of flexible printed wiring materials by flexing while immersed in a solution mixed from dry ice (solid carbon dioxide) and isopropyl alcohol.

2.0 Applicable Documents None

3.0 Test Specimen The test specimen shall consist of an etched conductor pattern in accordance with Figure 1.

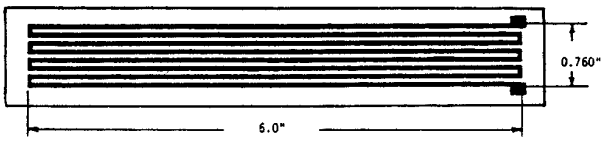

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Figure 1 Low Temperature Flexibility Test Pattern. Note: Conductors are 0.060 inch wide on 0.100 inch centers.)

4.0 Test Equipment

4.1 Flexing fixture similar to Photo 1, with 1 inch diameter mandrel.

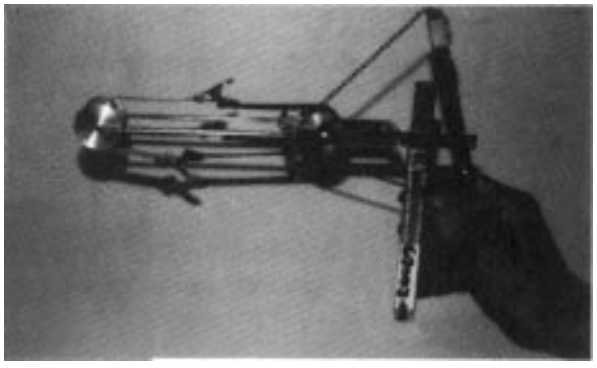

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Photo 1 Low Temperature Flexibility Flexing Fixture. (Note: Fixture Drawing available from IPC.)

4.2 Insulated container, approximately 20 quart capacity.

4.3 Two lbs. dry ice (solid carbon dioxide).

4.4 Three gallons reagent grade isopropyl alcohol.

4.5 Thermometer capable of measuring at least -65°C.

4.6 Safety gloves.

5.0 Procedure

5.1 Prepared a minimum of two test specimens per Figure 1 using good commercial practices.

5.2 Prepare a bath by mixing two lbs. of solid carbon dioxide with three gallons of isopropyl alcohol. *Caution:* use adequate safety precautions, as bath will produce extreme cold (approximately -65°C).

5.3 Mount the test specimen in the test fixture such that it is wrapped 180° around the 1 inch diameter mandrel.

5.4 Submerge the test specimen end of the flexing fixture into the cold bath and flex 5 times.

5.5 Remove the specimen from the bath and examine for cracking, delaminations, splits, and/or any other viable defect.

6.0 *Notes*

6.1 All safety precautions must be exercised when working with a mixture of dry ice and alcohol.

6.1.1 Dry ice has a temperature of -110°F, passes directly to the gaseous state, and is used as a refrigerant. Therefore, it is dangerous if not handled carefully.

6.1.2 Isopropyl alcohol is flammable and toxic; should not be ingested, and should also be handled properly.

6.2 Detailed drawings of the suggested flexing fixture are available from the IPC office.